

EN

***Case No COMP/M.5535 -
RENESAS TECHNOLOGY/
NEC ELECTRONICS***

Only the English text is available and authentic.

**REGULATION (EC) No 139/2004
MERGER PROCEDURE**

Article 6(1)(b) NON-OPPOSITION
Date: 02/12/2009

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EUROPEAN COMMISSION

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PUBLIC VERSION

MERGER PROCEDURE
ARTICLE 6(1)(b) DECISION

To the notifying party:

Dear Sir/Madam,

Subject : Case No COMP/M.5535 – Renesas Technology/ NEC Electronics

Notification of 27 October 2009 pursuant to Article 4 of Council Regulation No 139/2004

I. INTRODUCTION

1. On 27 October 2009, the Commission received a notification of a proposed concentration pursuant to Article 4 of Council Regulation (EC) No 139/2004¹ by which the undertaking Renesas Technology Corp. ("Renesas", Japan), jointly-controlled by Hitachi Ltd. ("Hitachi", Japan) and Mitsubishi Electric Corporation ("Mitsubishi", Japan) enters into a full merger within the meaning of Article 3(1)(a) of the Council Regulation with the undertaking NEC Electronics Corporation ("NEC-EL", Japan), controlled by NEC Corporation ("NEC", Japan) by way of purchase of shares.

II. THE PARTIES

2. **Renesas** is a Japanese company established in 2003 as a full-function joint venture jointly controlled by Hitachi and Mitsubishi. Renesas is active in the manufacture and supply of semiconductor solutions mainly for mobile, automotive and PC/AV (Personal Computing/Audio Visual) markets. In particular, it supplies microcontrollers for use in a broad range of applications (e.g. automotive components, portable devices, computer peripherals) as well as LCD drivers, SRAM, and other semiconductor products. Renesas is a vertically integrated device manufacturer (IDM).

¹ OJ L 24, 29.1.2004 p. 1.

3. **NEC-EL** is a Japanese company established in November 2002 as a wholly-owned subsidiary of NEC then listed on the Tokyo Stock Exchange in July 2003. NEC currently owns approximately 70% of the shares in NEC-EL. NEC-EL specialises in semiconductor products for a wide range of customer applications. NEC-EL is an IDM like Renesas.

III. THE OPERATION

4. The operation is a full legal merger of Renesas and NEC-EL. The definitive binding agreement setting out the basic terms was signed on 16 September 2009. The final merger agreement will be concluded at the end of January 2010. The ownership structure of the merged entity is anticipated to be such that none of the shareholders will solely or jointly control it. It is foreseen that NEC will hold 33.42%, Hitachi 30.73% and Mitsubishi 25.14%. Japanese corporate law does not confer any rights to minority shareholders that would amount to control in the meaning of the EC Merger Regulation.
5. Thus, the transaction constitutes a concentration within the meaning of Article 3(1)(a) of the Merger Regulation.

IV. COMMUNITY DIMENSION

6. The undertakings concerned have a combined aggregate world-wide turnover for the year 2008 of more than EUR 5 000 million² (Renesas³: EUR [...] million, NEC-EL⁴: EUR [...] million). Each of Renesas and NEC-EL has a Community-wide turnover for the year 2008 in excess of EUR 250 million (Renesas: EUR [...] million, NEC-EL: EUR [...] million), without achieving more than two-thirds of their aggregate Community-wide turnover within one and the same Member State.
7. The notified operation therefore has a Community dimension within the meaning of Article 1(2) of the EC Merger Regulation.

V. MARKET DEFINITION

A. The Relevant Product Markets

8. Renesas and NEC-EL are active in the manufacture and sale of a broad range of semiconductor devices. Semiconductors are a class of crystalline solids with electrical conductivity between that of a conductor and an insulator. Such materials can be treated chemically to allow transmission and control of an electric current. Semiconductor devices can be manufactured as either single discrete devices or as integrated circuits ("ICs") also referred to as chips. The present transaction involves ICs.

² Turnover calculated in accordance with article 5(1) of the Merger Regulation and the Commission Consolidated Jurisdictional Notice of 10 July 2007.

³ Fiscal year 2008, ended 31 March 2008.

⁴ Fiscal year 2008, ended 31 March 2008.

9. Only a few Commission merger precedents⁵ involve the production and supply of ICs. Most of those precedents concern ICs in the mobile handset industry. The Commission notably found that semiconductors exist in numerous types and can be classified according to several different criteria, such as the specific functions that they are intended to fulfil or whether they are designed for various possible applications (general purpose ICs) or for a specific application (Application Specific Devices - "ASDs").
10. The notifying parties suggest classifying ICs into three broad categories: Processing ICs, Memory ICs and Logic ICs, according to the main task they are designed to execute. They also suggest that all three categories can be further broken down into sub-categories:

Processing ICs

11. Processing ICs are designed to perform arithmetic operations along set instructions. Processing ICs are usually further segmented into Microprocessors ("MPUs"), Microcontrollers ("MCUs") and Application Specific Devices ("ASD" which are further subdivided into Application Specific Standard Products - "ASSPs", and Application Specific Integrated Circuits - "ASICs"), depending on the degree of customization of the product.
12. As regards processing ICs, the parties' activities mainly overlap in MCUs. There are also minor overlaps in MPUs and in ASICs. These minor overlaps do not lead to affected markets and therefore are not assessed in this decision⁶.
13. The notifying parties argue that the relevant product market should comprise all processing ICs (with the exception of compute MPUs that are used in computers), on the ground that they consist essentially of the same components: a central processing unit (CPU), some on-chip memory, input/output (I/O) peripherals and various other interface devices. According to the parties, none of these features is determining the potential end-use of the IC and various types can be used for the same end-use, therefore no exact delineation of relevant markets along any of these features is possible.
14. The notifying parties also submit that there is considerable demand-side substitutability between MPUs, MCUs, ASSPs and ASICs, claiming that these can to some extent be used interchangeably. For the same reasons the parties also dismiss a possible further segmentation by sector (e.g. automobile or communication ICs). They notably claim that their differing market shares along sectors are due to long standing customer relationships in certain markets rather than distinct characteristics of the semiconductor products in question.
15. Moreover, the notifying parties refer to strong supply-side substitutability, claiming that most semiconductor manufacturers can produce nearly any kind of semiconductors

⁵ Notably COMP/M.2820 - STMicroelectronics/Alcatel Microelectronics, COMP/M.5173 - STM / NXP / JV, COMP/M.5332 - Ericsson / STM / JV, COMP/M.4892 - Infineon/Siemens/JV, COMP/M.4751 STM/ INTEL/ JV. The antitrust case COMP/37.990 - Intel also involved the production and supply of ICs, and more specifically of high-end microprocessors, which is not an affected market in this case.

⁶ The market for the manufacture and sale of MPUs is assessed in detail in the Commission decision of 13 May 2009, COMP/37.990 – Intel.

product at the design level, with minimal time and cost involved in switching production from one type of product to another (with the exception of compute MPUs that are used in computers).

16. Contrary to the parties' claim, the market investigation indicated that a distinction needs to be made, both from a demand- and a supply-side point of view, between on the one hand MPUs and on the other MCUs and ASDs. MPUs are indeed sophisticated general purpose ICs, which do not incorporate peripherals components, and which would not be suitable to perform on a cost-effective basis the same functions as MCUs or ASDs. Conversely, MCUs or ASDs are not designed to perform as complex operations as MPUs.
17. The respondents to the market investigation also generally agreed with the subdivision of processing ICs between MCUs and ASDs. However, such distinction might be sometimes difficult when MCUs that are usually multi-purpose, are designed particularly for specific applications (e.g. using add-ons) and thus are to some extent similar to ASDs.
18. As regards a possible subdivision of MCUs, and more particularly according to end-use applications, the parties' arguments were not confirmed by the market investigation.
19. On the demand-side, substitutability among MCUs designed for different applications appears somewhat feasible in theory, since it is always possible to rewrite their program. In practice there appears however to be limited substitution because MCUs usually incorporate add-ons, interfaces or have specific characteristics (e.g. packaging requirement for resistance to high temperature in the case of automotive MCUs) which make them more suitable for a given application. Using a MCU designed for a specific application to perform other functions is not optimal in terms of costs-effectiveness. Consequently, it may often not be an efficient substitute to MCUs specifically designed to perform such functions.
20. From a supply-side perspective, the market investigation indicated that only a limited number of suppliers offer a wide range of MCUs and that they are rarely able to cover the whole spectrum of MCUs available. Most MCU manufacturers are specialized on certain application and consequently focus on a limited number of segments (e.g. automotive, security, industrial applications, communications) in line with their commercial strengths and know-how. According to the respondents to the market investigation, starting to produce other processing ICs and MCUs would require a significant investment in time and in money. This appears to be particularly true for certain sectors such as the automotive sector where quality requirements are high and specialisation is necessary.
21. The above elements provide an indication that MCUs might represent a separate market and that a sub-segment for automotive MCUs might be considered. However, for the purpose of the assessment of the present transaction, the exact definition of the relevant product markets for the various processing ICs can be left open, given that the proposed transaction does not raise any competition concerns under any alternative market definition.

Memory ICs

22. Memory ICs provide data storage and retrieval capacity within an electronic system and can be classified into two categories: volatile memory, which loses its contents when not powered, and non-volatile memory that can store data even when power is switched off. Volatile memory comes in two types: Static Random Access Memory ("SRAM") and

Dynamic Random Access Memory ("DRAM"). Random access memory ("RAM") refers to memory where any piece of data can be accessed almost instantly. In previous decisions⁷, the Commission considered SRAM and DRAM as two separate markets on the basis that they perform different functions.

23. As regards memory ICs, the parties' activities overlap only in the production of SRAMs.
24. The notifying parties claim that a new category of memory ICs has been emerging, called Pseudo SRAM (PSRAM) because it mimics SRAM in terms of functionality. The parties submit data that shows rapid expansion of PSRAM sales volumes⁸ at the expense of SRAMs and argue that the relevant product market should therefore include both SRAMs and PSRAMs.
25. The market investigation largely contradicted the parties' claim that the relevant product market should include both SRAMs and PSRAMs. According to the respondents SRAMs have significantly higher access rate, lower power consumption and much higher cost of manufacture than PSRAM. Moreover, one respondent indicated that PSRAM does not serve SRAM applications, while others confirmed that different technologies are at the basis of the two products.
26. A few respondents suggested a further possible sub-segmentation between Asynchronous and Synchronous SRAMs. However, none of these respondents provided evidence that these two kinds of SRAMs could not be used to perform the same functions.
27. The market investigation therefore indicated that SRAM might have to be considered separately. However, for the purpose of the assessment of the present transaction, the exact definition of the relevant product markets for the various memory ICs can be left open, given that the proposed transaction does not raise any competition concerns under any alternative market definition.

Logic ICs

28. The parties consider logic ICs to comprehend all those different types of semiconductors that are neither processing nor memory ICs. Logic ICs are generally not programmed and can be configured by the customer to perform a specific function.
29. The parties' activities overlap in the category of logic ICs of LCD drivers which are used to control and drive flat panel liquid crystal displays ("LCD").
30. Despite the high degree of supply-side substitutability between logic ICs, the parties claim that from a demand-side prospective the degree of substitutability is limited. Consequently the parties suggest that LCD drivers should be considered separately.
31. The market investigation confirmed the definition of a sub-segment for the design and manufacture of LCD drivers, in light of the specific functions that they perform and that cannot be performed by other logic ICs. This notably stems from the fact, among other factors, that LCDs drivers use high voltage process technology.

⁷ COMP/M.44 – Hitachi/NEC – DRAM/JV and IV/JV.22 – Fujitsu/Siemens

⁸ [...].

32. Some respondents to the market investigation indicated the possibility to define a narrower market along the display categories (e.g. size). However such distinction was not confirmed by the majority of the respondents. First, several suppliers indicated being able to produce drivers for any size. Second, some customers also mentioned that there exist LCD drivers that are designed to work with different types and all sizes of LCDs.
33. The market investigation therefore indicated that LCD drivers might be considered separately.
34. For the purpose of the assessment of the present transaction, the exact definition of the relevant product markets for the various logic ICs, including LCD drivers, can however be left open, given that the proposed transaction does not raise any competition concerns under any alternative market definition.

B. The Relevant Geographic Market

35. The parties consider the geographic markets for all kind of semiconductors to be at least EEA-wide in scope and possibly worldwide. According to the parties, there are many elements pointing to a worldwide market: while production facilities supplying these products are mostly concentrated in Asia, customers, which are generally large OEMs, are dispersed on a worldwide scale, transport costs and trade barriers are marginal and prices appear roughly homogenous worldwide.
36. In its previous decisions⁹ the Commission considered markets concerning various types of semiconductors to be at least EEA-wide and possibly worldwide. However, the precise scope of the geographic market was left open.
37. The market investigation confirmed that transport costs are not significant compared to the final price of a semiconductor (from 0.2% to 5% according to the various respondents¹⁰). The majority of the respondents also indicated that location was not a factor for supplier selection.
38. Most respondents considered that price levels are similar worldwide. Some respondents however indicated that prices might on average be higher in certain countries which focus on the higher-end of the market and state-of-the-art solutions (e.g. Japan, Korea). Two respondents also added that regulation and standards, notably in the communication sectors, could impose higher requirements and therefore have an influence on prices.
39. For the purpose of the assessment of the present transaction, the Commission considers the geographic scope of the above markets to be at least EEA-wide, if not worldwide. However the exact definition of the relevant geographic market for semiconductors can be left open, given that the proposed transaction does not raise any competition concerns under any of these two alternative geographic market definitions.

⁹ COMP/M.2820 - STMicroelectronics/Alcatel Microelectronics COMP/M.4751- STM/Intel, COMP/M.5173 – STM/NXP/JV, COMP/M.5332 – Ericson/STM/JV.

¹⁰ With the exception of one respondent which indicated a wider range: 6-20%, while still indicating that location was not a factor for its supplier selection.

VI. COMPETITIVE ASSESSMENT

40. The parties' activities overlap in if Processing ICs, Memory ICs and Logic ICs. However, their activities give rise to affected markets only on the hypothetical product markets for the manufacturing and sale of (i) MCUs, (ii) SRAM, and (iii) LCD drivers.
41. The respondents to the market investigation did not express any significant objections against the proposed transaction. None of the customers expressed any competition concerns as they all outlined that this market is characterized by intense competition. Only one competitor expressed concerns which were mainly related to the particular architecture used by the parties: for the reasons explained in the following paragraphs, the proprietary architecture of the parties does however not appear to represent a competitive advantage for the combined entity.

MCUs

42. According to the information submitted by the parties, on a hypothetical market for MCUs, the combined entity will have a market share of approximately [20-30]% at the EEA level and [30-40]% at a worldwide level¹¹. Should the market be further narrowed down to MCUs sold to the automobile industry, the merged entity's combined market shares would be approximately [20-30]% at the EEA level¹² and [30-40]% at a worldwide level.
43. The parties submit that the combined entity's market shares will not enable it to raise prices in particular because (a) the merged entity will continue to face strong competition from a number of significant players and (b) customers, mostly large OEMs and large distributors, have considerable buying power.
44. All respondents to the market investigation confirmed the parties' claim that post-merger the combined entity will continue to face several strong and effective competitors active at both the EEA level and worldwide level. The respondents mentioned strong players such as Freescale Technologies (with a [10-20]% share on the EEA market for the manufacture and sale of MCUs, and [10-20] % worldwide), Infineon ([10-20]% in the EEA and [5-10]% worldwide), Samsung Electronics ([10-20]% in the EEA and [5-10]% worldwide), STMicroelectronics ([5-10]% in the EEA and [5-10]% worldwide), NXP ([5-10]% in the EEA and [0-5]% worldwide), Microchip Technology ([5-10]% in the EEA and [5-10]% worldwide), Texas Instrument ([5-10]% in the EEA and [5-10]% worldwide), Fujitsu ([0-5]% in the EEA and [5-10]% worldwide) or Toshiba ([0-5]% in the EEA and [0-5]% worldwide).
45. Similarly, the market investigation confirmed that effective competitors are also present in the hypothetical sub-market for automotive MCUs, including Freescale Technologies ([20-30]% worldwide), Fujitsu ([5-10]% worldwide), Texas Instrument ([5-10]% worldwide), Infineon ([0-5]% worldwide), STMicroelectronics ([0-5]% worldwide), and Toshiba ([0-5]% worldwide).

¹¹ Turnover based market shares on a worldwide level for 2008. Source: Gartner.

¹² Market shares on a EEA level for automotive MCUs are based on the parties' best estimates.

46. According to the information submitted by the parties, many other smaller companies are also active in the wider MCU market both in the EEA (such as Atmel with [5-10]%, Intel with [0-5]%, Micronas with [0-5]%, and Cypress Semiconductor with [0-5]%) and on a worldwide level (such as Atmel with [0-5]%, Panasonic with [0-5]%, Denso with [0-5]%, and Sony with [0-5]%). Many of these players are also active in automotive MCUs, such as Denso ([0-5]% worldwide), Intel ([0-5]% worldwide) Atmel ([0-5]% worldwide), Panasonic, Micronas, Sony and Cypress Semiconductor (all less than [0-5]% worldwide). According to the parties, also Rohm, Winbond Electronics, and Silicon Laboratories (all less than [0-5]% worldwide) are active in automotive MCUs.
47. The market investigation further confirmed the parties' claim that customers are sophisticated buyers. The great majority of customers of MCUs generally have a policy of multi-sourcing in order to establish price and quality protection, to insure a stable procurement, to maximize technical support and to create a competitive environment. Some respondents have indicated that a limited numbers of MCUs that are produced for a specific end-use application and are thus created specifically on the basis of the customers' specifications cannot be multi-sourced. In these cases, vendors compete at the design-in stage to win specific opportunities, where they often have to participate in competitive tenders.
48. In fact, as revealed by the market investigation, many customers typically make their purchases through competitive bidding processes, involving multiple vendors. According to the respondents, several bids are launched during the year, one for every new project. Some customers do not recur to bidding. However, they none the less require vendors to go through a tough selection process, where they select suppliers on the basis of the products that best meet the specific technical requirement, of the best price, and on the reliability of the supply. Such purchasing patterns maintain pressure on all vendors to meet technical requirements and at the same time offer competitive prices for each new project.
49. The market investigation moreover revealed that MCUs are generally purchased through quarterly or yearly contracts, depending on the specific products. For some products, respondents indicated that contracts might be longer but do not usually exceed 3-5 years¹³. In these latter occasions, prices are usually re-negotiated every 6 months or yearly. Furthermore, the market investigation showed that contracts do not usually provide for exclusivity clauses and minimum purchase obligations. Finally, each contract concerns a specific project that does not bind the customer to a particular supplier for future projects/purchases. The market investigation indicated that suppliers have a similar customers' base and that throughout the years they win or lose single opportunities/projects with the same customers.
50. These customer strategies limit the parties' ability to derive market power from their market shares.
51. In addition the market investigation confirmed that neither Renesas nor NEC-EL possesses any unique or non-replicable know-how or exclusive right and that therefore all major semiconductor manufacturers are able to produce the same or similar products.

¹³ One respondent indicated that for automotive MCUs contracts might be longer (10-15 years). However, this respondent did not indicate if prices are negotiated on a more regular basis.

52. In that respect the market investigation revealed that the combined entity would not enjoy any particular advantage with regard to its specific architecture. One respondent expressed concerns with regard to the ability of the parties to use their proprietary architecture to their advantage, forcing other market players to adopt it, thus limiting the ability of other competitors to compete effectively. As a matter of fact, and contrary to many of their competitors that use ARM licence standard architecture¹⁴, both parties use mostly proprietary architecture.
53. However, the market investigation did not support these concerns, with the majority of the respondents considering the parties' proprietary architecture neither an advantage nor a disadvantage, in light of the fact that, on the one hand, some other major competitors also use proprietary architecture and, on the other hand, all suppliers, including the combined entity, also have ARM architecture. Moreover, some respondents clearly stated that they considered such architecture to represent a disadvantage for the combined entity, as customers would hesitate to employ a proprietary architecture that could prevent them from multi-sourcing.
54. Finally, analyst reports provided by the parties indicate that the market for MCUs is characterized by over-capacity and by a decline of prices that started at the end of the '90s¹⁵.
55. In light of the foregoing, and in particular the significant number of effective competitors active in the markets for MCUs and automotive MCUs, the considerable buyer power of customers, the steady decline of prices, the Commission concludes that the proposed concentration does not raise any competition concerns.

SRAMs

56. According to the information submitted by the parties, on a hypothetical market for SRAMs the combined entity will have a [10-20]% market share at the EEA level and a [30-40]% market share on a worldwide level.
57. The parties claim that after the transaction the combined entity will continue to face strong competition from a number of significant players.
58. The market investigation confirmed the presence of effective competitors such as Cypress semiconductor and Samsung Electronics that on an EEA market will continue to have stronger market presence than the merged entity, with market shares of [20-30]% and [20-30]% respectively (worldwide their market shares are [20-30]% and [10-20]% respectively).
59. The SRAM market is also characterised by the presence of a large number of smaller competitors such as GSI technology ([5-10]% on a EEA level and [5-10]% on a worldwide level), Sony ([0-5]% on a EEA level and [5-10]% on a worldwide level), Integrated Device Technology ([0-5]% on a EEA level and [0-5]% on a worldwide level) and Spansion ([0-5]% on a EEA level and [0-5]% on a worldwide level).

¹⁴ The ARM architecture was developed by the intellectual property company ARM Ltd. (UK) and is now the processing core for a large number of ICs.

¹⁵ Source WSTS and iSuppli.

60. Were PSRAMs regarded as part of the relevant product market, combined market shares would be significantly lower, i.e. [10-20]% on the global level.
61. The parties claim that the market for SRAM is characterized by effective competition. The market investigation confirmed such claim. First, the investigation revealed the same purchasing pattern as in the case of MCUs, as detailed above, hence a similar constraint exerted by sophisticated customers on SRAM manufacturers. Second, none of the respondents to the investigation considered NEC-EL and Renesas to be close competitors on the market for the manufacturing and sale of SRAMs, nor to have any "must have" product on this market. Third, the respondents to the investigation confirmed that the prices for SRAM have been steadily declining and some players have recently exited the market.
62. Finally, the market investigation indicated that many customers are substituting SRAM with a new type of processor called Flash Memory, thus contributing to the overcapacity that characterizes the market.
63. In light of the above considerations, the Commission concludes that the proposed concentration does not raise any competition concerns on the market for the manufacturing and sale of SRAMs

LCD drivers

64. As regards the overlap in LCD drivers, the concentration leads to an affected market at the worldwide level only, with a combined market share of [10-20]% ([10-20]% at the EEA level). At the global level, Samsung Electronics, Himax Technology and Novatek will continue to be significant players with market shares of [20-30]%, [10-20]% and [10-20]% respectively. In addition, the market for the manufacturing and sale of LCD drivers is characterised by the presence of a large number of smaller competitors such as Sharp ([5-10]% worldwide), Magnaship Semiconductor ([5-10]% worldwide), Toshiba ([0-5]% worldwide) and many others with market shares not exceeding [0-5]% on a worldwide level.
65. Similarly to MCUs and SRAMs, the market investigation confirmed the parties' arguments that this market is characterized by dynamic competition, notably respondents indicated the presence of strong and numerous competitors, the absence of "must have" products and the declining trend of demand¹⁶.
66. In light of the above considerations, the Commission concludes that the proposed concentration does not raise any competition concerns on the market for the manufacturing and sale of LCD drivers.

VII. CONCLUSION

67. For the above reasons, the Commission has decided not to oppose the notified operation and to declare it compatible with the common market and with the EEA Agreement. This

¹⁶ According to iSupply figures, demand for LCD drivers is indeed forecasted to contract by [...] during 2009.

decision is adopted in application of Article 6(1)(b) of Council Regulation (EC) No 139/2004

For the Commission,
(Signed)
Neelie KROES
Member of the Commission