Case No COMP/M.6203 - Western Digital Irland/ Viviti Technologies

Only the English text is authentic.

REGULATION (EC) No 139/2004
MERGER PROCEDURE

Article 8 (2)
Date: 23/11/2011

Brussels, 23.11.2011
C(2011) 8644 Final

PUBLIC VERSION

COMMISSION DECISION

of 23.11.2011

adressed to:
Western Digital Corporation

declaring a concentration to be compatible with the internal market and the EEA agreement

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(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to the Agreement on the European Economic Area, and in particular Article 57 thereof,

Having regard to Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings[1], and in particular Article 8(2) thereof,

Having regard to the Commission's decision of 30 May 2011 to initiate proceedings in this case,

Having given the undertakings concerned the opportunity to make known their views on the objections raised by the Commission,

Having regard to the opinion of the Advisory Committee on Concentrations[2],

Having regard to the final report of the Hearing Officer in this case[3],

Whereas:

1. On 20 April 2011, the Commission received a notification of a proposed concentration pursuant to Article 4 of the Regulation (EC) No 139/2004 ("Merger Regulation") by which the undertaking Western Digital Corporation ("WD", United States of America) acquires, by means of the purchase of shares, control within the meaning of Article 3(1)(b) of the Merger Regulation of the whole of Viviti

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1 OJ L 24, 29.1.2004, p. 1 ("the Merger Regulation"). With effect from 1 December 2009, the Treaty on the Functioning of the European Union ("TFEU") has introduced certain changes, such as the replacement of "Community" by "Union" and "common market" by "internal market". The terminology of the TFEU is used throughout this Decision.

2 OJ C ...,...200. , p....

3 OJ C ...,...200. , p....

Technologies Ltd, (a wholly owned subsidiary of Hitachi, Ltd and formerly known as Hitachi Global Storage Technologies Holdings Ltd. ("HGST", Singapore), (hereafter referred to as "the proposed concentration").

1. THE PARTIES

2. WD – hereafter referred to as "the Notifying Party" - designs, develops, manufactures and sells hard disk drives ("HDDs"), solid state drives ("SSDs"), external hard disk drives ("XHDDs") and media players. Its operations are vertically-integrated upstream in the manufacturing of key components, such as read/write heads and media.

3. HGST is a wholly-owned subsidiary of Hitachi, Ltd. It develops and manufactures digital storage devices, such as HDDs and SSDs, together with some branded XHDDs. It is also vertically-integrated upstream.

4. WD and HGST are hereafter referred to as "the Parties"; the entity resulting from the proposed concentration is hereafter referred to as "the Merged Entity".

2. THE OPERATION AND THE CONCENTRATION

5. On 7 March 2011, WD and Hitachi, Ltd announced and executed a share purchase agreement for the sale of all issued and outstanding capital stock of HGST. The implementation of the proposed concentration is conditional upon clearance under applicable antitrust laws and other customary closing conditions.

6. As a result of the proposed concentration, HGST will be solely controlled by WD. The operation therefore constitutes a concentration within the meaning of Article 3(1)(b) of the Merger Regulation.

3. UNION DIMENSION

7. The undertakings concerned have a combined aggregate worldwide turnover of more than EUR 5 000 million (WD: EUR 7 430 million; HGST: EUR […]* million).[4]

8. Each of them has a Union-wide turnover in excess of EUR 250 million (WD: EUR […]* million; HGST: EUR […]* million). They do not achieve more than two-thirds of their aggregate Union-wide turnover within one and the same Member State.

9. The notified concentration therefore has a Union dimension.

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[4] Turnover calculated in accordance with Article 5(1) of the Merger Regulation and the Commission Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (OJ C95, 16.04.2008, p. 1).

* Parts of this text have been edited to ensure that confidential information is not disclosed; those parts are enclosed in square brackets and marked with an asterisk.

4. PROCEDURE

10. The proposed concentration was notified to the Commission on 20 April 2011.

11. On 30 May 2011, the Commission decided to raise serious doubts as to the compatibility of the transaction with the internal market and initiated proceedings pursuant to Article 6(1)(c) of the Merger Regulation ("the 6(1)(c) Decision").

12. A non-confidential version of certain key statements of third parties collected during the Commission's first phase investigation was provided to the Notifying Party after the 6(1)(c) Decision. The Notifying Party submitted its written comments on the 6(1)(c) Decision on 15 June 2011 ("reply to the 6(1)(c) Decision").

13. On 18 August 2011, the Commission issued a Statement of Objections pursuant to Article 18 of the Merger Regulation ("Statement of Objections"), whereby the Commission provisionally concluded that the proposed concentration would create a significant impediment to effective competition on a number of HDD markets.

14. The Notifying Party replied to the Statement of Objections on 1 September 2011. On the same day, the Notifying Party waived its right to have a formal oral hearing pursuant to Article 18 of the Merger Regulation and to Article 14 of Commission Regulation 802/2004 of 21 April 2004 implementing Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings[5] ("the Implementing Regulation"). The Notifying Party made further submissions on 16 September 2011 and 26 September 2011.

15. The Notifying Party was granted access to the Commission's file on 19 August 2011, 12 September 2011, 22 September 2011 and 20 October 2011. The Commission also granted access to a data room to the Notifying Party's mandated external experts between 22 and 26 August 2011. On 15 August 2011, Toshiba Corporation ("Toshiba") waived its rights to claim confidentiality towards the Notifying Party for certain documents, on the condition that the content of such documents be disclosed only to the Notifying Party's external counsels and consultants and selected members of the Notifying Party's in-house legal counsel team. On 21 September 2011, Toshiba agreed to waive its rights to claim confidentiality towards the Notifying Party for certain documents that would be delivered, for the purpose of Article 17 of the Merger Implementing Regulation, to the Notifying Party's external legal counsels and economic consultants on the condition that they would not disclose the content of these documents to any person within the Notifying Party, including to members of the in-house legal counsel team.

16. On 16 August 2011, the Notifying Party made a request under Article 17 of the Implementing Regulation for access to the Commission's file in Case COMP/M.6214 – Seagate Technology PLC/The HDD Business of Samsung Electronics Co Ltd, which is another concentration affecting the same markets, and which was notified to the Commission one day before the notification of the WD/HGST transaction. The Notifying Party claimed that such access would be necessary to exercise its right of defence in the present case. By a letter of 25 August 2011, the Commission service refused that request. The Notifying Party repeated its request and claim to the

[5] OJ L 133, 30.4.2004, p. 1.

Hearing Officer on 26 August 2011. By a letter of 30 August 2011, the Hearing Officer also refused that request as third parties do generally not have the right of access to a file in an on-going merger proceeding. In accordance with Article 17 of the Implementing Regulation, only Seagate Technology PLC and the "other involved parties" in Case M.6214 within the meaning of Article 11(b) of the Implementing Regulation have such a right of access. In addition, in the present case, the Notifying Party has been granted access to all the relevant documents on which the present decision is based throughout the procedure. Therefore, the Hearing Officer has concluded, in his final report, that the effective exercise of the procedural rights of the Notifying Party in the present case has been respected.

17. In order to address the competition concerns identified in the Statement of Objections, the Notifying Party submitted commitments to the Commission on 3 October 2011 pursuant to Article 8(2) of the Merger Regulation. On 10 October 2011, the Notifying Party submitted a revised version of those commitments. The Commission launched a market test to gather the views of relevant market participants on the effectiveness of the proposed commitments. A further revised remedies package was submitted by the Notifying Party to the Commission on 24 October 2011, and subsequently amended pursuant to further discussions with the Commission. The Notifying Party submitted a final set of commitments on 28 October 2011.

5. COMPETITIVE ASSESSMENT

5.1. The framework of the assessment

18. WD publicly announced that it had entered into a share purchase agreement to acquire HGST on 7 March 2011. It initiated pre-notification contacts with the Commission services on 10 March 2011 and it notified the proposed concentration to the Commission on 20 April 2011.

19. Another concentration affecting the same markets, namely the acquisition by Seagate Technology Public Limited Company (controlled by Seagate Technology LLC) of the HDD business of Samsung Electronics Co., Ltd. ("the *Seagate/Samsung* transaction"),[6] was notified to the Commission on 19 April 2011, one day before the notification of the proposed concentration between WD and HGST. The notifying party in the *Seagate/Samsung* transaction initiated pre-notification contacts with the Commission on 14 March 2011 and the *Seagate/Samsung* transaction was publicly announced on the same day that it was notified to the Commission.

20. On 30 May 2011 the Commission initiated proceedings pursuant to Article 6(1)(c) of the Merger Regulation in both the *Seagate/Samsung* transaction and the proposed concentration.

21. On 8 August 2011, the Notifying Party and its parent company, WD, lodged an application for annulment of the 6(1)(c) Decision before the General Court of the

[6] Case No COMP/M.6214 – Seagate Technology PLC/The HDD Business of Samsung Electronics Co Ltd.

European Union.[7] In their application, the applicants request a partial annulment of the 6(1)(c) Decision in so far as it provides that the proposed acquisition by WD of HGST ought to be assessed on the working assumption that the parallel proposed acquisition by Seagate of the HDD business of Samsung will already have taken place (what the applicants call "the Priority Decision"). On 15 September 2011, the Commission lodged an objection to the admissibility of that application.[8]

22. On 19 October 2011, the Commission adopted a decision pursuant to Article 8(1) of the Merger Regulation declaring the *Seagate/Samsung* transaction compatible with the internal market.

5.1.1. The View of the Notifying Party

23. In a submission to the Commission dated 12 May 2011[9], the Notifying Party submitted that *"[i]n fact, as all of the previous parallel transactions have been cleared, the issue has never been of importance to the outcome of a case"*. It further submitted *that "the Commission and General Court precedents are consistent with the parallel treatment of the two cases"*. Such a parallel approach *"is consistent with the Merger Regulation which does not dictate what the Commission should do when considering two transactions in the same markets at the same time", "is justified on the specific facts of these cases", and "is the most fair and equitable solution"*. The Notifying Party further submitted that if the Commission were to consider that the two concentrations should be treated separately, the fact that the proposed concentration was entered into and announced first and that the Notifying Party was first to commence pre-notification discussions, means that the Commission should treat it first. However, after outlining this alternative approach, the Notifying Party reiterated that *"WD considers that much stronger arguments, including General Court precedent, mean that the two transactions should be considered in parallel."*

24. In its reply to the 6(1)(c) Decision, the Notifying Party withdrew from its earlier position that *"legal and policy arguments in this case are overwhelmingly in favour of considering the…transactions in parallel"*[10]. Instead, the Notifying Party submitted that the proposed concentration should be reviewed as if the *Seagate/Samsung* transaction did not exist, on the grounds that (i) the proposed concentration was signed and publicly announced before the Seagate/Samsung transaction, and (ii) WD had engaged in pre-notification discussions with the Commission before Seagate.

25. The Notifying Party argued in that reply that the past cases referred to in the 6(1)(c) Decision do not provide for support for a "first come first served" rule based on the date of formal notification. Rather, they would support the conclusion that the *Seagate/Samsung* transaction should be reviewed in light of the *WD/HGST* transaction, which was not a hypothetical factor when the *Seagate/Samsung*

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7 See Case T-452/11, Western Digital and Western Digital Ireland Ltd v Commission (OJ C 305, 15.11.2011, p. 6).

8 The Commission argues in its reply in Case T-452/11 in essence that the 6(1)(c) Decision is, according to established jurisprudence, not a challengeable act and that the Commission will take its final decision on the priority principle with the present decision.

9 Notifying Party's letter to the Commission of 12 May 2011.

10 Notifying Party's letter to the Commission of 12 May 2011.

transaction was notified to the Commission but a reality based on a legally binding agreement. Furthermore, the Notifying Party argued that there are a number of merger control systems outside the Union which do not follow the approach articulated in the 6(1)(c) Decision and the Commission itself had, in previous cases,[11] followed a different approach.

26. In its reply to the Statement of Objections (referring to its application for annulment of 8 August 2011 against the 6(1)(c) Decision), the Notifying Party submitted additional arguments against the Commission's proposed application of a priority principle based on the date of notification.

27. First, the Notifying Party submitted that the Commission is not competent to adopt a priority principle based on the date of notification, since the Merger Regulation does not provide for the application of such a priority principle and since such a rule falls outside the scope of the implementing provisions that the Commission is empowered to introduce under Article 23(1) of the Merger Regulation.

28. Secondly, the Notifying Party submitted that, as a matter of fairness and good administration, the Commission is required to approach each concentration on a case-by-case basis, on its own merits, rather than through a formalistic application of a general rule which fails to take into account the particular facts of a case. According to the Notifying Party, a decision to assess the proposed concentration against a market structure that overall includes only four HDD suppliers is contrary to the Notifying Party's legitimate expectation that the Commission would assess the proposed concentration on the basis of the market structure that existed when the Notifying Party signed, announced and "pre-notified" the proposed concentration to the Commission. Furthermore, the Notifying Party submitted that the Commission, without breaching its confidentiality obligations, should have taken steps to suggest to the Notifying Party that it might assess the proposed concentration against something other than a market involving five players. By failing to do so, the Commission knowingly allowed the Notifying Party to proceed on the mistaken understanding that the Commission would assess the proposed concentration as the consolidation of the market from five to four suppliers ("five to four merger").

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[11] The Notifying Party cited Commission Decision 999/152/EC of 20 May 1998 declaring a concentration to be compatible with the common market and the functioning of the EEA Agreement (Case IV/M.1016 Price Waterhouse/Coopers & Lybrand (OJ L 50, 26. 2.1999, p. 27) and Case COMP/M.1044 – *KPMG/Ernst and Young* (notified on 23 December 1997 (OJ C 5, 9. 1. 98, p.3) and later withdrawn). However, the Commission did not ultimately apply a combined approach in Case IV/M.1016 and Case COMP/M.1044. In its decision under the Article 6(1)(c) Merger Regulation, the Commission had considered both the market structure at the time of the notification and a market structure in which the other merger would have taken place. However, since the merger notified second was withdrawn at an early stage during the Commission's in-depth proceedings, the Commission ultimately did not have to decide the issue in those cases. The Notifying Party also cited Commission Decision 2003/26/EC of 20 December 2001 declaring a concentration to be compatible with the common market and the EEA Agreement, Case No COMP/M.2389 - Shell/DEA, (OJ L 15, 21.1.2003, p. 35) and Commission Decision 2002/792/EC of 20 December 2001 declaring a concentration to be compatible with the common market and the EEA Agreement, Case No COMP/M.2533 — BP/E.ON, (OJ L 276, 12.10.2002, p. 31). However, also for these mergers, the final Commission decision (unlike the Article 6(1)(c) Decision and the Statement of Objections) did not make explicit reference to a combined assessment approach as both mergers were finally cleared in the light of the commitments offered.

29. Thirdly, according to the Notifying Party, the Commission acted disproportionately and contrary to the principles of fairness and good administration, by requesting information from the Parties during the pre-notification procedure that went beyond the strict requirements of the Form CO.

30. The Notifying Party also submitted that but for the adoption of the priority principle, the Commission should and would have cleared the proposed concentration without issuing objections as confirmed by the fact that it has not issued a Statement of Objections with regard to the *Seagate/Samsung* transaction.

5.1.2. The Commission's Assessment

31. For the reasons that will be explained in recitals 31-44 and consistent with its previous practice, the Commission assessed the proposed concentration according to a priority principle ("first come, first served" approach) based on the date of its notification.

32. Assessing the competitive effects of a proposed concentration under the Merger Regulation involves a comparison of the competitive conditions that would result from the notified merger with the conditions that would have prevailed in the absence of the merger. In principle, the competitive conditions existing at the time of notification constitute the relevant framework of comparison for evaluating the effects of a concentration.[12] However, in some circumstances the Commission may take into account future changes to the market that can reasonably be predicted.[13]

33. The Commission takes the view that it is inherent in the general system of the Merger Regulation that a party that is the first to notify a concentration which, assessed on its own merits, would not significantly impede effective competition in the internal market or in a substantial part thereof, is entitled to have its operation declared compatible with the internal market within the applicable time limits.[14]

34. The situation where concentrations affecting the same market are notified within a very short time frame from each other is an unusual one. The Commission has faced such a situation in only a very small number of previous cases. In the recent past, the Commission decided such cases by applying a priority principle based on the date of notification. This approach has been clearly analysed in the published decisions in which it has been applied and it should have been known to the parties.[15]

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12 See, for instance, the judgment of the Court of First Instance of 6 June 2002 in Case T-342/99 *Airtours plc v Commission* [2002] ECR II-2585, paragraph 82 *("the level of competition obtaining in the relevant market at the time when the transaction is notified is a decisive factor in establishing whether a collective dominant position has been created for the purposes of Regulation No 4064/89"*), as well as judgment of the Court of First Instance of 19 May 1994 in Case T-2/93 *Air France v Commission* [1994] ECR II-323, paragraphs 70, 71 and 72; the judgment of the Court of First Instance of 8 July 2003 in Case T-374/00 *Verband der freien Rohrwerke and Others v Commission* [2003] ECR II-2275, paragraph 170; the judgment of the General Court (Sixth Chamber) of 13 September 2010 in Case T-279/04 *Éditions Odile Jacob v Commission*, [2010] ECR 0000, paragraph 327.

13 See point 9 of the Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings, (OJ C 31, 5.2.2004, p. 5) (the "Horizontal Merger Guidelines").

14 See, for example Articles 2(2) and 8(2) of the Merger Regulation.

15 Commission Decision of 4 May 2007 declaring a concentration to be compatible with the common market (Case No COMP/M.4601 - KARSTADTQUELLE / MYTRAVEL) according to Council

Consequently, the argument of the Notifying Party (at page 29 of its reply to the Statement of Objections) that it would have legitimate expectation that the Commission would assess the transaction on the basis of the market structure that existed when the parties signed, announced, and/or pre-notified the transaction to the Commission is unfounded.

35. Although there is no explicit provision in the Merger Regulation relating to the appropriate treatment of concentrations which are notified almost simultaneously, the Commission considers that the priority principle is inherent in the system of the Merger Regulation, Article 6(1) of which provides for the Commission to "examine the notification as soon as it is received" and which sets time limits by reference to the date of notification. The date of notification is therefore the only criterion that can ensure sufficient legal certainty, transparency and objectivity and respect the other provisions and aims of the Merger Regulation. The Commission recalls that ensuring legal certainty is also one of the primary aims of the Merger Regulation.[16]

36. The so-called "combined approach" originally advocated by the Notifying Party does not provide a clear benchmark for assessing the effects of mergers that are notified almost simultaneously. Also, under that approach, the Commission could be required ultimately to choose, between two concentrations, which concentration to prohibit. It would introduce uncertainty and the risk of arbitrary decisions because the Merger Regulation does not provide for clear criteria on the basis of which it could be decided whether one proposed concentration raises fewer competition concerns than another. Rather, the Merger Regulation provides for the assessment only on the basis of each notification's own merits. Moreover, the combined approach may lead the Commission to find competition concerns in and eventually prohibit both mergers, whereas one could have been declared compatible with the internal market, if assessed on its own merits. The approach could therefore lead to results that infringe the principle of proportionality.

37. Under the scheme of the Merger Regulation, the date of notification is the most appropriate basis for applying the priority principle.[17] It is a clear and objective criterion, determined in all cases in accordance with the rules of Article 5 of the Implementing Regulation, which lays down a notification-based system of merger control. Therefore, the argument of the Notifying Party in its reply to the Statement of Objections that the Commission is not competent to adopt such an implementing rule or that it has not followed the appropriate procedure is unfounded.[18]

Regulation (EC) No 139/2004 (OJ C 113, 23.5.2007, p. 1) at recitals 49 and 50; Commission Decision of 4 June 2007 declaring a concentration to be compatible with the common market (Case No COMP/M.4600 - TUI / FIRST CHOICE) according to Council Regulation (EC) No 139/2004 *(* OJ C 137, 21.6.2007, p. 6) at recitals 67, 68 and 69; Commission decision of 2 July 2008 (Case COMP/M.4942 - *Nokia/Navteq*) according to Council Regulation (EC) No 139/2004, at paras 260 and 261; Commission decision of 14 May 2008 (Case COMP/M.4854 - *TomTom/Tele Atlas*), at paras 187 and 188.

16 See, for instance, the judgment of the Court of First Instance of 20 November 2002 in Case T-251/00: Lagardère SCA and Canal+ SA v Commission [2002] ECR II-4825, paragraph 97, and the case-law cited therein.

17 See, *inter alia*, Articles 4, 6, 8, 9 and 10 of the Merger Regulation which make clear that its application is based on the notification system. This is also the case with regard to the Implementing Regulation.

18 This argument of the Notifying Party is not only irrelevant but it is also inaccurate because the Merger Regulation empowers the Commission to apply its provisions in an individual notified merger without

38. Other criteria, such as the date that a binding agreement is signed or the moment that a proposed concentration is made public, are also irrelevant and, in any case, very difficult to apply in an objective and transparent manner because they can also lead to uncertainty and arbitrary results.

39. A priority principle based on the date that a binding agreement was signed creates uncertainty since the existence of a binding agreement may remain unknown to the Commission or to other undertakings wishing to merge for an indeterminate period. Yet such a priority principle implies that an agreement may take priority over one already being assessed by the Commission (because a binding agreement for the second notified merger was signed before the first notified merger). Such a situation could arise at any time during the administrative procedure (and possibly even after a decision on the first notified merger had been adopted by the Commission).

40. In the same vein, the date of the first pre-notification contacts with the Commission does not constitute an appropriate criterion for priority, because pre-notification contacts are confidential and at the discretion of the undertakings. A priority principle based on the date of the first pre-notification contacts with the Commission could incite undertakings to enter in such contacts long before they possess the information required by Article 4 of the Implementing Regulation, thereby unduly securing a position of priority to the disadvantage of their competitors.

41. Pre-notification discussions are a voluntary part of the merger review process and are held in strict confidence. The Notifying Party in this case and Seagate in the *Seagate/Samsung* case opted to participate in pre-notification discussions with the Commission regarding their respective proposed concentrations. Those discussions were carried out in strict confidence in accordance with the Implementing Regulation and DG Competition Best Practices on the conduct of EC merger proceedings dated 20 January 2004 ("Best Practices"). The *Seagate/Samsung* transaction involved publicly traded companies and was, throughout the pre-notification phase, not yet known to the market. The existence of that transaction was therefore highly market sensitive and the Commission and its officials rightly adhered strictly to their obligations of confidentiality by not disclosing the *Seagate/Samsung* transaction to the parties to the *WD/HGST* transaction (or their legal or other representatives). The Commission respected the same duty of confidentiality regarding the pre-notification discussions held with the parties to the *WD/HGST* transaction vis-à-vis the parties to the *Seagate/Samsung* transaction. The Commission and its officials therefore treated the parties to both transactions in exactly the same, fair and non-discriminatory manner, in line with the Best Practices.

42. The proposed concentration was notified only one day after the *Seagate/Samsung* transaction. That does not, however, change the considerations referred to in recitals 31-440. What matters in law is which concentration is notified first. The system of the Merger Regulation and the principle of legal certainty requires that the same priority principle is applied irrespective of the duration of the 'gap' between notifications of concentrations affecting the same market.

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having to go through the implementing provisions of Article 23 of the Merger Regulation every time a specific issue of interpretation arises in an individual case.

43. Accordingly, in view of the date of its notification, the proposed concentration is assessed taking into account the *Seagate/Samsung* transaction which was approved by a Commission decision of 19 October 2011.

44. The starting point of the Commission's assessment is therefore a market structure with the following HDD suppliers: WD, HGST, Seagate/Samsung and Toshiba.[19]

5.2. Introduction to the HDD industry

5.2.1. Hard Disk Drives

5.2.1.1. The product

45. A hard disk drive is a device that uses one or more rotating disks with magnetic surfaces (media) to store and allow access to data. HDDs provide non-volatile data storage, which means that the data remains present when power is no longer applied to the device.

46. The main components of a hard drive are the Head-Disk-Assembly ("HDA") and the Printed Circuit Board Assembly ("PCBA").

47. The HDA includes heads, magnetic media coating ("media"), a head positioning mechanism (called head stack assembly - "HSA") and spindle motor. The disk-pack assembly comprises one or more layered disks (also called platters) positioned around a motor-driven spindle hub that rotates the disks. The more platters a HDD uses, the higher its storage capacity.

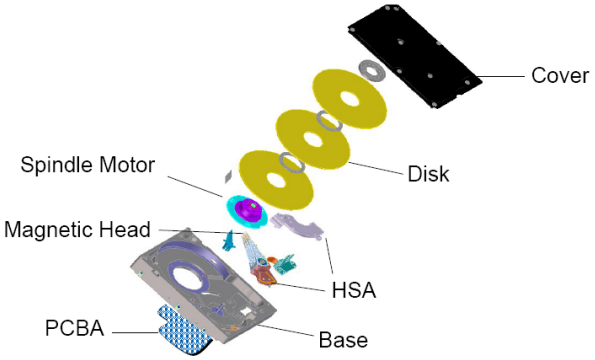
48. The disk is made up of a substrate material that gives the disk structure and rigidity, and on which thin layers of magnetic materials are deposited which holds the magnetic impulses that represent the data. The materials used tend to differ according to the form factor of the disk (that is, the standardised size of the platter). For instance, desktop 3.5" HDDs typically use aluminium substrates, while notebook 2.5" and smaller form factor HDDs (such as 1.8") tend to use glass substrates.

49. The head stack assembly ("HSA") is comprised of a magnetic positioner, that is, a pivot-arm module on which the individual heads are mounted. Each disk has a head suspended directly above it (and in some cases, two heads on each side of the disk) which can read data from or write data to the spinning disk.

50. The PCBA includes both standard and custom integrated circuits that typically comprise a drive interface and a controller, an interface connector to the host computer and a power connector. The following picture illustrates the structure of a HDD:

[19] As will be explained below, Tohsiba is only present in the worldwide markets for Enterprise Mission Critical HDDs, 3.5" Enterprise Business Critical HDDs, 2.5" Mobile HDDs and 2.5" CE HDDs. Only three market players, namely WD, HGST, Seagate/Samsung, are present in the worldwide market for 3.5" Desktop HDDs and 3.5" CE HDDs.

Figure 1: Components of an HDD



5.2.1.2. HDD manufacturing process

51. The manufacturing process broadly comprises three steps: (1) component production (2) assembly (HDA and PCBA), and (3) testing of HDDs. First, Toshiba and Samsung choose to source the entire production process of major components such as heads and media from third party contractors. Others including WD and HGST self-supply the large majority of these key components.

52. Secondly, the assembly of HDDs is generally undertaken by HDD suppliers. The exception is Samsung for which TDK also handled a large part of its HDD assembly.

53. Thirdly, HDDs manufacturers test HDDs for errors. This requires the availability of drive test equipment, which adds to the production time. Potential original equipment manufacturer ("OEMs") customers also conduct extensive testing of HDDs in a qualification process.

54. WD has seven manufacturing sites worldwide. In terms of upstream component production, WD utilises fabrication facilities in Fremont, California, United States of America and a slider fabrication facility in Bang Pa-In, Thailand to design and manufacture a substantial proportion of the heads and head gimbal assemblies included in WD HDDs. WD similarly has magnetic media and substrate design and manufacturing facilities in Malaysia, and a magnetic media design and manufacturing facility in Singapore. WD then ships these parts to Malaysia and Thailand, where it has assembly facilities.[20]

55. HGST has manufacturing facilities for head components (namely wafers, sliders and head gimbals) in San Jose, California (the United States of America), Odawara (Japan), Laguna (Philippines) and Shenzhen (China). Its media manufacturing operations are located in Shenzhen (China) and Sarawak (Malaysia) while small volumes are also produced at HGST's San Jose facility in the United States of America. HGST's principal HDD manufacturing and assembly sites are located in Singapore, Shenzhen (China), Prachinburi (Thailand) and Chonburi (Thailand).[21]

[20] Form CO, paragraph 255.
[21] Form CO, paragraphs 262 and 263.

5.2.2. HDD End-Uses

56. HDDs can be used in a variety of applications such as storage area networks and other business storage systems, desktop and laptop computers and a range of consumer electronics ("CE") applications including digital video recorders, camcorders and gaming devices.

57. HDDs are customarily categorised by reference to their end use, in particular:

(a) Enterprise HDDs (used in servers and enterprise storage systems), with a distinction between Mission Critical and Business Critical HDDs;

(b) Desktop HDDs (used, for example, in personal computers ("PCs") and home electronics devices);

(c) Mobile HDDs (used, for example, in laptop PCs and portable electronic devices); and

(d) CE.

58. A further differentiation of HDDs is possible according to their technical characteristics, such as their size (for example, 3.5", 2.5", 1.8" form factors), rotational speed (seek time), storage capacity[22] and the type of interface.[23]

59. The following table shows the main characteristics which are specific to HDDs belonging to the different end-use applications. The table shows that although there are some technical features which are common to HDDs across different applications, each end-use requires HDDs with certain technical requirements. The table also displays the shares that HDD products at different storage capacity points and rotational speeds represent in the sales within the end-use concerned.

[22] The storage capacity indicates the amount of data that can be stored on the HDD, commonly expressed as giga byte ("GB") or terra byte ("TB"). The capacity of HDDs currently ranges between approximately 80 GB and 3 TB. Interfaces enable data within HDDs to be accessed.

[23] Interfaces have been defined as industry standards and currently include SATA and SAS. Legacy interfaces include PATA, FC and SCSI. SATA and PATA were designed for consumer grade applications although SATA has now become the sole interface for new consumer drives. SCSI and FC are still supported by some enterprise grade drives although they have almost entirely been replaced by SAS interface.

Table 1: Characteristics of HDDs per end-use[24]

End-use	Mobile	Desktop	BC Enterprise	MC Enterprise	CE	External
Features	Shock Performance Low Noise Low Voltage	High Capacity	High Reliability, High Speed	High Reliability, High Speed	3.5" : Streaming 2.5" : Low Capacity 1.8" : Low Voltage	
Functionality	Notebook PC	Desktop PC			DVR, Game Console, DVC	
Capacity	**[…]***	[…]*	[…]*	[…]*	[…]*	[…]*
Speed (Krpm)	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*
Interface	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*
Size (Disk)	2.5" / 1.8"	3.5" / 2.5"	3.5" / 2.5"	3.5" / 2.5"	3.5" / 2.5" / 1.8"	3.5" / 2.5" / 1.8"

60. The segmentations set out in recitals 57 to 59 (that is, end-use applications or technical characteristics of HDDs) have been considered in past Commission Decisions.[25]

61. The four end-use categories are described in more detail in recitals 62 to 74.

5.2.2.1. Enterprise applications

62. Enterprise applications for HDDs include workstations, servers, network attached storage, storage area networks, other computing systems or subsystems, network-communications and video surveillance.

63. HDDs employed in Enterprise applications can be further segmented in: (i) Mission Critical HDDs, which are employed in high performance servers or storage arrays; and (ii) Business Critical HHDs which are used in the large storage or server farms of Internet companies such as Google and Facebook.

64. Mission Critical Enterprise HDDs are technically sophisticated and demand superior performance compared to the other types of HDDs. For instance, they offer an ability to read and write simultaneously, allow for higher usage levels and they are designed to operate in more demanding environments with lower failure rates.

65. Business Critical HDDs (also known as "near-line storage" HDDs), have higher storage capacity than Mission Critical HDDs but do not require the same level of

24 The numbers are based on the 2010 transaction data of WD, Seagate, HGST, and Samsung. So, Toshiba, even if present in a given segment, is not included in the numbers. Percentages represent percent shares in sales value. The data uses the Notifying Party's data processing steps.

25 See, *inter alia*, Commission Decision of 11 May 2009 declaring a concentration to be compatible with the common market (Case No COMP/M.5483 - TOSHIBA / FUJITSU HDD BUSINESS) according to Council Regulation (EC) No 139/2004 (OJ C 121, 29.5.2009, p. 1).

performance. From a technical point of view, business critical storage products have some commonalities with Desktop HDDs. For instance, they typically use the same SATA interface as the mainstream Desktop HDDs. There are however also major differences between the two types of drives. The main difference between the two types of drives lies with the heightened level of reliability which is required for Business Critical HDDs that in turn requires a more thorough test process than Desktop HDDs and higher quality of components such as heads. The technological complexities associated with creating a superior product translate into a significant price premium of Business Critical HDDs over Desktop HDDs.

5.2.2.2. Desktop applications

66. The Desktop segment consists primarily of HDDs that are incorporated in personal computers that are intended for regular use at a single location, namely individuals use desktop computers in homes, businesses and multi-user networks.

67. Most HDDs for Desktop applications are based on the 3.5" form factor, which offers the highest storage capacity and the lowest price per gigabyte ("GB"). However, some desktop computers (that is, small desktop computers that take up less space) also use 2.5" drives. The 2.5" drives used in those Desktop PCs however represent a very small share of the total drives used in Desktop PCs. […]*, in 2010 the percentage of 2.5" HDDs used in Desktop PCs amounted to [0-5]*% of the total HDDs employed in those devices, the rest being 3.5" HDDs.[26]

5.2.2.3. Mobile applications

68. The Mobile segment consists of HDDs that are incorporated primarily in notebook and netbook computers. Individuals use mobile computers both in and away from homes and businesses. Most Mobile HDDs are produced on the 2.5” form factor and they are generally more expensive than 3.5" Desktop HDDs.

69. This is in particular the case as HDDs intended for mobile devices utilize parts that are more expensive than those used in the HDDs that are intended for Desktops. This drives up the price range due to higher input unit costs. For example, Desktop HDDs use aluminum disks whereas Mobile HDDs use glass disks. In addition, Mobile HDDs require additional disks and head units compared to traditional Desktop HDDs to reach the same size capacity due to the absolute area of a 2.5” disk being about half the size of the area of a 3.5” disk. Moreover, the 2.5" HDDs are engineered for a higher shock tolerance and lower power consumption as compared to Desktop HDDs given that the former are incorporated into portable devices.

5.2.2.4. Consumer Electronics applications (CE)

70. The CE segment includes HDDs that are used in: (i) digital video recorders (“DVRs”) and satellite and cable set-top boxes ("STBs"); and (ii) game consoles. CE HDDs have certain technical commonalities with Desktop and Mobile HDDs as they use similar hardware. However, they use different firmware codes according to the product application concerned.

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[26] HGST's reply to the Commission's Request for Information of 23 June 2011, question 6.

71. HDDs supplied for CE applications include both 3.5" and 2.5" from factor drives as well as a small volume of 1.8" drives. In particular, Digital Video Recorders ("DVR") and STBs (which account for [30-40]*% of CE sales) mostly use 3.5" HDDs, while game consoles (which account for [10-20]*% of CE sales) shifted from using 3.5" HDDs to 2.5" HDDs in 2005.[27] The requirements for STBs and DVRs (notably higher storage capacity at lower prices) can be best met by the larger form factor HDDs while the power efficiency demanded by game consoles is offered by 2.5" HDDs.

72. As opposed to HDDs used in PC applications (whether Desktop or Mobile), 2.5" and 3.5" HDDs used in CE products are subject to (i) higher usage (power-on-hours/year, read/write GB/day); (ii) higher operating temperature environment; and (iii) higher security features of the compressed, copyrighted, multimedia content they store. This technically results in HDDs for CE applications being designed to deliver high reliability against demanding applications by having on the one hand, higher magnetic recording operating margin in the critical "write", "retain", and "read" sub-processes through the use of more capable/mature head, media, electronics; and on the other hand lower power via lower performance (rpm, etc) as HDDs are orders-of-magnitude faster than multimedia content requirements.[28]

73. As shown in the following table, CE applications are more demanding than PC applications but less demanding than Enterprise systems. Accordingly HDDs used in CE systems are technically more advanced than HDDs used in Desktops and Notebooks.

Table 2: Comparison of HDDs among different end-uses[29]

HDD Segment	Operating Annual Power-On-Hours	Operating Temperature	Operating Read/Write GB/Day	Reliability Challenge	Magnetic Margin (Heads, Media, Electronics)
PC	12x5x52=3120	20-30C	High	High	High
CE	24x7x52=8760	40-60C	Higher	Higher	Higher
Enterprise	24x7x52=8760	40-60C	Highest	Highest	Highest

74. The 1.8" drive is not discussed further in this Decision, as neither WD nor HGST manufacture this type of drives.

5.2.2.5. Volumes of HDDs by end uses and growth forecasts

75. In 2010, the industry shipped just above 650 million HDDs. According to an industry analyst forecast of February 2011 reproduced in the following table, total output is expected to grow by an average of around [5-10]*% per year, to […]* million HDDs to be shipped in 2015. With the steady growth of notebook computers, Mobile HDDs

27 Annex 5.12 to the submission by WD on 7 July 2011, "Citigroup - Hard Disk Drives", pp. 39 and 40.
28 WD reply to the Commission's request for information of 23 June 2011, question 16.
29 WD reply to the Commission's request for information of 23 June 2011, question 16.

have become the largest category with 278 million units. They are expected to grow strongly by an average of 15% per year. With 254 million units shipped in 2010, Desktop HDDs are the second-largest category but are forecasted to slightly decline by an average of 1.4% until 2015. Third, are HDDs for CE devices with currently 89 million units shipped. They are expected to grow by an average of 9% per year. Lastly, Enterprise HDDs represented only 5% of total HDD shipments in 2010 (but approximately 12% of the industry revenue due to their higher price points). Unit shipments are expected to grow by an average of 1.2% annually until 2015.

Table 3: 2010 Volumes of HDDs by end-use and 5-year forecast until 2015[30]

	CQ4 '10 Actuals	CQ1 '11 Forecast	CQ2 '11 Forecast	CQ3 '11 Forecast	CQ4 '11 Forecast	2010 Actuals	2011 Forecast	2012 Forecast	2013 Forecast	2014 Forecast	2015 Forecast	CAGR
Desktop HDD	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*
%	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	
Mobile HDD	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*
%	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	
CE HDD	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*
%	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	
Enterprise HDD	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*
%	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	
Total	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*
%	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*	

5.2.2.6. External hard disk drives

76. HDDs are also the primary input for external hard disk drives ("XHDDs"). XHDDs are stand-alone storage solutions that allow users to back up their internal HDDs as well as supplement the storage space of their PC systems, their home and small office networks, or their CE devices. With limited exceptions, XHHDs typically use the same HDDs that are contained in other end-uses such as Mobile and Desktop applications.

77. With an estimated 69 million units shipped in 2010 worldwide, HDDs for XHDDs represent approximately 10% of total HDD shipments. XHDDs are forecasted to grow by an annual average of over 20% in volume in the next five years up to approximately over 205 million units in 2015.[31]

5.2.3. The HDD Ecosystem

5.2.3.1. HDD manufacturers

78. The hard disk drive industry is more than 50 years old and has undergone considerable consolidation ever since International Business Machines Corporation

30 Source: Trend Focus, Storage Interlinks, 17 February 2011, CQ4 '10 Quarterly Update & Long Term Forecast.

31 WD reply to the Commission's request for information of 2 August 2011, question 1.

("IBM") invented the first HDD in 1956. While in the mid-1980s, the industry counted up to 85 vendors, the number of HDD suppliers had fallen to 12 by 2000.[32]

79. During the last decade, the HDD industry has seen a further wave of consolidation across HDD manufacturers. Most notably, Quantum Corporation ("Quantum") and Maxtor Corporation ("Maxtor") merged in 2000;[33] Hitachi acquired IBM's HDD business in 2002;[34] Seagate acquired Maxtor in 2006;[35] and Toshiba acquired Fujitsu's HDD business in 2009.[36]

80. Before the Seagate/Samsung transaction and the proposed concentration, HDDs were manufactured by five firms: Seagate, WD, HGST, Toshiba and Samsung.

81. The three leading HDD manufacturers in terms of 2010 market shares - Seagate, WD, and HGST - are vertically integrated upstream into media and heads component production.

82. Toshiba and Samsung are integrated downstream into the manufacture of PCs (especially notebooks) as well as Consumer Electronic ("CE") devices.

83. The two market leaders, Seagate and WD, are publicly listed companies specialised exclusively in the storage business. HGST, Toshiba and Samsung are part of larger conglomerates active in a variety of businesses.

84. There are differences among the product portfolios of HDD manufacturers. From an end-use perspective, Western Digital, Seagate and HGST have broad portfolios covering all end-uses (Enterprise[37], Desktop, Mobile, CE). Samsung has a negligible presence in Enterprise. Toshiba is not present in Desktop, does not produce 3.5" CE HHDs, and has only just started to produce HDDs for business-critical Enterprise applications. The following table provided by the Notifying Party illustrates the product portfolios:

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32 Deutsche Bank, *The HDD Industry - A changing landscape,* 11 May 2010, at p. 5.

33 Commission Decision of 8 December 2000 in Case COMP/M.2199- *Quantum HDD/ Maxtor,* (OJ C 68, 2.3.2001, p. 11).

34 Commission Decision of 2 August 2002 declaring a concentration to be compatible with the common market (Case No COMP/M.2821 - HITACHI / IBM HARDDISK BUSINESS) according to Council Regulation (EEC) No 4064/89 (OJ C 201, 24.8.2002, p. 19).

35 Commission Decision of 27 April 2006 in Case COMP/M.4100- Seagate/Maxtor (OJ C 126, 30.5.2006, p. 10).

36 Commission Decision of 11 May 2009 declaring a concentration to be compatible with the common market (Case No COMP/M.5483 - TOSHIBA / FUJITSU HDD BUSINESS) according to Council Regulation (EC) No 139/2004 (OJ C 121, 29.5.2009, p. 1).

37 WD only recently entered the Mission-Critical Enterprise segment/ market and to date has only a negligible presence there.

Table 4: HDD suppliers per End Use[38]

	End Uses			
	Enterprise	***Desktop***	***Mobile***	***CE***
WD	•	•	•	•
HGST	•	•	•	•
Seagate	•	•	•	•
Samsung	-	•	•	•
Toshiba	•	-*	•	•#

• = current sales
- = not currently present
* = The Notifying Party considers that, given Toshiba's recent launch of a 3.5" business-critical/ non-traditional Enterprise HDD, Toshiba is expected to establish a competitively significant presence also in the 3.5" Desktop segment in the near future. The Commission's investigation does not support that assumption.
# = Toshiba only produces 2.5" HDDs for CE, not 3.5" HDDs.

85. From a technical perspective, manufacturers offer HDDs with the following form factors and speed (measured in Revolutions Per Minute – "rpm"):

Table 5: HDD suppliers per form factor and rpm[39]

	form factor and rpm								
	1.8''	***2.5"***				***3.5"***			
	5400	***5400***	***7200***	***10000***	***15000***	***<6000***	***7200***	***10000***	***15000***
WD	-	•	•	•	-	•	•	z	-
HGST	x	•	•	•	•	•	•	•	•
Seagate	x	•	•	•	•	•	•	•	•
Samsung	•y	•	•	-	-	•	•	-	-
Toshiba	•	•	•	•	•	-	•	•	•

• = current sales
z = sales in the past
x = sales in the past but RPM were lower than 5400
- = not currently present
y = product is understood to have come to the end of its life

38 Form CO, paragraph 156.
39 Form CO, paragraph 156.

86. Apart from the small form factor 1.8", for which demand has dramatically declined in the last few years,[40] Table 5 gives some indication as to the differences in the technical portfolios of HDD manufacturers. Seagate and HGST offer the broadest portfolio. WD lacks high rotation 2.5" and 3.5" HDDs that are used in high-end Enterprise applications. Toshiba lacks lower speed 3.5" drives as it does not manufacture 3.5" Desktop HDDs. Samsung has the smallest technical portfolio as it lacks higher rotation HDDs (used in Enterprise applications) both for form factors 2.5" and 3.5".

5.2.3.2. HDD component makers upstream

87. Over the last few years, there has also been significant consolidation among manufacturers of key HDD components, notably suppliers of read/ write heads, spinning disks and spindle motors.

88. As regards read/ write heads, SAE Magnetics (HK) Limited ("TDK") is now the only provider of heads in the merchant market for read/ write heads. Toshiba and Samsung exclusively rely on TDK's heads. All other HDD suppliers self-supply a majority of their read/ write head needs. This production is reserved for internal use only. However, they also purchase TDK's heads to help manage peaks in demand and to keep up with competitive technologies.

89. There are a limited number of suppliers of HDD media in the merchant market, including Showa Denko and Fuji Electric. Seagate, WD, and HGST self-supply a large portion of their media needs.

90. No HDD provider is vertically integrated upstream into spindle motors.[41]

5.2.3.3. Different HDD customer groups

91. HDD customers are OEMs, Original Design Manufacturers ("ODMs"), distributors and retailers.

92. OEMs purchase HDDs, either directly or through a contract manufacturer such as an ODM, and assemble them into the computers or systems they build. Distributors, such as Ingram-Micro or Avnet, typically sell HDD products to small OEMs, dealers, systems integrators, online retailers and other resellers. Their main added value is expertise in logistics. Retailers typically sell HDD products – mostly XHDDs - directly to end-users through their storefront or online facilities.

93. A relatively small number of customers accounts for a large share of the HDD demand. Sales to OEMs alone represented […]*% of WDs total sales and […]*% of HGST's sales during their respective last business years. Sales to distributors accounted for […]*% of WD's 2010 net revenue while sales to its two main

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[40] Form factor 1.8" HDDs will no longer be produced except by Toshiba. In 2010, sales were down 40% from 2009 and amounted to approximately 6 million units, less than 1% of overall shipped HDD units (Form CO, Annex 7.3III.B.(i)).

[41] Only Samsung self-supplied a minor portion of its motor needs. Form CO, paragraph 147.

distributors accounted for […]*% of WD's total company-wide revenues. Similarly, the distributor […]* represented HGST's […]* largest HDD customer in 2010.[42]

5.2.4. Innovation and Technology Trends

94. The HDD industry historically has been characterised by significant advances in technology and rapid product life cycles. Significant developments in the HDD industry include the continuous increase in areal density and overall capacity, read/write speed, and the incremental decrease of production cost which are reflected in declining prices both overall (that is to say per HDD product) and per GB. Other aspects include, for instance, improved portability and energy consumption.

95. Western Digital and Seagate are leading […]* expenditure on R&D among HDD manufacturers.[43] […]*

96. Broadly speaking, innovation efforts of the HDD industry are focused on (1) extending the viable life of current technologies (incremental innovation) and (2) new enabling technologies.

5.2.4.1. Innovation in the HDD industry

97. HDDs benefit from standard interfaces which allow customers to replace any given manufacturer's HDD product with a competitor drive. This factor helped driving incremental innovation to improve the drives' capacity, design of heads or media, or their architecture and mechanical engineering, amongst others.

98. An important area for innovation is to increase the storage capacity of HDDs. The storage capacity of a disk drive is determined not only by the number of disks it contains but also by the areal density capability[44] of these disks. Current Perpendicular Magnetic Recording ("PMR") head technology is likely to allow for continued increases in areal density during the next few years. However, HDD makers seem increasingly challenged to meet recent areal density growth levels of roughly 40% annually based on PMR technology, as the technological advances required have become more complex.[45]

99. Incremental innovation leads to fairly short product cycles. Therefore, it is important for HDD manufacturers to be first to market or bring to market a similar product shortly afterwards. Given the short life cycles of HDD products suppliers must strive to quickly achieve volume production for each new storage size of drives to reduce production costs and benefit most from the temporary lead on any given product.

100. The last significant HDD technology – PMR - was commercially introduced in 2005. The next intermediate technology is expected to be[…]*,[46] […]*. The first HDDs with[…]*. Other future technologies […]*include[…]*[47][…]*[48],[…]*.[49]

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42 Form CO, paragraphs 167 and 168.

43 The Commission does not have data on the R&D expenditure of Toshiba's HDD business:

44 Areal density is a measure of storage capacity per square inch on the recording surface of a disk.

45 Form CO, paragraph 338; Deutsche Bank, *The HDD Industry - A changing landscape*, 11 May 2010, at p. 13.

46 […]*.

47 […]*.

101. Hybrid-HDDs are a recent innovation. They combine the capacity advantage of a traditional drive with the performance advantages of flash memory. By using the embedded flash memory portion of the drive for the most commonly accessed data, a hybrid drive is faster than traditional HDDs. At the same time, they are much cheaper than SSDs, as they use far less NAND flash than SSDs and instead rely primarily on the HDD for capacity. Seagate has recently begun to offer hybrid HDDs commercially and is currently the only HDD manufacturer to do so.

5.2.4.2. Technology trends in the storage industry

102. An SSD is a storage device that uses semiconductor, non-volatile media such as NAND Flash memory[50], rather than magnetic media and magnetic heads. SSDs record, store and retrieve digital data without any moving parts. Most SSD manufacturers use non-volatile NAND flash memory. SSD manufacturers are able to replicate traditional mechanical HDD form factors (1.8", 2.5", and 3.5"). SSDs can also use dynamic random-access memory (DRAM). DRAM provides faster data access, but because it loses its stored information when the memory is powered down, DRAM-based SSDs typically need an internal battery and/or backup disk systems to ensure data persistence.

103. Attributes such as robust durability, faster speeds, and low power consumption offer greater performance than HDDs in some storage applications. Unlike HDDs, which contain magnetic spinning disks that must be written to or read by a physical arm travelling across the disks, SSDs do not have any moving parts. They are consequently less susceptible to physical shock and mechanical failures. Additionally, data stored on SSDs can be read almost instantaneously because the drive does not need to spin-up the drive platter or move the drive heads. In practice, this allows users to load applications more quickly, increases data read and write rates, and decreases system boot-up and shutdown times. SSDs also use less energy and dissipate less heat than traditional HDDs. Finally, SSDs may enable lower height profiles which will be an advantage as mobile devices are getting thinner.[51]

104. SSDs are available in lower capacity points than HDDs, but SSDs currently cost significantly more per GB than HDDs. A 2009 TrendFocus study[52] points out that the lower price mainstream computing SSDs were approaching USD […]*per GB at the OEM level, while mobile computing HDDs were USD […]* per GB – a more than 10x cost per GB advantage.[53] Therefore, PC OEMs could offer HDD storage capacities ranging from 160 GB to 320 GB for a cost of less than USD 40 to the low

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48 […]*.

49 Bit-pattern recording is expected to allow a storage density of 2.5 terabytes per square inch. Such a density is possible because the procedure places individual bits on lithographed 'islands' of magnetic material which protects each bit's charge, thereby allowing those sectors to be far smaller than would otherwise be possible. Form CO, paragraph 338.

50 NAND flash memory is a type of non-volatile storage technology that does not require power to retain data. There are two types of flash memory, NAND and NOR. The names refer to the type of logic gate used in each memory cell. (Logic gates are a fundamental building block of digital circuits). NOR flash was first introduced by Intel in 1988. NAND flash was introduced by Toshiba in 1989.

51 Notifying Party's reply to the 6(1)(c) Decision, pp. 33-35.

52 TrendFocus of 29 June 2009, Focus on Update: Solid State Drives, p. 11.

53 Another research report puts the cost per GB advantage even higher at 17 times in 2009 (USD […]* for average MLC-based NAND vs. USD […] per GB in an average Mobile HDD). Deutsche Bank, *The HDD Industry - A changing landscape*, 11 May 2010, p. 27.

USD 50 range, while a SSD of 128 GB cost an OEM over USD 200, that is, four or five times as much with less than half of the total capacity of the average HDD. A [third party industry analyst's]* study from […]* 2011 forecasts that at the PC level, even in 2015, there will be an approximate […]*x cost-per GB advantage of HDDs over SSDs. The study further forecasts that a 1 terabyte ("TB") or 2 TB HDD will likely cost USD […]* in 2015, while 320 GB of packaged PC-grade SSD NAND flash will likely cost USD […]*. In other words, even with a 3 to 6x lower capacity, the SSD drive will still be approximately […]*% as expensive.[54]

105. Another industry study concludes that […]*as SSDs performance advantages do not justify the considerably higher price. […]*

Table 6: SSD v. HDD comparison on key metrics

	2.5" Intel SSD X25-M SATA	**2.5" Seagate HDD Momentus (5400 rpm)**	**1.8" Toshiba HDD MK-family (4200 rpm)**	**Comments**
Cost	160GB retails for ~$425	160GB retails for ~$50	120GB retails for ~$120	Much higher $/GB cost with SSD
Capacity	160/80GB – MLC NAND	640/500/320/250/160GB	250/160/120GB	SSDs offer lower capacity
Weight	3oz/86 grams	3.9oz/110 grams	2oz/62 grams	Little SSD advantage with overall NB weight of 2.5lbs to 8lbs.
Power	Read/Write 0.15W Idle/Standby 0.06W **Average 0.1W**	Read/Write 1.6W Idle/Standby 0.7W/0.2W **Average 1.3W**	Read/Write 1.2W Idle/Standby 0.4W **Average 0.8W**	**Adds ~5 mins of extra battery life**
Size	Same as 2.5" HDD	.374" x 2.75" x 3.95"	.31" x 2.13" x 3.09"	No advantage of SSDs
Volume	Same as 2.5" HDD	4 cu in	1.8 cu in	No advantage of SSDs in overall NB volume of 70 to 250 cubic inches
IOPS	250MB/s Read/70MB/s Write 0.11ms Latency	61 MB/s sustained internal 5.56ms Latency 300 Max external	65 MB/s sustained internal 5.5ms Latency 708 Mbps Max	**SSDs are very useful in high read IOPS situations, write speeds are slower**
Shock (Operating)	1000G	350G	500G	Rest of NB still fragile, particularly LCD
Operating temp.	0~70 deg C	0~60 deg C	5~55 deg C	Same

Source: Company data sheets and DB estimates

106. Currently, SSDs are typically used in either embedded systems (for example, telecom, point-of-sale, or industrial measurement equipment) or as storage solutions for CE applications with low capacity and high portability requirements (for example tablets or ultra-portable devices).

107. WD and HGST manufacture SSDs but HGST has to date only sold limited volumes as samples.[55] Toshiba is a leading manufacturer of NAND memory flash and produces SSDs. As part of the purchase agreement for Samsung's HDD business, Seagate has concluded a NAND flash memory supply agreement under which Samsung will provide Seagate with its semiconductor products for use in Seagate's enterprise SSDs and hybrid drives.[56]

108. A last technological development to note is cloud computing - a new computing technology that may in the long term affect where the storage is located and may thereby impact the HDD industry. Cloud computing delivers shared resources,

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54 […]*, Annex 7.3.VI to the Form CO.

55 From the information submitted by the Notifying Party, in 2010 WD had a revenue-based market share of only […]*%, whereas HGST's market share was below […]*% on a worldwide market for SSDs (Form CO, p. 29). Therefore, the minimal overlap arising in this regard from the proposed concentration does not give rise to an affected market and is not be assessed in this Decision.

56 Seagate, Press release of 19 April 2011, "Seagate and Samsung Announce Broad Strategic Alignment", http://www.seagate.com/ww/v/index.jsp?locale=en-US&name=samsung-seagate-alignment-announce-pr&vgnextoid=d00a78162ab6f210VgnVCM1000001a48090aRCRD.

software and information to users on demand on a multitude of devices, such as client PCs and handheld computing devices. Most cloud computing models consist of services delivered through common data centres that utilise servers and hard drives designed for the enterprise space. The question arises whether cloud-based storage diminishes the overall need for localized data storage and/ or accelerates the adoption of (lower capacity) SSDs. This question is discussed in section 5.3.1.3.

5.3. The relevant markets

5.3.1. Relevant Product Markets (HDDs)

109. The Commission's investigation has revealed that the following relevant product markets for HDDs can be defined: (i) Mission Critical Enterprise[57], (ii) 3.5" Business Critical, (iii) 3.5" Desktop, (iv) 3.5" CE, (v) 2.5" Mobile and (vi) 2.5" CE. The Commission's findings are based on the very limited demand-side substitutability between HDDs manufactured for a specific end use for another use, including as regards form factor. The Commission's investigation also confirmed that there is no, if any, supply-side substitutability between the manufacturing of the different types of HDDs (a possible exception may be between 2.5" Mobile and 2.5" CE HDDs, and between 3.5" Desktop and 3.5" CE HDDs).

5.3.1.1. Demand-side substitutability

A. The View of the Notifying Party

110. The Notifying Party stresses that due to demand-side and supply-side substitutability among different HDDs, the relevant product market should at least include all HDDs, with the possible exception of Enterprise Mission Critical HDDs.

111. The Notifying Party points out that the distinction of HDDs on the basis of the end-use (for example Desktops, Mobile PCs and tablets) is increasingly blurred for the following reasons.

112. First, HDDs that are sold for different end-uses are technically the same. As an illustration, 2.5” SATA HDDs with 5,400 or 7,200 rpm motors may be used in Notebooks, Desktop PCs and CE applications as well as external hard drives.

113. Second, the same end-use applications may employ HDDs with different technical specifications (for example either 2.5”or 3.5" form factor) as in the case of Samsung's U250 all-in-one PC[58] which is available with an HDD in either 2.5”or 3.5" form factor.

114. Third, rapid technological developments often lead customers to consider one type of HDD suitable for applications that were typically associated with a different HDD type before. As an illustration, based on a 2008 report from[…]*,[59] the share of 2.5"

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57 For the purpose of this Decision, there is no need to differentiate HDDs Mission Critical Enterprise HDDs according to the form factor as no competition concerns arise from this market under any alternative product market definition.

58 Form CO, p. 43.

59 IDC, Worldwide 2009-2013 Hard Disk Drive Forecast: A Post-Crisis Fundamental Shift, from Form CO, p. 43.

drives was expected to grow from [20-30]*% to [60-70]*% in the Enterprise segment and from [0-5]*% to [20-30]*% in the Desktop segment between 2008 and 2013, to the detriment of 3.5" drives.

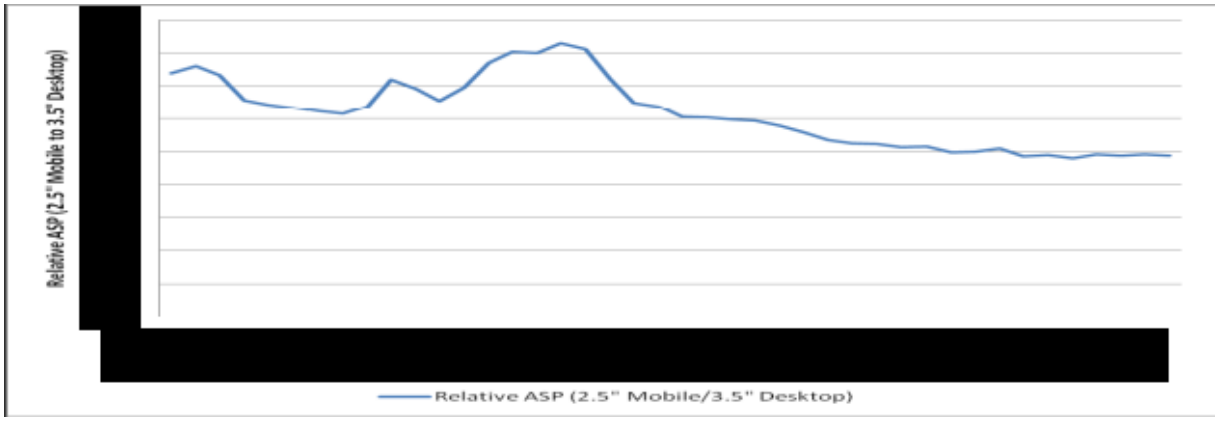
115. Furthermore, the Notifying Party submits that from the customer's perspective HDDs are also substitutable across form factors, notably 3.5" and 2.5". In that respect, the Notifying Party explains that while 2.5" Mobile HDDs continue to provide less storage capacity than 3.5" HDDs, they have however reached a capacity level which is adequate for most applications. This would for instance be shown by the increased use of 2.5" HDDs in Desktop PCs.[60] As a consequence, according to the Notifying Party, customers would replace a large portion of their purchases of 3.5 " HDDs for desktop applications with 2.5" HDDs should there be an increase in the price of the former of 5% to 10%.

116. That would be particularly the case as the only advantage of 3.5" drive over the 2.5" drive has historically been its lower price and its higher capacity (up to 3 TB as opposed to 750 GB for 2.5"). However, as the prices of the two types of drives have rapidly converged over time and the price differences are not significant, the Notifying Party believes that the switch toward the smaller form factor will accelerate in the future.

117. According to the Notifying Party the competitive interaction between 2.5" and 3.5" HDDs is also proven by the price correlation between the two types of drives as shown in Figure 2. Thus, products forming part of the same relevant market generally display broadly parallel price movements over time (absent significant shifts in relative volumes). In order to assess the co-movement of prices, the Notifying Party has compared the *ratio* of prices. If two price series fall by a similar percentage amount, quarter-on-quarter – other variables being equal – the ratio of prices will remain constant.

118. The following figure sets out the ratio of 2.5" Mobile average selling price ("ASP") to 3.5" Desktop ASP. A relative price close to unity implies both that the prices of 2.5" Mobile to 3.5" Desktop HDDs are at a similar level, and that the prices are changing at a similar rate.

Figure 2: Ratio of 2.5'' Mobile to 3.5'' Desktop HDD Prices



60 WD reply to the Commission's request for information of 28 June 2011, question 1.

119. Based on the analysis carried out by the Notifying Party, it appears that since 2007 there has been convergence in relative ASPs around unity. According to the Notifying Party, this undeniably indicates that a small (in the range of 5% to 10%) but permanent relative price increase of 3.5" HDDs would cause substantial switching to 2.5" HDDs, in line with the convergence in the ASPs of the two types of drives experienced since 2007. In the Notifying Party's view, the threat of a large replacement of 3.5" HDDs with 2.5" HDDs in several applications and notably in Desktop applications would therefore strongly deter 3.5" HDDs suppliers from increasing prices. In addition, WD stresses that beyond the price convergence between the 3.5" and 2.5" HDDs, the declining sales in the 3.5" HDD segment in favour of 2.5" HDDs would show further that both the PC industry as well as the CE sector is moving to a smaller form factor.[61]

120. On the basis of that reasoning, the Notifying Party takes the view that 3.5" HDDs and 2.5" HDDs belong to the same relevant product market irrespective of the end-use application of the device into which those drives are incorporated.

121. In its reply to the Statement of Objections, the Notifying Party further contests the delineation of HDD markets based on end-use and form factor. From the outset, the Notifying Party questions the approach taken by the Commission on the grounds that the relevant test for market definition would not be whether there exists a difference in absolute price levels, but whether a sufficient switch on the demand side would occur at the margin to make a SSNIP of 5%-10% unprofitable. Moreover, according to the Notifying Party, the differences in price levels observed by the Commission would be largely driven by product mix effects.

122. As regards more specifically delineation by end use, the Notifying Party first claims that the Commission's market investigation provides support for the view that, from a demand side perspective, different technical characteristics are not a barrier to switching. In particular, the Notifying Party refers to the replies which confirm that a 3.5" Business Critical HDD can be used instead of a 3.5" Desktop HDD from a technical perspective. To support that claim, the Notifying Party further provides examples of products sold to customers for different end-uses.

123. Secondly, the Notifying Party claims that the Commission dataset, once corrected, would show a substantially lower price differential than the Commission estimated in the Statement of Objections.

124. Thirdly, the Notifying Party argues that the Commission should have run a small but significant and non-transitory increase in price ("SSNIP") test taking into account additional performance features of Enterprise products. In this regard, the Notifying Party claims that customers often trade off quality and price and that a SSNIP on a lower quality product may lead to a switch to the higher quality product.

125. Fourthly, the Notifying Party considers that it is incorrect to extend conclusions with respect to demand substitutability between two end-use segments to other end-use segments. Moreover, according to the Notifying Party, given the high seasonality in

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[61] Annex 5.13 submitted by WD on 7 July 2011, *Hard Disk Drives near Cycle Recovery*, p. 38. According to Citigroup, the 2.5" notebook drive market has grown at 30% CAGR during 2000-2009 and has been responsible for 81% of all PC HDD unit growth during that period.

demand, the relevant timeframe for a SSNIP test would be one year. In addition, the Notifying Party argues that the observation that Enterprise HDDs are more customised and may not be easily shifted from one customer to another is of no relevance for the issue whether customers in other end-use segments can use Enterprise HDDs.

126. As regards more specifically delineation by form factor, the Notifying Party first argues that the Commission's analysis is static and backward looking. In this regard, the Notifying Party considers that the Commission's observation that limited switching occurred in the past does not constitute evidence that customers would not switch in the future following a price increase.

127. Secondly, according to the Notifying Party, the Commission's market investigation would support the view that Desktop OEMs would switch from 3.5" to 2.5" under certain circumstances. Moreover, the Notifying Party claims that 2.5" products would be available at the vast majority of capacity points required for Desktop applications. In particular, 41% of the sales of Desktop HDDs were made at 320 GB capacity and below in the last quarter of 2010. According to the Notifying Party, prices of lower capacity 3.5" HDDs would reach parity with lower capacity 2.5" HDDs in the very near future. In particular, the Notifying Party considers that the recently launched single platter 2.5" 500GB HDD is able to deliver the required capacity at a lower cost by removing certain raw material costs and expects this product to generate significant switching across form factors. […]*.

128. Based on average actual quarterly decline in WD sales, the Notifying Party estimates that prices for 500GB 2.5" and 3.5" Desktop will have converged substantially within the next year. The Notifying Party notes that if the proposed concentration were to affect the rate of price decline in 3.5" segment, price convergence would be achieved even more rapidly. In such a scenario, the Notifying Party estimates that, if the price of all 3.5" Desktop HDDs were to increase by 5% next quarter, [all sales below certain capacity point, which represent a substantial share of 3.5" Desktop HDDs sales, would switch to 2.5"]* well above the estimated critical percentage volume loss. Moreover, the Notifying Party claims that, given the superior product characteristics of 2.5" HDDs, it is likely that full price parity would not be necessary to drive a switch.

129. Furthermore, the Notifying Party claims that 3.5" HDDs could immediately be replaced by 2.5" HDDs if the smaller form factor is mounted in a bracket which costs USD 0.36 to USD 0.45 per unit. According to the Notifying Party, the price difference resulting from a SSNIP would be substantially higher than the cost of a bracket. In addition, the Notifying Party claims that redesign costs for customers are very modest. According to its estimates, redesign costs, if considered over the typical design life of a chassis, would amount to USD 0.21 per unit.

130. According to the Notifying Party, it would be likely that substitution by OEMs between different capacity points would create a chain of substitution from higher capacity 3.5" HDDs to lower capacity 2.5" HDDs. Moreover, the Notifying Party claims that, as consumers' preference for Notebooks keeps growing, the replacement of 3.5" HDDs by 2.5" will accelerate. In addition, the Notifying Party argues that the price of 3.5" drives going into the distribution channel for all end uses will be constrained by substitution between 2.5" and 3.5" XHDDs.

131. Thirdly, the Notifying Party contests the Commission findings with regard to the 3.5" CE market. The Notifying Party claims that the Commission focussed on specific sub-segments, thereby overlooking the prevalence of 2.5" HDDs in other segments. According to the Notifying Party, even on the segments considered by the Commission (namely, set-top boxes and DVRs), IDC would foresee that 2.5" penetration will exceed [10-20]*% by 2012. Furthermore, the Notifying Party claims that the price of CE 2.5" drives is comparable to 3.5" at lower capacity points and that the majority of set top boxes and DVR manufacturers do not typically require higher capacities. In addition, the Notifying Part submits projections of price declines suggesting that significant switching from 3.5" to 2.5" would make a SSNIP unprofitable in the CE market, even taking into consideration switching costs. Lastly, the Notifying Party considers this analysis to be conservative since it does not take into account the performance benefits of 2.5" drives over 3.5" drives in CE applications, such as less power consumption, less noise and vibration, less heat emission.

132. According to the Notifying Party, the only drives that constitute an exception to the general features of the HDD industry are Enterprise Mission Critical HDDs, which due to their different technical specifications and high performance requirements are not comparable to any other HDDs. As a consequence, this type of drives could form part of a separate product market as opposed to the other HDDs.

133. The Notifying Party finally claims that even if SSDs were to be excluded from being part of the same relevant market as HDDs, the significant competitive constraint currently exerted by SSDs over HDDs particularly, in (i) the netbook and the high-end ultra light notebook segments; as well as (ii) in the Enterprise Mission Critical applications should be taken into account in the assessment of the proposed concentration.[62]

B. The Commission's assessment

134. The Commission's second phase investigation did not confirm the existence of demand-side substitutability across all HDDs. This finding is based on the fact the various end-use applications largely determine the technical features of HDDs (namely capacity, interface, rpm and form factor) which can only in very limited cases be substitutable with one another. Moreover, for a given end-use application (as in the case of Desktop PCs and CE systems), HDDs of different form factors (namely 3.5" and 2.5") are not currently substitutable from a customer's stand-point.

a. Technical characteristics related to specific end uses

135. Respondents to the Commission's market investigation unanimously indicated that the intended end use of an HDD dictates specific technical characteristics in terms of form factor, interface, rotation per minute (rpm), and reliability requirements. Therefore there are only limited possibilities to substitute HDDs across different end-use applications.[63] In particular, any change of the HDD's technical characteristics can impact the performance of the final product into which the HDD is incorporated.

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62 Notifying Party's reply to the 6(1)(c) Decision, p. 15.

63 Customers reply to the Commission's request for information of 22 June 2011, question 2.

The HDD's technical characteristics are strictly determined by the end product requirements.[64]

136. In the following recitals, the respective technical characteristics of different types of HDDs used in different end-use applications are compared and their substitutability assessed.

(i) 3.5" Desktop HDDs v. 3.5" CE HDDs and 2.5" Mobile HDDs v. 2.5" CE HDDs

137. Although HDDs used for Desktop PCs and HDDs used for CE applications share substantial technical similarities such as the same interface and heads and media design, they have different hardware and pre-installed firmware which render them not substitutable from a customer's perspective.

138. In that respect, one large OEM explained that it generally uses for its CE applications Desktop drives which are however modified, configured and tested to meet the specific needs of its DVR applications.[65]

139. Another CE OEM explained that CE HDDs have much better acoustic capabilities than Desktop or Mobile drives due to slower seek times. This is the case as customers require best-in-class acoustic performance for the hi-fi entertainment experience and for multi-room products that operate 24/7 in a silent environment.

140. Command completion times on a Desktop or Mobile drive are unlimited whereas in a CE application the drive is required to complete commands within a maximum time of 500 ms. If a longer command completion time is permitted, this can manifest itself in stalled picture playback and macro-blocking which is highly visible to users and would trigger increased broadcaster call centre volume and complaints.

141. In a Desktop or Mobile drive the POH (Power on Hours) profile is typically 8-10 hours per day drive, whereas CE drives are required to operate 24/7.

142. The size of the cache memory is also different: a CE HDD needs a cache of 8 to 64 MB whereas a desktop PC can use a cache as low as 8 MB.[66]

143. In addition, another respondent stressed that due to performance differences between CE HDDs on the one hand and Desktop and Mobile HDDs on the other (which have higher failure rates) the latter are not viable substitutes to CE drives.[67]

144. That is the case as in comparison to drives used in PCs (whether Desktop or Notebooks), HDDs used in CE applications are subject to (i) higher usage (power-on-hours/year, read/write GB/day), (ii) higher operating temperature environment, and (iii) higher security features of the compressed, copyrighted, multimedia content they store which in turn results in CE HDDs being designed to deliver higher reliability against demanding applications. As a consequence, HDDs employed in CE

64 Customers reply to the Commission's request for information of 20 April 2011, questions 8.2 and 8.4.
65 Customers reply to the Commission's request for information of 22 June 2011, question 21.
66 Customers reply to the Commission's request for information of 22 June 2011, question 21.
67 Customers reply to the Commission's request for information of 15 September 2011, question 3.

applications are technically more advanced than HDDs used in desktops and notebooks.

145. In light of those arguments, the vast majority of CE OEMs indicated that not only they have never replaced CE drives with 3.5" Desktop HDDs or 2.5" Mobile HDDs (depending on the form factor required) but also that they would not be willing to do so even if the price of the former drives were to permanently increase by 5 to 10%. In support of this argument, one OEM also indicated it was aware of one instance where a competitor supplied a Desktop drive instead of a CE drive which resulted in significant customer dissatisfaction.[68]

(ii) 2.5" Mobile HDDs v. 3.5" Desktop HDDs

146. A large OEM explained that given their portable nature, notebooks require HDDs which are more shock resistant and have lower power consumption than those which are incorporated in desktop PCs which are intended to be used at a fixed location.[69] Those technical features are normally offered by 2.5" HDDs which are engineered in a more sophisticated way as compared to 3.5" HDDs for desktop systems, in order to satisfy the requirements of transportable devices, namely, the space constraint, shock tolerance and low power consumption. Moreover, in order to achieve the resistance requirements of HDDs employed in notebooks, manufacturers use the more expensive glass substrates which have a certain rigidity and hardness that cannot be offered by aluminium substrates typically employed in 3.5" HDDs for desktop PCs. Finally, 2.5" Mobile HDDs predominantly use lower speeds (5.4 Krpm as opposed to 7.2 Krpm in desktop PCs), as otherwise the system would suffer from over-heating. Incidentally, the lower rotation speed also leads to a reduction of noise, which is a further relevant feature of the Mobile segment.

147. For all these reasons, 3.5" HDDs are not viable substitute to 2.5" Mobile HDDs.

(iii) 3.5" Desktop HDDs v. 3.5" Enterprise Business Critical HDDs

148. In addition, despite certain similarities between 3.5" HDDs for Desktop applications on the one hand and for Enterprise Business Critical systems on the other hand, those two drives can be clearly distinguished on the basis of their technical features and the different applications where they are incorporated. First, as explained in recital 65, Enterprise Business Critical HDDs employ higher quality components compared to Desktop HDDs and have installed sensors that react to movement and heat which Desktop HDDs do not normally employ. Secondly, they go through a much longer testing process under harsher testing conditions which contributes to increased production costs. Thirdly, they have higher reliability compared to Desktop HDDs given that Business Critical HDDs need to be run 24 hours and handle large amounts of data while being relatively error-free. Also the warranties for the two types of drives are different, namely, five years for Business Critical Enterprise HDDs and three years for Desktop HDDs.[70]

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68 Customers reply to the Commission's request for information of 20 April 2011, questions 3.

69 Customers reply to the Commission's request for information of 20 April 2011, questions 8.2 and 8.4.

70 [Deposition of HGST executive to the FTC]*.

149. The different technical features of the two types of drives are in turn dictated by the end-use applications where those HDDs are employed and the different customers groups which purchase those drives. On the one hand, Business Critical Enterprise HDDs are sold to large enterprises, governments and businesses which use them in data centres for a relatively long time frame (more than 2 years) in a high usage environment. On the other hand, 3.5" Desktop HDDs are integrated into PCs sold to companies and consumers which do not need the enhanced performance offered by the Business Critical drives, notably, as HDDs used in PCs do not work in conjunction with other drives contrary to HDDs used in data centres and have a shorter life-span than drives used in Enterprise servers (for instance, PCs are generally renewed after a couple of years).[71]

b. Price differences between different HDDs with different end-uses

150. The Commission's market investigation also revealed that another distinguishing factor of HDDs used in different end-use applications is their selling price as shown in the following table.

Table 7: Price of HDDs by End use[72]

End use/from factor		ASP[73] (USD)	USD/GB
Mobile		[…]*	[…]*
Enterprise Mission Critical	2.5"	[…]*	[…]*
	3.5"	[…]*	[…]*
CE	2.5	[…]*	[…]*
	3.5"	[…]*	[…]*
Business Critical	3.5"	[…]*	[…]*
Desktop		[…]*	[…]*

151. Those price differences therefore further limit the demand-side substitutability further. For instance, although some respondents to the Commission's market investigation explained that it would be theoretically possible to use Enterprise Business Critical HDDs in Desktop applications due to certain technical similarities of the two types of drives, they unanimously indicated that such switch would not be commercially viable. There is indeed a significant price gap (around 38%) between

71 [Deposition of HGST executive to the FTC]*

72 The numbers are based on the 2010 transaction data of WD, Seagate, HGST, and Samsung. Therefore, Toshiba, even if it is present in a given segment, is not included in the numbers. Percentages represent percent shares in value terms. The data uses the Notifying Party's data processing steps (hence Desktop does not include XHDDs, as defined by RBB).

73 Average Selling Price ("ASP").

the two types of drives.[74] Consistent with the foregoing, a large OEM, underlined that the use of more expensive Enterprise Business Critical HDDs in a Desktop PC (with the exception of very high-end Desktop PCs) would render that Desktop PC non competitive with the others.[75] Moreover, two other large Desktop PCs OEMs, explained that not only are the two drives not substitutable for commercial reasons, but also because the design of those drives types is different and in some cases also the interfaces (SATA for Desktop HDDs and eSATA for Business Critical HDDs).[76]

152. For all those reasons, all the respondents to the Commission's market investigation confirmed that before considering using Enterprise Business Critical HDDs in Desktop PCs the price of the former should significantly decrease by 30 to 50% and that they do not expect this happening in the next three years.[77]

153. It follows from the foregoing that the two drives types are not substitutable to each other since Desktop HDDs do not achieve the high performance demanded by servers and Business Critical HDDs are too expensive to be used in Desktop PCs.

154. Those considerations on existing limits to demand-substitutability among HDDs employed in different end-uses applications are even more pertinent in the case of HDDs for Enterprise Mission Critical applications which require drives of extremely high reliability and capable of severe full-time workload at very high performance levels which in turn command higher prices as compared to the other HDDs.[78] As a consequence, Enterprise Mission Critical HDDs display some technical characteristics which distinguish them from any other HDD employed in different applications. Moreover, another distinguishing feature of those types of HDDs is the greater familiarity of customers with the product as well as the brand recognition which does not play a significant role with respect to other types of HDDs.[79] This is particularly the case as Enterprise Mission Critical HDDs are much more customized products within the customers' application servers as compared to any other HDDs types, therefore, they are less substitutable with other comparable drives manufactured by competing suppliers.[80] Also the qualification process of Enterprise Mission Critical HDDs by OEMs distinguishes them from the other types of drives since it is more thorough and longer (on average three to six months as opposed to two to three months for Desktop and Mobile HDDs, depending on the OEM concerned).[81] Furthermore, the manufacturing process is also significantly different as compared to the other types of HDDs. For all these reasons there are no other HDDs which are viable substitute to Enterprise Mission Critical drives.

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74 Customers reply to the Commission's request for information of 22 June 2011, question 18.

75 Customers reply to the Commission's request for information of 22 June 2011, question 18.

76 Customers reply to the Commission's request for information of 22 June 2011, question 19.

77 Customers reply to the Commission's request for information of 22 June 2011, question 19 and 20.

78 According to one OEM, HDDs prices are about five times higher than Desktop HDDs prices. Customers reply to the Commission's request for information of 22 June 2011, question 5, ID 3790.

79 Customers reply to the Commission's request for information of 22 June 2011, question 22.

80 [Deposition of HGST executive to the FTC]*

81 Customers reply to the Commission's request for information of 22 June 2011, question 39.

c. Different industry dynamics/supply chain models between HDDs with different end-uses

155. In addition, one large OEM pointed out that HDDs employed in different end-use applications not only display technical differences but they are subject to different industry dynamics and different supply chain models.[82] As an illustration, while demand for Desktop products have a much more seasonal pattern which tends to be more pronounced in the second half of the year, demand stemming from the business environment where Enterprise drives are mainly sold is more steady throughout the year with some increase toward the end of the year if companies need to spend their IT budget.[83]

156. A similar stance is also taken by […]*. Desktop or Mobile HDDs space appears to be slightly more commoditised (in relative terms) in that drives for both end-use applications tend to be more generic as compared to HDDs for Enterprise applications, which by virtue of their higher level of sophistication are more customised to the specific OEMs which will purchase them.[84] As a consequence, while Desktop or Mobile HDDs can be more easily shifted from one OEM to another, customised Enterprise HDDs usually cannot be sold to other customers beyond those that have qualified and asked for the specific drive. For this reasons, Enterprise drives require closer cooperation with the OEMs customers. As a consequence the structure of supply and demand with respect to Enterprise OEMs (both for Mission Critical and Business Critical HDDs) differentiates this customer group from purchasers of other HDDs types (such as Desktop HDDs).

157. Furthermore, different supply and demand dynamics are found also in relation to the other end-use segments,[…]*[85] The same stance is taken by a large PC OEM which confirmed that each market segment has its own market mechanism and price and contract negotiations are strictly dependent on the supply and demand dynamics of the specific market segment.[86] As a consequence the dynamics of the transactions affecting sales of the different HDDs types are quite different.

158. In that regard, the Court of Justice has in certain instances considered that the structure of supply and demand is important in determining the relevant market and may cause identical products to fall into different markets.[87]

d. Distinction by form factor

159. The Commission's market investigation did not confirm the Notifying Party's argument that regardless of the fact that certain form factors are mostly associated with specific end-uses (such as 3.5" HDDs to Desktop applications and 2.5" to Notebooks), HDDs with different form factors are substitutable to each other from a

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82 Customers reply to the Commission's request for information of 22 June 2011, question 36.

83 [Deposition of HGST executive to the FTC]*.

84 [Deposition of HGST executive to the FTC]*

85 [Deposition of HGST executive to the FTC]*

86 Customers reply to the Commission's request for information of 22 June 2011, question 59.

87 Judgment of the Court of 9 November 1983 in Case 322/81, NV Nederlandsche Banden Industrie Michelin v Commission [1983] ECR 3461, [1985] I CMLR 282; Judgment of the Court (Fifth Chamber) of 14 November 1996 in Case C-333/94 P: Tetra Pak International SA v. Commission [1996] ECR I-5951.

customer perspective. Given that 3.5" HDDs cannot be technically substituted for 2.5" drives due to the space constraints of the devices in which 2.5" HDDs are used, the following analysis will focus on the potential substitutability of 3.5" HDDs drives with 2.5" HDDs.

160. Starting with the assessment of the potential substitutability between 3.5" HDDs and 2.5" HDDs in Desktop applications, it clearly appears from table 8 that in the last three years Desktop PCs have predominantly been using 3.5" HDDs instead of 2.5" HDDs, which are only marginally used in Desktop PCs and therefore cannot currently be considered as substitute HDDs.

Table 8: Proportion of 2.5" HDDs used in Desktop PCs[88]

HDD's for Desktop PC Applications (Industry Total)

	2.5" HDD's for Desktop PC's		3.5" HDD's for Desktop PC's		2.5" % of Total	
	MUnits	Revenue (M$)	MUnits	Revenue (M$)	Units	Revenue
2008	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*
2009	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*
2010	[...]*	[...]*	[...]*	[...]*	[...]*	[...]*

Source: [...]*

161. This is primarily the case as 2.5" HDDs are more expensive at the same capacity point, than 3.5" HDDs due to the form factor restrictions and the additional engineering costs which the smaller form factor requires. As a consequence, given that most Desktop systems have no space constraint and do not necessarily require certain technical features achieved by 2.5" HDDs (for example shock resistance and low power consumption), it would not make commercial sense to use a smaller form factor drive for Desktop PCs instead of the traditional 3.5" HDDs. This consideration is particularly true in relation to Desktop customers who are considered quite price sensitive by WD.[89]

162. The very limited use of 2.5" HDDs in the Desktop space relates, in fact, to a specific category of Desktop PCs, namely, "All in one PCs", which are Desktop computers that combine the monitor into the same case as the Central Processing Unit, and therefore have similar space constraints as Notebooks. However, as acknowledged by HGST, "All in one PCs" are niche products as also proved by HGST's statement that it has very few customers currently using 2.5" HDDs in those Desktop applications.[90] The same view was also shared by another HDDs manufacturer which indicated that the ratio of 2.5" HDDs used in Desktop PCs is expected to increase only slightly until 2014 to 2015.[91]

163. It follows from the foregoing that, even assuming that the use of 2.5" HDDs in the Desktop PCs will grow by 100% over the next three years as compared to the current level the percentage of those drives used in Desktop PCs would still be modest

88 HGST reply to the Commission's request for information of 23 June 2011, question 6.
89 [Deposition of WD executive to the FTC]*
90 [Deposition of HGST executive to the FTC]*
91 One HDD supplier's reply to the Commission's request for information of 14 June 2011, question 9.

(below 4%).[92] Moreover, contrary to the Notifying Party's view, it is unlikely that […]*s increasing use of 2.5" HDDs in its "All in one PCs" will heavily influence the Desktop PCs industry as to trigger a significant migration of this industry from 3.5" HDDs to 2.5" HDDs, given that […]* has a relatively limited market share in the sales of Desktop PCs in Europe/United States of America as compared to other OEMs which instead predominantly use 3.5" HDDs.

164. Those findings were also confirmed by respondents to the Commission's market investigations.[93] With the exception of one OEM, all main PCs OEMs either do not produce any Desktop PC with 2.5" HDDs[94] or they use this drive only to a limited extent, as compared to 3.5" HDDs employed in the same end-use application.[95] In support of the above findings, one PC OEM explained that the switch from 3.5" to 2.5" in the Desktop market/segment has been announced for many years but has not yet taken place due to the existing higher price of 2.5" HDDs compared to 3.5" HDDs. The use of 2.5" HDDs in Desktop applications is still experimental.[96]

165. Those findings appear consistent with the analysis carried out by the Commission, showing that despite the increasing price convergence between 3.5" HDDs and 2.5" HDDs which took place in recent years those drives still display a relevant price difference particularly at high capacity points which has so far refrained customers to switch between the two drives types. As a consequence they cannot be considered as substitute.

166. In that regard, the Commission has reproduced the Notifying Party's graph, as presented in Figure 2 (using the same data source as the Notifying Party with the most recent data available) in order to verify the Notifying Party's claim that the existence of price correlation between the two drives concerned is an evidence of them being substitutable.

167. […]*

Figure 3: Evolution of average prices of 3.5" and 2.5" HDDs, 2000-2011[97]

[…]*

168. The fact that a significant difference between 2.5" and 3.5" HDD prices has remained at all times can be seen if the graph is restricted to a shorter period of time to rectify that scale effect. It is apparent that there is still a clear price premium (per Gigabyte) of 2.5" HDDs over 3.5" HDDs at the end of the sample. During the last two years of the data set, the price premium of 2.5" HDDs, despite being lower than 5 to 10 years ago, has stabilised and has consistently been above [60-70]*%.

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92 The assumption considers the total volume of HDDs forecasted to be shipped in Desktop applications in 2015 by TrendFocus, that is, […]* million units. See Table 3.

93 Customers reply to the Commission's request for information of 22 June 2011, question 7.

94 Customers reply to the Commission's request for information of 22 June 2011, question 16.

95 Customers reply to the Commission's request for information of 22 June 2011, question 7.

96 Minutes of meeting of 15 June 2011 with an OEM.

97 Source: IDC (2.5 includes mobile, and 3.5 includes desktop as per the IDC category).

Figure 4: Evolution of average prices of 3.5" and 2.5" HDDs, 2009-2011[98]

[…]*

Figure 5: Evolution of relative prices of 3.5" vs. 2.5" HDDs, 2000-2011[99]

[…]*

169. Similar graphs for the average capacity per drive (using the same data source) show that (i) the average capacity per drive is much higher for 3.5" HDDs than for 2.5" HDDs, (ii) the difference is relatively stable with the average 3.5" HDDs capacity being about 80% higher than that for 2.5" HDDs. This observation further confirms the existence of different technical features respectively associated with the typical 2.5" HDDs and 3.5" HDDs sold which in turn also translate into a price difference between the two drives.

Figure 6: Evolution of average capacity per drive for 3.5" and 2.5" HDDs, 2000-2011[100]

[…]*

Figure 7: Evolution of relative capacity per drive for 3.5" vs. 2.5" HDDs, 2000-2011[101]

[…]*

170. Notwithstanding the existence of the identified price premium of 2.5" HDDs over 3.5" HDDs, the Commission has tested with Desktop PC OEMs the Notifying Party's claim that if prices of 3.5" HDDs were to increase by 5% to 10% at least all sales capacity points below […]* GB (where the price difference with the equivalent 2.5" HDDs is relatively small) would be shifted to 2.5" HDDs. Given that those sales account for […]% of the current 3.5" Desktop HDDs sales, such switch would be sufficient to defeat any attempt by HDDs supplier to increase prices of 3.5" HDDs.

171. The following table sets out the price differences between 2.5" Mobile and 3.5" Desktop HDDs at the different capacity points, as calculated using the dataset as 'cleaned' by WD.

98 Source: IDC (2.5 includes mobile, and 3.5 includes desktop as per the IDC category).
99 Source: IDC (2.5 includes mobile, and 3.5 includes desktop as per the IDC category).
100 Source: IDC (2.5 includes mobile, and 3.5 includes desktop as per the IDC category).
101 Source: IDC (2.5 includes mobile, and 3.5 includes desktop as per the IDC category).

Table 9: Price comparison between 3.5 and 2.5" HDDs in 2010[102]

Capacity (GB)	2.5'' 5400 rpm v. 3.5'' 7200 rpm (without XHDDs)	2.5'' 7200rpm v. 3.5'' 7200 rpm (without XHDDs)
80	[…]*	[…]*
160	[…]*	[…]*
250	[…]*	[…]*
320	[…]*	[…]*
500	[…]*	[…]*
640	[…]*	[…]*
750	[…]*	[…]*
1000	[…]*	[…]*

172. Table 9 confirms, in line with the findings of the Commission's market investigation that a price difference between 2.5" Mobile HDDs and 3.5" Desktop HDDs exists at every capacity point. The price difference between 2.5" and 3.5" HDDs is below 10% for HDDs below […]* GB when comparing drives of different rotations per minute (rpm) (5400 rpm 2.5" v. 7200 rpm 3.5"). However, a correct comparison on a "like to like basis" shows instead that the price difference between drives with the same rotational speed is always above 10% even for HDDs at lower capacity points (below […]* GB).

173. Although it is true, as claimed by the Notifying Party, that a price increase by 5 to 10% of 3.5" Desktop HDDs with 7200 rpm would make 2.5" HDDs with 5400 rpm cheaper at capacity points below […]* GB (currently accounting for 36% of 3.5" HDDs Desktop sales), none of the respondents to the Commission's market investigation indicated that they would switch to drives with lower rotational speed.[103]

174. This is because drives with lower rotational speed (5400 rpm) have a performance gap with HDDs using 7200 rpm of 20% to 30%. More specifically, as explained by one OEM, there are measurable performance differences between 3.5" 7200 rpm HDDs and the equivalent 2.5" HDDs caused by: (i) interface-speed (6GB/s vs. 3GB/s impacting transfer rates on cache-hits), (ii) sequential data-transfer-rates (lower throughput on 2.5” drives because of smaller media-diameter), and (iii) random access times (less powerful actuator on 2.5” drives causes higher seek times).[104]

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102 The calculations use RBB's data cleaning. In particular, these are HDDs with SATA interface, excluding products with XHDD end use (as defined by RBB).

103 Customers reply to the Commission's request for information of 8 September 2011, question 4.

104 Customers reply to the Commission's request for information of 8 September 2011, question 2.

According to the OEM interviewed there is a measurable advantage for the high rpm drives particularly in terms of time for OS-Boot and Application-Load as compared to drives using lower rotational speed. As a consequence, if final users focus on high I/O performance the use of drives with lower rotational speed will definitely have a negative impact to the value proposition of the Desktop PCs sold due to the higher "latency times" associated to the lower rotational speed (namely, the waiting time for every data access is longer).[105]

175. In addition, another major OEM stressed that the inferior performance achieved by the use of drives with lower rotational speed (such as 2.5" HDDs with 5400 rpm) would be perceived by end users when accessing data or files on the drives.[106] Faster access time associated to the use of 3.5" HDD with 7200 rpm is particularly relevant for users of corporate Desktop PCs since they constantly access data in their hard drives. Given that this customer group accounts for a significant share of Desktop PCs' sales, the vast majority of those PCs employ drives with 7200 rpm.[107]

176. In confirmation of that finding, the Commission's market investigation revealed that all the PC OEMs interviewed[108] either do not use 3.5" Desktop HDDs with 5400 rpm or they only use this lower rpm in very niche applications (such "all in one" Desktops) and for some consumer Desktop PCs with high capacity (above 1 TB)[109] for which, in any event, equivalent 2.5" HDDs are not available.

177. For all these reasons, the OEMs interviewed unanimously confirmed that they would not substitute 3.5" Desktop HDDs with 2.5" drives with lower rpm even if the price of the former drives were to increase by 5% to 10%.[110] Moreover, the results of the Commission's market investigation clearly showed that for any switch to occur drives must be perfectly equivalent in terms of rotational speed, capacity and price.[111] This finding seems also acknowledged by the Notifying Party which indicated in one of its submissions that the *HDDs industry is rife with examples of switching from larger from factors to smaller form factors once price parity is reached.* [112]

178. The Commission's market investigation confirmed the findings in recitals 170 to 177 also on the basis of a forward looking analysis taking into account the likely evolution in the next three years of, on the one hand, prices for 2.5" and 3.5" HDDs of equivalent capacity and, on the other hand, the volumes of HDDs at different capacity points that are expected to be sold for Desktop applications.

179. With respect to the first point, the Commission's market investigation did not confirm WD's claim that the 2.5" single platter 500 GB HDDs will reach price parity with the 500 GB 3.5" HDDs (which currently accounts for most of Desktop HDDs sales) at the end of 2012. Although respondents expect the price differences between the two types of drives to decrease over time, none of them believes that the price gap

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105 Customers reply to the Commission's request for information of 8 September 2011, question 2.
106 Customers reply to the Commission's request for information of 14 September 2011, question 1 c.
107 Customers reply to the Commission's request for information of 8 September 2011, question 2.
108 Customers reply to the Commission's request for information of 8 September 2011, question 1.
109 Customers reply to the Commission's request for information of 8 September 2011, question 1.
110 Customers reply to the Commission's request for information of 8 September 2011, question 4.
111 Customers reply to the Commission's request for information of 8 September 2011, question 4.
112 WD submission of 8 September 2011.

between the two drives types will close at the end of 2012.[113] This appears very unlikely as the yields of the 2.5" single platter 500 GB will have to mature before being optimized so as to reduce the price difference with the equivalent 3.5" Desktop HDDs. Moreover, there will still be additional costs for glass media and smaller motors used in the production of 2.5" HDDs which are likely to maintain the price difference with the 3.5" drives at least for the next three years (which is the time line relevant for the Commission's merger control assessment).[114] This view is also shared by industry analysts like IDC.[115] What is more, a large OEM even indicated that with the release of 3.5" HDDs supporting 1 TB and 2 TB per platter the price gap between 3.5" HDDs and 2.5" drives will remains similar to that currently existing.[116]

180. Although some customers anticipate a price convergence between 2.5" HDDs and 3.5" HDDs in the future, the vast majority of respondents to the Commission's market investigation are confident that the price difference between the two drives will instead remain in the near future, particularly at higher capacity points where the premium of 2.5" HDDs over 3.5" drives is even larger (above 40%).[117] One important PC OEM even suggested that the price difference between those HDDs could even become wider in the future and that therefore it does not expect the Desktop industry to migrate to the smaller form factor.[118]

181. Respondents to the Commission's market investigation unanimously indicated that the Desktop PC industry is migrating to the use of higher capacity points (from 500GB upwards).[119] Already some large OEMs do not use 3.5" HDDs with capacity lower than 500 GB in their PCs and others indicated that HDDs with lower capacity points (such as 160 GB and 250 GB) will soon be phased out. Also two HDDs suppliers took the same stance in relation to the market's demand trends for the coming years.[120]

182. The Notifying Party itself does not contest the existence of this tendency in the Desktop PC's industry, mainly driven by consumers' demand for increasing storage space in their PCs. In particular, following WD projections, already at the end of 2012 sales of 3.5" Desktop HDDs will account for […]% of all its sales in this market segment while the large bulk of sales will be for drives of […] GB and higher capacity points.[121]

183. It follows from the foregoing that, the more the Desktop PC industry migrates to higher capacity drives, the wider the price gap with the equivalent 2.5" HDDs and the longer it will take for that gap to close and to lead to a possible shift from 3.5" HDDs to 2.5" HDDs in Desktop PCs. Moreover, at higher capacity points (from 1

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113 Customers reply to the Commission's request for information of 8 September 2011, question 8.

114 Customers reply to the Commission's request for information of 8 September 2011, question 8.

115 One HDD supplier's reply to the Commission's request for information of 9 September 2011, question 3.

116 Customers reply to the Commission's request for information of 8 September 2011, question 8.

117 Customers reply to the Commission's request for information of 22 June 2011, question 13 and 13.1.

118 Customers reply to the Commission's request for information of 22 June 2011, question 9.

119 Customers reply to the Commission's request for information of 22 June 2011, 8 September 2011, question 11.

120 HDDs suppliers reply to the Commission's request for information of 9 September 2011, question 6.

121 WD reply to the Commission's request for information of 8 September 2011, question 6.

TB up), there are no corresponding 2.5" HDDs substitutes and OEMs either would not replace high capacity HDDs (above 500 GB) with lower capacity HDDs or the very few which would consider doing so (although in small percentage) would definitely not switch to drives with storage capacity below 500 GB.[122] As explained by two large OEMs, this is the case as any replacement of high capacity HDDs with lower capacity drives would reduce the attractiveness of the Desktop PCs for consumers and in the worst case lead to a decline of the end-products' sales.[123]

184. Therefore, it should be concluded that in a forward-looking perspective, the portion of the Desktop HDDs market that would be constrained by 2.5" HDDs' prices will increasingly decline, thereby impairing any countervailing effect that any switch between the two drives might have against suppliers' attempt to raise prices of 3.5" HDDs drives. [In that respect it is worth noting that the Notifying Party has estimated that a volume loss of sales of 3.5" Desktop HDDs above a certain threshold would render a 5% increase of price of Desktop drives unprofitable for WD. However, given that WD estimates the volume of its sales of of 3.5" HDDs below certain capacity points (which would be potentially susceptible to price constraint by 2.5" HDDs with lower rpm) to represent a share of all its Desktop HDDs' sales well below that threshold, it appears that the Notifying Party would be able to increase prices of 3.5" HDDs by 5% without risking losing critical sales volumes]*.

185. Furthermore, a considerable number of respondents to the Commission's market investigation confirmed that in addition to the higher purchasing price of 2.5" HDDs as compared to 3.5" HDDs, switching between HDDs with different form factors would require a certain amount of investment at system design level, a different assessment of the relative weight of cost/capacity in the end product and in many cases the agreement of the final customer.[124] Accordingly, any replacement of 3.5" HDDs with 2.5" drives within Desktop PCs would not be immediate as OEMs would need to redesign the chassis, which as recognised by WD, would take at least [1-2 years]* at a cost of USD [0-10 million]*.[125] Alternatively, should customers decide to use carriers to fit 2.5" HDDs in a chassis designed for a bigger form factor they would incur higher costs than those estimated by the Notifying Party (USD [0-5]* per drive). According to the results of the Commission's market investigation the cost of carriers used for 2.5" HDDs is approximately USD [5-10]*. Moreover, as explained in this regard by one large OEM the final costs of 2.5" drives using a carrier is [3 to 4]* times higher than the equivalent 3.5" 7200 rmp HDDs and the volume of 2.5" drives using carriers currently employed in its Desktop applications account for a negligible percentage of the total volume of Desktop HDDs purchased.[126] Those extra costs would definitely represent an additional barrier to shift from the use of 3.5" HDDs to the smaller form factor.

186. In addition, as already explained in recital 135, any change to the technical specifications of a drive might affect the performance of the final product in which the HDD is incorporated. In confirmation of this finding, almost all the respondents to the Commission's market investigation indicated that the use of 2.5” HDDs in

122 Customers reply to the Commission's request for information of 8 September 2011, question 7.
123 Customers reply to the Commission's request for information of 8 September 2011, question 7.
124 Customers reply to the Commission's request for information of 20 April 2011, question 8.3.
125 WD reply to the Statement of Objections.
126 Customers reply to the Commission's request for information of 14 September 2011, question 1 c.

Desktop applications in replacement of 3.5" HDDs would not improve the performance of Desktop PCs since at higher capacity points 3.5" HDDs perform better (for example, faster reading and writing of data) and are more reliable. As pointed out by two important OEMs,[127] the advantages achieved by 2.5" HDDs such as lower power consumption and better shock resistance are not critical for Desktop PCs therefore they would not be perceived as improving features by final customers. The same opinion was shared by other two large OEMs, which indicated that Desktop PCs users are mainly interested in price and capacity while the other features peculiar to 2.5" HDDs are less important for customers.[128]

187. The vast majority of customers (including all Desktop manufacturers but one) submitted that they do not anticipate a major shift towards 2.5" HDDs within the Desktop PC industry in the next three years and that the use of 2.5" HDDs will continue to be limited to niche applications.[129] In confirmation of this finding, five of the main PC OEMs (including those customers which would not exclude replacing part of their purchases of 3.5" HDDs with equivalent 2.5" HDDs for certain Desktop PCs in case of a price increase of the former) indicated that they do not intend to increase their purchases of 2.5" HDDs for their Desktop applications over the course of the next three years,[130] notably, due to the higher cost of using 2.5" HDDs as well as the limited range of capacity points available compared to the 3.5" drives which make them less attractive for certain Desktop applications.[131]

188. [Documents reviewed by the EC support this conclusion]*[132].[133]

189. For those reasons, it appears that 2.5" HDDs are currently not substitutable to 3.5" HDDs in Desktop applications and are not expected to become substitutable at least in the next three years.

190. Those obstacles to switching between 3.5" HDDs and 2.5" HDDs –namely the price difference between the two drives and the fact that 2.5" HDDs do not offer the complete range of capacity points as the 3.5" HDDs- appear equally valid in relation to the CE market. In the CE market, both types of drives are used although end-use applications are different. Set-top boxes and DVR predominantly use 3.5" HDDs while game consoles use 2.5" HDDs.[134]

191. Also with respect to CE applications, the Commission has tested, firstly, whether in the current market conditions, CE OEMs would be willing to replace 3.5" HDD with 2.5" HDDs in their end-use applications (notably, STBs and DVRs) in the case of a price increase of the former drives by 5%-10%. Secondly, the Commission has tested whether the evolution in the next three years of, on the one hand, prices for 2.5" and 3.5" HDDs of equivalent capacity and, on the other hand, the volumes of HDDs at different capacity points that are expected to be sold for CE applications will render such switch more likely.

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127 Customers reply to the Commission's request for information of 22 June 2011, question 11 and 11. 1.
128 Customers reply to the Commission's request for information of 8 September 2011, question 5.
129 Customers reply to the Commission's request for information of 22 June 2011, question 14.
130 Customers reply to the Commission's request for information of 22 June 2011, question 8.
131 Customers reply to the Commission's request for information of 22 June 2011, question 9,
132 [Deposition to the FTC]*
133 [Deposition to the FTC]*
134 Annex 5.12 submitted by WD on 7 July 2011, Citi Group- Hard Disk Drives, at pp. 39-40.

Table 10: Price comparison between 3.5" and 2.5" HDDs in 2010[135] **Capacity (GB)**	**2.5'' 5400 rpm v. 3.5'' 5400 rpm**
160	[…]*
250	[…]*
320	[…]*
500	[…]*
640	[…]*
750	[…]*

192. In relation to the first point referred to in recital 191, respondents to the Commission's market investigation unanimously indicated that they would not replace 3.5" HDDs with 2.5" HDDs of equivalent capacity and rotational speed (which within the CE space is mainly of 5 400 rpm) even if the prices of the former drives were to increase by 5% to 10%.[136] This is because the price gap between the two drives types represents a significant barrier to switching to the smaller form factor for producers of DVRs and set top boxes given that HDDs represents the highest cost item in the manufacture of those products. Moreover, as explained by respondents to the Commission's market investigation, customers of DVRs and set-top boxes are extremely price sensitive, therefore, they would not be willing to pay more for the use of drives with the smaller form factor, regardless of the enhanced performance in terms of low power consumption.[137] In that respect, one CE OEM indicated that it has been tracking the price difference between 2.5" and 3.5" HDDs at the same capacity for the last two years and although it made its customers aware of the decreased cost gap between those drives types, at least for those HDDs with low storage capacity (160 GB), the majority of its customers were reluctant to pay any price premium even a minimum one (USD 0.50 for 2.5" 160 GB HDDs) to use drives with smaller from factor.[138]

193. Given that CE applications (DVR and set-top boxes) increasingly require higher capacity to store more media content inside those devices, 3.5" HDDs meet those storage requirements better than the 2.5" drives. In that respect, a major CE manufacturer explained that the total storage capacity in video applications is the driving factor and media files will continue to grow in size and users will continue to store more and more content.[139] For these reasons, it indicated that it does not

135 The figures are based on the 2010 transaction data of WD, Seagate, HGST, and Samsung for SATA, RPM 5400 HDDs. Toshiba, even if present in a given segment, is not included in the numbers. Shares represent percent shares in value terms. The data uses WD/RBB's data processing steps.

136 Customers reply to the Commission's request for information of 22 June 2011, question 4.

137 Customers reply to the Commission's request for information of 22 June 2011, question 6.

138 Customers reply to the Commission's request for information of 22 June 2011, question 17.

139 Customers reply to the Commission's request for information of 22 June 2011, question 16.

anticipate the DVR industry replacing 3.5" HDDs with 2.5" HDDs due to the higher cost and limited storage capacity of the latter drive.[140] To reinforce this argument, it also submitted that no supplier has been able so far to deliver a 2.5" drive which suits its requirements for DVRs at the same capacity and price point of 3.5" HDDs, which it considers as the most efficient and cost effective solution for non-mobile type applications.[141]

194. An analogous conclusion was shared by another major CE producer, which explained that currently 2.5" HDDs cannot provide the very highest level of data storage capacity required by DVRs and set-top boxes due to the reduced size of the smaller media. As a consequence, it does not expect to use 2.5" HDDs in its end-use applications over the course of the next three years.[142]

195. Another producer of set-top boxes also indicated that it is not currently considering replacing 3.5" HDDs with 2.5" HDDs in its set-top boxes as such a switch would also incur considerable costs in adapting the chassis which hosts the drive and the internal layout of its set-top boxes. Also, the extra space that the use of the smaller form factor would create is not needed in those specific devices.[143] In that respect, the customer interviewed also explained that even if it decided to use a bracket, which could eventually lower the cost of switching, estimated to be between USD 1.5 to USD2, its contractual obligations with its clients would prevent any switch unless the customers accepted the price increase resulting from the use of 2.5" HDDs.[144] However, considering the price sensitivity of those customers as, indicated by the respondents to the Commission's market investigation, it is unlikely that the latter would be prepared to incur any extra cost associated with the use of 2.5" HDDs.

196. It follows that the existence of a price premium associated with the use of 2.5" HDDs, coupled with the capacity limitations of those drives types which are not available at capacity points above 1 TB and the inferior performance achieved by those drives, particularly when the end-products need to support higher streaming, are the main barriers currently preventing CE OEMs from replacing 3.5" HDDs with 2.5" HDDs in their end-products, even in the event of a price increase of the former.[145]

197. That conclusion appears also valid on a forward looking perspective. Respondents to the Commission's market investigation confirmed that the DVRs and set-top boxes industry is moving towards high storage capacity (above 500 GB), while the use of drives with lower capacity is being progressively abandoned. As acknowledged by CE OEMs, the main reason leading manufacturers to produce CE devices with high storage capacity is that video applications (such as DVRs and set-top boxes) are required to store more multimedia content and customers demand for larger space to store their data.[146] As an illustration, one CE OEMs observed that the majority of its

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140 Annex 5.12 submitted by WD on 7 July 2011, Citi Group- Hard Disk Drives, at p. 39.

141 Customers reply to the Commission's request for information of 22 June 2011, question 21.

142 Customers reply to the Commission's request for information of 22 June 2011, question 16.

143 Customers reply to the Commission's request for information of 22 June 2011, question 9.

144 Minutes of telephone conference with one CE OEM on 14 September 2014.

145 Customers reply to the Commission's request for information of 8 September 2011, question 5 and 10.

146 Customers reply to the Commission's request for information of 8 September 2011, question 10.

standard products will use 500 GB for the next three years whilst its higher-end, multi-room applications, will initially employ HDDs with 1 TB and may move to higher capacity.[147] Another one indicated that its products will be using 3.5" 2 TB and 3 TB HDDs almost exclusively in the current and following year while one product only will use drives of 500 GB.[148] At those capacity points 2.5" drives are either too expensive or not available at all to be viable substitutes to 3.5" HDDs.

198. As with the replies provided by PC OEMs, CE OEMs also do not believe that in the near future 3.5" single platter 500 GB HDDs will reach price parity with the equivalent 2.5" HDDs. This is particularly the case as the 2.5" single platter HDDs will incorporate new technologies which do not have a proven track record. Therefore it will take some time for the industry 'to come up' the learning curve and improve yields to the extent necessary to decrease the price of this drive close to that of the equivalent 3.5" HDDs.[149] In confirmation of this finding, another CE OEM explained In that respect that production yields are important price factors and the more the HDDs market moves to higher capacities points, the longer it takes to achieve the desirable yields from the production process.[150]

199. It follows that given the existence of a significant price gap (40% and higher) which is expected to remain between 3.5" HDDs and 2.5" HDDs at the main capacity points (500 GB and above) which are used within the DVRs and set-top boxes industry, OEMs are not willing to use drives with the smaller form factor in their CE systems.

200. Accordingly, it should be concluded that in the Desktop market and also within the CE market 3.5" HDDs are not currently substitutable with 2.5" HDDs to any significant extent. For the CE market this concerns those end-use applications, notably, DVR and set-top boxes which currently employ HDDs with the bigger form factor. Furthermore, the Commission's market investigation confirmed that this situation is not expected to change dramatically during the course of the next three years as it can also be inferred from the projected sales of 3.5" HDDs for CE applications for 2015, which will not noticeably decrease as compared to the current level (47 million units in 2010 versus 46 million units in 2015).

5.3.1.2. Supply-side substitutability

A. The view of the Notifying Party

201. The Notifying Party claims that due to the supply-side substitutability which characterises the HDD industry, the relevant product market should encompass at least all HDDs, with the possible exception of Mission Critical Enterprise HDDs.

202. In that regard, the Notifying Party claims that, with the possible exception of Mission Critical Enterprise HDDs, a producer already active in the production of one type of HDD is generally able to switch production or expand into other types of HDDs without significant additional investments and in a short time frame, due to common form factors or existing know-how relevant also to those other types of HDDs.

147 Customers reply to the Commission's request for information of 8 September 2011, question 11.
148 Ibidem.
149 Customers reply to the Commission's request for information of 8 September 2011, question 8 and 9.
150 Minutes of telephone conference with one CE OEM on 14 September 2014.

203. According to the Notifying Party, this ability to respond swiftly to any increase in demand by switching production from one HDD type to another would be particularly effective in cases where different types of drives are manufactured on production platforms that can be easily converted for the production of various HDD types.

204. The Notifying Party submits that although HDD suppliers have chosen to focus on different segments of the HDD industry (such as Seagate on Enterprise products and Toshiba on mobile products) all suppliers seek to exploit these commonalities in the production process to utilise capacity efficiently and to maintain the competitive pressure on their rivals in the overall HDD market.[151] Therefore, according to the Notifying Party, the different market shares of HDDs suppliers in the various segments of the HDD market should not be considered as an indicator of separate markets, but rather as a result of business strategy choices.[152]

a. Supply-side substitutability between 2.5" and 3.5" form factor HDDs

205. According to the Notifying Party, the use of production platforms capable of some degree of conversion is common to the industry. […]*

206. The way in which components are integrated into an HDD follows the same design irrespective of whether the drive is a Desktop or a Mobile HDD. In other words, while components for the different end-use segments may vary in size, their designs are very similar and sometimes identical across the various segments. This platform strategy results in commonality of components across different products within product families and, in some cases, across product families, to reduce exposure to changes in demand.[153]

207. The Notifying Party claims that in order to create further flexibility in its manufacturing process, it designed and produced conversion kits which allow changes in form factors and switches production from 3.5" to 2.5" HDDs. For testing, WD uses test adapter kits which allow testing 2.5" HDDs in a 3.5" HDD tester.[154]

208. According to the Notifying Party's estimates, depicted in Figure 2, the overall conversion cost of a 2.5" line into a 3.5" line is USD […]* which requires […]* lead time. Based on WD's estimates, such conversion would enable an HDD manufacturer to produce […]* HDDs per quarter (that is, […]* units per year). The cost of higher scale conversion (that is to say, […]* units of HDDs per year which would allow a […]*% gain in market share in the Desktop space)[155] would instead require an expenditure of around USD […]*.[156]

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151 Form CO, Paragraphs 45-47.

152 WD reply to the Commission's request for information of 23 June 2011, question 14.

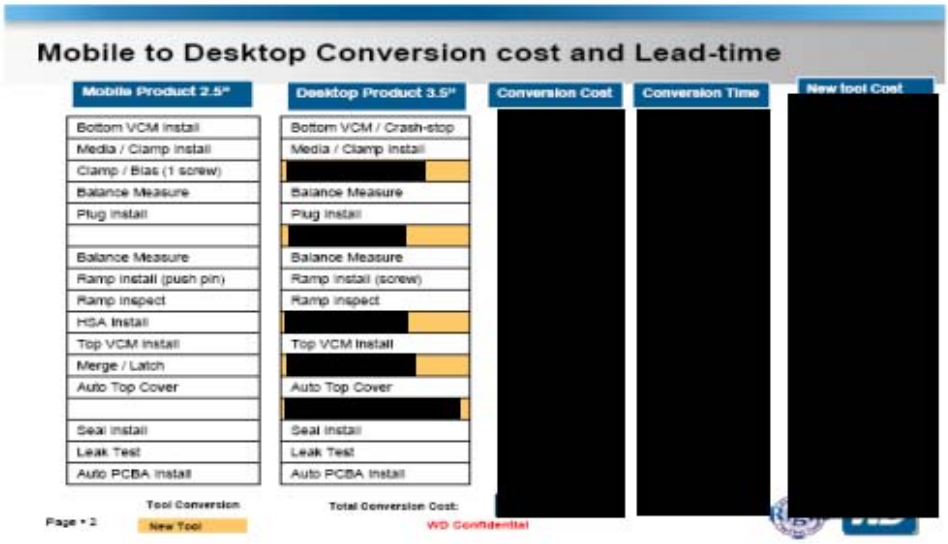
153 Form CO, Paragraphs 45-47.

154 WD reply to the Commission's request for information of 23 June 2011, question 11.

155 The calculation of the market share is based on an estimated total market size for 3.5" HDDs of 275 million units in 2012.

156 WD reply to the 6(1)(c) Decision.

Table 11: Mobile to Desktop Conversion cost and Lead-time[157]



209. The Notifying Party claims that the alleged supply-side substitutability among different types of HDDs is even more apparent when considering a change of the other technical requirements of HDDs, notably interface, rotational speed and capacity. In particular, drives with different capacity can, and often will, be produced on the same manufacturing equipment as the capacity of a disk drive is determined not only by the number of disks it contains but also the areal density capability of these disks. This also applies for different rotational speeds. For example, WD produces different models of HDDs with different capacities and rotational speeds all on the same manufacturing line. Finally, the Notifying Party explains that switching production from one interface to another does not involve any costs to develop the interface technology by the HDDs manufacturers since all of them already use the mainstream industry standard interfaces (PATA, SATA and SAS) and can flexibly switch among them.[158]

210. According to the Notifying Party, the only possible exception to this scenario regards the production of Enterprise Mission Critical Enterprise HDDs given the higher technical requirements involved in the production of such drives which are not common to the others, such as customised interfaces (Fibre Channel or SAS interfaces) and firmware and significant testing to ensure reliability and high performance.[159] As a consequence, Enterprise Mission Critical HDDs are also distinguished from the other HDDs types from a production stand-point.[160]

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157 WD reply to the 6(1)(c) Decision.

158 To the Notifying Party's' best knowledge Samsung may not yet have developed a SAS interface given that it is not active in the Enterprise segment where SAS is used as the standard interface. Form CO, paragraphs 45-47.

159 WD reply to the Commission's request for information of 28 June 2011, question 2.

160 WD reply to the Commission's request for information of 28 June 2011, question 2.1.

211. In its reply to the Statement of Objections, the Notifying Party claims that the observation that HDD suppliers have rarely switched production lines by form factor in the past and that conversion is not conducted in the regular course of business does not constitute evidence that switching cannot occur in the case of a price increase. Furthermore, the Notifying Party claims that for the purpose of product market definition supply-side substitution should be assessed for any supplier currently active in 2.5" HDDs and not only for Toshiba. In that regard, the Notifying Party refers to evidence submitted by HGST that conversion would only take 7 to 10 months, taking into account the time to ramp up production.

212. The Notifying Party further claims that switching costs are not significant in comparison to the overall profits resulting from the switch. According to the Notifying Party, the R&D and investment costs required for entry from 2.5" to 3.5" would amount to USD [25-50]* million whereas incremental gross profit, estimated on the basis of a 5% SSNIP in 3.5" Desktop HDDs applied to a market share of 10%, would amount to USD [50-100]* per year.

213. Finally, the Notifying Party submits that if prices of 3.5" HDDs were to increase by 5% from their current value, a HDD supplier previously active only in the supply of 2.5" HDDs which decided to start producing 3.5" HDDs would make a profit of USD [25-50]* million in its first year of production, after accounting for all costs of entry and production variable costs.

b. Supply-side substitutability between different end-use HDDs within each form factor

214. The Notifying Party claims that HDD suppliers can switch between different end-use within each form factor easily, at very low cost. The Notifying Party further submits that such substitution is likely to occur in a 'timely' manner, within a period of one year or less.

215. The Notifying Party submits that its production model allows it to flexibly produce different types of drives with the same form factor on the same assembly lines. A production line which at a given point in time was dedicated to the production of Desktop 3.5" HDDs could be switched immediately to the production of 3.5" HDDs for CE systems.[161]

216. In particular, the Notifying Party claims that it is not appropriate to segment 3.5” HDDs by end-use since there exists a very high degree of supply-side substitutability between 3.5” Business Critical HDDs and other types of 3.5” HDDs. In that regard, the Notifying Party submits that 3.5” Business Critical HDDs are very similar in terms of components to 3.5” Desktop HDDs and 3.5” CE HDDs.

217. The Notifying Party submits that in assessing supply-side substitutability, account should be taken by the Commission of whether a manufacturer of a product with one end use would have incentives to start producing products with an alternative end use following a SSNIP in the latter.

[161] WD reply to the Commission's request for information of 7 July 2011, question 2.

218. The Notifying Party acknowledges that whilst WD, Seagate/Samsung and HGST are currently active in 3.5" Desktop and 3.5" CE, Toshiba does not currently market an HDD specifically designed for each of these end-uses. In that regard, the Notifying Party claims that the lead times and product design costs which would be incurred for a supplier of 3.5" Business Critical Enterprise drives, such as Toshiba, to engage in supply side substitution in relation to 3.5" Desktop and CE, would not constitute an obstacle to such supply side substitution. The Notifying Party claims that the time taken to enter the 3.5" Desktop market would be the time taken to optimise a 3.5" Business Critical HDD for a Desktop application.

219. In that regard, the Notifying Party submits that Business Critical drives manufactured by WD that fail their rigorous testing procedure, so called "Waterfall HDDs", are typically sold into the distribution channel as Desktop drives. According to the Notifying Party, this practice would indicate, that 3.5" Business Critical HDDs can be, and are, used in a Desktop application today and that Toshiba need not spend any time in development in order to bring a Desktop product to market.

220. On the basis of WD's presence in 3.5" Business Critical HDDs, the Notifying Party acknowledges that a number of adjustments would need to be carried out to optimise a 3.5" Business Critical HDD for use in Desktop applications. These adjustments include: […]*. According to the Notifying Party, these adjustments would entail a cost approximately USD [0-10]* million.[162]

221. The Notifying Party estimates that in order for a Business Critical HDD supplier (which is not present in the 3.5" Desktop market) to have a single platter drive ready for sale into distribution and other channels, it would take [6-12]* months and a cost of around USD [10-25]* million (of which USD [0-10]* million would relate to the development of a single platter design and USD [0-10]* million to 'dumb-down' the Business Critical Drive).[163] The Notifying Party estimates that it would take no longer than [0-6]* months and a cost of USD [10-25] million (of which at least USD [0-10]* million would relate to the cost of developing a multi-platter drive and USD [0-10]* million would relate to the cost of 'dumbing-down' the Business Critical HDD) in order to have a multi-platter desktop drive ready for sale into distribution and other channels.

222. The Notifying Party submitted estimates which indicate that the cost for a 3.5" Business Critical HDD supplier to add new capacity in order to achieve a [5-10]*% market share in 3.5" Desktop would be significant, amounting to USD [400-500]*million.[164] The Notifying Party also estimates that the overall time required to install new capacity, to qualify with OEMs and ramp-up production would be approximately [6 to 24]* months. The Notifying Party estimates that if Toshiba were to benefit from distribution via distributors ([1-9]* months after the installation of new capacity), during the estimated two to three month OEM qualification time, Toshiba might achieve critical mass within one year.

223. The Notifying Party also submitted estimates which indicate that the total costs which a 3.5" Business Critical supplier would need to incur in order to achieve a

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162 WD reply to the Statement of Objections, p. 61, paragraph 164 and footnote 84.

163 WD reply to the Statement of Objections, p. 61, paragraph 164 and footnote 84.

164 WD reply to the Statement of Objections. p. 65, table 3.

10% market share in 3.5" CE would be significant, amounting to USD [200-300]* million.[165] The Notifying Party also estimates that the overall time required to obtain, to install new capacity,[166] to qualify with OEMs and ramp-up production would be approximately [12-24]* months.

224. As regards supply-side substitution between HDDs for use in Desktop and CE applications, the Notifying Party claims that such HDDs belong to the same product family and use the same interface, the same heads and media design and testing equipment. Moreover, the Notifying Party argues that any differences in firmware are minor from a development cost viewpoint and production costs are identical.

B. The Commission's assessment

225. The Commission analysed the degree of supply-side substitution across different types of HDDs in line with the criteria set in the Commission Notice on the definition of the relevant market for the purposes of Community competition law ("the Commission Notice on Market Definition").[167]

226. Firms are subject to three main sources of competitive constraints: demand side substitutability, supply side substitutability and potential competition. From an economic point of view, for the definition of relevant market, demand side substitution constitutes the most immediate and effective disciplinary force on the suppliers of a given product, in particular in relation to their pricing decisions.[168]

227. Supply-side substitutability may be taken into account when defining markets in those situations in which its effects are equivalent to those of demand substitution in terms of effectiveness and immediacy.[169]

228. This means that suppliers are able to switch production to the relevant products and market them in the short term (that is, such a period that does that does not entail a significant adjustment of existing tangible and intangible assets), without incurring significant additional costs or risks in response to small and permanent changes in relative prices. When these conditions are met, the additional production that is put on the market will have a disciplinary effect on the competitive behaviour of the companies involved. Such an impact in terms of effectiveness and immediacy is equivalent to the demand substitution effect.[170]

229. When supply-side substitutability would entail the need to adjust significantly existing tangible and intangible assets, additional investments, strategic decisions or

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165 WD reply to the Statement of Objections. p. 65, table 3.

166 The Notifying Party estimates that obtaining new capacity would involve a lead time of [1-6]* months.

167 Commission Notice on the definition of the relevant market for the purposes of Community competition law, OJ C 372, 9 December 1997, p. 5 ("Commission Notice on Market Definition").

168 Commission Notice on Market Definition, paragraph 13. Potential competition is not taken into account when defining markets since the conditions under which potential competition will actually represent an effective competitive constraint depend on the analysis of specific factors and circumstances related to the conditions of entry. If required, this analysis is only carried out at a later stage, in general once the position of companies involved in the relevant market has already been ascertained, and when such position gives rise to concerns from a competition point of view (Commission Notice on Market Definition, paragraph 24).

169 Commission Notice on Market Definition, paragraph 20.

170 Commission Notice on Market Definition, paragraph 20.

time delays, it will not be considered at the stage of market definition, but, rather, at a later stage in the competitive assessment.[171]

230. For the reasons which will be explained hereafter in more detail and on the basis of the characteristics of the markets in this particular case, it should be concluded that there exists a lack of immediate and effective supply side substitutability in the case at hand (both between 2.5" and 3.5" form factors and between HDDs intended for different end-uses within each of the 3.5" and 2.5" form factors). This is even more apparent in the case of Mission Critical Enterprise HDDs given the higher technical requirements involved in the production of such drives which are not common to the others. Therefore, there are insufficient grounds to conclude that despite the lack of demand side substitution, the markets should be defined in a broader manner.[172]

231. Furthermore, for the reasons which will be explained hereinafter in more detail and on the basis of the characteristics of the market in this particular case, it should be concluded that there exists a sufficient degree of supply-side substitutability as regards HDDs having the same form factor which are within the same end-use category.

a. Lack of supply side substitution between 2.5" and 3.5" form factor HDDs

232. The Commission's market investigation revealed that HDDs manufacturers do not regularly convert production lines which manufacture HDDs with a given form factor in order to produce HDDs with another form factor (for example from 2.5" to 3.5")[173] contrary to what is claimed by the Notifying Party.

233. That is particularly the case as each form factor utilizes a specific tooling design in the manufacturing process. As a consequence, most manufacturers including WD HGST and Toshiba indicated that they have assembly lines dedicated to each form factor which allow them to achieve the lowest cost of manufacturing by optimizing tooling design by form factor.[174]

234. […]*[175][The Commission’s investigation indicated that conversion between form factors is not a regular activity]*.[176] More importantly, Toshiba explained in this regard that since its production lines are designed to manufacture only 2.5" HDDs it is not possible to convert those lines in order to produce 3.5" drives.[177]

235. Accordingly, it is doubtful that most of the HDDs suppliers would be able to timely convert their production lines so as to produce HDDs with different form factors in

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171 Commission Notice on Market Definition, paragraph 23. Also as stated in paragraph 14 of the Commission Notice on Market Definition, the competitive constraints arising from supply side substitutability other than those described in paragraphs 20 to 23 of the said Notice and from potential competition arein general less immediate and in any case require an analysis of additional factors. As a result such constraints are taken into account in the assessment stage of the competition analysis.

172 Commission Notice on Market Definition, paragraph 14.

173 HGST reply to the Commission's Request for information of 23 June 2011, question 11.8; WD reply to the Commission's Request for information of 23 June 2011, question 11.1; Toshiba reply to the Commission's request for information of 26 October 2011, question 1.

174 HGST reply to the Commission's Request for information of 23 June 2011, question 12.

175 Ibidem.

176 WD reply to the Commission's request fro information of 23 June 2011, question 8:

177 Toshiba reply to the Commission's request for information of 26 October 2011, question 1.

order to fulfil the test set out in the Commission Notice on Market Definition in relation to supply-side substitution.

236. In any event, even in those instances where a potential conversion of production lines across different form factors is possible, it should be concluded on the basis of the results of the Commission's market investigation that such conversion would entail time delays and substantial costs.

237. First, according to Seagate the conversion of an existing product line into a new form factor would cost between USD [20-30] and [40-50] million and would entail a time frame of approximately 18 months.[178]

238. The Notifying Party in turn estimates that *"a manufacturer which already owns the necessary firmware, electronic and mechanical architecture (which all of WD's and HGST's competitors have) should be able to establish a presence in a neighbouring HDD segment within a period of [between 12 and 24]* months. The necessary R&D expenditure is estimated at around USD [25-50]* million"*.[179]

239. HGST indicated in that regard that in Q2 of 2011 following the earthquake and tsunami in Japan it converted tooling from 3.5" HDDs to 2.5" HDDs within a time frame of approximately [0-6]* months ([…]*). This conversion cost is estimated to be between USD […]*. Besides being a very unusual step for HGST, this conversion took place in the context of a situation of excess capacity for 3.5" HDDs, which is itself a rare occurrence.

240. In that respect, HGST also clarified that that conversion related to the production of various products which were already in high volume production. However, as acknowledged by HGST, if an HDD has not been previously manufactured, a further time delay of [0-6]* months would have to be incurred to ramp up production capacity in order to obtain scale and quality after the conversion of an existing production line.[180] Adding OEMs qualification (between [0-6]* months depending on the type of the drive concerned) to the conversion process brings the overall lead time to up to one year.

241. It follows that any switch across form factors would not be immediate and it would require significant adjustments to tangible and intangible assets. What is more, considering the specific circumstances of the present case where Toshiba is not manufacturing 3.5" HDDs (with the exception of 3.5" Business Critical HDDs), it must be assessed whether the latter would be able to switch from 2.5" Mobile and/or 2.5" CE HDDs to 3.5" HDDs (either for Desktop, CE or Business Critical applications) and vice-versa from 3.5" Business Critical HDDs (that it has just started to produce) to 2.5" HDDs immediately and effectively in such a way as to defeat any price increase by Seagate and the Merged Entity after the proposed concentration in any of those markets.

242. In that respect, Toshiba clearly pointed out that the equipment used for the manufacture of its 2.5” HDDs is designed to fit the size of the smaller form factor

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178 Seagate reply to the Commission's Request for information of 20 April 2011, question 13.

179 Form CO, p. 119.

180 HGST reply to the Commission's Request for information of 23 June 2011, question 11.

(2.5"). For this reason, it is unable to modify its production lines in order to manufacture 3.5" HDDs.

243. It follows that, the only way for Toshiba to establish a presence in the 3.5" HDDs markets (either in 3.5" Desktop or 3.5" CE) is by investing in new dedicated production lines. According to Toshiba the lead time required to develop, qualify and manufacture a sufficient volume of production of 3.5" Desktop HDDs would largely exceed one year. The Commission considers that a similar time line would be required to develop a sufficient volume of 3.5" CE HDDs considering the similarities of the two types of drives. Such lead time would be longer in order to manufacture Business Critical drives given the longer testing procedure required by those drives in comparison to Desktop HDDs.[181] Additionally, Toshiba also indicated that the investments required to set up 3.5" HDDs production lines (irrespective of the end-use application) would be significant (of a magnitude of USD 10-30 million).[182]

244. In any event, regardless of the costs and lead time associated with a hypothetical switch from the manufacture of 2.5" HDDs to 3.5" drives, it results from Toshiba's submissions that this conversion would not be materially feasible and commercially viable as also proven by the fact that in 2010 Toshiba set up new production lines to manufacture 3.5" Business Critical HDDs instead of trying to convert the existing lines.[183] Similar to the case of Toshiba, the fact that also WD has in the past established its presence in new HDDs markets (as in the case of 2.5" Mobile HDDs) through investments in new dedicated production lines rather than converting the existing ones further undermines the likelihood and commercial rational underlying a switch of production lines manufacturing drives with different form factors.[184]

245. On that basis, it should be concluded that any switch from 2.5" HDD to 3.5" HDDs lack immediacy and effectiveness as required by the Commission Notice on Market Definition and in any case it does not appear commercially rational.

246. The same conclusion is valid in relation to a purely hypothetical scenario where Toshiba decided to convert its 3.5" Business Critical HDDs production lines in order to produce 2.5" Mobile and/or 2.5" CE HDDs.

247. As already explained in recital 244, such conversion is not feasible according to Toshiba. Moreover, even if Toshiba were able to carry out any switch of production from its existing 3.5" Business Critical HDDs to 2.5" drives, it would have to carry out some adjustments to the Enterprise 3.5" Business Critical drives which would include, *inter alia*, switching off the existing firmware or developing a customised one for use in CE applications and lowering the rotational speed from 7200 rpm to 5900-5400 rpm for use in respectively 2.5" Mobile and 2.5" CE HDDs. All these adjustments would likely require an investment of several million of USD consistent with the costs estimated by WD which are required to modify 3.5" Business Critical drives for use in Desktop PCs.[185]

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181 Toshiba reply to the Commission's request for information of 7 September 2011, question 11.

182 Toshiba reply to the Commission's request for information of 14 June 2011, question 20.

183 Toshiba reply to the Commission's request for information of 26 October 2011, question 1.

184 WD reply to the Commission's request for information of 23 June 2011, question 13.

185 See recitals 253 to 286.

248. Moreover, even if Toshiba were able to convert all of its current production capacity of 3.5" Business Critical HDDs into 2.5" Mobile and/or 2.5" CE HDDs it would not be able to immediately and effectively gain a sufficient presence in any of those markets since it currently has a negligible market share in relation to 3.5" Business Critical HDDs which would be even smaller with respect to each of 2.5" CE and 2.5" Mobile HDDs, given that the total volume of Business Critical HDDs' sales for 2010 represent 57% of the 2.5" CE total volumes and 8.4% of the 2.5" Mobile total volumes.

249. It follows that in order to exert effective discipline over its competitors on each respective market, namely, 2.5" Mobile HDDs and 2.5" CE HDDs, Toshiba would have to significantly invest in additional production capacity which, according to the Notifying Party, takes on average [0-6]* months. In addition, as explained in recital 240, OEMs qualification would also require additional months which would therefore extend further the lead time between the decision to convert a production line and the shipment of HDDs to OEMs.

250. Moreover, regardless of the lead time and significant costs associated to the potential conversion of production lines across form factors, first, Toshiba would not have the ability to do so and second, it would also lack any economic incentive to sacrifice all of its production capacity of 3.5" Business Critical HDDs in order to manufacture drives which are already in high volume production, namely, 2.5" Mobile HDDs and 2.5" CE HDDs.

251. It follows that any switch between 3.5" Enterprise Business Critical HDDs to 2.5" Mobile HDDs and/or 2.5" CE would lack immediacy and effectiveness as required by the Commission Notice on Market Definition and it would not appear commercially rational.

252. For those reasons, it should be concluded that there exists a lack of immediate and effective supply-side substitution between drives of different form factors.

b. Lack of supply side substitution between different end-use categories within the same form factor

(i) 3.5" Business Critical to 3.5" Desktop and vice-versa

253. As explained in recitals 148 and 149, although from a technical point of view, 3.5" Business Critical HDDs have some commonalities with 3.5" Desktop HDDs, there are also major differences between these two types of HDDs. 3.5" Business Critical and 3.5" Desktop HDDs operate in very different conditions. The prolonged hours/year, GB/day and higher operating temperatures which 3.5” Business Critical HDDs operate under result in an increased operating stress and reliability challenges.

254. Although the Notifying Party submits that it manufactures drives for Business Critical and Desktop end-uses from the same base platforms, the Notifying Party acknowledges that the heightened level of reliability which is required for 3.5"

Business Critical and 3.5" Desktop HDDs results in several technical differences between the two drives.[186]

255. Better reliability is achieved in several ways. Reliability challenges are met for 3.5" Business Critical HDDs through the use of certain different components in comparison to 3.5" Desktop HDDs. For example, through the use of enhanced design margin/capability across not only the critical magnetic subsystem elements (heads, media, electronics), but also the mechanical subsystem. Faster random access times required for Business Critical drives as well as the vibration of the fans required to keep these drives from overheating increase the HDDs' exposure to vibration, which in turn makes it more difficult for the drive and adjacent drives to remain on their respective track. To address this problem, vibration sensors are installed on their PCBA and better head/media signal to noise ratio. The sensors are lacking from Desktop HDDs. Also due to the higher vibration, 3.5" Business Critical drives often utilise a tie shaft spindle motor, whereas Desktop drives typically use a rotating shaft spindle motor.[187] Furthermore, the reliability and performance expected by customers of 3.5" Business Critical HDDs requires HDD manufacturers to subject these HDDs to more extensive pre-release and manufacturing testing in comparison to 3.5" Desktop HDDs, which are tested for a shorter period of times and have significantly lower thresholds for passing tests, due to reduced specifications.[188]

256. 3.5" Business Critical HDDs are also more customised in comparison to 3.5" Desktop HDDs.[189] This customisation entails a closer interaction between the HDD supplier and customer for 3.5" Business Critical HDDs in comparison to 3.5" Desktop HDDs.[190]

257. Business Critical HDDs require greater firmware features/unique customer features (such as enhanced security, programmable limited time error recovery and full data path checking) which enhance reliability but which also increases their development time in comparison to 3.5" Desktop HDDs. The firmware loaded on Desktop HDDs does not support the broader 3.5" Business Critical HDD feature set.[191]

258. Although 3.5" Desktop HDDs only use the SATA interface, 3.5" Business Critical HDDs may be produced using the SATA or SAS interface. The SAS interface is more complex and supports higher performance. Although SAS currently represents only a small portion of 3.5" Business Critical HDDs, the use of the SAS interface for such drives is growing, as acknowledged by WD itself.[192] Toshiba's 3.5" Business Critical line offering covers both types of interface SAS and SATA.

259. 3.5" Business Critical drives require higher quality components (such as higher quality heads) and a more thorough test process than 3.5" Desktop HDDs. The

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186 WD reply to the Commission's request for information of 23 June 2011, question 14.

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188 HGST reply to the Commission's request for information of 23 June 2011, question 14; WD reply to the Commission's request for information of 23 June 2011, question 14; and WD submission of 23 September 2011, p. 3.

189 WD reply to the Statement of Objections, p. 118.

190 WD reply to the Statement of Objections, p. 118.

191 HGST reply to the Commission's request for information of 23 June 2011; and WD reply to the Commission's request for information of 23 June 2011, question 14.

192 WD reply to the Commission's request for information of 23 June 2011, question 14.

technological complexities associated with creating superior 3.5" Business Critical HDD translate into a higher production costs in comparison to a 3.5" Desktop HDD. The Notifying Party sales data indicates that the cost (USD) per GB for WD to produce 3.5" Business Critical HDDs is[…]*, whereas the cost per GB for HGST to produce 3.5" Desktop HDDs is […]*.

260. Importantly also, the technological complexities associated with creating the superior 3.5" Business Critical HDD translate into a significant price premium of 3.5" Business Critical HDDs over 3.5" Desktop HDDs. The price of Business Critical HDDs amount on average to […]* USD/GB versus […]* USD/GB of Desktop HDDs.[193] The average selling price of a 3.5" Business Critical HDD is, at USD […]*, significantly higher than the average selling price of USD […]* for a 3.5" Desktop HDD.

261. Whilst WD, HGST, Seagate/Samsung and Toshiba are all active in 3.5" Business Critical HDDs, only WD, Seagate/Samsung and HGST are currently active in 3.5" Desktop HDDs. Toshiba is not active in 3.5" Desktop HDDs. It is also only a recent entrant in relation to 3.5" Business Critical HDDs, having announced its offering in December 2010.

262. Both WD[194] and HGST[195] produce their 3.5" Business Critical HDDs on the same production line as those used to produce 3.5" Desktop HDDs.[196] According to the information provided by the Notifying Party, Seagate has shared assembly equipment which would enable Seagate to produce HDDs meant for different end-uses on the same production lines.[197] Toshiba produces its 3.5" Business Critical HDDs on dedicated production lines.[198]

263. Given that the exercise of market definition consists in identifying the effective alternative sources of supply for the customers of undertakings involved,[199] and given that the merged WD/HGST entity's remaining HDD competitor after the merger, Seagate/Samsung, is already currently active in both 3.5" Business Critical HDDs and 3.5" Desktop, an analysis should in particular be made as to whether HDD supplier Toshiba, which commenced activities in 3.5" Business Critical HDDs in Q2 of 2011 could switch production to 3.5" Desktop HDDs and market them in the short term (that is, such a period that does that does not entail a significant adjustment of existing tangible and intangible assets), without incurring significant additional costs or risks in response to small and permanent changes in relative prices in order to significantly constrain 3.5" Desktop HDD suppliers.[200]

193 See Table 7.
194 WD reply to the Commission's request for information of 23 June 2011, question 10.
195 HGST reply to the Commission's request for information of 23 June 2011, question 10.
196 WD reply to the Commission's request for information of 7 July 2011, question 2.
197 WD reply to the Commission's request for information of 23 June 2011, question 10.
198 Toshiba reply to the Commission's request for information of 14 June 2011 2011, question 15.
199 Commission Notice on market definition, paragraph 13.
200 Commission Notice on market definition, paragraph 20.

264. Toshiba currently produces 1 and 2 TB, 7200 rpm, 3.5", multi-platter Business Critical HDDs on both the SATA and SAS interface. It produces its 3.5" Business Critical HDDs on dedicated production lines.[201]

265. The Notifying Party submits that Business Critical drives manufactured by WD that fail their rigorous testing procedure, so called "waterfall HDDs", are typically sold into the distribution channel as Desktop drives. According to the Notifying Party, this practice would indicate, that 3.5" Business Critical HDDs can be, and are, used in a Desktop application today and that Toshiba need not spend any time in development in order to bring a 3.5" Desktop product to market. As acknowledged by the Notifying Party itself it is because these HDDs "fail the minimum criteria" for 3.5" Business Critical HDDs that they are "reclassified" as 3.5" Desktop HDDs.[202] However, the cost of production of such drives (originally intended for use in the Business Critical space) would be higher in comparison to those manufactured specifically for Desktop end-use.

266. The Commission considers that given the very limited volumes of 3.5" Business Critical HDDs currently produced by Toshiba, it is likely that the latter does not currently have any waterfall sales of its 3.5" Business Critical HDDs. In any event, waterfall sales represent only a small portion of 3.5" Desktop HDDs per HDD manufacturer and therefore are unlikely to effectively constrain 3.5" Desktop HDD suppliers.[203]

267. Toshiba has confirmed the Notifying Party's submission that Toshiba has the technical possibility to 'dress-down' its 3.5" Business Critical HDD to offer multi-platter 3.5" Desktop HDDs.[204] However, as acknowledged by the Notifying Party itself, the decision to optimise its 3.5" Business Critical HDDs for use in 3.5" Desktop would entail a number of adjustments. These adjustments include:[…]*.[205] According to the Notifying Party, these adjustments would cost approximately USD [0-10]* million.[206]

268. Toshiba acknowledges that since the basic design for 3.5" Business Critical and Desktop HDDs is the same, Toshiba could in theory produce 3.5" Desktop HDDs using 3.5" Business Critical SATA production lines.[207] However, in order to do so in practice, Toshiba would also need to purchase new dedicated manufacturing tools to convert its 3.5" Business Critical HDD lines to 3.5" Desktop HDD lines. Toshiba estimates that the cost for such dedicated manufacturing tools would be maximum USD 3 million per production line.[208]

269. Even with a 'dressed-down' version of its 3.5" Business Critical HDD, Toshiba would only be present in a small portion of 3.5" Desktop HDDs.

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201 Toshiba reply to the Commission's request for information of 14 June 2011 2011, question 15.

202 WD reply to the Statement of Objections, p. 60.

203 From the information submitted by the Notifying Party, it appears that WD's waterfall sales of 3.5" Business Critical HDDs represented […]*% of its HDD sales for Desktop applications, reply to the Statement of Objections, p. 66.

204 Toshiba reply to the Commission's request for information of 7 September 2011, question 11.

205 WD reply to the Statement of Objections, p. 61, paragraph 164.

206 WD reply to the Statement of Objections, p. 61, paragraph 164, footnote 84.

207 Toshiba reply to the Commission's request for information of 14 June 2011, question 22.

208 Toshiba reply to the Commission's request for information of 7 September 2011, question 15.

270. Like other suppliers' Business Critical HDDs,[209] Toshiba's 3.5" Business Critical HDDs are offered at higher capacity points in comparison to 3.5" Desktop HDDs which normally range from 250 GB to 1TB. As acknowledged by the Notifying Party, 1 TB and 2 TB HDDs represented only 25% of 3.5" Desktop HDDs in 2010.[210] Indeed, HGST acknowledges that a range of capacity points (including lower capacity drives) would need to be included in a 3.5" Desktop offering.[211]

271. Furthermore, the large majority of 3.5" Desktop HDDs are single platter HDDs. Toshiba currently does not produce any 3.5" single platter HDDs as its 3.5" Business Critical HDDs are high capacity drives with several platters. Therefore, Toshiba submits that it would have to change the entire design of its 3.5" Business Critical HDD, entailing adjustments to tangible assets.[212] The Notifying Party estimates that it would cost a 3.5" Business Critical HDD supplier such as Toshiba around USD [0-10]* million in order for to develop a single platter. In total, therefore, the cost of adjustments to optimise 3.5" Business Critical HDDs for Desktop applications and development of a single-platter 3.5" Desktop HDD would amount to approximately USD [10-25]* million.[213]

272. In 2010, the 3.5" Business Critical was approximately 13 times smaller than the 3.5" Desktop market in terms of volume. Even if Toshiba were to fully convert its 3.5" Business Critical HDD production line to produce 3.5" Desktop HDDs, Toshiba's capacity figures for 2010 and forecast capacity growth for 2011 would represent only a negligible fraction of total 3.5" Desktop HDD volumes produced in 2010.[214] Indeed, in order to exert effective discipline on the suppliers of 3.5" Desktop HDDs, Toshiba would have to engage in significant additional investments in order to increase its capacity over and above the one time costs outlined above.

273. The Notifying Party submitted that the total costs which would be incurred by a 3.5" Business Critical supplier in order to achieve a 5% market share in 3.5" Desktop would be significant, amounting to USD [400-500]* million.

274. Although Toshiba has in the recent past considered entry into the 3.5" Desktop space, [CONFIDENTIAL] Toshiba indicated that such entry [CONFIDENTIAL; concerns reasons not to enter]. On that basis, Toshiba decided not to plan production of 3.5" HDDs for Desktop end-uses.[215] Recent Toshiba internal documents submitted by Toshiba during the course of the Commission's investigation indicate a projected market share of 0% in relation to 3.5" Desktop HDDs for the period 2010 to 2013.[216]

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209 HGST reply to the Commission's request for information of 23 June 2011, question 14.

210 WD reply to the Statement of Objections, p. 70, paragraph 197.

211 HGST reply to the Commission's request for information of 23 June 2011, question 15.

212 Toshiba reply to the Commission's request for information of 7 September 2011, question 11 and Toshiba reply to questions for conference call on 16 September 2011, question 3b.

213 WD reply to the Statement of Objections, p. 61, paragraph 164 and footnote 84.

214 An important 3.5" Desktop OEM has similarly observed that Toshiba currently lacks production capacity in relation to 3.5" Business Critical HDDs to potentially meet 3.5" Desktop demands (Minutes of a conference call with an OEM of 29 April 2011).

215 Toshiba internal documents titled "Product Planning Meeting", April 2009 and "Toshiba Hard Disk Drive Product Planning Meeting 2009/Aug", August 2009, p. 6.

216 Toshiba internal document titled "Midterm sales plan", 28 July 2011.

275. The costs which would be required to convert production lines and invest in the new capacity required to exert effective discipline on the suppliers of 3.5" Desktop HDDs, as well as the risk that such strategy would be unprofitable, imply that although technologically feasible, a substitution of 3.5" Business Critical HDDs for 3.5" Desktop HDDs would not be commercially feasible for Toshiba. In any event, the switch would require significant adjustments to tangible and intangible assets.

276. Besides entailing additional costs, the decision to switch to 3.5" Desktop HDDs and increase in capacity would also entail substantial time delays in order to be fully and effectively implemented.

277. The Notifying Party estimates that it would take [0-12]* months to optimise a multi-platter 3.5" Business Critical HDD for sale in Desktop end-use applications[217] and [0-12]* months to develop a single-platter design and dress-down the Business Critical HDD.[218]

278. Toshiba indicated that it would need to change the design architecture of its Business Critical drives to produce 3.5" Desktop HDDs. To produce single platter 3.5" Desktop HDDs, the entire conversion process would require significant strategic investments and a lead time of more than one but less two years.[219]

279. Time would also be required for installing new production lines and for the 3.5" Desktop product to be effectively marketed, qualified and subsequently ramped up in volume. Indeed, as acknowledged by HGST, for *"OEM/direct customers, there is generally significant work performed prior to any purchases to qualify HGST's product and meet customers' technical requirements for integration"*.[220]

280. The Notifying Party estimates that the overall time required for installing new capacity, qualifying with OEMs and ramping-up production would be approximately [6 to 24]* months.[221] The Notifying Party estimates that if Toshiba were to benefit from distribution via distributors (0 to 6]* months after the installation of new capacity), during the estimated [0 to 6]*month OEM qualification time, Toshiba might achieve critical mass within one year.[222]

281. In light of all those factors, it should be concluded that there exists a lack of immediate and effective supply-side substitution from 3.5" Desktop to 3.5" Business Critical HDDs.

282. Toshiba would not, in response to small and permanent changes in relative prices, be able to switch production from 3.5" Business Critical HDDs to 3.5" Desktop HDDs and market the latter in the short term, without incurring significant additional costs or risks. Given that the impact, in terms of effectiveness and immediacy, of supply-

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217 WD reply to Statement of Objections, p. 61.

218 WD reply to Statement of Objections, p. 61.

219 Toshiba reply to the Commission's request for information of 7 September 2011, question 11 and Toshiba reply to questions for conference call on 16 September 2011, question 3b.

220 HGST reply to the Commission's request for information of 23 June 2011, question 5. In its reply to the Commission's request for information of 23 June 2011, HGST also states that "HGST sells primarily to OEMs directly in the Enterprise segment where distributors play a minor role."

221 WD reply to the Statement of Objections, p. 64, paragraph 175.

222 WD reply to the Statement of Objections, p. 64, paragraph 175.

side substitution by Toshiba is not equivalent to the demand substitution effect[223], there are insufficient grounds to conclude that despite the lack of demand side substitution, the markets should be defined in a broader manner.[224] Therefore, in terms of the Commission Notice on Market Definition, the impact of any supply-side substitution by Toshiba will be considered at a later stage in the competitive assessment.[225]

283. As regards a hypothetical[226] switching from 3.5" Desktop to 3.5" Business Critical HDDs, even if possibly economically feasible because of higher margins in relation to 3.5" Business Critical HDDs, such a switch would entail the cost of redirecting production lines from 3.5" Desktop to 3.5" Business Critical HDDs (or indeed establishing separate production lines).

284. 3.5" Business Critical HDDs utilise higher quality components and entail longer testing procedures in comparison to 3.5" Desktop HDDs. Furthermore, 3.5" Business Critical HDs are more customised when compared to 3.5" Desktop HDDs. The heightened reliability requirements of Business Critical HDDs and greater customisation of these HDDs entails a closer interaction between the HDD supplier and customer for 3.5" Business Critical HDDs in comparison to 3.5" Desktop HDDs.[227] In that regard, HDD suppliers already present in 3.5" Business Critical HDDs may be seen as having a reputational advantage when compared to suppliers who are not present in 3.5" Business Critical HDDs.

285. By illustration, it took Toshiba a substantial amount of time (well above one year) to develop its 3.5" Business Critical HDDs. Furthermore, although it announced its 3.5" Business Critical offering in mid December 2010 with volume production scheduled to start for the first quarter of 2011[228], Toshiba started volume production in the second quarter of 2011 and has yet to achieve significant sales and therefore, significant scale. Only three out of eleven 3.5" Business Critical customers have qualified one or more of Toshiba's 3.5" Business Critical HDDs and only two further OEMs have plans to qualify Toshiba's Business Critical HDDs.[229] Therefore, regardless of costs of adjustments to tangible assets, an effective switch from 3.5" Desktop to 3.5" Business Critical HDDs is not likely to be immediate.

286. On that basis, it should be concluded that there exists a lack of immediate and effective supply-side substitution from 3.5" Desktop to 3.5" Business Critical HDDs.

(ii) 3.5" Business Critical to 3.5" CE and vice-versa

287. HDDs used in CE applications are subject to high usage (power-on-hours/year, read/write GB/day), high operating temperature environment, and utilise high security features. This technically results in HDDs for CE applications being

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223 Commission Notice on market definition, paragraph 20.

224 Commission Notice on Market Definition, paragraph 14.

225 Commission Notice on Market Definition, paragraph 23.

226 Currently each of WD, HGST and Seagate/Samsung have 3.5" Desktop HDD activities.

227 WD reply to the Statement of Objections, p. 118.

228 See Toshiba press release of 13 December 2010, http://storage.toshiba.com/techdocs/MKxxx1GRZB_Release.pdf (accessed on 10 October 2011).

229 Customers reply to the Commission's request for information of 8 September 2011, question 2.

designed to deliver high reliability by having both high magnetic recording operating margin in the critical “write”, “retain”, and “read” sub-processes through the use of more capable/mature head, media, electronics and low power via lower performance.[230]

288. The Commission's market investigation indicated that 3.5" CE HDDs have particular firmware codes installed according to the application purpose. CE firmware codes perform certain functions for CE products such as going into 'idle mode' to reduce energy consumption, or to perform sequential data reading (a method of uni-tasking data reading employed on surveillance cameras).

289. 3.5" Business Critical and 3.5" CE HDDs therefore share certain similarities. However, the reliability and operating challenges posed by 3.5" Business Critical applications are in general higher than those posed by 3.5" CE applications.

290. The technological complexities associated with creating superior 3.5" Business Critical HDDs translate into higher production costs in comparison to 3.5" CE HDDs. The Notifying Party sales data indicates that the cost (USD) per GB for WD to produce 3.5" Business Critical HDDs is [0-1]*, whereas the cost per GB for HGST to produce 3.5" Desktop HDDs is [0-1].

291. The technological complexities associated with creating the superior 3.5" Business Critical HDD translate into a significant price premium of 3.5" Business Critical HDDs over 3.5" CE HDDs. The price of 3.5" Business Critical HDDs amount on average to […]* USD/GB versus […]* USD/GB of 3.5" CE HDDs.[231] The average selling price of a 3.5" Business Critical HDD is, at USD […]*, significantly higher than the average selling price of USD […]* for a 3.5" CE HDD.

292. WD, HGST, Seagate/Samsung and Toshiba are all active in 3.5" Business Critical HDDs. Toshiba is only a recent entrant in relation to 3.5” Business Critical HDDs. Only WD, Seagate/Samsung and HGST are currently active in 3.5" CE HDDs.

293. Both WD[232] and HGST[233] produce their 3.5" Business Critical HDDs on the same production line as those used to produce 3.5" CE HDDs.[234] According to the information provided by the Notifying Party, Seagate has shared production lines capable of producing different types of HDDs.[235] Toshiba produces its 3.5" Business Critical HDDs on dedicated production lines.[236]

294. Given that the exercise of market definition consists in identifying the effective alternative sources of supply for the customers of undertakings involved,[237] and given that the merged WD/HGST entity’s remaining HDD competitor after the merger, Seagate/Samsung, is already currently active in both 3.5" Business Critical HDDs and 3.5" CE, an analysis should in particular be made as to whether HDD

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230 WD reply to the Commission's request for information of 23 June 2011, question 16.
231 See Table 7.
232 WD reply to the Commission's request for information of 23 June 2011, question 10.
233 HGST reply to the Commission's request for information of 23 June 2011, question 10.
234 WD reply to the Commission's request for information of 7 July 2011, question 2.
235 WD reply to the Commission's request for information of 23 June 2011, question 10.
236 Toshiba reply to the Commission's request for information of 14 June 2011, question 15.
237 Commission Notice on Market Definition, paragraph 13.

supplier, Toshiba, which recently commenced activities in 3.5" Business Critical HDDs market could switch production to 3.5" CE HDDs and market them in the short term (that is, such a period that does that does not entail a significant adjustment of existing tangible and intangible assets), without incurring significant additional costs or risks in response to small and permanent changes in relative prices in order to significantly constrain 3.5" CE HDD suppliers.[238]

295. Toshiba currently produces 1 and 2 TB, 7200 rpm, 3.5", multi-platter Business Critical HDDs on both the SATA and SAS interface. It produces its 3.5" Business Critical HDDs on dedicated production lines.[239]

296. Whilst submitting that various attributes of CE HDDs are also common to Business Critical HDDs, the Notifying Party acknowledges that design changes are required to obtain CE specific firmware. The Notifying Party estimates that a supplier would need to incur a cost of [between]* USD [500,000 and USD two]* million for a multi-platter drive.

297. The large majority of 3.5" CE are single-platter HDDs. Toshiba currently does not produce any 3.5" single platter HDDs as its 3.5" Business Critical HDDs are multi-platter HDDs. Therefore, Toshiba would have to develop a single-platter design for 3.5" CE HDDs.[240] According to the Notifying Party, in order to obtain a single-platter design, a supplier would need to incur a cost of USD [25-50]* million. Furthermore, according to the Notifying Party, a period of up to [0-6]* months and a team of [<6]* to four engineers would be required to effect the design changes.

298. Given that total volumes of sales of 3.5" Business Critical HDDs for 2010 represent 40% of the total volumes of sales for 3.5" CE, new capacity would also be needed for a switch by a supplier from 3.5" Business Critical to 3.5" CE HDDs to be effective. As regards Toshiba in particular, Toshiba's current volumes of 3.5" Business Critical sales are very small (as is evidenced by Toshiba's minimal market share) and would only represent a minimal fraction of total volumes of sales for 3.5" CE for 2010. Therefore, in order to exert effective discipline on suppliers of 3.5" CE HDDs, Toshiba would have to engage in significant additional investments in order to increase its capacity, over and above the one time costs outlined above.

299. The Notifying Party estimates that the total costs that a 3.5" Business Critical supplier would need to incur in order to achieve a 10% market share in 3.5" CE would be approximately USD [200-300]* million.[241] Similarly, Seagate estimates

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238 Commission Notice on Market Definition, paragraph 20.

239 Toshiba reply to the Commission's request for information of 14 June 2011, question 15.

240 See also Toshiba's reply to questions for conference call on 16 September 2011, question 3a. According to the 2010 sales data submitted by WD and HGST to the Commission and revised by RBB Economics, 90% of 3.5" CE HDD units were single-platter drives. Going forward, HDDs with a capacity at or below 1 TB are likely to be increasingly served by single-platter drives given that a 3.5" single platter with a capacity of 1 TB has been introduced recently.

241 The Commission asked Toshiba to submit its calculations of required investments to serve 10% of the 3.5" CE market. Toshiba's estimates of the required investments are appreciably larger than those indicated by WD. Toshiba did not submit estimates, but indicated that considerations would be similar to calculations for 3.5" Desktop HDD market.

that the total costs for a non-3.5" CE HDD supplier to achieve a 10% market share in 3.5 CE HDDs would be approximately USD [100-200]* million.[242]

300. Besides entailing additional costs, the decision to increase capacity would also entail substantial time delays to be fully and effectively implemented.

301. The Notifying Party estimates that the time for obtaining new capacity,[243] OEM qualification and production ramp-up to achieve quality and scale would amount in total to approximately [12-24]* months. Seagate estimates that the total time required from procurement of equipment to production release would be [6 to 12]* months,[244] with 1 week for OEM qualification.

302. As regards qualification by OEMs, the Notifying Party submits that this would require approximately [0 to 6]* months. However, the Commission's market investigation has indicated that a longer time would be required for OEM qualification of 3.5" CE drives. Indeed, 3.5" OEMs indicated that qualification of 3.5" CE HDDs takes approximately [0 to 12]* months.[245] One OEM even indicated that for a new supplier's 3.5" CE HDDs to be qualified, a timeline of up to three years would be required.[246] Even if only a qualification period of three to eight months indicated by the other OEMs were to be taken into account, the Notifying Party's timeline estimates for obtaining new capacity, OEM qualification and production ramp-up to achieve quality and scale, would be extended significantly to at least 14 to 22 months. Similarly, Seagate's estimated timeline would be extended to 11 to 16 months.

303. Taking those facts into account, it should be concluded that there exists a lack of immediate and effective supply-side substitution from 3.5" Business Critical to 3.5" CE HDDs. Toshiba would not, in response to small and permanent changes in relative prices, be able to switch production from 3.5" Business Critical HDDs to 3.5" CE HDDs and market the latter in the short term, without incurring significant additional costs or risks. Given that the impact, in terms of effectiveness and immediacy, of supply-side substitution by Toshiba is not equivalent to the demand substitution effect,[247] there are insufficient grounds to conclude that despite the lack of demand side substitution, the markets should be defined in a broader manner.[248] Therefore, in terms of the Commission Notice on Market Definition, the impact of any supply-side substitution by Toshiba will be considered at a later stage in the competitive assessment.[249]

304. As regards a hypothetical[250] switching from 3.5" CE to 3.5" Business Critical HDDs, even if possibly economically feasible because of higher margins in relation to 3.5" Business Critical HDDs, such a switch would entail the cost of redirecting production lines from 3.5" CE to 3.5" Business Critical HDDs or indeed establishing

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242 Seagate reply to the Commission's request for information of 7 September 2011, question 10.
243 The Notifying Party estimates that obtaining new capacity would involve a lead time of […]*.
244 Seagate reply to the Commission's request for information of 7 September 2011, question 10.
245 Customers reply to the Commission's request for information of 22 June 2011, question 37 and 39.
246 Customers reply to the Commission's request for information of 22 June 2011, question 37 and 39.
247 Commission Notice on market definition, paragraph 20.
248 Commission Notice on Market Definition, paragraph 14.
249 Commission Notice on Market Definition, paragraph 23.
250 Currently all HDD suppliers have 3.5" Desktop HDD activities.

separate production lines, as well as longer testing procedures in comparison to 3.5" CE HDDs. Furthermore, the heightened reliability requirements of Business Critical HDDs and greater customisation of these HDDs entails a closer interaction between the HDD supplier and customer for 3.5" Business Critical HDDs in comparison to 3.5" CE HDDs. In this regard, HDD suppliers already present in 3.5" Business Critical HDDs may be seen as having a reputational advantage when compared to suppliers who are not present in 3.5" Business Critical HDDs.

305. By illustration, it took Toshiba more than one year to develop its 3.5" Business Critical HDDs. Furthermore, although it announced its 3.5" Business Critical offering in December 2010, Toshiba is still currently in the process of marketing those drives without achieving significant sales and therefore, significant scale. Indeed, only 3 out of 11 3.5" Business Critical customers have qualified one or more of Toshiba's 3.5" Business Critical HDDs.[251] Therefore, regardless of costs of adjustments to tangible assets, an effective switch from 3.5" CE to 3.5" Business Critical HDDs is not likely to be immediate.

306. For those reasons, it should be concluded that there exists a lack of immediate and effective supply-side substitution from 3.5" CE to 3.5" Business Critical HDDs.

(iii) 3.5" Desktop to 3.5" CE and vice-versa

307. 3.5" CE HDDs are similar to Desktop HDDs in that they use the same interface (SATA) and the same media and heads design. However, as recognized by all HDDs suppliers, drives for CE applications require customised firmware codes according to the specific end–use application where the drives are to be incorporated and in some case tuning motors to a lower rpm and reducing power consumption. Often additional acoustic damper plates or other means of reducing acoustic noise are also used in CE drives. As explained in more detail by HGST, firmware differences between Desktop and CE drives may include some or all of the following features: (i) slower spin up to achieve power savings, (ii) reduced error correction (namely, greater error tolerance in CE drives due to the streamed content), (iii) security features required by some OEMs to improve adherence to content protection requirements, (v) requirements to support always ready or always recording (nearly 24x7) achieved by implementing non-standard media maintenance routines in firmware.[252]

308. 3.5" CE HDDs are also more customised in comparison to 3.5" Desktop HDDs. As acknowledged by HGST, many CE OEMs require drives with customer unique features while 3.5" Desktop HDDs have usually a generic firmware code. This is in part due to non-uniformity of the operating system software and the set-top boxes hardware platform design among OEMs.[253] As a consequence, any development of those customised features requires a longer development time as compared to the standard 3.5" Desktop HDDs.

309. Additionally, it appears that due to their enhanced technical performance drives for CE applications use more capable/mature heads, media and electronics as compared

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251 Customers reply to the Commission's request for information of 8 September 2011, question 2.

252 HGST reply to the request for information of 23 June 2011, question 16.

253 HGST reply to the request for information of 23 June 2011, question 16.

to 3.5" Desktop HDDs which in turn translate into higher production costs in comparison to 3.5" Desktop HDDs as well as in a higher selling price (as displayed at Table 7).

310. It follows that in order to switch production from 3.5" Desktop HDDs to 3.5" CE HDDs a supplier needs to develop a specific firmware coupled with hardware modifications to accommodate the requirements of CE systems. According to the Notifying Party's estimates, CE specific firmware could be implemented within a period of [0 to 6]*months at a cost up to USD [<5]* million for a multi-platter drive and USD [25-50]* million to obtain a single platter design. Even if the supplier had already available capacity to start the production of the new drive type by converting existing capacity of 3.5" Desktop HDDs, OEMs' qualification time of the CE drives would also have to be added to the overall conversion time.

311. In that regard, the Commission's market investigation revealed that while the qualification of suppliers already active in the CE market can take between three and six months depending on the specific customers' requirements, the process can be much longer for the qualification of suppliers which are new to the production of this drive type. As an example, one major CE OEM indicated that its qualification process of a new entrant into the CE space would take approximately three years due to the field performance assessment pursuant to which the OEM verify the failure rates of the drives concerned.[254] This lengthy process increases further the time involved in any potential switch from 3.5" Desktop HDDs to 3.5" CE HDDs to one year and likely beyond.

312. In addition to this conversion and qualification time, additional time would also be required for 3.5" CE HDDs to be effectively marketed as to gain credibility and consequently be sufficiently competitive with the other suppliers' drives.*[This was confirmed by WD's executive]**.[255] This therefore might extend even further the lead time associated to a successful conversion of production capacity across the two HDDs types concerned, depending on the supplier ability to meet customers' requirements for quality and reliability of the product.

313. Moreover, as also experienced by WD when it entered the market for 2.5" Mobile HDDs, the mere fact of being present in a neighbouring market notably, the 3.5" Desktop HDDs space did not provide it with the immediate trust of customers*[…]**.[256] In the light of the Notifying Party's own experience, it is therefore reasonable to assume that any new supplier of 3.5" CE HDDs would need to develop at least a couple of product generations before gaining a competitive market share,[…]*.[257] This estimate even appears to be over-optimistic considering that, according to one HDDs supplier, HDDs producers introduce a new generation of a product on average only every [0-12]* months and full adoption of the new product by OEMs (to the extent that the new product generation replaces the older one) may take between one and four quarters).[258]

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254 Customers reply to the Commission's request for information of 22 June 2011, question 37 and 39.

255 [Deposition of WD's executive to the FTC]*.

256 [Deposition of WD's executive to the FTC]*

257 [Deposition of WD's executive to the FTC]*

258 HDD supplier reply to the Commission request for information of 20 April 2011, question 98.

314. The importance of gaining customers' confidence on the performance of the new HDDs seems even more important in the CE HDDs market given that those drives are optimized for higher performance and have a customised firmware which is not usually required by 3.5" Desktop HDDs. As a consequence, a higher level of drive sophistication requires a proven track record of each supplier's product in order to accommodate specific OEMs' firmware requirements.

315. The reverse hypothetical switching from 3.5" CE HDDs to 3.5" Desktop HDDs, would also entail adjustments to the production process of 3.5" CE HDDs which consist, *inter alia*, of (i) switching off the existing customised firmware, (ii) tuning motors to a higher rpm (as Desktop PCs mainly use drives with 7200 rpm) and (iii) changing heads, media and electronics in order to adapt them to the standard 3.5" Desktop drives.

316. According to the Notifying Party, that conversion could be achieved quickly. In addition, according to WD's estimates an additional [0 to 12]* months would be required to ramp-up production capacity as to achieve sufficient scale given that in 2010 the volume of sales of 3.5" CE HDDs accounted for [10-20]*%of the volumes of sales of 3.5" Desktop HDDs. Moreover, another [0-6]* months would be needed for OEMs qualification. Again, it would be reasonable to assume that a new entrant would need some time to successfully market its new HDDs so as to gain customers' confidence. As a consequence, also in the scenario where a supplier decided to convert its production capacity from 3.5" CE HDDs to 3.5" Desktop HDDs, it would need [0-12]* months in order to be sufficiently competitive on this market so as to effectively defeat any price increase of 3.5" Desktop HDDs by its competitors with the immediacy required by the test on supply-side substitution set by the Commission Notice on market definition.

317. Taking those matters into account, it should be concluded that even if an HDD supplier could switch production between 3.5" Desktop HDDs and 3.5 CE HDDs and vice-versa without incurring high costs, the time required to do so and particularly to gain a meaningful market share would likely be 1 year. It follows from this that there exists a lack of immediate and effective supply-side substitution from 3.5" Desktop HDDs to 3.5" CE HDDs and vice-versa which is required in terms of the Commission Notice on Market Definition to consider two products as belonging to the same market.

318. In any event, even if the markets for 3.5" CE and 3.5" Desktop HDDs were considered to form part of the same market by virtue of supply-side considerations *quod non*, the competitive assessment of the proposed concentration in this wider market would remain unchanged for the reasons explained under Sections 5.4.3 and 5.4.4. Indeed, the Commission considers that the same reasoning laid out in these sections would apply to such a potential wider market.

(iv) 2.5" Mobile to 2.5" CE and vice-versa

319. 2.5" Mobile and 2.5" CE HDDs are very similar drives as they both use the same physical hardware although 2.5" HDDs have a specific firmware code developed on the basis of the features required by the CE applications. For example, 2.5" CE HDDs which are generally used in game consoles offer a better performance in terms of sequential data reading than 2.5" Mobile HDDs. As a result of the enhanced

performance associated with 2.5" CE HDDs, those drives have slightly higher selling prices compared to 2.5" Mobile HDDs.[259]

320. By analogy with the conversion from 3.5" Desktop HDDs to 3.5" CE HDDs, converting the 2.5" Mobile HDD production line into 2.5" CE HDD production line would require notably, the development of firmware codes tailored to the specific CE application and the qualification of the factory drive test process code scripts to support the testing of the additional features. As referred to in recital 210, the adjustments of the 2.5" Mobile HDDs to meet the requirements of 2.5" CE drives would entail a lead time of [0-12]* months and limited investments of up to USD one million for multi-platter drives. Moreover, as already explained in recitals 312 and 313, additional marketing time of the newly manufactured 2.5" CE HDDs and a further lead time of [0-12]* months for OEMs qualification (and longer for drives of new entrants into the 2.5" CE space) should be added to the overall conversion time in order for a supplier to exercise an effective disciplinary force on its competitors. The lead time associated with a successful conversion of production capacity across the two HDDs types concerned could, therefore, add up to a total of [6-12]* months, depending on the supplier's ability to meet customers' requirements for product quality and reliability.

321. It may therefore be concluded that there exists a lack of immediate and effective supply-side substitution from 2.5" Mobile HDDs to 2.5" CE HDDs.

322. The reverse hypothetical switching from 2.5" CE HDDs to 2.5" Mobile HDDs, would also entail adjustments to the production process of 2.5" CE HDDs which consist, inter alia, of switching off the existing customised firmware, and changing heads, media and electronics as to adapt them to the standard 2.5" Mobile drives.

323. That conversion could be achieved relatively quickly. An additional [0 to 12]* months would be required to ramp-up production capacity to achieve sufficient scale which is a key factor in order to be competitive in a high volume market as the 2.5" Mobile HDDs space. This is the case as the volume of sales of 2.5" CE HDDs in 2010 account for 12% of the volume of sales of 2.5" Mobile HDDs. Furthermore, other [0 to 6] months would need to be added to the overall conversion time due to OEMs qualification. Also in this case, it would be reasonable to assume that a new entrant would need some time to successfully market its new HDDs to gain customers' confidence. Consequently, where a supplier decides to convert its production capacity from 2.5" CE HDDs to 2.5" Mobile HDDs, it would need at least [6 to 12] months before being competitive in this market.

324. It may therefore be concluded that even if an HDD supplier could switch production between 2.5" Mobile HDDs and 2.5 CE HDDs and vice-versa without incurring very high costs, the time required to do so, and particularly to gain a meaningful market share could total one year (or close to it). It follows from this that there exists a lack of immediate and effective supply-side substitution from 2.5" Mobile HDDs to 2.5" CE HDDs and vice-versa which is required in terms of the Relevant Market Notice to consider two products as belonging to the same market.

[259] See table 10.

(v) Mission Critical Enterprise

325. Mission Critical Enterprise HDDs are technically sophisticated and demand superior performance compared to the other types of HDDs. For instance, they offer an ability to read and write simultaneously, allow for higher usage levels and they are designed to operate in more demanding environments with lower failure rates.

326. The Notifying Party itself submits that due to their different technical specifications and high performance requirements which are not comparable to any other HDDs, Enterprise Mission Critical HDDs could form part of a separate product market from other HDDs.

327. The Commission's market investigation has confirmed that higher technical requirements are involved in the production Mission Critical Enterprise HDDs in comparison to other types of HDDs. In particular, Mission Critical Enterprise HDDs require the use of customised interfaces (Fibre Channel or SAS interfaces), firmware and significant testing to ensure reliability and high performance. As a consequence, Enterprise Mission Critical HDDs are also distinguished from the other HDDs types from a production stand-point.

328. On that basis, it should be concluded that there exists a lack of immediate and effective supply-side substitution between Mission Critical Enterprise HDDs and HDDs intended for other end-uses.

c. Supply side substitution between HDDs having the same form factor and within the same end-use category

329. The Commission's market investigation in this case has indicated that for products within the same generation and architecture drive, HDD suppliers can vary technical characteristics of HDDs such as rotational speed and capacity within short time frames (immediately or within days) and without significant additional investments.[260] In this regard, the Notifying Party also explained that changing production from a Mobile drive to another Mobile drive with a higher capacity does not necessitate any switching costs and can be implemented in one day.

330. On that basis, it should be concluded that there exists a sufficient degree of supply-side substitutability as regards HDDs having the same form factor and within the same end-use category.

d. Conclusion regarding supply-side substitution

331. It therefore should be concluded that there exists a sufficient degree of supply-side substitutability as regards HDDs having the same form factor and within the same end-use category. However, the Commission considers that the competitive constraints arising from supply side substitutability in the case at hand (both between 2.5" and 3.5" form factors and between HDDs intended for different end-uses within each of the 3.5" and 2.5" form factors) are less effective and immediate in comparison to the demand substitution effect. It should also be concluded that there

[260] One HDD supplier's reply to the Commission's request for information of 20 April 2011, question 13.

exists a lack of immediate and effective supply-side substitution between Mission Critical Enterprise HDDs and HDDs intended for other end-uses.

332. Therefore, there are insufficient grounds to conclude that despite the lack of demand side substitution, the markets should be defined in a broader manner than on the basis of a combination of form factor and end-use categories for HDDs.[261]

5.3.1.3. The significance of competition from SSD

A. The view of the Notifying Party

333. The Notifying Party claims that SSDs are making increasingly significant inroads into market segments historically served by HDDs suppliers and in some cases they have even displaced completely HDDs such as for Ipods, digital cameras and smart phone which require smaller and shock resistant storage components. Also in Enterprise Computing the growth trend for SSD has already outstripped that of HDDs as showed by the fact that in one year (from 2009 to 2010) the use of SSD doubled while HDDs grew by only approximately 20%.[262]

334. According to the Notifying Party, SSD growth has been also propelled by the use of flash memory in Tablet PCs which are in direct competition with Notebooks, a typical territory for HDDs sales. WD maintains that even at today's prices where SSDs still command a high premium per GB of capacity, several PC manufacturers offer Notebook with a SSD variant.[263]

335. HDD suppliers are therefore facing competitive pressure on all market segments where they currently have the strongest presence (desktop and mobile computers) from different ends. At one end, smart phones and Tablet PCs are becoming larger, more developed and sophisticated. In these segments, the use of flash memories has become prevalent. At the other end, as the continued growth of storing information on the cloud increases, the demand for large local storage capacities decreases.[264]

336. For those reasons, WD claims that even if the Commission were to exclude SSDs from the relevant market, *quod non*, it should at least take into account the significant competitive pressure that this technology is exerting on HDDs, particularly in certain segments such as the high-end notebooks (2.5" form factor) as well as Mission Critical Enterprise computing.[265]

337. In that regard, the Notifying Party also stresses that […]*.[266]

338. In support of that argument, WD underlines that according to technology research firm […]*'s estimates the price for 128 GB SSD storage will decrease by […]*% between 2010 and 2015. Therefore, the cost would fall to USD […]* whereas the equivalent HDD would only be marginally cheaper. According to the Notifying Party, at this price differential SSDs will be extremely competitive, particularly

261 Commission Notice on market definition, paragraph 14.
262 Notifying Party's reply to the Article 6(1)(c) Decision, pp. 33-35.
263 Ibidem.
264 Ibidem.
265 Ibidem.
266 Notifying Party's reply to the 6(1)(c) Decision, p. 36.

considering their superior characteristics as compared to HDDs. On this point, WD underlines that in any case, there is no need for substitution to affect large volumes but just to be important enough, at the margin, to defeat a putative price increase.

339. To conclude, the Notifying Party maintains that in addition to the increasing competitive pressure that SSDs exert on certain HDDs market segments (such as superlight and compact portable PCs such as the new Macbook Air) it is important to note that any attempt by HDD manufacturers to increase prices in the HDD sector will also result in OEMs (and consequently distributors) accelerating the transition to SSD.[267]

340. On the basis of those, the Notifying Party submits that SSDs do and will increasingly constitute a significant competitive constraint on HDD suppliers, particularly as the price differential between SSDs and HDDs decreases. Therefore, WD stresses that the disciplining force of SSDs on HDD pricing must be taken into account when examining the proposed transaction.

B. The Commission's assessment

341. The Commission's market investigation revealed that currently SSDs and HDDs are not sufficiently substitutable due to the significant price differential between the two technologies and the limited storage capacity of SSDs. Moreover, for the reasons which will be explained in the following section, it does not appear that the situation will change markedly in the short term, even in the Mobile and Mission Critical Enterprise spaces, which are the segments that appear most affected by the rise of SSDs as an alternative storage technology to HDDs.

342. It should therefore be concluded that SSDs and HDDs do not belong to the same relevant product markets.

The results of the market investigation

343. The HDD manufacturers which replied to the Commission's market investigation generally submitted that despite the significant price differential compared to HDDs[268], SSDs have increasingly penetrated into market segments historically dominated by HDDs, notably, (i) in very small form factor applications where low storage capacity is required, (that is, MP3 players, such as the Ipod, which used to employ 1.8" HDDs), (ii) ultra-portable notebooks (such as MacBook Air) and (iii) high-end Mission Critical Enterprise applications.[269] Particularly in the Mission Critical Enterprise segment, sales of SSDs have largely grown in recent years because of their enhanced performance features, as compared to HDDs (for example, SSD have the ability to provide much higher inputs/outputs per second (IOPS) than HDDS and therefore can rapidly process large volumes of data).[270]

344. Notwithstanding the factors referred to in recital 343, SSD technology is currently not equally suitable to all end-use applications, particularly where high storage

267 Notifying Party's reply to the 6(1)(c) Decision, p. 39.

268 Customers reply to the Commission's request for information of 20 April 2011, question 9.

269 Reply of Toshiba, Seagate, Samsung, HGST to the Commission's request for information of 20 April 2011, question 17.

270 HGST reply to the Commission's request for information of 20 April 2011, question 17.

capacity is required as is the case for Desktop PCs, Business Critical applications and CE end-use applications such as set-top boxes and DVRs. Thus, Toshiba pointed out that that it does not see any real possibility for SSDs to displace HDDs in CE and Enterprise Business Critical applications due to the high price gap with HDDs at the same capacity points.[271]

345. Also, the vast majority of the customers which replied to the Commission's market investigation supported the arguments on the limited substitutability between the two storage devices. Thus, they pointed out that despite the superior features of SSDs which render them attractive in certain applications (such as in the Mission Critical Enterprise space),[272] the existing price/GB differential between HDDs and SSDs coupled with some reliability problems (for example SSDs appear more susceptible to data losses) strongly hamper the possibility to replace HDDs with SSDs.[273]

346. In support of that contention, the OEMs interviewed indicated that they currently make minimal use of SSDs (on average much below 5%) as compared to HDDs across all end-use applications, including in notebook and Enterprise Mission Critical systems which are the segments most affected by SSD penetration.[274]

Table 12: Market Shares (Unit) by End use[275]

Market Shares (Unit) By End Use

	End Use	CY08	CY09	CY10	CY11	CY12	CY13
SSD	Consumer Electronics	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
	Desktop	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
	Mission-Critical Enterprise	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[5-10]%	[5-10]%
	Notebook	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
	Retail	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
HDD	Consumer Electronics	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%
	Desktop	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%
	Mission-Critical Enterprise	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[90-95]%	[90-95]%
	Notebook	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%
	Retail	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%	[95-100]%

347. That finding also appears strengthened from the data displayed in Table 12which show that, on the one hand, certain end-use applications marginally employ SSDs and such marginal use is not expected to increase in the near future (for example CE applications) and on the other hand, that even in those applications where SSDs have been adopted, namely, Enterprise Mission Critical HDDs and Notebook applications, they currently do not exert a significant constraint. In that regards, one major OEM which purchases Business Critical HDDs explained that due to an increasing demand for high storage capacity in the Business Critical space (3TB vs 400 to 500 GB achieved by SSDs), it does not consider a shift of this market segment towards SSD

271 Toshiba reply to the Commission's request for information of 20 April 2011, question 27.
272 Customers reply to the Commission's request for information of 22 June 2011, question 25.
273 Customers reply to the Commission's request for information of 20 April 2011, questions 9.
274 Customers reply to the Commission's request for information of 22 June 2011, question 23.
275 Seagate reply to the Commission request for information of 9 August 2011, question 2 (Annex 3).

to be possible. In addition, this would not make commercial sense at the current price level of SSDs which are ten times more expensive than HDDs at the 3 TB capacity point.[276]

348. In support of that finding, although a few respondents to the Commission's market investigation indicated their intention to increase their purchases of SSD in the coming years[277] following the expected price decrease of SSDs,[278] they unanimously confirmed that they do not expect a large replacement of HDDs with SSDs in the next three years. Such a replacement is unrealistic not only for costs reasons but also due to the inadequacy of SSDs to high write applications and its limited capacity as compared to HDDs.[279]

349. Consistent with that view, an important HDD customer indicated that the adoption of SSD might be limited to a niche market (as in the case of ultra-light Notebooks) where customers might be willing to pay a price premium, while customers in the mass market are not expected to pay any price premium, especially given that some superior features of the SSDs are not essential for those customers.[280] This is in particular the case for the Desktop PC market where neither resistance nor power consumptions are the main requirements for those devices.[281]

350. Additionally, the same customer underlined that HDDs can currently serve better than SSDs the various applications where the two technologies are potential competitors, including Desktop, Mobile and Mission Critical Enterprise applications.[282] The same consideration appears valid in relation to the CE space as confirmed by the fact that none of the OEMs active in this market segment considers SSDs as a valid alternative to HDDs.[283] As an illustration, two CE producers explained that currently SSDs are unable to handle the frequencies with which a set-top box writes to the memory component. Also, in this case as reiterated by many other respondents to the Commission's market investigation, the price disparities for comparable memory capacities in SSDs are too high to justify a replacement with HDDs.[284]

351. In confirmation of these arguments, respondents to the Commission's market investigation almost unanimously replied that they would not replace their purchases of HDDs with SSDs in the case of a permanent price increase of HDDs by 5% to 10%, irrespective of the end-use application concerned. As an illustration, all manufacturers of Desktop and Notebook PCs, indicated that even under such a scenario, the price differential with HDDs would still be considerable and the storage capacity too low so as to trigger any shift to SSD technology.[285] Even a large user of

276 Customers reply to the Commission's request for information of 22 June 2011, question 29.
277 Customers reply to the Commission's request for information of 22 June 2011, question 24.
278 Customers reply to the Commission's request for information of 22 June 2011, question 30.
279 Customers reply to the Commission's request for information of 22 June 2011, question 31.1.
280 Customers reply to the Commission's request for information of 22 June 2011, question 26.
281 Customers reply to the Commission's request for information of 22 June 2011, question 28.
282 Customers reply to the Commission's request for information of 22 June 2011, question 29.
283 Customers reply to the Commission's request for information of 22 June 2011, question 29.
284 Customers reply to the Commission's request for information of 22 June 2011, question 29.
285 Customers reply to the Commission's request for information of 20 April 2011, questions 10.

SSDs replied that a price rise of HDDs would drive only a marginal increase of its purchases of SSDs.[286]

352. OEMs active in the Enterprise and CE space confirmed this view. For example, while one Mission Critical Enterprise customer indicated that it would potentially consider a transition to SSD only on high-performance Enterprise products,[287] two other customers belonging to the same category did not express any intention to use SSD technology even in case of a price increase of HDDs by 5% to 10%.[288] One important CE customer, in turn, stressed that beyond the cost and capacity considerations, HDDs are significantly more reliable than SSDs, particularly in high write applications (as in the case of DVR and set top boxes). Therefore they are currently not acceptable as a substitute to HDDs for its products.[289] This is also confirmed by the industry analyst IDC which considers end-users concern about SSD reliability as a major shortcoming for SSDs' adoption.[290]

353. In addition, although a few respondents to the Commission's market investigation confirmed that a price increase of HDDs might accelerate the adoption of SSDs for certain end-use applications, notably, high-end Notebook and Enterprise applications, the vast majority did not consider that this would trigger a substitution of HDDs with SSDs in the next three years due to the substantial price gap which is expected to remain within this time frame.[291] Moreover, according to [an industry analyst]*, recent supply constraints on NAND flash, which is the largest bill-of-material component for an SSD, have translated into slower price-per-gigabyte erosion than forecasted. Therefore, it appears questionable that the price gap between SSDs and HDDs will close in the next three years as to significantly increase the competitive constrain of SSDs over HDDs.

354. That finding does not seem disputed by the emergence of new technologies such as storage in the cloud which according to the Notifying Party will help further the growth of SSDs to the detriment of HDDs by lowering customers' requirement for storage capacity.

355. In that respect, respondents to the Commission's market investigation generally confirmed that the development of storage in the cloud might reduce demand for large storage capacity. However, some significant PC's OEMs equally pointed out that cloud computing will not affect the large consumer Desktop market in the next three years[292] and that the adoption of the cloud will be limited in the short term due to problems associated with data transfer speed and server quality as well as data protection concerns of the end-users.[293] In that respect, one respondent even stressed that consumers' PC will continue to require significant capacity as consumers prefer

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286 Customers reply to the Commission's request for information of 20 April 2011, questions 10.
287 Customers reply to the Commission's request for information of 20 April 2011, questions 11.
288 Customers reply to the Commission's request for information of 20 April 2011, questions 11.
289 Customers reply to the Commission's request for information of 20 April 2011, questions 13.
290 Annex 5.14 to WD submission of 7 July 2011.
291 Customers reply to the Commission's request for information of 22 June 2011, question 32.
292 Customers reply to the Commission's request for information of 22 June 2011, question 69.1.
293 Customers reply to the Commission's request for information of 22 June 2011, question 69.

to store their personal data such as pictures, movies etc, in their PCs.[294] Three other major PC manufacturers shared this view.[295]

356. With respect to the Enterprise space, customers took a similar stance. For example, one OEM submitted that despite the increased interest among Enterprise customers in cloud-based information technology infrastructures, it is not sure that the adoption of this storage technology will lead to the reduction of demand for local storage, whether on desktop or notebook PCs or on local servers.[296]

357. In any event, it should be concluded from the analysis of the results of the Commission's market investigation that cloud-based services will not make inroads into the storage market for another 5 to 10 years.[297]

358. It follows that, contrary to the Notifying Party's view, at least within the timeframe considered for the assessment of the proposed concentration, the introduction of cloud services will not have any relevant impact on the rate of utilisation of SSDs irrespective of the end-use application considered.

359. Similar considerations are valid in relation to the risk that the future displacement of consumer Notebook sales by Tablet sales will favour the adoption of SSDs over HDDs. Thus, although some customers believe that the growth of Tablets might negatively impact Desktop PCs sales in the future, other major OEMs expressed the opposite view. For example, one OEM indicated that its company experienced a stable growth on Desktop PCs in the past couple of quarters and that it does not expect a decrease on Desktop PC demand in the near future.[298] Another major OEM seems to share that opinion since it anticipates that its sales of Desktop PCs will remain stable in developing countries, where price is more important.[299]

360. In addition, according to the analysis carried out by Citigroup, the risk of displacement of Laptops by Tablets is questionable at least in the near term and even considering the potential replacement of Notebooks with Tablets in the coming years, the Notebook market is still expected to expand, thus in turn leading to the continuing growth of HDDs used in those Notebooks.[300]

361. Consequently, even taking into account the impact of alternative technologies (cloud-based services) or consumer devices (such as Tablets) over HDDs, the latter still appear set to remain the prevalent storage technology, at least in the coming years.

C. Conclusion

362. On the basis of the arguments set out in recitals 341 to 361, the Commission concludes that SSDs and HDDs are not currently substitutable due to the significant price differential between the two technologies and the limited storage capacity of SSDs.

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294 Customers reply to the Commission's request for information of 22 June 2011, question 69.
295 Customers reply to the Commission's request for information of 22 June 2011, question 69.
296 Customers reply to the Commission's request for information of 22 June 2011, question 69.1.
297 Customers reply to the Commission's request for information of 22 June 2011, question 69.2.
298 Customers reply to the Commission's request for information of 22 June 2011, question 66.
299 Customers reply to the Commission's request for information of 22 June 2011, question 66.
300 Annex 5.12 to WD submission of 7 July 2011, Citi Group- Hard Disk Drives, at pp. 11-13.

363. Moreover, any potential future replacement of some types of HDDs with SSDs, notably, in the Mission-Critical Enterprise space and the high-end Notebook market such as ultra-portable notebooks, is likely to occur only in the long term.

364. Under these market conditions where SSDs exert a limited price constraint on HDDs due to the existence of a significant price gap between the two storage technologies it could be relatively easy for HDDs suppliers to raise HDDs prices in the short term without risking reducing their sales in favour of SSDs. This is because the price of SSDs is currently 20 times higher than the price of HDDs. Therefore even a price rise of HDDs by more than 50% would not trigger a significant shift towards SSDs.

365. Given that respondents to the Commission's market investigation do not expect that price gap to close in the coming three years, it can be concluded from this that, at least in the near future, SSDs will not exert sufficient competitive pressure on HDDs so as to prevent HDDs suppliers from raising their price.

5.3.1.4. Conclusion

366. The Commission finds that, from a demand perspective, customers appear unable to substitute HDDs produced for certain end-uses with other drives displaying a different form factor or other technical features required by different end-use applications.

367. From a supply-side perspective, the Commission concludes from its analysis of the results of the Commission's market investigation that there is insufficient supply side substitutability in terms of effectiveness and immediacy to justify a broader market definition.

368. On the basis of those arguments, the following relevant product markets can be defined: (i) Mission Critical Enterprise; (ii) 3.5" Business Critical; (iii) 3.5" Desktop; (iv) 3.5" CE; (v) 2.5" Mobile; and (vi) 2.5" CE. As regard more specifically the market for Mission Critical Enterprise HDDs, there is no need to conclude on whether this market should be further segmented according to the form factor (namely, 3.5" and 2.5") as the proposed concentration does not raise competition concerns under any alternative market definition.

5.3.2. Relevant Product Markets (XHDDs)

369. External hard disk drives (XHDDs) allow PC users to supplement the storage space of their PC systems, their home and small office networks, or their CE devices. They provide stand-alone storage solutions. In addition, XHDD are used as back up solutions to prevent the loss of files in case of system failure or file corruption in internal HDDs. XHDDs use HDDs as inputs that are then incorporated in a casing and built with the desired interface and power supply. The costs of HDDs represent 70% to 90% of the total production costs of an XHDD.[301]

[301] Customers reply to the Commission's request for information of 20 April 2011, question 100. Seagate, non-confidential version of Strategic Business Plan November 2010, p. 62, submitted on 12 August 2011.

370. The vast majority of XHDDs are connected with their interface directly to the PC or CE system (Direct Attached Storage (DAS)) while some XHDDs can (also) use Wi-Fi and other forms of network connection to transfer their contents to the PC or CE system (Network Attached Storage (NAS)).

371. The most common interface used for XHDDs is currently the Universal Serial Bus (USB).[302] For XHDDs to be used in connection with Apple computers, other interfaces such as eSata[303], FireWire or Thunderbolt are also integrated into XHDDs. It is predicted by one market player that the market will migrate to NAS solutions as Wi-Fi and networking become more prevalent.[304] However, currently the DAS segment is by far the most common system. WD, for example, achieves […]% sales by value with DAS XHDDs. The rotational speed is generally between 5,400 and 7,200 rpm and the capacity currently between 250 GB and 3 TB.

372. XHDDs are available in three form factors: 1.8", 2.5", or 3.5". The three models have different requirements and provide consumers with varying degrees of storage capabilities.

- **1.8" drives**: By far the least popular of the three. In 2009, for example, approximately only 260,000 units of this size were sold.[305] Still, this market seems to appeals to a clientele that is in search of ultra-portability for mass storage.[306] By way of comparison, consumers purchased 30.2 million units of the 2.5" and 24.5 million units of the 3.5" devices worldwide in 2009.[307]

- **2.5" drives**: Smaller and more easily transported. Furthermore, they are powered by the machine to which they are connected. Going forward, analysts expect that the 2.5" model will gain further in popularity – as long as it maintains pace with end-user requirements – due to price, portability, and USB connectivity.[308]

- **3.5" drives**: Directed towards users that require extreme storage capacities, and tend to be large and unwieldy. Additionally, due to their power usage, they require an external power source. This might change however with the introduction of the new interfaces such as USB 3 and Thunderbolt which are able to transfer a higher amount of energy.

373. The Commission's market investigation indicates that XHDDs are typically manufactured with the same 2.5" Mobile and 3.5" Desktop HDDs that are used in desktop PCs and notebooks with 5,400 and 7200 rpm.[309] However, some HDD suppliers, namely WD and Samsung, produce an HDD which is specifically designed

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302 Seagate, non-confidential version of Strategic Business Plan November 2010, p. 63, submitted on 12 August 2011.

303 Interface for external applications with separate cables, connectors, and different electrical requirements than SATA.

304 Seagate, non-confidential version of Strategic Business Plan November 2010, p. 63, submitted on 12 August 2011.

305 "Storage Demand Analysis System, 2009 Annual Study", TrendFocus, March 2009, at p. 97.

306 "Storage Demand Analysis System, 2009 Annual Study", TrendFocus, March 2009, at p. 97.

307 "Storage Demand Analysis System, 2010 Annual Study", TrendFocus, February 2010, at p. 36.

308 Ibidem.

309 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 42.

to serve as an input for XHDDs as it already has a USB port on board. That said, all XHDD suppliers have found solutions to transform bare 2.5" Mobile and bare 3.5" Desktop HDDs into XHDDs by adding XHDD features such as a USB port or other interfaces.[310]

374. XHDDs are mostly sold with additional features, mainly in the form of additional software such as software for back-up, security and encryption systems, sharing software, etc. Some XHDDs are further optimized through their firmware settings to provide faster recording and playback of streaming video and or further optimized with code to enable interoperability with DVRs or set top boxes ("Media XHDDs"). According to the Notifying Party Media XHDDs represent only a very small proportion of an overall XHDDs market.[311]

375. Unlike internal HDDs, XHDDs are sold as finished products on the merchant market and substantially target different customers, mainly end users of PC and CE devices as opposed to OEMs. XHDDs are a predominantly branded business. Suppliers have created a number of brands focusing on different customer segments of the XHDD market, such as mainstream, professional, Apple Macintosh users. Private labels do not play any role.

376. The Commission did not explicitly address XHDDs in its previous decisions in the HDD sector.

A. The view of the Notifying Party

377. The Notifying Party describe the market for XHDDs as a separate product market that is downstream of the market for HDDs (HDDs being an input for XHDDs) but does not exclude that HDDs and XHDDs may be found as belonging to the same relevant product market. According to the Notifying Party, all XHDDs form part of the same market regardless of the form factor or other specifications as typically all XHDD suppliers provide all types of XHDDs given the ease at which the production of one type can be switched to that of another.

378. However, according to the Notifying Party, media players are not part of the overall market but a distinct market in itself given their additional features.[312] According to the Notifying Party, a media player is a device that connects to a user's television, the Internet or home theatre system and plays digital movies, music and photos from external hard drives, USB mass storage devices, internal hard drives or content services accessed over the internet.[313] File navigation is usually performed with a remote control, with visual feedback supplied through a connected television set or liquid crystal display. Units are sometimes sold as 'empty shells' to allow users to fit their own choice of hard drive. Currently only Western Digital is producing Media Player while HGST is not active in this area.

310 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 43.
311 WD reply to the Commission's request for information of 1 August 2011, question 1.
312 Form CO, paragraph 129.
313 Form CO, paragraph 127 to 130.

B. The Commission's assessment

379. The market players have broadly confirmed that XHDDs form a separate product market that is downstream of the HDD market(s).[314] The XHDD suppliers have broadly indicated that a further segmentation according to form factor or interface would not be necessary.[315]

380. The qualification process needed for the introduction of a new HDD into the production process of an XHDD manufacturer is considerably faster than with other OEMs and mostly takes only a couple of weeks.[316] XHDD OEMs are therefore the first to buy in large quantities new HDDs which helps to ramp up the production of new HDDs and to introduce the new HDDs in the market.

381. The Commission's market investigation shows that it is a market where the price per GB as well as the total amount of capacity and the easy use of these products matter. Also mobility is a significant factor for end-consumers.[317] The brand is also important although it seems to a lesser extent than in other consumer good markets.[318]

382. There does not seem to be a clear distinction between 2.5" and 3.5" form factor XHDDs from a demand or supply side. All significant XHDD suppliers offer both types of XHDDs. Even Toshiba is offering a 3.5" XHDD although it does not produce itself the necessary input. No XHDD manufacturer sees the form factor as a criterion for a distinct product market.[319] However, two XHDD customers indicated that mobile XHDD and desktop XHDD might be distinct markets without substantiating further their reply.[320]

383. From a demand side, there seems to be a significant degree of substitution between 2.5" and 3.5" XHDDs. It should be noted that XHDDs, unlike HDDs, are finished products which are targeted at end-customers. While the market is generally growing strongly, there also seems to be a trend to replace more and more 3.5" form factor XHDDs with 2.5" form factor XHDDs.[321] The Notifying Party claims that the 2.5" form factor segment will dominate the XHDD market with a share of 80% or more within the next four years.[322]

384. The Commission's market investigation indicates that customers would not significantly switch to other media storage devices such as additional internal HDD storage, media recorders, writable DVDs, flash and other types of SSDs, cloud storage, etc. in the case of a permanent price increase of 5% to 10%.[323] One of the reasons put forward by an XHDD supplier is the difference "that other media storage

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314 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 2.
315 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 2.
316 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 15.
317 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 21.
318 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 21.
319 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 2.
320 XHDD Competitors reply to the Commission's request for information of 19 July 2011, question 4.
321 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 28.
322 WD reply to the Commission's request for information of 1 August 2011, question 1, 2. According to WD, its answer is based an analysis of IDC.
323 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 3.

devices are still much too expensive compared to XHDDs". XHDDs would be the most cost effective solution for high capacity needs.[324] Another supplier explained that SSDs and Flash would not have the capacity to be sufficient to serve as the backup of internal hard disk drives. The same argument can be made for DVDs. Another XHHD supplier points out that external usage requires cost performance and higher capacity such as 500 GB or more.[325] These statements all indicate that other media storage devices are currently not a real alterative for most part of the XHDD customers. This is confirmed generally by customers of the Parties.[326]

385. The Commission considers that XHDDs constitute a separate product market that is downstream of HDDs.

5.3.3. The Relevant Geographic Markets

A. HDDs

386. According to the Notifying Party, the market(s) for HDDs are world-wide in scope. HDDs are produced mainly in Asia and sold world-wide. Transport costs do not play a significant role and there are no significant barriers to trade. HDDs are manufactured to the same standards. In general, according to the Notifying Party, sales prices are negotiated on a worldwide basis and do not distinguish between shipment destination or, for example, the geographic focus of a given OEM. Consequently, unit prices would not typically differ from one geographic region to another.[327]

387. In its most recent decision, the Commission has shared the Notifying Party's view that the market(s) for HDDs are world-wide in scope.[328]

388. The overwhelming majority of the respondents to the Commission's market investigation in this case confirmed that the market(s) for HDDs are worldwide in scope.[329] Customers pointed out that they source HDDs globally, HDD prices would not differentiate between the regions and their HDD requirements are basically similar throughout the world.

389. The Commission therefore concludes that the geographic dimension of the relevant market for all HDD product markets is worldwide.

B. XHDDs

390. According to the Notifying Party, the market for branded XHDDs is global in scope.[330] Generally, all suppliers are active in all the regions of the world and prices

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324 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 3.

325 Toshiba reply to the Commission's request for information of 22 June 2011, question 3.

326 Customers reply to the Commission's request for information of 19 July 2011, question 5.

327 Form CO, Paragraph 131 et seq.

328 See paragraph 26 of Commission Decision of 11 May 2009 declaring a concentration to be compatible with the common market (Case No COMP/M.5483 - TOSHIBA / FUJITSU HDD BUSINESS) according to Council Regulation (EC) No 139/2004 (OJ C 121, 29.5.2009, p. 1).

329 Customers reply to the Commission's request for information of 20 April 2011, question 19, 20; Competitors reply to the Commission's request for information of 20 April 2011, question 32.

330 Form CO, Paragraph 138.

do not deviate significantly between the regions. The market is comparable with the market for HDD where the market is world-wide in scope.

391. The Notifying Party's comparison with the market(s) for HDD seems to be flawed as XHDDs are finished products which are targeted to be sold to end-customers while HDDs are mostly targeted to be sold to OEMs as an input for different applications. Therefore, the conclusion that the markets for HDD are world-wide in scope does not indicate that the market for XHDD must also be world-wide in scope.

392. The vast majority of XHDD suppliers expressed the view that the market for XHDD is worldwide in scope.[331] However, most of the XHDD suppliers did not substantiate their response sufficiently but moreover also indicate that there are in fact significant differences from a supply and/or demand side between the different regions in the world.[332] For example, HGST, though stating that the market is world-wide, points out that "*consumption habits and consumer preferences vary across different regions of the world. Specifically, customers' product utilisation and adoption rates vary by regional trends and technology utilisation. For example, higher capacity products are often adopted in North American markets earlier than in other regions. Consumer preferences and brand recognition may also influence consumption within each of the regions.*"

393. XHDD suppliers indicate that product offering and consumer preferences do vary between the regions.[333] HGST for example states that "*there can be regional differences in relation to power requirements, packaging and software*".[334] Also the outer design of the product might differ according to Toshiba.[335] It should be taken into account that besides the interface, software and design are important characteristics of XHDDs which differentiate them from bare HDDs. One XHDD supplier points out that in Japan there seems to be a strong preference for local brands[336] and the connectivity of the XHDD to television sets is of great importance.[337] Another XHDD competitor points out that "*there is some variation between regions on preference for higher capacity and multi-media XHDDs*".[338] Another XHDD supplier states that "*Consumers in developed countries normally have other preferences (different capacity etc.) than consumers in emerging markets for examples*".[339]

394. One of Seagate's internal documents indicates that the trend from 3.5" to 2.5" form factors "*is occurring at different rates within each region.*"[340] Even the Notifying Party admits that "*to a certain extent, customers in some regions may place more*

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331 See XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 4.

332 See for example HGST reply to the Commission's request for information of 23 June 2011, question 5; LaCie reply to the Commission's request for information of 22 June 2011, question 4. See Toshiba reply to the Commission's request for information of 14 June 2011, question 72.

333 XHDD competitors reply to the Commission's request for information of 22 June 2011, question 4.

334 HGST reply to the Commission's request for information of 23 June 2011, question 5.

335 Toshiba reply to the Commission's request for information of 22 June 2011, question 4.

336 See Minutes of telephone conference with LaCie, 18 May 2011.

337 Verbatim/Freecom reply to the Commission's request for information of 22 June 2011, question 5:"… *in Japan it is different, like connectivity to TV sets is very big…*".

338 One XHDD competitor's reply to the Commission's request for information of 22 June 2011, question 4.

339 One XHDD competitor's reply to the Commission's request for information of 22 June 2011, question 4.

340 Non-confidential version of Seagate, Strategic Business Plan November 2010, p. 60, submitted on 12 August 2011.

importance on value added features for backup, security and media centric application offerings than customers in other regions".[341]

395. The marketing study submitted by the Notifying Party also indicates that customer's preferences differ between the USA and Europe.[342] According to the study, US consumers tend to rate most storage functions and ease of use as well as security more important than European consumer. Also the level of brand awareness differs between US and European consumers.[343] According to that study, in 2008 portable XHDDs were more common in the US while desktop XHDDs were more common in Europe. NAS XHDDs are more common in the USA than in Europe.[344]

396. Another XHDD supplier points out that in China and other Asian countries, there are also a number of unbranded (white box) products/ do-it-yourself products available, that is, empty casings that customers will usually equip with a refurbished bare HDD.[345]

397. Additionally, according to the information provided by the Notifying Party and confirmed by the respondents to the Commission's market investigation[346], the competitive environment seems to vary significantly across the regions. The number of significant competitors varies strongly between the European Economic Area/Europe, the Middle East and Africa (EEA/EMEA), the United States of America and Asia-Pacific-Japan. Some competitors are only considerably active in certain regions of the world. For example, Buffalo, which has a market share of around 2% in the EEA, supplies nearly half of the market in Japan. Also IO Data is one of the leading players in Japan and a significant player in the Asian-Pacific region but not active at all in the EEA. Iomega is barely active in the whole Asian-Pacific region while it is the biggest non-integrated player in the EEA.

398. The proportion between vertically-integrated and non-integrated players is different between the regions. While in the United States of America the vertically-integrated market players, in particular WD and Seagate, have over 80% of the market, the Japanese market is primarily dominated by non- integrated players such as Buffalo and IO Data. The EEA/EMEA has one of the highest numbers of XHDD suppliers and non-integrated players still supply over 40% of the market.

399. Internal documents of the Parties generally differentiate between different regions (mainly EEA/EMEA, the United States of America, Asia-Pacific-Japan).[347] According to the Notifying Party estimated sales in the Middle East and Africa represent […]*% of the total EMEA sales and that it thinks that the market

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341 WD reply to the Commission's request for information of 23 June 2011, question 5.

342 WD, Western Digital Segmentation Study, MarketTools, October, 2008.

343 WD, Western Digital Segmentation Study, MarketTools, October, 2008, slides 89, 90.

344 WD, Western Digital Segmentation Study, MarketTools, October, 2008, slide 105-108.

345 LaCie reply to the Commission's request for information of 22 June 2011, question 4.

346 See for example HGST reply to the Commission's request for information of 23 June 2011, question 5 a: "*… the main market players in North America are WD and Seagate, while the European market has many mid-sized players fulfilling products needs. In China, a variety of small players occupy the main portion of the market.";* Freecom/Verbatim reply to the Commission's request for information of 22 June 2011, question 4 a: "*Yes, significantly*".

347 See for for example WD, "FQ4 Road to Success", 21/8/2011; WD, "EMEA Update 2.0.11 – EMEA Team", August 2011.

conditions and the market strength of the players in the EEA and EMEA are similar.[348]

400. Some XHDD suppliers point out that there are differences in the marketing and sales channels in the different regions.[349] In contrast to the HDD market(s) where the majority of sales are done to the same global active customers, the main customers, that is, retailers and distributors differ between the different regions.[350] The dominant type of customers also differs considerably. According to the Notifying Party, […]% of its direct XHDD sales in the EEA are to wholesalers and distributors while […] of its customers in the US are retailers.[351]

401. The Commission considers that the XHDD market is currently regional and therefore must be assessed at the EEA-wide level.

5.4. Competitive assessment

5.4.1. Unilateral effects

402. WD is currently the largest HDD supplier in terms of volume, and a close second to Seagate in revenues for HDDs overall. It is the largest supplier on the significant markets for 3.5" Desktop HDDs ([40-50]*% market share in revenues) and 2.5" Mobile HDDs ([30-40]*% market share in revenues), it is the largest supplier on the market for 3.5" CE HDDs ([40-50]*% market share in revenues), and the second largest on the market for 3.5" Business Critical HDDs ([30-40]*% market share in revenues).

403. With the proposed concentration, WD would reinforce its leading position to become by far the largest HDD supplier on all HDD markets except on the market for Mission Critical Enterprise HDDs where WD only recently entered. The activities of WD and HGST overlap in all the HDD markets, and the proposed concentration would overall result in significant increments in WD's current market shares.

404. Table 13 lists the market shares of the HDD suppliers on each of the relevant HDD markets.

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348 WD reply to the Commission's request for information of 1 August 2011, questions 7, 8.

349 See XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 4. See Toshiba reply to the Commission's request for information of 14 June 2011, question 72.

350 See Toshiba reply to the Commission's request for information of 22 June 2011, question 4.

351 WD reply to the Commission's request for information of 1 August 2011, question 10.

Table 13: 2010 revenue-based, worldwide market shares per end-use and form factor [352]

HDD SUPPLIERS	ALL HDDs [353]	MISSION CRITICAL ENTERPRISE	BUSINESS CRITICAL ENTERPRISE 3.5" [354]	DESKTOP 3.5"	MOBILE 2.5"	CE	
						3.5"	2.5"
WD	[20-30]*%	[0-5]*%	[30-40]*%	[40-50]*%	[30-40]*%	[40-50]*%	[0-5]*%
HGST	[10-20]*%	[20-30]*%	[20-30]*%	[10-20]*%	[10-20]*%	[10-20]*%	[30-40]*%
COMBINED	***[40-50]*%***	***[20-30]*%***	***[50-60]*%***	***[50-60]*%***	***[40-50]*%***	***[50-60]*%***	***[40-50]*%***
Seagate/Samsung[355]	[40-50]*%	[60-70]*%	[40-50]*%	[40-50]*%	[30-40]*%	[40-50]*%	[10-20]*%
Toshiba	[10-20]*%	[5-10]*%	-	-	[10-20]*%	-	[40-50]*%
Market size (million EUR)	**[20 000-30 000]***	**[0-10 000]***	**[0-10 000]***	**[0-10 000]***	**[0-10 000]***	**[0-10 000]***	**[0-10 000]***
Revenue share of sales in each market out of overall HDD sales[356]	**100%**	**[10-20]*%**	**[0-5]*%**	**[30-40]*%**	**[30-40]*%**	**[0-5]*%**	**[0-5]*%**

405. The Commission assessed the competitive effects of the proposed concentration on each of the relevant affected markets.

406. In line with the priority principle set out in Section 5.1, the relevant counterfactual is that pre-merger, Seagate/Samsung, WD, HGST and Toshiba are present as HDD

352 Source: Notifying Party's estimates based on IDC reports. Figures are rounded. Market shares in relation to the downstream EEA-wide XHDD market are included in Section 8, table 26.

353 The market share estimates for each of the 3.5" Desktop, 2.5" Mobile, 3.5" CE and 2.5" CE markets include the HDD suppliers' captive sales of such HDDs. According to the information provided by the Notifying Party, HDD suppliers make no or limited captive use of 3.5" Business Critical HDDs. Therefore, any captive sales which might be covered by the market share estimates for 3.5" Business Critical HDDs would be limited.

354 According to the information provided by the Notifying Party, the market share estimates for 3.5" Business Critical HDDs also include very small volumes of high end 2.5" HDDs. IDC does not record these HDDs as a separate category from 3.5" Business Critical HDDs due to the very low volume shipments of those HDDs.

355 The market shares of Seagate and Samsung before their planned concentration were as follows: on the 3.5" Business Critical Enterprise market: Seagate: [40-50]*%, Samsung: [0-5]*%; on the 3.5" Desktop market: Seagate: [30-40]*%, Samsung [10-20]*%; on the 2.5" Mobile market: Seagate: [20-30]*%, Samsung [10-20]*%; on the 3.5" CE market Seagate: [40-50]*%, Samsung: [0-5]*%; on the 2.5" CE market: Seagate: [5-10]*%, Samsung: [0-5]*%. Before its proposed concentration with Seagate, Samsung's market share in the Mission Critical Enterprise market was zero.

356 Figures are rounded. Overall HDD market also includes sales of 1.8" HDDs.

competitors on the various 2.5" markets and the 3.5" Business Critical market, and WD, Seagate and HGST are present as competitors on the 3.5" Desktop and 3.5" CE markets.

407. The Commission finds that the proposed concentration would result in a significant impediment to effective competition stemming from non-coordinated effects on the following markets:

– The worldwide 3.5" Desktop market (Section 5.4.3);

– The worldwide 3.5" CE market (Section 5.4.4);

– The worldwide 3.5" Business Critical market (Section 5.4.5).

408. As regards the EEA-wide XHDD market, (Section 5.4.9) there are some indications that the proposed concentration as notified may give rise to a significant impediment to effective competition as a result of non-coordinated effects in the EEA-wide XHDD market. However, since the commitments submitted by WD remove the significant impediment to effective competition in the upstream worldwide markets for 3.5" Desktop HDDs, 3.5" CE HDDs and 3.5" Business Critical HDDs and therefore a potential significant impediment to effective competition on the downstream EEA-wide XHDD market, there is no need to conclude in this regard.

5.4.2. The Commission's general approach on the 3.5" Desktop, CE and Business Critical markets

5.4.2.1. The View of the Notifying Party

409. The Notifying Party puts forward a number of arguments as to why the proposed concentration would not give rise to a significant impediment to effective competition, which apply with equal force to each of the 3.5" Desktop, 3.5" CE and 3.5" Business Critical markets.

410. First, the Notifying Party claims that the combination of the Parties' current market shares is not indicative of the post-merger market position of the Merged Entity. In its view, historic post-merger analysis in the HDD industry shows that strong HDD customers on the relevant HDD markets "re-allocate" purchase shares after each round of consolidation in the industry. Customers accordingly spread their sales as much as possible over multiple suppliers, thus reducing the market share increment that a concentration between two HDD competitors brings about.[357] Previous Commission's Decisions in the HDD industry have recognised this so-called "Conner Effect."[358]

411. Secondly, the Notifying Party submits that the Commission has not demonstrated that HGST is the closest competitor of WD.[359] In the Notifying Party's view, the proposed concentration would for that reason not significantly impede effective competition on any of the HDD markets.

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357 See also WD reply to the 6(1)(c) Decision, paragraphs 84-97.

358 Case No COMP/M.5483 – Toshiba/Fujitsu HDD Business, paragraph 33.

359 WD reply to the 6 (1) (c) Decision, paragraphs 98-111.

412. Thirdly, the Notifying Party submits that most HDD customers are large OEMs, which themselves operate on concentrated downstream markets and which are able to exert significant countervailing buyer power on the relevant HDD markets.[360] While most of the smaller OEMs purchase HDDs through distributors, each of these distributors would still account for a large portion of total sales for all the HDD manufacturers. The Notifying Party implicitly claims that these distributors would also have significant countervailing buyer power.

413. The Notifying Party claims that these customers have significant leverage over HDD manufacturers and that the threat for the manufacturers of losing even 10 points of any OEM's demand would be very serious. The Notifying Party notes that the HDD sector has typically been characterised by over-capacity. This, combined with the economies of scale, the low variable costs and the need to recoup high fixed costs, means that the fulfilment of any incremental demand from OEMs has a disproportionally high impact on the profitability levels of the HDD suppliers. In the view of the Notifying Party, the leverage that OEMs have over HDD suppliers would be further enhanced by the use of bidding procedures. The Notifying Party notes that typically, OEMs qualify between three and four suppliers and award business to between two and four suppliers on any given HDD market. In this manner, they induce competition between these suppliers in order to achieve a competitive outcome of their negotiations with these suppliers.

414. In the Statement of Objections, the Commission *inter alia* provisionally concluded that most customers on the 3.5" HDD markets multi-source their HDD supplies and that the removal of the third supply source would have a negative impact on these customers' ability to obtain competitive prices. In its reply to the Statement of Objections, the Notifying Party submits that the Commission overstates the importance of multi-sourcing for HDD customers. It considers that the Commission's evidence is selective insofar as a number of submissions, from wholesalers, distributors and retailers, but also from a number of OEMs, pointing out that two suppliers are enough to ensure competitive prices and security of supply, have not been taken into account. In addition, the Notifying Party considers that the Commission's questions on this matter were leading, prompting the respondents to say that there are obstacles to re-allocate shares. Moreover, according to the Notifying Party, accessible OEM replies to the Commission's Phase II questionnaire show numerous examples of customers sourcing from just one supplier or awarding shares to suppliers that exceed 60% to 70%. The Notifying Party argues that many customers can and do use a wide range of procurement methods other than multi-sourcing to secure competitive outcomes. These methods include in particular asymmetric shares of total available market.

415. Furthermore, according to the Notifying Party, the empirical evidence, based on transactional data submitted by the Notifying Party, HGST, Seagate and Samsung used by the Commission on multi-sourcing is unreliable. In particular, on the Desktop market, the Notifying Party points to the following limitations:

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360 WD reply to the 6(1)(c) Decision, paragraph 118.

– The Commission's analysis does not take into account distributors and retailers which account for between 20% and 40% of 3.5" Desktop HDD sales based on the data room, and […]*% of WD total 3.5" Desktop HDD sales.

– Customer aggregation is not meaningful for a number of charts. Even if each customer sources from just one supplier, the chart shows that the group of customers source from multiple suppliers if those individual customers are purchasing from different suppliers.

– In any case, the charts show that certain customers use one or two suppliers.

– Using the bidding data, RBB[361] analyzed the number of occasions when customers sourced 1, 2, 3 or 4 suppliers for each product type (defined as a unique combination of GB capacity, form factor, rpm and end-use) and found a number of instances in 2010 where customers sourced from just one or two suppliers.

416. The Notifying Party argues that, even if there were a preference to source no more than 60% to 70% from a single supplier and even if a customer chose security of supply over price, at some point the customer would view the premium required to multi-source to be too high. In that regard, the Notifying Party compares the gains from bidding aggressively to secure the highest share or weakly to obtain a higher price in the market for Desktop HDDs. On the basis of the Notifying Party's calculations, considering the case where the customer splits its total available market on a 70/30% basis, WD would make as much profit from offering the pre-merger price and winning the larger share as it would if it charged an additional 27% more than the pre-merger price and won the smaller share. The Notifying Party further argues that if WD sought to increase prices by 27%, then the customer would have a credible threat to switch to a rival supplier of 2.5" HDDs since price parity between 3.5" and 2.5" drives would be achieved at all capacity points at or below 640GB. Moreover, according to the Notifying Party, it seems likely that the opportunity to capture 30% of the market at prices 27% higher than the pre-merger level would provide an incentive to Toshiba to expand from producing business critical enterprise HDDs to desktop HDDs.

417. Considering a scenario where the customer were to offer a split of 60/40%, WD would make as much profit from offering the pre-merger price and winning the larger share as it would if it charged an additional 10% more than the pre-merger price for the smaller share. In such a scenario, according to the Notifying Party, the customer could use the following options that would render any attempt to sustain higher prices unprofitable: (i) re-allocate volumes to the lower priced supplier, (ii) withdrawal of volumes and separate tendering in "winner-takes-all" contest; (iii) switch to 2.5" HDDs and/or (iv) such volumes could be used to sponsor expansion by Toshiba.

418. In addition, the Notifying Party argues that in the two scenarios considered the analysis is conservative insofar as it does not take into account the additional incentive to bid aggressively that is to achieve scale economies.

[361] RBB is the external economic adviser to the Notifying Party.

419. Fourthly, the Notifying Party asserts that OEM customers on the relevant HDD markets have the ability to switch to alternative suppliers easily, at no cost and very rapidly.

420. In that context, the Notifying Party claims that despite incremental innovation taking place, HDD markets are commoditised product markets.[362] The Notifying Party argues that while product quality is an important driver for OEMs, all HDD manufacturers would be regarded as offering a similar level of product quality.[363] Competition on the HDD markets is therefore only driven by price.[364] As OEM customers could and would switch suppliers if the Merged Entity increased prices, the proposed concentration would not give rise to a significant impediment to effective competition on any of the relevant HDD markets.

421. Fifthly, the Notifying Party claims that after the merger, the Merged Entity would be subject to effective competition from Seagate and Toshiba. These competitors are either already active, well established competitors on the relevant HDD markets, or possess the know-how and other resources to expand their activities into the three 3.5" HDD markets should HDD customers wish to shift their demand away from the Merged Entity.

422. According to the Notifying Party, neither of those competitors would face capacity constraints.[365] Moreover, the HDD industry has experienced a steady increase in available capacity and the Notifying Party expects this trend to continue.[366] The Notifying Party argues that, in any case, capacity can be expanded quickly and at relatively low cost.[367]

423. The Notifying Party further explains that Seagate has been the largest HDD vendor for most of the past 15 years and is the revenue leader in overall HDD sales. After

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362 Form CO, paragraphs 186, 299-301. The Notifying Party points out that HDD products use standard interfaces and that there is a lack of brand loyalty amongst HDD customers. The Notifying Party also refers to the fact that OEMs have generally qualified all HDD suppliers so that they can switch easily between the different suppliers.

363 According to the Notifying Party, customers would care only about the technical characteristics (mostly storage size) of the HDD. Form CO, paragraph 186.

364 Form CO, paragraph 302.

365 Form CO, paragraphs 282 and 283; reply to the 6 (1) (c) Decision, paragraphs 112-118. The Notifying Party estimates that current industry-wide utilization levels are around […]*%. WD's installed capacity is WD: […]* units per quarter, and for Q1 2011 utilisation would be around […]*%.

366 Form CO, paragraph 286. The Notifying Party refers to an announcement by Toshiba in 2010 that it would significantly expand its HDD production facilities in Thailand. The Notifying Party also refers to TrendFocus estimates for overall HDD production capacity. According to these estimates, total HDD capacity would amount to 191 million per quarter by the end of 2010 and is forecasted to increase by 13% by the fourth quarter of 2011, up to 219 million units per quarter. The Notifying Party notes that Seagate and Samsung would increase their manufacturing capacities by 18% and 24% respectively. Moreover, the Notifying Party refers to HDD component manufacturers that tend to increase production capacity in line with overall HDD demand. For instance, TDK's capital expenditure for the production of heads would be about USD 90- 100 million in 2010 and is expected to grow by 50% in 2011 (Form CO, paragraph 214). Finally, the Notifying Party anticipates on the basis of industry reports that the natural disaster in Japan will lead to some HDD component shortages but that the duration and impact of these shortages is not yet known with certainty (see Digitimes Insight, 21 March 2011: "Japan earthquake to affect HDD industry").

367 Form CO, paragraph 323. The Notifying Party estimates that the capital expenditure for a new plant would amount to approximately USD 150-300 million for targeted production capacity and depending on whether existing production sites can be used.

the merger, Seagate would continue to be an effective competitor due to its size and scale, its broad portfolio of HDD products, its innovation strength and its brand reputation in the Enterprise markets.[368] Seagate would become a stronger competitor with the acquisition of Samsung.

424. Toshiba[369] has traditionally been the "pioneer" in the introduction of the small form factor HDDs and would still be a driving force in mobile 2.5" HDDs. This is supported by the fact that Toshiba serves certain high-quality demanding customers. The Notifying Party argues that Toshiba's recent product introductions in the 3.5" Business Critical market demonstrate that Toshiba has the necessary technology and manufacturing assets to produce 3.5" HDDs, particularly if encouraged by OEMs. On that basis, the Notifying Party expects Toshiba to introduce a 3.5" HDD for desktop applications in the near future.

425. Finally, according to the Notifying Party, the very competitive nature of the HDD markets would be illustrated by the rapid pace at which average selling prices for HDDs have declined, despite on-going industry consolidation. The Notifying Party asserts that this would not change with the proposed concentration.

5.4.2.2. The Commission's analytical framework

426. In making its competitive assessment on each of 3.5" Desktop, 3.5" CE and 3.5" Business Critical markets, the Commission applies the following principles laid down in the Horizontal Merger Guidelines.

427. A merger may significantly impede effective competition in a market by removing important competitive constraints on one or more sellers, who consequently have increased market power.[370]

428. The most direct effect of the merger will be the loss of competition between the merging firms. For example, if prior to the merger one of the merging firms had raised its price, it would have lost some sales to the other merging firm. The merger removes this particular constraint. In addition, non-merging firms in the same market can also benefit from the reduction of competitive pressure resulting from the merger, since the merging firm's price increase may switch some demand to the rival firms, which in turn may find it profitable to increase their prices. The reduction in these competitive constraints could lead to significant price increases in the relevant market.[371]

429. Accordingly, mergers in oligopolistic markets involving the elimination of important competitive constraints that the merging parties previously exerted upon each other together with a reduction of the competitive pressure on the remaining competitors may, even where there is little likelihood of coordination between the members of oligopoly, result in a significant impediment to effective competition.[372] The Merger

368 WD reply to the 6 (1) (c) Decision, paragraphs 65-70.
369 WD reply to the 6 (1) (c) Decision, paragraphs 71-83.
370 Horizontal Merger Guidelines, paragraph 24.
371 Ibidem.
372 Horizontal Merger Guidelines, paragraph 25.

Regulation clarifies that all mergers giving rise to such non-coordinated effects must be declared incompatible with the internal market.[373]

430. On each of the 3.5" Desktop, 3.5" CE and 3.5" Business Critical markets, therefore, the Commission has assessed whether the proposed concentration would remove an important competitive constraint that WD and HGST exerted upon each other and whether competitive pressure on the remaining competitor or competitors would be reduced. On that basis, the Commission has assessed whether the reduction in these competitive constraints could lead to significant price increases on these markets.

431. The Commission has made its assessment in light of the following factors that are relevant in accordance with the Horizontal Merger Guidelines:

For the likelihood of significant non-coordinated effects:

(1) The market shares that would result from the proposed concentration;

(2) The closeness of competition between WD and HGST;

(3) The post-merger possibilities for customers to switch suppliers;

(4) The likelihood that the proposed concentration would remove an important competitive force on the market;

(5) The likelihood that competitors would increase supplies if prices increase post-merger;

For the assessment of countervailing effects:

(6) Buyer power on the market after the proposed transaction;

(7) The likelihood of timely and sufficient entry on the market.

432. Pursuant to paragraph 26 of the Horizontal Merger Guidelines, not all of the factors listed in those Guidelines and referred to in points 1. to 5. need to be present for a significant impediment to effective competition on a market to arise.

Common issues on the three 3.5" markets

433. The market structure and competitive dynamics vary for each of the 3.5" Desktop, 3.5" CE and 3.5" Business Critical markets. A number of factors are nonetheless relevant for the Commission's competitive assessment on each of these markets.

A. Commodity vs. differentiated products

434. The Commission's market investigation did not confirm the Notifying Party's submissions that HDD products are pure commodity products.

435. The Commission's market investigation reveals that although brand loyalty appears not to be strong and OEMs can switch their HDD purchases between the different

[373] Recital 25 of the Merger Regulation.

HDD competitors, products on the relevant HDD markets display features of differentiated products.

436. As referred to in recitals 94 to 96, the Commission's investigation confirmed that technology and product innovation are important. Evidence submitted by the Parties demonstrates that margins across HDD products belonging to the same HDD product family diverge widely.[374] As stated in footnote 23, standard interfaces allow for switching between different HDD suppliers, but at the same time induce HDD competitor to innovate in order to improve the drives' storage capacity, head or media design, architecture and mechanical engineering. This gives a further indication that HDD products are to a certain degree differentiated products.

437. WD sales to OEMs accounted for […]*% of WD's net revenues in 2010. HGST sales to OEMs accounted for […]*% of HGST's net revenue.[375] Accordingly, the submissions of OEMs during the Commission's market investigation are representative for the view of an important customer group of the Parties.

438. Desktop OEMs confirm that factors such as performance (rotation, seek speed), reliability, noise and energy consumption of HHDs are important factors in their purchasing decisions on the relevant HDD markets. As regards performance and reliability, a large majority of Desktop OEMs list these factors as a number 1 or 2 priority in their purchasing decisions.[376] The vast majority of these OEMs confirm the same for energy consumption, and list HDD noise levels as a number 1, 2, or 3 priority. Distributors who responded to the Commission's requests for information confirm this to a lesser extent. A third of those distributors confirm that performance and reliability are a number 1 or 2 priority and the same proportion confirms that energy consumption and noise are a top 3 priority.

439. The importance of product quality and reliability, especially for OEMs, is underlined by the fact that these customers rank HDD competitors quarterly on the basis of the product quality they offer. HDD competitors closely monitor those rankings.[377] Moreover, contrary to the Notifying Party's views, OEMs do not consider that HDD competitors all offer the same levels of product quality. They have in recent years ranked HGST constantly first or second in their quality rankings.[378] Moreover, the share of the top 10 PC OEMs in the sales of each HDD competitor, which gives a good proxy of the perceived product quality of the different HDD competitors, shows significant quality differences between HDD suppliers.

440. Key executives of the Notifying Party[379] confirm that critical factors for success on the HDD markets are consistently high product quality and reliability,[380] large scale and low cost, focused asset management, effective technology deployment and

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374 Annex 24 to WD reply to the Commission's request for information of 22 June 2011, Annex 22 to HGST reply to the Commission's request for information of 22 June 2011.

375 Form CO, paragraphs 276 and 279.

376 Customers reply to the Commission's request for information of 22 June 2011, question 35.

377 See [Deposition of WD's executive to the FTC]*.

378 HGST "2011 Plan Overview – Senior Management, Hitachi GST", 27 February 2011, slide 10.

379 WD earnings call of 28 January 2009, WD CEO John Coyne. See also [Deposition of WD's executive to the FTC]*.

380 [Deposition of WD's executive to the FTC]*.

product breadth and product availability.[381] Those executives also confirm that a key factor driving competition is the ability of HDD suppliers to execute their product roadmaps well, and to bring high-quality products to the market in a timely and cost-effective manner. Most of these criteria indicate that HDD products are at the very least differentiated products to a certain extent.

441. On the basis of those findings, the Commission concludes that products on the HDD markets of concern have features of differentiated products.

B. Procurement process/multi-sourcing

442. The Commission's market investigation confirmed that OEMs typically qualify between three and four HDD suppliers. OEMs then generally award their actual HDD purchases between two and four suppliers in any given market. For instance, an OEM can grant 40% to the most competitive bidder, 30% to the second most competitive bidder, followed by 20% and 10% for a third or fourth bidder.[382]

443. The Commission's market investigation confirmed that, as such, customers on the relevant HDD markets face limited cost or time constraints in switching qualified HDD suppliers. However, the investigation also revealed that in practice, this ability to switch suppliers is limited due to the practice of multi-sourcing, which is essential for HDD customers. A key driver of these multi-sourcing strategies is security of supply.[383] Multi-sourcing enables customers to spread the risk that an HDD supplier does not meet their requirements in terms of quantities or quality. Moreover, the possibility to choose between more than two HDD suppliers enables customers to obtain better pricing while securing their supplies. The majority of customers currently observe some degree of correlation between the difference in purchases allocated and the price behaviour of the HDD suppliers. For instance, the bigger the share of purchases allocated to one bidder is compared to the others, the more aggressive on price the bidders are. [384]

444. Most OEMs confirmed that a minimum number of three suppliers are required in order to apply an effective multi-sourcing policy.[385] 14 out of 20 responding OEMs indicated that they are reluctant to allocate more than a maximum share ranging from 40% to 80% to a single supplier.[386]As one large Desktop OEM explained; it "*would wish to continue to procure HDDs from a range of suppliers, in order to ensure security of supply. Usually [the OEM] does not donate much higher than 60%. [A] major reason [for this] is supply security. If a supplier with 60 %+ has i.e. a technical problem it is almost impossible to balance this out with the remaining*

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381 [Deposition of WD's executive to the FTC]*.

382 Customers reply to the Commission's request for information of 20 April 2011, questions 73, 34 to 36.

383 Customers reply to the Commission's request for information of 20 April 2011, question 36. As pointed out by a large OEM customer: "We will continue to source the supply that allows us to optimize the mix for pricing, quality and assurance of supply". Another large OEM noted: "*All companies have multi-sourcing policies. There would otherwise be a risk to lose competitiveness from a technology point of view"* (Minutes of a meeting, 15 June 2011, p. 1)

384 Customers reply to the Commission's request for information of 22 June 2011, question 58.

385 Customers reply to the Commission's request for information of 20 April 2011, question 66. sixteen out of nineteen OEMs consider that at least 3 suppliers are required to continue an effective multi-sourcing policy.

386 Customers reply to the Commission's request for information of 22 June 2011, question 55.

source".[387] Another Desktop OEM belonging to the minority of respondents that did not mention that purchase share range specified that in principle, a 100% share could be allocated, but noted that this allocation would create significant risks for its security of HDD supplies.[388]

445. The Commission concludes that the ability of HDD customers to switch suppliers and re-allocate purchase shares would be significantly limited in a two-supplier scenario.

C. Evolutions in capacity and production

446. The Commission's market investigation confirms that the availability of production capacity for 3.5" HDDs is important to enable HDD competitors to be a reliable and flexible supply source for customers.

447. As the CEO of the Notifying Party has noted:

"([running capacity close to 98%/99% utilization is] very good for the short-margin and absorption benefit; however it inhibits our ability to provide one of the critical values that we provide to customers, which is availability and responsiveness. So our target is to run about a 90% utilization and we (…) were adding capacity in order to do so-to accomplish two things: to keep up with the demands of our customers and two, to restore our flexibility in order to being able to meet day-to-day, week-to-week changes and provide the right products at the right time."[389]

448. In the Statement of Objections, the Commission included the following graph that depicts the evolution in 3.5" HDD production capacity for WD and for 3.5" desktop for HGST between 2006 and 2010. This graph is relevant for the Commission's competitive assessment in two ways. First, it sheds light on the competitive constraint that HGST poses on the affected 3.5" HDD markets as a HDD supplier that is committed to the HDD industry. Second, it gives indications as to the likely post-merger ability and the incentive of WD and Seagate to expand capacity on those same affected markets.

Figure 8: Capacity in 3.5ff (Desktop for HGST)[390]

[…]*

449. As becomes clear from Figure 8, WD and HGST have been increasing production capacity for 3.5" HDDs from 2006 to 2010.[391] The Commission has compared this evolution against the evolution in capacity and output of Seagate and Samsung, before their proposed concentration. This analysis shows that Seagate's capacity has been more stable. Before its proposed concentration with Seagate, the 3.5" HDD

387 Customers reply to the Commission's request for information of 22 June 2011, question 46.1.

388 Customers reply to the Commission's request of 22 June 2011, question 55: "A sole source strategy poses significant risks related to supply, quality and price over time."

389 WD earnings call on 22 September 2009, WD CEO John Coyne.

390 Source: the Parties.

391 The decrease in production capacities in January 2009 is an effect of the economic recession.

production capacity of Samsung was also relatively stable, and generally lower than that of HGST, WD and Seagate.[392]

450. A similar picture emerges if account is taken of the evolution in overall HDD production and capacity of WD and HGST. The first two graphs (Figure 9 and Figure 10) depict the overall trend in capacity and production for each of WD and HGST. The third graph (Figure 11) depicts the actual growth or decline in capacity and production in one quarter as opposed to the previous quarter.

Figure 9: WD's HDD Production and capacity[393]

[…]*

Figure 10: HGST's HDD capacity and production[394]

[…]*

Figure 11: Evolution of HDD capacity[395]

[…]*

451. As becomes clear from Figure 9, Figure 10 and Figure 11, WD and HGST have also increased production capacity for overall HDDs in the time period that has been analysed by the Commission. The Commission has also compared this evolution against the evolution in production capacity of Seagate and Samsung before their proposed concentration.[396] This analysis confirms that Seagate's production capacity for all HDDs has again been relatively stable. It also confirms that HGST overall capacity has generally been higher than Samsung before that company merged with Seagate. The production capacity of Samsung before its proposed concentration with Seagate shows more of a growth trend, although it has still been more stable as compared to HGST. This shows that Samsung's capacity growth has been concentrated on other form factors than 3.5"HDDs, which is the relevant factor in the Commission's competitive assessment on the three 3.5" HDD markets:

452. In its reply to the Statement of Objections, the Notifying Party sought to refute the Commission's provisional finding that both WD and HGST increased their 3.5" Desktop and overall HDD production capacity whereas Seagate and Samsung's production capacity remained relatively stable during the same period. First, according to the Notifying Party, the data relied upon by the Commission does not consider external (contract manufacturing) capacity for HGST.[…]*. Secondly, the Notifying Party considers that the mere fact that Seagate and Samsung have not

392 The Notifying Party will obtain access to the data for Seagate and Samsung in a data-room.
393 Source: the Notifying Party.
394 Source: HGST.
395 Source: the Parties.
396 The Notifying Party will obtain access to the data for Seagate and Samsung in a dataroom.

significantly added to their 3.5" capacity does not reveal anything about the level of spare capacity of these suppliers. According to the Notifying Party, Seagate expanded capacity just prior to 2007 that is, prior to the start of the period considered by the Commission. Moreover, since Seagate and HGST's shares of 3.5" capacity are similar to their share of supply, for a given level of utilisation, Seagate would have three times as much spare capacity as HGST. Consequently, Seagate would have greater spare capacity in absolute terms than HGST.

453. The Commission takes note of the argument put forward by the Notifying Party with regard to the inclusion of external contract manufacturing into HGST production capacity. However, the Commission considers that trend in capacity expansion remains relevant for its assessment insofar as it is indicative of a certain commitment to the market and of the players' incentive to grow scale. In that regard, the Commission argues that external contract manufacturing shows a lower degree of commitment to the market than in-house manufacturing and interprets HGST's recent decision to internalise manufacturing as an indication of stronger commitment to the market and of its incentive to grow scale. In the same vein, if arguably, Seagate has in absolute terms three times as much spare capacity as HGST and hence, less need to expand capacity, the Commission considers this as an indication of Seagate's different incentives as regards capacity expansion.

454. The Notifying Party advocates that the merger would not affect the post-merger incentives of WD and Seagate to build capacity and expand output. By way of background information, the Notifying Party explains that HDD suppliers usually operate with a certain amount of spare capacity because, on the one hand, it provides flexibility to met variations in demand and, on the other hand, sufficient capacity is needed to meet the very strong demand in the second half of the year. In this regard, the Notifying Party explains that since the gross margin on each unit sold substantially exceeds the cost of investing to produce that unit, expansion to meet growing demand is profitable. The Notifying Party further submits that since the Merger would not change the underlying demand conditions, it would not change WD's longer term incentives for capacity expansion. According to the Notifying Party, distorting capacity expansion decisions would be profitable only in the event of collusion on capacity, a theory of coordination not retained by the Commission.

455. The Commission questions the validity of the argument of the Notifying Party with regard to its incentives, for all HDD markets, to further build capacity and expand output. Even if the gross margin on each unit sold exceeds the cost of investment to produce that unit, capacity expansion is only profitable in a growing market. Since as acknowledged by the Notifying Party, IDC forecasts that desktop sales are stable in absolute terms, it seems unlikely that large HDD suppliers that are already at scale, such as WD and Seagate, will have incentives to further expand production capacity.

456. Moreover, the Notifying Party argues that, given the structure of procurement process and the absence of binding capacity constraints, HDD suppliers do not choose quantity but rather bid in terms of price so as to try to win volumes. Consequently, pricing incentives would be of direct relevance to volume incentives. In this regard, the Notifying Party refers to its demonstration that a strategy of higher price is not profitable and submits that failure to win an award would mean that the larger share is allocated to the lower priced supplier which would not reduce overall output.

457. The Commission contests the Notifying Party's view that an HDD supplier always has an incentive to increase volume rather than prices. Moreover, the Commission considers that in HDD markets where only two players of the same scale together with the same high capacity utilisation rates would remain and where multi-sourcing effectively would guarantee a minimum share to the lower bidder, these two players would unilaterally choose on average higher prices after the proposed transaction. If the argument of the Notifying Party on the link between prices and volumes is followed, this means that the proposed concentration would negatively affect the post-merger unilateral incentives for WD and Seagate to expand capacity and output.

D. HDD competitors have different strengths and strategies

458. The Commission has assessed the competitive strengths of each of the HDD competitors on the basis of the various benchmarks identified by the Notifying Party's key executives, as well as the HDD customers: product breadth, product availability and execution of product roadmaps, product quality, technology and cost effectiveness/price.

a. General strengths and strategy of WD

459. WD's product portfolio is amongst the broadest of the HDD competitors.[397]

460. WD considers itself particularly flexible in the levels of its output and supply, and hence especially responsive to possible fluctuations in customer demand for HDDs. It therefore lists product availability as one of its main strengths.[398] WD also considers that its strength lies in its good execution of product roadmaps, its manufacturing and operational excellence and its cost effectiveness.[399]

461. Like HGST and Seagate, WD is vertically integrated upstream, which assists it in offering a flexible and high-quality supply of heads and other HDD components.

b. General strengths and strategy of Seagate

462. Seagate has one of the broadest portfolios in the HDD industry.[400]

463. Seagate has scale and is the leader in revenue in overall HDD sales. Seagate has however recently faced problems in executing its product roadmaps[401] as well as in its management of inventories, and hence its product availability.[402]

464. Like WD and HGST, Seagate is vertically integrated upstream into the production of heads and other HDD components. Technology is still listed as one of Seagate's strengths.[403]

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397 See
Table 4 and Table 5.

398 See, for instance, WD "Needham 4th Annual HDD and Memory Conference", 4 November 2011, slide 2, WD "Morgan Stanley Technology, Media and Telecom Conference", 28 February 2011, p. 2. See also [Deposition of WD's executive to the FTC]*.

399 Ibidem.

400 See
Table 4 and Table 5.

401 [Deposition of WD's executive to the FTC]*.

402 [WD internal documents; Deposition of WD's executive to the FTC.]*

c. General strengths and strategy of HGST

465. HGST's product portfolio covers virtually 100% of product offerings on the HDD markets.[…]*.[404]

466. In terms of its business model, WD considers HGST […]*.[405] HGST has in particular become effective in the execution of its product roadmaps and in bringing high quality products to its customers.[406]*[Reference to WD's interbnal documents]*.[407] HGST has in recent years firmly established itself as a cost-effective, profitable HDD competitor.[…]*.[408][…]*.[409]

467. Product quality is a strength of HGST, [410] as WD internal documents also confirm.[411] WD considers HGST's product quality to be the same as its own, and superior to Seagate's.[412] Customers also confirm this.[413]

468. Finally, HGST has a large IP rights portfolio[414] and believes it surpasses WD with regard to technology innovation.[415] HGST manufactures and owns critical and high quality component technologies such as read/write heads and recording media.[416] WD recognises the technology strength of HGST.[417]

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403 Customers reply to the Commission request for information of 20 April 2011, question 52.

404 Form CO, Annex 5.4a 14, "Project Gemini, Due Diligence Team Kick-Off", 18 February 2011, slide 8.

405 Form CO, Annex 5.4a14, "Project Gemini, Due Diligence Team Kick-Off", 18 February 2011, slide 8.

406 Ibidem. In terms of quality, [Deposition of WD's executive to the FTC]*.

407 Form CO, Annex 5.4a 23, WD "Confidential Information Memorandum for Private Lenders Only – USD 2,500,000,000 Senior Credit Facilities", March 2011, p. 32.

408 HGST "2011 Plan Overview – Senior Management, Hitachi GST", 27 February 2011, slide 32.

409 HGST "2011 Plan Overview – Senior Management, Hitachi GST", 27 February 2011, slide 32.

410 As stated in HGST internal documents, HGST *[…]** (HGST "2011 Plan Overview – Senior Management, Hitachi GST", 27 February 2011, slide 32). HGST has been *[…]** (HGST "2011 Plan Overview – Senior Management, Hitachi GST", 27 February 2011, slide 10). It prides itself of consistently ranking first or second in regular quality scoreboards of OEMs. [Deposition of HGST and WD's executives to the FTC]*.

411 Form CO, Annex 5.4a23, [WD's internal document]*.

412 Form CO, Annex 5.4a13, "Project Gemini, Due Diligence Team Kick-Off", 18 February 2011, slide 8.

413 Customers reply to the Commission's request for information of 11 April and 22 June 2011, Customer quotes on the quality of HGST products include that HGTS has the "*best quality and performance HDDs" (*LaCie reply to the Commission's request for information of 20 April 2011, question 48.1), *"is the best performing supplier from a quality metrics point of view" (*reply to the Commission's request for information of 20 April 2011, question 46.1), *" has the best overall quality in the industry" (*reply to the Commission's request for information of 20 April 2011, question 46.1), *"is leader in quality" (*reply to the Commission's request for information of 22 June 2011, question 51), *and has "the highest quality products" (*Customers reply to the Commission's request for information of 11 April, question 47).

414 Form CO, Annex 5.4a20. [WD's internal document]*.

415 [WD's internal document]*.

416 HGST reply to the Commission's request for information of 23 June 2011, question 50. From a technological standpoint, HGST is not dependent on TDK for any particular type of head. It is able to make heads suitable for all HDD form factors and end-use applications (HGST reply to the Commission's request for information of 23 June 2011, questions 60 and 61). HGST is able to manufacture heads which it considers to match the performance of TDK heads (HGST reply to the Commission's request for information of 23 June 2011, question 47). WD confirms that TDK heads are innovative (WD reply to the Commission's request for information of 23 June 2011, question 61). HGST heads appear to be even superior to TDK heads on some aspects (HGST "Product Development Update", 10 March 2010, pp. 77, 79 and 80, ID 0682). HGST media technology equals that of Showa Denko for certain types of media (HGST "Operations Update", 9 September 2010, p. 27, ID 3480).

417 [Deposition of WD's executive to the FTC]*.

d. General strengths and strategy of Toshiba

469. Toshiba's apparent strategic focus is on 2.5" and smaller form factor HDDs, as well as on HDDs sold in Enterprise markets. Toshiba is currently absent from the 3.5" Desktop and CE markets.

470. The Commission's market investigation revealed that Toshiba faced problems in integrating the Fujitsu business and experienced product quality shortcomings.[418] According to certain respondents, its limited product portfolio hampers its ability to compete in other HDD markets.[419] Moreover, a majority of customers do not identify it as a particularly strong innovator, except in relation to 1.8" form factor HDDs.[420]

471. The Commission has taken its findings on the relative strengths of the HDD competitors into account when analysing the closeness of competition between WD and HGST and the importance of the competitive force of HGST.

5.4.3. The market for 3.5" Desktop HDD

5.4.3.1. Introduction

472. As follows from Table 12, the estimated size of the worldwide 3.5" Desktop HDD market in 2010 was EUR 8.4 billion. This accounted for 33% of worldwide HDD sales.

473. As follows from Table 3, although sales of 2.5" HDDs are expected to grow more than those of 3.5" HDDs, sales on the 3.5" Desktop market are nonetheless forecast to be significant in the next years.[421] It is therefore clear that the 3.5" Desktop market will remain a large and important HDD market in the near future.

474. The customers on the 3.5" Desktop market are large OEMs and distributors. Large OEMs include Acer, Apple, Asustek, Dell, Fujitsu, HP, Lenovo, Medion and Positivo.

475. The 3.5" Desktop market is already highly concentrated. In the relevant pre-merger counterfactual, three competitors remain on the 3.5" Desktop HDD market: WD ([40-50]*% revenue share), Seagate/Samsung ([40-50]*%) and HGST ([10-20]*%). Toshiba does not manufacture 3.5" HDDs for desktop end uses.

476. Consistent and particularly pronounced quarterly price decreases have been observed on the 3.5" Desktop market, as illustrated by the following graph.

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418 Customers reply to the Commission's request for information of 22 June 2011, questions 49 and 50.

419 Customers reply to the Commission's request for information of 22 June 2011, question 49.

420 Customers reply to the Commission's request for information of 22 June 2011, question 71.

421 Industry analysts for instance report that for in-office use, corporations tend to still favour Desktop PCs for cost and security considerations. See for instance Deutsche Bank, "The HDD Industry-A changing landscape", 11 May 2010, p. 20.

Figure 12: Weighted average price of 3.5" Desktop products sold by WD, Hitachi, Seagate and Samsung[422]

[…]*

5.4.3.2. The impact of the proposed concentration

A. Merging parties have large market shares and creation of a duopoly

477. In the Statement of Objections, the Commission provisionally found that HGST is a particularly important competitor on the 3.5" Desktop market. Since Toshiba is not present on that market, the proposed concentration would remove the only remaining HDD competitor, apart from the merged Seagate/Samsung.

478. The larger the market share, the more likely a firm is to possess market power. Furthermore, the larger the addition of the market share, the more likely it is that a merger will lead to a significant increase in market power.[423] The market shares of the HDD suppliers on the 3.5" Desktop market are as follows:

Table 14: Worldwide market shares on the 3.5" Desktop market 2006-2010 (in value)[424]

	2006	2007	2008	2009	2010
WD	[20-30]*%	[30-40]*%	[30-40]*%	[30-40]*%	[40-50]*%
HGST	[10-20]*%	[10-20]*%	[10-20]*%	[10-20]*%	[10-20]*%
COMBINED	***[40-50]*%***	***[40-50]*%***	***[40-50]*%***	***[40-50]*%***	***[50-60]*%***
Seagate/Samsung	[50-60]*%	[50-60]*%	[50-60]*%	[50-60]*%	[40-50]*%
Others	[5-10]*%	[0-5]*%	-	-	-

479. As can be seen in the Table 14, WD is already one of the leading suppliers on the 3.5" Desktop market, with a [40-50]*% market share. HGST's market share is [10-20]*% and therefore significant. The proposed concentration would reduce the number of HHD competitors on the 3.5" Desktop market from three to two. After the merger, the Merged Entity would have the highest market share in value ([50-60]*%). The other half of the market would be controlled by Seagate/Samsung, with a [40-50]*% market share. Since Toshiba is not active on the market, there would not be any other supply alternative for customers than the Merged Entity and Seagate/Samsung.

480. In the Statement of Objections, the Commission provisionally concluded that the market share increment that the proposed concentration brings about gives an important first indication of market power and the increase in market power that would result from the proposed concentration.

481. In its response to the Statement of Objections, the Notifying Party claimed that in a dynamic, innovative industry such as the HDD industry, market shares are not a useful proxy for the increment in market power that the proposed concentration brings about.

482. In its reply to the Statement of Objections, the Notifying Party considers that the Commission failed to take into account the highly disruptive effect of innovation and entry of new generation products on the market positioning of the relevant players. In

422 Transaction data submitted by WD, HGST, Seagate and Samsung.

423 Horizontal Merger Guidelines paragraph 27.

424 Source: Notifying Party's estimates.

that regard, the Notifying Party underlines that the Commission does not expect the pace of innovation in relation to 2.5" HDDs to be affected by the proposed concentration and that the Commission has not raised this specific theory of harm with regard to 3.5" HDDs.

483. The Notifying Party submits that the race to innovation should not be affected for the following reasons:

- There is a very high commonality of R&D across form factors and end use.
- Both Seagate and Samsung would be considerably more innovative than HGST in both 3.5" Desktop and CE and Toshiba would be a strong innovator in other markets.
- 3.5" HDDs must stay ahead of 2.5" HDD competition by continuing to deliver better capacity points than those available in the 2.5" form factor. Failure to innovate would mean that 2.5" HDDs and 3.5" HDDs would be essentially indistinguishable in terms of capacity and price if innovation in 3.5" HDDs were to be delayed by just one year, giving rise to the prospect of large scale switching to 2.5" HDDs on account of their other advantages.

484. Against that background, the Notifying Party highlights that, as acknowledged by the Commission in the Statement of Objections, innovation gives rise to short life cycles which in turn drives a critical incentive to increase output quickly. This would in turn translate directly into pricing incentives. For example, as Seagate/Samsung brings out a new capacity point for use in Desktop applications, WD/HGST first loses share and faces greater pressure to bring out comparable or better 3.5" HDDs. Secondly, in order to stem loss of share, WD/HGST must offer lower prices for the newest Desktop products that it currently has on offer. However, by lowering the price of such drives, it must also lower the price of older drives as well, thereby causing price erosion.

485. According to the Notifying Party, innovation has constantly exerted downward price pressure regardless of the level of concentration of the market. This argument is based on the analysis of Log prices per GB by end-use segment and number of competitors since 2000.

486. The Commission considers that the fact that the proposed concentration might not reduce the rate of innovation does not exclude a price effect if the number of suppliers is reduced from three to two. Such a reduction might induce a higher price path. In that regard, the Commission does not consider historical trends used for the Notifying Party's study on innovation as evidence on what would happen with only two suppliers on the 3.5" markets and 3 suppliers on an overall market. Given the specificities of the Mission Critical market, previous situations on that market are too specific to provide useful indications on the impact of a market situation with two players on the degree of price erosion. Moreover, the analysis of Log prices per GB by end-use segment and number of competitors since 2000 is not informative of the consequence of the elimination of one of the major innovators in the market.[425] Lastly, since as already demonstrated above, the price gap between 2.5" HDDs and

[425] Customers reply to the Commission's request for information of 8 September 2011, question 19.

3.5" HDDs will remain significant, the Commission does not expect 2.5" HDDs to drive the market equilibrium price down.

487. The Commission maintains its findings that the post-merger market shares give a first indication of the increment in market power that the proposed concentration would bring about. The Commission has however tested these first indications in light of the structure of demand and the specific competitive conditions on the 3.5" Desktop market.

B. Customers have limited possibilities of switching supplier

a. Introduction

488. A merger may affect customers' ability to protect themselves against price increases when these customers have difficulties switching to other suppliers because there are few alternative suppliers. Such customers are particularly vulnerable to price increases.[426]

b. The view of the Notifying Party

489. The Notifying Party asserts that it expects OEMs to continue re-allocating purchase shares between HDD suppliers once the proposed concentration would be implemented. This would set in motion the "Conner-effect" accepted by the Commission in previous merger decisions concerning the HDD industry. On this basis, customers re-allocate purchase shares between HDD suppliers in order to keep the number of supply sources as stable as possible. This has in the past resulted in market share losses of merging HDD suppliers.

490. In the Notifying Party's view, the post-merger structure of demand on the 3.5" Desktop market would be such that customers would not face significant difficulties in switching suppliers. In its view, customers on the 3.5" Desktop market could easily switch HDD supplier. They could induce intensified competition between the remaining suppliers by allocating "highly asymmetric purchase shares" between them, prompting them to bid more aggressively for their business. The Notifying Party claims that customers could go even as far as single-sourcing their HDD supplies. According to the Notifying Party, WD/HGST and its remaining competitor Seagate would compete intensively for these "highly asymmetric purchase shares". According to the Notifying Party, tt would not be possible for the Commission to establish to the requisite legal standard that after the merger, Seagate would lack the incentive to bid aggressively against the Merged Entity and increase capacity and output. In light of this competition, the removal of HGST as an independent competitor would not have any impact on competition.

491. In the Statement of Objections, the Commission provisionally concluded that multi-sourcing is necessary on the affected 3.5" HDD markets and that in light of this practice, the removal of the third supply source would decrease competition between WD and Seagate. In its reply to the Statement of Objections, the Notifying Party claims that the Commission's assessment of these likely effects would be based on the wrong assumption that customers would not allocate more than a certain share of

426 Horizontal Merger Guidelines, paragraph 31.

their purchases to a single supplier. According to the Notifying Party, several customers would have confirmed that they have no maximum share that they would be willing to award to a single supplier. In any case, the Notifying Party argues that, even if the total share awarded to each supplier would be capped, customers would still be able to structure their purchases in a way that would elicit competitive bids from both suppliers. In this regard, the Notifying Party claims that out of the 74 customers contacted by the Commission, approximately 60% of customers would not be concerned by competition in a two-supplier environment.

492. In order to support its argument that after the merger the Merged Entity and Seagate would continue to compete intensively for the highest purchase shares of their individual customers, the Notifying Party submits that it is always more profitable for an HDD supplier to increase output and decrease price rather than the reverse. In the Notifying Party's view, the relevant question is whether the proposed concentration would affect the incentives of the Merged Entity such that after the merger, prices would be higher and output would be lower as compared to the situation before the merger. As concerns prices, the Notifying Party has submitted mathematical calculations that would show that it would always be more profitable for the Merged Entity to decrease prices, so that the proposed concentration would not have any price effect. As concerns output, the Notifying Party claims that HDD volumes sold would be a function of the prices charged. Since the merger would have no adverse impact on price, it would have no impact on volume.

493. The Notifying Party substantiates its argumentation with a hypothetical mathematical example of post-merger competition between WD/HGST and Seagate.

494. The Notifying Party reiterated that on that basis, the removal of HGST as the third independent competitor on the 3.5" Desktop market would not have any impact on competition.

c. The Commission's assessment

495. The Commission considers that the "Conner-effect" should not be taken as occurring automatically after each proposed concentration between HDD suppliers. The Commission considers that each individual proposed concentration should be assessed on its own merits, including the likely impact that the proposed concentration would have in terms of any post-merger "Conner-effect".

496. The Commission has in previous merger cases associated the "Conner-effect" with the preference of HDD customers to spread their purchases as much as possible over different HDD competitors.[427] This customer desire is likely to have triggered the market share changes between the HDD competitors on every occasion that two of those competitors merged.

497. The Commission finds that the proposed concentration differs in this regard from the previous concentrations in the HDD industry. In those previous cases, the Commission accepted that the "Conner effect" could mitigate the effects of concentrations between two HDD competitors, as customers were able to shift

[427] Case No COMP/M.5483 –Toshiba/Fujitsu HDD business, paragraph 33, and footnote 6.

purchase shares and ultimately keep their total number of HDD suppliers constant.[428] The Commission's investigation confirms that this proposed concentration is different from the other concentrations that the Commission has assessed.

(i) The nature of competition on the 3.5" Desktop market

498. The likely impact of the removal of HGST as an independent competitor on the 3.5" Desktop market needs to be assessed in light of the structure of demand and the specific competitive conditions on that market.

499. Various sources of evidence confirm that multi-sourcing of HDD supplies is prevalent on the 3.5" Desktop market.

500. The Commission first of all analysed the data on the bids for large Desktop customers that the competitors on the 3.5" Desktop market have submitted.[429] The following table displays the average shares of bids according to the number of suppliers participating in the bids.[430]

Table 15: Average shares of bids according to the number of suppliers participating in the bids for 3.5" Desktop[431]

	Average shares				Frequency	Frequency (%)	Volume	Share of total volume
Number of bidders	Larger bidder	Second larger	Third larger	Fourth larger				
1	[90-100]*%	[0-5]*%	[0-5]*%	[0-5]*	[300-400]*	[60-70]*%	[0-5]*	[10-20]*%
2	[70-80]*%	[20-30]*%	[0-5]*%	[0-5]*	[80-90]*	[10-20]*%	[0-5]*	[10-20]*%
3	[50-60]*%	[20-30]*%	[10-20]*%	[0-5]*	[50-60]*	[5-10]*%	[0-5]*	[10-20]*%
4	[50-60]*%	[20-30]*%	[10-20]*%	[5-10]*%	[50-60]*	[5-10]*%	[0-5]*	[50-60]*%

501. The Table 15 shows that the overwhelming majority of tendered HDD volumes on the 3.5" Desktop market (over […]*%) were sourced from multiple HDD suppliers, rather than being awarded entirely to one supplier. […]* of the tendered volumes were presented to four bidders. In the instances where four bidders participated, the share of HDD purchases that the first HDD supplier obtained was on average not significantly larger than […]*%. Close to […]*% of HDD tenders were presented to at least three suppliers. In those instances, the average purchase share allocated to the first HDD supplier varied between […]*% and […]*%.

502. The same picture emerges from the transactional data for the 3.5" Desktop market that the Commission compiled.[432] The Commission complemented its analysis of this

428 Case No COMP/M.5483 –Toshiba/Fujitsu HDD business, paragraph 33, and footnote 6.

429 The data covered WD, HGST, Seagate and Samsung (before its proposed concentration with Seagate).

430 This bidding analysis is based on the version created by RBB during the data room.

431 Source: Bidding data submitted by WD, HGST, Seagate and Samsung.

432 The data again covered WD, HGST, Seagate and Samsung (before its proposed concentration with Seagate).

data with transactional data for the largest individual Desktop OEMs (Annex 1 and Annex 2 of this Decision).

Figure 13: HDD suppliers' share in Desktop sales[433]

[…]*

503. The transactional data for the largest OEMs again indicate that the vast majority of them (representing [80-90]*% of the total 3.5" Desktop purchases of the period from 2007 to 2010) typically source from at least three HDD suppliers (see Annex 1). The purchase share of the first supplier is usually below 60% to 70%. This pattern for the individual Desktop OEMs is reflected in the data for the overall 3.5" Desktop market, where the market share of the largest HDD supplier for each quarter analysed is usually below 60% to 70%. Further analysis shows that these results are not driven by composition effects. Annex 2 displays the suppliers' purchase shares in the five largest Desktop OEMs' 3.5" Desktop 7200 rpm purchases broken down by capacity points. These five customers purchase [80-90]*% of the total 3.5" Desktop sales. As the graphs in annex 2 show, multi-sourcing is prevalent even on this disaggregated level, and it is particularly strong at the more important capacity points.

504. Desktop OEMs confirmed these purchase patterns during the Commission's investigations. Seven out of nine Desktop OEMs confirm that for security of supply reasons, they wish to source from at least three HHDs suppliers and that they are reluctant to allocate a higher than 60% to 70% purchase share to any individual HDD supplier.

505. The importance of multi-sourcing is finally supported by the following evidence emanating from the parties.

506. WD's own sales data shows that during the last five years, WD's purchase share with Desktop OEMs normally did not exceed the [60-70]*% to [70-80]*%.[434] This is in line with the picture that emerges from the bidding data and the transactional data. The Notifying Party's own evidence thus rebuts its statement that there are "numerous examples" of WD winning share with an OEM where it estimates that it has been awarded a very high share of [60-70]*% or more of available Total Addressable Market ("TAM").[435]

507. Moreover, key executives of the Parties also recognise the importance of multi-sourcing and security of HDD supplies, notably when there is peak in the demand for desktops. They highlight the impact this may have on the customers' willingness to

433 Source: Transaction data submitted by WD, HGST, Seagate and Samsung.

434 WD reply to the Commission's request for information of 23 June 2011, Annex 30. The data covered 2006 to 2011 year-to-date, and was compiled using IDC data and WD's internal database.

435 WD reply to the Commission's request for information of 23 June 2011, question 26. The Notifying Party only gave very anecdotal evidence of higher purchase shares being allocated for selected products only. This does not alter the overall picture on the 3.5" Desktop market that OEMs are generally reluctant to allocate a purchase share higher than […]*% to one single HDD supplier.

forego lower prices in order to obtain that security. As WD CEO John Coyne observed during the WD earnings call of 23 April 2009:

"(The) job for every (OEM) procurement officer is availability. And, so in times when supply is short to demand, that becomes the major concern of the procurement department followed by good value for money."[436]

508. [Deposition of HGST executive to the FTC]*.

(ii) Impact on competition between WD/HGST and Seagate

509. In the Statement of Objections, the Commission provisionally assessed the impact that the proposed concentration and the associated reduction of the number of suppliers on the 3.5" Desktop market to two, would have on a market where multi-sourcing is so prevalent.

510. The Commission provisionally concluded that in the pre-merger three-supplier scenario, OEM customers have multiple ways to split their purchase shares across different HDD suppliers. They can, for instance, split the purchase shares 40/30/30 between three suppliers, or 50/40/10, or 60/20/20. Alternatively, they could split their purchase shares 60/40 between two HDD suppliers, but use the market presence of the third HDD supplier (its presence "on the shelf") as leverage to obtain competitive prices from the two suppliers that are selected.

511. The Commission underlined that it is clear that in a three-supplier scenario, the potential purchase share differentials and hence the additional share that HDD competitors can compete for, can vary widely. In other words, the size of the contestable market can vary between a 0% purchase share (the OEM chooses two suppliers and the third supplier is put "on the shelf") and the maximum share that OEMs would be willing to allocate to one single HDD suppliers. For most customers, this share is 60-70%.

512. The Commission then highlighted that in the post-merger two-supplier scenario, customers would be faced with only two HDD suppliers. This would mean that the second HDD supplier would at least have a guaranteed purchase share that is the minimum share that most OEMs need to allocate to one HDD supplier. Most customers confirm that this share would be 30% to 40%. In that scenario, competition takes place for any purchase share that ranges between 30% to 40% and 60% to 70%. This means that the competition for the purchase shares in the 0% and 30% to 40% would be lost altogether, whereas the remaining competition for additional purchase shares would take place in the 30%/40% to 60%/70% range. The Commission provisionally concluded that under these circumstances, the removal of HGST as the third supply source on the 3.5" Desktop market would give rise to competition concerns.

513. In the Statement of Objections, the Commission moreover compared the transactional data for the 3.5" Desktop market with those for the 2.5" Notebook market. This data excludes sales by the remaining HDD competitor, Toshiba, on that market. Nonetheless, the comparison of the data for the 3.5" Desktop market, where

436 See also [Deposition of WD's executive to the FTC]*.

four HDD competitors were active before the proposed concentration between Seagate and Samsung, with the data for the 2.5" Mobile market, where five HDD competitors were active before that merger, gives some indications on the competitive dynamics on the 3.5" Desktop market and the likely impact of the proposed concentration in this regard.

Figure 14: HDD suppliers' share in Notebook sales[437]

[…]*

514. When the data for the 3.5" Desktop market (where four competitors were present before the proposed concentration between Seagate and Samsung) and the 2.5" Notebook market (where five competitors were present before that proposed concentration) are compared, it becomes apparent that wide shifts in purchase shares on the 3.5" Desktop market are less prevalent than on the 2.5" Notebook market, and that the purchase shares of the different HDD suppliers on the 2.5" Notebook market are more equal in size. The Commission takes this as a further indication that with a reduction of the number of HDD competitors on the 3.5" Desktop market from three to two, the volatility of purchase shares is likely to diminish and the size of the contestable 3.5" Desktop market would be reduced.

515. In its reply to the Statement of Objections, the Notifying Party put forward four main arguments to rebut these provisional conclusions.

516. First, the Notifying Party argues that post-merger, customers would be able to restructure their HDD purchases so that they would be able to intensify competition between the two remaining suppliers. In its view, customers would be able to induce HDD suppliers to compete more aggressively for higher shares of their purchases. The Notifying Party did not exclude that most OEMs would be able to single-source their HDD supplies, and in that way stimulate equally intense competition between WD/HGST and Seagate.

517. Secondly, the Notifying Party argued that even if purchase shares to individual HDD suppliers are capped at a certain maximum share, competition on the 3.5" Desktop market would not be affected by the proposed concentration. To illustrate this argument, the Notifying Party compared the profits that each of WD and Seagate would obtain when faced with the choice of competing for 30% or 70% of the overall demand of a customer. The Notifying Party seeks to demonstrate that on the basis of its margin assumptions, each of WD and Seagate would need to be expecting a significantly higher price than its competitors in order to compensate for the lower share of 30%. The price increase would be so significant that most customers would switch to 2.5" HDDs, or further entry on the market would be triggered.

518. Thirdly, the Notifying Party adduced some further quantitative elements that seek to demonstrate that HDD competitors always have an incentive to expand capacity and

437 Source: Transaction data submitted by WD, HGST, Seagate and Samsung.

output rather than to increase prices. In its view, the HDD industry's features such as high fixed costs, low variable costs that decline with increases in output and elastic demand faced by each supplier- imply that it is always more profitable for an HDD supplier to increase output and decrease price, rather than the inverse. The Notifying Party distinguished between a scenario where an increase of current capacity utilisation would be sufficient to increase supply volumes and under a scenario where there is a constraint on capacity. According to these data, in both scenarios, a 5% price decrease would always generate more profit than a 5% price increase.[438] This would show that after the merger, WD and Seagate would continuously decrease prices to such an extent that the removal of HGST would not matter.

519. The Notifying Party finally argued that HDD suppliers' drive to bring innovative HDD products to the market has in the past led to decreased prices on the 3.5" Desktop market. The Notifying Party argued that this would be likely to continue after the merger.

520. The Commission cannot conclude that the arguments put forward by the Notifying Party show that the proposed concentration would not result in a significant impediment to effective competition.

521. First of all, the Notifying Party's claims that after the merger, customers would be able to intensify competition between WD/HGST and Seagate by awarding highly asymmetric purchase shares to the winning bidder, or by even single-sourcing their HDD supplies, were not borne out by the Commission's market investigation.

522. Contrary to the Notifying Party's claim in its reply to the Statement of Objections, even in a two-supplier scenario, most OEMs confirm that they would be unwilling to allocate very high purchase shares to one single HDD supplier. This means that in a two-supplier scenario the share allocated to the most competitive bidder cannot be dramatically bigger than the share allocated to the least competitive bidder. Seven out of ten OEMs indicate that they would still be reluctant to allocate more than 60% to 70% of their HDD purchases to one single HDD supplier.[439] Three Desktop OEMs in addition specify that using a single source for their HDD supplies would entail a significant risk for the security of their HDD supplies.[440] It is therefore not likely that most OEMs would be able to restructure their HDD purchases along the lines described by the Notifying Party. To put it differently, it is not likely that the competitive outcome that is driven by three HDD suppliers bidding for any purchase share award between 0% and the maximum purchase share could be replaced by an overall "winner takes all" contest between the two remaining supply sources.

523. The Notifying Party's claim that WD/HGST and Seagate would continue to compete intensively for the highest purchase share of any HDD customer also does not exclude that the proposed concentration would give rise to an adverse price effect.

524. The Commission should state at the outset that it considers that the assumptions underlying this modelling submitted by the Notifying Party, that is, the extreme case

438 WD reply to the Commission's request for information of 23 June 2011, question 27.

439 Desktop OEMs reply to the Commission's request for information of 8 September 2011.

440 Ibidem; Customers reply to the Commission request for information of 22 June 2011, questions 54 and 54.1.

of a Bertrand model with homogenous goods, no capacity constraint and constant marginal cost, are incorrect. Economic theory indicates that it is only in very specific conditions that the number of bidders does not have an impact on price formation. One of these specific conditions is that competition is such that the winner takes all. There is then no smooth trade off between the price offered and the quantity sold: either the firm has the best offer and gets demand, or it does not and faces no demand at all.[441] The Commission considers that these conditions are not met in this case given the importance of multi-sourcing for customers.

525. In addition, the evidence on the "best responses" of HDD suppliers when faced between the choice of competing aggressively for the higher purchase share or less intensely for the lower share do not provide any indications on the market equilibrium in the presence of different numbers of actors. In the presence of a demand function where the most aggressive bidder has 70% of the total volume and the second one 30%, it is apparent that pricing at marginal cost is the market equilibrium with three or more players, but is not in the presence of two players.[442] Consequently, the removal of a third player that exerts an important constraint on prices will affect the price equilibrium post-merger, even though the remaining competitors still have certain incentives to compete on price. In other words, the calculations submitted by the Notifying Party do not provide evidence that competition on prices between the two remaining players will not lead to higher price equilibrium.

526. The same applies to the argument that after the merger, WD/HGST and Seagate would always have the incentive to decrease prices and increase output. The Notifying Party's argument that WD always has this incentive, irrespective of whether it is capacity constrained or not, ignores that to the extent that it is not capacity constrained, WD would only increase output if it was profitable for it to do so. Assuming that WD is profit-maximising, it would set its price at a level where it would not be profitable to either increase or reduce price, the so-called unconstrained optimum price. At that price, any further price reduction for HDDs would generate losses on all WD's HDD sales at the reduced price that outweigh the gains from additional sales. Importantly, these quantitative elements again do not shed light on the impact that the removal of HGST is likely to have on competition between the two remaining suppliers.

527. The Commission upholds its findings that the removal of HGST as the third remaining independent competitor on the 3.5" Desktop market would have a significant adverse effect on prices charged to customers on that market.

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441 These conditions are not generally sufficient either to move away from a world where the number of competitors has an influence on price formation. Typically, in addition, the bids must be lumpy - that is, each contest is not to be seen as one event of many but on the contrary has to be seen as crucial by each supplier - and there must be no incumbency advantage. For a more complete description, see for instance, *Bidding Markets*, Paul Klemperer, June 2005. In the present case, none of these seems correct either as manufacturers bid on a regular basis for customers which are not pivotal for their viability and as there is a persistent advantage to have introduced a new product on the market.

442 This result does not rely on the 70/30 split between the first and second offers. With two players, as soon as the second best price gets some demand, a player who expects its competitor to price at marginal cost always have an incentive to deviate from this price to meet this demand at a higher price. On the contrary, with at least three players, this deviation is not profitable as a player who deviates would at best have the third price and thus still meet no demand.

528. It is clear that in a three-supplier scenario where customers consider it essential to source from at least two suppliers but have multiple ways to spread their HDD purchases between three suppliers, the potential purchase share differentials and hence the additional share that HDD competitors can compete for, can vary widely. In light of the purchase share patterns described in recital 442, the three suppliers that bid know that they are able to achieve any purchase share between 0% (where only two HDD suppliers will be used and the third one is put "on the shelf") and 60% to 70% (the highest purchase share that most customers are willing to allocate to one single HDD supplier). This competition is likely to drive bid prices down to the marginal cost of each HDD supplier.

529. In the post-merger two-supplier scenario, customers would be faced with only two HDD suppliers. In light of the need for multi-sourcing of customers on the 3.5" Desktop HDD market, these suppliers would change from full competitors for any purchase share between 0% and the maximum share that any particular customer is willing to allocate one supplier, to effectively complementary supply sources for these customers. Under those circumstances, the guaranteed purchase share of the second supplier is at least the minimum share that the OEM customers wish to allocate to one HDD supplier. Most customers confirm that this share would be 30% to 40%. In that scenario, competition in relation to most OEM customers takes place for any purchase share that ranges between 30-40% and 60%-70%. This means that the competition for the purchase shares in the range of 0% to 30-40% would be lost altogether, whereas the remaining competition for additional purchase shares would take place in the range between 30%/40% and 60%/70% range. Thus, the removal of the third HDD supplier gives the two remaining supply sources certainty that they would obtain at least a minimum purchase with most OEM customers on the 3.5" Desktop market. In that scenario, bids by the two remaining suppliers are less likely to drive prices down to their marginal cost. As a result, the post-merger equilibrium where two suppliers are bidding is likely to be significantly higher than the pre-merger equilibrium where three suppliers were bidding.

530. The Commission therefore upholds its findings that in a market where only two players of the same scale and having the same high capacity utilisation rates would remain and where the need for multi-sourcing effectively turns these players into complementary supply sources with a guaranteed minimum share with most OEM customers, these two players would unilaterally choose on average higher prices after the proposed transaction. The Commission reiterates that if the argument of the Notifying Party on the link between prices and volumes is followed, this means that the proposed concentration would negatively affect the post-merger unilateral incentives for WD and Seagate to decrease prices and expand capacity and output.

531. The Commission's conclusions are corroborated by documents and statements emanating from the parties, as well as their main customers.

532. On price competition, […]* confirmed before the US FTC that in a two-supplier scenario that competition is likely to be less intense than in a three-supplier scenario:

[Deposition of HGST executive to the FTC]*[443]

533. For those reasons, the Notifying Party's evidence on past effects of innovation on price levels can also not be taken as excluding any price effect that would result from the removal of HGST as the third competitor on the 3.5" Desktop market. In particular, even if the drive for WD/HGST and Seagate to innovate were to be the same after the proposed concentration, this does not exclude the likelihood that price competition between WD/HGST and Seagate would be diminished if the third supply source is removed from the market.

534. Most customers expect that the reduction of the number of supply sources to two would have an effect on prices.[444] Contrary to the Notifying Party's claim in its reply to the Statement of Objections, virtually all OEM customers on the 3.5" Desktop market indicate that the presence of a third supply source can be used in price negotiations with other suppliers, and hence has an impact on price competition between the two other suppliers.[445] If the proposed concentration would go ahead, this particular constraint posed by HGST would be lost.

535. In order to further assess the likely magnitude of the price effect that would result from the proposed concentration, the Commission has assessed the importance of the competitive constraint that HGST has exercised on WD, and the general importance of HGST as a competitive force on the 3.5" Desktop market.

C. Removal of a close competitor and an important competitive force

536. The higher the degree of substitutability between the merging firms' products, the more likely it is that the merging firms will raise prices significantly.[446] In bidding markets, it may be possible to measure whether historically the submitted bids by one of the merging parties have been constrained by the presence of the other merging party.[447]

537. Pursuant to the Horizontal Merger Guidelines, firms can also have more of an influence on the competitive process than their market shares or similar measures would suggest.[448] A merger involving such a firm may change the competitive dynamics in a significant, anticompetitive way, in particular where the market is already concentrated.[449] On a market where bidding is prevalent, the presence of a competitor in bids can also shed light on the competitive influence that that competitor exerts.[450]

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443 [Deposition of HGST executive to the FTC]* See also the example given in relation to the HDD Enterprise markets [Deposition of HGST executive to the FTC]*.

444 Customers reply to the Commission's request for information of 22 June 2011, question 57.

445 Reply of Customers to the Commission's request for information of 8 September 2011, question 12.

446 Horizontal Merger Guidelines, paragraph 28.

447 Horizontal Merger Guidelines, paragraph 29.

448 Horizontal Merger Guidelines, paragraph 37.

449 Ibidem.

450 See paragraph 56 of Commission Decision 97/816/EC of 30 July 1997 declaring a concentration compatible with the common market and the functioning of the EEA Agreement, Case No IV/M.877 - Boeing/McDonnell Douglas (OJ L 336, 8.12.1997, p. 16).

a. Presence of HGST in bids on the 3.5" Desktop market

538. HGST's share of the 3.5" Desktop market is [10-20]*%. The Commission has assessed the constraint that HGST has exerted on the basis of bidding data compiled from WD and HGST, as well as their competitors Seagate and Samsung (before their concentration).[451]

539. Table 16 displays the number of bids and the number and identity of bidders taking part, as well as the purchase volumes associated with the bids.

Table 16: 3.5" Desktop HDDs: Number of bids made by other HDD manufacturers when WD bids[452]

[…]*

540. Although the volumes covered by contracts for which only one bidder competes with WD is relatively small, it is very often the case that HGST is the second alternative supply source for those bids. In those bids, HGST participated as often as its larger competitor Seagate. The sales volumes that HGST secured were higher than those of Seagate.[453] Before its acquisition by Seagate, Samsung only participated marginally.

541. Contracts for which two bidders compete with WD represent [20-30] % of total volumes. HGST and its larger competitor Seagate both participate in the vast majority [90-100] % of these bids. Again, before its concentration with Seagate, Samsung participated in a far lower number [10-20] % of bids.

542. In the Statement of Objections, the Commission provisionally concluded that HGST's presence in bids on the 3.5" Desktop market confirms that HGST has been a close competitor to WD and generally an important competitive force on the 3.5" Desktop market.

543. In its reply to the Statement of Objections, the Notifying Party underlined that the bidding data shows that Seagate is the closest competitor to WD. The Notifying Party also challenged the conclusion that HGST is a close and important competitor to WD. In its view, only a weak competitor would participate in so many bids and yet have such an allegedly low market share. The Notifying Party proposed an alternative approach to the Commission's bidding analysis. This analysis solely focussed on the identity of the second supplier (the "runner-up"), which would be Seagate. This would provide sufficient evidence that after the merger, WD and Seagate would continue to compete closely, and that the removal of HGST would not have any material impact on competition.

544. The Commission does not deny that Seagate is a close and important competitor to WD. The fact that this competitor would remain on the market would however only

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451 The bidding data cover the largest Desktop OEMs who purchase HDDs on the 3.5" Desktop market. The Commission's analysis is based on a bidding dataset that takes account of comments and adjustments made by the Notifying Party during the proceedings, in particular in relation to classification of HDD products and the exclusion of certain bids.

452 Source: Bidding data submitted by WD, HGST, Seagate and Samsung. Data submitted by Samsung are estimates.

453 As presented in table 12 of the RBB data room report.

provide useful indications on post-merger competition if the 3.5" Desktop market were a market where the "winner takes all".[454]

545. The 3.5" Desktop HDD market is however a market on which multi-sourcing is necessary. On that market, with only two suppliers, because customers need to multisource, the runner-up bidder would not get zero demand, but on the contrary, a very significant one. In this perspective, the presence of the third competitor is likely to pose a significant competitive constraint on WD. This finding is all the more valid since HGST has been an important competitive constraint on 3.5" Desktop HDD market. The bidding data supports the conclusion that HGST has been a close competitor and an important competitive constraint on WD. In the Notifying Party's corrected version of the bidding data, HGST gets the […]*% of the situations, compared to […]*% for Seagate and only […]*% for Samsung.

546. In order to further address the Notifying Party's claim that the removal of HGST as a third supply source does not matter, the Commission has computed the average purchase share with OEMs that the other HDD suppliers obtain when WD participates in or 'wins' a bid. Table 17 and Table 18 list those average purchase shares.

Table 17: Average shares when WD is one of the bidders in 3.5" Desktop HDD[455]

		Average shares			
		WD	HGST	Seagate	Samsung
WD does not participate		[…]*%	[…]*%	[…]*%	[…]*%
WD participates		[…]*%	[…]*%	[…]*%	[…]*%
	WD does not have the largest share	[…]*%	[…]*%	[…]*%	[…]*%
	WD gets the largest share	[…]*%	[…]*%	[…]*%	[…]*%

547. Those tables confirm that HGST obtains a larger purchase share with Desktop OEMs in cases where WD participates in a bid. When WD participates, HGST gets an average purchase share which is a […]* of Seagate's and covers […]* of Seagate's

454 The standard approach suggested by the Notifying Party is only useful in a situation where the winner takes all and where information on the characteristics of the bid and the products is unobserved. In such a case, the runner-up is likely to be the closest competitor in terms of unobservable characteristics and thus the one that is likely to impose the larger constraint to the winner. In the most extreme version of Bertrand competition with perfect information, even though the runner-up gets zero demand, its price is the one that drives the price of the winner. The situation on the 3.5" Desktop market is however different.

455 Bidding data submitted by WD, HGST, Seagate and Samsung. Data submitted by Samsung are estimates.

volume. Both figures are much larger than for Samsung. When WD obtains the larger purchase share, the difference between Seagate's and HGST's average purchase is lower.

548. HGST's volumes when WD gets the larger shares are approximately […]* smaller than Seagate's, which suggests that HGST mostly gets its shares in smaller contracts, which could explain the overall larger market share of Seagate.

Table 18: 3.5" Desktop HDDs: Associated volumes of bids when WD is one of the bidders in 3.5" Desktop HDD[456]

[…]*

549. The Commission upholds its finding that the analysis of the bidding data for the 3.5" Desktop market show that the proposed concentration would remove a close competitor to WD and a generally important competitive force on the 3.5" Desktop market.

b. Other evidence on the importance of HGST on the 3.5" Desktop market

550. The conclusion that HGST is an important competitive force on the 3.5" Desktop market is also confirmed by the following additional evidence.

(iii) The quality of HGST products

551. As became clear in Section 5.4.2.2.A., the Commission's market investigation confirms that large OEMs tend to attach more importance to product quality than distributors.

552. [References to Deposition of WD executive to the FTC and HGST's internal documents]..[457][458] The internal documents of the Parties and their competitors confirm that HDD suppliers generally see their presence and that of their competitors with the top PC OEMs as a relevant factor demonstrating the competitive strength of each HDD supplier. Before its proposed concentration with Seagate, Samsung monitored its HDD competitors on the basis of the number of top 10 PC OEMs that they serve.[459]

553. Under these circumstances, the share of the top 10 PC OEMs in the sales of each HDD competitor can give a further proxy for the perceived product quality of the different HDD competitors, as well as their ability to execute their product roadmaps.

554. The following table gives an overall view of the share that the top 10 PC OEMs represent in the respective overall sales of each of HGST and WD:

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456 Bidding data submitted by WD, HGST, Seagate and Samsung. Data submitted by Samsung are estimates.

457 [deposition of WD executive to the FTC]*.

458 [HGST's internal document]*.

459 Samsung "Mid/Long-term Business Strategy (2010-2020) Storage Division", p. 11 (ID: 3496).

Table 19: Share of top 10 PC OEMs in the overall sales of each of HGST and WD[460]

[…]*

555. As becomes clear from Table 19, the share that the top 10 PC customers on the 3.5" Desktop market represent in HGST's overall sales on that market is relatively high, and has over the years been comparable to other tier 1 HDD competitors. The same picture emerges if a comparison is made with Seagate and Samsung before their proposed concentration.[461] That analysis shows that the share that the top 10 PC OEMs represent in the sales of HGST has consistently been higher than that of Samsung. In the Statement of Objections, therefore, the Commission concluded that this evidence gives further support to its finding that HGST is a close competitor to WD, and an important competitive force on the 3.5" Desktop market.

556. In its reply to the Statement of Objections, the Notifying Party claims that the Commission cannot interpret this evidence in isolation of the allegedly modest sales volumes and market share of HGST on the 3.5" Desktop market. The evidence on the sales that HGST achieves with large OEMs would not be indicative of its competitive strength.

557. The Commission however reads this evidence together with that of the presence of HGST in the bids for the business of large OEMs.[462] The Commission concludes that the fact that HGST is a high-quality producer and achieves a high presence in bids on the 3.5" Desktop market supports its finding that HGST is a close competitor to WD, and in general an important competitive force on the 3.5" Desktop market.

(iv) Competitors' views on HGST

558. In the Statement of Objections, the Commission provisionally concluded that internal business strategy documents of the merging parties and their competitors on the 3.5" Desktop market further supported its view that HGST is a close competitor to WD, and generally an important competitive force on the 3.5" Desktop market. The competitor views of HGST as a close and important competitor on that market were based on various factors, such as the breadth of its product portfolio, the availability of its product and its ability to execute roadmaps well and bring high-quality products to customers in a timely and cost-efficient manner.

559. In its reply to the Statement of Objections, the Notifying Party argues that the Commission's findings are not robust because the Commission has not systematically compared the positions of WD and HGST to all other HDD suppliers active on the 3.5" Desktop market. The Commission is alleged to have based its findings on the breadth of WD and HGST portfolios across end-uses, without justifying the importance of such a criterion. The Notifying Party underlined that in any event, Seagate's product portfolio is more similar to WD's portfolio than HGST is, whereas

460 Transaction data submitted by the parties.

461 The Notifying Party will obtain access to these data in a data-room.

462 In its reply to the Statement of Objections, the Notifying Party argues that the fact that the top ten OEM customers account for a large share of HGST's sales is not an indicator of its closeness of competition with WD because it is not an indicator of the actual volumes sold to the top ten OEM customers.

Samsung's portfolio would be more to that of HGST than to that of WD.[463] The Commission is alleged finally to have disregarded evidence in WD internal documents outlining operational differences between WD and HGST.

560. Those arguments of the Notifying Party again come down to the claim that Seagate is the closest competitor of WD, and that this would not be different after the proposed concentration. The Commission reiterates that it does not deny that Seagate is a close and important competitor to WD. The Commission however found that HGST is also a close competitor to WD, and generally an important competitive force on the 3.5" Desktop market. The Commission found that the merging parties belong, together with Seagate, to the group of tier 1 competitors, whereas Samsung does not. The Commission provisionally concluded that the removal of the last remaining tier 1 competitor to WD and Seagate would significantly impede effective competition on the 3.5" Desktop market.

561. The fact that competitors view HGST as a tier-one competitor on the 3.5" Desktop market is reflected consistently in the internal business strategy documents of the parties and their competitors.

562. As follows from the evidence cited in recitals 459 to 461 and 465 to 468, the competitive strengths of WD and HGST overlap on a number of important parameters of competition on HDD markets, such as product portfolio,[464] supply flexibility and product availability and the ability to execute roadmaps well and bring high-quality products to the customers in a timely and cost-effective manner.

563. [References to Deposition of WD executive to the FTC and the parties' internal documents]*.[465][466][467][468]

564. The Parties' internal documents equally confirm that WD and HGST compete closely with each other on the 3.5" Desktop market.[469] [References to WD's internal

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463 The Notifying Party claimed that its analysis of the data relied upon by the Commission demonstrates that Seagate overlaps frequently with WD and that in those cases where there are only two suppliers of a product and one of them is WD, Samsung is the other supplier in a greater number of cases than HGST is. Moreover, according to the Notifying Party, the analysis of the share of supply for each supplier by capacity point in Q4 2010 would demonstrate that WD and Seagate are the most important players with the largest shares.

464 [HGST's internal document]*..

465 See, for instance, Deposition of WD CEO John Coyne before the FTC on 26 July 2011, p. 279: "*We think Seagate is technology focused, generally has effective cost and scale, but their lack of focus on that inhibits them as a competitor to us. (…) Hitachi is a blend in the middle, where they have the Seagate focus on technology, but the fact that they have many people with a WD legacy leads them to focus on cost so that they have the blend of those focuses. (….) Toshiba is very technology focused and more niche product focused. (…) And we're not sure why Samsung is in the business and why they have stayed in it for 20 years. (In terms of customer rankings on conformance with characteristics, not size): Seagate is number two on a trajectory to number three, and Hitachi a number three on a trajectory to number two. Toshiba is four, and Samsung is five."*

466 Form CO, Annex 5.4a14, "Project Gemini, Due Diligence Team Kick-Off", 18 February 2011, slide 8.

467 HGST "2011 Plan Overview – Senior Management, Hitachi GST", 27 February 2011, slide 32, ID 0765.

468 HGST "2011 Plan Overview – Senior Management, Hitachi GST", 27 February 2011, slide 32, ID 0765.

469 See also Deposition of WD CFO Wolfgang Nickl before the FCT on 2 August 2011, p. 45: "*Q: Do you know who you gained share relative to in 3.5 Desktop? A; I don't have exact numbers, but we certainly*

documents]*.[470] Evidence from the Notifying Party confirms that WD and HGST also compete closely with each other on product quality.[471] WD generally monitors HGST closely.[472] WD considered other competitors, including Samsung before its proposed concentration with Seagate, to be a second tier and hence more remote competitor.[473]

565. HGST also sees itself as a tier 1 competitor to WD, and a closer competitor than Samsung was before its proposed concentration with Seagate.[474] [Reference to deposition of HGST's executive to the FTC]*[475] which is also likely to have put HGST in direct and close competition with WD. […]* before its proposed acquisition by Seagate, Samsung was generally not considered to be a dependable HDD supplier,[476] nor a technology leader,[477] good performer in product roadmap execution[478] or a competitor with a sizeable product portfolio.[479] OEM customers therefore did not express a strong interest in strengthening the position of Samsung. Samsung therefore remained as a more remote competitor. All of this evidence gives further indications that HGST has been in close competition with WD.

566. Before its proposed concentration with Seagate, Samsung also classified HGST as one of the top tier HDD competitors,[480] and by implication a close competitor to WD. This view has been shared by industry analysts.[481]

567. Therefore, contrary to what the Notifying Party seems to suggest, the Commission did not base its conclusion that HGST is an important competitor on the 3.5" Desktop market on the breadth of its product portfolio alone. The Commission also relied upon various other criteria. The relevance of the breadth of a HDD competitors' portfolio for competition on HDD markets is, however, confirmed by statements of key executives of WD. The evidence that HGST's product portfolio is comparable to that of WD and Seagate, whereas Samsung's portfolio was more limited before its acquisition by Seagate, is also consistent.

568. That body of evidence shows that the merging parties and their competitors view HGST as a close and important competitor on the 3.5" Desktop market. It further

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gained some from Hitachi that had two different components that were impacted. So I guess 3 and half (market share gain) probably came from Hitachi."

470 See the various WD internal documents cited in paragraph 399.

471 See, for instance, Deposition of WD CFO Wolfgang Nickl before the FTC on 2 August 2011, p. 217.*"WD assumes that Hitachi produces drives of comparable quality and incurs similar costs associated with its warranties."*

472 See, for instance, the WD internal documents cited in paragraph 399.

473 Ibidem.

474 HGST "Board of Directors-2010 Marketing Plan", 9 December 2009, slide 3 "Competitive Environment": *"Seagate continues to improve operation efficiency and technology position, WD closing share to Seagate, Hitachi GST focused on improving execution (…), Samsung increasingly becoming marginalized as smallest HDD participant"* (ID: 738)

475 [Deposition of HGST's executive to the FTC]*.

476 [Deposition of HGST's executive to the FTC]*

477 [Deposition of HGST's executive to the FTC]*.

478 [Deposition of HGST's executive to the FTC]*

479 [Deposition of WD executive to the FTC]*

480 Samsung "Mid/Long-term Business Strategy 2010-2020, Storage Division", slides 6-7 (ID: 3496)

481 See, for instance, WD reply to the Commission's request for information of 22 June 2011, Annex 5.13, pp 40-42: […]*.

supports the Commission's findings that the proposed concentration would remove an important competitive constraint on that market.

(v) Evidence on HGST as a strong, but smaller competitor on the 3.5" Desktop market

569. HGST is an important, but smaller competitor to WD and Seagate. As the Notifying Party confirms, the HDD industry is a fixed-cost recovery industry. Suppliers in such industries usually seek to recoup their fixed cost on the basis of their returns on their sales base. Large HDD competitors, such as WD and Seagate, already recoup a significant part of their fixed cost from a large revenue base. This contrasts with HGST, which is the smaller competitor and has incentives to grow its scale and market share. By contrast, WD and Seagate are more likely to favour a more moderate growth of their market share, and would have a stronger incentive to increase prices on their large sales base. Documents and statements of WD and HGST confirm that the different incentives of large HDD competitors and smaller HDD competitor also exist in the HDD industry.[482]

570. The Commission's case file confirms that HGST has periodically been particularly competitive on price and non-price parameters such as product quality, in order to increase its market share. By contrast, the evidence on the role of WD demonstrated that WD is likely to have the incentive to pursue moderate share growth and price increases.

571. The Commission concluded that the proposed concentration would turn the incentives of HGST into those of the market leader, which is less likely to compete aggressively on price and quality in order to sustain its already significant market presence. Concentrations under such circumstances are likely to significantly impede effective competition.[483]

572. Accordingly, the Commission concludes that its provisional findings expressed in the Statement of Objections remain valid.

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482 During the WD earnings call on 21 July 2010, WD CEO John Coyne observed: "*There, is, of course, you have to recognize the models. And whenever quarter-on-quarter growth is lower, that all favors the small player in that environment (…) As the small player, you can afford to bid aggressively to get an increasing share and either keep your volume constant or grow it, and get the benefit o(e)f that growth on your bottom line. For the very large participant at any given customer to lean into that wind and price to grow volume, it's usually too costly to do that. So there's a natural tendency for the small players to* grow *when the market goes down, and then the ability of the large players to* scale *up rapidly causes the large players to typically grow when the market demand moves up."* [Deposition of WD executive to the FTC]*.

483 See paragraphs 105 and 109 of Commission Decision of 3 October 2007 declaring a concentration to be compatible with the common market (Case No COMP/M.4844 - FORTIS / ABN AMRO ASSETS) according to Council Regulation (EC) No 139/2004 (OJ C 265, 7.11.2007, p. 2); See paragraphs 142 and 145 of Commission Decision 2003/777/EC of 30 April 2003 declaring a merger to be compatible with the common market and the EEA Agreement (Case COMP/M.2861 Siemens/Drägerwerk/JV) (OJ L 291, 8.11.2003, p. 1).

(vi) Evidence on the role of HGST

573. Throughout 2010 and 2011, HGST's overall strategy has been to increase its market share.[484] The stated ambition of HGST's has been to become the number […]* player on the HDD markets by 2010, and the number […]* player by 2012.[485] From 2010 to 2011, the goal was to move from a [10-20]*% to a [10-20]*% overall market share.[486] For August 2010 and beyond, HGST's functional strategy has been to be a price-driver and to facilitate ease of doing business, secure brand positioning and sustain margins.[487]

574. Internal HGST documents confirm that these ambitions applied with equal force to the 3.5" Desktop market. For 2010, HGST's objectives for the 3.5" Desktop market were […]*[488] *[…]**[489]

575. As recently as August 2011, [Reference to WD internal documents]*[490] [491]

576. The Commission considers that the trend in capacity expansion by HGST and its recent decision to internalise its production of 3.5" HDDs is indicative of HGST's commitment to the 3.5" Desktop market market and of its incentive to grow scale.

577. The Commission's market investigation confirms that HGST was competing on price and non-price parameters such as product quality in order to increase its market share on the 3.5" Desktop market.

578. The Commission initially carried out a preliminary multiple regression analysis of the bidding data of the Parties, as well as Seagate and Samsung before their proposed concentration. In that preliminary analysis, the price offered by WD was modelled as a function of which other supplier is taking part in the tender, and a number of other factors, such as product characteristics (capacity, rpm), customer identity and the time period concerned. Although no statistically significant relationship between HGST's presence and WD's prices was found, the coefficients for the presence of Samsung and in particular of Seagate were also found not to be significant. These inconclusive results demonstrate the limits of the regression.

579. As the Parties themselves note, pricing is in any event not necessarily indicative of market share growth and hence competitive influence on the 3.5" [Deposition of HGST's executive to the FTC]*[492]

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484 See, for instance, HGST "2010 Strategic Planning", 5 August 2010, slides 18 and 32; HGST "Sales and Marketing Update", 7 December 2010, slide 18 HGST "Financial Update", 7 December 2010, slide 56.

485 HGST "2010 Strategic Planning", 5 August 2010.

486 [Deposition of HGST's executive to the FTC]*.

487 [HGST internal document]*

488 Presentation to HGST Board of Directors, 21 May 2010, slide 35. HGST "Sales & Marketing Update", 7 December 2010; HGST Executive Summary of Board Presentation by HGST CEO S. Milligan, 7 December 2010, slide 59[…]*. This overall strategy is reflected in internal HGST e-mails discussing individual pricing for Desktop customers during that period, see the various e-mails cited in paragraph 399.

489 Presentation to HGST Board of Directors, 27 April 2010 , slide 10: […]* Presentation to HGST Board of Directors, 21 May 2010, slide 33: […]*.

490 [WD internal documents]*.

491 [WD internal documents]*.

580. The evidence from the Parties nonetheless suggests that price has frequently been an important parameter in HGST's strategy to increase its market share. [Reference to HGST internal document]*[493]

581. The following extracts from internal documents and public statements of WD, HGST and Seagate confirm that HGST has periodically been aggressive on price on the 3.5" Desktop market:

Hitachi (HGST) has turned more price aggressive attempting to gain share most notably from Seagate/Samsung. We continue to hear in our research (that) WD (is) more willing to play ball on price attempting to fend off share gain attempts by HGST" (Cleveland Research Company, 25 May 2010)[494]

[Reference to HGST internal document]*[495]

[Reference to WD internal document]*[496]

[Reference to WD internal document]*[497]

"OEMs (are) working down CQ1's HDD upside and the hit from Hitachi's more aggressive pricing/supply." (Wall Street Report on WD, 22 July 2010)[498]

[Reference to HGST internal document]*[499][500][501]

582. In October 2010, WD indicated during its earnings call that it projected a HDD price erosion of 5%. HGST's internal projection for price erosion on the HDD markets was higher than WD, namely between 7 and 9 %. Internal price erosion estimates drive the product pricing of each HDD competitor. [references to HGST internal documents and to deposition of HGST's executive to the FTC]*[502]

583. And, on 12 January 2011, hence shortly before the March 2011 earthquake in Japan, a WD employee noted:

[Reference to WD internal document]*[503]

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492 [Deposition of HGST's executive to the FTC]*

493 [HGST internal document]*.

494 WD internal document submitted on 28 July 2011, "May-10 HDD Distribution Report (Cleveland Research)".

495 [HGST internal document]*.

496 [WD internal document]*.

497 [WD internal document]*.

498 [WD internal document]*.

499 [HGST internal document]*..

500 Customer acceptance.

501 [WD internal document]*.

502 [Deposition of HGST's executive to the FTC]*.

503 [WD internal document]*.

584. The Commission's investigation confirms that quality has been another important parameter in HGST's strategy […]

[References to HGST internal documents]*[504][505]

585. The evidence cited in recitals 573 to 588 confirms that that strategy has been successful with HDD customers.

586. In its reply to the Statement of Objections, the Notifying Party argues that this conclusion is at odds with HGST's market share evolution in desktop since from 2009 to 2010, HGST's share has only grown by one percentage point.

587. A large number of customers on the 3.5" Desktop market are concerned that the proposed concentration would have a negative impact on the level of product quality on the 3.5" Desktop market.[506] Some OEMs have expressed the fear that HGST *"may suffer when it merges with WD, an average/below quality vendor"*[507] [Reference to HGST internal documents]*[508]

588. This evidence confirms that as the important, but smaller competitor on the 3.5" Desktop market, HGST has had the incentive to grow its market share and to actively deploy price and non-price parameters of competition in order to achieve that outcome. HGST's market share on the 3.5" Desktop market has grown again after a period of decline. It can be expected that HGST would have been able to grow further, once the impact of the March 2011 earthquake in Japan on its operations would have been reduced.[509] According to one very large OEM, HGST has recently gained significant purchase shares to the detriment of WD.[510] This trend is also visible to some extent in the transactional data submitted by WD, HGST, Seagate and Samsung.

(vii) Incentives of HGST will align to those of WD

589. The Commission's evidence confirms that WD's incentives as a large competitor is to seek to moderate its share growth. It shows that post-merger, WD is less likely to expand output as intensively as it did in the situation when HGST was still present on the market.

590. The likely incentives of WD can be demonstrated by the internal references it has made to an alleged "misalignment" of supply and demand, and a resulting "oversupply" of HDDs. In reality, this "misalignment" appears to reflect a tendency of HDD customers to hold considerable HDD inventories.[511] The Parties' own evidence confirms that there are often legitimate reasons for this practice, such as the desire of OEMs to obtain security of HDD supplies throughout the year, obtain the right product mix at attractive prices, or their genuine misreads of demand on the

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504 [HGST internal documents]*.
505 [HGST internal documents]*
506 Replies to question 51 of the Commission's request for information of 22 June 2011.
507 Customers reply to the Commission's request for information of 22 June 2011, question 51.
508 [HGST internal documents]*
509 [Deposition of WD executive to the FTC]*
510 Minutes of a telephone conference with a large PC OEM on 8 July 2011.
511 [Deposition of WD executive to the FTC]*

downstream PC market and hence of HDD demand for their products.[512] The Parties' own evidence also confirms that HDD customers use inventories as an instrument to obtain attractive HDD prices in quarters where overall HDD supplies increase and prices are lower, and use up their inventories in quarters where HDD supplies decrease and prices are higher.[513]

591. Numerous statements from WD employees confirm that against this background, the post-merger incentives of WD are likely to be to moderate its share growth and increase prices in order to increase its own profitability:[514]

(…) We intend to depart from what has been the industry's typical approach to inventory holding and supply-demand balancing in the March quarter. (…) The consequence of this mismatch in unit volume trends between the PC and HDD industries has been to put pressure on March quarter pricing, contribute to an inventory overhang exiting the March quarter and consequently exert further pricing pressure in the June quarter, which has repeatedly seen the weakest seasonal demand profile. (…)We are signaling our intent to do as much as we can in developing our build plans to eliminate those misalignments from the supply-demand dynamics (19 January 2011)"

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512 [Deposition of WD executive to the FTC]*.

513 [Deposition of WD executive to the FTC]*

514 [Reference to WD internal document.]* See also WD earnings call of 19 October, WD CFO Wolfgang Nickl: *""As I mentioned, price decline is a very important contributor to this equation. We're in control of our cost declines and we are working on our channel mix. So it will come down to win the supply demand situation and will allow pricing to stabilize". We intend to depart from what has been the industry's typical approach to inventory holding and supply-demand balancing in the March quarter. Historically, over the last decade, PC volumes have shown an average unit volume decline of around 9% sequentially when March quarters are compared to the immediately preceding December quarters. Despite that PC industry historical demand trend, the HDD industry has typically shipped volumes that were down approximately 4% sequentially during the same period as HDD producers attempted to utilize the capacity that had already been put in place to service the seasonally stronger December quarter volumes. The consequence of this mismatch in unit volume trends between the PC and HDD industries has been to put pressure on March quarter pricing, contribute to an inventory overhang exiting the March quarter and consequently exert further pricing pressure in the June quarter, which has repeatedly seen the weakest seasonal demand profile. Consequently, although we believe that end user demand would be around 160 million units, we are forecasting an HDD TAM of 155 million units for the last quarter as we anticipate some further flushing of excess inventory in the PC pipeline (…)We've highlighted that there is a misalignment between the traditional market demand drivers and the traditional behaviors relative to supply, and we have all seen what the outcome of that is in terms of those imbalances driving excessive inventories, which in turn tend to drive significant price declines (…) We are signaling our intent to do as much as we can in developing our build plans to eliminate those misalignments from the supply-demand dynamics (19 January 2011)*" WD earnings call on 19 January 2011, Tim Leyden and John Coyne. [Reference to WD internal documents]*WD earnings call on 23 April 2009, Tim Leyden. See also WD earnings call on 18 January 2011, Wolfgang Nickl: "*We exceeded the upper end of our revenue guidance by USD 75 million which was achieved through a combination of remixing our product and business segments, improved pricing discipline, resulting in lower like for like price declines, higher volume due to a slightly (higher) tier TAM and moderate market share gains" ;* WD earnings call on 19 January 2011, WD CFO Wolfgang Nickl; "*We strongly believe that the effects from fixed-cost under absorption are of much lesser impact to the bottom line than subjecting the entire volume to significant price declines",* and [Deposition of WD executive to the FTC]*.

During the March quarter (…), the WD team continued its disciplined approach to market participation. (…) We did this by optimizing product mix, limited our participation in certain markets and concentrating on cost reduction and factory utilization. We are pleased with the results of our actions to size the business to reflect demand realities that the industry faced and we sacrificed some near-term share growth in order to make progress."

Q: Are you willing to give up share in order to end the quarter and help the inventory position? A: We are very committed to contribute to the supply demand balance. We can only contribute to 31% of the supply demand balance. We just try to drive a balanced inventory for the overall industry to avoid excessive price declines in this quarter and next quarter, because we are pretty clear on the fact that the absorption cost that we face are insignificant in comparison to the excessive price declines that you can subject the business to for the quarters to come (28 February 2011)

592. Despite the alleged "misaligned" supply situation, WD has constantly achieved those gross margin targets, which itself qualifies as being sufficient to achieve a satisfactory return on its sales and to make important investments, notably in research and development.[515] HGST and Seagate have also achieved their gross margin targets in the last two years. This confirms that despite the supply situation depicted by the Notifying Party, three remaining HDD suppliers on the market would be able to obtain satisfactory returns on their sales. As one industry analyst pointedly noted:

"Consolidation has reached its logical conclusion with Samsung's sale to STX, leaving the industry with the economic equilibrium of three players and sustainable profitability).[516]

593. The Commission upholds its provisional finding that the proposed concentration would align the incentives of HGST as the important, but smaller player, to the incentives of WD, the stronger player. The removal of the particular constraint that HGST has posed on WD in this regard further supports the conclusion that the proposed concentration would remove an important competitive force from the 3.5" Desktop market.

c. Impact on customers

594. The views that customers on the 3.5" Desktop market have expressed during the Commission's investigation confirm that the proposed concentration is likely to remove an important competitive constraint from the 3.5" Desktop market and have a price effect.

595. OEMs that responded to the Commission's requests for information confirm that their scope to re-allocate purchase shares between HDD suppliers would be reduced after

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515 [Reference to deposition of WD executives to the FTC]* As WD CFO Wolfgang Nickl already observed during the WD earnings call on 22 September 2009: *"What we've seen historically, is that for our margin range, in the weaker quarters we tend to below the midpoint of the 18% to 23% range and in the stronger quarters we tend to be above the midpoint."* [reference to deposition of WD executives to the FTC]*

516 Analysis by Richard Kugele (Needham), 19 April 2011.

the proposed concentration and that this would have an impact on competition between the remaining competitors on the 3.5" Desktop market.

596. Eight out of nine Desktop OEMs confirmed that in the post-merger market situation with two HDD suppliers, prices charged by each of WD and Seagate are likely to increase.[517] Some of the Desktop customers explicitly link the likelihood of price increases to their diminished ability to shift purchase shares between HDD competitors, and the leverage that they lose to obtain competitive prices from these competitors:

"It's true that higher shares get honored by lower pricing – in a highly competitive market. If only two suppliers are present a single one would anyhow get 50%+ and there might not be the need to be very aggressive on pricing any longer"[518]

597. During a telephone call, one large Desktop OEM further explained the constraints that it would face if only two HDD competitors remain on the 3.5" Desktop market.[519] It explained that in a two-player scenario, WD's and Seagate's purchase shares with that OEM would fluctuate by small amounts on a quarter to quarter basis. For example, percentages share could shift by amounts within 5% below or above 50%. That OEM expected that if it would seek to shift its purchase shares further, its own competitors would follow suit. Given the capital expenditure that HDD competitors need to make in order to meet the overall additional HDD demand, the relevant OEM did not expect that only two HDD competitors on the 3.5" Desktop market would be able to accommodate such shifts. The OEM in question indicated that it would expect WD and Seagate to compete for its business, but not to the same degree as compared to the pre-merger situation. In its response to the Commission's requests for information, the OEM concerned indicated that it expected prices to increase if the proposed concentration goes ahead.

598. Other Desktop OEMs noted:

"The fact that there will be fewer suppliers on the market could result in price increases and less supply security, less available output, less incentive to increase product quality and service quality."[520]

"We have some short term concerns about the security of supply and prices."[521]

"The balance of the market will no longer exist […]with only three suppliers in the industry, price, supply can be easily manipulated, whether consumer will be able to enjoy the same outcome brought up by the intense competition of the market can definitely be doubted."[522]

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517 Customers reply to the Commission request for information of 22 June 2011, question 51.
518 Customers reply to the Commission's request for information of 22 June 2011, question 58.
519 Minutes of a telephone conference with a large PC OEM on 8 July 2011.
520 Customers reply to the Commission's request for information of 22 June 2011, questions 51.1.
521 Customers reply to the Commission's request for information of 22 June 2011, questions 51.1.
522 Customers reply to the Commission's request for information of 22 June 2011, questions 52.1.

"The combination of supply/price might lead to an impact on both, in an unfavourable way to the customer."[523]

599. The majority of the OEM customers on the 3.5" Desktop market who responded to the Commission's requests for information equally express concerns on the impact of the proposed concentration on the incentives of the remaining competitors to expand output and in that way decrease prices.

600. According to one large OEM, "*there would be capacity issues for multiple customers to [allocate more demand] at the same time in the post-merger situation.*"[524]

601. Other customers note:

"The fewer players in the market, the greater control over supply thereby placing more control in the sellers' hands".[525]

"We believe that production control will be a means for HDD makers to interfere (in) the balance of supply and demand and avoid price erosion (…).The balance of the market will no longer exist and we might be forced to increase our willingness to pay higher prices to obtain the supply."[526]

Supply in the HDD market is from time to time very short. Of course supply or product availability is an instrument to 'control' prices, or better to say that market dynamics will apply. So the combined supply/price might lead to an impact on both, in an unfavorable way for the customer."[527]

602. None of the Desktop OEMs that responded to the Commission's requests for information have indicated that they have re-allocated purchase shares for the 3.5" Desktop market since the announcement of the merger between WD and HGST, or the preceding merger between Seagate and Samsung.[528]

603. The evidence confirms that the significant impediment to effective competition that is likely to occur in relation to large OEMs, applies with equal or even more force to distributors and smaller OEMs, which largely buy their HDDs from the distribution channel, as well as XHDD suppliers who source their HDD input from the 3.5" Desktop market.

604. Distributors that serve small OEMs generally confirm that they purchase the HDDs that their OEM customers want.[529] Typically, distributors pass any price increases for HDDs on to these customers. As one major distributor indicated: "*We try to retain our margin irrespectively of seasonally caused fluctuations in the demand of our clients*".[530] One third of the distributors indicated that they could not anticipate the

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523 Customers reply to the Commission's request for information of 22 June 2011, questions 51.1.
524 Minutes of a telephone conference with a PC OEM of 8 July 2011.
525 Customers reply to the Commission's request for information of 22 June 2011, questions 52.1.
526 Customers reply to the Commission's request for information of 22 June 2011, question 51.1.
527 Customers reply to the Commission's request for information of 22 June 2011, question 51.1.
528 Customers reply to the Commission's request for information of 22 June 2011, question 45.
529 Customers reply to the Commission request for information of 20 April 2011, question 36.
530 Customers reply to the Commission's request for information of 20 April 2011, question 57.

impact that the proposed concentration would have on their OEM customers.[531] Another third of the distributors foresaw no impact.[532] However, two out of three distributors foreseeing no impact are exclusive distributors of WD. Hence, the proposed concentration with HGST would have no impact on their supply and their distribution business. Two major distributors did anticipate that the proposed concentration would have a negative impact on prices.[533] Three major distributors underlined that generally speaking, HDD suppliers serve large OEMs first and that they have in the past experienced supply constraints when the demand of large OEMs was served first.[534] These statements confirm that the significant impediment to effective competition is likely to occur in relation to large OEMs, applies with equal or even more force to distributors and smaller OEMs.

605. The conclusion that a significant impediment to effective competition in relation to large OEMs is likely to apply with equal or even stronger force with regard to distributors is borne out by the merging parties' internal documents and by statements of their key executives. {Reference to deposition of HGST executive to the FTC]* this means that distributors are already likely to be more heavily impacted by constraints in their HDD supplies than large OEMs:

"The distribution channel is the most volatile from a pricing perspective (…) It's the most transactional element of our market. It's the least relationship-based. So, if there's a shortage, typically, as a general rule, the OEMs will be protected and then you'll drain the distribution channel, therefore prices will go up."[535]

606. In its internal "Roadmap to success" for the distribution channel, WD notes:

[WD internal document]*[536]

607. The Commission's market investigation confirms that this effect is likely to be even more pronounced for XHDD suppliers. As one XHDD supplier that sources HDDs from the 3.5" Desktop market noted:

"It becomes clear that the two vendors already set their preferred customers which are the car industry, CE and PC OEMs, all others are behind the line. In case there are… [3 parties on the overall HDD market excluding Mission Critical, and 2 parties on the 3.5" Desktop market)… left, security of supply becomes a very big issue (…) Prices will go up. Reliability of supply is just not there."[537]

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531 Customers reply to the Commission's request for information of 20 April 2011, questions 53 and 54; Customers reply to the Commission's request for information of 22 June 2011, question 51.

532 Ibidem.

533 Ibidem.

534 Customers reply to the Commission's request for information of 20 April 2011, questions 50-51.

535 [Reference to deposition of HGST executive to the FTC]* and [Reference to deposition of WD executive to the FTC]*

536 [WD internal document].

537 One XHDD supplier's reply to the Commission's request for information of 22 June 2011, question 51.

608. Four out of five XHDD suppliers that responded to the Commission's requests for information expressed concerns on the impact that the proposed concentration would have on their security of supply and the prices that they obtain.[538]

609. In its supplemental submission of 26 September 2011, the Notifying Party argues that given that the average price of a 3.5" Desktop HDD represents around 6% of the price of an average Desktop PC, in the event that a 10% price rise was achieved and passed on entirely by customers, this increase would amount to substantially less than 1% increase in the price of an average Desktop computer to the final consumer.

610. The Commission does not consider this argument valid since in a case of unilateral concerns the harm is to be assessed not only on the final consumer but in particular on the direct customer of the relevant product. As outlined in the Horizontal Merger Guidelines, the concept of consumers encompasses intermediate and ultimate consumers, that is, users of the products covered by the merger.[539]

d. Conclusion

611. The Commission concludes that, in particular in light of the importance of multi-sourcing on the 3.5" Desktop market, the reduction of the number of HDD suppliers from three to two would significantly impede effective competition on that market. Post-merger, customers on the 3.5" Desktop market would be dependent on two remaining supply sources: WD/HGST and Seagate. The removal of HGST as the sole remaining alternative supply source is likely to reduce price competition between WD and Seagate as compared to the situation where HGST is still present. As a result, the post-merger price equilibrium is likely to be significantly higher than the pre-merger one.

612. The Commission also concludes that due to its individual competitive strengths, HGST has been a close competitor to WD and an important competitive force on the 3.5" Desktop market. The Commission concludes that the removal of this competitive constraint is likely to have a significant price effect.

D. Competitors are unlikely to increase supply if prices increase

613. On the 3.5" Desktop market, Seagate would remain as the only competitor to the Merged Entity. The relevant benchmark is whether Seagate has the ability and incentive to add capacity and output so as to countervail any price increase by the Merged Entity.

614. The Commission's market investigation reveals that all competitors on the 3.5" Desktop market currently already have high capacity utilisation rates.[540] There are already capacity constraints at peak times, stemming from the production cycles in end-use markets, typically in third and fourth quarters.[541] Capacity utilisation varies and is lower at the beginning of the calendar year when demand is sluggish. As an illustration, at the beginning of 2010, industry-wide utilisation levels were around

538 Customers reply to the Commission's request for information of 22 June 2011, questions 49 to 51.
539 Horizontal Merger Guidelines, footnote 105.
540 Customers reply to the Commission's request for information of 20 April 2011, question 86.
541 Customers reply to the Commission's request for information of 11 April 2011, questions 50 and 51.

[70-80]*%, whereas they had increased to around [80-90]*% at the end of 2010.[542] They nonetheless remain higher throughout the year. The Figure 8 to Figure 11 show that WD's own capacity has been periodically constrained over the last years. The same applies to Seagate, and Seagate's production capacity and output has in general been more stable than its competitors.[543] The cost of investment in capacity shifts between different HDD competitors, which has to be factored in the decision to increase capacity, remains significant.[544] As Seagate CFO Pat O'Malley noted: "*I'd say we're pretty much optimizing our capacity today. There's not a whole lot of excess capacity*".[545] This suggests that the current ability of the merged Seagate to react to a price increase from the merged WD/Hitachi by increasing capacity utilisation and output would rapidly face its limit. Although the Notifying Party refers to certain capacity expansions by HDD suppliers, it has identified no expansion plans that specifically cover 3.5" Desktop drives.

615. In its reply to the Statement of Objections, the Notifying Party argues that the Commission has overlooked certain statements by Seagate and Samsung according to which HDD supply is typically not constrained by available capacity. Moreover, according to the Notifying Party, the Commission would have disregarded replies from customers stating that they do not perceive HDD suppliers as capacity constrained.

616. The Commission considers the question to be moot given the lack of incentives of the remaining competitor. Ultimately, even if the ability to convert or expand capacity existed, the remaining competitor Seagate would need to consider it profitable to do so. In recitals 523 to 535, the Commission demonstrated that Seagate is not likely to have the incentives to expand its capacity and output in order to countervail any price increases by the Merged Entity.

617. Industry analysis confirms this view :

"Exiting 2009, HDD vendors began to ramp capacity aggressively to align with the industry's 2010 projection of as much as 690M units (~24% yoy growth). Despite some warning signs of slowing demand in 2CQ, both STX and WD continued to follow through with their capex plans— that is until demand took another leg down in 3CQ. Recently, Western Digital reported that they spent $200M in capex during 3CQ, about $75M below its guidance, to align with lower industry shipments. With 4Q10 shipments tracking to below seasonal growth, we expect further capex push-outs by the industry, which should help tighten supply going into 2011." [546]

618. The Commission concludes that it is unlikely that Seagate would have the ability and incentive to increase its supplies so as to countervail any price increase by the Merged Entity.

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542 Form CO, paragraph 186.

543 The Notifying Party will obtain access to Seagate's data in a data-room.

544 Customers reply to the Commission's request for information of 11 April 2011, question 89.

545 1 March 2010, Morgan Stanley Technology, Media & Telecom Conference.

546 Hard Disk Drives, Near Cycle Recovery; Initiating with Buys on STX and WDC, CITI, 7 December 2010.

E. No countervailing buyer power

619. Competitive pressure on a supplier is not only exercised by competitors but can also come from its customers. Even firms with very high market shares may not be in a position, post-merger, to significantly impede effective competition if customers possess countervailing buyer power.[547]

620. Even if OEMs were to be considered as able to exercise buyer power pre-merger, in order for countervailing buyer power to be found to sufficiently off-set potential adverse effects of the merger, it must also exist and remain effective following the merger.[548]

621. The proposed concentration eliminates a credible alternative supplier for customers and reduces the sources of supply to two. The Commission has demonstrated that the proposed concentration would seriously increase the constraints that OEMs face in switching their purchases shares between the different HDD competitors. Thus, the bargaining strength of OEMs will be negatively impacted by the proposed concentration and customers would not possess sufficient countervailing power to counter the increase in market power brought about by the proposed transaction.

622. In any event, countervailing buyer power cannot be found to sufficiently offset potential adverse effects of the proposed concentration if it only ensures that a particular segment of customers with particular bargaining strength is shielded from significantly higher prices or deteriorated conditions after the merger.[549]

623. The evidence from the Parties confirms that the significant impediment to effective competition that is likely in relation to large OEMs, applies with equal or even more force to distributors and smaller OEMs, which largely buy their HDDs from the distribution channel, as well as XHDD suppliers who source their HDD input from the 3.5" Desktop market.

624. [Reference to deposition of HGST executive to the FTC]* this means that distributors are already likely to be more heavily impacted by constraints in their HDD supplies than large OEMs:

[Reference to deposition of HGST executive to the FTC]* [550]

625. In its internal "Roadmap to success" for the distribution channel, WD noted:

[WD internal document]*[551]

626. The Commission's market investigation confirms that this effect is likely to be even more pronounced for XHDD suppliers. As one XHDD supplier that sources HDDs from the 3.5" Desktop market noted:

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547 Horizontal Merger Guidelines, paragraph 64.
548 Horizontal Merger Guidelines, paragraph 67.
549 Horizontal Merger Guidelines, paragraph 67.
550 [Deposition of HGST executive to the FTC]* See also [Deposition of WD executive to the FTC]*.
551 [WD internal document]*

"It becomes clear that the two vendors already set their preferred customers which are the car industry, CE and PC OEMs, all others are behind the line. In case there are… [3 parties on the overall HDD market excluding Mission Critical, and 2 parties on the 3.5" Desktop market))… left, security of supply becomes a very big issue (…) Prices will go up. Reliability of supply is just not there."[552]

627. Four out of Five XHDD suppliers that responded to the Commission's requests for information have expressed concerns on the impact that the proposed concentration would have on their security of supply and the prices that they obtain.[553]

628. In its reply to the Statement of Objections, the Notifying Party argues that if the majority of distributors and retailers, which are the smaller players in the market, are unconcerned by the proposed concentration, the larger more sophisticated OEMs have even less cause for concern. In that regard, the Notifying Party claims that large OEMs have the ability and incentive to deploy successful counterstrategies to defeat any price increase by the Merged Entity. These would include:

– Asymmetric share award for the majority of a customer's total demand;

– Long term agreements with a supplier for a portion of their requirements;

– "taking TAM off the table" mid-quarter and organising side-auctions for part of their requirements;

– Stalking bids;

– Bundled purchases;

– Sponsorship of entry.

629. The Notifying Party provides examples of OEMs applying such strategies and refers to replies of the Commission's market investigation to support its claim.

630. While certain Desktop OEMs that replied to the Commission's market investigation confirmed the use of such procurement strategies, the majority of Desktop OEMs indicated that reduction of the number of available suppliers of 3.5" HDDs for use in Desktop PCs from three to two would have an impact on their ability to secure lower prices by using any of the strategies mentioned in recital 629. According to one Desktop OEM: "*Theoretically, at least some of the strategies mentioned above could still be used. However, as (i) the customers would need to secure their supply and therefore are dependent on at least two suppliers (100% share would generally bear too much risk of supply lacks in case of problems), (ii) the customers cannot transfer to other technologies due to the performance differences, (iii) the customers are also dependent on other products of the suppliers which may only be provided in packages, (iv) we do not expect a new supplier to start this market segment and (v) as the remaining suppliers would know this, the customers negotiation position would presumably be weaker than in a market with more suppliers."*[554]

552 Freecom reply to the Commission's request for information of 22 June 2011, question 51.

553 Customers reply to the Commission's request for information of 22 June 2011, questions 49 to 51.

554 Customer replies to Commission request for information of 8 September 2011, question 14.

631. Moreover, as already indicated in recital 604, it is incorrect to consider that the majority of distributors are unconcerned. Two major distributors did anticipate that the proposed concentration would have a negative impact on prices while one third of the distributors could not anticipate the impact of the proposed concentration. In addition, two out of three distributors foreseeing no impact are exclusive distributors of WD whose business would not be impacted.[555]

632. For those reasons, the Commission takes the view that there is no sufficient countervailing buyer power since customers are not in a position to counteract the likely anti-competitive effects of the merger.

F. No likely, timely and sufficient entry

a. No likelihood of sufficient and timely entry by Toshiba

(i) The View of the Notifying Party

633. The Notifying Party claims that it expects Toshiba to enter the 3.5" Desktop (and 3.5" CE) markets if the proposed concentration were to give rise to anticompetitive effect and that such entry would be likely, timely, and sufficient.[556]

Likelihood of entry

634. First of all, the Notifying Party argues that Toshiba is already serving the 3.5" Desktop (and CE) markets. It points out that Toshiba markets a 2.5" HDD that Toshiba's marketing communication describes as "ideal for […] desktop PCs" and another HDD as "ideal for […] set top boxes".[557] Moreover, the Notifying Party considers that Toshiba could ship its "higher specification" 3.5" Business Critical Enterprise drive as a 3.5" Desktop HDD, although it recognises that the Business Critical HDD is "slightly more expensive to produce".[558] It submits that WD has "waterfalled" between [10% and 40%]*of its Business Critical sales into Desktop sales. For instance, one reason is that the drives have not met the more stringent testing requirements.[559]

635. Secondly, the Notifying Party considers that Toshiba is the market leader in 2.5" HDDs and has the potential to grow rapidly in any other HDD segment. Toshiba already supplies high quality HDD products to important customers.[560] Moreover, the Notifying Party indicates that Toshiba has the necessary technology and manufacturing assets to produce 3.5" HDDs. The Notifying Party notes that Fujitsu, which was acquired by Toshiba in 2009, has traditionally been active in 3.5" HDDs, which it decided to abandon because it considered growth in 2.5" HDDs to be stronger. Toshiba would nonetheless have retained its access to know-how and the former Fujitsu employees who were active in the HDD business.

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555 Customers reply to the Commission's request for information of 20 April 2011, questions 53 and 54, Customers reply to the Commission's request for information of 22 June 2011, question 51.

556 WD reply to the Statement of Objections, paragraph 537.

557 WD reply to the Statement of Objections, paragraph 540.

558 WD reply to the 6(1)(c) Decision, paragraph 54.

559 WD reply to the Statement of Objections, paragraph 161.

560 WD reply to the 6(1)(c) decision, paragraph 75. Other customers would have referred to Toshiba's strong engineering background, good quality products and reliability as a supplier.

636. Thirdly, customers, in particular Desktop OEMs with whom Toshiba already has strong relationships, can sponsor Toshiba's entry as they did in the past with other suppliers.[561] In its reply to the Statement of Objections, the Notifying Party argues that the Commission's question in the Commission's market investigation was not clear in setting the scenario in which the OEM would be ready to sponsor Toshiba's entry. Should the Commission have specified the scenario of price increases or output restrictions, customers' answers would have been different. Moreover, the Notifying Party argues that even if Toshiba did not actually enter, in light of the reduced timeframe and costs required to manufacture 3.5" Desktop HDDs, it remains "on the shelf" for any customer wishing to sponsor its entry to use the potential entry of Toshiba as leverage in order to obtain competitive prices from the two suppliers that are selected.[562]

637. Fourthly, the Notifying Party estimates that Toshiba could profitably enter the 3.5" Desktop market on the basis of its prior investments on the 3.5" Business Critical market. Toshiba's recent launch of 3.5" Business Critical HDD products would demonstrate that Toshiba has the assets to produce 3.5" form factor HDDs,[563] and Toshiba could build on those investments by entering these markets. A number of design changes would be required to (cost-)optimize the (more sophisticated) 3.5" Business Critical Enterprise HDD for (less sophisticated) high capacity Desktop applications.[564] The one-off cost for the design change would amount to USD [0-25] million. On the assumption of a 5% price increase on this market for at least one year and of a market share of 5%, the estimated profits after the first year of production would be USD [25-50]* million.[565] The Notifying Party also submits similar calculations for an entry scenario into the 3.5" markets based on Toshiba's existing 2.5" HDD production.[566]

638. Fifthly, the Notifying Party argues that a significant proportion of investment are not sunk as 3.5" production lines can be converted back to 2.5" lines at relatively little cost, and back end testers can be designed to be interchangeable between form factors.[567] In particular, the Notifying Party submits that within [0-6]* months, suppliers can convert 3.5" lines into 2.5" lines with an investment of approximately USD [500,000-1 million]* per line (producing [0-10]* million units per annum).

639. Sixthly, the Notifying Party argues that Toshiba would not necessarily need to invest into new capacity but could outsource manufacturing to TDK/SAE, which currently manufactures 3.5" HDDs for Samsung – capacity that, in the Notifying Party's view, could become available if the Seagate/ Samsung transaction closes, given Seagate's possible intention to take some of Samsung's HDD production in-house.[568]

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561 WD reply to the Statement of Objections, paragraph 547 and 551.

562 WD reply to the Statement of Objections, paragraph 555.

563 WD reply to the 6 (1) (c) decision, paragraph 78.

564 According to the Notifying Party, these changes could include […]*.

565 WD reply to the Statement of Objections, paragraph 180.

566 WD reply to the Statement of Objections, paragraph 285.

567 WD reply to the Statement of Objections, paragraph 284.

568 WD reply to (6)(1)(c) Decision, paragraph 55 and WD reply to the Statement of Objections, paragraph 544.

640. Seventhly, the Notifying Party submits that as a non-integrated supplier, Toshiba would require less scale to be successful.[569] This would be evidenced by the fact that Toshiba is able to sustain its product portfolio on the 1.8" HDD markets, which are much smaller than the 3.5" Desktop market.[570]

Timeliness of entry

641. In its reply to the Statement of Objections,[571] the Notifying Party argues that Toshiba's entry would be timely as it could be realised in less than one year. Specifically, it submits that [0-6]* months[572] would be required to optimize the product features of the existing 3.5" Business Critical drive for desktop applications respectively. In parallel, new capacity could be ordered and installed, which would take [0-6]* months. At the end of that period of [0-12]* months, it would be possible to start production and ship into the distribution channel (which would not require qualification). That channel accounts for [60-70]*%of WD's shipments of 3.5" desktop drives and can therefore be considered to a substantial sales channel. Qualification with OEMs would take an additional period of [0 to 6]* months, which means that production for OEMs could start after a total of [6 to 12]* months. Finally, ramping up to achieve scale and quality may take another [0 to 12]* months although shipments into the distribution channel starting earlier may reduce this time scale. Therefore, the overall time required to enter the 3.5" Desktop markets would be [12 to 24]* months on the basis of the existing design of Toshiba's 3.5" Business Critical drive.

642. Moreover, the Notifying Party submits that Toshiba's responses to the Commission's request for information of 14 June 2011 confirmed that the latter can immediately produce Desktop HDDs with no further investment based on its existing 3.5" Business Critical product.[573]

Sufficiency of entry

643. The Notifying Party argues that Toshiba's entry would be sufficient insofar as it would ensure the third supplier allegedly required by a number of OEM customers to continue multisourcing and Toshiba would be an important competitive force. In that regard, the Notifying Party refers to the significant resources of the Toshiba's Group and to Toshiba's business plan to significantly increase its market share in the Business Critical HDD market in the next three years. Moreover, Toshiba overall is a larger company than any of its HDD competitors, so that it would have the resources to invest further in this area.[574]

569 WD reply to the 6 (1) (c) Decision, paragraphs 74 and 76.
570 Ibidem.
571 WD reply to the Statement of Objections, paragraph 175. As discussed in recitals 253 to 286, the Notifying Party's arguments regarding supply-side substitutability are discussed in this section on entry.
572 […]*.
573 WD reply to the Statement of Objections, paragraph 538.
574 WD reply to the 6(1)(c) Decision, paragraph 71.

(ii) The Commission's assessment

644. When entry into a market is sufficiently easy, a merger is unlikely to pose any significant anticompetitive risk.[575] For entry to be considered a sufficient competitive constraint on the merging parties, it must be shown to be likely, timely and sufficient to deter or defeat any anticompetitive effects of the merger.[576]

645. While Toshiba has recently entered the 3.5" Business Critical market, the Commission's market investigation reveals that Toshiba's entry on the 3.5" Desktop would be unlikely and insufficient. With regard to the timeliness of entry, it appears that entry might occur within the two years normally foreseen by the Horizontal Merger Guidelines. However, given that the industry's product cycles are short, it is uncertain whether such entry would be sufficiently swift to credibly deter or defeat the exercise of market power by the Merged Entity.

Likelihood of entry

646. For entry to be likely, it must be sufficiently profitable taking into account the price effects of injecting additional output into the market and the potential responses of incumbents.[577] Entry is less likely if it would only be economically viable on a large scale, thereby resulting in significantly depressed price levels.[578] Barriers to entry must be taken into account, as these barriers can have an impact on the profitability of entry.[579] Moreover, the expected evolution of the market is relevant. Entry is more likely to be profitable in a market that is expected to experience high growth in the future than in a market that is mature or expected to decline.[580] The fact that a potential entrant already has the production facilities to enter a market is also important.[581]

647. First, Toshiba's existing HDDs do not serve the 3.5" Desktop (or 3.5" CE) market. With respect to the Notifying Party's claim that Toshiba markets certain 2.5" drives in desktop PCs, it should be pointed out that certain 2.5" drives are also used in desktop applications, such as "all-in-one desktops". However, such desktops belong to a niche market[582] which is very small.[583] In addition, the Commission has no indication that Toshiba sold its 2.5" HDDs for Desktop applications in the last three years.[584] As regards the claim that Toshiba could sell its 3.5" Business Critical Enterprise drives as a 3.5" Desktop HDD, it should be pointed out that the Notifying Party itself notes that these drives are more costly to produce.[585] Therefore, they sell for significantly higher prices. Moreover, no customer active on the 3.5" Desktop market referred to Toshiba's 3.5" Business Critical HDDs when contemplating the

575 Horizontal Merger Guidelines, paragraph 68.
576 Ibidem.
577 Horizontal Merger Guidelines, paragraph 69.
578 Ibidem.
579 Horizontal Merger Guidelines, paragraphs 70-71.
580 Horizontal Merger Guidelines, paragraph 72.
581 Horizontal Merger Guidelines, paragraph 73.
582 See recital 162
583 Horizontal Merger Guidelines, paragraph 75.
584 Toshiba's reply to the Commission's request for information of 7 September 2011, question 5.
585 The Commission found that the average cost-difference was […]*% in 2010, see Table 7.

prospect of Toshiba entering the Desktop market.[586] In any event, and regardless of the higher cost of such drives, even if a portion of Toshiba's sales of its Business Critical HDDs were sold as 3.5" Desktop HDDs, the constraint would likely be negligible given that Toshiba currently has less than [0-5]*% of the Business Critical market. Even if Toshiba's output and market share in Business Critical were to grow significantly, the volume of the overall Business Critical market is 13 times smaller than the 3.5" Desktop market (based on 2010 volumes). A large OEM customer also pointed out Toshiba's limited supply base for Business Critical drives and its lack of production capacity in Business Critical drives to potentially meet desktop demands.[587] For those reasons, the claim that Toshiba is, or could be, serving the 3.5" Desktop (or 3.5" CE) markets with its existing HDDs should be disregarded.

648. Secondly, the Notifying Party cites Toshiba's strength in other HDD markets (most notably 2.5" and 1.8" HDD markets), its technical capabilities, its reputation with HDD customers and its overall company resources in order to demonstrate that Toshiba is likely to enter the 3.5" Desktop market. Irrespective of all these factors, the Commission could only conclude that such entry is likely to occur if it has sufficient indications that it would be profitable for Toshiba to enter that market. The Notifying Party referred to the possibility for Toshiba to serve customers that would have high quality requirements and would already source from it. However, these customers source these products on other markets than the 3.5" Desktop (and 3.5" CE) markets. The customers' submissions are, therefore, not conclusive as to the likelihood that Toshiba would enter the 3.5" Desktop (or 3.5" CE) markets.

649. Toshiba's apparent strategic focus is on the 2.5" HDD and Enterprise HDD markets. Fujitsu decided to exit the 3.5" Desktop market in 2002[588] long before its acquisition by Toshiba, because it considered growth prospects on the 2.5" HDD markets to be stronger. However, there are no public indications that Toshiba is likely to make the investments to make such a large-scale entry now as result of the proposed concentration. Its recent reported public statement that it intends to profit from any business opportunity that arises from the proposed concentration is silent on the prospect of entering the 3.5" Desktop market.[589]

650. Thirdly, no customer active on the 3.5" Desktop market referred to a realistic prospect of entry by Toshiba.[590] OEMs that did comment on the prospect of entry by Toshiba indicated that they are not aware of any plans of Toshiba to enter.[591]

651. With respect to the Notifying Party's claim that customers could sponsor Toshiba's entry, the Commission cannot rely on findings in previous merger proceedings in the HDD industry that OEMs can easily sponsor entry into HDD markets of concern so that it can conclude that this proposed concentration would not be likely to significantly impede effective competition on the 3.5" Desktop market. With just two exceptions, all of the large Desktop OEMs indicated that they would not guarantee a

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586 Customers reply to the Commission's request for information of 22 June 2011, question 61.

587 Minutes of a conference call with an OEM of 29 April 2011.

588 Reply of Seagate to the Commission's Request for information of 20 April 2011, question 13.

589 *"Toshiba Foresees Gains From WDC-Hitachi Deal"*, 10 March 2011, http://blogs.barrons.com/techtraderdaily/2011/03/10/toshiba-foresees-gains-from-wdc-hitachi-deal/?mod=yahoobarrons (consulted 14 October 2011).

590 Customers reply to the Commission's request for information of 22 June 2011, question 61.

591 Ibidem.

purchase volume to Toshiba in order to have it as a third supply source on the 3.5" Desktop market. Their decision to allocate purchase volumes to Toshiba would depend on the competitiveness and product quality with which Toshiba could enter.[592] Moreover, during Seagate's earnings call of 20 July 2011, Seagate CEO Steve Luzco stated that he does not believe that OEMs would sponsor the entry of Toshiba onto the 3.5" Desktop market.

652. As regards the Notifying Party's claim that the relevant question of the Commission′s market investigation[593] should have specified the scenario of price increases, it is clear from many responses that customers are not prepared to pay a price premium. This implies that customers would not commit long term to a price higher than the current competitive price given that an important aim of sponsoring Toshiba's entry would be to increase competition and defeat the price increase. Hence, there have to be indications that Toshiba would need to find it profitable to enter at current price levels as it could not expect to be sponsored at higher prices.

653. Fourthly, while Toshiba confirms that it has the technical possibility to "dress down" its 3.5" Business Critical HDDs of 1 TB and 2 TB, to offer high capacity, multi-platter 3.5" Desktop HDDs, it has credibly demonstrated to the Commission that it does not view the 3.5" Desktop market as sufficiently profitable for it to consider entering it even in the case of a SSNIP from 5% to 10%. In its view, the 3.5" Desktop market has not been growing but is rather saturating or depleting while 2.5" HDDs are growing.[594] In any case, Toshiba would merely compete in a small portion of the 3.5" Desktop market with "dressed down" versions of its multi-platter Business Critical drives. According to the Notifying Party, only 25% of the 2010 market concern capacity points between 1 TB and 2 TB.[595]

654. The Commission asked Toshiba to submit its calculations for possible entry on the basis of WD′s assumptions referred to in recital 637 for investments necessary to serve 5% of the 3.5" Desktop market. The information on the Commission′s file confirms the Commission's view that Toshiba's entry is unlikely. In particular, it could not be confirmed that entry into the 3.5" Desktop market would be profitable, even when substituting Toshiba's estimate of the average sales price with the actual average sales price for 3.5" desktop single platter products[596] in 2010.

655. Those results contradict WD's conclusions that entry would be profitable after the first year of production. Its submission results in rates of return before taxes on revenues of […]* in 3.5" Desktop after the first year of production.[597]

656. In any event, even when making abstraction of diverging assumptions on upfront investment costs, the Notifying Party's calculations do not convincingly demonstrate that Toshiba's entry would be likely. The rates of return before taxes on revenues

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592 Customers reply to the Commission's request for information of 22 June 2011, question 61.

593 Customers reply to the Commission's request for information of 22 June 2011, question 61.

594 Non-confidential minutes of telephone conference with Toshiba, 16 May 2011.

595 WD reply to the Statement of Objections, paragraph 197.

596 With SATA interface and a speed of 7200 rpm.

597 This applies also to the Notifying Party's scenario of entry into 3.5" markets based on Toshiba's existing 2.5" HDD production, in which case a rate of return before taxes on revenues amounts to […]*% (see reply to the Statement of Objections, paragraph 285).

represent a relatively small return on capital investments after the first year of production. Furthermore, those calculations are based on a number of optimistic assumptions. The overall timescale of [6 to 24]* months required for developing the product, building up capacity and ramping up production is not included in the profitability calculation. Consequently, on the basis of WD's assumptions, profitability would be only achieved after approximately two years[598] after the decision to enter. Moreover, it is unlikely that Toshiba would manage to immediately gain a rate of close to 100% capacity utilization and a 5% share of the 3.5" Desktop market as assumed.

657. Moreover, the Notifying Party's calculations assume that market prices increase permanently by 5%. While entry may be triggered by higher prices, the Horizontal Merger Guidelines provide that entry must be "sufficiently profitable taking into account the price effects of injecting additional output into the market and the potential responses of the incumbents."[599] However, the Notifying Party's calculations ignore that large-scale entry by Toshiba may lead to higher output in the market which would likely result in oversupply (given that 3.5" Desktop is projected to slowly decline until 2015). In addition, incumbents could also respond by temporarily lowering their prices in order to defeat any profitability of Toshiba's entry. The likely impact of entry on price levels would therefore decrease the profitability of Toshiba's entry even further. Assuming the absence of a 5% price increase and instead using WD's 2010 average sales prices of USD 42.47 would effectively result in a […]*% rate of return before taxes on revenues.[600] Similarly, the price effect of additional volume is also likely to lower the average selling price, resulting in even lower profitability.

658. Lastly, the proposed concentration is likely to result in business opportunities for Toshiba in other HDD markets, which have strong potential for growth. Provided that enough HDD manufacturers serve a particular HDD market, HDD customers are able to shift purchase shares from one supplier to another in order to "re-balance" purchase shares across suppliers. This "Conner effect" can be expected in a market such as 2.5" Mobile HDDs, in which HGST has a market share of [10-20]*% and the Merged Entity would have a market share of [40-50]*%. Seagate/Samsung has a market share of [30-40]*% and Toshiba currently has a market share of [10-20]*%. Therefore, Toshiba can expect to benefit from OEMs' re-allocation. In addition, the 2.5 Mobile HDD market – already the largest one – is expected to grow strongly by an average of [10-20]*% per year until 2015.[601] 2.5" CE is expected to grow by [10-20]*% per year. In contrast, the 3.5" Desktop market is mature and expected to slightly decline until 2015 by an average of [0-5]*% annually.[602] Toshiba is already present with a large product portfolio in 2.5" and can therefore be expected to give priority to investments in additional production capacity on such high growth markets where it has greater ability and incentives to grow. It would be unreasonable

598 Approximately [12-24]* months for development, qualification and ramping up, and one year of production.

599 Horizontal Merger Guidelines, paragraph 69.

600 Estimated total revenue for 3.5" Desktop: 9 759 908 units * USD 42.47 = USD 414 503 293 and initial year ROI of USD 5 890 524.

601 Trend Focus, Storage Interlinks, 17 February 2011, CQ4 '10 Quarterly Update & Long Term Forecast.

602 Trend Focus, Storage Interlinks, 17 February 2011, CQ4 '10 Quarterly Update & Long Term Forecast.

to rely on Toshiba to sufficiently constrain the Merged Entity in all the HDD markets affected by the proposed concentration.

659. Fifthly, with respect to the Notifying Party's argument that a significant proportion of upfront investment would not be sunk as 3.5" production lines could be converted to 3.5" Business Critical lines, it can be noted firstly that such conversion would require further investments, for instance into additional testers given that Business Critical drives require significantly longer testing time than 3.5" Desktop HDDs.[603] In any event, the required volumes for entering 3.5" Desktop at sufficient scale would be much higher than the capacity required for 3.5" Business Critical. For a [5-10]*5% market share in Desktop, the Notifying Party assumes that [0-50]* million drives would need to be produced. This volume alone corresponds to [50-60]*% of the total Business Critical market. Therefore, even if conversion into 3.5" Business Critical lines would not require much additional investment, most of this capacity would not be needed even under the optimistic assumption that Toshiba's share in 3.5" Business Critical would grow significantly from currently less than [0-5]*%.

660. With respect to a conversion of 3.5" Desktop lines into 2.5" lines, the Commission's market investigation showed that in principle a new entrant may be able to convert a 3.5" Desktop production line into a 2.5" HDD production line with additional investment, provided that the 3.5" Desktop production lines were designed with the option for conversion in mind at the outset.[604] As to the cost for conversion, the figures provided by the Notifying Party[605] amount to USD […]* million for a [5-10]*% market share of [0-10]* million units.

661. The Notifying Party's claim that sunk costs for investment into 3.5" Desktop would be limited due to relatively low costs for converting 3.5" lines into 2.5" lines should be dismissed. Firstly, the conversion cost submitted by the Notifying Party amount to more than 50% of the cost of a new 3.5" assembly line, as submitted by the Notifying Party.[606] Moreover, a HDD competitor with extensive experience in producing both 3.5" and 2.5" HDDs estimates its conversion costs at a very significantly higher amount for the same production volume.[607] Finally, and irrespective of the conversion cost, the actual costs for assembly lines with different form factors vary very significantly between form factors in the experience of at least one competitor.[608] Apart from technical differences with respect to the product design and manufacturing set up, the fact that a company entering one or several neighbouring markets displaying another form factor lacks experience in this/ these market(s) may be an important element to explain these cost differences. At least one

603 See also recitals 253 to 286.

604 HDD suppliers reply to the Commission's request for information of 16 September 2011, question 4.

605 USD [500 000-1 million] per production line of [0-10] million units per annum.

606 The Notifying Party estimates the cost of a 3.5" HDD assembly line at USD [1-2 million] for [0-10] million units per annum (Reply to the Statement of Objections, paragraph 172). The conversion cost is estimated at USD [500 000-1 million] per production line of [0-10]million units per annum.

607 HDD suppliers reply to the Commission's request for information of 7 September 2011, question 8. Another HDD competitor did not submit estimates for conversion as it not active in the 3.5" Desktop HDD market (HDD suppliers reply to the Commission's request for information of 16 September 2011, question 4).

608 HDD suppliers reply to the Commission's request for information of 7 September 2011, question 12, and HDD suppliers reply to the Commission's request for information of 23 September 2011, question 1.

HDD manufacturer indicated that the setting up of 3.5" production lines can be significantly more costly than the setting up of 2.5" production lines.[609] Therefore, regardless of the amount of conversion cost, in such scenario the total cost of a 2.5" HDD assembly line, for example a 2.5" Mobile HDD line (which has been converted from a 3.5" production line such as 3.5" Desktop) would be very significantly higher than the cost for directly setting up such 2.5" line. Therefore, a very significant part of the investment into a 3.5" Desktop assembly line would be sunk.

662. Sixthly, with respect to the Notifying Party's claim that Toshiba could outsource manufacturing to TDK/SAE as capacity to manufacture 3.5" HDDs may become available, the Commission has no indication that sufficient TDK/SAE 3.5" manufacturing capacity will become available in the relevant timeframe following the potential acquisition of Samsung by Seagate.

663. Seventhly, with respect to the claim that less scale of production would be needed by Toshiba, HDD production is likely to benefit from economies of scale due to high volume production. From the Notifying Party's arguments regarding prices of 2.5" HDDs at 5400 rpm v. those at 7200 rpm, it can be inferred that large volumes benefit from economies of scale and scope.[610] The lack of sufficient volume would therefore be likely to reduce the profitability of Toshiba's potential operations in 3.5" Desktop.

Timeliness of entry

664. For entry to be timely, it must be verified that entry would be sufficiently swift and sustained to deter or defeat the exercise of market power.[611] What constitutes an appropriate time period depends, amongst others, on the characteristics and dynamics of the market but is normally considered timely if it occurs within two years.[612]

665. The Commission's market investigation reveals that if Toshiba were to credibly enter the 3.5" Desktop market, it would need to offer 3.5" single platter Desktop drives given that the large majority of Desktop HDDs are single platter drives.[613] A single platter drive uses less key components, for instance just one disk and head, and is therefore cheaper. Currently, Toshiba does not produce any 3.5" single platter drive as its Business Critical enterprise drives are high-capacity drives with several platters. Therefore, Toshiba submits that it would have to change the entire design of its existing Business Critical HDDs.[614] According to Toshiba, the estimated time for developing, qualifying and preparation for volume production of a 3.5" single platter Desktop drive would be longer than one year, but within 2.5 years.

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609 HDD suppliers reply to the Commission's request for information of 7 September 2011, question 12, and HDD suppliers reply to the Commission's request for information of 23 September 2011, question 1.

610 Submission by the Notifying Party of 23 September 2011, p. 9.

611 Horizontal Merger Guidelines, paragraph 74.

612 Ibidem.

613 See also Toshiba's reply to questions for conference call on 16 September 2011, question 3a. According to the 2010 sales data submitted by WD and HGST to the Commission and revised by RBB Economics, […]*% of 3.5" Desktop HDD units were single-platter drives. Going forward, HDDs with a capacity at or below 1 TB are likely to be increasingly served by single-platter drives given that a 3.5" single platter with a capacity of 1 TB has been introduced recently.

614 Toshiba's reply to the Commission's request for information of 7 September 2011, question 11 and Toshiba's reply to questions for conference call on 16 September 2011, question 3b.

666. It is uncertain whether a period of that length can be considered as sufficiently swift for entering a market to credibly deter or defeat the exercise of market power by the Merged Entity given the specific characteristics of the industry. The Notifying Party itself points out that the industry is characterised by short product life cycles of one to two years in the case of HDDs for consumer and commercial PCs and notebooks.[615]

667. The Notifying Party infers from Toshiba's responses to the Commission's request for information of 14 June 2011 that the timeframe is well below the threshold indicated by the Horizontal Merger Guidelines. However, the information given by Toshiba in its Reply to the Commission's request for information of 14 June 2011 is based on the assumption that Toshiba transforms its existing multi-platter 3.5" Business Critical HDD into a multi-platter Desktop drive.[616] However, a 3.5" multi-platter Desktop drive would only cater to a relatively small segment of the 3.5" Desktop market and is therefore not conducive to constraining the Merged Entity.

668. For those reasons, it should be concluded that although entry could occur within two years, it is unlikely that entry would be sufficiently swift to credibly deter or defeat the exercise of market power by the Merged Entity, given in particular the short product life cycles.

Sufficiency of entry

669. For entry to be sufficient, entry must be of sufficient scope and magnitude to deter or defeat the anticompetitive effects of the merger. Small-scale entry, for instance into a market niche, is normally not considered sufficient.[617]

670. First, if Toshiba entered the 3.5" Desktop, it is uncertain whether it could sufficiently replicate the constraints that HGST exercised on those markets with a market share of [10-20]*%. The Notifying Party's submission on entry assumes a market share for Toshiba of merely 5%. On this basis alone, a significant increase in Toshiba's output and revenues would be required. Actual investments as well as the increase in output and in revenues would need to be substantially higher if Toshiba were to enter with a magnitude that fully replicates the constraints that HGST is currently exercising. Given Toshiba's potential to grow in other markets such as 2.5" Mobile and its greater ability and incentive to focus on these other opportunities (see for example recitals 649 and 658 above), it appears unreasonable to rely on Toshiba to sufficiently constrain the Merged Entity in all the HDD markets affected by the proposed concentration.

671. If Toshiba entered the market with a "dressed-down" version of its 3.5" Business Critical products with multi-platter drives with capacities of 1 TB and 2 TB, which would be comparatively easier and quicker than developing a new single platter Desktop 3.5" drive – Toshiba would merely compete in a small portion of the 3.5" Desktop market only. According to the Notifying Party, 25% of the 2010 market concern capacity points between 1 TB and 2 TB.[618] While the importance of this

615 Form CO, paragraph 288. See, for instance, also reply to the Statement of Objections, paragraph 18.
616 Toshiba's reply to questions for conference call on 16 September 2011, questions 3c and 3d.
617 Horizontal Merger Guidelines, paragraph 75.
618 WD reply to the Statement of Objections, paragraph 197.

market segment is likely to increase, HDDs with a capacity of 1 TB are likely to be increasingly served by single-platter instead of multi-platter drives going forward. This is because a 3.5" single platter with a capacity of 1 TB was announced recently[619] and is likely to be more cost-effective due to the use of less key components (such as read/ write heads). Therefore, Toshiba's potential entry with "dressed-down" versions of its current multi-platter 3.5" Business Critical HDDs would be considered small-scale entry and would not be sufficient.

672. For those reasons, it cannot be concluded that entry by Toshiba on the 3.5" Desktop market would be likely and sufficient. Furthermore, the Commission concludes that while it might occur within two years, it is unlikely whether such entry would be timely given the short product life cycles in the 3.5" Desktop market.

b. No other likely, timely and sufficient entry

673. In previous merger cases in the HDD industry, the Commission already found that entry by new competitors on any of the HDD markets was unlikely.[620] This was inter alia due to the high barriers to entry which appear to characterize the market, namely: the high capital expenditures required, economies of scale and the necessary intellectual property rights which are held by the current HDD suppliers. The Notifying Party has not contested these previous findings.

674. The Commission's market investigation in this case confirmed its past findings. Customers almost unanimously discarded the possibility of new entrants into the HDD market in light of the barriers to entry mentioned in the previous recital that new competitors would face.[621] There are no other indications that such entry would be likely, timely and sufficient. The Notifying Party's own internal documents estimate that the risk of new entry onto the HDD markets is "low".[622]

675. It should therefore be concluded that there would be no likelihood of timely and sufficient entry by a new HDD competitor to defeat the likely anti-competitive effects of the proposed merger.

5.4.3.3. Conclusion

676. The proposed concentration creates a duopoly in a market which is already highly concentrated. The proposed concentration results in the elimination of important competitive constraints that WD and HGST previously exerted upon each other together with a reduction of competitive pressure on the remaining competitor Seagate/Samsung. It also results in the elimination of one of three competitors and therefore effectively reduces customers' sources of supply to two. As a result, it negatively impacts their ability to secure competitive prices when multi-sourcing. The remaining competitor on the 3.5" Desktop market is unlikely to increase supply if prices increase. The proposed concentration would remove an important

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619 See HGST press release of 6 September 2011 "Hitachi GST ships one terabyte per platter hard drives", http://www.hitachigst.com/press-room/2011/hitachi-gst-ships-one-terabyte-per-platter-hard-drives (consulted 14 October 2011).

620 Case COMP/M. 5483-Toshiba/Fujitsu HDD Business, paragraph 34.

621 Customers reply to the Commission's request for information of 11 April 2011, question 86.

622 Form CO, Annex 5.4a.6 WD "Finance Team/Biz Update, Wolfgang Nickl, Senior Vice President & Chief Financial Officer", February 2011, slide 7.

competitive force on the 3.5" Desktop market. There is no countervailing buyer power that would ensure sufficient competitive pressure on the 3.5" Desktop market. Further timely and sufficient entry into the market, whether by Toshiba or others appears unlikely.

677. For those reasons, it should be concluded that the proposed concentration is likely to result in a significant impediment to effective competition in the worldwide 3.5" Desktop market.

678. The Commission considers moreover that even if the 3.5" Desktop and 3.5" CE were considered to form part of the same market *quod non*, the same reasoning laid out in the present Section would apply to this wider market.

5.4.4. The 3.5" CE Market

5.4.4.1. Introduction

679. *Market size.* As can be seen from Table 13 in recital 404, the value of the worldwide 3.5" CE market amounted to approximately EUR 1.4 billion in 2010. In 2010, this market accounted for approximately 5% of the value of overall worldwide HDD sales.

680. *Demand side*. The customers on the 3.5" CE market are generally OEMs. These include Motorola, Pace, Cisco, Medion, Echostar and Thomson Technicolor.

681. *Supply side.* The 3.5" CE market is highly concentrated, with three suppliers being present in the pre-merger situation: WD, HGST and Seagate/Samsung.

5.4.4.2. The impact of the proposed concentration

A. Merging parties have large market shares and creation of a duopoly

Table 19: Worldwide market shares 2006-2010 (in value)[623]

	2006	**2007**	**2008**	**2009**	**2010**
WD	[30-40]*%	[30-40]*%	[40-50]*%	[40-50]*%	[40-50]*%
HGST	[10-20]*%	[10-20]%	[10-20]%	[10-20]%	[10-20]%
COMBINED	***[40-50]%***	***[50-60]%***	***[50-60]%***	***[50-60]%***	***[50-60]%***
Seagate/Samsung	[50-60]%[624]	[40-50]%[625]	[40-50]%[626]	[40-50]%[627]	[40-50]%[628]

623 Source: Notifying Party's estimates.
624 Seagate: [40-50]*%; Samsung: [5-10]*%.
625 Seagate: [40-50]*%; Samsung: [5-10]*%.
626 Seagate: [30-40]*%; Samsung: [0-5]*%.
627 Seagate: [40-50]*%; Samsung: [0-5]*%.
628 Seagate: [40-50]*%; Samsung: [0-5]*%.

682. The larger the market share, the more likely a firm is to possess market power. Furthermore, the larger the addition of the market share, the more likely it is that a merger will lead to a significant increase in market power.[629]

683. WD is currently the second largest market player with a [40-50]*% market share. The combined WD/HGST entity would be the market leader holding a market share in excess of [50-60]*% ([50-60]*%). The market share increment brought about by the proposed concentration would be [10-20]*% and hence significant. The large market shares of the merging parties and the resulting addition of market share for WD provides a first indication of market power and the increase in market power post merger.[630]

684. Toshiba is absent from the 3.5" CE market. Therefore, post-merger, the Merged Entity will only face one remaining competitor, Seagate/Samsung, with a similar market share [40-50]*% (Seagate: [40-50]*%, Samsung: [0-5]*%).

685. In its Reply to the Statement of Objections, the Notifying Party claimed that in a dynamic, innovative industry such as the HDD industry, market shares and concentration levels are not a useful proxy for the increment in market power that the proposed concentration brings about.[631]

686. The findings in the Statement of Objections that the post-merger market shares and concentration levels give a first indication of the increment in market power should be preserved. As follows from the recitals that follow, the Commission has nonetheless tested these first indications in light of the structure of demand and the specific competitive conditions on the 3.5" CE market.

B. Customers have limited possibilities of switching supplier

687. A merger may affect customers' ability to protect themselves against price increases when these customers have difficulties switching to other suppliers because there are few alternative suppliers. Such customers are particularly vulnerable to price increases.[632]

a. The view of the Notifying Party

688. The Notifying Party asserts that it also expects OEMs on the 3.5" CE market to continue re-allocating purchase shares between HDD suppliers once the proposed concentration would be implemented. This would set in motion the "Conner-effect" accepted by the Commission in previous merger decisions concerning the HDD industry.

689. The Notifying Party's view is that the post-merger structure of demand on the 3.5" CE market would also be such that customers would not face significant difficulties in switching suppliers. In its view, customers on the 3.5" CE market could easily switch HDD supplier and could induce intensified competition between the remaining suppliers by allocating "highly asymmetric purchase shares" between

629 Horizontal Merger Guidelines, paragraph 27.
630 Horizontal Merger Guidelines, paragraph 27.
631 WD Reply to the statement of objections, paragraphs 558-559.
632 Horizontal Merger Guidelines paragraph 31.

them or by single-sourcing their HDD supplies. The quantitative elements adduced by the Notifying Party to support this claim are similar to those submitted in relation to the 3.5" Desktop market. The Notifying Party reiterated that on this basis, the removal of HGST as the third independent competitor would also not have any impact on competition on the 3.5" CE market.

690. The Notifying Party's assertion that the post-merger "Conner-effect" would mean that the proposed concentration would not significantly impede effective competition on any relevant HDD market, is also not convincing in relation to the 3.5" CE market. Also in relation to that market, the proposed concentration differs from the previous concentrations that have been assessed by the Commission. The Commission's assessment of the likely impact of the proposed concentration takes account of the specific competitive conditions on the 3.5" CE market.

691. The Notifying Party submits that in contrast to the situation on the 3.5" Desktop market, it would be common for customers on the 3.5" CE market to only qualify two HDD suppliers. Moreover, the share of HDD purchases that customers on the 3.5" CE market award to a single supplier would exceed 60% during numerous quarters.

b. The Commission's assessment

692. Even if the purchase share patterns on the 3.5" CE market were to be somewhat different from those on the 3.5" Desktop market, this does not alter the conclusion that the proposed concentration would significantly impede effective competition on the 3.5" CE market.[633]

693. The fact that some 3.5" CE customers were to have solicited bids from two HDD suppliers only, does not provide conclusive indications on the importance of multi-sourcing on this market. From early stages of the Commission's investigations onwards, most OEMs purchasing on this market indicated that a minimum of three suppliers is required for an effective multi-sourcing policy.[634] The critical driver behind OEMs' multi-sourcing strategy is security of supply.[635] This gives a first indication that even if some CE customers were to source from two suppliers only, they would consider the market presence of a third alternative supply source to be important.

694. That finding is confirmed by the fact that virtually all CE OEMs confirm that they use the market presence of alternative supply sources to obtain better prices from those HDD suppliers that are bidding.[636] WD itself effectively acknowledges this by

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633 The Notifying Party's analysis of the bidding data would have demonstrated that in CY 2010, all customers of 3.5" CE drives would have sourced from just one or two suppliers per product type. However, the Notifying Party recognised that the bidding data for the 3.5" CE market were substantially incomplete. The Commission therefore considers that it is not possible to draw meaningful references, positive or negative, from the bidding data for this market. The Commission therefore does not consider the bidding data further.

634 Four out of five 3.5" CE OEMs (Customers reply to the Commission's request for information of 22 June 2011, question 66).

635 Customers reply to the Commission's request for information of 20 April 2011, question 36.

636 Customers replies to the Commission request for information of 8 September 2011, question 11.

referring to an instance where […]*.[637] This provides an example of how CE customers use the presence of a HDD supplier "on the shelf" in order to obtain competitive prices from those suppliers that are bidding. This would apply equally in a situation where there is one bidder, as when there are two bidders. The mere existence of alternative competitors, combined with the possibility to take TAM off the table, is used by customers to secure better terms from bidders.

695. Most customers confirm that in the post-merger situation where only two supply sources remain, they would be reluctant to single-source their HDD supplies or award asymmetric purchase shares in a manner that approaches a single-sourcing situation.[638]

696. Under those circumstances, the proposed concentration is likely to significantly impede effective competition on the 3.5" CE market on the same basis as it would on the 3.5" Desktop market.

697. It is clear that in a three-supplier scenario where customers have multiple ways to spread their HDD purchases between three HDD suppliers, the potential purchase share differentials and hence the additional share that HDD competitors can compete for, can vary widely. In other words, the size of the contestable market can vary between a 0% purchase share (the OEM chooses two suppliers and the third supplier is put "on the shelf") and the maximum purchase share that OEMs wish to allocate to an individual HDD supplier. Hence, the suppliers that bid know that they are able to achieve any purchase share between 0% (in case only two HDD suppliers will continue to be used and the third one continues to be put "on the shelf") and the highest purchase share that most customers are willing to allocate to one single HDD supplier. This competition is more likely to drive bid prices down to the marginal cost of each HDD supplier.

698. In the post-merger two-supplier scenario, customers would be faced with only two HDD suppliers. The guaranteed purchase share of the second supplier is at least the minimum share that the OEM customers wish to allocate to one HDD supplier. Thus, the removal of the third HDD supplier gives the two remaining supply sources further certainty that they would obtain at least a minimum purchase with most OEM customers on the 3.5" CE market. In that scenario, bids by the two remaining suppliers are less likely to drive prices down to their marginal cost. As a result, the post-merger equilibrium where two suppliers are bidding is likely to be higher than the pre-merger equilibrium where three suppliers were bidding.

699. As already mentioned in recital 486, the Commission considers that the fact that the merger might not reduce the rate of innovation does not exclude a price effect if the number of suppliers is reduced from three to two. Reduction might induce a higher price path. The information submitted by the Notifying Party is therefore not dispositive of the absence of effect on price erosion stemming from a reduction of the number of competitors from three to two.

700. Virtually all OEMs on the 3.5" CE market have raised concerns that the post-merger presence of only two suppliers will negatively impact prices, security of supply and

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637 WD reply to the Statement of Objections, paragraph 572.

638 CE OEMs reply to the Commission's request for information of 8 September 2011, question 13.

product quality.[639] One OEM observed that *"generally the more suppliers there are in the market place, the more competitive each supplier has to be on pricing consequently this tends to drive prices downwards".*[640] Four out of four 3.5" CE OEMs do not expect that the presence of two suppliers would be sufficient to ensure a competitive outcome on the market.[641] This is in line with the likely significant impediment to effective competition that has been identified by the Commission for the 3.5" CE market. One OEM that purchases HDDs on the 3.5" Desktop and CE markets indicates that any negative developments in the 3.5" Desktop market regarding supply terms and prices will equally apply to the 3.5" CE market.[642]

701. In Section 5.4.3.2., reference was made to the Parties' internal documents and statements by their key executives that confirmed that in a two-supplier scenario, competition will be less intense than in a three-supplier scenario, which would be the post-merger situation on the 3.5" CE market. As demonstrated in that Section, HGST internal documents reflect that in a two-supplier scenario price competition is likely to be less intense than in a three supplier scenario, and that there are limitations for customers to move to highly asymmetric purchase allocations: […]*[643] Industry analysts, finally, also expect that in a market structure in which only two large HDD suppliers are active, there will be less intense competition to take market share and less competitive pressure.[644] This evidence also applies to the 3.5" CE market.

702. In order to further quantify the likely effects of the proposed concentration, the Commission has assessed the importance of the constraint that HGST has posed on the 3.5" CE market.

C. Merger eliminates a close competitor and an important competitive force

703. In the Statement of Objections, the Commission provisionally concluded that the proposed concentration would also remove a close competitor and an important competitive force on the 3.5" CE market.

704. In its Reply to the Statement of Objections, the Notifying Party argues that the evidence would not support the view that the Parties would be uniquely close competitors. In particular, the Notifying Party claims that the Commission has failed to take the product-level of the shares of the HDD competitors on the 3.5" CE market into account when assessing the importance of the competitive constraints posed by the different competitors. In that regard, the Notifying Party referred to the sales of the different competitors in CY10 Q4. During that quarter, […]% of HGST's 3.5" CE sales were of […]* GB […] rpm SATA interface product whereas WD's sales for this product category would account for […]% of WD's sales. This would show that HGST was not exercising a particularly important constraint on WD.

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639 Customers reply to the Commission's request for information of 22 June 2011, question 51.

640 Customers reply to the Commission's request for information of 22 June 2011, question 52.1.

641 Customers reply to the Commission's request for information of 22 June 2011, question 52.

642 Customers reply to the Commission's request for information of 22 June 2011, question 59.

643 [Deposition of HGST executive to the FTC]*

644 Caris and Co., 25 February 2010: "With STX and WDC now pretty well equal in size/scale, degree of vertical integration and cost structure, (it is) much less likely (vs. some historical incidents) that one vendor feels any ability to leverage their size/scale/pricing to try to take share/pressure another." The same report lists HGST, which would be removed as a result of the proposed concentration, as the important third, but smaller competitor on the HDD markets.

705. It is not denied thqt Seagate is an important competitor on the 3.5" CE market. Nonetheless, the evidence cited in the recitals that follow shows that WD and HGST belong to the same tier one group of HDD suppliers, and that HGST is therefore a close competitor to WD and generally an important competitive force on the 3.5" CE market.

706. As described in Section 5.4.2.2.D., the competitive strengths of WD and HGST overlap on a number of important parameters of competition, such as product portfolio and supply flexibility. WD and other competitors generally view HGST as a strong and committed Tier 1 HDD competitor, which is in line with HGST's own classification of itself as one of the top three HDD competitors. HGST's recent decision to internalise its production of 3.5" HDDs shows its commitment to the 3.5" HDD markets. Before its concentration with Seagate, competitors generally viewed Samsung to be a far more remote competitor to WD, Seagate and HGST. These considerations also apply to the 3.5" CE market.

707. The Notifying Party's submissions on the mix in the 3.5" CE products that WD, HGST and their competitors sell does not alter that conclusion. A more detailed assessment of each of the HDD competitors' product portfolio on the 3.5" CE market shows that although WD has more limited sales of 3.5" 500 GB 7200 rpm SATA HDDs where HGST has a strong presence, the second largest sales category of HGST does overlap with the first sales category of WD (3.5" 320 GB 7200 rpm SATA HDDs). Before its proposed concentration, Samsung does not sell any HDD products with a storage capacity above 160 GB, whereas Seagate's sales on the 3.5" CE market were concentrated at capacity points that are higher than 500 GB. HGST's and WD's product portfolio therefore do overlap to a significant extent. This evidence still shows that HGST is a close competitor to WD, and generally an important competitive force on the 3.5" CE market.

708. Finally, HGST is also an important, but smaller competitor to WD and Seagate on the 3.5" CE market. As mentioned in recital 569, the HDD industry is a fixed-cost recovery industry. Suppliers in such industries usually seek to recoup their fixed cost on the basis of their returns on their sales base. Large HDD competitors such as WD and Seagate already recoup a significant part of their fixed cost from a large revenue base. This contrasts with HGST, which is the smaller competitor and has incentives to grow its scale and market share. By contrast, WD and Seagate are more likely to favour a more moderate growth of their market share, and would have a stronger incentive to increase prices on their large sales base. Documents and statements of WD and HGST confirm that the different incentives of large HDD competitors and smaller HDD competitors also exist in the HDD industry.[645]

709. In its Reply to the Statement of Objections, the Notifying Party argues that the Commission does not provide any evidence that supports HGST's alleged growth strategy. This finding would, moreover, be contradicted by the evolution of HGST's shares of sales since 2009, which would have been rather stable.

710. This argument canoot be accepted. The Commission refers to recitals 573 to 588, where it provided numerous extracts of HGST's internal documents that reflected its

645 See Section 5.4.3.2.C.

overall growth strategy. This growth strategy applied to all HDD markets, and thus included the 3.5" CE market.

711. Moreover, HGST internal documents referred to in the Statement of Objections indicated that periodically, HGST has been competing aggressively on pricing in order to secure business from 3.5" CE customers at the expense of Seagate.[646] That documentation shows that HGST also has been a close competitor and important competitive force on the 3.5" CE market. This competitive pressure exerted by HGST would be removed by the proposed concentration.

712. The Commission's in-depth investigation also confirms that the proposed concentration would remove an important constraint in terms of product quality.

713. As acknowledged in HGST internal documents, HGST considers itself to be a quality leader: "*When we're looking at the feedback from our customers and our quarterly business reviews, which provide ranking, quality rankings of the suppliers, we end up in the number 1 or number 2 position for – from most of our customers…it is clear that we're ranked high, and I believe we would call ourselves to be the quality lead*er."[647] HGST believes that *"its dedication and focus on quality…provides HGST with a strategic advantage over competitors. HGST enforces strict quality standards … critical to the Company's ability to qualify products quickly and achieve a significant share of business from its customers*"[648] WD internal documents also acknowledge that an increasing number of customers have consistently ranked HGST as a top supplier in their quarterly business reviews.[649]

714. In that regard, an important CE OEM confirmed that HGST's quality exceeds that of its competitors[650] and is concerned that *"with increased demands to meet demand requirements a supplier could begin to cut corners and quality of the product will suffer*."[651]

715. The Commission therefore based its assessment of the competitive strength of HGST on the 3.5" CE market on a combination of evidence on its general strength on 3.5" HDD markets and evidence that relates to the 3.5" CE market in particular. Therefore, the conclusion that the proposed concentration would remove a close competitor and an important competitive force on the 3.5" CE market should be confirmed.

Impact on customers

716. The views that 3.5" CE customers expressed during the Commission's market investigation showed that the proposed concentration would remove an important competitor from the market, and would have a negative price effect.

646 HGST email of 19 May 2011.
647 [Deposition of HGST executive to the FTC]*
648 [Reference to WD internal documents]*.
649 [Reference to WD internal documents]*.
650 Customers reply to the Commission's request for information of 22 June 2011, questions 48.1 and 51.1.
651 Customers reply to the Commission's request for information of 22 June 2011, questions 51.1.

717. A large majority of 3.5" CE HDD customers replying to the Commission's market investigation have raised concerns on the impact of the proposed concentration on the 3.5" CE market.[652]

718. An important customer of 3.5" CE HDDs expressed its concern the proposed concentration will lead to a reduction in the level of price erosion observed to date on the market.[653] The same OEM observes that HDD suppliers are "*becoming quite adept at managing the market and creating an environment for constrained supply and firming pricing. With less players this ability will be increased and make it easier to manipulate supply and demand*".[654] This customer believes that the impact of the proposed concentration could be *"of considerable commercial significance."*[655]

719. Similarly, another important customer of 3.5" CE HDDs is also concerned that the proposed concentration could impact its price negotiations with the remaining suppliers: *"with fewer customers and both companies having a similar view on holding inventory and making decisions to reduce production to ensure they do not have excess inventory available and in some instances making sure supply is below demand."*[656]

720. Finally, an OEM that purchases products on both the 3.5" Desktop and 3.5" CE markets confirmed that any negative developments in the 3.5" Desktop market regarding supply terms and prices will equally apply to the 3.5" CE market.[657]

D. No countervailing buyer power

721. Competitive pressure on a supplier is not only exercised by competitors but can also come from its customers. Even firms with very high market shares may not be in a position, post-merger, to significantly impede effective competition if customers possess countervailing buyer power.[658]

722. Even if OEMs were to be considered as able to exercise buyer power pre-merger, in order for countervailing buyer power to be found to sufficiently off-set potential adverse effects of the proposed concentation, it must also exist and remain effective following it.[659]

723. In the Statement of Objections, the Commission provisionally concluded that the proposed concentration would eliminate a credible alternative supplier for customers and reduces the sources of supply to two. Thus, the Commission provisionally concluded that the bargaining strength of OEMs would be negatively impacted by the proposed concentration and customers would not possess sufficient countervailing power to counter the increase in market power brought about by the proposed concentration.

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652 Four out of six 3.5" CE OEMs (Customers reply to the Commission's request for information of 22 June 2011, question 51 and 51.1).

653 Customers reply to the Commission's request for information of 22 June 2011, questions 51.1 and 65.

654 Customers reply to the Commission's request for information of 22 June 2011, questions 54.1 and 65.1.

655 Customers reply to the Commission's request for information of 22 June 2011, question 52.1.

656 Customers reply to the Commission's request for information of 22 June 2011, question 65.2.

657 Customers reply to the Commission's request for information of 22 June 2011, question 59.

658 Horizontal Merger Guidelines, paragraph 64.

659 Horizontal Merger Guidelines, paragraph 67.

724. In its reply to the Statement of Objections, the Notifying Party argued that the Commission did not base its conclusions on specific evidence for the 3.5" CE HDD market. The Notifying Party claims that CE HDD segment is characterised by the presence of very powerful and sophisticated global customers which enjoy significant countervailing buyer power and can make use of different procurement strategies, and that no significant impediment to effective competition could be expected on the 3.5" CE market.

725. That claim cannot be accepted. Throughout the Commission′s market investigation, all of the 3.5" CE OEMs that responded to requests for information (four out of four) confirmed that they believed that the proposed concentration would have a negative effect on prices and output. This confirms that these customers do not believe that they would have sufficient post-merger buyer power to countervail any price effect arising from the proposed concentration.

726. It follows from the responses of CE OEMs to the Commission's requests for information that the possible counterstrategies that in the view of the Notifying Party would allow buyers to countervail any price increase are far less prevalent than the Notifying Party has suggested.[660] Moreover, all of the respondent CE OEMs confirmed that the proposed concentration would negatively affect their ability to obtain lower prices on the basis of such strategies. According to one major CE OEM, "*Since there is no threat of replacement, one or both suppliers may decide not to provide best in class pricing due to the fact that they know most customers will not want to be sole sourced especially during grow periods. If one supplier chooses not to provide best in class pricing and other supplier does, the one who does will know it did not have to be as aggressive since they will see their award share increase.*"[661]

727. The Commission′s assessment is thus based on the sourcing strategies that exist on the 3.5" CE market, and the views that were expressed by customers purchasing on this market. For those reasons, the provisional conclusion in the Statement of Objections that there would be no sufficient post-merger countervailing buyer power since customers are not in a position to counteract the likely anti-competitive effects of the proposed concentration must be confirmed.

E. Entry by Toshiba or by others is unlikely

728. When entering a market is sufficiently easy, a merger is unlikely to pose any significant anti-competitive risk. For entry to be considered as a sufficient competitive constraint, it must be shown to be likely, timely and sufficient to deter or defeat any potential anti-competitive effects of the merger.[662]

729. The Commission's market investigation reveals that entry by Toshiba into the 3.5" CE market is unlikely. Although Toshiba has recently entered the 3.5" Business Critical market, internal Toshiba documents submitted to the Commission are silent on a possible entry by Toshiba into the 3.5" CE market. Also, the Commission's market investigation would not support an expectation by customers of Toshiba's

660 Customers reply to the Commission's request for information of 8 September 2011, question 14.
661 Ibidem.
662 Horizontal Merger Guidelines, paragraph 68

entry into the 3.5" CE market. One customer has explicitly indicated that it is unlikely that Toshiba would enter the 3.5" CE market.[663]

730. In its Reply to the Statement of Objections, the Notifying Party claims that the Commission has not specifically investigated the issue of Toshiba's entry into the 3.5" CE market. Moreover, the Notifying Party argues that given that Business Critical, Desktop and CE HDDs use the same interface, heads and media and that differences in firmware are minor from a development point of view, Toshiba could easily enter the 3.5" CE market. The Notifying Party makes a number of arguments that are specific to the 3.5" CE market.

731. First of all, the Notifying Party claims that Toshiba has the requisite know-how since Fujitsu had already developed a 3.5" CE HDD prior to its acquisition by Toshiba.

732. Secondly, the Notifying Party considers that the investments required to include additional features characterising CE HDDs would not be significant since Toshiba has the capability due to its expertise in 2.5" CE and 3.5" Business Critical drives. With regard to the latter, the Notifying Party estimates that a number of design changes would be required to (cost-)optimize the (more sophisticated) 3.5" Business Critical Enterprise HDD for (less sophisticated) CE applications.[664] The one-off cost for the design change would amount to USD [10-25]* million for 3.5" CE.[665] Based on the assumption of a 5% price increase for at least one year and of a market share of 10%, the estimated profits after the first year of production would be USD [0-10]* million for entry into the 3.5" CE market.[666] The Notifying Party also submits similar calculations for an entry scenario into the 3.5" markets based on Toshiba's existing 2.5" HDD production.[667]

733. Thirdly, in its Reply to the Statement of Objections, the Notifying Party argues that Toshiba's entry would be timely as it could be realised in less than one year. Specifically, it submits that [0-12]* months[668] would be required to optimize the product features of the existing 3.5" Business Critical drive for CE applications. In parallel, new capacity could be ordered and installed, which would take [0-6]* months. At the end of that period of [0-12]* months, it would be possible to start production and ship into the distribution channel (which would not require qualification). Qualification with OEMs would take an additional [0-6]* months, which means that production for OEMs could start after a total of [6-2]* months. Finally, ramping up to achieve scale and quality may take another [0-12]* months although shipments into the distribution channel starting earlier may reduce this time. Therefore, the overall time required to enter the 3.5" CE markets would be [6-24]* months on the basis of the existing design of Toshiba's 3.5" Business Critical drive.

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663 Customers reply to the Commission's request for information of 22 June 2011, question 61.

664 According to the Notifying Party, these changes could include […]*.

665 The difference of USD [0-10]* million in comparison to "dressing down" to a 3.5" Desktop HDD is due to the programming of CE specific firmware, which could be achieved within [0-6]* months with a team of 2-4 R&D engineers (see reply to the Statement of Objections, paragraph 168).

666 WD reply to the Statement of Objections, paragraph 180.

667 WD reply to the Statement of Objections, paragraph 285.

668 […]*.

734. The Commission's market investigation reveals, first, that Toshiba does not have any design technology that will create a competitive 3.5" CE HDD.[669]

735. Secondly, the Commission asked Toshiba to submit its estimates for investments to enter, on the basis of WD's scenarios (investments to serve 10% of the 3.5" CE market). Toshiba did not submit estimates, but indicated that considerations would be similar to calculations for 3.5" Desktop HDD market. These considerations contradict the Notifying Party's conclusions that entry would be profitable after the first year of production.[670]

736. Moreover, the Notifying Party's calculations assume that market prices increase permanently by 5%. While entry may be triggered by higher prices, the Horizontal Merger Guidelines provide that entry must be "sufficiently profitable taking into account the price effects of injecting additional output into the market and the potential responses of the incumbents."[671] However, the Notifying Party's calculations ignore that large-scale entry by Toshiba may lead to higher output in the market which would be likely to result in oversupply (given that 3.5" CE sales are projected to slowly decline by an average of 0.6% annually until 2015). In addition, incumbents could also respond by temporarily lowering their prices in order to defeat any profitability of Toshiba's entry. The likely impact of entry on price levels would therefore decrease the profitability of Toshiba's entry even further. Assuming the absence of a 5% price increase and instead using Western Digital's 2010 average sales prices of USD 42.47 would effectively result in a negative -4% rate of return before taxes on revenues for the 3.5" CE market after the first year of production.[672] Similarly, the price effect of additional volume is also likely to lower the average selling price, resulting in even lower profitability.

737. Furthermore, if Toshiba were to credibly enter the 3.5" CE market, it would need to offer 3.5" single platter CE drives given that the large majority of 3.5" CE HDDs are single platter drives.[673] With "dressed down" versions of its multi-platter Business Critical drive, Toshiba would merely compete in a small portion of the 3.5" CE market. As acknowledged by the Notifying Party, only 9% of the 2010 market concerned capacity points of 1 TB and beyond, in 2010.[674] Given that a single platter drive uses less key components, for instance media and heads, it is generally cheaper. Currently, Toshiba does not produce any 3.5" single platter drive as its Business Critical enterprise drives are high-capacity drives with several platters. Therefore, it would have to change the entire design architecture of its existing Business Critical HDDs.[675]

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669 Toshiba reply to questions for conference call on 16 September 2011, question 7a.

670 The Notifying Party's submission results in rates of return before taxes on revenues of […]*% in 3.5" CE after the first year of production.

671 Horizontal Merger Guidelines, paragraph 69.

672 Estimated total revenue for 3.5" CE: […]* and initial year ROI of USD […]*.

673 See also Toshiba's reply to questions for conference call on 16 September 2011, question 3a. According to the 2010 sales data submitted by WD and HGST to the Commission and revised by RBB Economics, […]*% of 3.5" CE HDD units were single-platter drives. Going forward, HDDs with a capacity at or below 1 TB are likely to be increasingly served by single-platter drives given that a 3.5" single platter with a capacity of 1 TB has been introduced recently.

674 WD reply to the Statement of Objections, paragraph 244.

675 Toshiba reply to the Commission's request for information of 7 September 2011, question 11 and Toshiba reply to questions for conference call on 16 September 2011, question 3b.

738. For those reasons, it cannot be concluded that entry by Toshiba on the 3.5" CE markets would be likely timely and sufficient to deter or defeat any potential anti-competitive effects of the proposed concentration.

739. Thirdly, in analogy to the analysis for the 3.5" Desktop market, the Commission concludes that while entry likely on the 3.5″ CE market could occur within the two years normally foreseen by the Horizontal Merger Guidelines, it is uncertain that such entry would be sufficiently swift to credibly deter or defeat the exercise of market power by the Merged Entity.

740. As regards new entrants into the HDD market, the Commission's market investigation has also almost unanimously discarded this possibility. The HDD industry is characterised by high barriers to entry, including high capital expenditures and economies of scale required, as well as necessary IP rights which are held by the current HDD suppliers.[676] Furthermore, SSDs cannot be considered as exercising a significant competitive constraint within the relevant time frame for the competitive assessment. Timely and sufficient entry into the 3.5" CE market therefore appears unlikely.

741. It should therefore be concluded that there would be no likelihood of timely and sufficient entry by a new HDD competitor to defeat the likely anti-competitive effects of the proposed merger.

5.4.4.3. Conclusion

742. The proposed concentration creates a duopoly in a market which is already highly concentrated. The proposed concentration results in the elimination of important competitive constraints that WD and HGST previously exerted upon each other together with a reduction of competitive pressure on the remaining competitor Seagate/Samsung. It also results in the elimination of one of three competitors and therefore effectively reduces customers' sources of supply to two. As a result, it negatively impacts their ability to secure competitive prices when multi-sourcing. There is no countervailing buyer power after the proposed concentration. Further timely and sufficient entry into the market, whether by Toshiba or others is unlikely.

743. Accordingly, it should be concluded that the proposed concentration is likely to result in a significant impediment to effective competition in the worldwide 3.5" CE market.

744. Even if the 3.5" Desktop and 3.5" CE were considered to form part of the same market *quod non*, the same reasoning laid out in the present Section would apply to this wider market.

5.4.5. The 3.5" Business Critical Enterprise Market

5.4.5.1. Introduction

745. *Market size.* According to the Notifying Party, the value of the worldwide 3.5" Business Critical market amounted to EUR 1 billion in 2010. On the basis of the

676 Customers reply to the Commission's request for information of 20 April 2011, question 86.

market size estimates provided by the Notifying Party, this market accounted for approximately 4% of the value of a worldwide overall HDD market.

746. *Demand side*. The customers on the 3.5" Business Critical market are generally OEMs. Customers include HP, Dell, Lenovo, Asustek, Acer, EMC, Fujitsu, IBM, NetApp, Cisco and Xyratex. End customers for Business Critical HDDs include Google and Facebook, who use these HDDs in their large storage or server farms.

747. *Supply side*. Like the other HDD markets, the 3.5" Business Critical market is highly concentrated, having only four suppliers: WD, HGST, Seagate/Samsung and, recently, Toshiba.

5.4.5.2. The impact of the proposed concentration

A. The proposed concentration results in the creation of a market leader in a highly concentrated market

Table 20: Worldwide market shares 2008-2010 (in value)[677]

	2008	**2009**	**2010**
WD	[10-20]*%	[20-30]*%	[30-40]*%
HGST	[20-30]*%	[20-30]*%	[20-30]*%
COMBINED	***[40-50]*%***	***[50-60]*%***	***[50-60]*%***
Seagate/Samsung	[50-60]*%[678]	[40-50]*%[679]	[40-50]*%[680]
Toshiba[681]	-	-	-

748. The larger the market share, the more likely a firm is to possess market power. Furthermore, the larger the addition of the market share, the more likely it is that a merger will lead to a significant increase in market power.[682]

749. WD is currently the second largest market player with a [30-40]*% market share. From 2008 to 2010, it nearly doubled its market share and gained [10-20]*percentage points. HGST is the third largest market player. The combined WD/HGST entity would be the market leader holding a market share in excess of [50-60]*% ([50-60]*%), with a significant increment of [20-30]*%. The large market shares of the merging parties and the resulting addition of market share for WD provides a first indication of market power and the increase in market power after the merger.[683]

677 Source: Notifying Party's estimates.
678 Seagate: [50-60]*%; Samsung: [0-5]*%
679 Seagate: [40-50]*%; Samsung: [0-5]*%
680 Seagate: [40-50]*%; Samsung: [0-5]*%
681 Toshiba announced a new line up of 3.5" Business Critical Enterprise HDD offering in December 2010 and currently has a negligible share of the market.
682 Horizontal Merger Guidelines paragraph 27.
683 Horizontal Merger Guidelines, paragraph 27.

750. The Merged Entity will have an appreciably larger market share than its next competitor, Seagate, which currently holds a [40-50]*% market share. Seagate has lost market share (approximately [10-20]* percentage points) over the period 2008 to 2010. Toshiba has only recently announced its 3.5" Business Critical Enterprise HDDs product offering and currently has a negligible share of the market.

B. Merging firms are close competitors

751. In its Reply to the Statement of Objections, the Notifying Party claimed that transactional data would not support the Commission's finding that the Parties' product portfolios overlap. On the contrary, according to the Notifying Party the transaction data relating to the fourth quarter of 2010 show that all HGST's 3.5" Business Critical HDDs sales were at just two capacity points while WD had a portfolio much more similar to Seagate's portfolio. Furthermore, according to the Notifying Party, competition for the largest OEMs would mainly be between Seagate and WD or Seagate and HGST but not between the Parties themselves.

752. It is not denied that Seagate may be an important competitor on the 3.5" Business Critical market. Nonetheless, WD and HGST belong to the same tier one group of HDD suppliers, and that HGST is therefore a close competitor to WD and generally an important competitive force on the 3.5" Business Critical market.

753. While it is true that WD has a wider product portfolio than HGST -as HGST is present only at two capacity points, namely, 1TB and 2TB- these two capacity points are the most important ones for WD. Based on the transactional data, in the fourth quarter of 2010 WD's 1TB and 2TB sales as a proportion of its total 3.5" Business Critical sales amounted to […]*% and […]*%, respectively. The corresponding figures for HGST are […]*% and […]*. Hence, HGST's and WD's product portfolio overlap to a significant extent. In addition, Samsung was not present at capacity points above 1TB, whereas Seagate's sales on the 3.5" Business Critical market were concentrated at the same two capacity points as WD's and HGST's (1TB and 2TB). As a consequence, these elements show that HGST is a close competitor to WD, and generally an important competitive force on the 3.5" Business Critical market.

754. The Commission's market investigation confirms that HGST's competitive strengths have turned it into a close competitor to WD.

755. The competitive strengths of WD and HGST overlap on a number of important parameters of competition, such as product portfolio and supply flexibility.

756. Like WD, HGST is considered as one of the three tier-one competitors on the HDD market.[684] HGST has been "*successfully competing […]**[685] HGST has pursued a

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[684] WD internal documents; and Citi "Hard Disk Drives: Near Cycle Recovery; Initiating with Buys on STX and WDC", December 2010, p. 40*: "The top 3 players (Western Digital, Seagate, Hitachi) all have vertically integrated manufacturing, and essentially control the market with a combined 79% market share. Meanwhile, Toshiba and Samsung are considered relatively marginal players, whose commitment to the HDD business continues to be questioned given their heavy dependence on merchant vendors for critical components. Both Toshiba and Samsung have struggled to move beyond 10-11% market share during the past 5 years. (…) According to Trend Focus, Hitachi is currently the third largest player with 18%market share. The company has market shares of roughly 20% in notebooks, Enterprise and Consumer Electronics, but is relatively weak in Desktop with 12% share (…) Much has*

similar business model to WD's. Like WD, one of HGST's strengths lies in its wide product portfolio.[686] Furthermore, HGST pursues a vertically integrated manufacturing strategy based on the ownership of critical component technologies such as read/write heads and recording media. HGST's degree of vertical integration upstream allows it to maintain control over its product roadmap and component cost, quality and availability.[687]

757. The availability of production capacity is an important factor enabling HDD competitors to be a reliable and flexible supply source for customers on the market. The capacity and output figures in Section 5.4.2.2.C. indicate that HGST is a close competitor to WD. HGST, like WD has been increasing production capacity for 3.5" HDDs in the relevant time period.[688] Seagate's capacity and output, on the other hand, has been more stable. The same was true for Samsung. Samsung's capacity expansion was mainly focused on 2.5" HDDs rather than 3.5" HDDs.

758. Furthermore, the Commission's market investigation has not shown that HGST is a remote competitor to WD in such a way as to undermine the extent of the competitive constraint which is suggested by HGST's market share.

C. Customers have limited possibilities of switching supplier

759. In its Reply to the Statement of Objections, the Notifying Party claims that data made available in the data-room would confirm that large OEMs have for long periods of time sourced from two or even one supplier. Moreover, according to the Notifying Party, at product level (that is to say a unique combination of GB capacity, form factor, rpm and end-use), customers would have sourced from only one supplier in 2010.

760. Furthermore, the Notifying Party questions the reasons why the Commission dismisses Toshiba's own projections regarding its forecasted growth in the Business Critical market in the next three years. In this regard, the Notifying Party points out that Toshiba was the second qualified SAS supplier (the new leading interface) and this can help its growth as the SAS interfaces expand.

761. Lastly, the Notifying Party argues that 70% of the respondents to the Commission's market investigation would not exclude relying on Toshiba's Business Critical offerings. In addition, according to the Notifying Party, while Business Critical HDDs are more customised products than other HDDs, customers' ability to switch would not be affected as illustrated by Dell and NetApp's recent qualifications of a third supplier of Business Critical HDDs.

762. The Commission's market investigation indicates that the removal of HGST as an important supply source on the 3.5" Business Critical market is likely to have a

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improved during the past 2-3 years, with the company finally becoming consistently profitable in 2008 and making significant external management hires."

685 [HGST internal document]*.

686 WD "Project Gemini, Due Diligence Team Kick-Off", 18 February 2011, slide 8.

687 WD "Confidential Information Memorandum for Private Lenders Only - USD 2,500,000,000 Senior Credit Facilities", March 2011, p. 33.

688 See recital 453.

detrimental effect on the ability of customers on that market to secure competitive prices when multi-sourcing their supplies.

763. A merger may affect customers' ability to protect themselves against price increases when these customers have difficulties switching to other suppliers because there are few alternative suppliers. Such customers are particularly vulnerable to price increases.[689]

764. The Commission′s first phase market investigation indicated that OEMs engage in multi-sourcing strategies in order to ensure security of supply, ensure the ability to effective negotiate on price and ensure the ability to obtain products of the desired quality.[690] The Commission's first-phase investigation also indicated that a minimum of three suppliers is required in order for OEMs to continue to engage in an effective multi-sourcing policy.[691]

765. Consistent with those findings, the additional market investigation carried out by the Commission also confirmed that the vast majority of the OEMs consulted (seven out of ten respondents on this point) generally enters into negotiations with at least three suppliers for their purchases of 3.5" Business Critical HDDs, although several of them award their purchases' shares to only two suppliers.[692] This therefore shows, that also within the Business Critical market suppliers use the market presence of the third or fourth HDDs supplier (its presence "on the shelf") as leverage to obtain competitive prices from the two suppliers that are selected.

766. Therefore, contrary to the Notifying Party's view, the mere fact that some customers use only two sources of supply for certain products, does not undermine the great importance associated to the number of available suppliers on the market for negotiations purposes as this can impact OEMs' ability to secure sufficient volumes of supply at competitive prices. In support of this contention, one large OEM reported that "*WD* […] *has been known to heavily leverage a known single sourced position to an unfair price*".[693]

767. Besides the merged WD/HGST entity and Seagate (which the merger with Samsung only bringing a minimal increment in market share of [0-5]*%) the only remaining market player in the 3.5" Business Critical Enterprise market after the merger would be Toshiba.

768. The Commission′s in-depth investigation therefore examined the extent to which Toshiba (as the third remaining player) may be considered as a viable alternative third supplier in the absence of HGST.

769. The Commission's in-depth investigation examined how Toshiba's 3.5" Business Critical Enterprise HDDs compare in terms of characteristics, innovative qualities and capabilities in relation to 3.5" Business Critical HDDs offered by the other HDD

689 Horizontal Merger Guidelines, paragraph 31.

690 Customers reply to the Commission's request for information of 20 April 2011, question 36.

691 Customers reply to the Commission's request for information of 20 April 2011, questions 66. 6 respondents out of 9 Business Critical OEMs replied that 3 suppliers are the minimum necessary to continue an effective multisourcing strategy.

692 Customers reply to the Commission's request for information of 8 September 2011, question 3.

693 Customers reply to the Commission's request for information of 8 September 2011, question 5.

suppliers. The Commission's market investigation also examined whether Toshiba is perceived by OEMs as currently exercising an important competitive constraint in relation to the 3.5" Business Critical Enterprise HDDs and whether OEMs expect Toshiba to develop a sufficiently constraining influence on the Merged Entity post-merger in the 3.5" Business Critical Enterprise market.

770. The Commission investigation indicated that OEMs do not perceive Toshiba as currently exercising a sufficiently constraining influence in the 3.5" Business Critical market.[694] The Commission's market investigation indicated that to date only three out of the eleven Business Critical OEMs have qualified Toshiba's products.[695] One OEM replying to the Commission's market investigation noted that it was not even aware that Toshiba had launched 3.5" Business Critical products.[696] Another important OEM indicated that it is not aware that Toshiba has been shipping 3.5" Business Critical Enterprise HDDs to major OEMs yet.[697] Another customer observed that Toshiba is not shipping in substantial volumes yet.[698] OEMs generally appear unable to compare Toshiba's 3.5" Business Critical Enterprise HDD offering with that of its competitors as they have not yet completed the evaluation process and/or used or qualified the products.[699]

771. As regards a more dynamic assessment of Toshiba's role in the competitive interplay between market players within the next three years, the Commission's market investigation indicated that only two out of the eight OEMs which have not qualified yet Toshiba's HDDs have developed plans to do so. In particular, one OEM indicated that it plans to qualify the 4 TB product generation (which is not yet in production), although it does not believe that such product will be as competitive as that of the other suppliers, since Toshiba's product offering is considered late to market.[700] Another one customer confirmed that irrespective of its plans to qualify Toshiba, it considers Toshiba's current roadmap limited and late to the market in comparison to that of its competitors.[701] Additionally, one OEM which has already qualified Toshiba's products expressed its intention to qualify Toshiba's next generation Business Critical HDDs early next year.[702] Another two OEMs have indicated that any possible qualification will depend on future demand in the market.[703]

772. Furthermore, while five OEMs (out of the eleven consulted) expect Toshiba's Business Critical products to grow into a competitive force in the next three years, two do not expect Toshiba to exert an important competitive constraint in the future

694 Customers reply to the Commission's request for information of 8 September 2011, question 2.4. Among the 11 customers interviewed, only 3 consider Toshiba's products already able to exert a competitive constraint over the other players, 3 took a neutral position and 5 clarly expressed that they do not see Toshiba as a competitive supplier of Business Critical HDDs yet.

695 Customers reply to the Commission's request for information of 8 September 2011, question 2.

696 Customers reply to the Commission's request for information of 22 June 2011, question 62.

697 Customers reply to the Commission's request for information of 22 June 2011, question 62.3.

698 Customers reply to the Commission's request for information of 22 June 2011, question 62.3.

699 Customers reply to the Commission's request for information of 22 June 2011, questions 62 and 62.1.

700 Customers reply to the Commission's request for information of 8 September 2011, question 2.2.

701 Customers reply to the Commission's request for information of 8 September 2011, question 2.2.

702 Customers reply to the Commission's request for information of 8 September 2011, question 2.2.

703 Customers reply to the Commission's request for information of 8 September 2011, question 2.2.

and four are neutral or uncertain on Toshiba's ability to effectively compete with the other market players.[704]

773. Among those five customers that consider that Toshiba's Business Critical HDDs will grow into a sufficient competitive constraint over its competitors' products, only one however, indicated that Toshiba's current product offering is already a viable alternative to that of the other suppliers.[705] Another OEM reported on the one hand, that Toshiba's current product offering is competitive on cost and able to support a significant production volume and on the other hand, that Toshiba should offer 3 TB Business Critical HDDs to have a fully competitive portfolio. Another OEM submitted that it is conceivable that Toshiba will be able to gain a solid customers' base within the next two years although its Business Critical products have been late to market so far.[706] A further OEM, which however has not qualified Toshiba' products yet, explained that Toshiba's will have the chance to grow into an effective competitive force within the Business Critical HDDs market depending on its ability to execute its roadmaps in a way as to achieve time to market, quality and reliability of its products.[707]

774. Among those OEMs discounting Toshiba's ability to become competitive in the Business Critical HDDs market, one important OEM indicated that Toshiba's Business Critical HDDs products have been *"late to market"*, that Toshiba has cancelled two of its previously announced products and that *"it will likely be 2 years before Toshiba successfully executes"*.[708] According to that OEM, Toshiba is currently "*unproved and only as good as their PowerPoint roadmaps."*[709] That OEM considers that if Toshiba's slow start in this market is indicative of its ability to bring Business Critical products to market, Toshiba may be expected to always be late on a capacity point. This would, in turn, mean that Toshiba would not enjoy higher margins for its products and hence it would struggle to fund future R&D.[710] Similarly, another OEM indicated that Toshiba's roadmap is currently limited and was late compared to other suppliers.[711] The same customer explained that it had not qualified Toshiba's HDDs so far due to quality issues associated to its products.[712] Another one reported that it does not believe that Toshiba's 3.5" Business Critical Enterprise HDDs will grow into an effective competitive force and that it does not anticipate qualifying Toshiba's products in the future.[713]

775. In any event, as indicated in HGST's internal documents, Enterprise Business Critical HDDs are more customised products in comparison to 3.5" Desktop, 2.5" Mobile and CE HDDs.[714] This would imply that although the ability of customers to source from three suppliers remains an important factor at the *outset* of the procurement process, customers are less likely to switch to alternative suppliers during the *lifecycle* of the

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704 Customers reply to the Commission's request for information of 8 September 2011, question 2.5.
705 Customers reply to the Commission's request for information of 8 September 2011, question 2.5.
706 Customers reply to the Commission's request for information of 8 September 2011, question 2.5.
707 Customers reply to the Commission's request for information of 8 September 2011, question 2.5.
708 Customers reply to the Commission's request for information of 8 September 2011, question 2.5.
709 Customers reply to the Commission's request for information of 22 June 2011, question 62.
710 Customers reply to the Commission's request for information of 22 June 2011, question 62.4.
711 Customers reply to the Commission's request for information of 8 September 2011, question 2.4.
712 Customers reply to the Commission's request for information of 22 June 2011, question 62.4 and 62.
713 Customers reply to the Commission's request for information of 8 September 2011, question 2.5.
714 [Deposition of HGST executive to the FTC]*

HDD once the HDD has been qualified with a certain supplier. This in turn impacts the ability of smaller competitors to swiftly increase their supplies and therefore market share. Moreover, since HDDs employed in servers have a longer life-span, OEMs tend to qualify Business Critical HDDs less frequently in comparison to non-Enterprise HDDs.[715] This fact also presents obstacles for a smaller competitor like Toshiba, to quickly increase its supplies.

776. Taking those factors into account, the Commission's market investigation indicated that Toshiba does not currently exercise a sufficiently constraining influence in the 3.5" Business Critical market. The Commission's market investigation indicates that Toshiba's presence in the 3.5" Business Critical market is currently 'small-scale' and not of sufficient scope and magnitude to deter or defeat the anti-competitive effects of the proposed transaction.[716]

777. Furthermore, there is no clear indication that Toshiba's presence in the market is likely to develop into a sufficient competitive constraint in a sufficiently swift and sustained manner.[717] The Commission′s market investigation does not sufficiently indicate Toshiba's ability to timely develop into a third viable alternative supplier, which would enable customers to continue to engage in effective multi-sourcing strategies and which would sufficiently constrain the Merged Entity by replacing the current competitive pressure exerted by HGST.

778. In this regard, Toshiba's own estimates about its forecasted growth in the Business Critical market[718] cannot be considered as strong evidence that such growth will effectively take place also taking into consideration the delay encountered by Toshiba to start production of 3.5" Business Critical HDDs, compared to its own forecasts. Indeed, Toshiba announced its 3.5" Business Critical offering in mid-December 2010, with volume production scheduled to start in Q1 2011, but it started volume production, later, in Q2 2011 and has yet to achieve significant sales and scale. As a consequence, it is not excludable that also the forecasted sales for the next three years will not be fully realized in the future, particularly, in view of the doubts raised by some large OEMs regarding Toshiba's ability to achieve time to the market.

779. Moreover, the concerns expressed by an important customer of Business Critical 3.5" HDDs reflect the impact which, HGST's removal will have on OEMs' ability to multi-source, particularly considering the current uncertainty on Toshiba's future development in this market.

780. That OEM raised concerns that the proposed concentration will negatively impact its choice in terms of product quality, security of supply and its ability to reallocate purchase shares between qualified suppliers. That OEM notes that this is particularly due to the fact that to date Seagate's Business Critical products have been *"plagued with quality issues and qualification delays"*. That OEM reports that it has not been successful in qualifying a current generation Seagate product.[719]

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715 [Deposition of HGST executive to the FTC]*.

716 Horizontal Merger Guidelines, paragraph 75.

717 Horizontal Merger Guidelines, paragraph 74.

718 Toshiba reply to the Commission's request for information of 14 June 2011, question 38.

719 Customers reply to the Commission's request for information of 22 June 2011, questions 51, 51.1, 52.1, 53 and 53.1.

781. The Notifying Party submits that it expects OEMs to re-allocate purchase shares between HDD suppliers once the proposed concentration is implemented. This would set in motion the "Conner-effect" accepted by the Commission in previous merger decisions concerning the HDD industry.

782. The proposed concentration differs from the previous concentrations that have been assessed by the Commission. The "Conner-effect" can be seen as another reflection of the fact that HDDs customers prefer to spread their purchases as much as possible over different HDDs competitors.

783. However, the Commission's investigation confirms that the removal of HGST as an important supply source on the 3.5" Business Critical HDDs market is likely to have a detrimental effect on the ability of customers on that market to effectively multi-source their supplies. The Commission's investigation does not support Toshiba's ability to timely develop into a third viable alternative supplier, which would enable customers to continue to engage in effective multi-sourcing strategies. Therefore, the Conner-effect is unlikely to materialise in the 3.5" Business Critical market.

D. Merger eliminates an important competitive force

784. In its Reply to the Statement of Objections, the Notifying Party claims that Toshiba has the necessary skills to excel on the 3.5" Business Critical market:

Toshiba is the second qualified SAS supplier;

(e) The setting up of technology centres with TDK and SDK would enable Toshiba to develop a technologically competitive position;

(f) Toshiba would be better placed than WD or Seagate to exploit synergies with technological developments of non-volatile memory (SSDs, flash).

785. The Commission's market investigation showed that the proposed concentration removes the competitive constraint currently exercised by HGST as the third strongest player on the market and an important player in terms of quality and innovation.

786. Compared with the pre-merger situation, the only remaining competitive constraint on WD (and Seagate/Samsung) would be Toshiba. The Commission's market investigation indicated that OEMs do not perceive Toshiba as currently exercising a sufficiently constraining influence in the 3.5" Business Critical market.[720] Furthermore, there is no clear indication that Toshiba's presence in the market is likely to develop into a sufficient competitive constraint in a sufficiently swift and sustained manner.[721] In any event, Toshiba is generally weaker than HGST and exercises a weaker competitive constraint than that currently exercised by HGST on WD and Seagate.

787. Whilst Toshiba is generally regarded as a marginal second-tier competitor by competitors and industry analysts, HGST is considered as one of the three tier-one

720 Customers reply to the Commission's request for information of 8 September 2011, question 2.4.

721 Horizontal Merger Guidelines, paragraph 74.

HDDs competitors, alongside WD and Seagate.[722] Unlike Toshiba, HGST has pursued a similar business model to WD and Seagate's. In particular, like WD and Seagate, HGST pursues a vertically integrated manufacturing strategy based on the ownership of critical component technologies. […]*[723] […]*.[724] Sector studies indicate that vertical integration offers significant advantages over non-integrated players such as Toshiba.[725] HGST's degree of vertical integration upstream allows it to maintain control over its product roadmap and components cost, quality and availability.[726]

788. Conversely, Toshiba is entirely dependent on component suppliers for its HDD component requirements. Although TDK heads are considered as highly innovative by HDDs market players,[727] […]*.[728] […]*.[729] […]*.[730]

789. Besides vertical integration, another important factor distinguishing HGST from Toshiba is the former's focus on HDDs quality. HGST believes that *"its dedication and focus on quality […] provides HGST with a strategic advantage over competitors. HGST enforces strict quality standards […] critical to the Company's ability to qualify products quickly and achieve a significant share of business from its customers"*.[731] WD internal documents acknowledge that an increasing number of customers have consistently ranked HGST as a top supplier in their quarterly business reviews.[732]

790. Also, the Commission's market investigation indicates that 3.5" Business Critical customers generally consider HGST as a main innovator in relation to Enterprise HDDs. OEMs generally rank HGST as the second most important innovator for Enterprise Business Critical HDDs after Seagate, whilst Toshiba is most of the time considered by customers the least innovative player in comparison to HGST, WD

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722 WD internal documents; and Citi "Hard Disk Drives: Near Cycle Recovery; Initiating with Buys on STX and WDC", December 2010, p. 40*: "The top 3 players (Western Digital, Seagate, Hitachi) all have vertically integrated manufacturing, and essentially control the market with a combined 79% market share. Meanwhile, Toshiba and Samsung are considered relatively marginal players, whose commitment to the HDD business continues to be questioned given their heavy dependence on merchant vendors for critical components. Both Toshiba and Samsung have struggled to move beyond 10-11% market share during the past 5 years. (…) According to Trend Focus, Hitachi is currently the third largest player with 18%market share. The company has market shares of roughly 20% in notebooks, Enterprise and Consumer Electronics, but is relatively weak in Desktop with 12% share (…) Much has improved during the past 2-3 years, with the company finally becoming consistently profitable in 2008 and making significant external management hires."*

723 HGST reply to the Commission's request for information of 23 June 2011, question 50.

724 HGST reply to the Commission's request for information of 23 June 201, questions 60 and 61.

725 Deutsche Bank industry report, "The HDD Industry – A Changing Landscape", 5 November 2011.

726 WD "Confidential Information Memorandum for Private Lenders Only - USD 2,500,000,000 Senior Credit Facilities", March 2011, p. 33.

727 WD reply to the Commission's request for information of 23 June 2011, question 61.

728 HGST reply to the Commission's request for information of 23 June 2011, question 47.

729 HGST "Product Development Update", 10 March 2010, pp. 77, 79 and 80.

730 HGST "Operations Update", 9 September 2010, p. 27.

731 WD "Confidential Information Memorandum for Private Lenders Only - USD 2,500,000,000 Senior Credit Facilities", March 2011, p. 31.

732 WD "Confidential Information Memorandum for Private Lenders Only - USD 2,500,000,000 Senior Credit Facilities", March 2011, pp. 31 and 32.

and Seagate.[733] One important OEM has specifically indicated HGST as the top innovator in relation to Business Critical HDDs.[734]

E. No countervailing buyer power

791. Competitive pressure on a supplier is not only exercised by competitors but can also come from its customers. Even firms with very high market shares may not be in a position after the merger to significantly impede effective competition if customers possess countervailing buyer power.[735]

792. As stated in recital 775, although the ability of customers to source from three suppliers is an important factor at the outset of the procurement process, customers are less likely to switch to alternative suppliers during the *lifecycle* of an Enterprise HDD once the HDD has been qualified with a certain supplier. Therefore, already pre-merger, Enterprise HDD customers' buyer power appears to be rather limited during the lifecycle of the HDD.

793. In any event, even if OEMs were to be considered as able to exercise buyer power pre-merger, in order for countervailing buyer power to be found to sufficiently off-set potential adverse effects of the merger, it must also exist and remain effective following the merger.[736]

794. In that regard, the Notifying Party claims that Business Critical HDD customers are large OEMs and significant purchasers such as Google which generally organise procurement in such a way as to secure competitive outcomes, therefore exerting a strong degree of buyer power.

795. The Commission's market investigation showed that although OEMs buying 3.5" Business Critical HDDs structure their purchases through a number of bidding strategies so as to secure lower prices from HDDs suppliers, such strategies are not always successful and their effectiveness is also dependent on the number of players available on the market. As an example, one large OEM reported that it has not been able to secure lower prices from HDDs suppliers for the majority of its purchases through any of the procurement strategies suggested by the Notifying Party (namely, awarding asymmetric purchase shares, concluding long-term agreements, re-negotiating quarterly prices after revision of TAM projections, etc.).[737]

796. The proposed concentration eliminates a credible alternative supplier, HGST. Furthermore, it appears unlikely that Toshiba will swiftly develop into a credible alternative supplier. Thus, the proposed concentration reduces customers' ability to multi-source and, consequently any bargaining power of OEMs will be negatively impacted. It appears that after the proposed concentration customers would not possess sufficient countervailing power to counter the increase in market power brought about by the proposed transaction. In support of this three large Business Critical OEMs indicated that the reduction in the number of suppliers could impact

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733 Customers reply to the Commission's request for information of 22 June 2011, question 70. WD is never indicated as an innovator by 3.5" Business Critical customers.

734 Customers reply to the Commission's request for information of 8 September 2011, question 9.

735 Horizontal Merger Guidelines, paragraph 64.

736 Horizontal Merger Guidelines, paragraph 67.

737 Customers reply to the Commission's request for information of 8 September 2011, question 5.

their ability to secure lower prices trough the current bidding strategies. According to one large OEM: "Should the number reduce to three, as a matter of fact, the ability to use certain of the above negotiation strategies would be limited accordingly". Another large BC OEM indicates that "WD is the most opportunistic and price-unreasonable supplier we have. They have been known to heavily leverage a known single sourced position with them to an unfair price."[738]

797. Taking those elements into account, it should be concluded that there is no sufficient countervailing buyer power since customers are not in a position to counteract the likely anti-competitive effects of the merger.

F. New entry is unlikely

798. When entering a market is sufficiently easy, a merger is unlikely to pose any significant anti-competitive risk. For entry to be considered as a sufficient competitive constraint, it must be shown to be likely, timely and sufficient to deter or defeat any potential anti-competitive effects of the merger.[739]

799. The Commission's market investigation has almost unanimously discarded the possibility of new entrants into the HDD market. The HDD industry is characterized by high barriers to entry, including high capital expenditures and economies of scale required, and necessary IP rights which are held by the current HDD suppliers.[740] Furthermore, SSDs cannot be considered as exercising a significant competitive constraint within the relevant time frame for the competitive assessment. Entry into the 3.5" Business Critical market therefore appears unlikely.

800. It should therefore be concluded that there would be no likelihood of timely and sufficient entry by a new HDD competitor to defeat the likely anti-competitive effects of the proposed merger.

5.4.5.3. Conclusion

801. The proposed concentration results in the elimination of important competitive constraints that WD and HGST previously exerted upon each other together with a reduction of competitive pressure on the remaining competitor Seagate/Samsung. Given that Toshiba is currently not of sufficient scope and magnitude to deter or defeat the anti-competitive effects of the proposed concentration and appears unlikely to develop into a competitive constraint in a sufficiently swift manner, the proposed concentration effectively reduces customers' sources of supply to two. As a result, it negatively impacts their ability to secure competitive prices when multi-sourcing. There is no countervailing buyer power after the proposed concentration. Further timely and sufficient entry into the market appears unlikely.

802. It should therefore be concluded that the proposed concentration is likely to result in a significant impediment to effective competition in the worldwide 3.5" Business Critical Enterprise market.

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738 Customers reply to the Commission's request for information of 8 September 2011, question 5.

739 Horizontal Merger Guidelines, paragraph 68

740 Customers reply to the Commission's request for information of 20 April 2011, question 86.

5.4.6. The market for 2.5" Mobile HDDs

5.4.6.1. Introduction

803. *Market size.* As follows from Table 13 set out in recital 404, the estimated size of the worldwide 2.5" Mobile HDD market in 2010 was EUR 9.7 billion. This accounted for 38% of worldwide HDD sales. As illustrated in Table 3 set out in recital 75, sales of 2.5" HDDs are expected to grow more than sales of any other HDD markets until 2015, with a compound annual growth rate of 14.9%.

804. *Demand side.* The customers on the 2.5" Mobile market are large OEMs and distributors. Large OEMs include for instance Acer, Apple, Asustek, Dell, Fujitsu, HP, Lenovo, Medion, Positivo and Sony.

805. *Supply side.* Currently, there are four suppliers active in the 2.5" Mobile market, notably: WD, HGST, Seagate/Samsung and Toshiba.

5.4.6.2. The impact of the proposed concentration

806. The market shares of the HDD suppliers on the 2.5" Mobile market are as follows:

Table 21: Worldwide market shares 2006-2010 (in value)[741]

	2006	**2007**	**2008**	**2009**	**2010**
WD	[5-10]*%	[10-20]*%	[20-30]*%	[30-40]*%	[30-40]*
HGST	[20-30]*	[20-30]*	[20-30]*	[10-20]*	[10-20]*
COMBINED	***[30-40]****	***[40-50]*%***	***[50-60]*%***	***[40-50]*%***	***[40-50]*%***
Seagate/Samsung	[20-30]*	[20-30]*	[20-30]*	[30-40]*	[30-40]*
Toshiba[742]	[40-50]*%	[30-40]*	[20-30]*	[20-30]*	[10-20]*

807. WD is currently the leading supplier on the 2.5" Mobile market, with a [30-40]*% market share in value. The market share increment that the proposed concentration brings about is [10-20]*%. After the merger, the Merged Entity would have a combined market share of [40-50]*% in value.

808. However, after the merger, the Merged Entity will continue to face competition from the merged Seagate/Samsung and Toshiba, two strong suppliers which will hold market shares (in value) of [30-40]*% and [10-20]*% respectively.

809. Seagate was the number two player on the 2.5" Mobile market in 2010, with a [20-30]*% market share in value. OEMs sourcing, amongst others, 2.5" Mobile HDDs underline that its main strengths are its brand, its lead in technology, its

741 Source: Notifying Party's estimates.

742 Includes Fujitsu share. Toshiba acquired Fujitsu's HDD Business in 2009.

manufacturing capabilities and its reliability as a source of supply.[743] Seagate became an even stronger competitor with the addition of Samsung and a combined market share of [30-40]*%.

810. The Commission's market investigation revealed that Toshiba is a strong competitor on the 2.5" Mobile HDD market. Some OEMs replying to the Commission's market investigation noted its strategic focus on 2.5" Mobile HDDs (as well as smaller form factors). For instance, one large OEM that has a long relationship with Toshiba states that it has "proven to be a reliable supplier of 2.5 inch HDDs". Two other significant PC OEMs indicated that Toshiba's strength results from its strong Mission Critical Enterprise and Notebook products.[744] According to certain OEMs sourcing 2.5" Mobile HDDs, Toshiba's strengths lay in its increased Engineering resources and its product development speed.[745]

811. Customers also noted that when Toshiba bought Fujitsu's HDD business in 2009, its market share in 2.5" Mobile decreased quite significantly, due to integration issues, as well as OEMs' re-allocation of shares following that transaction ("Conner-effect").[746] Previous decisions by the Commission concerning the HDD industry have recognised the so-called “Conner Effect”. Accordingly, customers spread their sales over multiple suppliers, thus reducing the market share increment that a concentration between two HDD competitors brings about. In those previous cases, it was accepted that the "Conner effect" could mitigate the effects of concentrations between two HDD competitors, as market share shifts were likely in light of the ability of customers to shift purchase shares and ultimately keep their total number of HDD suppliers constant.[747]

812. It can be expected that Toshiba will gain market share in 2.5" Mobile HDD market for the very same reasons that it lost shares in 2009. HDD suppliers competing with the Merged Entity may benefit from the re-allocation of customers' shares after the proposed concentration.

813. The Commission's market investigation confirmed that both Seagate/Samsung and Toshiba are qualified as valid and reliable HDDs suppliers by nearly all 2.5" HDD customers. Therefore, after the proposed concentration, there will be three suppliers available for all the 2.5" HDD customers.

814. Whereas the proposed concentration would reduce the number of HDD competitors on the worldwide 2.5" Mobile market from four to three, the Commission's market investigation confirmed that the reduction of the number of HDD competitors from four to three is not likely to significantly reduce the ability of customers on that market to effectively multi-source their HDD supplies. Indeed, sixteen out of the seventeen 2.5" Mobile HDDs customers which replied to the Commission's market investigation indicated that three suppliers are sufficient to continue an effective

743 Customers reply to the Commission's request for information of 20 April 2011, question 52.
744 Customers reply to the Commission's request for information of 20 April 2011, question 51.
745 Customers reply to the Commission's request for information of 20 April 2011, question 52.
746 Customers' reply to the Commission's request for information of 22 June 2011, question 49.
747 Case COMP/M.5483 –*Toshiba/Fujitsu HDD business*, Commission decision of 11 May 2009, paragraph 33, and footnote 6.

multi-sourcing policy.[748] Only one OEM sourcing 2.5" Mobile HDDs indicated that it would need "in Notebooks (…) at least four suppliers with the capability / desire to be over 25%".[749]

815. Moreover, a majority of OEMs sourcing 2.5" Mobile HDDs stated that they will "re-allocate" HDD purchase shares. One OEM specifically stated its intention to do so for 2.5" Mobile HDDs and at least one large OEM also specifically indicated that it will shift business to Toshiba for 2.5" HDDs.[750]

816. As emerged from the Commission′s market investigation,[751]in a three-supplier scenario, OEM customers have multiple ways to split their purchase shares across different HDD suppliers as leverage to obtain competitive prices while securing their supplies. The size of the contestable market can vary between a 0% purchase share (the OEM chooses two suppliers and the third supplier is put "on the shelf") and a 60% to 70% share (the maximum purchase share that most OEMs wish to allocate to an individual HDD supplier). Therefore, it can be concluded that the presence of three HDD suppliers will ensure sufficient possibilities for customers to multi-source and switch suppliers and prevent the Merged Entity from obtaining and exercising significant market power.

5.4.6.3. Conclusion

817. To conclude, the Merged Entity will enjoy a substantial market share on the 2.5" Mobile HDD market. However, it will continue to face at least two strong competitors with significant market shares. With three remaining suppliers, customers will retain sufficient possibilities to switch supplier and effectively multi-source. It should therefore be concluded that the proposed concentration is unlikely to significantly impede effective competition on the worldwide market for 2.5" Mobile HDDs.

5.4.7. The market for 2.5" CE HDDs

5.4.7.1. Introduction

818. *Market size*. The value of the worldwide 2.5" CE market amounted to approximately EUR 1.12 billion in 2010. This market accounted for approximately 4% of the value of a worldwide overall HDD market in 2010.

819. *Demand side*. The customers on the 2.5" CE market are generally OEMs.

820. *Supply side.* There are currently four suppliers on the 2.5" CE market: Seagate/Samsung, WD, HGST and Toshiba.

5.4.7.2. The impact of the proposed concentration

821. The market shares of the HDD suppliers on the 2.5" CE market are as follows:

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748 Customers reply to the Commission's request for information of 20 April 2011, question 66.

749 Customers reply to the Commission's request for information of 20 April 2011, question 66.

750 Customers reply (PC OEMs) to the Commission's request for information of 22 June 2011, question 46 and 46.1.

751 Minutes of a meeting with a large PC OEM on 15 June 2011.

Table 22: Worldwide market shares 2006-2010 (in value) [752]

	2006	2007	2008	2009	2010
WD					[0-5]*%
HGST	1[10-20]*%	[10-20]*%	[30-40]*%	[30-40]*%	[30-40]*%
COMBINED	-	-	-	-	***[40-50]*%***
Seagate/Samsung	[60-70]*%	[40-50]*%	[10-20]*%	[10-20]*%	[10-20]*%
Toshiba[753]	[20-30]*%	[30-40]*%	[50-60]*%	[50-60]*%	[40-50]*%

822. Currently HGST is the number two supplier, behind Toshiba, in the 2.5" CE market with a [30-40]*% market share in value. The proposed concentration will only result in a small increment of [0-5]*% in market share, given WD limited market presence.

823. After the merger, the Merged Entity will continue to face competition from Toshiba and the merged Seagate/Samsung, two strong suppliers which will hold market shares (in value) of [40-50]*% and [10-20]*% respectively.

824. In the post-merger scenario, even in light of the multi-sourcing patterns prevalent in this market, the contestable market will not be significantly reduced by the proposed concentration. Consequently, OEM customers will continue to have multiple ways to split their purchase shares across the three different HDD suppliers.

825. In light of WD's limited presence in the 2.5" CE HDD market, the loss of competitive pressure in the market resulting from the proposed concentration will not be particularly important. Furthermore, the Commission's market investigation did not reveal any indication that WD would be an important competitive force on the worldwide market for 2.5" CE HDDs.

5.4.7.3. Conclusion

826. It should therefore be concluded that the proposed concentration is not likely to significantly impede effective competition on the worldwide market for 2.5" CE HDDs.

5.4.8. The Mission Critical Enterprise Market

5.4.8.1. Introduction

827. *Market size.* According to the Notifying Party, the value of the worldwide Mission Critical Enterprise HDDs market amounted to EUR 3 billion in 2010. On the basis of the market size estimates provided by the Notifying Party, this market accounted for approximately 13% of the value of a worldwide overall HDD market.

752 Source: Notifying Party's estimates. Figures are rounded off.

753 Includes Fujitsu share. Toshiba acquired Fujitsu's HDD Business in 2009.

828. *Demand side*. The customers on the Mission Critical Enterprise market are generally OEMs. Customers include HP, Dell, Lenovo, Asustek, Acer, EMC, Fujitsu, NetApp, Cisco and Xyratex.

829. *Supply side*. The Mission Critical Enterprise market is highly concentrated, having only four suppliers: WD, HGST, Seagate/Samsung and Toshiba.

5.4.8.2. The impact of the proposed concentration

Table 23: Worldwide market shares 2008-2010 (in value) in the market for Mission Critical Enterprise[754]

	2008	**2009**	**2010**
WD	[0-5]*%	[0-5]*%	[0-5]*0%
HGST	[10-20]*%	[20-30]*%	[20-30]*%
COMBINED	***[10-20]*%***	***[20-30]*%***	***[20-30]*%***
Seagate/Samsung	[60-70]*%[755]	[60-70]*%[756]	[60-70]*%[757]
Toshiba	[10-20]*%	[10-20]*%	[5-10]*%

830. The proposed concentration will only result in a negligible increment ([0-5]*%) to the market share of the current second player HGST ([20-30]*%) on an overall market for Mission Critical Enterprise HDDs (including drives with both form factors). After the merger, the combined entity will therefore have a market share of [20-30]*%. The Merged Entity would have the same combined market share (WD: [20-30]*% and HGST: [0-5]*%) after the merger also in a narrower market encompassing only 2.5" Mission Critical Enterprise HDDs where the Parties' activities exclusively overlap in relation to Mission Critical Enterprise drives. WD does not produce 3.5" drives for use in this market. In the potential narrower market for 2.5" Mission Critical HDDs, the market leader is Seagate ([50-60]*%) and the other main player Toshiba ([10-20]*%).

831. In light of WD's minimal market share ([0-5]*% in the wider market and [0-5]*% in the narrower one), the loss of competitive pressure resulting from the proposed concentration will not be significant. Moreover, WD and HGST are not close competitors since the latter is the second well-established player whose products are known by OEMs for their high quality and reliability[758] whilst WD is a small player which entered the market in 2009 and has so far struggled to gain a meaningful market share.

832. As after the merger market leader Seagate ([60-70]*%) and Toshiba ([5-10]*%) will remain on the market, OEMs' ability to multisource HDDs will not be impacted.

754 Source: Notifying Party's estimates.
755 Seagate: [60-70]*%; Samsung: [0-5]*%
756 Seagate: [60-70]*%; Samsung: [0-5]*%
757 Seagate: [60-70]*%; Samsung: [0-5]*%%
758 Customers reply to the request for information of 20 April 2011, question 46.1 and 47.1.

833. Accordingly, the proposed concentration will not have any material impact on the competitive structure of the worldwide market for Mission Critical Enterprise HDDs. After the merger, the Merged Entity will continue to face competition from the much stronger Seagate and Toshiba as well.

5.4.8.3. Conclusion

833.1. It should therefore be concluded that the proposed concentration is not likely to significantly impede effective competition on the worldwide market for Mission Critical Enterprise.

5.4.9. The Market for XHDDs in the EEA

5.4.9.1. Introduction

834. The EEA market is a very important market for XHDDs. More than 1/3 of the total worldwide turnover of XHDDs of EUR 5.6 billion is achieved in the EEA.

835. XHDDs are available in three form factors: 1.8", 2.5", or 3.5". The three models have different requirements and provide consumers with varying degrees of storage capabilities. The Commission's market investigation indicated that XHDDs are typically manufactured with the same 2.5" Mobile and 3.5" Desktop HDDs that are used in Desktop PCs and Notebooks with 5,400 and 7200 rpm.[759]

A. XHDD Customers in the EEA

836. The XHDD market is growing fast, even faster than the markets for internal HDDs. In 2010, the total XHDD market accounted for approximately EUR 2 billion in the EEA. Between 2006 and 2010, the total market size in volume more than doubled. The market is expected to grow by approximately 20% annually in the next years.

837. The demand side seems to be very fragmented in the EEA. The very broad majority of XHDD turnover of the Parties' sales in 2010 were achieved with wholesalers and distributors such as [WD and HGST's customers]*.[760] The sales of the Parties indicate that customers tend to purchase lower volumes per customer compared to the major OEMs in the upstream HDD markets.[761]

838. Distributors and wholesalers sell them mostly on to retailers (such as computer superstores, warehouse clubs, online retailers and computer electronic stores). The final customers of XHDD are end-consumers or small and medium sized businesses.

B. XHDD Suppliers in the EEA

839. On the supply side, the XHDD market seems to be at first glance less concentrated than the markets for internal HDDs. In addition to the HDD producers (namely WD, HGST, Seagate/Samsung and Toshiba), there are alternative XHDD suppliers such

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759 XHDD Competitors reply to the Commission's request for information of 22 June 2011, question 42.

760 WD reply to the Commission's request for information of 23 June 2011, question 11; HGST reply to the Commission's request for information of 23 June 2011, question 11.

761 See for example WD reply and HGST reply to the Commission's request for information of 23 June 2011, question 11.

as LaCie, Verbatim, Buffalo and Iomega ("non-integrated suppliers") which are not vertically-integrated upstream in the manufacturing of HDDs. Basically all significant XHDD manufacturers supply the full range of different XHDD types.

840. The XHDD market was first developed by non-integrated suppliers.[762] In recent years, the HDD manufacturers have entered the downstream XHDD market. From 2000 on, they were able to gain significant market shares to the detriment of non-integrated suppliers.

841. Since 2008, all vertically-integrated HDD manufacturers have been active in the downstream market for XHDDs worldwide and to a different extent also in the EEA. WD and Seagate/Samsung are the leading suppliers in the XHDD market worldwide and in the EEA.

842. WD has been active as an XHDD supplier since 2000 when it launched its first XHDD product.[763] WD has become the leading XHDD supplier worldwide and in the EEA. WD uses […]* % distributors and wholesalers in the EEA as the main channels for its branded goods (included XHDDs). WD sells its XHDDs under its brand "Western Digital" […]*. WD uses contract manufacturers for the production of external storage devices.[764]

843. HGST entered the market for branded XHDDs in 2009 with the acquisition of the company Fabrik which had just shortly before acquired Simple Tech, a company selling branded XHDDs. HGST currently sells its branded XHDDs under its "Hitachi" brand as well as under an number of sub-brands such as "G-Technology", "Touro", "Lifestudio" and "SimpleTech". The "G-Technology" brand is specialized in XHDDs for Apple end-customers.

844. Seagate started to supply XHDDs in 2004, strengthening its product offering in 2005 and 2006 considerably following its acquisitions of Mirra and Maxtor. Seagate sells a broad range of XHDD products, in a variety of capacities and form factors aiming at all different end-customer levels. Seagate's XHDD products are mainly marketed under three sub-brands: Expansion, BlackArmor and GoFlex. The Commission unconditionally cleared Seagate's acquisition of Samsung's HDD Business (including its XHDD Business) on 19 October 2011.

845. Samsung started its XHDD business at the end of 2008 and had managed to establish itself as a sizeable XHDD supplier in the EEA and worldwide within a period of two years.

846. Toshiba is also a recent entrant which started its XHDD supply in 2006 and its US-business in 2007. It entered the market mainly with 2.5" XHDDs for which it is able to produce the HDD input itself. Toshiba also supplies 3.5" XHDDs for which it sources its HDD input from other HDD manufacturers.

847. There are a number of non-integrated suppliers such as Iomega (EMC), LaCie, Verbatim/Freecom, and Buffalo. Some market players mainly focus on a specific

762 Also called "External Box Builder".

763 WD reply to the Commission's request for information of 23 June 2011, question 7.

764 Form CO, Footnote 5

region like Buffalo and IO Data which are mainly active in Japan and other Asian countries. Buffalo has only a small presence in the EEA while IO Data does not seem to be active in the EEA pursuant to the market data provided by the Notifying Party.

848. Iomega Corporation ("Iomega"), a wholly-owned subsidiary of EMC Corporation, is active in innovative storage and network security solutions for small businesses, home offices, consumers and others. EMC Corporation is a worldwide USD 17 billion group focused on information infrastructure.

849. Buffalo is a global manufacturer of storage, multimedia, and wireless networking products for the home and small businesses. Buffalo is part of the worldwide USD 1.3 billion Melco Holdings Inc. group of companies ("Melco") which are involved in the manufacture of numerous access memory products, Flash memory products, USB products, CD-ROM/DVD-RW drives, hard disks, local area network products, printer buffers, liquid crystal displays, Microsoft Windows accelerators, personal computer components and CPU accelerators.

850. Verbatim is the data storage technology division of the worldwide USD 31 billion company of Mitsubishi Chemical Holding Corporation. In 2009, it also acquired Freecom, another XHDD supplier. Verbatim is positioned as a brand for the retail channel while Freecom is positioned as a professional specialist brand, primarily selling to resellers and Apple specialists.

851. LaCie is one of the pioneers in the XHDD market and was one of the first suppliers of XHDDs. It tries to differentiate itself through innovation, design and now embedded cloud storage. LaCie is today active worldwide.

852. There have been a high number of other non-vertically integrated XHDD suppliers in the past which have either left the market or, like Maxtor, Freecom or SimpleTech, have been acquired by other companies.

5.4.9.2. The Statement of Objections

853. In the Statement of Objections, the Commission provisionally concluded that the proposed concentration would lead to a risk of significant impediment to effective competition in the EEA market for XHDDs as a result of non-coordinated effects. The Commission's provisional conclusions were based on the following findings.

854. First, WD is already the leading XHDD player in the EEA XHDD market. The acquisition of HGST further increases its current number one market position.

855. Secondly, the combined market shares and moderate increment underestimate the market power of the Merged Entity and the competitive constraint that HGST exerted on WD. The Commission's market investigation indicates that the market has to be assessed in a dynamic perspective as the entry of HDD manufacturers in the XHDD market is currently rapidly changing the competitive landscape, mirroring in a closer fashion the upstream HDD markets. There are indications that the market shares of the integrated competitors, which include WD and HGST, are likely to increase and that the market shares of the non-integrated competitors are likely to decrease. Current market shares therefore do not accurately reflect the market power of the Merged Entity after the merger and the increment in market power that the concentration will bring about.

856. Thirdly, HGST is with a close competitor of WD. In contrast to the non-integrated XHDD suppliers, HGST is the only competitor besides Seagate/Samsung which can produce the whole range of XHDDs without being dependent on its competitors for the relevant input.

857. Fourthly, the proposed concentration will enable the Merged Entity to hinder expansion by most of its competitors as it will have the ability and incentive to make the expansion of non-vertically integrated players more costly by raising the price of the HDDs used to produce XHDDs.

858. Finally, there are no countervailing factors such as low barriers to entry or buyer power which would sufficiently mitigate the adverse impact on competition which might result from the proposed concentration on the downstream market for XHDDs.

859. Taking all these factors into account, the Commission provisionally concluded in the Statement of Objections that the proposed concentration would remove a significant competitive constraint and significantly impede effective competition in the EEA XHDD market.

5.4.9.3. The view of the Notifying Party

860. According to the Notifying Party the market structure post-merger cannot reasonably be considered to lead to unilateral effects. The Commission's approach to extrapolating market trends would be flawed and even if the non-integrated suppliers on the market were weakened or were to exit the market after the merger, there would be still three vertically integrated suppliers left. This would be sufficient to maintain current levels of competition and innovation.

861. WD and HGST would not be each other closest competitors and the Commission has failed to demonstrate that the Merged Entity would have the ability, incentive and effect of restricting access to input.

862. According to the Notifying Party, barriers to entry are low. Desktop or Notebook OEMs could enter the XHDD market and use bare HDDs, which they purchase as input for their Notebooks or Desktop computers in order to manufacture XHDDs.

863. Finally, the Notifying Party submitted that retailers would have a significant amount of buyer power and could threaten to delist the Merged Entity's brands.

5.4.9.4. The Commission's assessment

A. The Merged Entity is the leading player in the EEA

864. Table 24 shows the market shares in value of the Parties and their integrated and non-integrated competitors in the EEA between 2006 and 2010 according to the best estimates of the Notifying Party. The XHDD market is even more differentiated than the HDD markets due to the high number of different segments such as 2.5" and 3.5" XHDDs as well as NAS XHDDs. For differentiated products, sales in value and their

associated market share will usually be considered to better reflect the relative position and strength of each supplier.[765]

Table 24: **XHHD EEA market shares 2006-2010 (in value)** [766]

Companies	**2006**	**2007**	**2008**	**2009**	**2010**
WD	[10-20]*%	[10-20]*%	[20-30]*%	[20-30]*%	[30-40]*%
HGST	[0-5]*%	[0-5]*%	[0-5]*%	[0-5]*%	[0-5]*%
Combined	**[10-20]*%**	**[10-20]*%**	**[20-30]*%**	**[20-30]*%**	**[30-40]*%**
Seagate/Samsung	[10-20]*%	[10-20]*%	[10-20]*%	[10-20]*%	[10-20]*%
Toshiba	[0-5]*%	[0-5]*%	[0-5]*%	[5-10]*%	[0-5]*%
All integrated XHDD suppliers	[20-30]*%	[30-40]*%	[40-50]*%	[50-60]*%	[50-60]*%
Iomega	[10-20]*%	[10-20]*%	[10-20]*%	[10-20]*%	[10-20]*%
LaCie	[10-20]*%	[10-20]*%	[10-20]*%	[10-20]*%	[5-10]*%
Verbatim/Freecom	[5-10]*%	[5-10]*%	[5-10]*%	[5-10]*%	[5-10]*%
Buffalo	[0-5]*%	[0-5]*%	[0-5]*%	[0-5]*%	[0-5]*%
TrekStore	[5-10]*%	[5-10]*%	[5-10]*%	[0-5]*%	[5-10]*%
Others (non-integrated supplier)	[20-30]*%	[20-30]*%	[10-20]*%	[10-20]*%	[5-10]*%

865. WD is the market leader with a [30-40]*% market share. Between 2006 and 2010, it nearly tripled its market share. It gained [10-20]*% which is as large as the total market share of the second player Seagate/Samsung. In addition, Seagate and Samsung were able to gain rapidly market share. Before the acquisition of Maxtor in 2006, Seagate had only a [5-10]*% market share. Samsung was able to acquire a [5-10]*% share in the two years since its entry.

765 See Commission Notice on Market Definition, paragraph 55.

766 Source: WD estimates, request for information of 10 August 2011, Annex to question 2. According to the Notifying Party, the data for 2006 to 2009 has been estimated by reference to GFK "EU 5" data. GFK compiles retail data, that is, point of sale data. However, the data for 2010 is estimated by reference to IDC data. IDC compiles data at a wholesale level. The Notifying Party considers the data to be the most accurate available. Because of rounding, the market shares of all players might be over 100% in a giving year.

866. After the merger, the only other integrated XHDD competitor besides Seagate/Samsung would be Toshiba with a market share of only around [0-5]*%.

867. The non-integrated competitors are Iomega with [10-20]*%, LaCie with [5-10]*%, Verbatim/Freecom [5-10]*%, Trekstor [5-10]*% and Buffalo [0-5]*%.

868. HGST is the third largest integrated XHDD supplier with a [0-5]*% market share which it acquired in only two years since entering the market. The combined entity WD/HGST would have a [30-40]*% market share with an increment of [0-5]*%. The Merged Entity would be in value [150-160]*% the size of its second largest competitor Seagate/Samsung. The Merged Entity would therefore be appreciably larger than the number two player post-merger.

869. The combined market share of [30-40]*% of the Merged Entity does not *prima facie* provide strong indications that the proposed concentration would significantly impede effective competition. However, the Commission has in several cases where the parties' combined market share was less than [40-50]*% considered that the transaction would lead to the creation or the strengthening of a dominant position.[767] Thus, the combined market share of [30-40]*% does in itself neither increase nor decrease the likelihood that the merger significantly impedes effective competition. The likelihood that a proposed concentration may significantly impede effective competition must be assessed on a case-by-case basis taking account of the individual competitive environment.

870. In addition and in contrast to the Notifying Party's claims, an HHI level below 2000 – on this market […]* – does not necessarily indicate that non coordinated effects are unlikely to arise from a proposed concentration. A proposed concentration can involve a recent entrant with a relatively small market share.[768] HGST is such an entrant. In addition, as explained below, the Commission's market investigation indicated that the current level of the market share of the Merged Entity underestimates its market strength and that its market position must be assessed in a dynamic perspective taking into account the strong market trends in the XHDD market.

B. The market shares and increment may underestimate the market power of the Merged Entity and the competitive constraint exerted by HGST on WD

871. There are various indications that the modest market share's increment that the proposed concentration would bring about could understate the post-merger market power of the Merged Entity and the increment in market power that the concentration would bring about.

872. The market shares shown in Table 24 in recital 864 show the dynamic trends that affect the XHDD market. Between 2006 and 2010, non-integrated XHDD players, which had in 2006 a market share of approximately [70-80]*%, lost more than 1/3 of their market shares to the benefit of integrated XHDD suppliers such as WD and HGST. Smaller market players were either acquired or left the market. For example, the smaller players which are aggregated in the category "Others" lost [10-20]*%

767 Cf. Horizontal Merger Guidelines, paragraph 17.

768 Horizontal Merger Guidelines, paragraph 20 (a).

percentage points in the last five years and today account together for only [5-10]*% of the EEA XHDD market. According to the market shares provided by the Notifying Party, non-integrated players such as Teac, Tradebrand, Storex, Chiligreen no longer have any significant market presence in the EEA.

873. The existing non-integrated XHDD suppliers are with the exception of Iomega losing market share. LaCie which was the leading XHDD supplier in 2006 has lost more than half of its market share. TrekStore which was one of the leading XHDD suppliers lost market share and went into insolvency in 2009. Verbatim was able to stem its market share losses over the past five years by acquiring Freecom. The only non-vertically integrated player that was able to organically grow its business is Iomega, which has gained market shares in the last 5 years. However, the clear trend is still that non-vertically integrated XHDD suppliers were generally not able to compete sufficiently against the vertically integrated XHDD suppliers.

874. There are no indications that this dynamic trend would be stopped. The majority of XHDD customers indicated that they expect that non-integrated XHDD suppliers will further lose significant market shares to the benefit of the integrated XHDD suppliers in the near future.[769]

875. Even before the proposed concentration, HDD producers seemed to expect a further worldwide industry consolidation and "*shake-out*" of non-integrated XHDD suppliers. According to the Strategic business plan of Seagate from 2010, non-integrated XHDD suppliers have each year been losing market shares to the benefit of vertically-integrated suppliers: "*The long term viability of external box builders is the most important trend facing the industry*." XHDD suppliers "*are being pushed out of the market by the hard disc drive manufacturers who have better cost structures and a growing presence in the local markets. This trend should continue as the favourable cost structure and ever expanding retail reach of the hard disc drive industry overwhelms the external box builders"*.[770]

876. The Commission's market investigation indicated that one of the reasons is that HDD suppliers are more and more reluctant to supply their XHDD competitors with competitive inputs. In particular, WD seems to have significantly decreased its supply of HDDs to XHDD suppliers in recent years. […]*.[771] It is asserted by non-integrated suppliers that the integrated players might favour their own XHDD production in price and availability.[772]

877. At the worldwide level, pursuant to the Notifying Party, integrated XHDD suppliers have already increased their market share by [50-60]*% since their first entry in 2000. An internal strategic business paper of Seagate even assumes that the

769 See Customers reply to the Commission's request for information of 19 July 2011, question 18. For example, Best Buy expects the market share of non-integrated XHDD to decline further 25%, reply of Best Buy to the Commission's request for information of 19 July 2011, question 18.

770 Non-confidential version of Seagate, Strategic Business Plan November 2010, p. 59.

771 [HGST internal document describing HGST business strategy]*.

772 One XHDD supplier's reply to the Commission's request for information of 22 June 2011, question 51.

integrated XHDD suppliers have already roughly a [70-80]*% market share worldwide.[773]

878. The different pace which characterises this global trend can be explained by the fact that the trend first started in the Americas where integrated players have already together over 80% of the market. Currently, the trend can be observed in the EEA while in Asia the non-integrated XHDD suppliers control still the majority of the market.

879. According to internal documents of the Notifying Party, WD itself projects that independently of the proposed concentration it will rapidly strengthen its market share by the end of 2011 and thus considerably increase its market leading position.[774]

880. The moderate market share's increment that the proposed concentration would bring about ([0-5]*% based on 2010 figures) must also be assessed against the background of these market dynamics. HGST was able to acquire [0-5]*4% in two years while Samsung was able to acquire [5-10]*% within the same time frame. HGST plans to grow its market share to [10-20]*% in the next years.[775] It is therefore not unlikely that HGST would be able to achieve a significant growth of its market share in the XHDD market even in the absence of the proposed concentration. It should be noted, in this regard, that in the Americas HGST is already the number three XHDD supplier behind WD and Seagate.[776]

881. Moreover, as will be discussed in the recitals that follow, there are indications that the proposed concentration will accelerate this process. Therefore, the combined market share of the Merged Entity in 2010 of approximately [30-40]*% is not a good proxy for assessing its market strength. The market power of the Merged Entity post-merger must be assessed in a dynamic perspective taking into account the rapid trends of the last years and the years to come.

882. Taking into account only the current market shares of the vertically-integrated XHDD players and proportionally subtracting the market shares of the non-integrated XHDD manufacturers, WD would have a [50-60]*% market share, followed by Seagate/Samsung with [30-40]*%, HGST with [5-10]*% and Toshiba with [0-5]*%. The Merged Entity WD/HGST would therefore account roughly for nearly [60-70]*% of the market, followed by Seagate/Samsung with [30-40]*%.

883. That calculation is only a theoretical worst-case assumption. It cannot be expected that all the non-integrated market players will necessarily leave entirely the EEA market in the next two or three years. However, it indicates that the competitive constraint which WD and HGST exert on each other as well as the market power of the Merged Entity is underestimated by the Notifying Party's market share estimates from 2010. It also shows that even if the Merged Entity would not gain proportionately more market shares from the non-integrated players than its

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773 Non-confidential version of Seagate, Strategic Business Plan November 2010, p. 59, submitted on 12 August 2011.

774 [WD internal document on WD business strategy]*

775 See HGST, 2010 Performance Objectives for Greg Piligian.

776 See WD reply to the Commission's request for information of 1 August 2011, question 9.

competitors Seagate/Samsung and Toshiba, it would still control soon over half of the market with a considerable gap to the number two and three players.

C. WD and HGST are close competitors

884. The Commission's market investigation indicated that WD and HGST compete more closely with each other compared to competition between WD or HGST with the non- integrated players that are still present on the market. In fact, both Parties have more in common in respect of the supply of XHDDs than non- integrated XHDD suppliers and even Toshiba, as Toshiba is only partly integrated XHDD supplier.[777]

885. Toshiba might become a closer competitor to the other fully integrated XHDD suppliers if as predicted by the Notifying Party the importance of 2.5" XHDD grows considerably in the coming years. However, Toshiba will still not be able to use its own HDD supply for a significant part of the market in the next two or three years. Also its market share development between 2007 and 2010 seems to indicate that Toshiba was not able to increase its market presence and profit from the described market dynamics in the same way as the fully integrated player like WD and HGST.

886. Both Parties are able to utilise their captive HDDs for their XHDDs. It has to be borne in mind that HDDs are by far the most important input of an XHDD. The HDD determines to a large extent the price and the capacity as well as the mobility. The respondents indicate that these are also the most important characteristics for the XHDD end-customers.[778] The fact that both Parties are close competitors upstream in the HDD markets makes it more likely that they are also close competitors downstream.

887. Downstream in the EEA XHDD market, WD and Seagate are seen by customers and competitors as the closest competitors.[779] However, a number of market participants also see HGST as competing closely with WD.[780] This is in line with the statement of the Notifying Party: "*As with HDDs, it would consider Seagate as its closest competitor in XHDD followed by the other vertically integrated suppliers*".[781]

888. Another indicator showing that WD and HGST compete closely is the fact that their top four EEA XHDD customers in 2010 are identical […]*. Moreover, ranking them by their importance in value for WD and HGST results in an identical ranking of these four customers.[782]

889. The Commission's market investigation is not conclusive on how the single brands compete with each other. Competitors and customers generally do not differentiate in their responses between the different brands of the Parties and their competitors. The

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777 Toshiba purchases 3.5" HDDs from its competitors (namely, WD/HGST and Seagate/Samsung) to produce 3.5" XHDDs.

778 Customers reply of to the Commission's request for information of 19 July 2011, question 15.

779 Competitors reply to the Commission's request for information of 22 June 2011, question 22; Customers reply to the Commission's request for information of 19 July 2011, question 17.

780 Competitors reply to the Commission's request for information of 22 June 2011, question 14.

781 WD reply to the Commission's request for information of 23 June 2011, question 10.

782 WD reply to the Commission's request for information of 23 June 2011, question 11; HGST reply to the Commission's request for information of 23 June 2011, question 11.

likely reason might be that brands are in this market less important,[783] in particular compared to other consumer markets. Only one XHDD supplier differentiated in his answers between the brands of HGST and stated that HGST would compete with WD, Seagate and Samsung with its Hitachi brand while it would compete more closely with LaCie and WD with its G-Tech sub-brand.[784] According to the Notifying Party, WD and HGST are positioned as premium brands. However, the biggest non-integrated supplier Iomega which had in 2010 still more than 3 times the size of HGST would not have a premium brand positioning.[785]

890. Taking all these facts into account, it can be concluded that WD and HGST are close competitors in the market for XHDDs and are competing more closely with each other than the non-integrated XHDD suppliers which still account for [40-50]*% of the EEA XHDD market in 2010. Therefore, it can be concluded also on this basis that relatively modest market share of HGST in 2010 underestimates the competitive constraint exerted by HGST on WD.

D. Merged entity able to hinder expansion by competitors

891. The Commission's market investigation also provided indications that the proposed concentration would enable the Merged Entity to hinder the expansion of its competitors and to raise its rival's costs. These indications have been assessed in accordance with its paragraph 36 of the Horizontal Merger Guidelines in conjunction with principles drawn from its Non-Horizontal Merger Guidelines.[786] In particular, the Commission has assessed the likelihood that the Merged Entity would have an increased ability and incentive to hinder the expansion of its XHDD competitors by raising their HDD input costs.

892. The Commission recognises that based on 2010 figures, WD and HGST were not the largest suppliers of HDDs to XHDD producers.

893. That finding however does not exclude that after the proposed concentration, the Merged Entity will have an increased ability to raise its rival's costs.

894. HDDs represent 70% to 90% of the input costs of XHDDs and are therefore clearly an important input for XHDDs. 3.5" XHDDs still have a large part of the input volumes used on the downstream XHDD market and the Merged Entity would have a high degree of control of influence over the supply of this important input.

895. In oligopolistic input markets as those of HDDs, a decision of the Merged Entity to restrict access to its inputs may reduce the competitive pressure on remaining input suppliers which may in turn allow those suppliers to raise the input price they charge to non-integrated downstream competitors.[787] The question whether the Merged Entity would have the increased ability to increase HDD prices for its downstream XHDD competitors is therefore closely linked to the likelihood that the merger would give rise to non-coordinated effects on the upstream 3.5" HDD markets. It was

783 Customers reply to the Commission's request for information of 19 July 2011, question 15.
784 LaCie reply to the Commission's request for information of 22 June 2011, question 22.
785 WD reply to the Commission's request for information of 23 June 2011, question 8.
786 OJ C 265, 18.10.2008, p. 6.
787 Non-Horizontal Merger Guidelines, paragraph 38.

concluded in sections 5.4.3., 5.4.4. and 5.4.5 that such non-coordinated effects are likely to arise on each of the 3.5" HDD markets.

896. The majority of the non-integrated XHDD suppliers expressed concerns that the Merged Entity would be able to raise their costs, *inter alia*,by charging them higher prices for the HDDs used to produce XHDDs and consequently hinder them from expanding in the downstream market for XHDDs.[788]

897. Even before the proposed concentration, there has been a trend according to which non-integrated XHDD suppliers are losing market shares to integrated XHDD suppliers.[789] The Commission's market investigation indicated that one of the reasons for this is that HDD suppliers are more and more reluctant to supply their XHDD competitors with competitive HDD inputs, in particular in the third and fourth quarter of the year where demand is generally the highest.[790] In particular, WD seems to have significantly decreased its HDD supplies to XHDD suppliers in recent years[791] and is not considered by most of the non-integrated XHDD suppliers as a reliable source of competitive inputs.[792]

898. In general, HDD suppliers which have already a significant presence downstream would already now not supply their best products to non-integrated XHDD suppliers or impose excessive pricing. In addition, non-integrated XHDD suppliers generally stated that the supply of HDDs over the distribution channel would not be economically feasible as such HDDs were generally too expensive due to the additional mark-up of the distributor.

899. In the last three years, non- integrated XHDD suppliers have already experienced supply shortages for HDDs.[793] This mainly occurred during the peak seasons of business which are the back-to-school and Christmas periods. Non-integrated XHDD manufacturers are concerned that the HDD producers would always give priority to Desktop, Mobile and Enterprise OEMs followed by distributors and XHDD competitors would only come last.[794]

900. In contrast to Toshiba, HGST was seen by the XHDD producers as a viable alternative to source competitive HDDs as input for XHDDs.[795] One competitor pointed out that "*WD&Hitachi combined represent a bigger threat to fair competition than Seagate&Samsung combined*"[796] and that only "*HGST has the capability to disturb the WD/Seagate duopoly*".[797]

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788 Non-integrated XHDD producer reply to the Commission's request for information of 22 June 2011, question 32.

789 See Seagate, Strategic Business Plan November 2010, p. 59, 63, submitted on 12 August 2011.

790 Non-integrated XHDD producer reply to the Commission's request for information of 22 Juni 2011, question 31, 33.

791 See WD reply to the Commission's request for information of 23 June 2011, Annex to question 14 with the revenue, volume and margin for sales of HDDs to producers of external drives.

792 XHDD suppliers reply to the Commission's request for information of 22 Juni 2011, question 33.

793 XHDD suppliers to the Commission's request for information of 22 June 2011, question 13.

794 XHDD suppliers to the Commission's request for information of 22 June 2011, question 13.

795 Non-integrated XHDD producers reply to the Commission's request for information of 22 June 2011, question 14, 22, 33, 34.

796 LaCie reply to the Commission's request for information of 22 June 2011, question 48.

797 LaCie reply to the Commission's request for information of 22 June 2011, question 22.

901. Non-integrated XHDD competitors consider that the proposed concentration would increase the ability of WD/HGST to raise its rivals' costs and strengthen and accelerate the trend of gradual phase-out of non-integrated players.[798] Four out of five XHDD suppliers that responded to the Commission's requests for information expressed concerns on the impact that the proposed concentration would have on their security of supply and the prices that they obtain.[799]

902. Toshiba is seen only as a "smaller player"[800] which does not have the capacity to significantly increase its customer base.[801] Moreover, Toshiba, which produces 2.5" HDDs itself but has to rely on the other HDD producers for its 3.5" XHDD offerings, indicated that the proposed concentration might make it more difficult to be able to source competitively 3.5" HDDs should the Merged Entity decide not to supply to Toshiba.[802] As a consequence, also Toshiba's competitiveness on the downstream market for XHDDs might risk to be impaired by the proposed transaction.

903. Even if the Parties were not the biggest direct suppliers of HDD to XHDD suppliers in 2010 as claimed by the Notifying Party in its reply to the Statement of Objections, this does not negate the fact that there is a high likelihood that the Merged Entity will have the ability to unilaterally raise the prices in 3.5" Desktop and Business Critical HDDs for the reasons explained at section 5.4.3.2.

904. Therefore, the proposed concentration will be likely to increase the ability of WD to raise the costs of non-integrated XHDDs manufactures in the downstream EEA XHDD market.

905. As concerns the incentive for WD to raise its rivals' costs in the downstream EEA-wide XHDD market, margins on that market seem to be generally higher than in the upstream 2.5" Mobile or 3.5" Desktop HDD markets. According to the Notifying Party's own submission, the large majority of sales of XHDDs are done with higher margins than of the like-for-like HDDs.[803]

906. On the one hand, the combined market share of WD and HGST which in turn mirrors the sales base on which to benefit from those higher margins, may not seem very large now. On the other hand, on the basis of the dynamic analysis of the downstream XHDD market, the current level of sales of each Party may understate the potential market share growth of the Merged Entity going forward.

907. Moreover, the type of strategies deployed in the past is also a relevant factor in the analysis.[804] [WD business secret relating to supply to downstream XHDD suppliers]*.[805] This provides a further indication that it currently already has an incentive to foreclose its non-integrated competitors. The proposed concentration

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798 Non-integrated XHDD producers reply to the Commission's request for information of 22 June 2011, question 32, 33.

799 Customers reply to the Commission's request for information of 22 June 2011, questions 49 to 51.

800 LaCie reply to the Commission's request for information of 22 June 2011, question 48.

801 LaCie reply to the Commission's request for information of 22 June 2011, question 34.

802 Reply of Toshiba to the Commission's request for information of 22 June 2011, question 35.

803 See WD reply to the Commission's request for information of 10 August 2011, question 33, Comparision of margins per unit of HDDs and XHDDs on the like-for-like basis.

804 Non-Horizontal Merger Guidelines, paragraph 45.

805 See WD reply to the Commission's request for information of 23 June 2011. […]*.

will align the incentive of HGST with those of WD, which would make the continued deployment of such foreclosure strategy more effective. The Notifying Party's claims cannot therefore negate the conclusion that in case the non-coordinated effects on the upstream 3.5" HDD markets would persist, the proposed concentration may increase the ability and incentive of WD to raise rivals' costs in the downstream EEA XHDD market.

E. Barriers to entry

908. In line with the Notifying Party's claims, several PC OEMs such as Asus, Acer, and Medion have tried to enter the XHDD market. However, so far they have only had very limited success. According to the market shares estimated by the Notifying Party, none of those players were able to gain significant market shares since 2006. For example, Acer which was already selling XHDDs in 2006 had not been able since 2010 to achieve even 1% market share annually. Moreover, Asus and Medion are not even listed separately in the EEA market share table provided by the Notifying Party which suggests that their position in the EEA market for XHDDs is more limited than that of Acer.

909. One reason for the limited success of these PC OEMS might be that the end-consumers see their brands mainly as PC brands and not as XHDDs brands. Therefore, their brands are only of limited use for the XHDD markets. […]*. Also Apple was not able to acquire any significant market share on the overall XHDD market, although having some success in a niche segment for consumer NAS space.

910. In addition, the proposed concentration would increase the barriers to enter the XHDDs market as it would make access to the most important input, HDD, more difficult as a result of the significant reduction of the HDD supply base. Any potential entrant would have to compete against the three remaining HDD suppliers, in particular the Merged Entity WD/HGST. The latter would be able to raise the costs of new entrants and leverage its upstream market power into the downstream XHDD market.

F. No countervailing buyer power

911. The Notifying Party submitted that retailers would have a significant amount of buyer power and could threaten to delist the Merged Entity's brands if it raised prices after the merger.

912. The Notifying Party did not substantiate its claim that it has encountered the threat of being delisted by large retailers such as Media Markt, Dixons or Fnac. Additionally, given that these retailers only account for […]*of the customer base of the Merged Entity are therefore unlikely to influence significantly its pricing behaviour.

5.4.9.5. Conclusion

913. Taking those factors into account, there are indications that the proposed concentration as notified to the Commission may give rise to a significant impediment to effective competition as a result of non-coordinated effects in the EEA-wide XHDD market. In any event, since the commitments submitted by WD remove the significant impediment to effective competition in the upstream worldwide markets for 3.5” Desktop HDDs, 3.5” CE HDDs and 3.5” Business

Critical HDDs and therefore the potential significant impediment to effective competition on the downstream EEA-wide XHDD market, there is no need to conclude in this regard.

914. In particular, the commitments will allow for the emergence of a new, viable and effective competitor on the upstream 3.5" HDD markets.

915. With the emergence of such a competitor, it is unlikely that the Merged Entity would have the ability unilaterally to increase prices in the upstream 3.5" HDD markets concerned. It will in turn also be unlikely that it would have the ability to increase its rivals' costs in the downstream EEA XHDD market.

916. In addition, it can be expected that if a new, viable and effective competitor emerges on the upstream 3.5" HDD markets, this competitor will have all the assets to enter the downstream market for XHDDs in the midterm and long-term, which is a growing market.[806] As explained in recitals 840 and 908, in contrast to OEMs, the HDD suppliers have been very successful in entering the XHHD market in recent years. Therefore, it can be expected that also the Divestment Business will be able to enter successfully the XHDD market. In addition, this new competitor will also have an increased incentive to supply HDDs to the non-integrated XHDD suppliers, in particular, as it would in the beginning not be active on the downstream XHDD market.

5.4.10. Coordinated effects

917. The Commission also assessed whether the proposed concentration would lead to a significant impediment to effective competition stemming from coordinated effects.

5.4.10.1. The View of the Notifying Party

918. The Notifying Party argues that the markets concerned by the proposed concentration have not been subject to coordination and considers that the proposed concentration will not give rise to a risk of coordination and impede competition as a result of coordinated effects.

919. The Notifying Party submits that HDD suppliers do not have the ability to reach terms of coordination. The quarterly investor calls by WD and Seagate communicating estimations of next quarter's Total Available Market (TAM) do not allow the companies to develop a "shared understanding" as to their respective share of this TAM (and hence to coordinate on output). First, HDD suppliers do not have control over what share they are allocated by customers.

920. Secondly, in markets characterised by numerous products, with innovation being the key driver, and short product lifecycles, it is difficult to reach terms of coordination.[807] Product mix effects resulting from different margins of products would render

806 Finally, the majority of the market respondents indicate that the scope of the divestment business is sufficient to ensure that the Divestment Business be viable and competitive in the XHDD market.

807 WD reply to the (6)(1)(c) Decision, paragraph 161.

coordination on output unstable unless there were more detailed coordination covering each product in every quarter - which would be difficult.[808]

921. Thirdly, TAM is controlled by customers. They could defeat the hypothesized coordination on TAM by overstating their demand. In such scenario, HDD suppliers would have strong incentives to cheat because they would have excess capacity.

922. Fourthly, coordinating on output would not work in an industry characterised by HDD suppliers' ability to rapidly expand output and strong incentives to so do given the cost structure of this business.

923. Fifthly, the Notifying Party argues that WD/HGST and Seagate/Samsung would have materially different cost structures and degrees of vertical integration, making it more difficult to agree on the desired level of coordinated output.

924. As for monitoring to a sufficient degree whether the other firms are deviating, the Notifying Party argues that monitoring for instance through the Requests for Quotations (RFQ) that customers send out to suppliers cannot be effective. First, OEM supplies account for only a part of the market and not all OEM customers operate through an RFQ process.[809] Also, OEMs could increase their sourcing through spot purchases and distributors where coordination on output would be more difficult. Secondly, it is not possible to infer detailed market shares from OEMs' forecasts of demand, as they often differ substantially from their actual requirements and are only made known for products that a particular supplier bids to supply.[810]

925. The Notifying Party submits that there would be no credible and effective punishment mechanism. The gains from deviation are large, given that quarterly contracts offered by OEMs are lumpy when viewed in relation to the relatively short product life span. Therefore, a reversal to competition would not be sufficient to deter deviation. Effective coordination would have to limit innovation as well. However, this would be bound to fail given that a deviant firm would gain a substantial lead over its rival. The rival would not be in a strong position to punish the deviant quickly because it would be behind the curve in the innovation race.[811]

926. Finally, WD/HGST and Seagate/Samsung would continue to be constrained by outsiders and external factors. First, Toshiba would have incentives to enter/expand in markets in which there would be coordination. Secondly, OEMs have countervailing buyer power and can restructure the way they procure HDDs. Thirdly, if prices were to rise, this would encourage the industry to increase the pace and extent of substitution through SSDs.[812]

5.4.10.2. The Commission's assessment

927. To assess coordinated effects, the Horizontal Merger Guidelines[813] and well-established case law[814] require proof that the merger will make coordination more likely, more

808 Annex 4 of WD reply to (6)(1)(c) Decision, p. 2.
809 WD reply to (6)(1)(c) Decision, paragraph 163.
810 Annex 4 of WD reply to (6)(1)(c) Decision, p. 4.
811 Annex 4 of WD reply to (6)(1)(c) Decision, p. 4.
812 Annex 4 of WD reply to (6)(1)(c) Decision, p. 5.
813 Horizontal Merger Guidelines, paragraphs 39 pp.

effective or more sustainable. The analysis needs to focus in particular on (i) the ability to reach terms of coordination; (ii) the ability to monitor deviations; (iii) the existence of a credible deterrent mechanism if deviation is detected; and (iv) the reactions of outsiders such as potential competitors and customers. For the sake of clarity, antitrust rules, in particular Article 101 TFEU will continue to apply to the Merged Entity after the closing of the proposed concentration, regardless of the outcome of this assessment under the Merger Regulation.

928. With respect to the ability to reach the terms of coordination, it is easier to coordinate among a few players than among many.[815] The proposed concentrationwould reduce the number of HDD suppliers to three (WD/HGST, Seagate/Samsung and Toshiba) in the markets for 2.5" Mobile and 2.5" CE.[816] The Commission's market investigation did not reveal historic evidence or customers' perception of coordination in markets such those of 3.5" Business Critical Enterprise or 3.5" CE HDDs, in which essentially only three HDD suppliers[817] have been competing with each other.[818] This is one indication that a reduction to three HDD manufacturers in the 2.5" Mobile and 2.5" CE markets does not necessarily imply a merger-specific risk of coordination.

929. As regards the 2.5" Mobile HDD market, the largest HDD market by volume and revenue, Toshiba is still likely to have the incentive after the merger to expand sales and increase its market share from its current [10-20]*% share.[819] In 2.5" Mobile, Toshiba is unlikely to accept the status quo of remaining in a distant third place compared to WD/HGST ([40-50]*%) and Seagate/Samsung ([30-40]*%) and coordinate on this basis. In 3.5" Business Critical Enterprise, Toshiba has invested substantially over the past two years or so into developing and manufacturing HDDs with the view of gaining market share from WD/HGST ([50-60]*%) and Seagate/ Samsung ([40-50]*%). However, given that Toshiba started volume production in this market only in Q2 2011, Toshiba has not yet gained any notable market share and it is too early to tell whether its entry will be successful. The Commission's market investigation indicates that certain OEMs that currently source from the

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814 See for example Case T-342/99, *Airtours plc v. Commission [2002] ECR II-2585*; Judgment of the Court of First Instance (Third Chamber) of 13 July 2006 in Independant Music Publishers and Labels Association (Impala, association internationale) v Commission (Case T-464/04), , [2006] ECR II-2289; Judgment of the Court (Grand Chamber) of 10 July 2008 in Bertelsmann AG and Sony Corporation of America v Independent Music Publishers and Labels Association (Impala) (Case C-413/06 P), [2008] ECR I-04951.

815 Horizontal Guidelines, paragraph 45.

816 Toshiba is a potential 3rd competitor in the market of 3.5" Business Critical Enterprise HDDs given that it recently entered this market. However, Toshiba has not yet gained any notable market share and its success in this market is uncertain. Therefore, the aforementioned market is not included into those counting three remaining competitors.

817 Samsung had no, or an insignificant (less than [0-5]*% market share) presence in these markets. Toshiba started selling 3.5" Business Critical HDDs only in 2011 but is not present in any other 3.5" market.

818 See for instance customers reply to the Commission's request for information of 20 April 2011 question 63 (parallel announcements), question 27 (refusal to bid) and question 77 (expected restriction of supplies post-merger), in which the large majority of customers did not perceive typical signals of coordination attempts. Furthermore, out of 40 HDD customers replying to the same questionnaire, only one XHDD provider considered that the merger's impact would be an increase in the "likelihood of a cartel".

819 This is true regardless of whether Toshiba's entry into the 3.5" Business Critical market will ultimately be successful.

parties would likely shift share after the merger to alternative suppliers such as Toshiba depending on the product offering, allowing Toshiba to further grow in the markets where it is present.[820] Moreover, Toshiba itself has publicly recognised that it expects to benefit from the WD/HGST merger by gaining share, amongst others, in the 2.5" Mobile and the 3.5" Business Critical Enterprise markets:

"From our perspective, Western Digital's announced intent to acquire Hitachi Global Storage Technologies is a positive development for the industry as a whole and for Toshiba in particular. Consolidation in the HDD market historically leads OEMs to re-balance their suppliers, which could present some opportunities for Toshiba. Considering our strong OEM relationships and our growing footprint in personal storage products, realigning the competitive forces gives Toshiba a chance to expand in the markets for mobile drives, enterprise nearline and high-performance HDDs, and SSDs." [821]

930. That statement has been confirmed by the Commission's market investigation in which Toshiba stated that "reallocation might lead to a small growth in Toshiba's sales".[822]

931. In the markets of 3.5" Desktop and 3.5" CE only two competitors would remain after the merger. Given Toshiba's recent entry, there is a potential third competitor in the 3.5" Business Critical Enterprise although it yet has to gain market share. Firms may find it easier to reach a common understanding on the terms of coordination if they are relatively symmetric, including in terms of market shares.[823] The Merged Entity would control [50-60]*% in each, the 3.5" Desktop and 3.5" CE markets, with Seagate/Samsung having [40-50]*% of sales. In the 3.5" Business Critical market, the 2010 market shares would be [50-60]*% and [40-50]*% respectively, with Toshiba having started volume production only in Q2 2011.

932. However, a number of elements appear to complicate agreeing on the terms of coordination in a sustainable way in those markets. As far as tacit collusion on price is concerned, the Commission's market investigation confirmed that the market is characterised by non-transparent bidding contests either through Requests for Quotations ("RFQs") – with 1 to 3 bidding rounds – or direct negotiations with the different suppliers.[824]

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820 six out of eleven responding customers stated that they would shift a portion of HDD purchases to alternative suppliers with one OEM mentioning explicitly Toshiba in the 2.5" segment (see Reply to the Commission's request for information to customers of 20 April 2011, questions 64.2 and 64.2.1.). As for the 3.5" Business Critical market, roughly half of responding Business Critical OEMs have qualified or have plans to qualify Toshiba's HDDs. (Customers reply to the Commission's request for information of 8 September 2011, question 2).

821 "Toshiba Foresees Gains From WDC-Hitachi Deal", 10 March 2011, http://blogs.barrons.com/techtraderdaily/2011/03/10/toshiba-foresees-gains-from-wdc-hitachi-deal/?mod=yahoobarrons (retrieved 14 October 2011).

822 Toshiba's reply to the Commission's request for information of 20 April 2010, question 56.1.

823 Horizontal Guidelines, paragraph 48.

824 Generally, HDD customers do not inform a potential supplier of prices quoted by another potential supplier (Customers reply to the Commission's request for information to customers of 20 April 2011, question 28). A majority of respondents consider that potential suppliers are usually not aware of the price quoted by their respective competitors (reply to the Commission's request for information to customers of 20 April 2011, question 30). Most HDD customers consider that previous suppliers cannot

933. With regard to potential tacit collusion on output (for example on each HDD supplier's share of quarterly TAM), it appears that coordination at the aggregate level (such as at the level of each product market) could potentially be destabilised because of product mix effects. In the event of a tacit agreement to share the overall TAM, each company would wish to achieve their share with high margin products within the allocated share of TAM. Notably, these product mix effects also apply within a given combination of product characteristics (such as form factor, capacity, rpm and interface) due to different product generations. Moreover, "sweet spots" for volume sales appear to differ by supplier (and among products) due to different technology and production capability.[825] This heterogeneity in product lifecycles makes it difficult to accurately predict the point within a lifecycle at which a product is at high yield and to overcome the difficulties raised by product mix effects. Effective and sustainable coordination would therefore require collusion at product level. Moreover, alignment would need to take place at least on a quarterly basis given that product launches are frequent (leading to relatively short life cycles of individual products[826]) and price negotiations with customers generally take place on at least a quarterly basis. The multitude of products within a given market[827] as well as the frequency of price negotiations with customers would therefore make it more unlikely to put in place a process of tacitly reaching the terms of coordination.

934. In any case, the divestiture remedies and other commitments offered by the Notifying Party and described in Section 5.6, would allow for the emergence of a new competitor in all markets in which only two HDD suppliers would be left. It is likely that the purchaser of the assets to be divested, which would have a lower market share in these markets than the Merged Entity and Seagate/Samsung, would have strong incentives not to participate in any coordination that seeks to preserve the status quo, or to deviate from the terms of coordination.

935. With respect to the EEA-wide market for XHDDs, coordinated effects are unlikely due to the less concentrated structure of that market (characterised by a higher number of suppliers holding smaller market shares).

5.4.10.3. Conclusion on coordinated effects

936. Taking those factors into account, it is concluded that it is unlikely that the proposed concentration will give rise to a significant impediment to effective competition stemming from coordinated effects in the relevant markets, all the more so in light of the commitments offered by the Notifying Party.

5.4.11. Customer foreclosure

937. The proposed concentration brings together two undertakings that are already vertically integrated upstream in the production of heads and media used in the manufacture of

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learn easily and quickly the price agreed with the new supplier (Customers reply to the Commission's request for information to customers of 20 April 2011, question 68).

825 See data for WD and HGST top 10 products in Annex 4 of WD reply to (6)(1)(c) Decision, pages 13-14.

826 For WD 3.5" Desktop products, the median value of lifecycle is of […]* quarters. The lifecycle of the majority of products does not extend beyond […]* quarters (See Annex 4 of WD reply to (6)(1)(c) Decision, pages 12-13).

827 For examples, WD offers over […]* different Desktop products during any quarter. See Annex 4 of WD reply to (6)(1)(c) Decision, p. 2.

HDDs. Each of the parties to the proposed concentration also sources a portion of their head and media requirements externally, from head and media manufacturers present on the merchant market. The extent of this external sourcing of heads and media differs for each of the parties to the proposed transaction.

938. The Commission carried out an assessment of the risk of customer foreclosure stemming from the proposed concentration to the detriment of heads and media suppliers respectively and the possible impact which such foreclosure would have on Toshiba's ability to source competitive components and therefore its ability to compete on the HDD markets.[828]

939. According to paragraph 29 of the Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings[829] ("the Non-Horizontal Merger Guidelines"): *"A merger is said to result in foreclosure where actual or potential rivals' access to supplies or markets is hampered or eliminated as a result of the merger, thereby reducing these companies' ability and/or incentive to compete. […] Such foreclosure is regarded as anti-competitive where the merging companies – and, possibly, some of its competitors as well – are as a result able to profitably increase the price charged to consumers".*

940. In assessing the likelihood of anticompetitive customer foreclosure, the Commission examined whether: (i) the combined entity would have the ability post-merger to foreclose head and/or media suppliers' access to a sufficient customer base through the possible reduction in external purchases due to an increased combined internal head and media production capability for the Merged Entity post merger; (ii) the combined entity would have the incentive to do so; (iii) a foreclosure strategy would have a negative impact on the viability of heads and/or media suppliers; (iv) a foreclosure strategy would have a significant detrimental effect in the downstream markets for HDDs by impairing Toshiba's ability to effectively compete on those markets and therefore by allowing the Merged Entity to raise HDD prices.

941. As explained in the recitals that follow, the data provided by the parties in combination with the results of the Commission's market investigation showed that while the Merged Entity may have a certain ability to foreclose components' suppliers it will not have the incentive to do so and in any case, any attempt of foreclosure would have no effect on components' suppliers and by consequence on the downstream HDDs markets.

942. For these reasons the proposed concentration does not lead to a significant impediment to effective competition stemming from customer foreclosure.

5.4.11.1. Heads

A. Introduction

943. Heads are key components for the production of HDDs and account for approximately [20 to 30]*% of the total value of an HDD. They are not employed in any other end-use application beyond HDDs.

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828 As indicated in recital 88, Toshiba fully sources its upstream heads and media requirements from the merchant market.

829 OJ C265, 18 October 2008, p. 6.

944. Each of WD, HGST and Seagate/Samsung produce heads internally and also purchase heads from TDK. None of the three vertically integrated players sell heads in the merchant market.[830] Toshiba has no internal head manufacturing capability and purchases all its head requirements from TDK, the only independent supplier of heads in the merchant market.

945. As acknowledged by the Notifying Party, TDK heads are considered to be highly innovative.[831] In the context of the Commission's market investigation, [Details on HGST's ability to manufacture high quality heads]*.[832]

946. In 2010 WD purchased […]* heads from TDK, accounting for approximately […]*% of TDK total 2010 head production.[833] HGST produces the vast majority of its head requirements internally. HGST's purchases from TDK in 2010 amounted to […]* units, accounting for […]*% of TDK's total 2010 head production..[834] […]*whilst HGST's external demand for heads decreased.[835]

947. During the Commission′s first phase market investigation, concerns were voiced that the proposed concentration could result in a reduced demand for heads from TDK, which could in turn translate into revenue losses for TDK and therefore fewer resources for research and development. In turn, this may raise Toshiba's costs or severely impact Toshiba's ability to compete on the HDD markets (should TDK's viability be affected as a result of the loss of sales to the merged WD/HGST entity) and by consequence, allow the Merged Entity to profitably establish higher HDD prices.[836]

B. Ability to foreclose

948. The Notifying Party submits that after the merger, it would have no ability to foreclose access to downstream markets because even the removal of WD/HGST's demand would not materially affect heads supplies.[837]

949. The capacity utilisation figures for heads submitted by Notifying Party indicate that from 2005 to date, [Details on WD capacity utilization for heads]*.[838] On the basis of the 2010 capacity utilisation rate ([…]*%), WD could produce approximately […]* additional units.[839]

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830 Since neither WD nor HGST sell heads in the merchant market, input foreclosure is not assessed in this decision.

831 WD reply to the Commission's request for information of 23 June 2011, question 61.

832 HGST reply to the Commission's request for information of 23 June 2011, question 47.

833 According to TDK, the volume of purchases of heads by WD in 2010 was higher than that indicated by WD. In any event for the purpose of the assessment of the impact of a potential customer foreclosure strategy, both sets of data will be taken into account. TDK's reply to the Commission request for information of 13 May 2011, question 1 and WD reply to the Commission request for information of 27 May 2011, question 17.

834 TDK reply to the Commission's request for information of 13 May 2011, question 1 and HGST reply to the Commission's request for information of 27 May 2011, question 17.

835 TDK reply to the Commission's request for information of 13 May 2011, question 1.

836 TDK reply to the Commission's request for information of 27 April 2011, question 33.

837 WD reply to the 6(1)(c) Decision.

838 WD reply to the Commission's request for information of 8 July 2011, question 7 and Annex 26 (upof).

839 WD reply to the Commission's request for information of 23 June 2011, question 65.

950. At the same time, the Notifying Party submits that the costs associated with shifting HGST's supply of heads from TDK towards internal sourcing would be high. In this regard, the Notifying Party submits that a capital investment of approximately USD [0-10]* million would be required to internalise the supply of heads for existing HDDs and approximately USD [25-50]* million would be needed to internalise the supply of heads for pipeline HDDs.[840] Given that WD current external demand for heads by far exceeds HGST's external demand for heads, the cost for internalising WD's demand for heads is expected to be greater than the figures indicated for internalising HGST demand. The Notifying Party estimates that it would require [12 to 24 moths]* to internalise the supply of heads for HGST drive programmes that are already shipping in volume and [1 to 2 years]* for drive programmes in the development phase.

951. […]*.[841] Whilst on the basis of the 2010 capacity utilisation rate ([…]*%), HGST could produce approximately […]* additional units, which would be enough to absorb HGST's current yearly external demand for heads.[842]

952. Taking those elements into account, the Merged Entity would appear to have sufficient spare capacity to immediately internalise approximately [50-100]* million units of heads, which represents approximately [40-50]*% of the Merged Entity's combined 2010 external demand for heads (and approximately [5-10]*% of the Merged Entity's total[843] 2010 demand for heads). In any event, WD confirmed that the Merged Entity would theoretically be able to produce internally all the Merged Entity's external requirements for heads within a period of one to two years time.[844]

953. It also appears to be contractually feasible for the Merged Entity to reduce purchases from TDK. [WD and HGST's strategic information on the sourcing strategy for heads]*.[845]

954. It can therefore be concluded that after the merger, the Merged Entity would have in principle the ability to deprive TDK of […]* purchases of head units over time, thereby foreclosing the latter from a significant customer.

C. Incentive to foreclose

955. The Notifying Party submits that even though WD and HGST are vertically integrated, they are pursuing a dual-sourcing (internal and external) strategy and purchase a portion of their head requirements from TDK. In that regard, the Notifying Party submits that it is integral to WD's strategy to source from TDK to give WD volume flexibility and security of supply. In addition, according to WD, sourcing of heads from TDK is important to WD's ability to be competitive in terms of time to market as many of WD's most innovative products are launched on the basis of heads sourced from TDK.

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840 WD reply to the Commission's request for information of 23 June 2011, question 61.

841 WD reply to the Commission's request for information of 8 July 2011, question 7 and Annex 26 (upof).

842 HGST reply to the Commission's request request for information of 23 June 2011, question 51.

843 Internal and external.

844 WD reply to the Commission's request for information of 7 November 2011, question 2. In its reply to the request for information of 7 November 2011, question 2, the Notifying Party states that it would take [12 to 24 months]* to internalise the supply of heads for drive programmes already shipping in volume and [1 to 2 years]* for drive programmes in the development phase.

845 Supplier (TDK) reply to the Commission's request for information of 21 June 2011, question 10 and WD reply to the Commission's request for information of 23 June 2011, question 69.

Accordingly the Merged Entity would not have the incentive to stop sourcing heads from TDK.[846]

956. The benefits of dual-sourcing described in the preceding recital appear valid especially in light of the practice of the parties and their other vertically integrated competitor, Seagate, to purchase part of their heads requirements externally.

957. Although HGST has [WD and HGST have opted for a dual-sourcing strategy]*.

958. The advantages of a dual sourcing strategy were also confirmed by the Commission's market investigation which showed that the other vertically integrated player on the HDD market, Seagate/Samsung, also externally sources part of its heads requirements.

959. The Commission believes that the Merged Entity will have strong incentives to continue sourcing part of its heads requirements from TDK in the coming years consistent with WD's current dual sourcing strategy. This conclusion appears reasonable particularly in light of the HDD sales that the Merged Entity could risk to lose without an external source of heads, should its production facilities be unable to meet the Merged Entity's demand for heads or the quality level requested by customers for their HDDs. As a consequence, the risk of losing important sales of HDDs is a significant deterrent for the Merged Entity to pursue a foreclosure strategy to the detriment of TDK, particularly in view of the benefits that a dual sourcing strategy would bring to the Merged Entity post transaction.

960. It can therefore be concluded that after the merger, the Merged Entity is likely not to have the incentive to internalise all of its demand for heads and therefore pursue a foreclosure strategy.

D. Impact on effective competition

961. The Notifying party submits that it intends to continue its dual sourcing strategy for the merged WD/HGST entity and accordingly it intends to purchase approximately [10-20]*% to [10-20]*% of the Merged Entity's total demand for heads externally.

962. The Commission's market investigation revealed that irrespective of the medium term ability of the Notifying Party to pursue a foreclosure strategy, the proposed concentration would not have detrimental effects on TDK's business.

963. From the information on the Commission′s file, it can be concluded that in the context of the relevant counterfactual and on the basis of volumes purchased by the parties in 2010, if the Merged Entity were to purchase […]* of its requirements externally, this percentage of purchases by the Merged Entity would not impact TDK in a detrimental manner.[847]

964. Moreover, any potential reduction of the volume of heads sold by TDK to the Merged Entity as compared to the current level could be compensated by Toshiba's future

846 WD reply to the 6(1)(c) Decision.

847 TDK reply to the Commission's request for information of 7 November 2011, question 2.

purchases which are expected to increase as a result of the customer reallocation in the 2.5" Mobile market.[848]

965. A purchase of [10-20]*% by the Merged Entity from TDK would result in an increase of approximately [0-50]* million heads from TDK in comparison to the 2010 combined purchase figures for WD and HGST.

966. In any event, even if the Notifying Party will not externally purchase any heads from TDK after the merger, information on file with the Commission indicates that on the basis of volumes purchased by the parties in 2010, TDK would not be impacted in a detrimental manner.[849]

967. Taking those factors into account, it can be concluded that the proposed concentration is unlikely to have any significant adverse effects on TDK's business. Consequently it is also unlikely to weaken Toshiba's ability to competitively source heads and to effectively compete on the HHD markets.

E. Conclusion

968. It should be concluded that the proposed concentration is unlikely to significantly impede effective competition in any of the HDD markets due to their vertical relationship with the upstream market for heads.

5.4.11.2. Media

A. Introduction

969. Media constitute important components in the manufacture of HDDs.

970. Each of WD, HGST and Seagate/Samsung manufacture a portion of their media production internally and source their remaining requirements from independent media manufacturers present on the merchant market. Toshiba sources all of its demand for media externally. There are currently two independent media manufacturers, Fuji and Showa Denko.

971. WD and HGST currently do not purchase any of their requirements from Fuji. Therefore, the proposed concentration might only have possible detrimental effects in relation to Showa Denko's media business.

972. The Commission′s market investigation also aimed at assessing whether the proposed concentration would negatively impact Toshiba's ability to compete in the HDD markets. Such effect could occur if the viability of Showa Denko's media business is impaired as a result of foreclosure of Showa Denko from a sufficient customer base, which could in turn prevent Toshiba from obtaining sufficient and competitive media to produce HDDs.

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848 See recital 812.

849 TDK reply to the Commission's request for information of 7 November 2011, question 2.

973. However, for the reasons which will be explained in the recitals that follow, the proposed concentration is unlikely to negatively impact the viability of Showa Denko and by consequence Toshiba's ability to competitively source media.

B. Ability to foreclose

974. In 2010, WD acquired approximately […]* units of media from Showa Denko,[850] whilst HGST acquired approximately […]*[851] […]*.

975. On the basis of the capacity utilisation rate for media ([…]*%) for 2010, submitted by Notifying Party, WD could produce approximately […]* additional units.[852] On the basis of the capacity utilisation figures for 2010, submitted by HGST, capacity utilisation figures HGST could produce approximately […]* additional units.[853]

976. The Merged Entity would therefore appear to have sufficient spare capacity so as to immediately internalise just over […]* units of media, which represents approximately […]*% of the Merged Entity's combined 2010 external demand for media.

977. The Notifying Party estimates that the Merged Entity would theoretically be able to produce internally all the Merged Entity's requirements for media within a period of one to two years time.[854]

978. It follows that the Merged Entity would be able to reduce a portion of its demand for media from Showa Denko within the short term. The Merged Entity would be able to internalise all the Merged Entity's media demand only in the medium term.

C. Incentives to foreclose

979. The Notifying Party submits that after the merger, it does not intend to source all of the Merged Entity's demand for media internally and that it plans to procure […]*% of the Merged Entity's demand for media from external sources.[855] In this regard, WD emphasises that dual sourcing of media is important for continuity of supply, risk mitigation and 'time to technology' reasons.[856]

980. The Notifying Party's statements appear valid particularly in light of the advantages associated to a dual sourcing strategy as compared to the risk of losing business opportunities that the absence of external components suppliers might cause.

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850 WD reply to the Commission's request for information of 23 June, question 54. The figures for WD's media purchases submitted by Showa Denko in its reply to the Commission's request for information of 21 June 2011, Attachment 1, are slightly higher.

851 HGST reply to the Commission's request for information of 7 November 2011, question 1. The figures for HGST's media purchases submitted by Showa Denko in its reply to the Commission's request for information of 21 June 2011, Attachment 1, are slightly higher.

852 WD reply to the Commission's request for information of 23 June 2011, question 65.

853 HGST reply to the Commission's request for information of 23 June 2011, question 51.

854 WD reply to the Commission's request for information of 7 November 2011, question 2. In its reply to the request for information of 7 November 2011, question 2, the Notifying Party states that it would take [12 to 24 months]* to internalise the supply of media for drive programmes already shipping in volume and [1 to 2 years]* for drive programmes in the development phase.

855 WD reply to the Commission's request for information of 23 June 2011, question 58.

856 WD reply to the Commission's request for information of 23 June 2011, question 58.

981. It follows that the Merged Entity would only have low incentives to internalise all of its media requirements in the coming years.11.2.4. Impact on effective competition

982. The Commission's market investigation revealed that, on the basis of 2010 media purchases from Showa Denko, even in the unlikely scenario where Showa Denko were to lose all of WD and HGST's purchases of media post-transaction, the viability of its business would not be impaired and any such loss would be compensated by the expected increase in demand for media going forward as a result of the customer reallocation in the 2.5" Mobile market.[857]

983. As a result, Showa Denko's turnover after the merger is expected to be preserved in a way that it will be able to competitively operate on the market. This conclusion is also corroborated by Toshiba's announcement (16 July 2011) of an advanced technology centre with TDK and Showa Denko. This initiative will result in the development of new technologies which in turn may increase TDK's and Showa Denko's attractiveness as suppliers also for the vertically integrated manufacturers.

984. Moreover, in the unlikely scenario where Showa Denko's viability were negatively impacted as a result of the loss of its sales to the Merged Entity after the merger, Toshiba's ability to compete in the HDD markets would remain unaffected as Toshiba would be able to continue sourcing competitive media from another media supplier.

985. It can be concluded that the proposed concentration is not likely to have any significant adverse effect on Toshiba's ability to source its media requirements and to effectively compete on the HDD markets.

D. Conclusion

986. It should be concluded that the proposed concentration would not significantly impede effective competition in any of the HDD markets due to their vertical relationship with the upstream market for media.

5.4.12. Efficiencies

5.4.12.1. Introduction

987. It is possible that efficiencies brought about by a merger counteract the effects on competition and in particular the potential harm to consumers that it might otherwise have.[858] In order to assess whether a merger would significantly impede effective competition, the Commission performs an overall competitive appraisal of the merger. In making this appraisal, the Commission takes into account the factors referred to in Article 2 (1) of the Merger Regulation, including the development of technical and economic progress provided that it is to the consumers' advantage and does not form an obstacle to competition.[859]

988. The Commission may decide that as a consequence of the efficiencies that a merger brings about, there are no grounds for declaring the merger incompatible with the

857 See recital 812.
858 Horizontal Merger Guidelines, paragraph 76.
859 Horizontal Merger Guidelines, paragraph 77.

internal market. This will be the case if the Commission is in a position to conclude on the basis of sufficient evidence that the efficiencies generated by the merger are likely to enhance the ability and incentive of the Merged Entity to act pro-competitively for the benefit of consumers, thereby counteracting the adverse effects on competition which the merger might otherwise have.[860]

989. For the Commission to take account of efficiency claims in its assessment of the merger and to conclude that as a consequence of efficiencies there are no grounds for declaring the merger to be incompatible with the internal market, the efficiencies have to benefit consumers, be merger-specific and verifiable.[861] These conditions are cumulative.

5.4.12.2. The view of the Notifying Party

990. The Notifying Party submits that the Commission should take account of a number of efficiencies that would be brought about by the proposed concentration.

991. Firstly, the combination of the Parties' complementary footprint in the Enterprise, CE and XHDD markets would benefit consumers by making the Merged Entity better positioned to compete rigorously with Seagate and Toshiba.[862]

992. Secondly, the combination of the Parties' R&D resources would lead to greater and faster product development and improve the Merged Entity's ability to initiate and implement large technology transitions that are required to continue developing faster and higher capacity HDDs at lower prices. The Notifying Party submits that it plans to invest more than USD […]* annually in R&D to broaden its product portfolio and to invest in fundamental research and the development of latest-generation HDD components.[863]

993. Thirdly, the Notifying Party expects to achieve significant other savings in its operational expenses.[864] More specifically, the proposed concentration would give rise to economies of scale […]*.[865] The Notifying Party submits that the proposed concentration is expected to yield operating expense savings of more than USD 400 million. Two-thirds of the synergies would be achieved in the first […]* and the balance over […]*. The Notifying Party also expects that the proposed concentration will result in savings […]*.[866] […]*.[867]

994. Fourthly, the Notifying Party notes that the reduction of duplicative and redundant factory overhead is expected to be realised over the first [0-6]* months after implementation of the proposed concentration.[868] The proposed concentration would

860 Horizontal Merger Guidelines, paragraph 77.
861 Horizontal Merger Guidelines, paragraph 78. The Commission's approach to efficiencies has been upheld. See paragraph 386 of the judgment of the General Court (Third Chamber) of 6 July 2010 in Ryanair Holdings plc v Commission, [2010] ECR 00000, (OJ C 221, 14.8.2010, p. 35).
862 Form CO, paragraph 348.
863 Form CO, paragraphs 348, 353 and 356.
864 Form CO, paragraphs 349-353.
865 [WD strategic information concerning projected efficiencies]*.
866 Form CO, paragraph 355.
867 WD reply to 6 (1) (c) Decision, paragraph 212.
868 Form CO, paragraphs 354 and 357.

moreover reduce capital costs through the better utilisation of existing assets and consolidation of equipment suppliers. These savings would occur over the initial 1 to 3 years after implementing the proposed concentration.

995. Finally, the Notifying Party expects that the […]* use of internally-produced components such as heads and media will enable a reduction in cost of goods sold.[869] The Merged Entity would have the flexibility to increase the internal production of these components, thereby reducing the premium paid for procuring them for third party suppliers. The proposed concentration would moreover offer potential for further vertical integration, such as in the area of suspensions.[870]

5.4.12.3. The Commission's assessment

996. The Notifying Party estimates efficiencies would result in an overall reduction in annual costs equal to […]*% of post-merger revenue.[871] Of these savings, […]* percentage points would result from […]*.[872] The Notifying Party asserts that the competitive pressure from Toshiba and the countervailing buyer power on the HDD markets will ensure pass-on of these savings to consumers.[873] These savings concern the overall HDD business.

997. The Notifying Party's figures for the estimated efficiencies overstate its own internal assumptions. […]*, WD Chief Financial Officer confirmed that WD's internal assumption is that the estimated efficiencies would result in an overall reduction in annual costs close to […]*% of post-merger revenue.[874]

998. In its Reply to the Statement of Objections, the Notifying Party argues that the Commission misrepresented WD […]* testimony with regard to cost savings. According to the Notifying Party, WD […]* confirmed the estimated […]*% cost saving in his FTC deposition of 2 August 2011 and indicated that the […]*% range was a conservative estimate presented to the WD Board of Directors prior to the announcement of the proposed concentration.

999. The Commission has reviewed the internal documents submitted by the Notifying Party to substantiate its efficiencies claims and notes that contrary to the Notifying Party's assertion, the synergies estimates presented to lenders after the announcement of the proposed concentration are exactly the same as the ones presented to the WD Board of Directors prior to that announcement.

1000. Moreover, the source and details for those calculations are unclear. The Notifying Party only specifies that its "efficiencies were analysed and quantified under the direction of its Chief Financial Officer."[875] The Notifying Party does not clearly identify those savings that are […]*. For the first category of efficiencies, the Notifying Party must adduce particularly cogent evidence that they will be passed on

869 Form CO, paragraph 356.
870 WD reply to the 6(1)(c) Decision, paragraph 209.
871 WD reply to the 6(1)(c) Decision, paragraph 197.
872 Ibidem.
873 Form CO, paragraphs 358-360.
874 [deposition of WD executive to the FTC]*.
875 WD reply to the 6(1)(c) Decision, footnote 101.

to consumers. In its reply to the Statement of Objections, the Notifying Party spelled out the ten sources of costs savings that it expects to achieve post merger. […]*.

1001. In its Supplemental submission of 26 September 2011, the Notifying Party indicates that in general the share of total efficiencies accruing to 3.5" HDDs is proportional to 3.5" HDDs' share of all HDDs. On this account, the Notifying Party estimates that reduction in fixed costs and reductions in marginal cost of goods sold (COGS) directly attributable to 3.5" HDDs amount to USD […]*.

1002. […]*. On the one hand, there are significant inconsistencies between the various estimates submitted by the Notifying Party. On the other hand, and more importantly, the Notifying Party has not provided any of the raw underlying data and calculations on which these much aggregated estimates are based.

1003. Despite the uncertainty regarding the nature and the extent of the efficiencies claimed by the parties, the Commission has provided its best efforts to analyse the claimed efficiencies. The relevant benchmark in assessing efficiency claims is that efficiencies must benefit consumers in the relevant market and that they must be merger specific and verifiable.[876]

A. Verifiability

1004. Efficiencies first have to be verifiable so that the Commission can be reasonably certain that the efficiencies are likely to materialise. This verifiability is the necessary first step to ascertain that efficiencies are substantial enough to counteract the merger's expected harm to consumers.[877] Where reasonably possible, efficiencies and the resulting benefit to consumers should be quantified. As a minimum, it must be possible to foresee a clearly identifiable positive impact on consumers, not a marginal one.[878]

1005. The Notifying Party's efficiency claims are rather general in nature. As stated in recital 998, the source and details for the Notifying Party's efficiency estimates are unclear. As concerns the likelihood that the claimed efficiencies will materialise, the Notifying Party notes that it "*has recent acquisition experience*" and that it "*is confident that it will be able to realise the projected efficiencies*".[879] Also, the Notifying Party further claims that the fact that the efficiencies would be "*the cornerstone*" of the rationale of the proposed concentration and that a certain time estimate for the achievement of the efficiencies has been given, would be sufficient to conclude that the efficiency claims are not speculative.[880]

1006. The Notifying Party concludes that the claims are "*not "speculative*" because they are expected to start being materialised in 2011. The fact that the Notifying Party claims to expect such a short timing for the efficiencies to materialize is not a proof in itself. So long as the Notifying Party does not provide detailed quantitative or other evidence clearly explaining how efficiency calculations have been undertaken – that

876 Horizontal Merger Guidelines, paragraph 76-88.
877 Horizontal Merger Guidelines, paragraph 86.
878 Ibidem.
879 Form CO, paragraph 362.
880 Ibidem.

is to say by providing the raw data and clearly specifying the underlying assumptions on which the calculations are based – the Commission is not in a position to confidently conclude that the claims are verifiable and on the contrary has to treat these claims as being unsubstantiated. Claiming confidence about the materialisation of efficiencies without any evidence is not sufficient. Similarly, the mere quotation of past experience in acquisitions without providing any evidence to document which recent acquisition it refers to or how the alleged efficiencies actually materialised is also insufficient.

1007. For efficiencies to be deemed verifiable, the Notifying Party must at the very least provide hard evidence that would allow the Commission to compare the claimed efficiencies with some relevant benchmark. It is impossible for the Commission to ascertain on which basis the parties can claim that they will save […]*. All the figures provided by the parties in the Reply to the Statement of Objections are extremely aggregated by nature and the Notifying Party did not submit any evidence that would allow the Commission to verify their credibility, as it would for instance be the case if these efficiency claims had been generated using hard engineering figures based on past, comparable, experience. Overall, the Commission is therefore not in a position to conclude that the claimed efficiencies are verifiable.

B. Merger specificity

1008. The Notifying Party must demonstrate for each of the efficiencies claimed, that it is a direct consequence of the proposed concentration and it cannot be achieved to a similar extent by less anticompetitive alternatives.[881]

1009. The Notifying Party asserts that the efficiencies are merger-specific and could not have been achieved more efficiently by other means than the proposed concentration.[882] This assertion is not backed up by hard evidence and does not therefore meet the required standard of the merger specificity test.

1010. In its Reply to the Statement of Objections, the Notifying Party argues that [WD strategic information concerning R&D agreements]*. Similarly, the efficiency gains resulting from combining the complementary strengths of the Parties would not be achievable without the merger. However, the parties have not submitted hard evidence supporting this claim, in particular relative to the type of complementarities that each of the merging firms are bringing together (including the reasons why such complementarities could not be put to profit through cooperation).

1011. The Notifying Party also did not show that [WD strategic information concerning R&D agreements]*. There is currently a multitude of R&D cooperation agreements on the relevant HDD markets. These include cooperation agreements between HDD competitors (for instance cross-licensing agreements) and joint research and development programmes with HDD component suppliers. The Notifying Parties failed to explain in detail which efficiencies can be attained by less restrictive means such as the ones described in this recital. It also failed to describe which efficiencies cannot be attained by such less restrictive means, and for what reason. Finally, the

881 Horizontal Merger Guidelines, paragraph 85.

882 Form CO, paragraph 361.

Notifying Party has not demonstrated that. [WD strategic information concerning R&D agreements]*.

1012. Moreover, many other items of the efficiency claims are extremely unlikely to be fully, if at all, merger specific. […]*. The incentives to increase yield, improve quality and reduce inventories would also be present absent the merger. The Notifying Party has not explained, not to mention proven, how the merger modifies the incentives or ability to generate these efficiencies. The role of the merger in attaining these efficiencies is thus at the very least dubious.

1013. In any case, on the basis of the Notifying Party's submission, the Commission is not in a position to verify the merger specificity of any of the claimed efficiencies.

C. Benefit to consumers

1014. The relevant benchmark in assessing efficiency claims is that consumers[883] will not be worse off as a result of the merger. For that purpose, efficiencies should be substantial and timely and should in principle benefit consumers in those relevant markets where it is likely that competition concerns would occur.[884]

1015. The nature of the impact of marginal and fixed costs savings are different. It is generally admitted that cost efficiencies that lead to reductions in variable or marginal costs are more likely to be relevant to the assessment of efficiencies than reductions in fixed costs.[885] However, in dynamic markets, where innovation is relevant, fixed costs savings can also have a dynamic impact on (quality adjusted) prices if these fixed costs savings lead to a faster erosion of prices and/or a faster increase in quality.

Variable costs savings

1016. The Commission first analyses the more classical efficiency claims based on marginal or variable cost reductions. There must overall be sufficient certainty that, *inter alia* in light of the existence of competitive pressure on the remaining firms in the market, claimed efficiencies are likely to be passed on to consumers to a degree that is sufficient to counteract the likely consumer harm.[886] In its reply to the Statement of Objections, the Notifying Party refers to economic theory to show that reductions in marginal costs create an incentive to increase output and lower prices given that the extra revenue from an additional unit sold would be greater than the extra cost associated with that unit.

1017. In addition, the Notifying Party claims that the fact that two mergers are occurring simultaneously is likely to increase the pressure to pass on benefits. Indeed, the Notifying Party considers it likely that Seagate will achieve costs savings through its

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883 As pointed out in the Horizontal Merger Guidelines, footnote 105, "*the concept of 'consumers' encompasses intermediate and ultimate consumers, i.e. users of the products covered by the merger. In other words, consumers within the meaning of this provision include the customers, potential and/or actual, of the parties to the merger*."

884 Horizontal Merger Guidelines, paragraph 79.

885 Horizontal Merger Guidelines, paragraph 80.

886 Horizontal Merger Guidelines, paragraph 84.

acquisition of Samsung's HDD business that will in turn create an incentive to expand output.

1018. First, the Notifying Party seems to consider as a fact that reductions in variable costs are passed on. However, the Horizontal Merger Guidelines merely indicate that reductions in variable costs are, in principle, more likely to result in lower prices for consumers (emphasis added).[887] Hence, the Notifying Party still needs to demonstrate that the claimed efficiencies will be passed on to a sufficient degree to the final consumer.

1019. Secondly, the incentive on the part of the Merged Entity to pass efficiency gains on to consumers is often related to the existence of competitive pressure from the remaining firms in the market and from potential entry.[888] Like the price equilibrium or the degree of price erosion, the pass-through is determined by the degree of concentration on the market after completion of the proposed concentration. In that regard, it has been concluded that the merger would significantly relax the competitive constraint the remaining actors exert on each other, resulting in higher equilibrium prices and smaller pass-on. It has been explained in sections 5.4.3, 5.4.4 and 5.4.5 that in a scenario where only two suppliers compete and know that they would at least obtain a guaranteed minimum share in the purchases of individual customers, prices are less likely to be driven down to the marginal costs of each supplier.

1020. The Notifying Party provided graphical analysis of WD's quaterly average sales price per unit and average cost per unit and per GB, broken down by fixed and variable cost in the period from CY06Q1 to CY11Q1. […]*. In particular, in the 3.5" Desktop market, ASP and ACP per unit both fell by […]*% while ASP and ACP per GB showed a strong correlation and both fell by […]*% over the period.

1021. Furthermore, the Notifying Party provided a regression analysis to evaluate the contributions of fixed cost reductions and variable costs reductions in the observed price reduction. According to this analysis, across all business segments, a […]*% reduction in cost would result in an […]*% reduction in average price, indicating substantial pass-on. Based on all the above-mentioned elements, the Notifying Party estimates that the merger will generate downward pricing pressure in the region of […]*%.

1022. That analysis cannot be accepted for at least two reasons.

1023. First, the Commission considers that WD's historical pass-through estimate, even if it were valid, would not be indicative of the pass-through after the merger. Pass through of variable costs heavily depends on the market structure and the competitive constraint market players impose to each other. The Commission has proved that the market conditions are likely to change and that the merger is likely to relax the competitive constraint the two remaining players will impose on each other, compared to the situation before the merger. Hence, even if it were valid, a historical analysis of pass-through in an entirely different, and generally more competitive, market situation before the merger is likely to overestimate the pass-through after the

887 Horizontal Merger Guidelines, paragraph 80.

888 Horizontal Merger Guidelines, paragraph 84.

merger. When the expected competitive effect of the merger is significant, the magnitude of the overestimation is likely to be large and problematic. Even if it were to be primarily based on historical data, a consistent estimate of the pass-through after the merger should take into account the change in the incentives to compete. The Notifying Party has failed to do so.

1024. Secondly, the figure put forward by the parties of an estimated pass-through of […]*% is very likely to be largely overestimated, even for the pre-merger pass through of variable costs reductions.[889] If anything, the graphical analysis unambiguously shows declining trends for both prices and costs. This is, by and large, the core reason of the price-cost correlation. Attributing the full cause of the price decline to the trend in costs is clearly fallacious.

1025. That fallacy is first a consequence of the choice of the parties to use average prices and costs across a large range of products. These average figures are largely determined by composition effects. It is thus impossible to delineate the correlation of prices and costs variations for a given physical drive from the pure composition effects. Changes in the mix of products sold are likely to bias the price-cost correlation upwards. For a given quality, a low cost product is likely to be priced relatively low and the share it represents for a particular manufacturer is likely to increase over time (as low price products are likely to lead to large sales volumes). This can create declining trends of average prices and costs, without resulting from changes in prices or costs of any particular product. For such an analysis to be meaningful, it should at the very least rely on product level data. It also should rely on the use of up-to-date time series and panel data econometric techniques that address the issue of the obvious non stationary and autocorrelation of individual price and cost patterns.

1026. Moreover, and most importantly, pass-through of variable cost reductions refers to the impact on the price of one manufacturer of a unilateral decline of the variable cost of this very manufacturer. Variable costs of all manufacturers tend to decline simultaneously. Then, not controlling for the costs of the other manufacturers spuriously adds the competitive effect of the decline of the costs of competitors to the effect of the reduction of the own costs of this manufacturer. That unambiguously biases upwards the pass-through estimates.

1027. Finally, the interpretation of a causal link between prices and costs should be particularly cautious, even when this link has been estimated using product level data, adequate econometric techniques and proper specification. For instance, as explained by the Notifying Party in Annex 2 of the Reply to the Statement of Objections, at the time of its introduction, for instance at a new capacity point, a product faces little competition. Then, as time passes, competitors introduce those products and drive prices down. At the same time, as production of these products ramp up, unit variable costs typically go down as a result of learning by doing and scale effects. Some of these variable costs reductions might be passed-on to consumers. However, neglecting the role played by the introduction of comparable products by competitors in the unit price decline unambiguously overestimates the influence of simultaneous cost declines. Moreover, as prices decrease, partly due to

889 Reply to the Statement of Objections, paragraph 684, see also figures 21, 22, 23 and Table 19.

the competitive effect, quantities sold increase. Price decline thus accelerates the ramp-up, and thus variable cost reductions, creating a reverse causality of prices on costs that increase the upward bias of the estimates.

1028. To conclude, due to all the methodological issues described above, the figure of […]*% of pass-through of variable costs reductions is not credible and it could at best be a very rough and significant overestimate of the pass-through that might prevail following the proposed concentration. The Notifying Party has thus failed to provide a credible estimate for the pass-through of variable cost reductions. They have also failed to link such estimate with the pass-through after the merger. Hence, for none of the efficiencies claimed and related to variable costs savings, the Notifying Party has demonstrated in any detail to which extent they are likely to be passed on to consumers or to counteract likely consumer harm.

Fixed costs savings

1029. According to the Notifying Party, the view that fixed cost savings may not be passed-on through output increases and price decrease is not applicable to an industry with innovation competition. […]*. In that sense a substantial portion of these expenditures may be considered variable costs in the medium term.

1030. It is acknowledged that in dynamic industries where innovation plays a major role, even savings that can be seen to be fixed at the time production takes place, might have an influence on prices from a dynamic perspective. However, the type of fixed costs savings that are liable to benefit consumers is rather limited by nature. In this case, alleged fixed cost reductions would be passed on to customers only if the rate of introduction of new products and/or new production technologies, and hence (quality adjusted) price erosion, was made faster.

1031. The Notifying Party has not put forward no claim or a consistent line of arguments that the merger would accelerate the introduction of new products and thus price erosion. The parties have not provided evidence either showing a likely acceleration of the price erosions, as the result of higher rate of introduction of new products or process innovations following the transaction.

1032. None of the fixed cost efficiencies claimed by the parties are of nature to accelerate price erosion. Three of the four items referred to by the Notifying Party are unrelated to innovation and thus completely irrelevant for consumers. [WD information on fixed costs savings]*.

1033. Of all the items listed by the parties, only one is related to. [WD information on fixed costs savings]*. However, the claim is that, by [WD information on fixed costs savings]*. However, the Notifying Party does not claim, let alone prove, that the marginal cost of [WD information on fixed costs savings]* would decline due to the merger, which could indeed increase the incentive to innovate. Then, while the type of reduction of costs associated to [WD information on fixed costs savings]* claimed by the Notifying Parties could benefit the Merged Entity, this is not liable to accelerate […]*.

1034. Therefore it can also not be concluded that the claimed fixed costs efficiencies will be passed on to consumers.

D. Price paid by final customers

1035. Finally, as already indicated in recital 609, the Notifying Party argues that given that the average price of a 3.5" Desktop HDD represents around […]*% of the price of an average Desktop PC, in the event that a 10% price rise was achieved and passed on to consumers entirely, this increase would amount to substantially less than […]*% increase in the price of an average Desktop computer.

1036. In any event, as explained in recital 610, the argument of the Notifying Party is not valid since in a case of a proposed concentration that gives rise to non-coordinated horizontal effects, the harm must be assessed not only on the final consumer but in particular on the direct customer of the relevant product.[890]

E. Conclusion

1037. On the basis of the evidence that the Notifying Party has submitted, it cannot be concluded that the proposed concentration is likely to enhance the ability and incentive of the Merged Entity to act pro-competitively for the benefit of consumers, thereby counteracting the adverse effects on competition which the proposed concentration is likely to have. The Notifying Party has failed to prove that the efficiencies claimed are verifiable. Even if it had, the Notifying Party has failed to prove that they were merger specific. Finally, if the Notifying Party had proven that they are verifiable and merger specific, and it has not done so, it has failed to prove that the merger will benefit customers. Accordingly, it cannot be concluded that the proposed concentration is compatible with the internal market as a result of the efficiencies that it would allegedly bring about.

5.5. General conclusion of the competitive assessment in the relevant markets

1038. For the reasons set out in Section 5., it is concluded that the proposed concentration is likely to significantly impede effective competition by creating anti-competitive non-coordinated effects in the worldwide 3.5" Desktop HDD market, the worldwide 3.5" Business Critical Enterprise HDD market and the worldwide 3.5" CE HDD market.

1039. As regards the EEA-wide XHDD market, there are indications that the proposed concentration as notified on 20 April 2011 to the Commission may give rise to a significant impediment to effective competition as a result of non-coordinated effects in that market. Yet, since the final set of commitments submitted by WD on 28 October 2011 remove the significant impediment to effective competition in the upstream worldwide markets for 3.5” Desktop HDDs, 3.5” CE HDDs and 3.5” Business Critical HDDs, they also address the potential significant impediment to effective competition on the downstream EEA-wide XHDD market. Therefore there is no need to conclude in this regard.

890 Horizontal Merger Guidelines, footnote 105.

5.6. Commitments submitted by the Notifying Party

5.6.1. Remedies Principles

1040. The following principles from the Commission notice on remedies acceptable under Council Regulation (EC) No 139/2004 and under Commission Regulation (EC) No 802/2004 ("Commission's Remedies Notice")[891] apply where parties to a merger choose to offer commitments in order to restore effective competition.

1041. Where a concentration raises competition concerns in that it could significantly impede effective competition, the parties may seek to modify the concentration in order to resolve the competition concerns and thereby obtain clearance of their merger.

1042. Where a proposed concentration threatens to significantly impede effective competition the most effective way to maintain effective competition, apart from prohibition, is to create the conditions for the emergence of a new competitive entity or for the strengthening of existing competitors via divestiture by the merging parties.

1043. The divested activities must consist of a viable business that, if operated by a suitable purchaser, can compete effectively with the Merged Entity on a lasting basis and that is divested as a going concern. The business must include all the assets which contribute to its current operation or which are necessary to ensure its viability and competitiveness and all personnel which are currently employed or which are necessary to ensure the business' viability and competitiveness.

1044. Personnel and assets which are currently shared between the business to be divested and other businesses of the parties, but which contribute to the operation of the business or which are necessary to ensure its viability and competitiveness, must also be included. Otherwise, the viability and competitiveness of the business to be divested would be endangered. Therefore, the divested business must contain the personnel providing essential functions for the business such as, for instance, group R & D and information technology staff even where such personnel are currently employed by another business unit of the parties —at least in a sufficient proportion to meet the on-going needs of the divested business.

1045. Normally, a viable business is a business that can operate on a stand-alone-basis, which means independently of the merging parties as regards the supply of input materials or other forms of cooperation other than during a transitory period.

1046. The intended effect of the divestiture will only be achieved if and once the business is transferred to a suitable purchaser in whose hands it will become an active competitive force in the market. The potential of a business to attract a suitable purchaser is an important element already of the Commission's assessment of the appropriateness of the proposed commitment. In order to ensure that the business is divested to a suitable purchaser, the commitments must include criteria to define the suitability of potential purchasers. This will allow the Commission to conclude that

891 OJ C 267, 22.10.2008, p. 1.

the divestiture of the business to such a purchaser will likely remove the competition concerns identified.

1047. There are cases where only the proposal of an up-front buyer will allow the Commission to conclude with the requisite degree of certainty that the business will be effectively divested to a suitable purchaser. The parties to such merger cases must undertake in the commitments that they are not going to complete the notified operation before having entered into a binding agreement with a purchaser for the divested business, approved by the Commission.

5.6.2. Description of the commitments submitted

1048. On 3 October 2011, the Notifying Party submitted commitments purporting to address the Commission's objections regarding the proposed concentration. These commitments essentially consisted in a "carve-out" from […]* current HDD operations by (i) divesting […]* production lines used to manufacture and assemble 3.5" Desktop, CE and Business Critical HDDs; (ii) licensing certain IP rights relating to those 3.5" products; and (iii) transferring […]*personnel. Thus, the initial commitment proposal of 3 October 2011 concerned a combination of assets (mainly a few machines, an IP license and some personnel) which did not form a uniform and viable business in the past and which would have to be "carved out" from […]* existing 3.5" HDD business and relocated.

1049. There were doubts that the combination of assets and relative agreements in the commitment package that was proposed on 3 October 2011 would result in a business that would "be immediately viable in the hands of a suitable purchaser".

1050. The Notifying Party subsequently submitted a second set of commitments on 10 October 2011 (the second commitment package). The second commitment package effectively comprised the divestment of an HDD business of […]*, including the following main tangible and intangible assets:

(i) The divestiture of a HDD business including in particular the following tangible assets:

- A production plant located in […]* that manufactures 3.5" HDDs.[892] The production plant includes […]* fully configured production lines capable of manufacturing 3.5" Desktop, CE and Business Critical HDDs for end-uses, including XHDDs. The HDDs that can be produced on these lines have an areal density of up to 1 Terra byte ('TB') per platter and have 1, 2, and 3 platter designs. The production lines have a production capacity of […]* units per year.[893] On the basis of the 2010 production volumes of the divested production assets, the production volumes of the Divestment Business would be as follows: approximately […]* units on the 3.5" Desktop market, […]* units on the 3.5" CE market and […]* units on the 3.5" Business Critical market.

892 The […]* plant has also in place 2.5" lines that will be carved out and retained by the Merged Entity.

893 […]*.

** Should read: "14 cities".

- Product designs for 3.5" HDDs in production including […]* and pipeline products […]* and building upon 3.5" HDDs manufactured in the production plant located at […]*;

- The existing inventory, parts, and supplies at the production plant in […]* at the time of transfer of the legal title of the Divestment Business to the purchaser.

- Distribution offices in 17 cities** on three continents (America, Asia, Europe).

(ii) As regards intangible assets, the Notifying Party offered:

- The transfer of all 3.5" HDD Intellectual Property ("IP") Rights used solely in the manufacture of 3.5" HDDs by the Divestment Business, including any trade secrets, know-how, technology, methods, invention, processes, firmware/software, databases, schematics, specifications, designs, and trademarks. This also included the assignment of the […]* trademark. All 3.5" HDD IP rights would be licensed back by the purchaser to the Notifying Party on a non-exclusive, perpetual, royalty-free, fully paid-up, and non-transferable basis. In return, the Notifying Party offered to commit itself not to use the […]*Platforms to manufacture HDDs for the 3.5" Desktop, 3.5" CE and 3.5" Business Critical markets;

- Insofar as required by the purchaser, a non exclusive, perpetual, royalty-free, fully paid-up, non-transferable, worldwide license for other HDD IP rights used in the manufacture of 3.5" HDDs by the Divestment Business and also in the manufacture of HDDs by […]*, including any trade secrets, know-how, technology, methods, inventions, processes, firmware/software, databases, schematics, specifications and designs;

- HGST sales agreements with customers that are solely or exclusively 3.5" specific and served by the Divestment Business, as well as any parts of broader "framework" sales agreements with customers that are 3.5" specific and served by the Divestment business.

- Transfer of any contracts, agreements, leases, commitments, or understandings that relate solely or exclusively to the Divestment Business (insofar as the relevant counterparties to these contracts and arrangements agree).

(iii) Transfer of personnel, composed of [<250]* manufacturing and development engineers located at […]*, up to [<250]* other product development resources as required, up to [<500]* sales, marketing and sales administration staff at various locations worldwide, and [<5,000]* employees (direct labour) employed at […]*;

(iv) A supply agreement, under which the Notifying Party would supply HDD components ([…]* components) at then-prevailing market prices for a period up to […]*. The supply agreement would be automatically renewable for periods of […]* unless terminated by notice of […]. The purchaser would have the discretion to determine purchase volumes for components to support production volumes of 3.5" HDDs up to the maximum production capacity of the […]* plant ([…]* units).

5.6.3. The market test of the second commitments proposal

1051. The Commission market launched a market test regarding the second commitments proposal on 10 October 2011.

1052. The main purpose of the market test was to check whether those commitments are sufficient to remove the competition concerns entirely and in all respects and whether they are capable of being implemented effectively.

5.6.3.1. Suitable purchaser

1053. The market test indicated that the identity of the purchaser of the Divestment Business is of key importance for the effectiveness of the divestiture.

1054. The vast majority of customers on the markets of concern confirm that in order to grow into a viable and effective competitor on those markets, a suitable purchaser would have to be committed to the HDD industry and have the proven expertise, know-how and operational experience to operate successfully on HDD markets, in particular on the 2.5" HDD and Enterprise markets that neighbour the markets of concern. This would inter alian allow the Divestment Business to spread R&D efforts across different HDD markets and to remain innovative on the markets of concern.

1055. The market test also indicated that the number of potential suitable purchasers is very small. Most respondents identified Toshiba, which would be the only remaining competitor to WD and Seagate on most HDD markets, as the only suitable purchaser. A minority of respondents referred to TDK as another suitable purchaser. As the number of potential suitable purchasers is limited and the identity of the purchaser is crucial to ensure the effectiveness of the commitments, specific suitable purchaser criteria as well as a so-called "upfront buyer" clause are important to ensure the effectiveness of the commitments.

5.6.3.2. Sufficiency of the Divestment Business package

A. Tangible assets

1056. With respect to the sufficiency of the products and manufacturing facilities to be divested to ensure a viable and competitive Divestment Business, the results of the market test differed for the four markets of (potential) concern.

1057. As regards the 3.5" Desktop market, the results of the market test was mixed. A slight majority of nine responding customers and suppliers expect the tangible assets to be sufficient to ensure the viability and competitiveness of the Divestment Business, while seven found the remedy to be insufficient. Twelve respondents did not express a clear view or stated that they lacked the expertise to give an informed view on the sufficiency of the package of tangible assets to be divested. Six respondents explicitly stated that the 4-platter and 5-platter HDDs with high storage capacity currently produced in HGST's Thai plant would need to be included for the business to be viable in the 3.5" Desktop market given that these products are higher-margin products.

1058. As regards the 3.5" Business Critical market, a clear majority of customers and suppliers, including four out of six Business Critical customers, do not believe that

the products to be divested are sufficient for the Divestment Business to be viable and competitive in this fast growing market.[894] These concerns relate to the 4- and 5-platter 3.5" HDDs currently manufactured in HGST's plant in Thailand. Such higher margin products are seen as important for long-term viability and competitiveness. These respondents considered that the effective cap on the capacity of the divested products at currently 3 TB would be restrictive, as data storage needs in this market increase fast. In addition, another respondent explained that the limited portfolio of 3.5" products will disadvantage the Divestment Business. Two out of three component suppliers also shared that view.

1059. As regards the 3.5" CE and XHDD markets, a majority of customers and suppliers expected the scope of the divestiture to be sufficient. However, a minority of respondents also raised the importance of 4-platter and 5-platter 3.5" HDDs for these markets.

1060. As for pipeline products, the second commitments proposal limited the scope of divestiture to pipeline products "currently being manufactured" at the production plant located at […]*. In this regard, the second commitment package was somewhat contradictory given that pipeline products are, by definition, products which have not yet reached manufacturing stage. In this regard, a respondent pointed out that the technology used in the current products manufactured at the […]* production plant will be viable only for a couple of years. In order to ensure the viability and competitiveness of the Divestment Business, all the undergoing development for the 3.5" HDD products should therefore be included in the Divestment Business.

B. Intangible assets notably Intellectual Property ("IP") Rights

1061. Due to lack of HDD manufacturing experience and a lack of information, customers were in general unable to provide a meaningful assessment of whether the IP arrangements included in the second commitments proposal were sufficient to render the Divestment Business viable and competitive in the 3.5" Desktop, CE and Business Critical market.

1062. One respondent indicated that the IP that were to be included in the Divestment Business only seemed to cover the 'manufacture' of HDDs. This would need to be extended to include design, development use and sale of 3.5" HDDs. That respondent also raised the issue that products being manufactured at the […]* production plant might be produced using IP rights owned by third parties, and that the purchaser of the Divestment Business might need to acquire such licenses from third parties. [View on personnel requirements for the purchaser to be able to engage in follow-on innovation]*. It considered that it was not able, on the basis of the limited information provided to fully assess whether the commitment to engage in cross licensing would be sufficient to ensure the viability and competitiveness of the Divestment Business. It also considered that in order to ensure the continued viability

894 Ten customers and suppliers view the remedies as insufficient and/or believe that the 4- and 5-platter HDDs should be included. Six consider the remedy to be sufficient, twelve do not have a clear view or expertise. One Business Critical customer explicitly opposes the divestment of these HDDs due to uncertainties regarding the potential purchaser and concerns over future product quality. Another Business Critical customer stresses that in case these high-capacity products were to be divested as well, the continuity of supplies by a viable business needs to be ensured.

and competitiveness of the Divestment Business, all IP relating to pipeline 3.5" HDDs should be included in the Divestment Business.

1063. Seagate considers that the IP arrangements in the commitments are sufficient to ensure the viability and competitiveness of the Divestment Business. However, it notes that the purchaser of the Divestment Business should not be restricted in relation to innovation.

1064. Components suppliers, although unable to fully assess whether the IP rights to be assigned/licensed are of adequate scope, noted that there should be no cap on the allowed extent of follow-on innovation in the second commitments proposal.

C. Supply agreement for key components

1065. Respondents to the market test almost unanimously expressed the view that the initial duration of the components supply agreement between WD and the Purchaser of the Divestment Business should be […]* years. In that respect, many respondents explained that that duration should be sufficient to allow the Divestment Business to cover, at least the first product generation of 3.5" HDDs which generally does not exceed […]* years and especially to build up a supply relationship with external providers of [certain components]*. Only two respondents disagreed with the proposed initial duration of […]* years and expressed the concern that in the absence of a long term supply contract for key components the Divestment Business would be forced out the market.

1066. All three independent component manufacturers (TDK, Showa Denko and Fuji) indicated that they have excess production capacity to support the production capabilities of the Divestment Business or that they would be willing to invest in new production capacity to meet the Divestment Business' demand, provided that the returns on investments justify the increase of capacity. Since those respondents indicated that the time period needed for expansion of production capacity ranged from […]* (depending on the volume of production) and that a lead time of up to […]* would be required to replace the components supplied by WD with those externally sourced by third parties, they considered a supply agreement with an initial duration of […]* to be sufficient to support the Divestment Business' production platform for a start-up period.

1067. The results of the market test as concerns the impact of the purchase cap (components needed to produce maximum […]* units of 3.5" HDDs annually) were mixed. Half of the customer respondents appeared concerned by this provision as they believed it could prevent the Divestment Business from increasing its HDDs production volume due to the lack of a sufficient components' supply. Other respondents did not express any specific view or appear unconcerned by the existence of the components' volume cap.

1068. Finally, the market test confirmed that the supply agreement should include more detailed provisions on pricing, quality specifications and product warranties. In particular, one respondent indicated that an essential condition for any component supply agreement is that the contract provides quality warranties to the HDD manufacturer (which in the case at stake would be the Purchaser of the Divestment Business) as well as provisions concerning reparation, replacement or refund of the

defective components. All three independent components suppliers also explained that contractual clauses on the following items should be included in the supply agreement, namely on (i) pricing, (ii) quality, (iii) product specifications, (iv) product warranty, (v) indemnification, (vi) forecast and ordering procedure, (vii) delivery and (viii) no termination without cause.

1069. A major customer pointed out in reply to the market test that the second commitments proposal should clearly define a mechanism for price determination as the reference in the second commitments proposal to *"then prevailing market prices"* is ambiguous. This is in particular the case as WD is vertically integrated in the production of heads and media and therefore has different production costs in comparison to those of the independent components suppliers which in turn translate into different selling prices.

D. Personnel

1070. With respect to the proposal to divest personnel, most respondents to the market test consider that they are not in a position to comment on personnel provisions of the second commitments proposal, either because they do not have experience (as component supplier, distributor, etc) or because they consider that they do not have enough information to give an informed view.

1071. A number of respondents underlined that the issue of personnel is not so much a question of the number of personnel to be included, but mostly depends on the functional role and the capability of the staff transferred. Most respondents considered that the quality of engineering personnel (together with transferred IP rights) would be an important element that determines the viability of the Divestment Business. In this regard, one respondent underlined that it should be up to the Purchaser to define the key personnel that is subject to the non-solicitation clause with WD.

1072. Most respondents considered that the quantity and quality of sales personnel included in the divestiture is sufficient.

5.6.4. Final set of remedies

1073. The Notifying Party submitted a third commitments proposal on 24 October 2011. The third commitments proposal was subject to some technical modifications. The Notifying Party offered the final commitments proposal on 28 October 2011. The final commitments proposal contained the following new provisions.

1074. First, the final commitments proposal includes an "upfront buyer" clause and more specific suitable purchaser criteria. Under the upfront buyer clause, the Notifying Party cannot close the proposed concentration with HGST before it has completed the sale of the Divestment Business to a suitable Purchaser. In particular, it is now specified that the purchaser must (i) be committed to maintain the competitiveness of the Divestment Business including the development of 3.5" HDD technology in each of the markets of concern; and (ii) have proven expertise and an ongoing track record as an R&D innovator within the HDD industry, and preferably proven expertise in a market neighbouring a market of concern. The Commission considers that this provision together with the improvements to second commitment package mentioned

in the recitals that follow ensure the effectiveness of the commitments and the long term viability and competitiveness of Divestment Business.[895]

1075. Secondly, the Notifying Party undertakes to divest all of […]* 3.5" […]* production lines in […]*. The Notifying Party also offers to divest product designs for any pipeline […]* 3.5" […]* HDD that is currently in development by […]*. The Notifying Party submits that together with the assets in […]* production plant that were already included in the second commitments proposal, the final commitments proposal would allow the Divestment Business to have a market share of […]*% on the 3.5" Business Critical market.[896]

1076. Thirdly, the final commitments proposal provides that the divestiture would include the assignment of all HGST or WD IP that is used solely in the manufacture of 3.5" HDDs by the Divestment Business. In addition to the transfer of product/equipment designs for the transferred production platforms, relative know-how and the […]* trademark, these include the in-process integrated product/equipment reference design for pipeline products currently being developed by […]* to manufacture 3.5" HDDs at the […]* production plant together with the in-process integrated product/equipment reference designs for pipeline products which are currently being developed by […]* to manufacture […]* platter 3.5" HDD at the […]* facility. In addition, the Notifying Party would also assign co-ownership rights in approximately […]* patents and patent applications.

1077. All the 3.5" HDD IP rights referred to in recital 1076 would be licensed back to WD by the purchaser of the Divestment Business on a non-exclusive, perpetual, royalty-free, fully paid-up and non-transferable basis. This licence back would be subject to a restrictive covenant in favour of the purchaser, whereby the Merged Entity would agree not to use the transferred design platforms (including the pipeline design platforms) to manufacture 3.5" HDDs for use in Desktop, CE and Business Critical applications.

1078. HGST's other IP rights which relate to the 3.5" HDD Divestment Business but are also used in the business that is to be retained by the Merged Entity would not be transferred. Instead, the final commitments proposal provides that the Divestment Business would obtain a non-exclusive, perpetual, royalty-free, fully paid-up, non-transferable, worldwide licence for these other HDD IP rights. The licence would include the right to assert and sublicense the HGST and WD patents retained by the Merged Entity to respond to patent assertions by competitors against the Divestment Business in the event that the assigned patents do not provide sufficient protection.

1079. The final commitments proposal finally provides that the purchaser would be able to use the transferred/licensed IP to engage in innovation, including 'follow-on' innovation on that conducted by HGST and WD as regards HDDs. WD is prepared to enter into a patent 'cross-license' agreement with the purchaser covering future

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895 These criteria go beyond those traditionally included in divestiture packages, which require the purchaser: to be independent and unconnected to the merging parties, have the expertise and resources to develop the Divestment Business and not to raise *prima facie* competition concerns as a purchaser.

896 Based on 2010 volume figures. This would consist of [5-10]*% coming out of the […]* plant, and [5-10]*% out of the […]* plant. The market share of the Divestment Business in terms of value would be around [10-20]*%, based on the actual sales figures of all four market participants in 2010.

patents (defined as those filed within a five-year period from the transfer of the Divestment Business).

1080. Fourthly, the final commitments proposal also includes a stronger commitment to conclude an agreement for the supply of components. Under the final commitments proposal, that agreement would:

– Provide the Purchaser with discretion to determine purchase volumes (in line with the current production capacity of the Divestment Business, with reasonable flexibility in the event that the Divestment Business increases or decreases capacity);

– Contain competitive pricing for the components;

– Include a warranty that the components are free from defects and an exclusive remedy for any breach of warranty (for instance, repair or replace);

– […]*;

– Oblige WD to defend the Purchaser from any third party claims that the components […]*; and

– Allow the Purchaser to terminate with […]*.

1081. The final commitments proposal foresees strict firewall procedures to ensure that any sensitive information gathered under the supply agreement, such as the Divestment Business' product roadmaps, would not be shared or passed on to anyone outside WD's head and media operations.

1082. Fifthly, the final commitments proposal contains a commitment for the Notifying Party to use its best efforts, subject to local laws, to provide all engineering personnel required to run the 4 platter 3.5" HDD Business Critical production lines […]* facility and/or develop 5 platter pipeline HDD. The final commitments proposal now explicitly defines the Key Personnel which includes in particular a hold-separate manager responsible for the day-to-day management of HGST's 3.5" HDD production plant in […]* and a hold separate manager responsible for the day-to-day management of WD's 4 platter 3.5" HDD Business Critical production lines and 5 platter 3.5" HDD pipeline product platforms currently located in the facility in […]*. In addition, engineering personnel required to continue development of the 3.5" 5 platter pipeline project at WD and Intellectual Property personnel that provide Intellectual Property support services for the Divestment Business are also part of Key personnel.

5.6.5. The Commission's assessment of the final commitments proposal

5.6.5.1. Purchaser criteria and upfront buyer clause

1083. As indicated in recital 1053, the Commission's market test revealed that the profile and identity of the purchaser of the Divestment Business is of key importance. The market test showed that in order to become a viable and effective competitor on each of the markets of concern, a suitable purchaser would have to be committed to the HDD industry and have the proven expertise, know-how and operational experience

to operate successfully on HDD markets, in particular on markets that neighbour the markets of concern.

1084. Taking those elements into account, the final commitments proposal contains an upfront buyer clause and detailed suitable purchaser criteria.

1085. Under the upfront buyer clause, WD will not be able to implement the proposed concentration with HGST before it has entered into a binding sale and purchase agreement for the sale of the Divestment Business with a suitable purchaser, approved by the Commission.

1086. In order to be approved by the Commission, the purchaser of the Divestment Business must, amongst other things, (i) be committed to maintain the competitiveness of the Divestment Business including the development of 3.5" HDD technology in each of the markets of concern; and (ii) have proven expertise and an ongoing track record as an R&D innovator within the HDD industry, and preferably proven expertise in a market neighbouring a market of concern. Furthermore, the purchaser must, in order to be approved by the Commission not be likely to create, in light of the information available to the Commission, *prima facie* competition concerns or give rise to a risk that the implementation of the Commitments be delayed.

1087. In the event that no such suitable purchaser is identified by the Notifying Party and subsequently approved by the Commission within the Divestiture Period and if the transfer of the legal title of the Divestment Business to the Purchaser has not occurred within two months of the end of the Divestiture Period, the Final commitments proposal provides that, the Notifying Party shall demonstrate to the satisfaction of the Commission that it has abandoned the proposed concentration.

1088. The Commission considers that these provisions address the findings of the market test as to the importance of the identity of the purchaser. Indeed, the sale of the Divestment Business to a purchaser meeting the suitability criteria established in the Final commitments proposal, would allow for the immediate restoration of effective competition in the worldwide 3.5" Desktop, 3.5" Business Critical and 3.5" CE HDD markets and the EEA-wide XHDD market. Moreover, given the increased incentive for the parties to close the divestiture in order to complete their own concentration, the inclusion of an up-front buyer clause is likely to accelerate the transfer of the business to be divested. The Commission considers that this provision together with the improvements to the commitments proposal analysed in the recitals that follow ensure the long term viability and competitiveness of Divestment Business.

5.6.5.2. Suitability of the scope of the commitments

A. Tangible assets

1089. The Divestment Business includes (i) HGST's 3.5" production line capacity at the production plant at […]* and related pipeline products, (ii) WD's 3.5" HDD 4 platter production lines located at the facility in […]*, and (iii) WD's 3.5" HDD 4 and 5 platter pipeline products. These production lines are capable of producing 3.5'' Desktop, CE, Business Critical HDDs as well as 3.5" HDDs that can be used for producing XHDDs. Therefore, the Divestment Business will constitute a third competitor in the 3.5'' Desktop and 3.5'' CE segments, and potentially a fourth

competitor in 3.5'' Business Critical Enterprise (or, in the event that the approved purchaser is Toshiba, strengthen the potentially emerging third competitor, Toshiba, which entered the 3.5" Business Critical market in 2011).

1090. As regards the overlap between WD and HGST in the 3.5" Desktop and 3.5" CE markets, and assuming that the Divestment Business utilises the production lines in direct proportion to the way in which they have been used in 2010, the following tables show that the Final commitments proposal eliminates nearly all of the overlap in the 3.5" Desktop market and all of the overlap in the 3.5" CE market.

Table 25: 3.5" Desktop Share of Sales (2010)[897]

Supplier		Sales (Units)	Share (%)
WD		[…]*	[40-50]*
HGST		[…]*	[5-10]*
Pro Forma Combined		[…]*	[50-60]*
Divestment Business	WD 4 platter sales	[…]*	[0-5]*
	HGST China	[…]*	[5-10]*
Divestment Business Total		[…]*	**[5-10]***
WD/HGST (Post Transaction)		[…]*	[40-50]*
Actual Increment		[…]*	**[0-5]***
Seagate/ Samsung		[…]*	[40-50]*
Total		[…]*	**100**

Table 26: 3.5" CE Share of Sales (2010)[898]

Supplier		Sales (Units)	Share (%)
WD		[…]*	[30-40]*
HGST		[…]*	[10-20]*
Pro Forma Combined		[…]*	[50-60]*
Divestment Business	WD 4 platter sales	[…]*	[0-5]*
	HGST China	[…]*	[10-20]*
Divestment Business Total		[…]*	**[10-20]***
WD/HGST (Post Transaction)		[…]*	[30-40]*
Actual Increment		[…]*	**[0-5]***
Seagate/ Samsung		[…]*	[40-50]*
Total		[…]*	**100**

1091. As may be seen from Table 25 and Table 26, the market share increment of the proposed concentration between WD and HGST on the 3.5″ Desktop market would be *de minimis* ([0-5]*%[899]) if the Final commitments proposal is implemented. For the 3.5" CE market, the actual increment would be negative as all HGST assets used to produce 3.5" CE HDDs are divested and, in addition, WD's 4 platter production lines (of which some HDD models also serve 3.5" CE customers) are also included in

897 Source: IDC; Note: HGST data shows actual sales not IDC estimates.

898 Source: IDC; Note: HGST data shows actual sales not IDC estimates. CE sales include 3.5" HDDs for use in XHDDs manufactured and sold by HGST.

899 Even if not taking into account the to-be-carved out 4-platter production lines […]*.

the Divestment Business.[900] Therefore, it should be concluded that the Final commitments proposal with regard to the tangible assets are sufficient to address the Commission's concerns on the 3.5" Desktop and 3.5" CE markets.

1092. With respect to the 3.5" Business Critical market, the Final commitments proposal would allow the Divestment Business to have a market share of [10-20]*% on the 3.5" Business Critical market, as demonstrated in the following table. This would consist of [5-10]*% coming out of […]* production plant, and [5-10]*% out of […]* facility.[901] The market share of the Divestment Business in terms of value would be around [20-30]*%.[902]

Table 27: 3.5" Business Critical Share of Sales (2010)[903]

Supplier		Sales (Units)	Share (%)
WD		[…]*	[30-40]*
HGST		[…]*	[20-30]*
Pro Forma Combined		[…]*	[50-60]*
Divestment Business	WD 4 platter sales	[…]*	[5-10]*
	HGST China	[…]*	[5-10]*
Divestment Business Total		[…]*	**[10-20]***
WD/HGST (Post Transaction)		[…]*	[40-50]*
Actual Increment		[…]*	**[10-20]***
Seagate/ Samsung		[…]*	[40-50]*
Toshiba		Entry in 2011	Entry in 2011
Total		[…]*	**100**

1093. The Final commitments proposal addresses about [60-70]*% of the overlap in volume terms between WD and HGST in the 3.5″ Business Critical market. The Merged Entity would still gain an [10-20]*% volume share in the Business Critical market and have a market share of [40-50]*% after the merger. Seagate/Samsung would have [40-50]*% of volume in that market, while Toshiba is expected to gain limited market share for the first time in 2011.

1094. The Notifying Party submits a number of arguments as to why it offers to divest all of its own 4-platter 3.5" Business Critical production lines in WD's facility in […]* instead of offering to divest the 4/5-platter production lines currently owned by

900 Even if not taking into account the to-be-carved out 4-platter production lines […]*, the overlap would be entirely removed.

901 Based on 2010 volume figures and assuming that the Divestment Business utilises the production lines in direct proportion to the way in which they have been used in 2010.

902 Based on the actual sales figures as submitted to the Commission by all four suppliers participating in this market in 2010.

903 Source: IDC; Note: HGST data shows actual sales not IDC estimates.

HGST.[904] According to it, the proposed divestment constitutes a more viable and proportionate offering to the purchaser of the Divestment Business. First, on viability, WD points out that HGST's current 4/5-platter HDDs are produced in its plant in Prachinburi (Thailand). This is near the current flood zone and may impede any sale in the near future.

1095. Secondly, on proportionality, it claims that HGST's 4/5 platter Business Critical designs and lines are closely linked to HGST's product and equipment design platform of the Enterprise Mission Critical products. Divestiture of these assets would result in the loss of manufacturing efficiencies that would weaken the Merged Entity on the Mission Critical HDD market, which is not a market of concern. According to the Notifying Party, the architecture and firmware structure of WD's 4-platter Business Critical HDDs differ from those of WD's Mission Critical products. Thereofore, the divestiture of these assets would be more straightforward and proportionate.

1096. The Notifying Party furthermore maintains that the purchaser of the Divestment Business would not be disadvantaged by the inclusion of WD's rather than HGST's 4/5 platter assets because [no existing synergies would be lost]*."[905] [906] […]*.[907] […]*.[908] […]*.

1097. The Notifying Party points out that in the event that the purchaser of the Divestment Business chose to transfer the 4/5 platter assets to the […]* production plant, the only potential challenges in integrating WD's 4-platter assets as opposed to the HGST's 4/5 platter assets that WD can currently foresee is with regard to "production floor system or shop floor control", which it does not consider to be a significant integration planning obstacle.[909]

1098. On the basis of those explanations, it may be concluded that the divestiture of WD's existing 4-platter business as well as its 4- and 5-platter HDDs currently under development is sufficient to address the competition concerns on the 3.5" Business Critical market. While this divestiture does not entirely remove the overlap, this market is comparatively smaller. Moreover, if Toshiba as a suitable buyer acquired the Divestment Business, it would strengthen substantially Toshiba's emerging 3.5"

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904 It appears that the proposed divestment comprises […]* production lines currently manufacturing […]* different HDD models with an areal density of [WD business secret]* giga byte ("GB") per platter and a total capacity of up to 2 terra byte ("TB"). For [WD business secret]* HDD models, we await confirmation that these are meant to be included into the divestment business. WD currently does currently not produce 5-platter 3.5" HDDs.

905 Form RM submitted on 24 October 2011.

906 HGST reply to question 1 of the Commission's request for information of 26 October 2011. The remainder of this paragraph is also based on this reply.

907 The recording components (suspension and slider/head) differ both mechanically and magnetically. The disk components differ in terms of thickness and substrate material. They use different components such as fixed shaft motors and mechanics.

908 Furthermore, while the two factories do share, along with the remainder of HGST, technical support, sales, and product marketing functions and some financial and IT infrastructure, each facility maintains separate financial site controllers and accounting systems, inventory management systems, local HR and IT infrastructure and support.

909 WD understand that manual checking of the shop floor system would likely not be required if […]* lines were to be integrated at […]*, whereas it would be need to be checked manually for […]* (WD reply to question 2 of the Commission's request for information of 26 October 2011.)

Business Critical business. Insofar as the Divestment Business is acquired by another buyer considered suitable, the remedy would create, post-merger, four suppliers of 3.5" Business Critical HDDs. Therefore, the scope of the Final commitments proposal with regard to the tangible assets addresses in a satisfactory manner, the Commission's concerns on the 3.5" Business Critical HDDs.

B. Intangible assets

1099. In order to ensure that the Divestment Business will be able to viably compete in each of the markets where competition concerns have been identified (namely, the 3.5" Desktop, CE and Business Critical HDDs markets) it is essential that the Divestment Business is provided with all the intangible assets (including intellectual property ("IP") rights) which are required to manufacture and sell 3.5" HDDs.

1100. The Final commitments proposal fully addresses the shortcomings identified in the course of the market test with respect to the scope of the IP rights intended to be assigned to the Divestment Business.

1101. First, the Final commitments proposal provides that the Purchaser of the Divestment Business will either co-own or have access to all the IP rights required to manufacture and sell all the 3.5" HDDs that are the subject of the Divestment Business and/or necessary for the viability or competitiveness of the Divestment Business. More specifically, all IP rights (including any trade secrets, know-how, technology, methods, inventions, processes, firmware/software, databases, schematics, specifications, designs and trademarks) used predominantly in the manufacture of 3.5" HDDs by the Divestment Business will be transferred to the Purchaser whilst all the other IP rights used in the manufacture of 3.5" HDDs by the Divestment Business and by the retained businesses of HGST and/or WD will be licensed to the Purchaser.

1102. The IP arrangements in the Final commitments proposal are sufficiently broad and non-exhaustive in such a way as to cover all the IP rights which would render the Divestment Business viable and competitive. In order to secure that outcome, the Final commitments proposal explicitly provides that the Monitoring Trustee would oversee the scope and terms of both the transfer and the license of the IP rights to the Divestment Business, therefore ensuring that all the intangible assets needed to compete on each of the 3.5" HDDs markets (for Desktop, Business Critical and CE HDDs) will be effectively assigned to the Divestment Business.

1103. Secondly, in order to secure the long-term competitiveness of the Divestment Business, the Final commitments proposal explicitly provides that the Divestment Business will be assigned (under a co-ownership regime) all the IP rights relating to pipeline products (such as […]*) and that it will have the right to use the transferred or licensed IP rights to engage in future innovations.

1104. These provisions will allow the Divestment Business to offer a competitive products' portfolio which includes the latest generation of HDDs and to continue developing innovative products which are deemed necessary to compete in the 3.5" HDDs markets on an equal footing as the other players.

1105. Thirdly, in order to ensure that the Divestment Business will have maximum flexibility in the use of the licensed IP rights, the Final commitments proposal

confers to the Divestment Business the right to sub-license all those IP rights which are required to support viability and competitiveness of the Divestment Business.

1106. Finally, the Final commitments proposal also foresees a restrictive covenant in favour of the Purchaser of the Divestment Business which will prevent WD from using the transferred design platforms and the designs for pipeline products in the manufacture of 3.5" HDDs for Desktop, CE and Business Critical. That restrictive covenant will prevent WD from offering the same products designs for its HDDs as those of the Divestment Business which could in turn undermine the value proposition of the products sold by the Divestment Business.

1107. It is concluded that the intangible assets included in the Final commitments proposal ensure the immediate and continued viability and competitiveness of the Divestment Business.

C. Supply agreement for key components

1108. The Final commitments proposal fully addresses the shortcomings indentified by respondents to the market test with respect to the provisions on the supply agreement for components.

1109. First, the Final commitments proposal contains flexibility to the amount of components which may be supplied by WD to the Divestment Business in the event that the Divestment Business increases or decreases capacity. The Divestment Business will therefore be able to increase its production volume of HDDs and develop into a competitive force in each of the 3.5" HDDs markets (for Desktop, Business Critical and CE), without risking to remain without a sufficient components' supply.

1110. Secondly, the Notifying Party has inserted an explicit clause which allows WD to terminate the supply agreement only […]* and it has […]*. That provision will provide the Divestment Business with sufficient time to qualify external sources of supply for key components, without impairing its viability caused by components' unavailability. Moreover, in order to secure a further flexibility in favour of the Divestment Business, the Notifying Party also included in the Final commitments proposal an additional provision which clearly entitles the Purchaser of the Divestment Business to terminate the supply agreement for any reason at any time with a six-month notice.

1111. Thirdly, the Final commitments proposal specifies that the price of components should be based on a clear […]*. The Final commitments proposal provides that the Monitoring Trustee will monitor on an ongoing basis the terms and implementation of the Supply agreement. The Final commitments proposal ensures that the mechanism for the determination of the price of components will be objective and therefore that the Divestment Business will not be charged high, anticompetitive prices which would increase its production costs and place it in a disadvantageous position in comparison to its competitors.

1112. Fourthly, the Final commitments proposal contains specific provisions on product specifications, product quality requirements for components and product warranties. With those provisions, there will not be any risk that the quality of the HDDs

manufactured by the Divestment Business would be undermined by key components of lower quality.

1113. Finally, the Final commitments proposal provides that the Monitoring Trustee will supervise the negotiation of the supply agreement to ensure that its clauses are consistent with the general principles set out in that package. The final commitments proposal foresees a strong involvement of the Monitoring Trustee in defining appropriate measures to ring-fence any sensitive information belonging to the Divestment Business related to or arising from the supply agreement. These arrangements address the concern that the disclosure of any confidential information belonging to the Divestment Business might be used against the latter to prevent it from competing aggressively in the HDDs markets.

D. Personnel

1114. The personnel that are essential for the viability and competitiveness of the Divestment Business are now clearly identified.

E. Other

1115. The Final commitments proposal also provides for a reinforced role for the Monitoring Trustee which will act as a first mediator in case of disputes between the Notifying Party and the Divestment Business.

5.6.5.3. Suitability to remove the competition concerns

1116. In each of the 3.5" Desktop, CE and Business Critical HDD markets, OEM customers will be able to multi-source from a third HDD supplier if the final commitments proposal is implemented. This will enable these customers to procure their supplies from three suppliers in order to address any security of supply concerns. The entry of the Divestment Business on those markets will address the concern that there would be no competition for the guaranteed lower TAM award in a two-supplier market scenario.

1117. In addition, with a third competitor on the markets referred to in the previous recital, it is unlikely that Seagate/Samsung would have the incentives to restrict supply in the event of a putative price increase by WD. The Divestment Business will have the incentives to compete to gain share by undercutting its relatively larger competitors.

1118. The divestiture of WD's 4/5 platter assets also addresses the concern revealed in the market test that without the 4/5-platter assets, the Divestment Business would have insufficient assets to be viable and competitive in the 3.5" Business Critical HDD market in particular, and to a lesser extent on the 3.5" Desktop and CE markets.

1119. As the commitments will allow for the emergence of a new, viable and effective competitor on the upstream 3.5" HDD markets, any potential significant impediment to effective competition on the EEA-wide XHDD market is consequently also remedied.

1120. With the emergence of such a competitor, the Merged Entity will not be able to unilaterally increase prices in the upstream 3.5" HDD markets concerned. It will also

not have the ability to increase its rival's costs in the downstream EEA XHDD market.

1121. In addition, it can be expected that if a new, viable and effective competitor emerges on the upstream 3.5" HDD markets, this competitor will have all the assets to enter the downstream market for XHDDs in the medium-term and long-term, which is a growing market.[910] As explained in recitals 840 and 908, in contrast to OEMs, the HDD suppliers were very successful in entering the XHHD market in recent years. Therefore, it can be expected that also the Divestment Business will be able to enter successfully the XHDD market. In addition, this new competitor will also have an increased incentive to supply HDDs to the non-integrated XHDD suppliers, in particular, as it would in the beginning not be active on the downstream XHDD market.

Conclusion

1122. In light of the findings in recitals 1083 to 1121, it is concluded that the Final commitments proposal dated 28 October 2011 fully addresses the competition concerns identified by the Commission on the worldwide 3.5" Desktop, 3.5" Business Critical and 3.5" CE HDD markets and the EEA-wide XHDD market.

5.6.6. Conditions and obligations

1123. Pursuant to the second subparagraph of Article 8(2) of the Merger Regulation, the Commission may attach to its decision conditions and obligations intended to ensure that the undertakings concerned comply with the commitments they have entered into vis-à-vis the Commission with a view to rendering the concentration compatible with the internal market.

1124. The fulfilment of a measure that gives rise to a structural change of the market is a condition, whereas the implementing steps which are necessary to achieve this result are generally obligations on the parties. Where a condition is not fulfilled, the Commission's decision declaring the concentration compatible with the internal market is no longer applicable. Where the undertakings concerned commit a breach of an obligation, the Commission may revoke the clearance decision in accordance with Article 8(6) of the Merger Regulation. The undertakings concerned may also be subject to fines and periodic penalty payments in accordance with Articles 14(2) and 15(1) of the Merger Regulation.

1125. In accordance with the basic distinction described in recital 1123 as regards conditions and obligations, this Decision should be made conditional on the full compliance by the Notifying Party with the Section B and the Schedule (including Annex A thereto) of the final commitments proposal submitted by the Notifying Party on 28 October 2011 and all other Sections should be obligations within the meaning of Article 8(2) of the Merger Regulation. The full text of the commitments is attached as an Annex to this Decision and forms an integral part thereof.

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[910] Finally, the majority of the market respondents indicate that the scope of the divestment business is sufficient to ensure that the Divestment Business be viable and competitive in the XHDD market.

6. CONCLUSION

1126. The Final commitments proposal as contained in Annex 3 to this Decision modify the proposed concentration that was notified to the Commission on 20 April 2011 to such an extent that that concentration would not significantly impede effective competition on the worldwide markets for 3.5" Desktop, 3.5" CE and 3.5" Business Critical HDDs as well as on the EEA-wide market for XHDDs.

1127. The notified concentration should therefore be declared compatible with the internal market and the functioning of the European Economic Area Agreement pursuant to Article 8(2) of the Merger Regulation and Article 57 of the EEA Agreement, subject to compliance with the commitments set out in the Annex 3 of this Decision.

HAS ADOPTED THIS DECISION:

Article 1

The notified concentration whereby Western Digital Corporation would acquire sole control of Viviti Technologies Ltd, formerly known as Hitachi Global Storage Technologies Holdings Ltd., within the meaning of Article 3(1)(b) of the Merger Regulation is hereby declared compatible with the internal market and the EEA Agreement.

Article 2

Article 1 is subject to compliance by Western Digital Corporation with the conditions set out in Section B of Annex 3.

Article 3

Western Digital Corporation shall comply with the obligations set out in the Sections C, Section D, Section E and Section F of Annex 3 not referred to in Article 2.

Article 4

This Decision is addressed to:

Western Digital Corporation
3355 Michelson Drive, Suite 100
CA 92612 Irvine
United States of America

Done at Brussels, 23.11.2011

For the Commission
(signed)
Joaquín ALMUNIA
Vice-President

ANNEX 1

[…]*

ANNEX 2

[…]*

COMMITMENTS

Pursuant to Article 8(2) of Council Regulation (EC) No. 139/2004 (the "Merger Regulation"), Western Digital Corporation (the "Company") hereby provides the following Commitments (the "Commitments") in order to enable the European Commission (the "Commission") to declare its proposed acquisition of Hitachi Global Storage Technologies ("HGST") compatible with the Internal Market and the EEA Agreement by decision pursuant to Article 8(2) of the Merger Regulation (the "Decision").

The Commitments shall take effect upon the date of adoption of the Decision.

This text shall be interpreted in the light of the Decision to the extent that the Commitments are attached as conditions and obligations, in the general framework of Community law, in particular in the light of the Merger Regulation, and by reference to the Commission Notice on remedies acceptable under Council Regulation (EC) No 139/2004 and under Commission Regulation (EC) No 802/2004.

Section A. Definitions

For the purpose of the Commitments, the following terms shall have the following meaning:

Affiliated Undertakings: undertakings controlled by the Company and/or by the ultimate parents of the Company. The notion of control shall be interpreted pursuant to Article 3 Merger Regulation and in the light of the Commission Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004.

Closing: the transfer of the legal title of the Divestment Business to the Purchaser.

Divestment Business: the business defined in the Schedule that the Company commits to divest.

Effective Date: the date of the adoption of the Decision.

Divestiture Period: the period of months from the adoption of the Decision.

HDD(s): Hard Disk Drive(s).

Hold Separate Manager: the person appointed by the Company for the Divestment Business to manage the day-to-day business under the supervision of the Monitoring Trustee.

Key Personnel: all personnel necessary to maintain the viability and competitiveness of the Divestment Business as listed in Section 2(g) of the Schedule.

Monitoring Trustee: one or more natural or legal person(s), independent from the Company, who is approved by the Commission and appointed by the Company, and who has the duty to monitor the Company's compliance with the conditions and obligations attached to the Decision.

Personnel: all personnel currently employed by the Divestment Business, including Key Personnel, staff seconded to the Divestment Business, and the additional personnel listed in Section 2(f) of the Schedule.

Purchaser: the entity approved by the Commission as acquirer of the Divestment Business in accordance with the criteria set out in Section D.

Transaction: WD's proposed acquisition of HGST.

Trustee: the Monitoring Trustee.

3.5" HDD Intellectual Property Rights: means all HGST or WD intellectual property (including any trade secrets, know-how, technology, methods, inventions, processes, firmware/software, databases, schematics, specifications, designs, and trademarks) used predominantly in the manufacture of 3.5" HDDs by the Divestment Business.

Other HDD Intellectual Property Rights: means all HGST or WD intellectual property (including any trade secrets, know-how, technology, methods, inventions, processes, firmware/software, databases, schematics, specifications, and designs) used in the manufacture of 3.5" HDDs by the Divestment Business and also in the manufacture of HDDs by the retained businesses of HGST and/or WD as appropriate.

WD/HGST Closing: means the transfer of the legal title in HGST to the Company.

Western Digital Corporation, incorporated under the laws of Delaware, United States, with its registered office at 3355 Michelson Drive, Suite 100, Irvine, California, 92612, and registered with the Delaware Charter under number 33-0956711.

Section B. The Divestment Business

Commitment to divest

1. The Company commits to divest, or procure the divestiture of the Divestment Business by the end of the Divestiture Period as a going concern to a purchaser and on terms of sale approved by the Commission in accordance with the procedure described in paragraph 15. To carry out the divestiture, the Company commits to find a purchaser and to enter into a final binding sale and purchase agreement for the sale of the Divestment Business within the Divestiture Period. The Transaction shall not be implemented unless and until the Company has entered into a final binding sale and purchase agreement for the sale of the Divestment Business and the Commission has approved the Purchaser under the terms of sale in accordance with paragraph 15.

The Company shall be deemed to have complied with this commitment if, by the end of the Divestiture Period, the Company has entered into a final binding sale and purchase agreement, the Commission has approved the Purchaser and the terms in accordance with the procedure described in paragraph 15, and Closing occurs within a period not exceeding […]* months after the approval of the purchaser and the terms of sale by the Commission.

In the event that the Company has not entered into a final binding sale and purchase agreement with a purchaser approved by the Commission (in accordance with the

procedure described in paragraph 15) within the Divestiture Period and if the Closing has not occurred within […]* months of the end of the Divestiture Period, the Company shall demonstrate to the satisfaction of the Commission that the Company has abandoned the Transaction forthwith and notify both Hitachi Limited and Viviti Technologies Limited of its intention to terminate the Sale and Purchase Agreement dated March 7, 2011 between Western Digital Corporation, Western Digital Ireland, Hitachi Limited, and Viviti Technologies Limited (the "SPA") subject and pursuant to Section 10.1(b) of the SPA.

2. In order to maintain the structural effect of the Commitments, the Company shall, for a period of 10 years after the Effective Date, not acquire direct or indirect influence over the whole or part of the Divestment Business, unless the Commission has previously found that the structure of the market has changed to such an extent that the absence of influence over the Divestment Business is no longer necessary to render the proposed concentration compatible with the common market.

Structure and definition of the Divestment Business

3. The Divestment Business consists of the 3.5" HDD business described in the Schedule. The present legal and functional structure of the Divestment Business as operated to date is also described in the Schedule. As described in more detail in the Schedule, the Divestment Business includes:

   (a) All tangible and intangible assets (including intellectual property rights), which contribute to the current operation or are necessary to ensure the viability and competitiveness of the Divestment Business;

   (b) All licences, permits, and authorisations issued by any governmental organisation for the benefit of the Divestment Business;

   (c) Any contracts, leases, commitments, and customer orders of the Divestment Business and all customer, credit and other records that relate predominantly to the Divestment Business (items referred to under (a)-(c) hereinafter collectively referred to as "Assets");

   (d) The Personnel; and

   (e) A supply agreement pursuant to which the Company will supply [certain components]* to the Divestment Business on the terms described in the Schedule.

Section C. Related commitments

Preservation of Viability, Marketability and Competitiveness

4. From the WD/HGST Closing until Closing, and, as regards the part of the Divestment Business that the Company owns as of the Effective Date, from the Effective Date until Closing, the Company shall preserve the economic viability, marketability, and competitiveness of the Divestment Business, in accordance with good business practice, and shall minimise as far as possible any risk of loss of competitive potential of the Divestment Business. In particular the Company undertakes:

(a) Not to carry out any act upon its own authority that might have a significant adverse impact on the value, management, or competitiveness of the Divestment Business or that might alter the nature and scope of activity, or the industrial or commercial strategy or the investment policy of the Divestment Business;

(b) To make available sufficient resources for the development of the Divestment Business, on the basis and continuation of the existing business plans; and

(c) To take all reasonable steps, including appropriate incentive schemes (based on industry practice), to encourage all Key Personnel to remain with the Divestment Business.

Hold-separate obligations of Parties

5. The Company commits from the Effective Date until Closing to keep the part of the Divestment Business which it owns as of the Effective Date separate from other parts of its business and to ensure that Key Personnel of the Divestment Business – including the Hold Separate Manager – have no involvement in any business retained and *vice versa*. The Company shall also ensure that the Personnel does not report to any individual outside the Divestment Business. The Company commits from the WD/HGST Closing until Closing to keep the Divestment Business separate from other parts of its business and to ensure that Key Personnel of the Divestment Business – including the Hold Separate Manager – have no involvement in any business retained and *vice versa*. The Company shall also ensure that the Personnel does not report to any individual outside the Divestment Business.

6. Until Closing, the Company shall assist the Monitoring Trustee in ensuring that the Divestment Business is managed as a distinct and saleable entity separate from the businesses retained by the Company. The Company shall appoint a Hold Separate Manager who shall be responsible for the management of the Divestment Business, under the supervision of the Monitoring Trustee. The Hold Separate Manager shall manage the Divestment Business independently and in the best interest of the business with a view to ensuring its continued economic viability, marketability and competitiveness and its independence from the businesses retained by the Company.

Ring-fencing

7. The Company shall implement all necessary measures to ensure that it does not, after the WD/HGST Closing, obtain any business secrets, know-how, commercial information, or any other information of a confidential or proprietary nature relating to the Divestment Business. In particular, the participation of the Divestment Business in a central information technology network shall be severed to the extent possible, without compromising the viability of the Divestment Business. The Company may obtain information relating to the Divestment Business which is reasonably necessary for the divestiture of the Divestment Business or whose disclosure to the Company is required by law.

Non-solicitation clause

8. The Company undertake, subject to customary limitations, not to solicit, and to procure that Affiliated Undertakings do not solicit, the Key Personnel transferred with the Divestment Business for a period of 3 years after Closing.

Due Diligence

9. In order to enable potential purchasers to carry out a reasonable due diligence of the Divestment Business, the Company shall, subject to customary confidentiality assurances and dependent on the stage of the divestiture process:

   (a) Provide to potential purchasers sufficient information as regards the Divestment Business;

   (b) Provide to potential purchasers sufficient information relating to the Personnel and allow them reasonable access to the Personnel.

Reporting

10. The Company shall submit written reports in English on potential purchasers of the Divestment Business and developments in the negotiations with such potential purchasers to the Commission and the Monitoring Trustee no later than 10 days after the end of every month following the Effective Date (or otherwise at the Commission's request).

11. The Company shall from the Effective Date inform the Commission and the Monitoring Trustee on the preparation of any data room documentation and due diligence procedure and shall submit a copy of any information memorandum to the Commission and the Monitoring Trustee before sending the memorandum out to potential purchasers.

Section D. The Purchaser

12. In order to ensure the immediate restoration of effective competition, the Purchaser, in order to be approved by the Commission, must:

   (a) Be independent of and unconnected to the Company;

   (b) Have the financial resources, proven expertise in the data storage industry and incentive to maintain and develop the Divestment Business as a viable and active competitive force in competition with the Company and other competitors in each of the "markets of concern" (*i.e.,* 3.5" Desktop, Consumer Electronics and Business Critical HDDs);

   (c) Neither be likely to create, in the light of the information available to the Commission, *prima facie* competition concerns nor give rise to a risk that the implementation of the Commitments will be delayed, and must, in particular, reasonably be expected to obtain all necessary approvals from the relevant regulatory authorities for the acquisition of the Divestment Business;

(d) Be committed to maintaining the competitiveness of the Divestment Business, including the development of 3.5" HDD technology, in each of the "markets of concern" (*i.e.,* 3.5" Desktop, Consumer Electronics and Business Critical HDDs); and

(e) Have proven expertise and an ongoing track record as an R&D innovator within the HDD industry and preferably proven expertise in a market neighbouring a market of concern (the before-mentioned criteria for the purchaser hereafter the "Purchaser Requirements").

13. The final binding sale and purchase agreement shall be conditional on the Commission's approval. When the Company has reached an agreement with a purchaser, it shall submit a fully documented and reasoned proposal, including a copy of the final agreement(s), to the Commission and the Monitoring Trustee. The Company must be able to demonstrate to the Commission that the purchaser meets the Purchaser Requirements and that the Divestment Business is being sold in a manner consistent with the Commitments. For the approval, the Commission shall verify that the purchaser fulfils the Purchaser Requirements and that the Divestment Business is being sold in a manner consistent with the Commitments. The Commission may approve the sale of the Divestment Business without one or more Assets or parts of the Personnel, if this does not affect the viability and competitiveness of the Divestment Business after the sale, taking account of the proposed purchaser.

Section E. Trustee

I. Appointment Procedure

14. The Company shall appoint a Monitoring Trustee to carry out the functions specified in the Commitments for a Monitoring Trustee.

15. The Trustee shall be independent of the Company, possess the necessary qualifications to carry out its mandate (including expertise in Intellectual Property rights), for example as an investment bank or consultant or auditor, and shall neither have nor become exposed to a conflict of interest. The Trustee shall be remunerated by the Company in a way that does not impede the independent and effective fulfilment of its mandate.

Proposal by the Company

16. No later than one week after the Effective Date, the Company shall submit a list of one or more persons whom the Company proposes to appoint as the Monitoring Trustee to the Commission for approval. The proposal shall contain sufficient information for the Commission to verify that the proposed Trustee fulfils the requirements set out in paragraph 17 and shall include:

(a) The full terms of the proposed mandate, which shall include all provisions necessary to enable the Trustee to fulfil its duties under these Commitments; and

(b) The outline of a work plan which describes how the Trustee intends to carry out its assigned tasks.

Approval or rejection by the Commission

17. The Commission shall have the discretion to approve or reject the proposed Trustee and to approve the proposed mandate subject to any modifications it deems necessary for the Trustee to fulfil its obligations. If only one name is approved, the Company shall appoint or cause to be appointed, the individual or institution concerned as Trustee, in accordance with the mandate approved by the Commission. If more than one name is approved, the Company shall be free to choose the Trustee to be appointed from among the names approved. The Trustee shall be appointed within one week of the Commission's approval, in accordance with the mandate approved by the Commission.

New proposal by the Company

18. If all the proposed Trustees are rejected, the Company shall submit the names of at least two more individuals or institutions within one week of being informed of the rejection, in accordance with the requirements and the procedure set out in paragraphs 17 and 18.

Trustee nominated by the Commission

19. If all further proposed Trustees are rejected by the Commission, the Commission shall nominate a Trustee, whom the Company shall appoint, or cause to be appointed, in accordance with a trustee mandate approved by the Commission.

II. Functions of the Trustee

20. The Trustee shall assume its specified duties in order to ensure compliance with the Commitments. The Commission may, on its own initiative or at the request of the Trustee or the Company, give any orders or instructions to the Trustee in order to ensure compliance with the conditions and obligations attached to the Decision.

Duties and obligations of the Monitoring Trustee

21. The Monitoring Trustee shall:

(i) Propose in its first report to the Commission a detailed work plan describing how it intends to monitor compliance with the obligations and conditions attached to the Decision.

(ii) Oversee the on-going management of the Divestment Business with a view to ensuring its continued economic viability, marketability, and competitiveness and monitor compliance by the Company with the conditions and obligations attached to the Decision. To that end the Monitoring Trustee shall:

(a) Monitor the preservation of the economic viability, marketability, and competitiveness of the Divestment Business, and the keeping separate

of the Divestment Business from the business retained by the Company, in accordance with paragraphs 6 and 7 of the Commitments;

(b) Supervise the management of the Divestment Business as a distinct and saleable entity, in accordance with paragraph 8 of the Commitments;

(c) (1) in consultation with the Company, determine all necessary measures to ensure that the Company does not after the WD/HGST Closing, and, as regards the part of the Divestment Business that the Company owns as of the Effective Date, from the Effective Date until Closing, obtain any business secrets, know-how, commercial information, or any other information of a confidential or proprietary nature relating to the Divestment Business, in particular strive for the severing of the Divestment Business' participation in a central information technology network to the extent possible, without compromising the viability of the Divestment Business, and (2) decide whether such information may be disclosed to the Company as the disclosure is reasonably necessary to allow the Company to carry out the divestiture or as the disclosure is required by law;

(d) Monitor the splitting of assets and the allocation of Personnel between the Divestment Business and the Company or Affiliated Undertakings;

(e) Monitor on an ongoing basis the terms and implementation of the supply agreement pursuant to which the Company will supply [certain components]* to the Divestment Business on the terms described in the Schedule;

(f) Monitor the implementation of, and ongoing compliance with, the firewall undertakings contained in Section 2(h) of the Schedule;

(g) Oversee the scope and terms of the transfer of Intellectual Property (pursuant to Section 2(b) of the Schedule) and the license of Intellectual Property (pursuant to Section 2(c) of the Schedule); and

(h) Act as an initial mediator on any disputes between the Company and the Divestment Business, in particular as regards the scope and scale of the transferred / licensed Intellectual Property rights mentioned in paragraph 23(ii)(g) above.

(iii) Assume the other functions assigned to the Monitoring Trustee under the conditions and obligations attached to the Decision;

(iv) Propose to the Company such measures as the Monitoring Trustee considers necessary to ensure the Company's compliance with the conditions and obligations attached to the Decision, in particular the maintenance of the full economic viability, marketability, or competitiveness of the Divestment

Business, the holding separate of the Divestment Business and the non-disclosure of competitively sensitive information;

(vi) Provide to the Commission, sending the Company a non-confidential copy at the same time, a written report within 15 days after the end of every month after the Effective Date. The report shall cover the operation and management of the Divestment Business so that the Commission can assess whether the business is held in a manner consistent with the Commitments and the progress of the divestiture process as well as potential purchasers. In addition to these reports, the Monitoring Trustee shall promptly report in writing to the Commission, sending the Company a non-confidential copy at the same time, if it concludes on reasonable grounds that the Company is failing to comply with these Commitments;

(vii) Review and assess potential purchasers as well as the progress of the divestiture process and verify that, dependent on the stage of the divestiture process, (a) potential purchasers receive sufficient information relating to the Divestment Business and the Personnel in particular by reviewing, if available, the data room documentation, the information memorandum and the due diligence process, and (b) potential purchasers are granted reasonable access to the Personnel; and

(viii) Within one week after receipt of the documented proposal referred to in paragraph 15, submit to the Commission a reasoned opinion as to the suitability and independence of the proposed purchaser and the viability of the Divestment Business after the Sale and as to whether the Divestment Business is sold in a manner consistent with the conditions and obligations attached to the Decision, in particular, if relevant, whether the Sale of the Divestment Business without one or more Assets or not all of the Personnel affects the viability of the Divestment Business after the sale, taking account of the proposed purchaser.

III. Duties and obligations of the Company

22. The Company shall provide and shall cause its advisors to provide the Trustee with all such cooperation, assistance and information as the Trustee may reasonably require to perform its tasks. The Trustee shall have full and complete access to any of the Company's or the Divestment Business' books, records, documents, management or other personnel, facilities, sites and technical information necessary for fulfilling its duties under the Commitments and the Company and the Divestment Business shall provide the Trustee upon request with copies of any document. The Company and the Divestment Business shall make available to the Trustee one or more offices on their premises and shall be available for meetings in order to provide the Trustee with all information necessary for the performance of its tasks.

23. The Company shall provide and shall cause its advisors to provide the Monitoring Trustee, on request, with the information submitted to potential purchasers, in particular

give the Monitoring Trustee access to the data room documentation and all other information granted to potential purchasers in the due diligence procedure. The Company shall inform the Monitoring Trustee on possible purchasers, submit a list of potential purchasers, and keep the Monitoring Trustee informed of all developments in the divestiture process.

24. The Company shall provide the Monitoring Trustee with all managerial and administrative support that it may reasonably request on behalf of the management of the Divestment Business. This shall include all administrative support functions relating to the Divestment Business which are currently carried out at headquarters level. The Company shall indemnify the Trustee and its employees and agents (each an "Indemnified Party") and hold each Indemnified Party harmless against, and hereby agrees that an Indemnified Party shall have no liability to the Company for any liabilities arising out of the performance of the Trustee's duties under the Commitments, except to the extent that such liabilities result from the wilful default, recklessness, gross negligence or bad faith of the Trustee, its employees, agents or advisors.

25. At the expense of the Company, the Trustee may appoint advisors (in particular for corporate finance or legal advice), subject to the Company's approval (this approval not to be unreasonably withheld or delayed) if the Trustee considers the appointment of such advisors necessary or appropriate for the performance of its duties and obligations under the Mandate, provided that any fees and other expenses incurred by the Trustee are reasonable. Should the Company refuse to approve the advisors proposed by the Trustee the Commission may approve the appointment of such advisors instead, after having heard the Company. Only the Trustee shall be entitled to issue instructions to the advisors. Paragraph 26 shall apply *mutatis mutandis*.

IV. Replacement, discharge and reappointment of the Trustee

26. If the Trustee ceases to perform its functions under the Commitments or for any other good cause, including the exposure of the Trustee to a conflict of interest:

(a) The Commission may, after hearing the Trustee, require the Company to replace the Trustee; or

(b) The Company, with the prior approval of the Commission, may replace the Trustee.

27. If the Trustee is removed according to paragraph 28, the Trustee may be required to continue in its function until a new Trustee is in place to whom the Trustee has effected a full hand over of all relevant information. The new Trustee shall be appointed in accordance with the procedure referred to in paragraphs 16-21.

28. Beside the removal according to paragraph 28, the Trustee shall cease to act as Trustee only after the Commission has discharged it from its duties after all the Commitments with which the Trustee has been entrusted have been implemented. However, the Commission may at any time require the reappointment of the Trustee if it subsequently appears that the relevant remedies might not have been fully and properly implemented.

Section F. The Review Clause

29. The Commission may, where appropriate, in response to a request from the Company showing good cause and accompanied by a report from the Monitoring Trustee:

(i) Grant an extension of the time periods foreseen in the Commitments, or

(ii) Waive, modify, or substitute, in exceptional circumstances, one or more of the Undertakings in these Commitments.

Where the Company seeks an extension of a time period, it shall submit a request to the Commission no later than one month before the expiry of that period, showing good cause. Only in exceptional circumstances shall the Company be entitled to request an extension within the last month of any period.

30. For the avoidance of doubt, in the event the Transaction does not proceed for any reason, the Company has no obligations to perform any of the obligations contained in these Commitments.

……

[…]*
duly authorized for and on behalf of the Company

SCHEDULE

1. **The Divestment Business as operated to date has the following legal and functional structure:**

The Divestment Business comprises *inter alia* a production plant located in […]* that manufactures 3.5" HDDs[1] and the […]* 3.5" HDD […]* production lines […]* located in […]*.[2] It also includes any pipeline product design currently in development by the Divestment Business.
The Divestment Business is capable of producing Desktop, CE, Business Critical 3.5" HDDs for various applications, including XHDDs. The HDDs produced are intended to serve all types of 3.5" HDD customers, including OEMs and distributors.

For the avoidance of doubt, the Divestment Business does not include any WD or HGST production lines that manufacture 2.5" HDDs or Mission Critical Enterprise HDDs.

2. Following paragraph 4 of these Commitments, the Divestment Business includes but is not limited to:

(a) the following main tangible assets:

The Divestment Business shall include the following tangible assets:

- The HDD production plant located at […]* that manufactures 3.5" HDDs. It includes, in particular, fully configured production lines for the production of 3.5" HDDs, such lines having a total capacity of […]*annual units of output, as more fully described in Annex A-2. The production lines are able to produce Desktop, CE, and Business Critical HDDs for various applications, including XHDDS. For the avoidance of doubt, it does not include those production lines at […]* that manufacture 2.5" HDDs.
- The […]* 3.5" HDD […]* production lines […]* located in […]*.
- The existing inventory, parts, and supplies of the Divestment Business that exist at Closing and are associated with the Divestment Business (*i.e.*, not associated solely with 2.5" HDD production lines) but recognising that until Closing inventory, parts, and supplies may be used in the ordinary course of business.

- Product designs for 3.5" HDDs in production at […]*, and any pipeline product […]* currently being developed or foreseen to be developed in […]* (but excluding HDDs that are manufactured in plants other than […]*).

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1 The HDD production lines of the Divestment Business are capable of running […]*.
2 […]*.

- Product designs for […]* 3.5" HDDs […]* production line and product designs for any pipeline […]* 3.5" HDD product currently in development by […]*.
- Distribution offices in […]* [6 cities on three continents (America, Asia, Europe)].

(b) the following main intangible assets:

The Company will ensure that the Purchaser of the Divestment Business will either co-own (pursuant to Section 2(b)) or have access to (under Section 2(c)) all proprietary WD or HGST Intellectual Property required to manufacture and sell the 3.5" HDDs that are the subject of the Divestment Business and/or necessary for the viability or competitiveness of the Divestment Business to compete in the "markets of concern" (namely 3.5" HDDs for Desktop, CE, and/or Business Critical applications).

The Divestment Business shall include the assignment of the following intangible assets:

- ***Patents.*** WD would assign co-ownership rights in approximately […]* patents and pending patent applications […]*. The retained patents will be made available to the Divestment Business pursuant to the license agreement described in Section 2(c) below.

- All 3.5" HDD Intellectual Property Rights, *i.e.*, all HGST or WD intellectual property (including any trade secrets, know-how, technology, methods, inventions, processes, firmware/software, databases, schematics, specifications, designs, and trademarks) used predominantly in the manufacture of 3.5" HDDs by the Divestment Business. More specifically, such assignment shall include:

    - ***Designs.***

        - […]* The […]* integrated product/equipment reference designs identified in Annex A-3. […]* Technical summaries for specific product platform models are provided in Annex A-3.

          The in-process integrated product/equipment reference designs for pipeline products identified in Annex A-3, which are currently being developed by […]* to manufacture 3.5" HDD […]* products at […]* the facility.

        - The integrated product/equipment reference designs for 3.5" HDD production lines. Technical summaries for specific product platform models are provided in Annex A-3.

The in-process integrated product/equipment reference designs for pipeline products identified in Annex A-3, which are currently being developed by […]* to manufacture […]* 3.5" HDD at the […]* facility.

- ***Trademark.*** An assignment of the […]* registered and pending trademark.

- ***Know-how.*** Copies of process, component, product, equipment, and tooling documentation, including specifications and schematics. The know-how transferred also includes copies of documentation on the product and manufacturing firmware / software required for using

  - […]* The […]* integrated product/equipment reference designs for the 3.5" HDD production lines located at […]*, and

  - […]* The integrated product/equipment reference designs for […]* 3.5" HDD […]* production lines.

For the avoidance of doubt, all 3.5" HDD Intellectual Property Rights will be licensed back by the Purchaser to the Company on a non-exclusive, perpetual, royalty-free, fully paid-up, and non-transferable basis.

Notwithstanding the license back, the Company will also offer a restrictive covenant in favour of the Purchaser not to use the transferred design platforms (including the pipeline design platforms) to manufacture 3.5" HDDs for CE, Desktop, and Business Critical applications, as identified in Annex A-3.

(c) the following main licenses, permits and authorizations:

The Divestment Business shall include a non-exclusive, perpetual, royalty-free, fully paid-up, non-transferable, worldwide license for Other HDD Intellectual Property Rights to make 3.5" HDDs.[3] See Annex A-3. The scope of this license shall include issued patents and pending patent applications.

Except for patents, the license will include the right to sub-license Other HDD Intellectual Property Rights that are required to support viability and competitiveness of the Divestment Business (*e.g.*, to work with suppliers to provide services). As regards patents, the license will include the right to assert and sub-license the HGST and WD patents retained by the Company to respond to patent assertions by competitors against the respective HGST and WD assets contributed to the Divestment Business in the event that the assigned patents do not provide sufficient protection.

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[3] Other HDD Intellectual Property Rights means all HGST or WD intellectual property (including any trade secrets, know-how, technology, methods, inventions, processes, firmware/software, databases, schematics, specifications, and designs) used in the manufacture of 3.5" HDDs by the Divestment Business and also in the manufacture of HDDs by the retained businesses of HGST and/or WD as appropriate.

The Purchaser will be able to use the transferred/licensed IP to engage in innovation, including "follow on" innovation conducted by HGST and WD previously as regards HDDs.

If an assignment is not possible, the Company will use best efforts to cause the sub-license of any HGST and WD patent cross-license agreements that exist with third parties at the time of Closing.

The Company is prepared to enter into a patent cross-license agreement with Purchaser covering future patents (*i.e.*, those filed prior to the end of a five-year period following Closing).

(d) the following main contracts, agreements, leases, commitments and understandings

The Company will use best endeavours to transfer, assign, or novate:

- Any contracts, agreements, leases, commitments, or understandings that relate solely or exclusively to the Divestment Business (insofar as the counterparty or counterparties agree).

- Those sales agreements that HGST and WD has/have in place with customers that are predominantly 3.5" specific and served by the Divestment Business.

- Any parts of broader "framework" sales agreements that HGST has in place with customers that are predominantly 3.5" specific and served by the Divestment Business.

(e) the following customer, credit and other records:

The Company will use best endeavours to transfer, assign, or novate any credit and other records that relate predominantly to the Divestment Business.

(f) the following Personnel:

The Divestment Business shall include the following personnel:

- [<250]* manufacturing and development engineers located at.

- [<250]* development engineers:

    - […]*

    - […]*

- […]*

- [<5,000]* employees (direct labour) employed at […]*.

- [<500]* sales, marketing and sales administration staff at various

locations worldwide.

- […]* Intellectual Property personnel that provide Intellectual Property support services for the Divestment Business.

In addition, WD will use best efforts to provide all engineering personnel required to run the 4 platter 3.5" HDD Business Critical production lines […]* and/or develop 5 platter pipeline HDD subject to local laws.

(g) the following Key Personnel:

The Company will make all reasonable efforts to cause the transfer of the following Key Personnel:

- The […]* (overall responsibility for the labour force, output, profitability, security, functioning of the plant, welfare of the staff, quality, and safety; also has some civic responsibilities);

- The […]* (assists the in performing his duties and also responsible for communication and liaison with support organisations);

- The […]* (responsible for product yields, ensuring quality builds and that specified engineering processes are followed, and liaison with support organisations); and

- Functional Team […]* (report to the);

- A Hold Separate Manager responsible for the day-to-day management of HGST's 3.5" HDD production facilities located in;

- A Hold Separate Manager responsible for the day-to-day management of WD's 4 platter 3.5" HDD Business critical production lines and 5 platter 3.5" HDD pipeline product platforms currently located in.

- Engineering personnel required to continue development of the 3.5" 5 platter pipeline project at WD.

- Intellectual Property personnel that provide Intellectual Property support services for the Divestment Business.

An organisational chart of these employees and their names is attached as Annex A-4.

(h) the following arrangements for the supply of transitional services::

The Company will, concurrently with Closing, enter into one or more Supply Agreements, pursuant to which the Company or one or more of its Affiliated Undertakings will offer for sale to the Purchaser [certain components]* to support the Divestment Business for a period of up to years. This Agreement will be automatically renewable for periods of year unless terminated by the

Company by notice of year prior to any such termination or renewal date. The Supply Agreement will *inter alia*:

- Afford the Purchaser discretion to determine purchase volumes in line with the current production capacity of the Divestment Business, with reasonable flexibility in the event that the Divestment Business increases or decreases capacity as measured by a percentage of the Purchaser quarterly forecasts on a rolling basis;

- […]*

- Be determined on a competitive […]* pricing formula;

- Include a warranty that the components are free from defects in materials and workmanship, and that they comply with all agreed-upon specifications, including product and quality specifications. Seller will provide an exclusive remedy for any breach of warranty (*i.e.*, repair or replace); and

- Include a clause obliging the Company to defend the Purchaser from any third party claims that the components […]*. The Company shall also pay any damages finally awarded to such third party by a court of competent jurisdiction, to the extent such damages were the direct result of the alleged infringement.

- Allow the Purchaser to terminate with.

Strict firewall procedures will be adopted so as to ensure that any competitively sensitive information related to, or arising from, this Supply Agreement (*e.g.*, product roadmaps) will not be shared with, or passed on to, anyone outside the Company's [component]* operations.

In order to assist the Purchaser of the Divestment Business with the transfer and installation of the […]* 3.5" HDD production lines and the installation of the design/firmware, the Company is prepared to enter into a services agreement for a transitional period.

3. The Divestment Business shall not include:

The Divestment Business shall not (and does not need to) include cash or cash equivalents, equity interests in any person, tax assets, or insurance policies.

4. **Guide to Annex A**

- Annex A contains details and particulars on the Divestment Business. […]*