



**EUROPEAN COMMISSION**

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**Innovation in EU Merger Control**

Check Against Delivery  
Seul le texte prononcé fait foi  
Es gilt das gesprochene Wort

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# The EU legal and economic framework

## Legal framework

Merger control rules in the EU aim at preserving competitive market structures and ensuring that consumers fully enjoy the benefits of competition. These benefits include low prices, high quality, wide choice, as well as innovative products and services. EU rules enable the European Commission to assess the impact of mergers on all of these parameters, with innovation being no exception.

The applicable legal test under the EU Merger Regulation<sup>1</sup> is whether a merger significantly impedes effective competition.<sup>2</sup> When examining mergers, in line with the EU Merger Regulation and our Horizontal Merger Guidelines,<sup>3</sup> the Commission considers both the loss of competition between the merging firms and the reduction of competitive pressure on other non-merging firms.<sup>4</sup>

In many industries innovation is a key parameter of competition and thus an important criterion in the Commission's merger appraisals. Our Horizontal Merger Guidelines make clear that increased market power resulting from a merger may manifest itself in various ways, including through diminished innovation.<sup>5</sup> Some important elements of the general framework of assessment set out in our guidelines are suitable also for the innovation analysis (for example, the extent to which rival innovators are close competitors).<sup>6</sup>

The Horizontal Merger Guidelines expressly mention innovation as one of the criteria against which to assess the likely effects of a merger, and in particular whether the merger eliminates an important competitive force.<sup>7</sup> In this context, the guidelines acknowledge that effective competition may be significantly impeded by a merger between two important innovators.<sup>8</sup> The wording of the guidelines makes it explicit that the

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<sup>1</sup> Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings, OJ L 24, 29.01.2004, pages 1-22; available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0139&from=EN>.

<sup>2</sup> EU Merger Regulation, Article 2(2) and (3).

<sup>3</sup> Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("Horizontal Merger Guidelines"), OJ C 31, 05.02.2004, pages 5-18; available at: [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52004XC0205\(02\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52004XC0205(02)&from=EN).

<sup>4</sup> EU Merger Regulation, recital 25; Horizontal Merger Guidelines, paragraph 24.

<sup>5</sup> Horizontal Merger Guidelines, paragraph 8.

<sup>6</sup> Paragraph 8 of the Horizontal Merger Guidelines explains that the reference to "increased prices" in the Guidelines is often used as shorthand for various ways in which a merger may result in competitive harm.

<sup>7</sup> Horizontal Merger Guidelines, paragraphs 37-38.

<sup>8</sup> In the same vein, the EU antitrust rules recognise that horizontal R&D cooperation agreements and technology licensing agreements can, in certain circumstances, restrict innovation (see in particular European Commission's Horizontal Cooperation Guidelines, paragraph 119 and Guidelines on Technology Transfer Agreements, paragraph 26).

assessment of pipelines within a merger between two firms with pipeline products related to a specific product market is only one example of how harm to innovation competition may occur.<sup>9</sup>

The Commission's awareness of innovation effects is also demonstrated by the fact that under our rules mergers between firms which are important innovators or have promising pipeline products generally do not benefit from the simplified review procedure, even if all other required conditions are met.<sup>10</sup>

To enable a proper assessment of innovation effects, our standard merger notification forms require the parties to provide information on the R&D, IP rights and pipeline products relevant for the notified transaction.<sup>11</sup>

Mergers can also foster innovation. The Horizontal Merger Guidelines recognise that some horizontal mergers can actually increase the firms' ability and incentives to innovate, thereby also increasing the competitive pressure on rivals to create new goods and services.<sup>12</sup> As I will explain later, such effects are typically assessed by the Commission in the context of efficiency submissions by the parties.

You will recognise all these elements of our legal framework. They, actually, do not differ substantially from those applicable here in the U.S.<sup>13</sup>

The legitimacy of innovation concerns was confirmed by the EU General Court in its 2015 judgment in *Deutsche Börse AG v Commission*.<sup>14</sup> This was an appeal against the Commission decision prohibiting the merger between two major stock exchanges, in part based on innovation concerns. In particular, the Commission considered that the transaction, which would have created a quasi-monopoly in some areas, would have limited the introduction of new products and would have reduced innovation in technology, process and market design in relation to several types of European financial derivatives. Note that the innovation concerns were not specifically related to particular pipeline

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<sup>9</sup> Horizontal Merger Guidelines, paragraph 38.

<sup>10</sup> Commission Notice on a simplified procedure for treatment of certain concentrations under Council Regulation (EC) No 139/2004 (2013/C 366/04), paragraph 11.

<sup>11</sup> See in particular Sections 8.7 and 8.9 of the Form CO and Section 7.2.3 of the Short Form CO.

<sup>12</sup> Horizontal Merger Guidelines, paragraphs 36 and 81; similarly, in relation to non-horizontal mergers, see European Commission's Non-Horizontal Merger Guidelines, paragraph 13.

<sup>13</sup> For instance, the Horizontal Merger Guidelines published by the U.S. Department of Justice and the Federal Trade Commission specifically discuss harm to innovation competition. In section 6.4 the U.S. Horizontal Merger Guidelines indicate that U.S. authorities may consider "*whether a merger is likely to diminish innovation competition by encouraging the merged firm to curtail its innovative efforts below the level that would prevail in the absence of the merger. That curtailment of innovation could take the form of reduced incentive to continue with an existing product-development effort or reduced incentive to initiate development of new products*".

<sup>14</sup> *Deutsche Börse AG v European Commission*, T-175/12 [2015].

projects of the merging parties but were wider in scope. On appeal, the General Court agreed with the Commission's analysis, in particular that pre-merger the close competition between the parties was an important driver of innovation, bringing new and improved offerings to customers. Hence, the appeal of Deutsche Börse on this and other grounds was dismissed.

Overall, the legal framework of EU merger control is well geared to capture not only short-term static effects of mergers on prices but also their longer-term dynamic effects on competition, including effects on choice, quality and innovation.

### **Economic framework**

The EU legal framework for the assessment of innovation concerns is also grounded in solid economic principles. It is well-recognised that economic rivalry between firms often induces them to offer more attractive deals to customers not only by lowering prices for current products, but also by stimulating efforts to cut costs, increase quality and introduce better products. By innovating, a firm can capture profitable sales from its rivals and can also mitigate the risk that its current sales will be displaced by better products offered by its competitors. A horizontal merger, by suppressing competition between two rivals, can therefore reduce their incentive to innovate, and more generally diminish the intensity of dynamic competition, to the detriment of current and future consumer welfare.

These possible adverse effects are more likely to be pronounced if a merger brings together two out of a limited number of effective innovators which, but for the merger, would have been likely to divert significant profitable future sales from each other by investing and by competing in improved, innovative, products. A merger, therefore, can reduce innovation incentives, and more generally reduce the intensity of competition in innovative products, by internalising these competitive effects.

Conversely, a merger may stimulate innovation if it allows firms to better appropriate the social value of their innovation. For example, in the absence of a merger competitors may be able to free-ride on successful innovation carried out by their rivals. A merger could boost innovation by internalising these involuntary knowledge spill-overs. Similarly, a merger may enhance innovation by bringing together complementary R&D assets, by allowing for greater scale economies in process innovation, or by enabling cost efficiencies in R&D.

These economic principles are developed in the existing economic literature, for example in the formal literature on R&D joint ventures, and in several policy papers on the relationship between competition and innovation.<sup>15</sup> Empirical studies also have confirmed the negative impact mergers can have on innovation.<sup>16</sup>

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<sup>15</sup> See, for example, M. Porter, "Competition and antitrust: towards a productivity-based approach to evaluating mergers and joint ventures", *The Antitrust Bulletin*, Winter 2001; R. Gilbert, "Looking for Mr. Schumpeter: Where are we in the competition-innovation debate?", Chapter 6 in A. Jaffe, J. Lerner and S. Stern (eds.), *Innovation Policy and the Economy*, Volume 6, 2006; J. Baker, "Beyond Schumpeter vs. Arrow: How antitrust fosters innovation", *Antitrust Law Journal*, 74, 2007; C. Shapiro, "Competition and

These economic principles do not establish an economic (nor legal) presumption that mergers necessarily reduce innovation and harm future competition in the absence of efficiencies. They do however provide useful guidance for merger control, and provide a solid economic foundation for the concern that, under certain conditions, a merger may reduce innovation competition, to the detriment of consumers.

Recently, following the *Dow/DuPont* decision, some colleagues from the Commission's Chief Economist team have published formal economic work as a contribution to the economic literature on the possible effects of mergers on innovation.<sup>17</sup> This work looks at the possible effects of a merger on innovation and consumer welfare in a model where firms compete offering differentiated products and can enhance the quality of their products by innovating. This work suggests that, under the parameters and assumptions applied in the model, a merger between two out of a limited number of innovators can depress innovation incentives and more broadly reduce current and future consumer welfare, in the absence of innovation-related efficiencies, including the internalisation of knowledge spill-overs. The publication of this work has led up to a lively debate in economic circles on the impact of mergers on innovation. A number of new economic papers have appeared. It is a useful debate, which we are following with attention. At this stage, however, our enforcement practice has not relied on specific economic models in the assessment of innovation effects.

## The European Commission's enforcement practice

The European Commission has conducted innovation assessment of mergers since the early days of the EU Merger Regulation.

Let me quote from one Commission decision: "[...] *the strengthening of Du Pont [...] leads to a considerable reduction of competition, in particular with regard to the competition in product development. Product differentiation resulting from continuing innovation is one of the driving forces of this market. Competition in product development between Du Pont and [the target] in the past has been an important source of innovation [...]*". This is not an extract from our decision of last year in the *Dow/DuPont* case – it is the language from the Commission decision in *DuPont/ICI* of 1992.<sup>18</sup>

The Commission was mindful of the effects of mergers on innovation since the very beginning of EU merger control.

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innovation: Did Arrow hit the bull's eye?", Chapter 7 in J. Lerner and S. Stern (eds.), "The rate and direction of inventive activity revisited", 2012.

<sup>16</sup> For a recent example see C. Cunningham, F. Ederer, S. Ma, "Killer Acquisitions", 2017, available at: [http://faculty.som.yale.edu/songma/files/cem\\_killeracquisitions.pdf](http://faculty.som.yale.edu/songma/files/cem_killeracquisitions.pdf).

<sup>17</sup> G. Federico, G. Langus and T. Valletti, "Horizontal mergers and product innovation", *International Journal of Industrial Organization*, forthcoming.

<sup>18</sup> Case M.214 *Du Pont/ICI*, Commission decision of 30 September 1992, paragraph 47.

Our enforcement practice over the years, however, has mainly been concerned with the short term impact of mergers. Most of our interventions continue to address those. Innovation effects are systematically considered, but only in a limited number of cases they constitute the basis for our intervention.

Let's look at some statistics. In the last three years (between 2015 and 2017) the Commission received more than 1,070 merger notifications. Out of those, we have intervened in 73 cases, which gives an intervention rate of slightly less than 7%.<sup>19</sup> The overwhelming majority of our interventions were based on horizontal static unilateral effects on prices (66 cases). Innovation concerns were identified in 10 cases,<sup>20</sup> usually in addition to static price concerns. Interventions based on innovation concerns thus remain relatively rare.

When people talk about innovation concerns in mergers, they may actually be referring to different types of effects.

A common type of cases involving innovation relates to transactions in which **pipeline products** of one merging party overlap with the existing or pipeline products of the other merging party ('pipeline-to-existing' and 'pipeline-to-pipeline' overlaps, respectively). The relevant pipeline products are usually quite developed, likely to reach commercialisation, and already known to target a specific product market. Such cases are essentially assessed under the framework of potential competition. One of the main concerns relates to future price effects, and in this regard the analysis does not differ substantially from the assessment of competitive effects involving existing products. Adverse price effects may occur even if all the potentially competing pipeline products are expected to be brought to the market by the merged entity. Moreover, if the Commission finds that a merger would lead to the likelihood of discontinuation of the pipeline product in question there may be even stronger harm to consumers – in this case because the merger would reduce product variety (in addition to leading to higher prices) and would also lead to a more significant reduction of competition with third parties (further exacerbating the loss of future product market competition brought about by the merger).<sup>21</sup>

Examples of such cases concerning pipeline overlaps are common among pharmaceutical or medical device mergers. For example, in *Medtronic/Covidien*,<sup>22</sup> the target company had a promising late-stage pipeline product, a drug-coated balloon for treatment of vascular

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<sup>19</sup> Intervention is defined as the Commission conditional clearance decisions in Phase I and Phase II, prohibition decisions, and abandonment of transactions in Phase II.

<sup>20</sup> Six of those cases related the pharmaceutical and medical devices industries: *BD/Bard*, *J&J/ Actelion*, *Boehringer Ingelheim/Sanofi Animal Health Business*, *Novartis/GSK Oncology Business*, *Pfizer/Hospira*, *Medtronic/Covidien*; two were industrial mergers: *General Electric/Alstom* and *Halliburton/Baker Hughes*; one was an agrochemical merger: *Dow/DuPont*; and one was a merger between suppliers of vehicle components: *Knorr-Bremse/Haldex*.

<sup>21</sup> On these types of effects, see also discussion in the U.S. DOJ and FTC Horizontal Merger Guidelines, page 24.

<sup>22</sup> Case M.7326 *Medtronic/Covidien*, Commission decision of 28 November 2014.

diseases, which was expected to compete in the near future with similar existing products of the acquirer. The transaction would thus have eliminated competition from the target's innovative product, in the market where there was only one other credible competitor. The Commission approved this transaction subject to the divestiture of the target's pipeline product. A mirror commitment was accepted also by the U.S. FTC. And the remedy appears to have been successful – in the hands of the new owner the divested product was launched in Europe in January 2015 and received the U.S. FDA approval in July 2017.<sup>23</sup>

Similarly, in *Pfizer/Hospira*,<sup>24</sup> concerns arose due to the overlap between an *infliximab* biosimilar drug of Pfizer which was at an advanced testing stage and an existing *infliximab* biosimilar of Hospira. Only one other competitor was developing another such biosimilar. To address the competition concerns, Pfizer committed to divest its pipeline *infliximab* biosimilar drug

Another type of cases involves the effects on **innovation at earlier stages**, that is, on early R&D efforts of the parties which have not yet taken shape of concrete products, or which do not yet have a high probability of successful commercialisation. Such R&D efforts may target an existing product market or take place upstream of actual product markets in wider innovation areas.

A concrete concern in such cases is the discontinuation, delay or re-orientation of ongoing and overlapping lines of research or early pipeline projects of the merging parties. Indeed, it is common, following a merger, for the merged firm to review its combined R&D activities and re-prioritise its R&D efforts. The existing overlapping lines of research or pipeline projects of one merged party may be abandoned, delayed or re-oriented post-merger, because those R&D efforts could cannibalise the profits from existing and future products of the other merged party. The merger may also result in the reduced incentives for the merged firm to launch research (discovery) of new projects and development of future pipeline products. The adverse effect on innovation activities may take place almost immediately after the merger is implemented and, in the long term, consumers would be harmed by a loss of product variety. This effect will exacerbate the loss of future product market competition in the future downstream market(s) targeted by the overlapping R&D capabilities and activities of the parties.

For these effects to materialise, and to offset other possible effects that the merger may have in fostering innovation, a number of conditions will have to be met. Typically innovation can be stifled by mergers which bring together important and close innovators with similar R&D capabilities, in a sector where innovation is an important parameter of competition, the number of effective innovation players can be reliably identified and is limited, and the barriers to entry are high. Moreover, the higher the pre-merger ability of

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<sup>23</sup> See Philips' press release "Efficacy of Philips' Stellarex\* .035" low-dose drug-coated balloon demonstrated in clinical trial at two years" (15 September 2017), available at: <https://www.philips.com/a-w/about/news/archive/standard/news/press/2017/20170915-efficacy-of-philips-stellarex-035-low-dose-drug-coated-balloon-demonstrated-in-clinical-trial-at-two-years.html>.

<sup>24</sup> Case M.7559 *Pfizer/Hospira*, Commission decision of 4 August 2015.

the players to successfully reap the social benefits of their innovation (for example through effective IPR protection against imitation), the lower is the likelihood that the merger would foster innovation through increased appropriability.

As mentioned before, it would not be appropriate to establish any legal or economic presumption that a horizontal merger will have a negative impact on innovation. Rather, to prove these effects, it is necessary to conduct a detailed examination of evidence in each case, in particular the overlaps between the parties' R&D capabilities and projects, the importance of the rival innovators, and the barriers to entry. On top of this, specific evidence of discontinuation of R&D efforts (closure of plants, reduction of targets, cut in the R&D investments, etc.) may corroborate the analysis, and support the theory of harm.

## **Innovation assessment in recent EU merger cases**

In a number of recent cases the Commission has assessed innovation concerns, often covering the two types of effect I have just mentioned, i.e. elimination of potential competition from pipeline products and wider innovation effects. I will now describe three such recent cases which involved in particular the wider innovation concerns: *GE/Alstom*, *Dow/DuPont* and *Bayer/Monsanto*.

### **GE/Alstom**

One example of a merger raising such wider innovation concerns was *General Electric/Alstom*.<sup>25</sup> In that case, the transaction brought together two major players in the market for 50 Hertz heavy duty gas turbines. Such turbines are mainly used in gas-fired power plants. Only four full technology competitors existed in that market which was characterised by high barriers to entry.

The Commission's investigation showed that, in addition to actual competition concerns, the transaction raised serious issues due to Alstom being an important innovator. The Commission established that, from an innovation and technology point of view, Alstom was often seen as best-in-class in terms of technology, efficiency and flexibility. Alstom was also a strong innovation competitor when measured in terms of R&D investments, headcount and capabilities. It was actively pursuing pipeline projects to deliver to customers cutting-edge heavy duty gas turbines in the medium to longer term. Specific evidence from GE's post-closing integration plans showed that GE would eliminate most of Alstom's R&D capabilities related to heavy duty gas turbines. All in all, the merger would eliminate an important independent innovator<sup>26</sup> from the market, thus reducing innovation pressure also on the remaining players.

In addition to these broader innovation concerns, the Commission also found that GE would likely have discontinued Alstom's specific products: an existing turbine called GT26 and a

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<sup>25</sup> Case M.7278 *General Electric /Alstom*, Commission decision of 8 September 2015.

<sup>26</sup> In line with paragraphs 37 and 38 of the Horizontal Merger Guidelines.

pipeline turbine called GT36, thus depriving customers of new and innovative machines and of future technology upgrades of GT26 turbines that were already installed.

## **Dow/DuPont**

The Commission conditionally cleared the merger between Dow and DuPont, two major agro and chemical companies, in March 2017.<sup>27</sup>

The Commission's in-depth investigation primarily concerned the parties' activities in pesticides, where the merger would create, at the time, the number one seed and pesticide company in the world. The competition concerns identified by the Commission related to a large extent to the standard horizontal unilateral effects on prices of existing overlapping products of the parties.

In addition, the Commission raised concerns with respect to innovation in pesticides. Those concerns were based on the likelihood of negative effects of the transaction on the parties' early pipeline products and lines of research,<sup>28</sup> as well as the likely reduction in the overall innovation efforts post-merger. The Commission's detailed assessment of innovation was based on several elements.

*First*, the Commission looked at the market features and structure. It was found that in the agrochemical industry innovation was an important parameter of competition, barriers to entry were high, and the number of integrated innovative players was limited. To explain these points, let's look at some basics of the agrochemical industry.

Agrochemical companies sell formulated pesticide products which protect crops against pests. An important part of competition consists of bringing new, more effective pesticides to the market, which allows companies to defend their existing sales and capture new market shares from competitors. The main component of pesticides is an active ingredient (AI) which is a result of innovation. Discovering and launching an AI is a lengthy process which follows several relatively fixed stages, comprised of discovery, early development, advanced development, registration and commercialisation. The whole process takes approximately 10 years. The average overall cost of coming up with a new AI is very high – around USD 250-300 million. To launch new AIs, agrochemical companies require a complex R&D organisation and specific assets, equipped not only to discover new molecules but also to perform the necessary field tests and studies necessary to obtain regulatory approval in different world regions. Hence, barriers to entry and expansion in this industry are very high at both discovery and development levels.

Moreover, the Commission observed that this industry has effective IP protection. Indeed, AIs are patent protected for a long time period (25 years) and pesticide products enjoy significant sales with very high margins both during the patent period and also post-patent expiry.

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<sup>27</sup> Case M.7932 *Dow/DuPont*, Commission decision of 27 March 2017.

<sup>28</sup> Overlaps in late pipeline products were analysed under potential competition.

Other important industry features recognised by the Commission were regulatory pressure from authorities and resistance that pests develop to pesticides over time. The parties argued that these factors would ensure that industry players would continue to innovate post-merger to avoid their products becoming obsolete. While these factors obviously play a role, the Commission considered that regulatory pressure and resistance alone were not sufficient to prevent the significant harm to innovation resulting from a structural change in the R&D landscape.

Furthermore, the pesticide industry has an oligopolistic structure with only five integrated R&D players. The Commission's investigation also indicated that not all of these players were active in every segment of the industry. The concentration at the level of specific crop and pest combinations where innovation competition actually took place (i.e. innovation spaces) was even higher. In addition, the Commission observed that the previous waves of consolidation were accompanied by certain reduction in the innovation intensity and output, as demonstrated by lower R&D spend and fewer AIs brought to the market.

*Second*, the Commission assessed the importance of the merging parties as innovators. It was established that both parties, and in particular DuPont, were important innovators in several innovation spaces in herbicides, insecticides and fungicides, having more of an influence on competition than their market shares or R&D expenditure shares would suggest. This conclusion was based on a number of past and forward-looking indicators, such as the parties' expertise and assets, targets in terms of R&D efforts (input) and new AIs (output), track record of bringing new AIs on the market, and strength of patent portfolios.

*Third*, the Commission examined whether the parties were close innovation competitors. The degree of closeness determines the risk of cannibalisation. In assessing the closeness of competition in innovation, it is important to consider whether the parties "meet" each other within and across different stages of the innovation process, including discovery and early/late development. Thus we looked at the parties' overlapping discovery targets/lines of research at the discovery stage and overlapping pipelines at the development stage. It was established that both Dow and DuPont were targeting and competing head-to-head in a number of important innovation spaces in herbicides, insecticides and fungicides.

*Fourth*, the Commission assessed evidence on the likely effects on innovation. It considered that (i) the merger would reduce the parties' incentives to continue R&D in relation to their existing overlapping innovation projects, and (ii) more generally and in the longer term, the merger would reduce the incentives of the parties to invest in R&D efforts in relation to new pesticides in those areas where the parties had significant overlapping R&D capabilities.

The first type of effects would manifest itself in the likely discontinuation, delay or re-orientation of the parallel early pipeline products and lines of research due to the risk of cannibalization. Some of those projects were still at their inception and their individual probability of success was uncertain (e.g. 20-30%). However, one should not confuse the

uncertain outcome of innovation in relation to any specific project, with the likelihood of negative effects on innovation. Indeed, even if there is uncertainty as to the outcome of the innovation process in the future, a merger between firms with competing innovation projects can blunt the incentives to invest in competing projects, reducing the chance of successful innovations being brought to market, to the detriment of consumers. Therefore, while the outcome of any given innovation effort may be uncertain, this does not mean that competition concerns in relation to innovation efforts are not warranted.

The second effect of this particular merger regarding the likely reduction in the incentive to invest in R&D effort in relation to new products in the future was specifically confirmed by concrete evidence regarding the significant planned cut backs in the parties' innovation efforts (e.g. in terms of planned R&D inputs, such as R&D spend, FTEs number, etc., and output targets), compared to their pre-merger plans.

*Finally*, the Commission considered whether the remaining competitors would be likely to compensate for the lost innovation competition. This was found not to be the case for a number of reasons.

After the merger, only three global integrated players (BASF, Bayer, Syngenta) would remain to compete with the merged company, in an industry with very high barriers to entry. Moreover, as I mentioned, not all of the five integrated R&D competitors were present in every innovation space. This was in particular due to the companies' differentiated innovation assets and capabilities, limited capacity (physical, financial), and different value of revenues associated with each crop/pest combination. Thus, the concentration level in many innovation spaces was higher than at the overall industry level. More than two thirds of European pesticide sales are served by four or fewer of the global R&D integrated players.

For example, BASF was found to be a relatively weak innovator in insecticides, where each of the parties was a strong player. This decreased the level of pre-merger competition in some innovation spaces for insecticides (i.e. R&D targeting specific insects and crops) to four players at most, and sometimes fewer. For instance, in one particular line of research the parties themselves considered to be the only two innovators. In other areas, where third party competitors also pursued R&D efforts, the Commission evaluated the level of such a constraint, in particular in view of the advancement, targets and estimated efficacy of the competitors' pipelines, as compared to the closeness between the parties' R&D efforts. This required a deep dive into the competitor's pipelines and related innovation capabilities.

In addition, other non-integrated companies were active to some extent in some stages of the innovation process. However, they were not comparable to the five global R&D integrated players since they did not have the capabilities to engage in all the stages of innovation and commercialisation. For example, there were a number of smaller Japanese companies active in research for the discovery of new AIs. However, their research efforts, development capabilities, regulatory expertise and route-to-market were mainly designed for the Japanese markets and were more limited for Europe.

Overall, the Commission concluded that the presence and R&D efforts of competitors were insufficient to prevent a loss of innovation competition after the merger.

The Commission decision also contains an annex surveying the economic literature on the possible impact of mergers on innovation.<sup>29</sup> This annex primarily rebutted the theoretical arguments brought forward by the merging parties on the basis of their reading of the economic literature. The annex also provided support for the detailed factual investigation of the likely impact of the transaction set out in the Commission decision, without however seeking to establish a general conclusion that horizontal mergers generally harm consumers through adverse effects on innovation.

Only after conducting this thorough factual analysis of all above-mentioned elements the Commission concluded that the merger would harm innovation. To address the identified innovation concerns, the parties committed to divest most of DuPont's global R&D organisation in pesticides, including pipelines at the discovery stages, R&D facilities and employees, with the exception of a few limited assets to support the retained business.

## **Bayer/Monsanto**

The Commission has applied a similar framework of assessment of the dynamic effects on innovation in the next notified agrochemical concentration – Bayer's purchase of Monsanto, which the Commission conditionally cleared several weeks ago.<sup>30</sup>

This was a somewhat complementary transaction bringing together the world's largest supplier of seeds (Monsanto) and the second largest supplier of pesticides (Bayer) to create the leading global integrated seed and pesticide player. This explains why the identified competition concerns, including those on innovation, were contained to a few specific overlapping areas of the parties, rather than spanning across their agrochemical activities.

In *Bayer/Monsanto*, the Commission identified concerns on innovation competition in three areas: broad acre traits, non-selective herbicides, and, as a combination of the two, herbicide tolerant systems, which consist of a herbicide tolerant trait and the corresponding herbicide.

Like in *Dow/DuPont*, in all these areas rivalry was found to be a key driver of the incentives to innovate. Indeed, the possibility to capture additional market share by launching an innovative trait, pesticide or a combined system, provided a powerful motivation for firms to engage in R&D. Also, the investigation showed that the effectiveness of IP rights and other legal forms of protection was high in these areas, which suggested strong appropriability already before the concentration. In addition, the relevant innovation spaces were already concentrated and the barriers to entry and expansion were very high.

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<sup>29</sup> Annex 4 of Commission decision of 27 March 2017 in case M.7932 *Dow/DuPont*.

<sup>30</sup> Case M.8084 *Bayer/Monsanto*, Commission decision of 21 March 2018.

Furthermore, the parties were found to be important and close innovators, based on their past and current innovation efforts. This was confirmed in particular by the patent analysis and the assessment of the parties' innovation targets and lines of research which revealed important overlaps. For example, in traits both Monsanto and Bayer were targeting several identical innovation spaces for weed and insect control in soy, cotton, wheat and across broad acre crops, while in herbicides each of the parties was actively trying to develop a successor to Monsanto's blockbuster product glyphosate.

Following the transaction, it was likely that the specific overlapping R&D lines of research and early pipeline projects would be cancelled, slowed down or re-oriented due to the increased risk of cannibalisation. Also direct documentary evidence confirmed this. Moreover, the initiation of the development of future new products in the relevant areas would also suffer.

On the other hand, following a similar detailed analysis, the Commission dismissed innovation concerns in a number of areas. Hence, innovation harm was not confirmed in relation to fungicides, insecticides, microbials and bee health products because the innovation potential of remaining competitors was found sufficient or the merging parties were not competing closely with each other.

The parties undertook to resolve the identified innovation concerns by divesting the relevant R&D assets to BASF. The Commission is currently assessing in separate proceedings whether BASF can be considered a suitable purchaser to preserve the same level of competition in innovation.

## **Efficiencies and countervailing effects in innovation cases**

Speaking about mergers and innovation, one should not focus only on harm. The Commission recognises that some mergers may lead to an increase in innovation. In our framework, such effects are typically analysed in the context of countervailing efficiencies. This is similar to the approach in the U.S. Horizontal Merger Guidelines.<sup>31</sup> It is the parties who bear the burden of proving that the three required conditions – verifiability, merger-specificity and pass-on to consumers – are met. Indeed, the parties, and not the Commission, hold the relevant knowledge and evidence.

This applies also to the notion of appropriability, at least when the parties claim that the merger would allow them to share knowledge more effectively, thus increasing the incentives to innovate. It is for the parties, with their full industry/business knowledge, to demonstrate how the merger would enable such beneficial knowledge sharing. A related source of countervailing effects may be the presence of involuntary knowledge spill-overs, which a merger may help to partially internalise. The relevance of this effect depends on the characteristics of each industry. As the Commission showed in *Dow/DuPont* and

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<sup>31</sup> U.S. DOJ and FTC Horizontal Merger Guidelines, page 31.

*Bayer/Monsanto*, in some industries the protection against imitation may be strong already pre-merger, for instance thanks to effective IP rights or product life-cycle management techniques. Hence, under these circumstances, it is less likely that a merger would increase the incentives to innovate by internalising significant involuntary knowledge spill-overs.

Efficiencies can also be established when complementary innovation capabilities/assets are brought together by the merger. In *TomTom/Tele Atlas*<sup>32</sup> the Commission recognised that the vertical integration between a navigation systems provider and a digital maps developer would allow to deliver “better maps – faster” to the benefit of consumers and being at least partially merger-specific. Merger specificity is important in this context; for example in some industries collaborations are extensive.

However, in line with our Horizontal Merger Guidelines (and also the U.S. ones), reductions in R&D assets/programs, as such, are not considered to be efficiencies if it cannot be established that they increase productivity of R&D compared to pre-merger level.<sup>33</sup>

## **Remedies in innovation cases**

The main requirements for appropriate remedies in innovation cases are not different from those involving other type of competition concerns. These requirements are clearly set out in our Remedies Notice and the case law of the EU courts: a remedy must entirely remove the competition concerns raised by the merger, be comprehensive and effective from all points of view, and be capable of being implemented effectively within a short period of time. Structural remedies (divestitures) are preferred to behavioural ones.

If anything, in innovation cases, strict adherence to these general principles is ever more important. Preserving something as volatile as innovation can be very challenging.

Remedies in innovation cases are almost invariably structural. Utmost diligence is required to ensure a successful transfer of the innovation prowess of one market player to another. This notably requires adequate scope and scale of the divestment remedy. As a rule of thumb, the transfer should encompass a standalone R&D organisation/unit. Any reverse carve-outs should be limited in order not to undermine its viability and competitiveness. In specific circumstances, it may nevertheless be possible and proportionate to transfer only part of the R&D activities or specific assets provided they can be carved out in a clean and effective manner without undermining their innovation potential.

For an innovation remedy to work, it is important to include all key elements of the innovation value chain, such as R&D facilities, IP rights, data, test results, documentation, know-how, etc. Perhaps one of the most crucial elements is the transfer of all necessary personnel (scientists, engineers, project managers, regulatory staff, etc.). Also, transitional

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<sup>32</sup> Case M.4854 *TomTom/Tele Atlas*, Commission decision of 14 May 2008, paragraphs 244-250.

<sup>33</sup> European Commission’s Horizontal Merger Guidelines, paragraph 80; U.S. DOJ and FTC Horizontal Merger Guidelines, page 31.

support for the know-how transfer (e.g. training) may be required. Furthermore, any offers to share R&D assets (e.g. IP rights), rather than fully transfer them, should be carefully examined, given that sharing may affect the incentives of the remedy taker to invest in R&D. Finally, it is not excluded that the remedy may have to include also a divestiture of certain existing products, due to their close links with the transferred R&D activities or in order to support/fund those activities.

In addition to the remedy design, the identity of the purchaser is key in remedies addressing innovation concerns. It is crucial that the divested innovation-related activities/assets end up in the hands of a candidate with all the capabilities and incentives to continue the innovation efforts and to bring their fruits to the market. Specific purchaser criteria are often embedded in the parties' commitments. An upfront buyer clause may be necessary, meaning that the parties are not able to close their main transaction until the Commission approves the purchaser. The Commission, with the help of an independent trustee, carefully evaluates the proposed candidates, including their capabilities, assets, finances, business plans, incentives, track record, etc.

All these features can be found in the remedies that the Commission accepted in recent innovation cases (*GSK/Novartis Oncology Business*, *General Electric/Alstom*, *Dow/DuPont*, *Bayer/Monsanto*, etc.).

However, innovation concerns do not necessarily lead to broader remedies than concerns over existing products. In the Commission's practice, it is a standard requirement to include in the divestment business all the assets which are necessary to ensure its viability and competitiveness, both at present and in the future.<sup>34</sup> In line with this policy, in a number of recent mergers involving concerns only regarding the overlaps in existing products, the parties committed to divest also their pipeline products, R&D facilities and employees to ensure that the transferred businesses/assets remain competitive in the long run.<sup>35</sup>

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<sup>34</sup> See, for example, Commission notice on remedies acceptable under Council Regulation (EC) No 139/2004 and under Commission Regulation (EC) No 802/2004, (2008/C 267/01), paragraphs 23 and 25.

<sup>35</sup> See, for example, Case M.8087 *Smiths/Morpho*, Commission decision of 18 January 2017 (in which the parties committed to divest Morpho's entire business in the market for explosive trace detection equipment, including not only the current manufacturing facilities, but also the R&D facilities and engineers that were working on the next-generation of equipment) and Case M.7893 *Plastic Omnium/Faurecia Exterior Automotive Business*, Commission decision of 11 July 2016 (in which the parties committed to divest several production plants for plastic bumpers and other car components, including the R&D centre connected to these plants).

## **Conclusion**

Innovation analysis is an important part of our merger control practice. The Commission is keen to ensure that innovation competition is not harmed by mergers, which is a particular risk in transactions combining close and important innovators in concentrated industries with high barriers to entry and well-paced innovation processes. Our decisions so far have not been based on any presumptions regarding innovation effects but relied on a meticulous, fact-based analysis.

Innovation is a key means to increase productivity and improve standard of living. By integrating innovation assessment in its merger analysis, the European Commission fulfils its duties under the EU Merger Regulation and, more generally, contributes to advancing the objectives of the European Union.