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**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND
THE COUNCIL**

**on the implementation of Decision No 1608/2003/EC of the European Parliament and of
the Council on science and technology statistics**

1. INTRODUCTION

Official statistics on science, technology and innovation in the European Union are based on Decision No 1608/2003/EC of the European Parliament and of the Council of 22 July 2003 concerning the production and development of Community statistics on science and technology¹.

Article 5 of Decision No 1608/2003/EC (the ‘Decision’) requires the Commission to present a report to the European Parliament every 3 years evaluating the Decision’s implementation. This is the fifth implementation report² submitted by the Commission to the European Parliament and the Council under Article 5. The report evaluates the implementation of the individual statistical actions listed in Article 2 of the Decision. These actions are aimed at establishing a statistical information system on science, technology and innovation to support and monitor EU policies. The report mainly covers developments since the previous report in 2018.

The Commission implements the Decision through regulatory measures and voluntary data collections in the EU Member States, and through Eurostat’s own production of statistics.

In 2012, the Commission adopted Implementing Regulation (EU) No 995/2012³. The Implementing Regulation lays down the rules for the Decision’s implementation and focuses in particular on statistics on:

- research and development (R&D);
- government budget allocations for research and development (GBARD);
- innovation; and
- other relevant aspects, namely human resources in science and technology; patents; high-technology industries; and knowledge-based services.

By specifying both the statistical units required and the uniform reporting standards, the Implementing Regulation also makes R&D and innovation statistics in the EU more harmonised and strengthens the link of these statistics with European business statistics. The statistics collected have become widely quoted reference data in EU policy monitoring.

The Decision and the Implementing Regulation have improved statistics on R&D and innovation, helping to implement the following EU actions:

¹ Decision No 1608/2003/EC of the European Parliament and of the Council of 22 July 2003 concerning the production and development of Community statistics on science and technology (OJ L 230, 16.9.2003, p. 1).

² The previous reports were COM(2007) 801, adopted on 14 December 2007; COM(2011) 184, adopted on 11 April 2011; COM(2014) 211, adopted on 7 April 2014; COM(2018) 769, adopted on 28 November 2018.

³ Commission Implementing Regulation (EU) No 995/2012 of 26 October 2012 laying down detailed rules for the implementation of Decision No 1608/2003/EC of the European Parliament and of the Council concerning the production and development of Community statistics on science and technology (OJ L 299, 27.10.2012, p. 18).

- In June 2010, the European Council adopted the Europe 2020 strategy for jobs and smart, sustainable and inclusive growth⁴. One of the strategy's five EU headline targets is to improve the conditions for innovation and R&D, with the aim of raising combined public and private R&D investment levels to 3% of GDP by 2020.
- In its Communication of 6 October 2010⁵ on the innovation union flagship initiative, the Commission proposed creating additional indicators to measure the intensity of R&D and about high-growth innovative companies. It also proposed creating an annual innovation union scoreboard⁶ to monitor overall progress in innovation performance. In 2017 and 2019, the European Innovation Scoreboard was improved, using more insights from the EU's 'Community Innovation Survey'⁷ (CIS). The 2020 European Innovation Scoreboard was published on 23 June 2020. Data on R&D and innovation are the basis for the Commission's reporting on sustainable development and on the European Research Area. Data on R&D expenditure are used for national accounting purposes.
- Data on R&D and innovation are a basis for the Commission's analysis of the EU's performance in science, research and innovation, published in the Commission's report 'Science, Research and Innovation Performance of the EU' (SRIP).

This report takes stock of the implementation of the statistical information system on science, technology and innovation (STI). Chapter 2 of the report focuses on the most important developments in the implementation of measures. Chapter 3 covers data quality, and Chapter 4 looks at costs and statistical burden. Chapter 5 looks ahead to future developments.

2. MOST IMPORTANT DEVELOPMENTS SINCE NOVEMBER 2018

The most important developments in the implementation of measures since November 2018 under Article 2 of the Decision are listed below:

- On 27 November 2019, the European Parliament and the Council adopted Regulation (EU) 2019/2152 on European business statistics⁸, covering, amongst other things, European statistics on R&D and innovation. This Regulation will repeal the Decision with effect from 2021. A major impact of Regulation (EU) 2019/2152 is a better integration of different branches of business statistics and different statistical production systems. This will improve the quality of the data and lead to a more efficient production of data. The CIS and the R&D enterprise survey have been reviewed to ensure their definitions are fully compliant with the general definitions set out in Regulation (EU) 2019/2152 and which are used across European business statistics (e.g. in the Statistical Business Register and the Structural Business Survey). This makes the results more consistent and reduces the burden on respondents by re-

⁴ European Council conclusions of 17 June 2010.

⁵ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Europe 2020 Flagship Initiative Innovation Union*, COM(2010) 546.

⁶ Renamed 'European Innovation Scoreboard' in 2016.

⁷ A survey sent to businesses across Europe every 2 years to assess their innovativeness, and obtain insights into which business environments are conducive to innovation.

⁸ Regulation (EU) 2019/2152 of the European Parliament and of the Council of 27 November 2019 on European business statistics (OJ L 327, 17.12.2019, p. 1).

using information already available from other sources. Moreover, the alignment with other relevant data collections and national accounts standards makes it easier to use R&D and innovation data in cross-sectional reports.

- European statistics on R&D and GBARD are consistent with the guidelines in the OECD's 'Frascati Manual – Guidelines for Collecting and Reporting on Research and Experimental Development'. This enables international comparison beyond the EU. In 2015, the OECD released a new version of the Frascati Manual (FM2015). Subsequently, Eurostat, in close cooperation with the EU Member States, adapted its data collections on R&D and GBARD statistics to ensure continued alignment with the guidelines of the FM2015. Eurostat developed methodological guidelines for issues where the FM2015 leaves choices between different options or room for interpretation. These methodological guidelines will make it that much easier to compare R&D and GBARD statistics across EU Member States.
- European statistics on innovation are aligned with the 'Oslo Manual – Guidelines for collecting and interpreting innovation data'. The Oslo Manual is co-published by the OECD and Eurostat. The fourth edition of the Oslo Manual was published late 2018. It better clarifies concepts used in innovation statistics and covers new topics related to business innovation. To make the most of this new edition of the Oslo Manual, Eurostat, in close co-operation with the EU Member States, has changed the Community Innovation Survey (CIS) extensively. The CIS now better reports on innovation activities and capabilities, knowledge flows, external drivers and enablers, and innovation output, including on innovations with environmental benefits (eco-innovations). In addition, Eurostat has re-designed the CIS to provide more information on all enterprises, i.e. on both innovative enterprises and non-innovative enterprises. This will help policymakers to understand better what distinguishes strong innovators from weak or non-innovators, and to design appropriate policies. These changes will increase the quality and policy relevance of the results.
- Eurostat has technically improved the transmission of data on R&D and GBARD as well as data from the CIS. Data used to be sent via extensive Excel sheets but is now sent according to the statistical data and metadata exchange (SDMX) format. This has led to significant improvements in data transmission, which helps to shorten the time Eurostat needs to validate the data. This also has the potential to improve the timeliness of data release in the future.
- For European statistics on 'human resources devoted to science and technology' and 'gender-disaggregated statistics on science and technology', Eurostat has reviewed the statistical production process to ensure full compliance with the data from the EU Labour Force Survey.
- Apart from the areas mentioned above, the Decision requires new statistical variables to be developed in 'patents statistics' and 'high-technology statistics'. The development of methodology and the production of data for 'high-technology statistics' continues. For 'patents and intellectual property rights (IPRs)', Eurostat has discontinued its activities because the European Patents Office now publishes related data itself.

3. DATA QUALITY

Statistics must be sound and fit for purpose. The R&D and innovation data collections are undergoing a systematic quality review, which involves collecting quality reports and regularly monitoring compliance.

The European Statistics Code of Practice⁹ sets the standard for developing, producing and disseminating European statistics. It covers 16 main principles, some of which relate to the general institutional conditions (professional independence or adequacy of resources) required of EU Member State authorities and organisations dealing with statistics. These principles strengthen the overall quality of European statistics. The Code of Practice covers several quality principles relating directly to the STI surveys (such as accuracy, coherence and comparability), and these principles are monitored through regular quality reporting.

EU Member State compliance with the mandatory data-provision requirements has been very satisfactory overall. However, some compliance problems, mainly related to late data delivery, remain in isolated cases. Eurostat has been annually collecting national quality reports on R&D and GBARD statistics since 2007. It has also been collecting national quality reports for each round of the CIS since 2004 (the CIS is released every 2 years) and produces a synthesis of the CIS quality reports. Regulation (EU) No 995/2012 made quality reporting part of mandatory data provision as of 2013. A consultation between data producers and users in 2017 confirmed that the data most relevant for national and EU policy-making are covered by that Regulation. In 2018 and 2019, Eurostat conducted an in-depth consultation on the process for collecting R&D and GBARD data and on the quality of this data, and discussed possible ways of improving this with EU Member States during the Working Group on ‘Science Technology and Innovation’ in November 2019.

Data for optional variables or categories¹⁰ are not always delivered. EU Member States cite cost, high burden to respondents and certain characteristics of their national data production systems as reasons for not delivering this. Eurostat continues to encourage EU Member States to provide data on optional variables and categories, aiming to receive consistent data across EU Member States and over time. Since the early 2000s, this data has become slowly but steadily more complete. Given that the drive to improve the completeness of optional variables and categories is a long process, the Commission will continue its policy of providing guidance and support to increase completeness.

For R&D statistics, Eurostat and the EU Member States continue to work to ensure that data are collected for all organisations engaged in R&D, regardless of their size or the economic sector they are in. Moreover, where EU Member States provide estimates, Eurostat regularly assesses their quality.

⁹ <http://ec.europa.eu/eurostat/documents/4031688/8971242/KS-02-18-142-EN-N.pdf>. The European Statistics Code of Practice was endorsed by the Statistical Programme Committee on 24 February 2005. It was revised by the European Statistical System Committee (ESSC) on 28 September 2011 and again on 16 November 2017.

¹⁰ Variables, or particular categories within variables, that are part of the European R&D and CIS data collections, but are not covered by Commission Implementing Regulation (EU) No 995/2012.

4. COST AND BURDEN

Eurostat has made several attempts in the past to collect data on the cost and burden of collecting STI data. Eurostat has requested that exact figures be included in the quality reporting, but it has proved difficult to obtain consistent data allowing comparison or evaluation of the overall costs. Many EU Member States have pointed out that it will not be possible to separate the cost of compiling European R&D and innovation statistics from the cost of compiling other European business statistics or from the cost of similar activities that serve mainly national information needs. Where data are available, reporting methodologies vary between EU Member States and between institutions within EU Member States. These variations preclude meaningful comparison or publication of the individual cost estimates.

However, on various occasions in recent years, national statistical authorities have reported a lack of resources, raising serious concerns about their ability to meet existing or new European data requirements. Priority setting is therefore more crucial than ever, for existing and planned statistical operations alike.

To limit the cost of producing statistics, the overall requirements in Regulation (EU) 2019/2152 on European Business Statistics are being kept at the current level. Eurostat has also taken action to increase cost efficiency and relevance. A sample selection of what it has done is described below.

- Between 2016 and 2020, Eurostat better integrated the CIS data collection into business statistics, making it possible to reuse information already available from other statistics.
- Eurostat has revised the concepts used in the R&D business survey and in particular in the CIS to correspond to accounting conventions and common practices in business. This makes reporting by businesses easier and increases the quality of the data.
- Eurostat has promoted more efficiency in a variety of ways. For example, it has set technical transmission standards. It has also set common rules and procedures for the validation of data. This has made producing statistics more efficient in EU Member States and at Eurostat.

5. FUTURE DEVELOPMENTS

A major goal for the future development of EU statistics on science and technology will be to further strengthen the link between these statistics and other business statistics. To achieve this, R&D, GBARD and innovation statistics are included in Regulation (EU) 2019/2152 on European Business Statistics. This will make the data more consistent and easier to compare and help to reduce cost and burden at the same time.

During the Working Group on ‘Science Technology and Innovation’ in November 2019, Eurostat and the EU Member States agreed that the 2020 CIS would provide data on innovations with environmental benefits and data on the perceived relevance of climate change for businesses. This data is highly relevant for ‘The European Green Deal’.

The continued internationalisation of R&D, innovation, and other business activities pose additional challenges for compiling science, technology and innovation (STI) statistics, and will continue to pose challenges in the future. These challenges include both obtaining new statistical data on internationalisation and mastering business surveys in a more globalised (and therefore more complex) world.

Eurostat and the EU Member States will work closely together to make better use of the CIS data in the future. This work will not increase the burden on survey respondents. Eurostat and the EU Member States are working on projects that aim to:

- report on different innovation profiles of enterprises (e.g. ‘strategic innovator’, ‘adaptor’, ‘weak or non-innovator’). This would make it possible to show which of these innovation profiles are more common in each country. For example, it could show what percentage of the businesses in a country are 'strategic innovators', and what percentage are 'adaptors'. Moreover, it will be possible to identify the characteristics of the different profiles. The aim is to provide policymakers with more differentiated insight into what drives or hampers innovation.
- better measure the outcomes of innovation by linking CIS data to time-lagged data from the Statistical Business Register and the Structural Business Survey. This activity can improve statistical information about start-ups and scale-ups¹¹.
- support the production of regional CIS data.

The projects will be combined to make the most of synergies.

As was the case with the R&D and GBARD data, EU Member States will transmit CIS data via SDMX in the future. This will increase the efficiency, flexibility and timeliness of data transmission.

Eurostat and the EU Member States will improve the provision of metadata and quality reports for R&D and GBARD statistics.

Eurostat and the EU Member States will seek further measures to increase the timeliness of estimates for key indicators from the CIS.

These developments will take account of the increasingly vital role of research and innovation in coping with the challenges that lie ahead, as outlined in the following examples:

- Under ‘The European Green Deal’, the von der Leyen Commission has set the ambition of transforming the EU’s economy and putting it on a new path of sustainable growth. To achieve this, the European Commission has designed a set of deeply transformative policies, ensuring that sustainability is a mainstream part of all EU policies¹². The Commission has proposed several instruments, like the new Horizon Europe programme, proposals mentioned in the Sustainable Europe Investment Plan, and the InvestEU Programme¹³. An important aspect of ensuring that sustainability is always taken into account is to mobilise research and foster

¹¹ Companies that are too old to be classified as start-ups but that experience strong growth.

¹² COM(2019) 640 final.

¹³ Section 2.2.1 of COM(2019) 640 final.

innovation¹⁴. To formulate and implement related policies requires high-quality data on R&D and innovation, including data related to innovation with environmental benefits.

- The von der Leyen Commission has presented its ambition of shaping Europe's digital future. The Commission is working on a digital transformation, based on three pillars: technology that works for people; a fair and competitive digital economy; an open, democratic and sustainable society. Research and innovation in digital technologies and their application are a key aspect of the digital transformation, and data on R&D and business innovation are needed to support related policymaking.
- In March and April 2019, the European Parliament and the Council reached a provisional agreement on Horizon Europe. The European Commission is proposing a budget of around EUR 100 billion to: strengthen the EU's scientific and technological bases and the European Research Area (ERA); boost the EU's innovation capacity, competitiveness and jobs; and deliver on citizens' priorities and sustain the EU's socio-economic model and values.
- The Commission's Proposal for the revised multiannual financial framework 2021-2027, adopted on 28 May 2020¹⁵, underlines that research and innovation will remain a priority for EU policymaking in the years to come.

6. CONCLUSION

This report evaluates the implementation of actions listed in Article 2 of Decision No 1608/2003/EC, which is aimed at creating a statistical information system on science, technology and innovation. The most important developments since 2018 have been: (i) a better integration of R&D and innovation statistics into European business statistics in order to improve the quality of the data and produce the data with greater efficiency; (ii) the adaptation of the data collection on R&D to the 2015 edition of the Frascati Manual; (iii) the review of the CIS to increase the quality and policy relevance of the survey's results and align it with the latest edition of the Oslo Manual; and (iv) a technically improved transmission of the data (SDMX format). The constant monitoring of the compliance and quality of R&D and CIS statistics required by EU legislation shows that the quality of the data Eurostat publishes is good. Eurostat, in cooperation with the EU Member States, is taking several measures to increase cost efficiency and reduce the administrative burden of producing these statistics, and to increase their completeness.

¹⁴ Section 2.2.3 of COM(2019) 640 final.

¹⁵ COM(2020) 443 final.