Assessment and summary of Member States' reports for Modules 1, 3 and 4 of Annex II of Commission Implementing Decision 2012/795/EU

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Table of contents

Appendices

Appendix 1 Member State level assessment

Appendix 2 Permit links

1 Introduction

1.1 This report

This is the final report for project "Assessment and summary of Member States' reports for Modules 1, 3 and 4 of Annex II of Commission Implementing Decision 2012/795/EU", which is Service Request 16 under framework contract ENV.C.4/FRA/2015/0042. The specific contract number is 070201/2018/787598/SFRA/ENV.C.4.

1.2 Study context

1.2.1 Industrial Emissions Directive

The Industrial Emissions Directive 2010/75/EU (IED) is the primary instrument at the EU level to mitigate the environmental impacts from EU industry. The IED entered into force on 6 January 2011 and had to be transposed by the Member States into national legislation by 7 January 2013. The IED aims to ensure that emissions and other environmental topics from different industrial sources are dealt with in an integrated way and minimised. All installations conducting activities listed in Annex I to the IED are required to operate according to a permit. The permit extends to all environmental aspects of an installation's operating activities, including emissions, waste, resource use, noise, prevention of accidents and restoration of the site upon closure. The permit is issued by the relevant Member State authorities reflecting the principles and provisions stipulated by the IED. Sector specific chapters of the IED outline specific requirements for certain sectors: combustion plants (Chapter III), waste incineration (Chapter IV), solvent-using installations (Chapter V) and installations producing titanium dioxide (Chapter VI).

All permit conditions must be based on Best Available Techniques (BAT), which are set out in the formally adopted BAT conclusions (BATC). The permit conditions for existing installations must be updated to comply with BAT within four years of adoption of the BATC unless an exemption is sought (new installations must comply with BAT from when they commence operation). Installation operators may apply for a derogation from a BAT-Associated Emission Levels (BAT-AELs) for certain aspects of the permit, where they can demonstrate that achieving the BAT-AELs would lead to disproportionately higher costs compared to the environmental benefits owing to the geographic location, local environmental conditions, or technical characteristics of the installation.

14 sectoral BATC have now been published under the IED. The BATC for the Manufacture of Glass ("GLS BATC") (European Commission, 2012) and Iron and Steel production ("I&S BATC") (European Commission, 2012a) were the first to be published under the IED regime and were adopted in March 2012. Consequently, the competent authorities in the EU Member States had until March 2016 to update permits for the installations covered within the scope of the I&S BATC and GLS BATC with the new requirements and for operators to achieve compliance.

1.2.2 Member State reporting on the implementation of the IED

Member States need to ensure that information on the implementation of the IED is available to the Commission as required by Article 72 of the IED.

The Commission Implementation Decision 2012/795/EU on the type, format and frequency of information to be made available provides two questionnaires for the Member States to respond to (European Commission, 2012b). Questionnaire in Annex I of the Decision covered the period from 7 January 2013 to 31 December 2013 and focused on the changes that Member States had to adopt in order to implement the provisions of the IED. Questionnaire in Annex II of the Decision covers the first four years of IED implementation from 2013 to 2016 (7 January 2013 to 31 December 2016). This Annex comprises four Modules, the following three being the focus of this project:

- **Module 1: Implementation update:** This comprises two questions asking for any major changes in implementing the IED compared to the Annex I questionnaire response, and for any difficulties in transposition related to Article 80(1).
- **Module 3: A 'sectoral spotlight'**: This covers implementation of the provisions in the I&S BATC and GLS BATC in terms of number of relevant installations, status of updating permits, setting stricter permit conditions and different emission limit values (ELVs) than established in the BATC, details of the derogations granted according to Article 15(4), and monitoring among others. This is the first time Member States report to the Commission on implementation of the BATC and thus the first formal opportunity for the Commission to evaluate how well implementation of the BATC requirements has occurred in practice.
- **Module 4: implementation of Chapter IV and V of the IED**: This gathers information on the implementation of the provisions on waste incineration and solvent emissions. Detailed information for each waste incineration plant was required, including installation ID, types of waste incinerated, capacity of waste throughputs and operating conditions. With regard to solvent emissions, questions aimed to identify whether reduction schemes were applied instead of ELVs, and what was the progress achieved by them. Furthermore, information on the number of plants that have been granted derogations was required.

To facilitate Member State reporting to Annex II questionnaire, an electronic reporting tool was prepared for Member States to use. With the exception of Greece which faced some technical difficulties with the use of the electronic reporting tool, all Member States reported information for all Modules using the tool.

The next reporting on the implementation of the IED will be delivered in line with the requirements of Commission Implementing Decision (EU) 2018/1135 (European Commission, 2018):

- For installations covered by Chapters II, III and IV of Directive 2010/75/EU, with the exception of waste incineration plants and waste co-incineration plants with a nominal capacity of less than 2 tonnes per hour, the reports according to the format set out in Annex I of the above Decision will be submitted by 30 June 2019 and will cover the implementation status in 2017.
- For waste incineration plants and waste co-incineration plants with a nominal capacity of less than 2 tonnes per hour and on installations covered by Chapter V of Directive 2010/75/EU, the reports according to the format set out in Annex II of the above Decision will be submitted by 30 September 2019 and will refer to the year 2017 and will cover the implementation status in 2017 and 2018.

1.3 Aims and objectives

The aim of the project was to assess the completeness of Member State responses, extract pertinent information from that reported on implementation of the legislation and, where relevant, provide comparisons between sectors, Member States and over time. Consequently, the assessment of the Member States' IED implementation reports has been undertaken as follows:

- Assessment of completeness of Member States' reporting under each question specified in Commission Implementation Decision 2012/795/EU under Modules 1,3 and 4.
- EU-wide assessment, concentrating on common themes and trends in the implementation of the IED across all Member States, performed under each question specified in Commission Implementation Decision 2012/795/EU under Modules 1,3 and 4.
- A detailed Member State-level assessment included as an Appendix to the main report. This also includes an assessment for Norway.

Member States representatives were contacted to fill in any gaps identified in their reporting, or to clarify the information provided. This report includes clarifications received from 24 out of the 25 contacted Member States. Response from the Netherlands was not received.

1.4 Structure of the report

This report includes the following sections:

- **Section 2 Analysis of the completeness of the Member States' reports** – sets out the methodology and results of the completeness assessment.
- **Section 3 EU-level assessment** – provides an EU-wide assessment of the information provided under each question specified in Commission Implementation Decision 2012/795/EU under Modules 1,3 and 4, concentrating on common themes and trends.
- **Section 4 Conclusions and recommendations** – summarises the findings from the completeness assessment and the EU-wide assessment and provides overall conclusions and recommendations.
- **Annex I**: **Member State level assessment** – provides in-depth assessment of the provided information for each of the 28 Member States as well as Norway
- **Annex II: Permit links** – includes all permit links provided by Member States in this study.

2 Analysis of the completeness of Member States reports

2.1 Approach

This section provides an explanation of the approach taken to assess completeness of Member States implementation reports. The assessment covered all questions of Modules 1, 3 and 4 of Annex II of the Commission Implementing Decision 2012/795/EU. For each question in turn, completeness of the information provided was checked and a traffic light system was used to highlight whether response was provided, and whether the information is complete or incomplete. This is described in Table 2-1.

Table 2-1 Traffic light rating system for assessment of data completeness

Red	No answer although required
Amber	Information partly missing or unclear
Green	Complete information available
N/A	No answer was provided but based on the information in responses to other questions it was not applicable.
Blank	This is relevant to questions 5.1, 9.1, 10.1 and 12.2 only. For these questions the reporting tool did not include any way of validating whether the information applied to the Member State or not. In that sense these questions were considered as optional for Member States to respond. Consequently, where no answer was provided by the Member State to these questions it was not considered a gap in reporting.

Answers marked amber, red, N/A or blank were complemented with a short justification stating what is missing or considered incomplete. Where data gaps were identified (answers marked as red or amber), Member States representatives were contacted with additional questions. In total, 25 Member States were contacted during the consultation stage and 24 of them provided additional information (apart for the Netherlands). The clarifications received have been reflected in the Member State and EU-level assessment.

2.2 Completeness of Member States reporting

Error! Reference source not found. below provides the results for each Member State (as provided i n Annex I) aggregated at an EU level in a matrix showing each aspect of the questionnaire and the assessment for each Member State. The assessment is based on the information provided by the Member States in the original reporting as well as the additional clarifications provided during the consultation stage. The assessment highlights the questions where information provided was particularly incomplete or missing (considered horizontally across all Member States). Overall across all modules Member State reporting is considered relatively complete, specifically:

1. **Module 1:** Member State reporting for this module was the most complete. However only seven Member States provided further information on the difficulties in implementation in question 2.1.
2. **Module 3:** Member State reporting for Module 3 is also considered broadly complete following the receipt of clarifications from Member States. For instance, complete information has been provided by most Member States for questions 3, 4, 5, 6, 7.1, 7.3 and 10. Gaps remain in Questions 7.2 and 9.1 which relate to permit links that are unavailable or broken, and question 8.2 which relate to gaps in reported monitoring frequencies.

3. **Module 4:** Member State reporting for Module 4 is also considered complete. Shortcomings in Member States' reporting include:
    - Reporting of operating hours in excess of one year- Meaning that reporting combines multiple units or years of data under Question 11.2b.
    - Justification for derogations of solvent plants not reported under Question 12.2.
    - Erroneous or missing plant coordinates under question 11.1.

Table 2-2 Summary table for completeness assessment

	AT	BE[1] - BR	BE - FL	BE - WA	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
Module 1 - Implementation update																														
1																														
1.1				N/A	N/A					N/A					N/A	N/A		N/A	N/A			N/A	N/A	N/A			N/A	N/A		
2																														
2.1	N/A	N/A			N/A	N/A		N/A	N/A	N/A			N/A		N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A		
Module 3 – Sectoral Spotlight																														
3		N/A					N/A									N/A					N/A									
4.1		N/A					N/A									N/A					N/A									
4.1.1		N/A					N/A			N/A				N/A		N/A			N/A		N/A		N/A		N/A	N/A	N/A			
5.1																														
5.2		N/A					N/A									N/A					N/A									
6.1/2		N/A					N/A									N/A					N/A									
7.1		N/A					N/A									N/A					N/A									
7.2		N/A					N/A									N/A					N/A									
7.3		N/A					N/A									N/A					N/A									
8.1		N/A					N/A									N/A					N/A									
8.2		N/A					N/A									N/A					N/A									
9.1																														
10.1																														
Module 4 - Implementation of Chapter IV and V of the IED																														
11.1			BE-BR																											
11.2(a)																														
11.2(b)																														
11.2(c)					N/A	N/A	N/A	N/A		N/A		N/A			N/A	N/A		N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A			
12.1																														
12.2																														

[1] The completeness assessment presents Belgium regionally to reflect that three separate reports were submitted by this Member State. In some cases, there are differences between the level of completeness between the three regions. Throughout the report, Belgium has been considered as an entire country where possible apart from the instances where information reported for different regions was contradictory.

3 EU-level assessment

3.1 Introduction

This section describes the status of the implementation of the IED across the EU-28 from 2013 to 2016. This is based on the Member State specific, question-by-question analysis (presented in Appendix 1). This section follows the order of the Modules and questions as presented in the questionnaire. It draws conclusions on common themes regarding implementation status and highlights any trends as well as exceptions across the Member States. Where relevant the information reported by the Member States has been compared to the information provided in the previous reporting period to allow assessment of progress in implementation.

Analysis for each question starts with the text of each question in the Decision (presented in *italics* on blue background), and the information requested from the Member States in the reporting tool (presented in **bold** underneath the text of the question). This is to facilitate the understanding of the information presented and the context in which it was provided. It also helps illustrate some of the limitations in the information requested from the Member States in the reporting tool.

3.2 Module 1 Implementation Update

3.2.1 Question 1 Changes since the last reporting period

1. Have any major changes to the implementation of Directive 2010/75/EU been made since the last reporting period, compared to the information reported in response to the questionnaire for first reporting under IED? If so, provide an update by describing the changes and the reasons for them, and provide references where appropriate.

The reporting tool required Member States to answer a Yes/No question regarding major changes in implementation. Where a Member State selected yes, two additional fields appear – a dropdown list with the headings of implementation questions from Annex I for previous reporting period and a free text field where the changes and reasons could be described in more detail.

Question 1 looks at the changes to the implementation of the IED that has occurred since the last reporting period in 2013 and asks Member States to give details on any changes. The questionnaire provided a drop-down box to categorise the issues faced and a free-text box to describe them. 17 Member States[2] (60%) reported that major changes had occurred to the implementation of the Directive since 2013.

[2] Austria, Belgium, Cyprus, Czech Republic, Germany, Denmark, Spain, Finland, France, Hungary, Italy, Luxembourg, Malta, Romania, Sweden, Slovakia, United Kingdom

The table below shows the number and Member States that have reported changes against each category of implementation.

Table 3-1 Reporting by Member States on changes to the IED implementation since the last reporting period

Changes to IED implementation	Member States reporting of implementation changes	Total number of changes reported against each category.
Environmental Inspections	10 (CY, CZ, DE, DK, FR, IT, MT, SE, SK, UK)	22
Site closure	10 (AT, BE, CY, CZ, DK, FR, IT, SE, SK, UK)	20
ELVs, equivalent parameters and technical measures	7 (BE, CZ, DK, FR, IT, SK, UK)	15
Access to information and public participation	6 (BE, CZ, DE, DK, MT, SK)	6
Reconsideration and updating of permits	6 (BE, CZ, DK, FR, SK, UK)	8
General Binding Rules	5 (AT, CZ, DE, DK, SK)	5
Monitoring Requirements	5 (BE, CZ, FR, IT, SK)	5
Permit conditions	5 (CZ, DK, MT, SK, UK)	6
Development in BAT	4 (BE, CZ, DK, SK)	4
Emerging Techniques	3 (CZ, DK, SK)	3
Non-compliance	3 (MT, SK, UK)	3
Other reasons	8 (BE, DE, EL, FI, HR, LU, RO, SE)	12

A number of Member States reported multiple changes having occurred within a single category. Table 3-1 shows the total number of changes that have occurred during the reporting process. However, these numbers may not entirely represent the changes that occurred as the responses depend on how Member States chose to report the changes. For example, Austria has reported several legal changes that occurred under the *General Binding Rules* category, however has only reported it as one change,

whereas the Czech Republic reported multiple changes in the category *Environmental Inspections* and reported them as separate changes.

Finally, some of the responses given indicated that changes had occurred at the regional level. Belgium reported changes that are specific to the Flanders or Wallonia regions, whereas Austria reported multiple changes that occurred both at the federal and state levels. A more detailed breakdown of the changes that have occurred is given in Table 3-2. The information is summarised as reported by Member States against the categories of issues set out in the electronic reporting tool. It demonstrates that in some instances the issues reported do not match well the categories. For example, United Kingdom reported that guidelines have been produced to aid permit reconsideration but reported it against category "Permit conditions" rather than "Reconsideration and updating of permits".

Table 3-2 Key implementation changes

Category	Changes
Environmental Inspections	Environmental inspection plans have been drawn up or updated in five Member States since the last reporting period (Cyprus, Denmark, France, Malta and the United Kingdom). Amendments to the legislation have been made in Cyprus, Sweden and Slovakia A methodology for the systematic appraisal of environmental risks has been developed in Italy.
Site Closure	The main change that has occurred regarding site closures has been around the creation, or updating, of guidelines which is the case in Austria, Belgium (Flanders), the Czech Republic, Italy and Sweden. In France, guidance has specifically been drawn up regarding the *Methodology for Drafting IED Baseline Reports*.
ELVs, Equivalent Parameters and Technical Measures	Since the last reporting period, guidance documents on setting ELVs have been produced by two Member States (the Czech Republic and Denmark). Changes to the derogation process: • The cost-benefit assessment and methodology has been updated (France, UK) • Clarification on the granting of time limited derogations has been provided (Italy, Slovakia, UK)
Reconsideration and updating of permits	A review and updating of conditions of integrated permits was carried out (Czech Republic) and an update on when a permit reconsideration may occur (United Kingdom). A new action plan for reconsidering and updating permits was produced in Belgium (Flanders), and a new summary document for the same process was released in Denmark. Amendments to the legislation around the reconsideration of permits was carried out in France and Slovakia.
Permit conditions	The majority of changes that have occurred regarding permit conditions have been minor amendments to the regulation (occurring in the Czech Republic, Denmark and Slovakia).

Category	Changes
	The United Kingdom (specifically England and Scotland, separately) have produced guidelines specifying how permit reviews are to be carried out.
Access to information	Four Member States, Belgium (Flanders), the Czech Republic, Denmark and Malta, reported that new websites have been set up to share IED information with the public. Germany (the federal state of Hamburg) reported that additional information was added to the website for Hamburg after the passing of the Hamburg Environmental Information Act and the Hamburg Transparency Act. In Slovakia, the process by which members of the public may challenge decisions stemming from the IED has been updated
Monitoring requirements	Two Member States (Slovakia and Czech Republic) have made amendments to the IED legislation regarding monitoring requirements. Guidance was issued by two Member States (Italy and Czech Republic) on monitoring requirements. A review of the national methodology for conducting baseline reviews was carried out in France. In Belgium (Flanders) the Public Waste Agency (OVAM) has started to notify all installations (IPPC and non-IPPC) about periodic monitoring frequency.
General Binding Rules	National legislation governing General Binding Rules have been amended in Austria, Germany and Slovakia. In the Czech Republic, the Ministry of Environment has prepared advisory documentation on using General Binding Rules, where binding conditions of operation are formulated according to BATCs. However, these rules are not currently used and there are no plans to adopt them.
Development in BAT	Belgium (Flanders) reported it has set up a new website for reporting on changes to BATCs. In the Czech Republic a new BAT Information Exchange Forum has been set up and is held annually. The minutes from the meetings are made available online[3]. In Denmark new BATCs that have been released by the European Commission have been added to Annex 7 of the Order of Environmental Permits. In Slovakia, the Inspectorate has set up a new organisational unit: the BAT Centres, to evaluate all aspects of developments in BAT.
Non-compliance	In Malta, administrative fines were added as a way for the state to ensure compliance with permit conditions. In 2015 in Slovakia a new act was introduced to define what constitutes *Integrated Permitting*. In the United Kingdom (Wales) a new system for categorising non-compliance by severity was introduced.

[3] www.mpo.cz/ippc

Category	Changes
Emerging Techniques	In the Czech Republic a new *Operational Programme Environment 2014-2020* was developed to support emerging techniques. Denmark established the *Environmental Technological Development and Demonstration Programme* with a budget of 436 million Krone (€58 Million) to support emerging techniques Slovakia has improved the promotion of environmental techniques and eco-innovation although there have been no legislative changes.
Other Reasons	The majority of changes reported in 'Other Reasons' generally related to amendments and small changes to the transposed IED legislation. This was the case in Belgium (Flanders), Spain, Hungary, Luxembourg, Romania and Sweden. Finland reported that the IED had been fully transposed in to national legislation which had not yet taken place during the last reporting period.

3.2.2 Question 2 Difficulties encountered

2. Have you encountered any difficulties in applying the laws, regulations and administrative provisions adopted in accordance with Article 80(1)? If yes, describe these difficulties and the reasons for them.

The reporting tool required Member States to answer a Yes/No question regarding difficulties encountered in accordance with Article 80(1). Where a Member State selected yes, a table with three free text fields appeared. These asked for the relevant article/paragraph of Article 80(1), description of the difficulty and description of the reason for the difficulty.

Question 2 asks Member States to report on any difficulties faced in applying the 'laws regulations and administrative provisions adopted in accordance with Article 80(1)'. Eight Member States[4] (28%) reported implementation issues and a total of 36 different implementation issues have been reported. Question 2.1 asks Member States to specify the relevant article/paragraph within Article 81(1). A total of 15 different types of answers were reported. The two articles most frequently reported against were 15 and 14 which were reported against eight and five times respectively, (however only by four and three different Member States). Table 3-3 shows the number of Member States that reported different implementation issues and the number of times specific article of the IED was referred to in responses to question 2.

Table 3-3 IED Articles where implementation issues were reported

IED article	Member States reporting an implementation issue	Number of times an article was referenced in Question 2.1
Article 15 Emission limit values, equivalent parameters & technical measures	BE, EL, FR, UK	8

[4] Belgium, Cyprus, Spain, Finland, France, Italy; Sweden, United Kingdom

IED article	Member States reporting an implementation issue	Number of times an article was referenced in Question 2.1
Article 14 Permit conditions	FR, SE, UK	5
Article 21 Reconsideration and updating of permit conditions by the Competent Authority	BE, FR	3
Annex V Technical provisions relating to combustion plants	SE, UK	2
Article 30 Emission limit values	ES, UK	2
Article 22 Site closure	ES, UK	2
Article 16 Monitoring requirements	IT, UK	2
Article 72 Reporting by Member States	SE	2
Article 42 Scope	SE	1
Article 40 Multi-fuel firing combustion plants	UK	1
Article 11 General principles governing the basic obligations of the operator	ES	1
All	FI	1
Articles 12, 24 and 50[5]	CY	1
Chapter III Special provisions for combustion plants	UK	1
General Comments	UK	3

In some cases, Member States have reported against both the article and paragraph of the article. For example, the UK has reported implementation issues with Articles 15(3), 15(4) as well as Article 15 overall, and hence has been counted three times (as they are reporting different issues).

Moreover, some Member States have reported similar issues against different articles. For example, Belgium (Flanders and Wallonia) have reported issues with the four-year implementation deadline for new BATC, reporting it against Article 21, whereas the United Kingdom has reported the same issue

[5] The articles have been reported together against a single issue.

as a 'General Comment'. In addition to this, Spain has reported the same difficulty it faces regarding the BATCs for Large Combustion Plants against three different articles (11, 15 and 30).

Table 3-4 shows all articles where more than one Member State has reported an implementation issue against it. The following table discusses this in greater detail, only articles where more than one issue has been reported are discussed[6].

Table 3-4 Implementation difficulties faced

Article	Associated Implementation Issues
Article 15 Emission limit values, equivalent parameters and technical measures	Belgium (Wallonia) reported difficulties with setting ELVs, particularly when the BATC acknowledge the difficulty in achieving the BAT-AELs in specific circumstances. Evaluating the environmental costs and benefits of granting derogations was raised as an issue by four Member States: Belgium (Wallonia), France, Spain and the United Kingdom). For Spain this was a particular difficulty when granting derogations for Large Combustion Plants.
Article 14 Permit conditions	The implementation and interpretation of BATC was noted as a particular issued when BATC do not have associated AELs (France, Sweden and the United Kingdom). This was noted as a particular issue in Sweden due to their use of General Binding Rules. Moreover, in Sweden they further noted the difficulty in comparing BAT-AELs with the limit values provided for in the permit conditions.
Article 21 Reconsideration and updating of permit conditions by the competent authority	Specifically, in relation to Article 21(3) Belgium (both Flanders and Wallonia) and France described difficulties with implementing BATCs within the required four-year implementation period.
General Comments	The United Kingdom raised three difficulties described as *General Comments.* The first related to Article 21 and implementing BATCs in the required four years. The other issues related to a lack of clarity about the interpretation of 'capacity', with respect to plant size, and the definition of *Other Then Normal Operating Conditions (OTNOC)* as used in the Waste Incineration BREF.
Annex V Technical provisions relating to combustion plants	Sweden reported difficulties with regard to granting derogations when procedures other than measurement requirements have been set in place, through regulations, in the same way as the provisions of the Directive. While the United Kingdom reported an issue that there is no NOx ELV for gas turbines which run for less than 500 hours per annum.

[6] For information on other implementation issues please see the relevant appendix.

Article	Associated Implementation Issues
Article 72 Reporting by Member States	Sweden reported that they have faced implementation issues due to the fact they have implemented the IED via General Binding Rules. It therefore spends a lot of time interpreting requests for information from the Commission, where the wording of the request assumes that the IED has been implemented by permits rather than GBRs. The Member State often finds it difficult to accurately provide the information requested using the predefined fields and formats.
Article 30 Emission Limit Values	Spain further stated the difficulty they were having implementing BATCs for Large Combustion Plants.
Article 22 Site closure	Spain noted difficulties in preparing baseline reporting, in relation to article 22. While the United Kingdom noted difficulties with the protection of soil and groundwater.
Article 16 Monitoring requirements	The interpretation of the phrase 'where applicable' in Article 16(1) on monitoring requirements was reported as an issue for the United Kingdom. Italy reported that the monitoring frequencies set out ground water and subsoil were too burdensome for operators of small installations, particularly when it has been demonstrated they are not covered by the requirements to submit a baseline report.

3.3 Module 3 Sectoral Spotlight

3.3.1 Question 3 Number of reported installations

Question 3 was not included in the implementing decision.

The reporting tool required information on numbers of installations in the Iron and Steel and Glass manufacturing sectors, split by sub-sectors and provided in total per sector. The numbers by sub-sector were optional.

The total number of permitted installations in the EU 28 by activity by sector is shown in Figure 3-1. It also includes a comparison to the numbers presented in the Member State Industrial Country Profiles (Ricardo, 2018) for 2015[7]. In many instances, the numbers from the 2015 country profiles exceeded these from the current reporting. However, it is noteworthy that the 2015 data was not part of an official reporting and therefore discrepancies between the reported numbers are possible. In total, 308 Iron and Steel installations (as compared with 339 reported in 2015), and 414 Glass manufacturing installations (as compared to 468 reported in 2015) were reported to have IED permits by the Member States.

Figure 3-1 Number of permitted installations by activity and sector in the EU-28

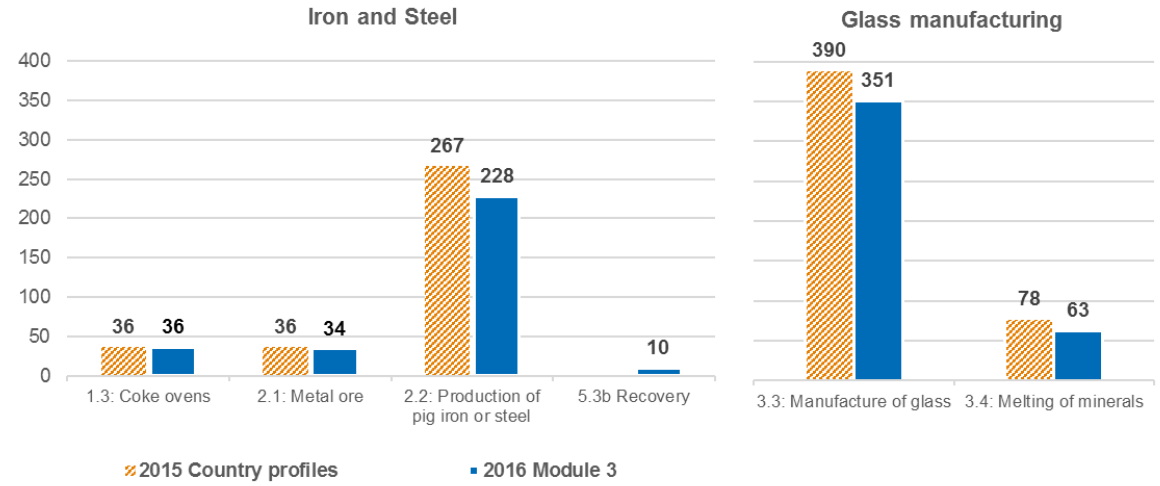
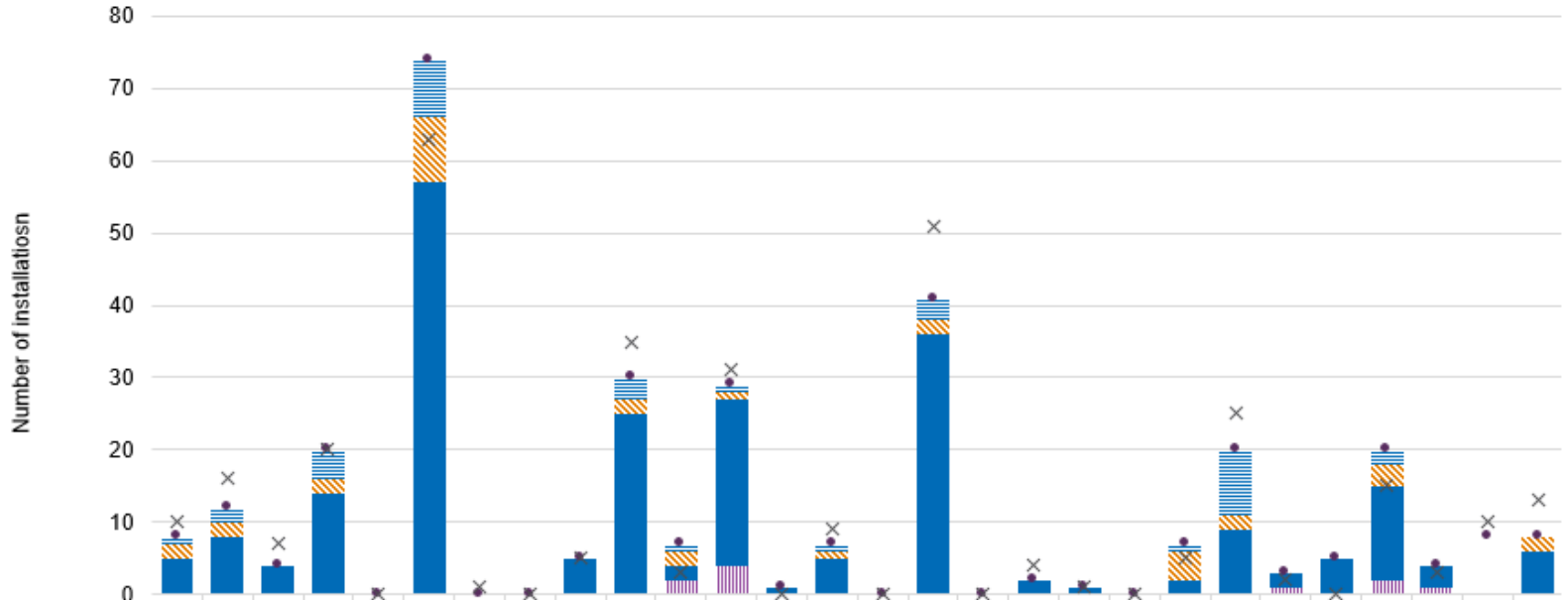


Figure 3-2 and Figure 3-3 show the total number of installations reported by Member States in the Iron & Steel (IS) and Glass manufacturing (GLS) sectors, respectively. In both figures, each bar shows the number of installations across the activities for each sector. The grey x symbol represents the total number of installations presented in the Member States Country Profiles (Ricardo, 2018). More detailed information on the differences between the data in the Country Profiles and the data reported by Member States in Module 3 is presented in Appendix 1.

Three Member States (Cyprus, Ireland and Malta) do not have either spotlight industry, but to maintain a full picture including all MS, they have been included in relevant Figures as having 0 installations.

[7] This data was provided by DG ENV

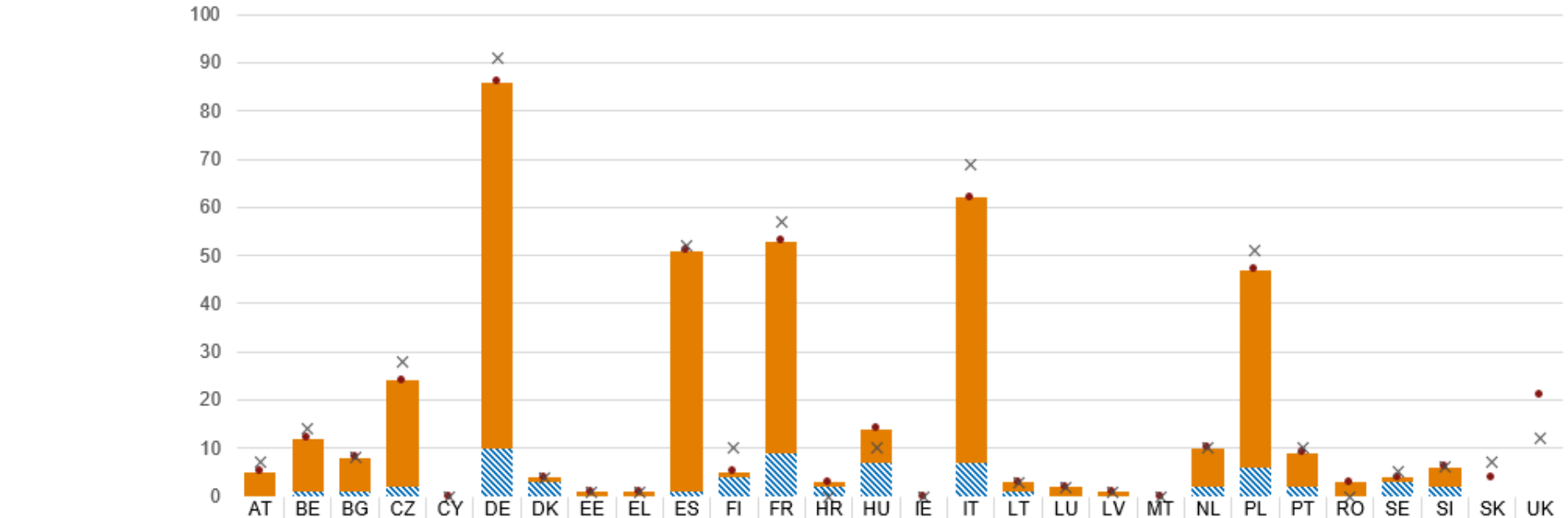
Figure 3-2 Total number of installations reported to be permitted under IED per Member State in the iron and steel industry in 2016.



	AT	BE	BG	CZ	CY	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
1.3: Coke ovens	1	2	0	4	0	8	0	0	0	3	1	1	0	1	0	3	0	0	0	0	1	9	0	0	2	0		0
2.1: Metal ore	2	2	0	2	0	9	0	0	0	2	2	1	0	1	0	2	0	0	0	0	4	2	0	0	3	0		2
2.2: Production of pig iron or steel	5	8	4	14	0	57	0	0	5	25	2	23	1	5	0	36	0	2	1	0	2	9	2	5	13	3		6
5.3b Recovery	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	1	0	2	1		0
Total installations 2016	8	12	4	20	0	74	0	0	5	30	7	29	1	7	0	41	0	2	1	0	7	20	3	5	20	4	8	8
Total installations 2015 (Country profiles)	10	16	7	20	0	63	1	0	5	35	3	31	0	9	0	51	0	4	1	0	5	25	2	0	15	3	10	13

Note: Separate data reported by Flanders and Wallonia are combined for Belgium as a whole. Slovakia (SK) did not submit the optional breakdown by activity, and thus only the total is available.

Figure 3-3 Total number of installations reported to be permitted under the IED per Member State in the glass manufacturing industry in 2016.



	AT	BE	BG	CZ	CY	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
3.3: Manufacture of glass	5	11	7	22	0	76	1	1	1	50	1	44	1	7	0	55	2	2	1	0	8	41	7	3	1	4		
3.4: Melting of minerals	0	1	1	2	0	10	3	0	0	1	4	9	2	7	0	7	1	0	0	0	2	6	2	0	3	2		
Total installations 2016	5	12	8	24	0	86	4	1	1	51	5	53	3	14	0	62	3	2	1	0	10	47	9	3	4	6	4	21
Total installations 2015 (Country profiles)	7	14	8	28	0	91	4	1	1	52	10	57	0	10	0	69	3	2	1	0	10	51	10	0	5	6	7	12

Note: Slovakia (SK) and the United Kingdom (UK) did not submit a breakdown of glass manufacturing installations by activity, and thus only the total is shown.

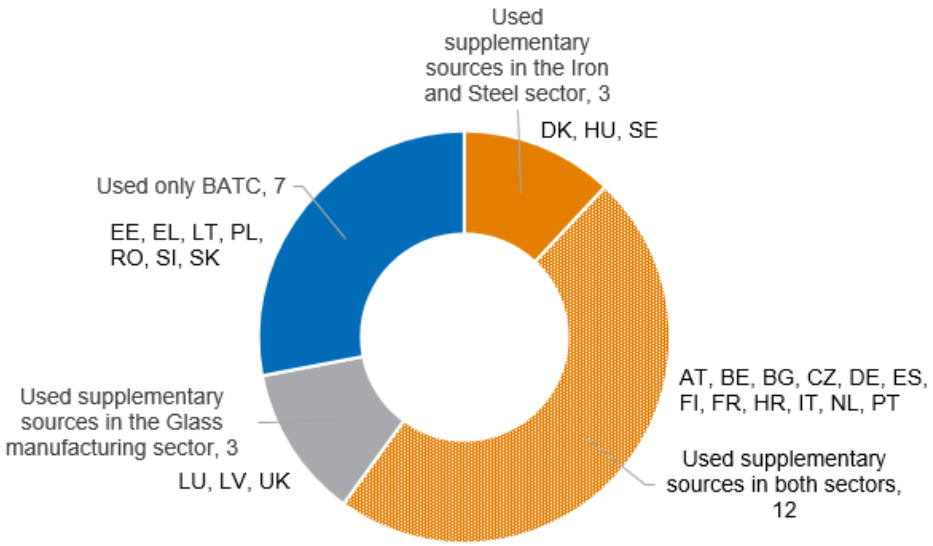
3.3.2 Question 4 Permit conditions

4. Have any other sources of information, apart from BAT conclusions, been used as the reference for setting permit conditions (Article 14(3))?

The reporting tool required Member States to specify whether sources of information other than the BAT conclusions have been used as the reference for setting permit conditions by answering a Yes/No question. Where a Member State selected yes, the tool asked for the sector, type of source and source to be specified. The type of source is selected from a dropdown menu with the following options: "other emission standards", "scientific literature or research results", "own measurements" and "other". Additional feedback may also be provided.

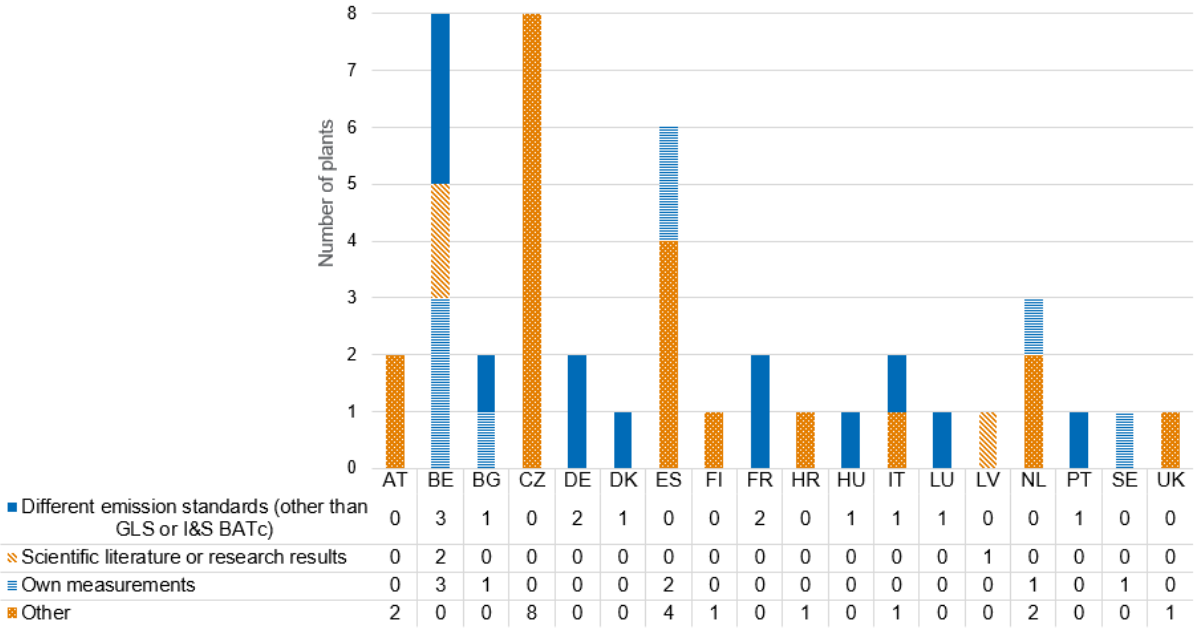
A total of 18 Member States (72% of the 25 reporting Member States) stated that sources of information other than the BATCs have been used as the reference for setting permit conditions in the two spotlight sectors. Of these, 12 used alternative sources of information in both the Glass manufacturing and Iron and Steel sectors, and 6 used it in just one of the two sectors (Figure 3-4).

Figure 3-4 Number of Member States using BATC only and using sources other than BATC in the Glass manufacturing and Iron and Steel sectors



Member States that reported using sources of information other than the BATCs were asked to specify the types of sources by selecting between four different categories of supplementary sources. The categories included *different emission standards*, *scientific literature*, *own measurements* and *other*. The most Member States reported using *different emission standards* (10), followed by *other* (8) and *own measurements* (7). *Scientific literature* was the least used category, with only 4 Member States reporting using it as a source. In terms of number of sources per category across the EU, the most sources reported were from the *other* category (20), followed by *different emission standards* (16), *own measurements* (11), and *scientific literature* (4).

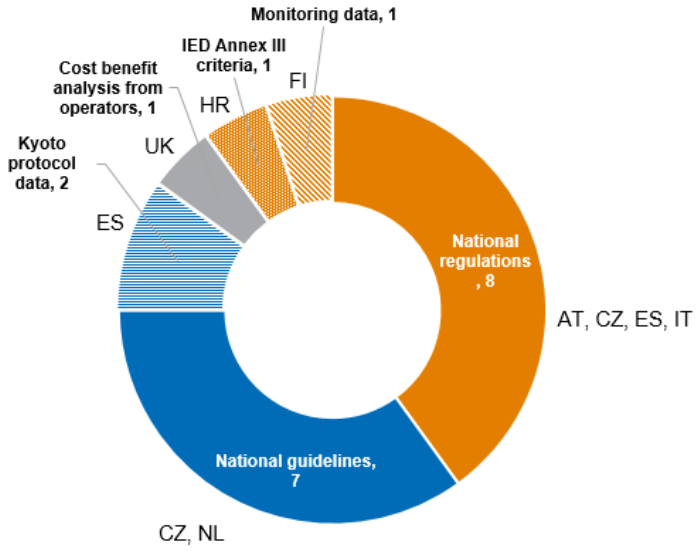
Figure 3-5 Types of supplementary sources used in each Member State and number of times each category has been used



	AT	BE	BG	CZ	DE	DK	ES	FI	FR	HR	HU	IT	LU	LV	NL	PT	SE	UK
Different emission standards (other than GLS or I&S BATc)	0	3	1	0	2	1	0	0	2	0	1	1	1	0	0	1	0	0
Scientific literature or research results	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Own measurements	0	3	1	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0
Other	2	0	0	8	0	0	4	1	0	1	0	1	0	0	2	0	0	1

A further categorisation of the sources reported as *other* was performed on the basis of the additional feedback provided by Member States. Figure 3-6 illustrates the different categories of other sources, with number of sources belonging to each category and the respective Member States reporting them showed on the side. It is noteworthy that in many cases one Member State has reported several sources from the same category, and therefore the number of Member States does not correspond to the number of sources. The classification provided makes it clear that most supplementary sources from the *other* category were either national regulations or national guidelines developed to assist the implementation of the IED.

Figure 3-6 Other sources used split into categories



3.3.3 Question 5 Stricter permit conditions

5.1 Which environmental quality standards required stricter permit conditions than those achievable by the use of BAT, and what additional measures were included in the permits (Article 18)?

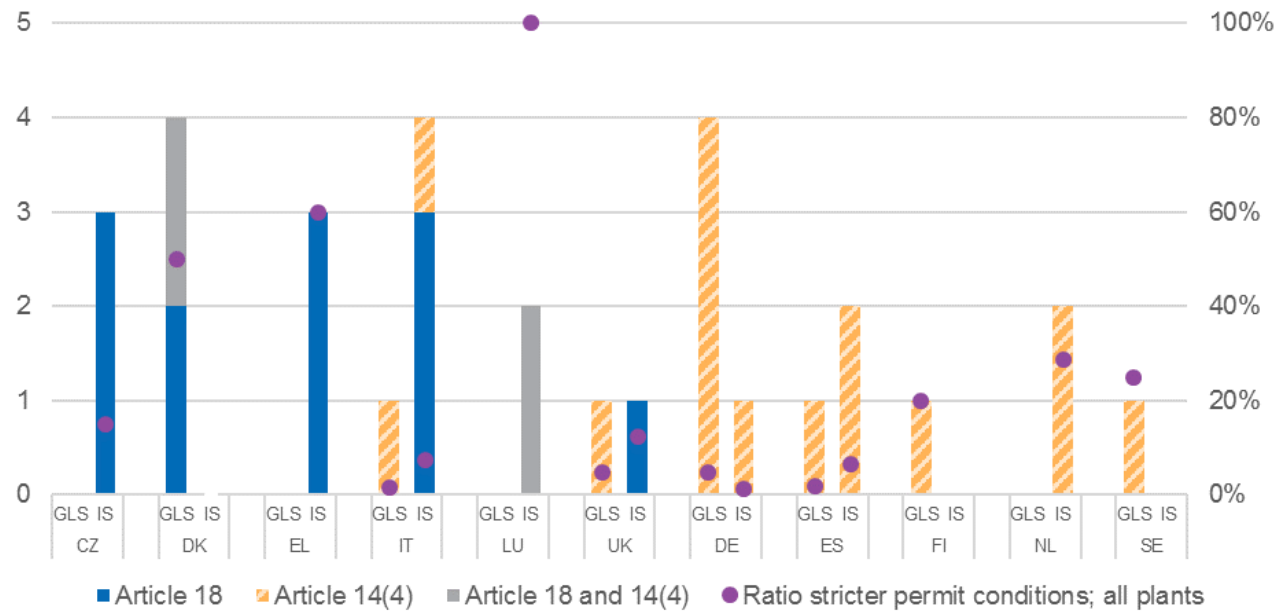
5.2 Provide examples of other situations where the competent authorities have, under Article 14(4), set stricter permit conditions than achievable by the use of BAT.

The reporting tool asked Member States to provide information for each installation with stricter permit conditions under Article 18. The required information included the installation sector, the medium to which the EQS applies, pollutants concerned, link to permit and permit issuing date, installation name and geographical location and additional measures included in the permit. Where pollutants to water are selected, the reporting tool asks about the reason why stricter EQS were needed.

The reporting tool also required Member States to indicate whether there are examples of other situations where the competent authorities have set stricter permit conditions than achievable by BAT under Article 14(4) by answering a Yes/No question. Where yes was selected, the Member State was asked to provide the following information for all installations concerned: installation name, link to permit and permit issuing date, geographical coordinates, sector and description the context in which stricter permit conditions have been set.

Figure 3-7 presents the number of installations which required stricter permit conditions due to environmental quality standards (Article 18) or other situations (Article 14(4)) and relative to the total number of installations within the sector in a Member State. It shows installations that have stricter permit conditions under Article 18, Article 14(4), or both articles. The grey bar (both articles) is not a sum figure, it shows unique installations whose permits are subject to stricter permit conditions from both articles (not just one or the other). For example, for Denmark, 2 installations are subject to Article 18, and another 2 are subject to both Article 18 and Article 14(4). 11 Member States (Czech Republic, Denmark, Greece, Italy, Luxembourg, United Kingdom, Germany, Spain, Finland, the Netherlands and Sweden) chose to set stricter permit conditions due to environmental quality standards (EQS) (Article 18) or other situations (Article 14(4)), as per Figure 3-7.

Figure 3-7 Number of installations which required stricter permit conditions due to environmental quality standards (Article 18) or other situations (Article 14(4)).

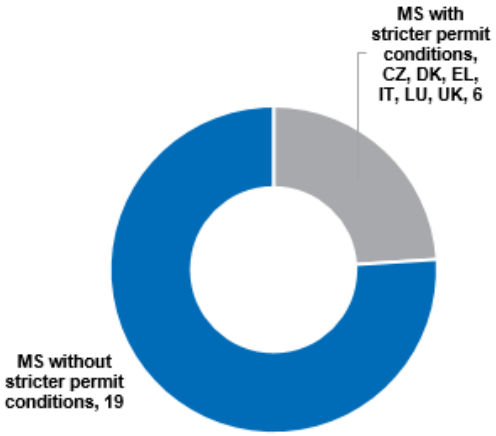


Analysis of geographical coordinates and other details provided revealed that for three installations in two Member States (Denmark and Luxembourg), the same installation has required stricter permit conditions under both articles. In these cases, they are not duplicated and instead distinguished in Figure 3-7 as covered under both articles. Figure 3-7 also shows that the ratio of total installations ranges from 100% (e.g. 2 out of 2 installations in Luxembourg under both Article 18 and 14(4)), to less than 10% (e.g. for Member States with larger number of installations such as the United Kingdom for the glass sector or Italy for Iron and Steel, where only very few installations required stricter permit conditions under Article 18

Article 18 Stricter permit conditions based on EQS

As shown in **Figure 3-8** six Member States employed Article 18 and set stricter permit conditions based on EQS. For five of these (Czech Republic, Greece, Italy, Luxembourg and United Kingdom) this was done in the Iron and Steel sector, and for one (Denmark) in the Glass manufacturing sector. Four Member States indicated the reasons for these stricter permit conditions in the case of water EQS (Czech Republic, Greece, Denmark and the United Kingdom), ranging from high background concentrations of pollutants (United Kingdom) to lack of dilution due to a small catchment area (Denmark).

Figure 3-8 Number of MS that set stricter permit conditions under Article 18



The specific additional measures set are tighter ELVs expressed as concentrations, with the exception of one Member State (Czech Republic) that set an annual emissions ceiling on emissions to air. Table 3-5 summarises the pollutant groups for which stricter permit conditions based on EQS have been set. This shows that, five out of six Member States have set stricter permit conditions for heavy metal, and four out of six have done so for combustion pollutants such as nitrogen and sulphur dioxide.

Table 3-5 Summary of pollutants by pollutant type that required stricter permit conditions based on EQS under Article 18, and the environmental media the relevant EQS apply to.

Pollutant type with stricter permit conditions	No. of Member States	Member States (Sector, EQS media)
Heavy metals	5/6	DK (GLS, Water + Air), EL (IS, Water), IT (IS, Air), LU (IS, Air), UK (IS, Water)
Combustion pollutants[8]	4/6	CZ (IS, Air), DK (GLS, Air), IT (IS, Air), LU (IS, Air)
Inorganic chemical pollutants[9]	2/6	DK (GLS, Air), IT (IS, Air)
Organic chemical pollutants[10]	1/6	IT (IS, Air)

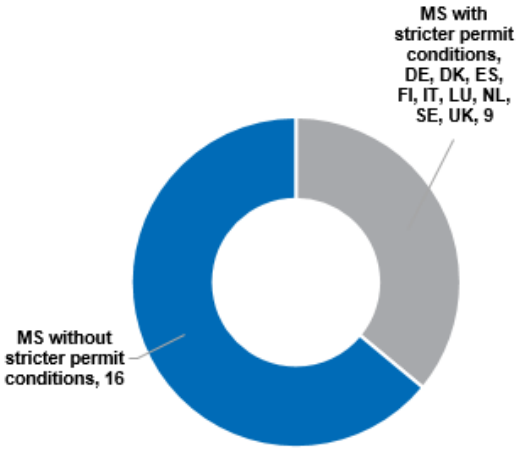
Article 14(4) Stricter permit conditions in other situations

As shown in Figure 3-9 nine Member States employed Article 14(4) and set stricter permit conditions in other situations:

- Five (Italy, Luxembourg, Germany, Spain and the Netherlands) for installations in the Iron and Steel sector.
- Seven (Denmark, Italy, United Kingdom, Germany, Spain, Finland and Sweden) for installations in the Glass manufacturing sector.

Three Member States (Germany, Spain, Italy) cited the precautionary principle for setting stricter permit conditions, while the remaining six cited more specific reasons, that include dust (Luxembourg) and noise (Spain, Denmark) nuisance, co-incineration of waste in a glass melting furnace requiring additional measures as per the waste-incineration Statutory Order (IED Annex VI) (Denmark), higher risk assessment from baseline reports (Denmark) and odour nuisance (Denmark). The Netherlands stated that emissions measurements showed that lower limits were feasible for dust and heavy metal emissions, so the ELVs were adjusted according to a more ambitious BAT. Similarly, the UK mentions that its NOx limit has historically been lower than what is required by the BATC.

Figure 3-9 Number of MS that set stricter permit conditions under Article 14(4)



[8] CO, NO_x, Particulate Matter, Dust and SO_2

[9] For example, hydrogen chloride (HCl) or hydrogen fluoride (HF)

[10] For example, dioxins and polycyclic aromatic hydrocarbons (PAHs)

3.3.4 Question 6 Setting permit conditions in the absence of relevant BAT conclusions

6.1. Describe the procedure for, and examples of, setting permit conditions:

(a) on the basis of a BAT not described in any of the relevant BAT conclusions (Article 14(5));

(b) on the basis of a BAT determined in consultation with the operator, because the individual BAT conclusions do not cover 'an activity or a type of production process carried out within an installation' or 'do not address all the potential environmental effects of the activity or process' (Article 14(6)).

6.2. For the above examples, identify:

(a) why the information in the BAT conclusions was not applicable;

(b) which supplementary information sources were used to identify BAT;

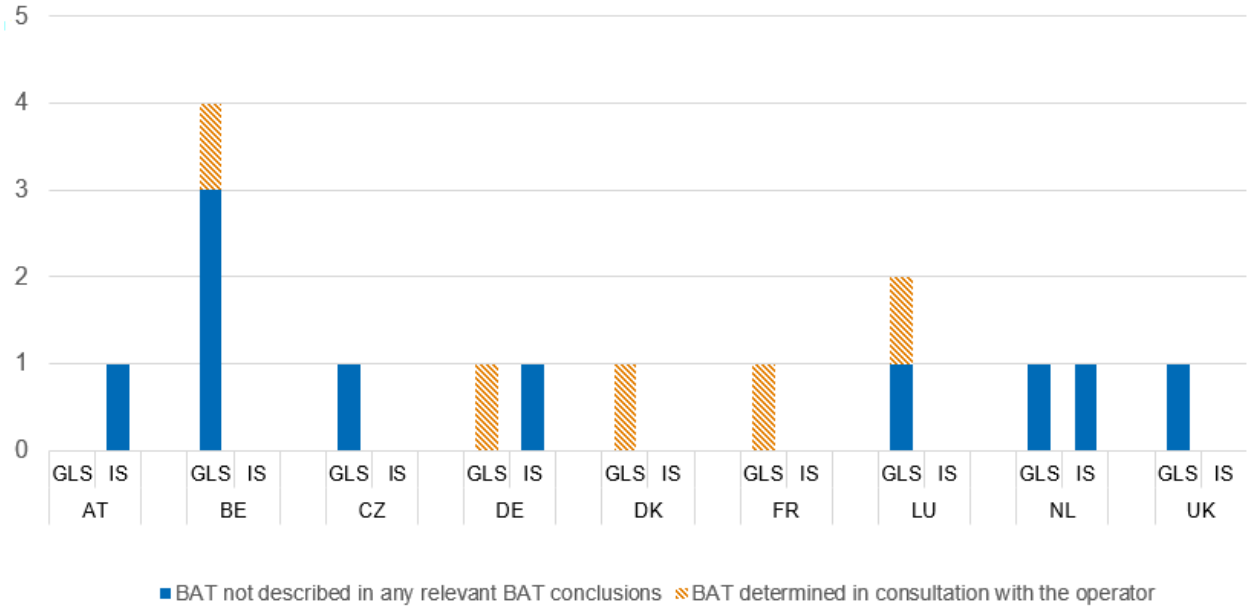
(c) how the criteria listed in Annex III to Directive 2010/75/EU were given special consideration.

The reporting tool asked Member States to indicate whether it has set permit conditions based on BAT not described in BAT conclusions by answering a Yes/No question. Where yes was selected, the Member State was asked to provide the following information for all installations concerned: i) sector; ii) whether the basis for setting permit conditions was BAT not described in any relevant BAT conclusions or BAT determined in consultation with the operator; iii) description of the procedure in the absence of relevant BAT conclusion; iv) the BAT that is not described in any of the relevant BAT conclusions; v) why the information in the BAT conclusions was not applicable; vi) which supplementary information sources were used to identify the BAT and vii) how the criteria listed in Annex III to IED directive were given special consideration by selecting from a multiple selection drop-down list the applicable criteria and providing in free text a description of how the selected criteria where given special consideration.

Out of the 25 reporting Member States, seven stated that they set permit conditions based on BAT not described in any relevant BATCs. Of these, six did so in the glass manufacturing sector, two in the Iron and Steel sector and one in both sectors.

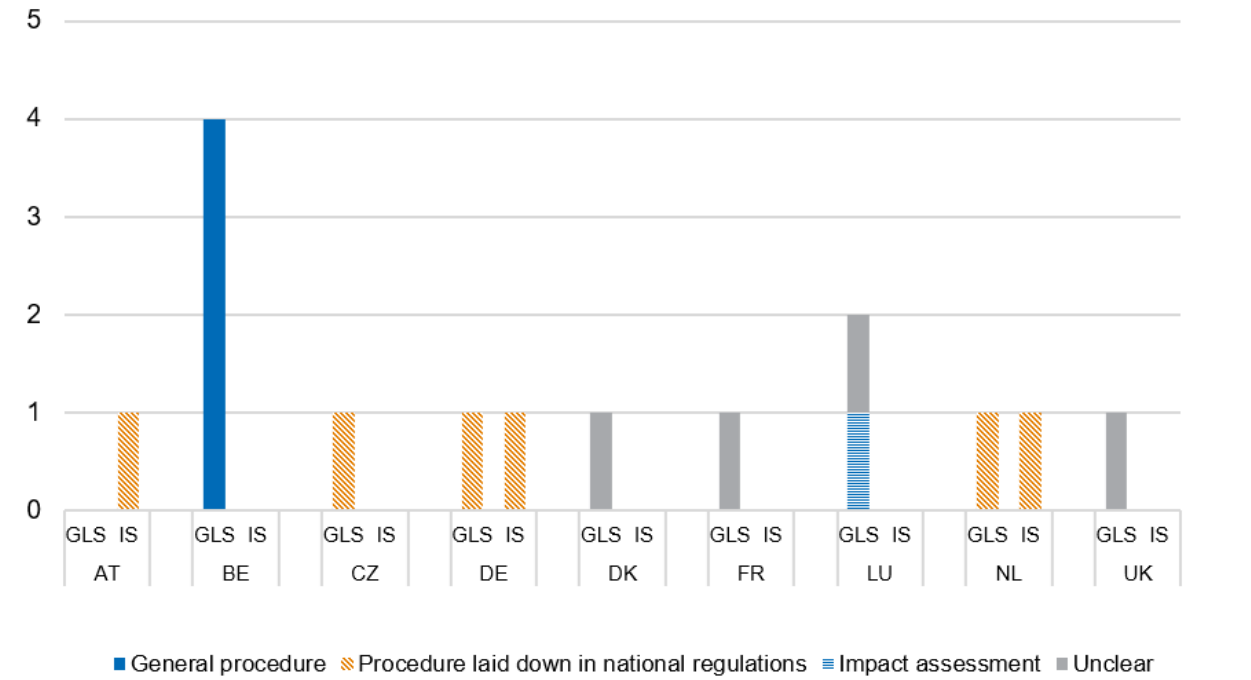
A total of 15 examples exist where Member States set permit conditions on the basis of BAT not described in the BATCs. Figure 3-10 illustrates these, split by Member State, sector and basis for using different BAT. Ten of the cases related to BATs that are not described in the BATCs (seven in the Glass manufacturing sector and three in the Iron and Steel sector) compared to five where BAT was determined in consultation with operator (all in the Glass manufacturing sector).

Figure 3-10 Cases of setting permit conditions based on BAT not in the BAT conclusion, per Member State, sector and basis for using different BAT



Member States reported the procedures for setting permit conditions based on alternative BATs. Following categorisation of the reported information, four key groups were identified, namely *procedures laid down in national regulations*, *general procedures*, *impact assessments* and *unclear*. Figure 3-11 presents the procedures followed split by Member State. It should be noted that no further detail was provided regarding the general procedures reported by Belgium and this has been queried with the Member State.

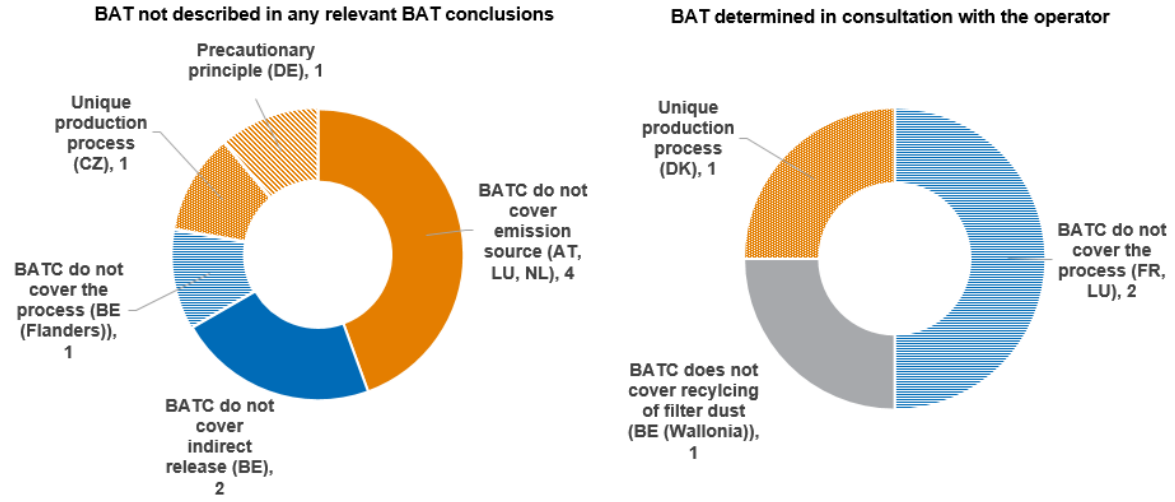
Figure 3-11 Procedures followed for setting permit conditions per Member State



Furthermore, Member States provided the reasons for using different BATs. These were grouped in six different categories. The most common reason was that the BATCs for the relevant sector did not cover the emission source (6) or the process in question (2), did not cover indirect releases (2) or that the

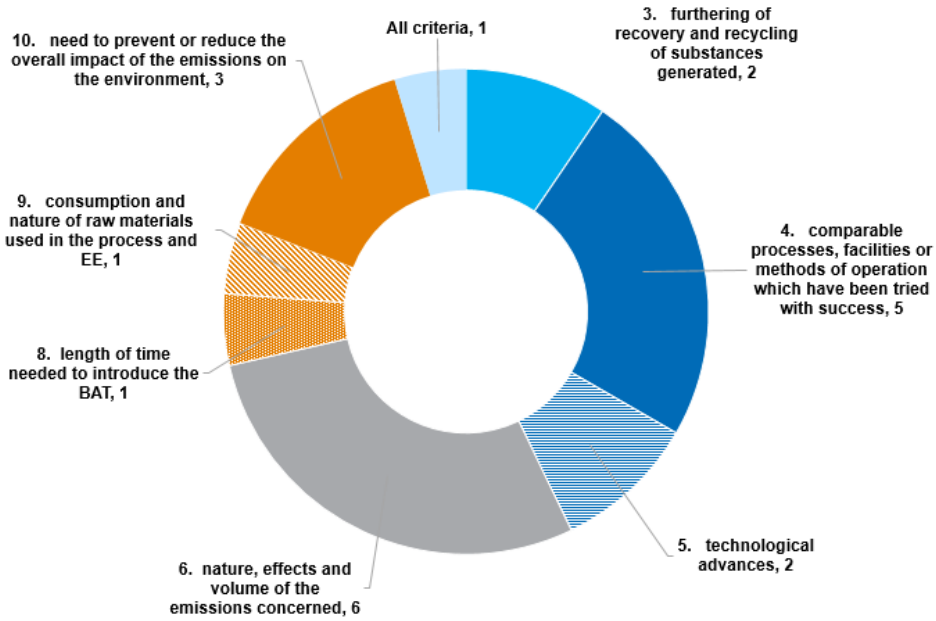
installation implemented innovative production processes not covered by the BATCs (2). Figure 3-12 presents information on which categories of reasons were used *in the absence of BAT in the relevant BAT conclusion* and which were used *in consultation with the operator*. Further details on the Member States that used them is presented on the side.

Figure 3-12 Reasons for using BAT not described in the BAT conclusions



The Member States further reported supplementary sources of information used to set the permit conditions. These included national regulations and ELVs, monitoring data, reports and other BATCs. The IED Annex III Criteria for determining best available techniques was used in all cases. Figure 3-13 summarises the number of times each criterion was used, with the most commonly used being *6. Nature, effects and volume of the emissions concerned* (six times) and *4. Comparable processes, facilities or method of operation which have been tried with success* (five times).

Figure 3-13 Number of times each criterion from the IED Annex III has been used



3.3.5 Question 7 Emission limit values, equivalent parameters and technical measures

Article 15 (3) Emission limit values different to BAT-AEL

7.1. For permits where one or more emission limit value(s) are different to the emission levels associated with BAT in the BAT conclusions in terms of values, periods of time or reference conditions (Article 15(3)(b)):

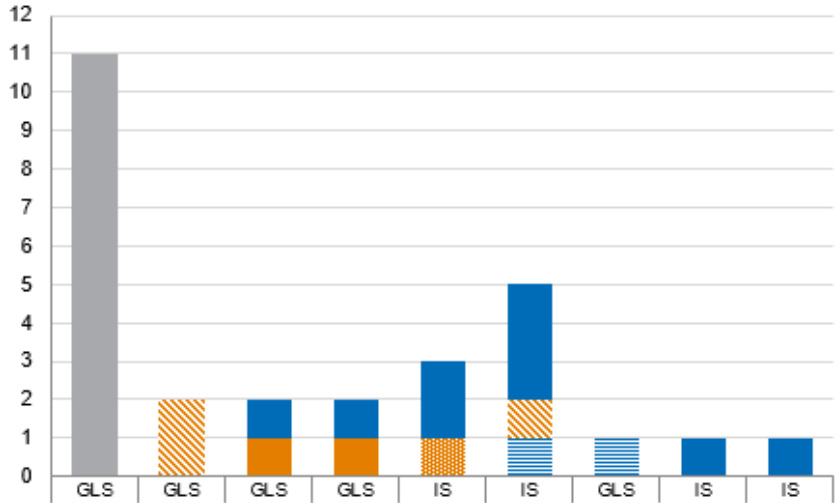
(a) describe the nature of these different emission limit values and provide examples of them;

(b) provide examples, using the data summary referred to in Article 14(1)(d)(ii), showing how emission monitoring has been used to 'ensure that emissions under normal operating conditions have not exceeded the emission levels associated with the best available techniques' (the second subparagraph of Article 15(3)).

The reporting tool asked Member States to indicate whether different ELVs were set under Article 15(3)(b) by answering a Yes/No question. Where yes was selected, information is required on the sector, number of installations, installations names, nature of the deviation of ELVs and examples to show how emission monitoring has been used to ensure that emissions under normal operating conditions have not exceeded the BAT-AELs. A minimum of one example per sector was required by this question.

Eight out of the 25 reporting Member States (32% of all reporting Member States) have set different ELVs under Article 15(3), all of which have done so for emissions to air. Figure 3-14 provides information on the pollutants affected, summarised by Member State and sector.

Figure 3-14 Number of different emission standards set per pollutant and sector in each Member State



	GLS CZ	GLS DE	GLS DK	GLS NL	IS RO	IS SE	GLS SK	IS SK	IS UK
Dust	0	0	1	1	2	3	0	1	1
NOx	0	2	0	0	0	1	0	0	0
SOx	0	0	0	0	0	1	1	0	0
Heavy metals	11	0	0	0	0	0	0	0	0
NH3	0	0	1	1	0	0	0	0	0
PCDD/F	0	0	0	0	1	0	0	0	0

Of the reporting Member States, three did not provide clear information on how the ELVs differed (DE, NL, UK). The Czech Republic and Sweden reported that the different ELVs were set because of the adoption of alternative monitoring approaches. In the case of Sweden, this was done due to requirements imposed by national legislation. Denmark set their reference conditions on 10% oxygen

content instead of 8% for ammonia and dust, whereas Romania imposed stricter ELVs for dust and PCDD/F.

Article 15(4) Derogations

7.2. For all installations where an Article 15(4) derogation has been granted, indicate the:

(a) emission sources benefitting from a derogation;

(b) emission levels associated with BAT for which a derogation has been granted;

(c) actual emission limit values;

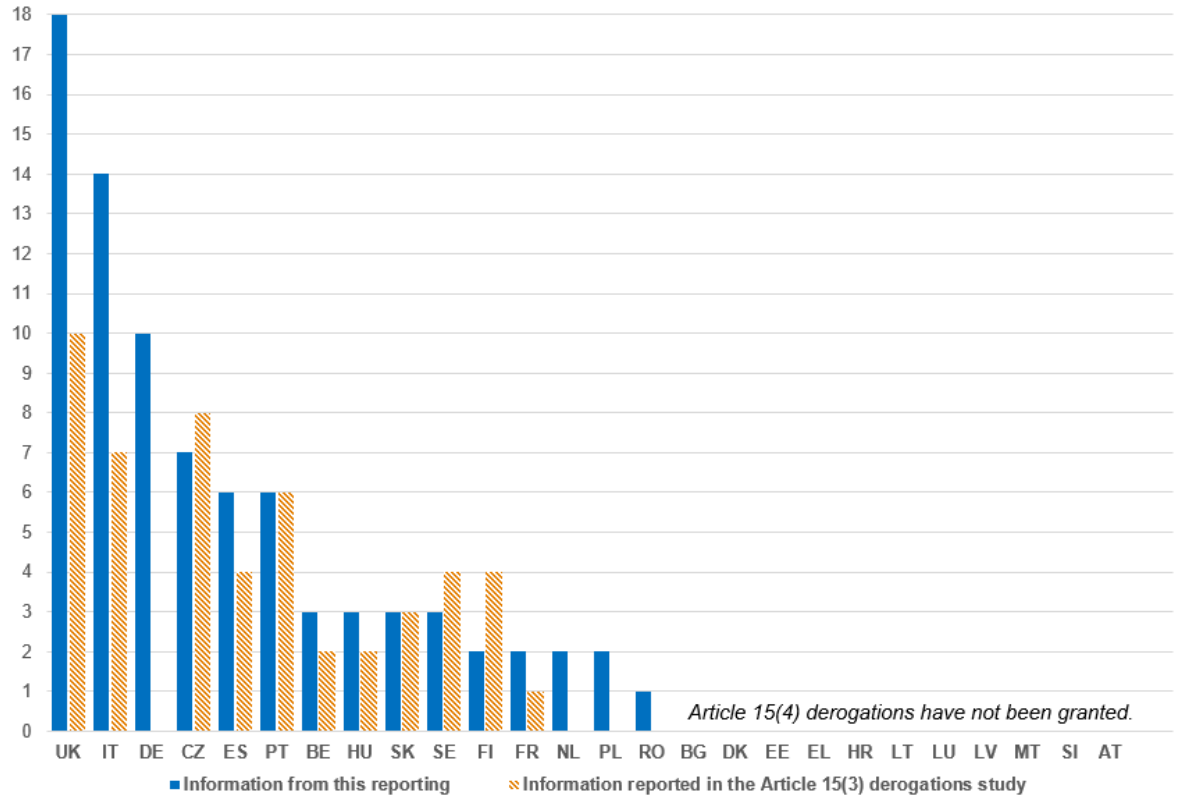
(d) transitional period(s) granted to comply with Article 15(3), if any;

(e) website(s) containing information on the application of Article 15(4) derogations (Article 24(2)(f)).

The reporting tool asked Member States to indicate whether Article 15(4) derogations have been granted by answering a Yes/No question. Where yes was selected, the Member State was asked to report the number of installations concerned. Member States were given a choice between providing active permit links and permit issuing dates for all installations or providing detailed information about the installations. This information included the sector, installation name, permit issuing date, geographical coordinates, emission sources benefiting from the derogation, BAT conclusion chapter, BAT conclusion, BAT-AELs, pollutants, compartment, actual ELVs and derogation expiration date.

A total of 15 Member States (60% of all 25 reporting Member States) have granted Article 15(4) derogations in the Iron and Steel and Glass manufacturing sectors. The most derogations were granted in the UK (18) followed by Italy (14), Germany (10) and the Czech Republic (7). Romania had the smallest number of reported derogations, reporting only one derogation. Figure 3-15 presents the number of derogations per Member State and information on the Member States where Article 15(4) derogations have not been granted. This is compared to the numbers reported previously in the Article 15(4) derogations study (Amec Foster Wheeler, 2017), where this information was available per sector.

Figure 3-15 Number of Article 15(4) derogations per Member State, presented in descending order



Note: The discrepancies between numbers could be due to the following factors: a) derogations were still pending approval in the previous reporting; and b) derogations being reported differently in each reporting, i.e. in the current reporting, derogations are reported per installation, but in the Article 15(4) study, some Member States reported by process not making clear whether any of the processes belonged to the same installation. The latter approach will ultimately result in more derogations.[11]

The reporting tool gave Member States the choice between providing permit links or providing detailed information about each derogation. For 43 out of 81 (52%) derogations only permit links were provided and therefore assessment of the information on pollutants concerned and differing ELVs could not be performed. In most cases, the links led to individual permits, although some of the permit links provided by one Member State (IT) led to portal websites where permits could be easily identified. The assessment for the remaining 38 derogations is summarised per sector below.

Iron and steel

Detailed information was available for seven Iron and Steel derogations granted in four installations in Hungary, the Netherlands, Spain and Romania. Some of the derogations were granted for more than one BATC, with the most frequently derogated BATC being BAT 20 dust and BAT 26 dust. At this stage, the analysis has been performed for three installations only. This is due to the fact that the Netherlands provided ELVs that were 4,000-8,000% higher than the upper BAT-AELs which is likely to result from a mistake in the reported units. The issue has been queried with the Member States, but response was not received.

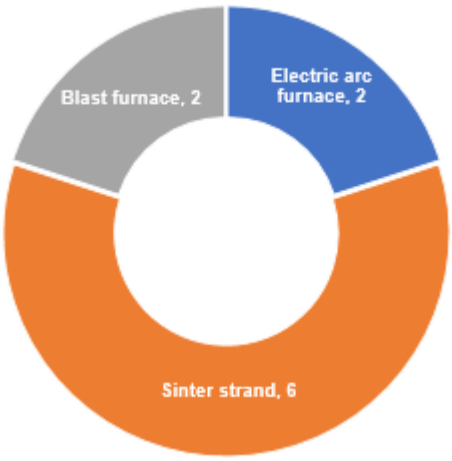
[11] Although the Article 15(4) study states that 4 derogations were granted in the Iron and Steel sector in Sweden, consultation with the Member State revealed that one of these concerned an Article 15(3) derogation.

Table 3-6 Information about derogations granted in the Iron and Steel sector

Pollutants concerned	BAT number	MS reporting derogations	Number of derogations	% ELV set above BAT-AEL
Dust	BAT 20	HU, RO	2	23% in the case of RO.32% in the case of HU.
Dust	BAT 26	HU	2	23%
NOx	BAT 65	NL	1	7900%[12].
NOx	BAT 66	NL	1	4400%.
PCDD/F	BAT 89	ES	1	400%

With regard to emission sources, most derogations were granted for sinter strands (6), followed by blast furnaces and electric arc furnaces (Figure 3-16).

Figure 3-16 Number of derogations per emissions source



Note: the numbers in this figure refer to processes and not installations

Table 3-7 presents an assessment of the potential environmental impacts of the four derogations with available information (excluding the derogations granted in the Netherlands). The analysis consists of three main parts: (i) calculation of annual and total lifetime emissions due to the derogations granted; (ii) estimation of the proportion of the additional annual emissions from all emissions reported for the pollutant from the Glass manufacturing sector to the E-PRTR in 2016; and (iii) monetisation of the environmental and health impacts using the EEA damage cost factors (EEA, 2014) inflated to 2016

[12] It is likely that the very high value results from a mistake in the reported units. The issue has been queried with the Member State, but no clarifications have been received.

prices based on the World Bank GDP deflators (World Bank, 2019). The assessment assumed that sinter strands and EAFs operated 8760 hours a year and was based on information on flow rates for these specific processes and installations acquired from the *Ex-post assessment of the costs and benefits of the implementation of BAT conclusions for the Iron and Steel industry* (Ricardo, 2018a). To estimate absolute emissions from the derogated installations, the difference between BAT-AEL and the emission limits set was multiplied by the flow rate of the plant expressing in Nm3/yr, and converted to tonnes in the case of dust and grams in the case of PCDD/F emissions. Specific damage costs were used for all Member States reporting derogations. The damage cost in Table 3-7 is a summative of all Member State damages for a given pollutant.

Table 3-7 Environmental impact assessment of derogations in the Iron and Steel sector

Pollutant	Annual emissions due to derogations	Total lifetime emission due to derogations (t)	Emissions due to derogations as a proportion of all sector emissions in 2016 (E-PRTR)	Annual damage cost
Dust	285 t	1045 t	7.42%	17 million EUR
PCDD/F	5.6 g	2 g	0.8%	15 thousand EUR

Note: The E-PRTR emissions data and the damage cost used only include or apply to PM10 emissions This is a possible limitation as calculated dust emissions due to derogations may also include PM2.5

Glass manufacturing

Detailed information was available for 31 Glass manufacturing installations with derogations in Germany, Hungary, the Netherlands, Spain and Romania. Some of the derogations were granted for more than one BATC, with the most frequently derogated BATC being BAT 17 (NOx) and BAT 19 (SOx). Table 3-8 summarises information about the number of derogations per pollutant and BAT, the Member States that granted these derogations, and how much higher have ELVs been set in comparison to upper BAT-AELs. The table shows that the highest ELVs in comparison with BAT-AELs have been set for BAT 9 CO, BAT 31 SOx, BAT 32 Dust and BAT 35 HF in Spain and the UK, with levels more than 300% higher. The unusually high levels have been queried with the two Member States. Information was provided by Spain, explaining that all instances concerned the same derogation granted to a glass installation that was delayed installing an electro filter and a desulphurisation system because of reasons beyond their control. However, the techniques have been now fitted and the installation is operating at upper BAT-AEL for all the listed pollutants since December 2016. The UK confirmed that the reported derogation levels were correct.

Table 3-8 Information about derogations granted in the Glass manufacturing sector

Pollutants concerned	BAT number	MS reporting derogations	Number of derogations	% ELV set above BAT-AEL
CO	BAT 9	ES	1	400%
Dust	BAT 16	PL, PT, UK	7	50%-250% (Mean: 121%)
NOx	BAT 17	HU. UK	20	19%-163% (Mean: 86%)

Pollutants concerned	BAT number	MS reporting derogations	Number of derogations	% ELV set above BAT-AEL
NOx	BAT 18	PT	8	25%-75% (Mean: 45%)
SOx	BAT 19	PL, PT, UK	18	30%-200% (Mean: 115%)
Dust	BAT 24	ES, UK	2	150%-250% (Mean: 200%)
NOx	BAT 25	ES, UK	4	56%-125% (Mean: 83%)
NOx	BAT 27	ES	1	60%
HCl	BAT 28	ES	1	20%
HF	BAT 28	ES	1	25%
Dust	BAT 31	ES	1	50%
SOx	BAT 31	ES	1	300%
Dust	BAT 32	UK	2	322%
HF	BAT 35	UK	2	329%
NOx	BAT 49	HU	1	88%
NOx	BAT 58	DE	1	3%

With regard to emission sources, most derogations were granted for melting furnaces (69), with only two derogations granted to finishing processes. These numbers relate to the total number of derogated emission sources, rather than the number of derogations as one derogation can cover multiple emission sources.

Table 3-9 presents an assessment of the potential environmental impacts of all 69 derogations applying to melting furnace processes. The analysis consists of three main parts: (i) calculation of annual and total lifetime emissions due to the derogations granted; (ii) estimation of the proportion of the additional annual emissions from all emissions reported for the pollutant from the Glass manufacturing sector to the E-PRTR in 2016; and (iii) monetisation of the environmental and health impacts using the EEA damage cost factors (EEA, 2014) inflated to 2016 prices based on the World Bank GDP deflators (World Bank, 2019). The assessment assumed that melting furnaces had an output of 188t/day and operated 8760 hours a year, based on information from the Glass Manufacturing BREF (JRC, 2013). To estimate absolute emissions from the derogated installations, the annual output was multiplied by the difference between BAT-AEL and the emission limits set in the derogations where these were expressed in kg/t. Where these were expressed in mg/Nm^3, conversion factors from the BREF were used to convert the calculated difference to kg/t, and then the same process was followed. Specific damage costs were used for all Member States reporting derogations. The damage cost in Table 3-9 is a summative of all Member State damages for a given pollutant.

Table 3-9 Environmental impact assessment of derogations in the Glass manufacturing sector

Pollutant	Annual emissions due to derogations (t)	Total lifetime emission due to derogations (t)	Emissions due to derogations as a proportion of all sector emissions in 2016 (E-PRTR)	Annual damage cost (million EUR)
Dust	60	281	4.9%	3.6
NOx	2,308	13,104	3%	19.5
SOx	725	4,907	2%	18.6
HF	31	121	70 %	No info
HCl	0.8	0.7	0.25%	No info
CO	17	14	0.24%	No info

Note: The E-PRTR emissions data and the damage cost used only include or apply to PM10 emissions This is a possible limitation as calculated dust emissions due to derogations may also include PM2.5

Article 15(5) Temporary derogations for the testing and use of emerging techniques

7.3. Have temporary derogations been granted for the testing and use of emerging techniques (Article 15(5))?

The reporting tool asked Member States to indicate whether temporary derogations for the testing and use of emerging techniques have been granted by answering a Yes/No question. Where a Member State selected yes, a table with two fields appeared requiring information on the relevant sector and description of the emerging technique.

A total of 3 Member States out of 25 with Iron and Steel and Glass Manufacturing industries present reported using temporary derogations for the testing and use of emerging techniques under Article 15(5) (12% of all Member States). Spain and the Netherlands used the provision to test techniques in the Iron and Steel sector whereas Italy granted a temporary derogation in the Glass manufacturing sector. The following technologies were tested:

- Spain - polymer injection technology, the addition of white slags to the furnace;
- The Netherlands – new method of producing liquid iron in sinter strands and pelletisation plants with no pre-processing;
- Italy - carbon reduction by auxiliary firing has been tested in the glass melting process.

3.3.6 Question 8 Monitoring

8.1. In general terms, what monitoring frequencies have been set in permits for air emissions, water emissions, soil/groundwater emissions and other relevant process parameters?

8.2. How have BAT conclusions been used to determine these frequencies?

The reporting tool asked the Member States to select a sector and indicate with a checkbox the relevant kind of emissions for which monitoring frequencies have been set. Five checkbox options will be provided: "air emissions", "water emissions", "groundwater emissions", "soil emissions" and "Other relevant process parameters". When a specific kind of emission was selected, the system provided sub-questions which assessed if the monitoring frequencies are

shorter or longer than those specified in the BAT conclusions and the share of ELVs for which this is the case. Member States were also required to provide information on how BAT conclusions were used in the determination of the frequencies.

Table 3-10 summarises how Member States have determined monitoring frequencies across the five relevant categories of emissions that are monitored under the IED. If BATC/IED is applicable, for emissions to air, water, groundwater and soil, it is shown whether monitoring frequencies are set that are "different from the BATC and/or IED", and if they are compatible or longer. For other process parameters, it is shown if the Member States indicated it as applicable to their permits, whether BATC are used to specify regular monitoring frequencies, and the percentage of permits for which this is done.

Table 3-10 Monitoring frequencies set by Member States for different environmental media

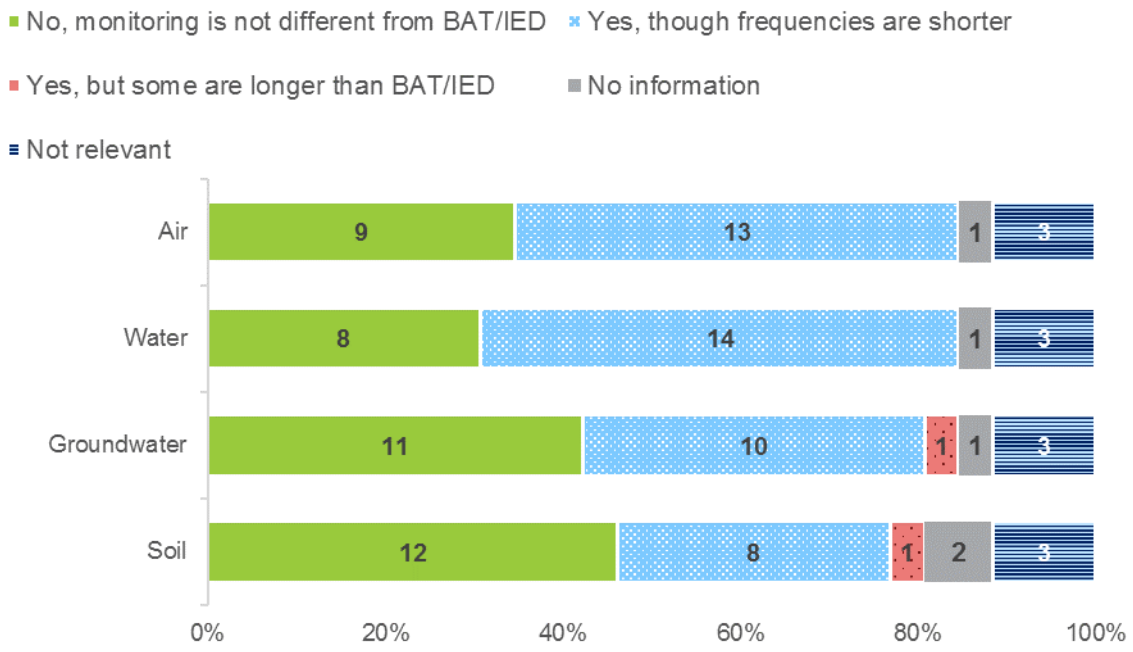
The following sections cover each spotlight sector and emissions type individually.

Iron and steel

Figure 3-17 shows the number of Member States that apply BATCs and/or the IED itself in the determination of monitoring frequencies for the Iron and Steel installations. BATCs are the most frequently used for establishing monitoring frequencies for emissions to air and water, but less so for groundwater, soil and other parameters.

Three Member States (Denmark, Estonia, Lithuania) indicated that monitoring requirements for Iron and Steel are not applicable, and they are displayed as 'not relevant' in Figure 3-17. Denmark, Estonia and Lithuania have not reported any iron and steel installations in question 3 of Module 3.

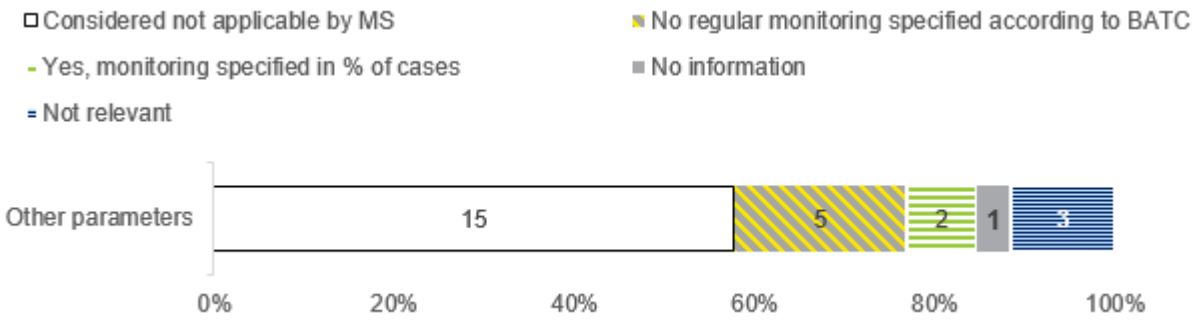
Figure 3-17 Number of Member States applying monitoring frequencies from BATC or IED in the iron and Steel installations for air, water, groundwater and soil emissions



Note: Where different regions in Belgium reported different information, each region is counted as one Member State

The Member States were asked a different question on other process parameters, as shown in Figure 3-18. Specifically, Member States were not asked if they have any monitoring frequencies that are different from the BATC. Instead, the question asked if the Member State has used BATC for setting monitoring frequencies, and if so, in what % of cases this was included in the permits.

Figure 3-18 Number of Member States applying monitoring frequencies from BATC or IED in the iron and Steel installations for other process parameters



Note: Where different regions in Belgium reported different information, each region is counted as one Member State

Trends in setting monitoring frequencies for each environmental medium is described below. For each emissions type, see Appendix 1 for a summary overview per Member State, including the % of installations that were reported as having an 'incompatible' (interpreted as 'longer') monitoring frequency set in the permits.

For three Member States, this question is not relevant, as they do not have an Iron and Steel industry (Denmark, Estonia, Lithuania). These are therefore not part of the analysis below. One Member State provided no information initially and also no sufficient information after a second round of inquiry (Croatia). Therefore, the below paragraphs refer to a total of 22 Member States (counting Flanders and Wallonia as separate) which did provide information.

- **Emissions to Air:** Nine Member States (Austria, Belgium-Wallonia, Bulgaria, Czech Republic, Germany, Greece, Hungary, Italy, France) indicated that monitoring requirements are not different from BATC. 13 Member States (Belgium-Flanders, Spain, Finland, Luxembourg, Latvia, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, United Kingdom) reported monitoring frequencies for air that can be different, but not longer and thus not incompatible with BATC. No Member States indicated monitoring frequencies longer than as required by BATC.

- **Emissions to Water:** Eight Member States (Austria, Belgium-Wallonia, Bulgaria, Czech Republic, Germany, Greece, Italy, France) indicated that monitoring requirements are not different from BATC. 14 Member States (Belgium-Flanders, Spain, Finland, Hungary, Luxembourg, Latvia, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, United Kingdom) reported monitoring frequencies for water that can be different, but not longer and thus not incompatible with BATC. No Member States indicated monitoring frequencies longer than as required by BATC.

- **Emissions to Groundwater:** Eleven Member States (Austria, Belgium-Wallonia, Bulgaria, Czech Republic, Germany, Finland, France, Italy, Netherlands, Sweden, Slovenia) indicated that monitoring requirements are not different from BATC. Ten Member States (Greece, Spain, Hungary, Luxembourg, Latvia, Poland, Portugal, Romania, Slovakia, United Kingdom) reported monitoring frequencies for groundwater that can be different, but not longer and thus not incompatible with BATC. One Member State (Belgium-Flanders) indicated monitoring frequencies longer than as required by BATC.

- **Emissions to Soil:** Twelve Member States (Austria, Belgium-Wallonia, Bulgaria, Czech Republic, Germany, Finland, France, Italy, Latvia, Netherlands, Sweden, Slovenia) indicated that monitoring requirements are not different from BATC. 8 Member States (Spain, Hungary, Luxembourg, Poland, Portugal, Romania, Slovakia, United Kingdom) reported monitoring frequencies for soil that can be different, but not longer and thus not incompatible with BATC. One Member State (Belgium-Flanders) indicated monitoring frequencies longer than as required by BATC.

For the different question on other process parameters, the results are as follows:

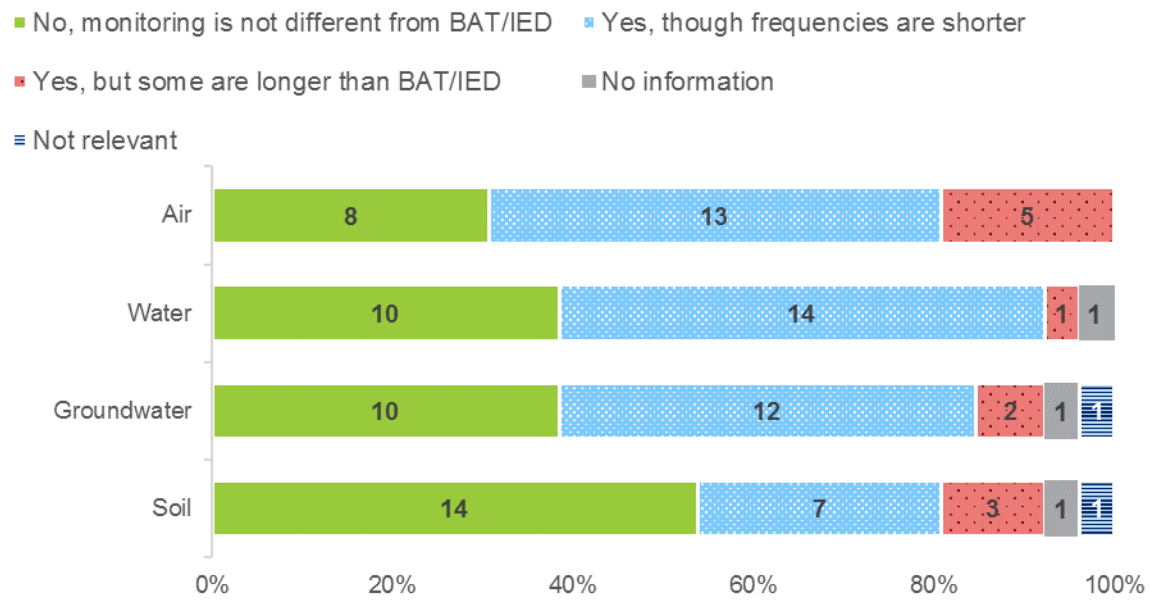
- **Other process parameters:** 15 Member States (Belgium-Flanders, Belgium-Wallonia, Bulgaria, Czech Republic, Germany, Greece, Finland, France, Hungary, Italy, Latvia, Netherlands, Portugal, Sweden, Slovenia) did not specify whether they used the BATC for setting monitoring frequencies for other process parameters. Five Member States (Luxembourg, Poland, Romania, Slovakia, United Kingdom) specified that permits do not contain conditions on regular monitoring as specified by BATC. Two Member States (Austria, Spain) indicated monitoring frequencies for this category are based on BATC in a percentage of cases.

With respect to how BATCs were used to determine monitoring frequencies for Iron and Steel, most Member States provided little specific information, stating only that BATCs are directly integrated (Austria, Spain, Finland, Luxembourg, Latvia, Portugal, Sweden, Slovenia). Some Member States provided more detail on which BATs are used, which additional documents are relevant (such as MON Monitoring (European Commission, 2018)), and how national legislation is relevant. This is available per Member State in Annex I.

Manufacture of glass

Figure 3-19 shows the number of Member States that apply BATCs and/or the IED itself in the determination of monitoring frequencies for the installations in the Manufacturing of Glass sector. Monitoring frequencies for emissions to air and water are most commonly based on BATC, and emissions to groundwater on IED itself. Frequencies of monitoring emissions to soil based on IED itself and of other parameters based on BATC are less frequently reported.

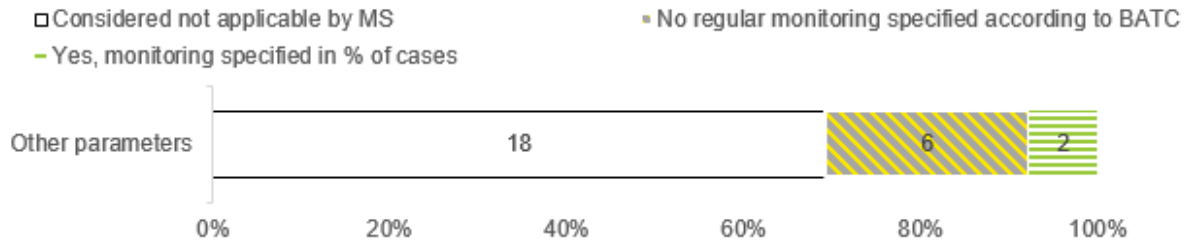
Figure 3-19 Application of monitoring frequencies from BATC or IED by percentage of Member States for the manufacture of glass for air, water, groundwater and soil emissions



Note: Where different regions in Belgium reported different information, each region is counted as one Member State

The Member States were asked a different question on other process parameters, as shown in Figure 3-20. Specifically, Member States were not asked if they have any monitoring frequencies that are different from the BATC. Instead, the question asked if the Member State has used BATC for setting monitoring frequencies, and if so, in what % of cases this was included in the permits.

Figure 3-20 Number of Member States applying monitoring frequencies from BATC or IED in the manufacture of glass for other process parameters



Note: Where different regions in Belgium reported different information, each region is counted as one Member State

Trends in setting monitoring frequencies for each environmental medium is described below. For each emissions type, see Appendix 1 for a summary overview per Member State, including the % of installations that were reported as having an 'incompatible' (interpreted as 'longer') monitoring frequency set in the permits.

- **Emissions to Air:** Eight Member States (Belgium-Wallonia, Bulgaria, Germany, Greece, Hungary, Italy, France Portugal) indicated that monitoring requirements are not different from BATC. 13 Member States (Czech Republic, Estonia, Spain, Finland, Croatia, Latvia, Lithuania, Luxembourg, Netherlands, Romania, Sweden, Slovenia, Slovakia) reported monitoring frequencies for air that can be different, but not longer and thus not incompatible with BATC. Five Member States (Austria, Belgium-Flanders, Denmark, Poland, United Kingdom) indicated that monitoring frequencies can, in certain cases, be longer than as required by BATC.

- **Emissions to Water:** Ten Member States (Austria, Belgium-Wallonia, Bulgaria, Czech Republic, Finland, France, Germany, Italy, Lithuania, Portugal) indicated that monitoring requirements are not different from BATC. 14 Member States (Belgium-Flanders, Croatia, Estonia, Hungary, Luxembourg, Latvia, Netherlands, Poland, Romania, Spain, Sweden, Slovenia, Slovakia, United Kingdom) reported monitoring frequencies for water that can be different, but not longer and thus not incompatible with BATC. One Member State (Denmark) indicated that monitoring frequencies can, in 25% of cases, be longer than as required by BATC.

- **Emissions to Groundwater:** Ten Member States (Austria, Croatia, Czech Republic, Denmark, France, Italy, Netherlands, Portugal, Sweden, Slovenia) indicated that monitoring requirements are not different from the IED. 12 Member States (Belgium-Wallonia, Bulgaria, Germany, Estonia, Spain, Hungary, Lithuania, Luxembourg, Latvia, Poland, Romania, Slovakia) reported monitoring frequencies for groundwater that can be different, but not longer and thus not incompatible with the IED. Two Member States (Belgium-Flanders, United Kingdom) indicated that monitoring frequencies can, in certain cases, be longer than as required by the IED. Finland reported that no monitoring for emissions to groundwater was implemented in the Glass sector as these were strictly forbidden in the Environmental Act, thus implying emission limit of 0.

- **Emissions to Soil:** 14 Member States (Austria, Belgium-Wallonia, Bulgaria, Czech Republic, Germany, Denmark, France, Italy, Croatia, Lithuania, Netherlands, Portugal, Sweden, Slovenia) indicated that monitoring requirements are not different from the IED. Seven Member States (Estonia, Hungary, Luxembourg, Latvia, Poland, Romania, Slovakia) reported monitoring frequencies for soil that can be different, but not longer and thus not incompatible with the IED. Three Member States (Belgium-Flanders, Spain, United Kingdom) indicated that monitoring frequencies can, in certain cases, be longer than as required by the IED. Finland reported that no monitoring for emissions to groundwater was implemented in the Glass sector as these were strictly forbidden in the Environmental Act, thus implying emission limit of 0.

For the different question on other process parameters, the results are as follows:

- **Other process parameters:** 18 Member States (Austria, Belgium-Flanders, Belgium-Wallonia, Bulgaria, Croatia, Czech Republic, Germany, Greece, France, Denmark, Hungary, Italy, Lithuania, Latvia, Netherlands, Portugal, Sweden, Slovenia) did not specify whether they used the BATC for setting monitoring frequencies for other process parameters. Six Member States (Estonia, Finland, Luxembourg, Poland, Romania, Slovakia) specified that permits do not contain conditions on regular monitoring as specified by BATC. Two Member States (Spain, United Kingdom) indicated monitoring frequencies for this category are based on BATC in a percentage of cases.

With respect to how BATCs were used to determine monitoring frequencies for the Glass manufacturing sector, the data is similar to Iron and Steel, with the same Member States stating only that BATCs are directly integrated (Austria, Spain, Finland, Luxembourg, Latvia, Sweden, Slovenia). For more detailed information on Member State responses to question 8 see Annex I.

3.3.7 Question 9 Reconsideration and updating of permit conditions

9. For all permit reconsiderations that were not completed by 8 March 2016, identify:

(a) the installation names and permit reference numbers;

(b) the reasons for not having completed the reconsideration;

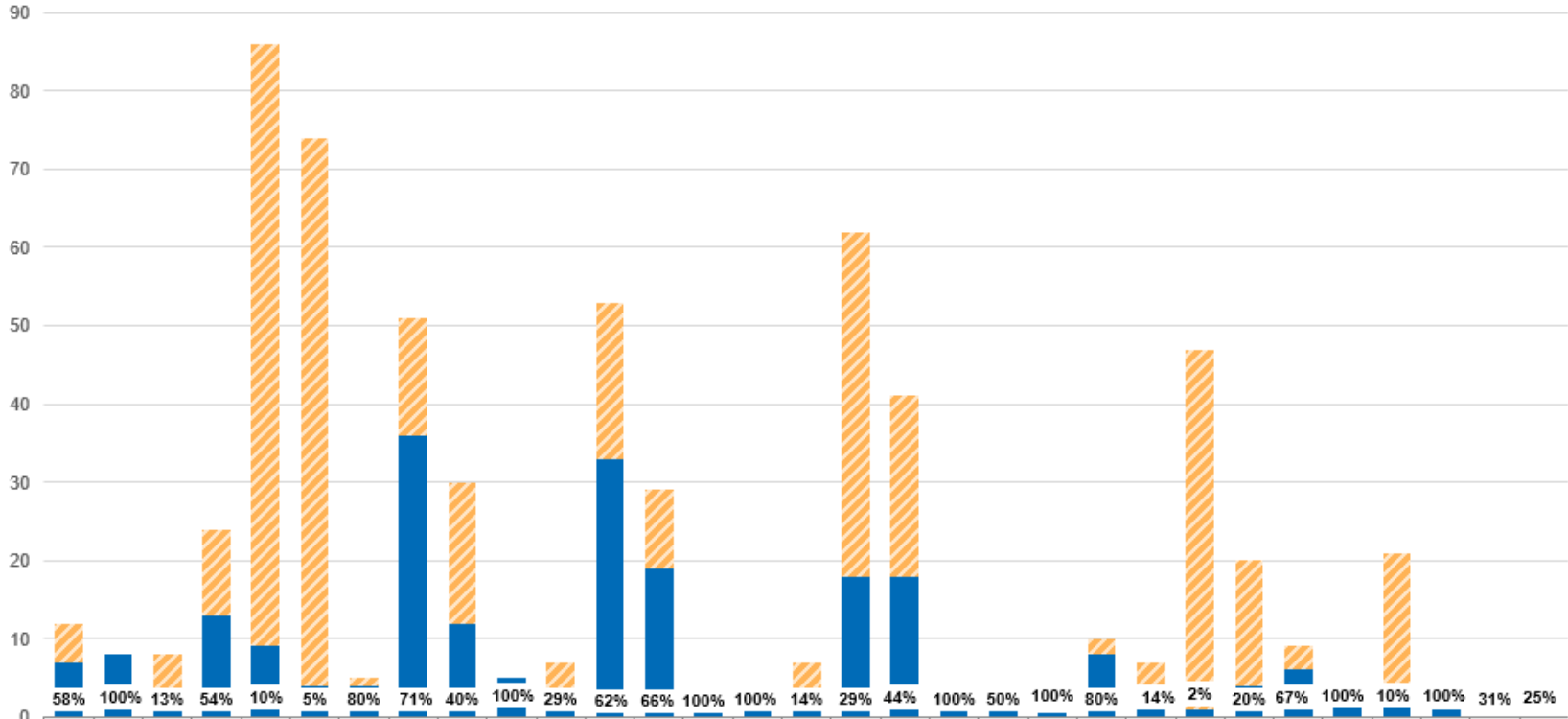
(c) the date by which the reconsideration will be completed.

The reporting tool sought information on all individual permits that were not reconsidered by 8 March 2016. For each of these, information was required on sector, installation name, geographical location, link to active permit and permit issuing date, reasons for not having completed the reconsideration by the deadline and date by which the reconsideration has or will be completed.

A total of 227 permits across 17 Member States (68% of all reporting Member States) were not reconsidered by the deadline of 8 March 2016. Of these, 144 were in the Glass manufacturing industry (31% of all installations in the sector) and 83 in the Iron and Steel industry (25% of all installations in the sector). Detailed information about the number of delayed permits in each Member State is presented in Figure 3-21, split by sector and expressed as a proportion of all installations.

All Member States provided descriptions of the reasons that led to the delays in permit reconsiderations. These were categorised into groups and the most commonly reported ones are presented in Figure 3-22, with information on the Member States that reported them. The figure contains only reasons that were reported more than six times. Overall delays in the implementation of the BATCs was the most frequently reported reason (66 cases), followed by lack of human and technical resources (34) procedural delays (30) and delays with documentation submissions by the operators (24). Other reported reasons not included in the figure include changes of ownership or modifications in the installations, difficult negotiations with operators, late applications or technical issues with the installations.

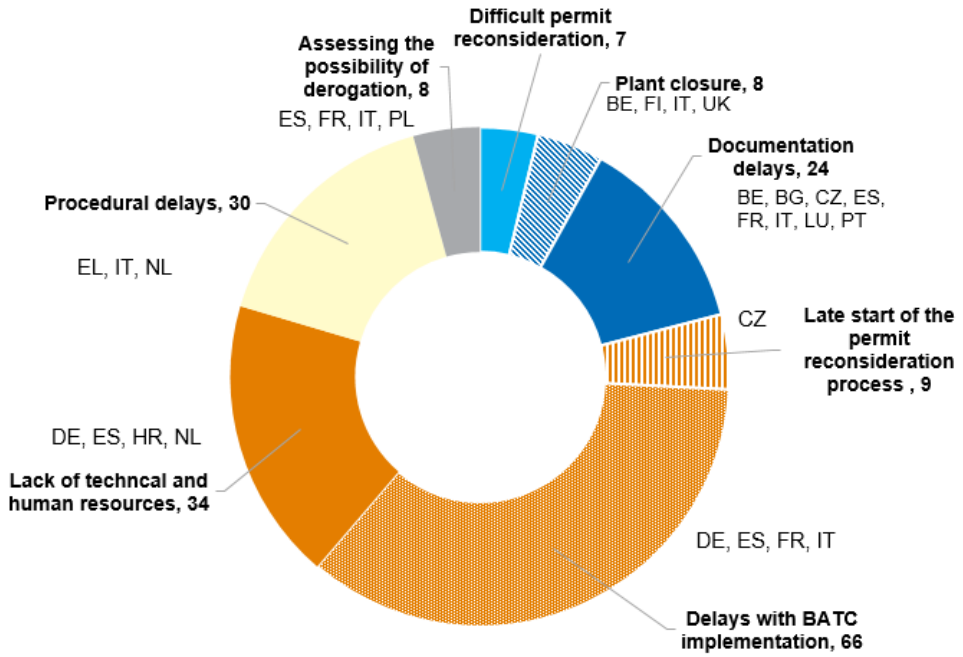
Figure 3-21 Number of permits not revised by 8 March 2016



	GLS BE	IS BE	GLS BG	GLS CZ	GLS DE	IS DE	IS EL	GLS ES	IS ES	GLS FI	IS FI	GLS FR	IS FR	GLS HR	IS HR	IS HU	GLS IT	IS IT	IS LU	GLS LV	IS LV	GLS NL	IS NL	GLS PL	IS PL	GLS PT	IS PT	GLS UK	IS UK	GLS Total	IS Total
Permit reconsidered before 08/03/16	5	0	7	11	77	70	1	15	18	0	5	20	10	0	0	6	44	23	0	1	0	2	6	46	16	3	0	19	0	311	239
Permit reconsidered after 08/03/16	7	8	1	13	9	4	4	36	12	5	2	33	19	3	1	1	18	18	2	1	1	8	1	1	4	6	3	2	1	144	83

Note: The UK have reported zero Iron and Steel installations, and therefore the permit reconsideration not completed before the 8 March 2016 could not be presented as a proportion of all permit reconsideration for the sector in these two countries. The issue has been queried with the UK, but no response has been provided in time for inclusion in this report.

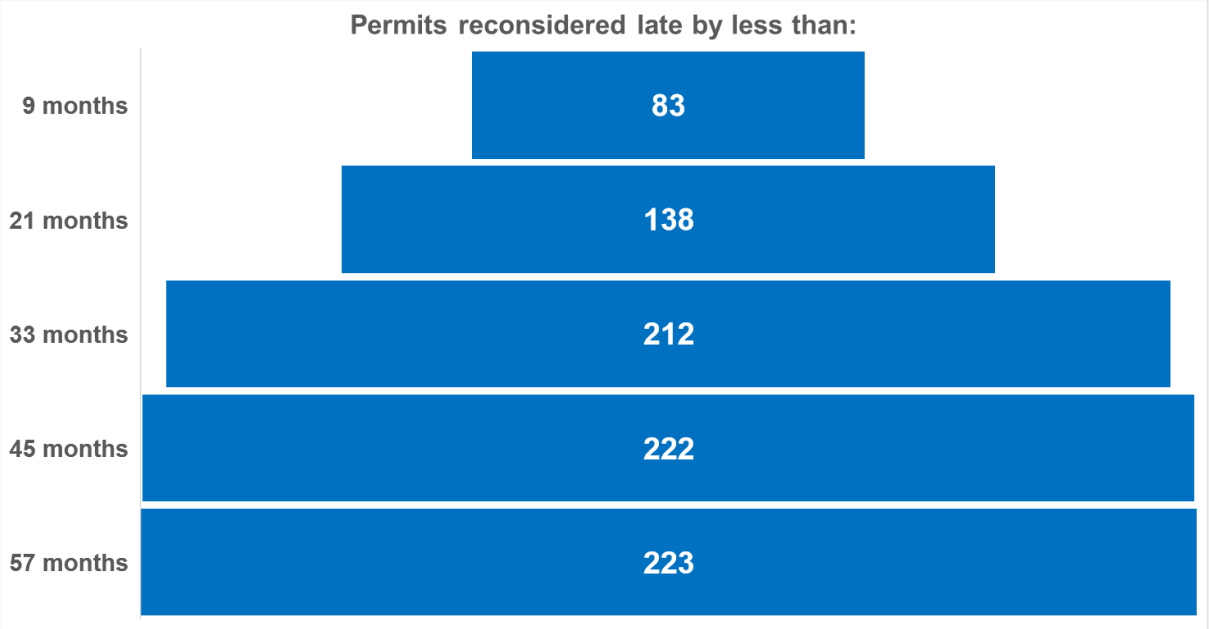
Figure 3-22 Key reasons for the delays in permit reconsiderations



Furthermore, all Member States were required to provide the dates by which permit reconsiderations have to be completed. Most of these fell later in 2016 (83, Figure 3-23) with 14 having a deadline in March 2016, thereby having a delay of only few days or weeks. A total of 83 permits were reconsidered by the end of 2016 (or nine months after the original deadline), additional 55 were recosidered by 2017 (or 21 months after the original deadline). Further 74 permits were reconsidered by the end of 2018 (or 33 months after the original deadline) with more than half of these (39) having a reconsideration deadline of 31 December 2018. One permit reconsideration was extended as late as 2020 (57 months after the original deadline) due to procedural delays and overall complexity of the case. This related to a Dutch iron and steel installation.

It is noteworthy that eight permit reconsiderations are not included in Figure 3-23. Seven of these instances related to installation closures with no imminent plans to resume actities. In the eight instance, permit reconsideraiton was not neccesarily since the installation was already compliant with the BATCs.

Figure 3-23 Number of late permit reconsiderations



Note: *The number of permits for each category is a cumulative number accounting for the permits in the previous category as well as additional permits reconsidered in the category period..*

3.3.8 Question 10 Other

10. Do you have feedback on any practical problems you encountered in using the BAT conclusions for the two sectors in the scope of this Module 3?

The reporting tool sought information on problems encountered in the use of the BAT conclusions in the Iron and Steel and Glass manufacturing sectors. This information could be provided as a free text.

Out of the 25 Member States reporting under Module 3, 11 provided no feedback under question 10 and 1 (HR) specified that information on the practical difficulties encountered in the implementation of the BATCs was not currently available. Of the Member States that reported information, 6 reported no problems having been encountered whereas the remaining 7 provided feedback on issues that had been experienced.

The types of practical difficulties encountered varied significantly between Member States. Some key examples included:

- Difficulties with assessing the compliance of installations with BAT-AELs (BE, Flanders);
- Difficulties with setting permit conditions at a level lower than upper BAT-AEL since this is often challenged by operators. In some cases, BAT-AELs for new installations are also challenged due to the impact the restriction has on the quality of the product (DE);
- Incomplete transposition of BATCs in national law (e.g. BAT 57, DE);
- The Cross-Media and Economics BREF do not provide guidance on the assessment of whether it is economically and technically feasible to implement BAT within 4 years. Guidance is also required on whether Article 15(4) derogations can be used to extend the compliance period until the next investment cycle for the installations (IT);
- Mistakes in the translations of the BATCs (FI);
- More stringent national regulations (FR, SE);
- Lack of clarity in the wording of the BATCs text and some footnotes (FR, NL);

- Difficulties in assessing whether on-site waste water treatment plant is covered by the BATCs for the Iron and Steel sector when not all processes are in scope (NL);
- Energy efficiency BATs are less relevant since installations are covered by the Energy Efficiency Directive (PL);
- Improvements of furnaces in Glass installations take place every 10-12 years which constrains setting lower ELV at BAT-AEL level prior to upgrade (PT);
- Difficulties in permit reconsiderations due to lack of human resources (PT).

3.4 Module 4 'Minimum' Requirements

3.4.1 Question 11 Waste incineration and co-incineration

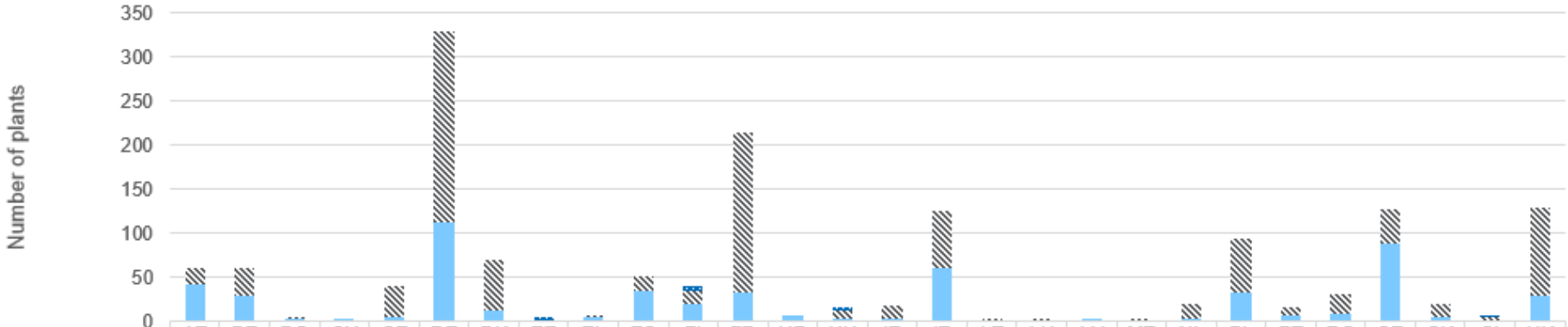
11.1. Identify the plants for which competent authorities have authorised conditions under Article 51(1), (2) or (3) as well as the actual conditions authorised, and the results of verifications made in this respect– (Article 51(4)).

The reporting tool asks Member States to provide the following information for all waste incineration and co-incineration plants: i) all reference numbers of the waste (co-)incineration plants; ii) their IED reference number where available; iii) the type of plant; iv) the plant name; v) geographical coordinates; vi) type of waste processed; vii) permitted capacity of waste throughput for each type of waste; viii) link to permit and permit issuing dates for all plants exceeding capacity of 2 t/h; and ix) information on whether the plant benefits from changed operating conditions under Article 51 IED. Where a plant benefits from changed operating conditions, a verification against the requirements of Article 50 should be provided.

Member States reported that in 2016 there were 1,504 plants operating under Chapter IV of the IED, of which 926 (62%) were waste incineration plants, 568 (38%) were co-incineration plants and 10 were large combustion plants (Figure 3-24). This represents an overall decrease by around 10% in the number of plants from the previous 2013 reporting, when Member States reported 1,673 plants. The proportion of co-incineration plants reported has decreased, having been 41% in 2013. The Member States reporting the highest number of plants under the IED were Germany (329), France (214), the UK (130), Sweden (127) and Italy (126). These Member States also had the highest number of plants in the 2013 reporting, however the number of plants reported has decreased in Germany, the UK and Sweden.

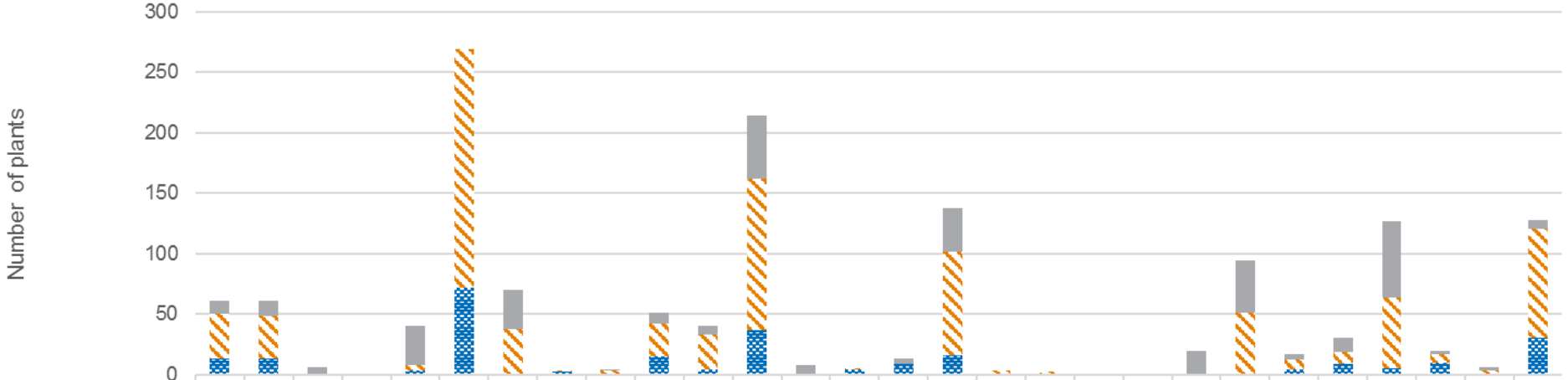
The proportion of incineration and co-incineration plants reported varied between Member States, with the highest proportion of co-incineration being reported in Greece (83%), Austria, (69%), Sweden (69%), and Spain (67%). There are more incineration plants reported by Member States than co-incineration plants, with the highest proportion of incineration plants being reported by Malta (a total of one incineration plant), the Czech Republic (88%), France (85%) and Denmark (83%).

Figure 3-24 Number of co-incineration and incineration plants by Member State (2016)



	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SK	SI	UK
LCP	0	0	0	0	0	0	0	1	0	0	5	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Incineration	19	32	3	0	35	216	58	1	1	17	15	181	0	10	14	66	2	1	0	1	17	61	9	22	39	15	3	101
Co-incineration	42	29	3	1	5	113	12	1	5	35	20	33	8	3	4	60	1	1	1	0	3	33	8	9	88	6	2	29

Figure 3-25 Number of plants processing different waste types by Member State (2016)



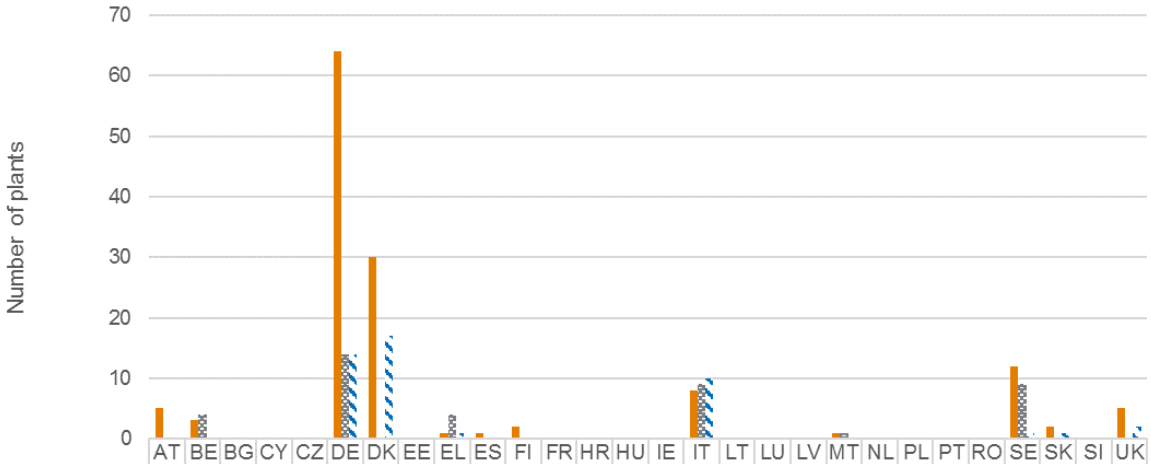
	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SK	SI	UK
Both	11	13	5	1	32	0	32	0	1	9	7	52	7	0	4	36	0	0	1	1	20	43	5	11	63	3	3	7
Non-Hazardous	37	35	1	0	5	197	38	1	2	27	29	125	0	1	0	86	2	1	0	0	0	50	8	10	59	7	2	91
Hazardous	13	13	0	0	3	72	0	2	1	15	4	37	1	4	9	16	1	1	0	0	0	1	4	9	5	10	1	30

The number of plants processing different types of waste varied between Member States. 18 Member States reported a higher number of plants processing non-hazardous waste than hazardous waste. Some Member States also reported a significant number of plants processing both hazardous and non-hazardous waste: in particular all plants in Cyprus, Malta, the Netherlands and Latvia, 88% of plants in Croatia and 80% in the Czech Republic. Germany reported no plants of this type (i.e. plants in Germany process either hazardous or non-hazardous waste only) despite having the largest number of incineration and co-incineration plants. The Member States that reported the highest proportion of plants processing exclusively hazardous waste are Hungary (80%), and Estonia (67%).

Different operating conditions

12 Member States reported different operating conditions under Article 51(1), Article 51(2) or 51(3) (Figure 3-26). The Member States reporting the most plants with different operating conditions were Germany, Denmark, Sweden, Italy, the UK and Greece. Different operating conditions were reported to be set under Article 51(1) most commonly (134 plants), with the most in Germany (64), Denmark (30), and Sweden (12). There were similar numbers of plants reported by Member States to have different operating conditions under Article 51(2) (41) and Article 51(3) (46)[13].

Figure 3-26 Number of Plants with different operating conditions under Article 51(1), Article 51(2) and Article 51(3)



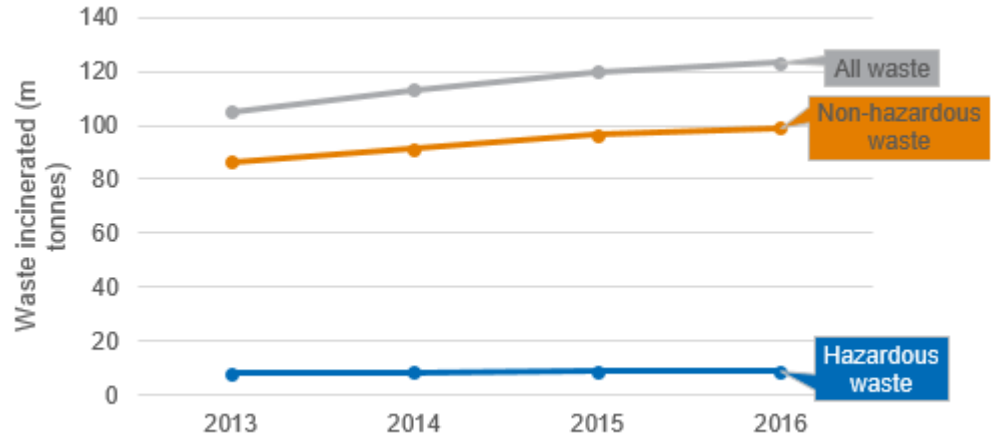
	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SK	SI	UK
Article 51(1)	5	3	0	0	0	64	30	0	1	1	2	0	0	0	0	8	0	0	0	1	0	0	0	0	12	2	0	5
Article 51(2)	0	4	0	0	0	14	0	0	4	0	0	0	0	0	0	9	0	0	0	1	0	0	0	0	9	0	0	0
Article 51(3)	0	0	0	0	0	14	17	0	1	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	1	1	0	2

Quantities of waste incinerated

Member States have reported quantities of waste incinerated from 2013-2016 (Figure 3-27). Total reported waste incinerated in the EU has increased every year, while non-hazardous waste incinerated increased from 2013-2015 and decreased in 2016. These increases occurred in the same period in which the total number of incineration and co-incineration plants has decreased, which implies that plants have increased the quantity of waste they incinerate. Reported hazardous waste incinerated has remained relatively constant throughout the period.

[13] Where a plant was granted derogations under multiple paragraphs of Article 51 it is counted in the total for each applicable paragraph

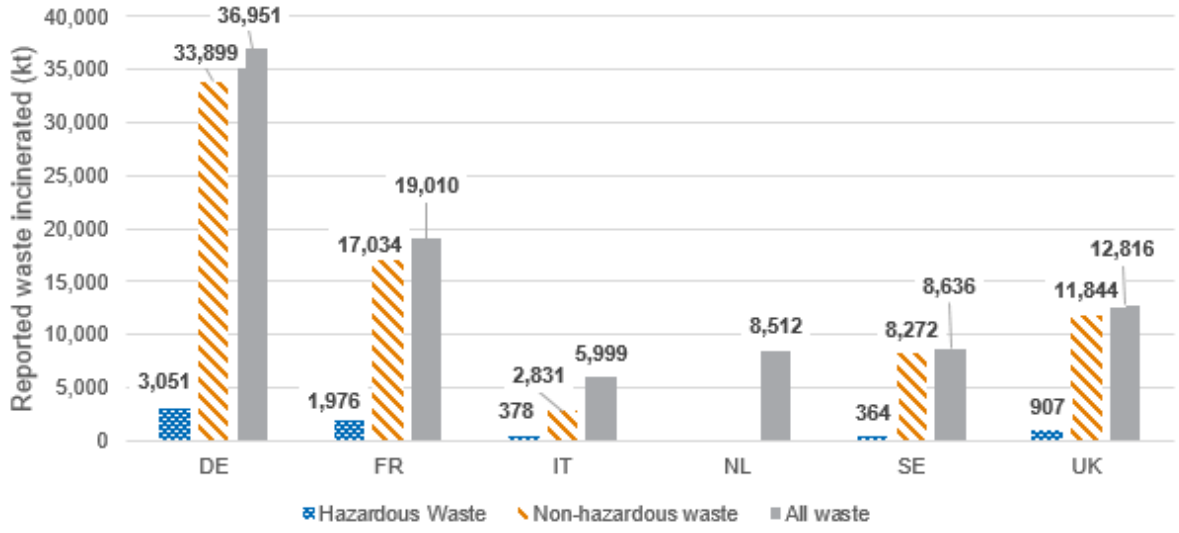
Figure 3-27 Reported waste incinerated in the EU-28, 2013-2016



Note: Amalgamation of all Member State data provides a high-level estimate of waste incineration trends. Some Member States have reported total waste incinerated but not the breakdown of hazardous and non-hazardous waste incinerated thus the trends for all waste, non-hazardous waste and hazardous waste are inconsistent.

The Member States reporting the highest quantities of total waste incinerated in 2016 are Germany (36,951 kt), France (19,010 kt), the UK (12,816 kt), Sweden (8,636 kt), the Netherlands (8,512 kt), and Italy (5,999 kt). The quantities of waste incinerated in 2016 for these Member States is shown in Figure 3-28.

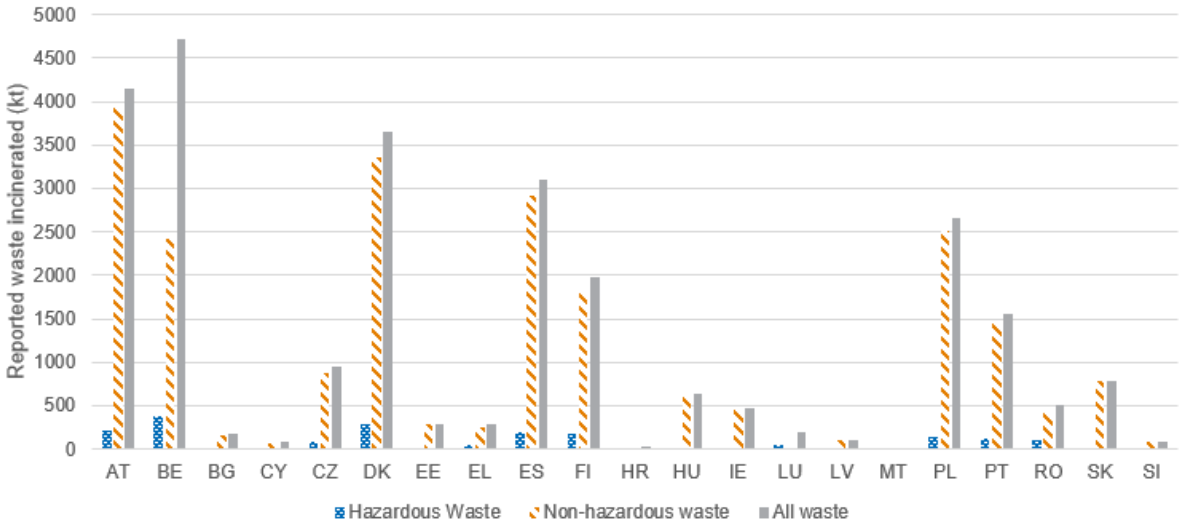
Figure 3-28 Reported quantities of waste incinerated in Member States reporting over 5,000 kt of total waste incinerated (2016)



Note: For data reported by Italy, hazardous and non-hazardous waste do not add up to total waste. The Netherlands only reported total waste incinerated.

The Member States reporting under 5,000 kt of waste per year are shown in Figure 3-29. Belgium, Austria, Denmark, Spain, and Poland reported the highest quantities of total waste (under 5,000 kt) incinerated in 2016.

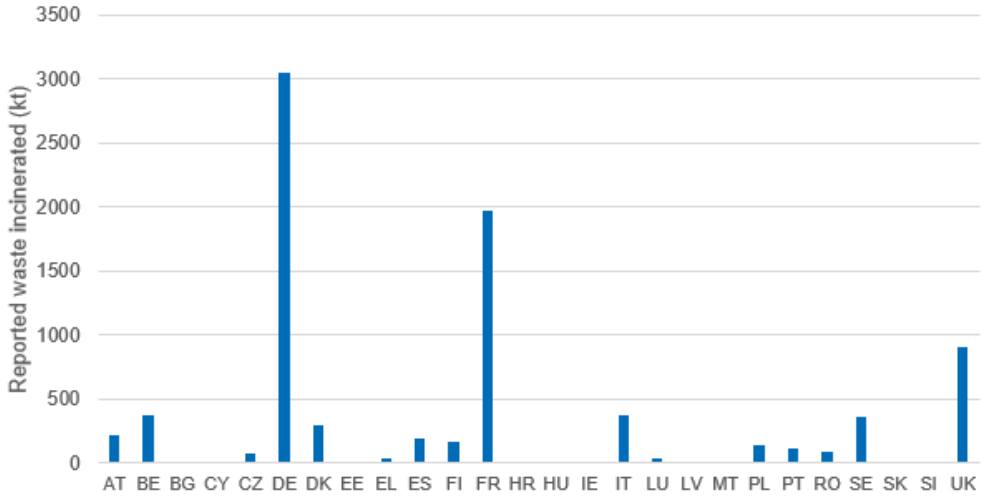
Figure 3-29 Reported quantities of waste incinerated in Member States reporting under 5,000 kt of total waste incinerated (2016)



Note: LT not shown due to no reported waste incinerated. MT did report tonnes of waste incinerated but values are very small (500t hazardous waste; 5700t total waste).

The quantities of hazardous waste incinerated in 2016 are shown in Figure 3-30. Germany, France and the United Kingdom reported significantly more hazardous waste incinerated than other Member States.

Figure 3-30 Reported quantities of hazardous waste incinerated in 2016



Note: LT did not report quantities of waste incinerated. The Netherlands only reported total waste incinerated and not separate quantities of hazardous and non-hazardous.

11.2. For each waste incineration plant and waste co-incineration plant with a capacity of 2 tonnes or more per hour, provide:

(a) information on the functioning and monitoring of the plant;

(b) an account of the running of the incineration or co-incineration process (indicating the operational hours, number and cumulative duration of break-downs, if available);

(c) the level of emissions into air and water, in comparison with the emission limit values;

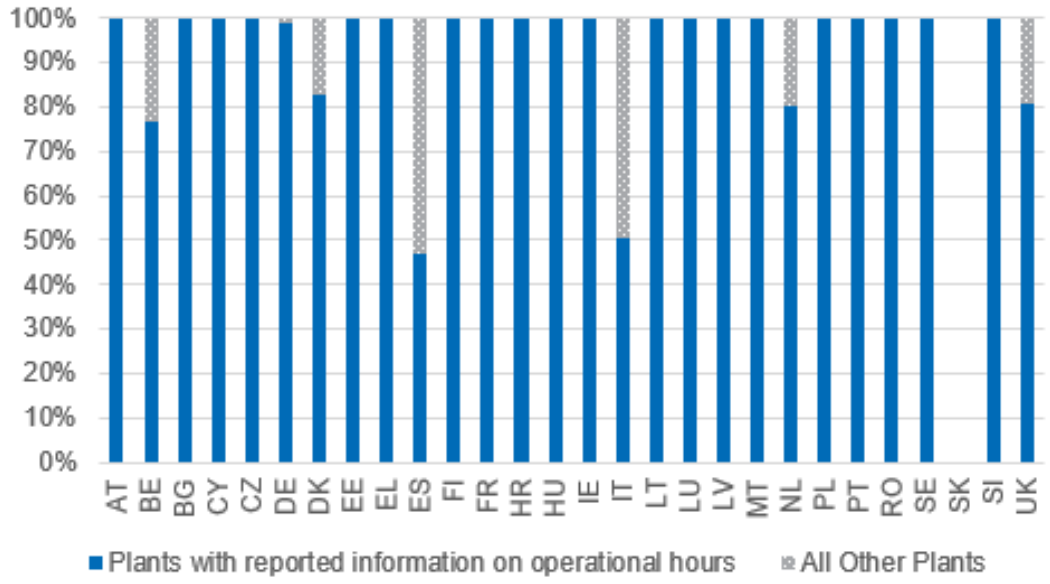
(d) a description of how this information has been made available to the public, including a link to any relevant websites created for this purpose (Article 55(2)).

With regard to question 11.2(a), the reporting tool requires information on the amount of waste incinerated by type category per year from 2013 to 2014. Question 11.2(b) seeks information on operational hours and number and cumulative duration of breakdowns where available for all plants with capacity exceeding 2 t/h. Question 11.2(c) asks whether every individual plant benefitting from authorised conditions under Article 51 is compliant with ELVs specified in part 8 of IED Annex VI. Furthermore, it requires information on which pollutants are concerned, and how this information has been made available to the public.

The number of reported plants exceeding 2 t/h waste incinerated that reported information on operational hours across the EU-28 is 88%.

The % of plants with reported information across different Member States is shown in Figure 3-31. 22 Member States reported information on operational hours for 100% of plants exceeding 2 t/h capacity. The Member States reporting the lowest proportion of information on operational hours are Spain (47%), Italy (50%), and Belgium (76%).

Figure 3-31 Proportions of Member States reporting information on operational hours for plants exceeding 2 t/h capacity (2016)



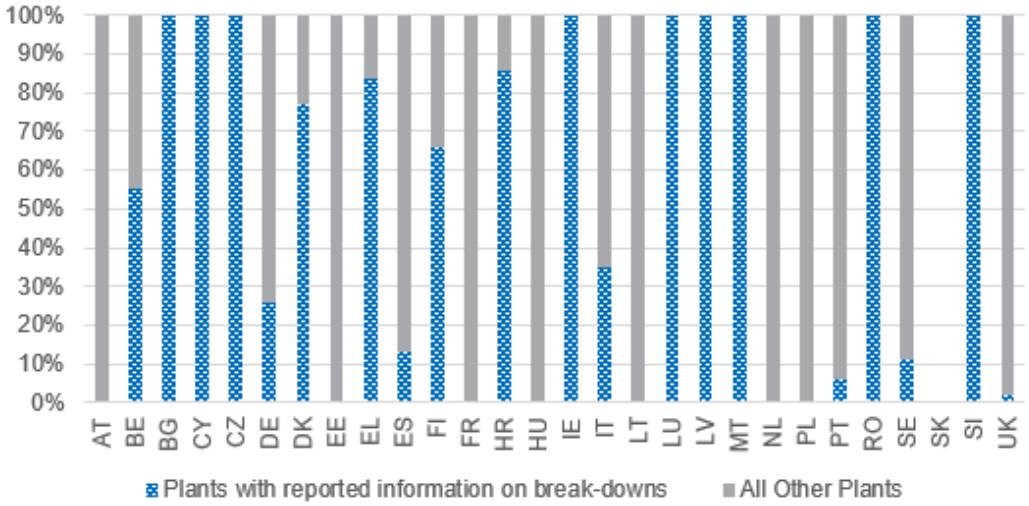
The operating hours reported across Member States ranged from 0 to 8,760. There were also 152 plants reporting over 8,760 operating hours (which is the total number of hours in a year). It is expected that in these cases, hours are reported together for multiple units in a plant, or potentially erroneous. This was queried with Member States and one responded that multiple years of operating hours had been combined. Removing these values from consideration gives mean operating hours of 6,822.

Information on break-downs was reported for a much lower proportion of plants by Member States (23%). The number of reported break-downs ranged from 0 to 1,585 per Member State. It was reported

that 11 plants had over 100 break-downs, four of which were in Germany and three in Italy. This may be due to break-downs for multiple units at plants being reported together or may be erroneous values. This was also queried with Member States and the same Member State responded that multiple years of breakdowns had been combined in the reporting.

The reported information on break-downs by Member State is shown in Figure 3-32. Some Member States (Bulgaria, Cyprus, Czech Republic, Ireland, Luxembourg, Latvia, Malta, Romania) reported break-downs for 100% of plants exceeding 2t/h capacity.

Figure 3-32 Proportion of Member States reporting information on break-downs for plants exceeding 2t/h capacity (2016)



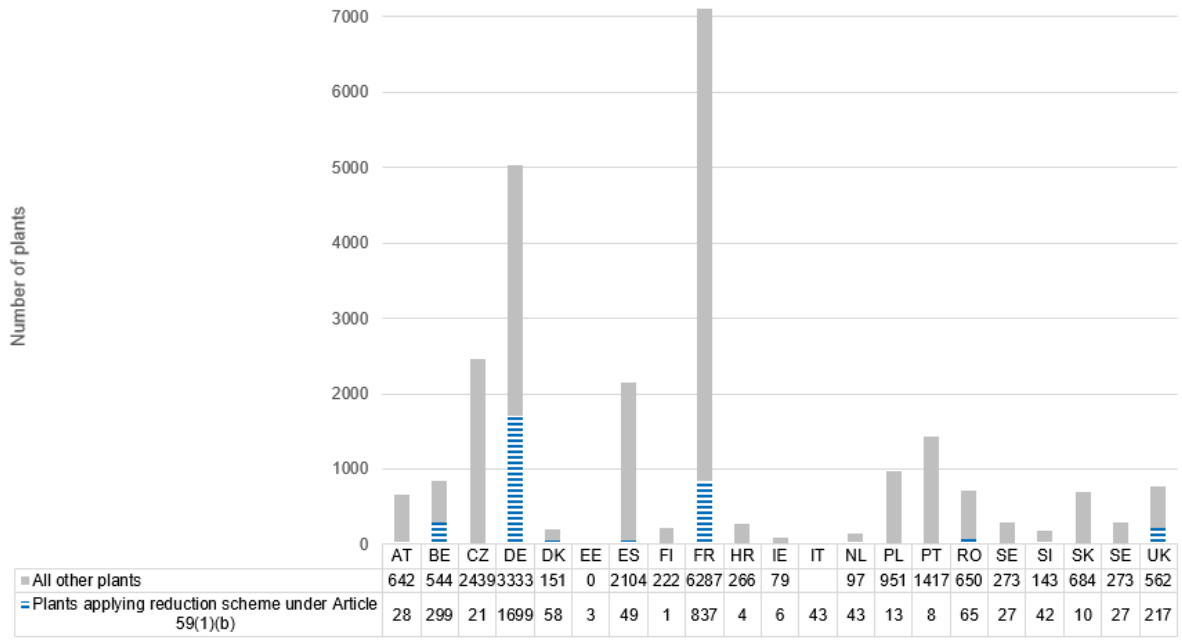
3.4.2 Question 12 Solvent emissions

12.1. Where Member States have opted to apply a reduction scheme (as described in Annex VII, Part 5) instead of emission limit values, what progress has been made in achieving an equivalent emission reduction (Article 59(1)(b))?

The reporting tool asks Member States to indicate whether it has opted to apply a reduction scheme by answering a Yes/No question. Where yes was selected, the Member State is asked to provide the total number of installations and the number of installations covered by article 59(1).

Member States are required to report the number of plants that choose to apply an emission reduction scheme under Article 59(1)(b) (Figure 3-33). Member States with the highest proportion of plants applying the reduction scheme are Belgium (35%), Germany (33%), the Netherlands (31%), the UK (28%), Denmark (28%), and Slovenia (23%). A total of 3,501 plants were reported to apply the reduction scheme in 2016. This is a small decrease of around 3.5% from previous reporting in which 3,631 plants were reported to apply the reduction scheme. When not counting plants applying the reduction scheme in Italy due to a lack of up to date information on total number of solvent plants, 14% of plants apply a reduction scheme in the EU.

Figure 3-33 Number of plants applying a reduction scheme under Article 59(1)(b) and other plants (2016)



	AT	BE	CZ	DE	DK	EE	ES	FI	FR	HR	IE	IT	NL	PL	PT	RO	SE	SI	SK	SE	UK
All other plants	642	544	2439	3333	151	0	2104	222	6287	266	79		97	951	1417	650	273	143	684	273	562
Plants applying reduction scheme under Article 59(1)(b)	28	299	21	1699	58	3	49	1	837	4	6	43	43	13	8	65	27	42	10	27	217

Note: Member States are only required to report on numbers of solvent emission plants in the case that a reduction scheme is applied. Member States not shown do not contain plants applying a reduction scheme. Italy reported the number of plants applying a reduction scheme but did not report the total number of plants. This was queried with the MS and it was stated that up to date figures are not available- However a 2013 figure of 14,810 facilities was provided.

12.2. Identify the plants for which derogations were granted in accordance with Article 59(2) or Article 59(3), as well as the justification for granting such derogations.

The reporting tool asked Member States to provide information for all plants granted derogations under Article 59(2) and (3), including reference number of the plant and reference number of the IED installation, names, geographical coordinates, operator names, competent authorities for granting permits and derogations, type of derogation and justification for the derogation.

15 Member States reported plants with derogations under Article 59(2) or Article 59(3) (Figure 3-34), with 98 derogated plants in total. This is a decrease from the previous reported under Article 5.3 of the Solvent Emissions Directive where 19 Member States reported derogations in 2013 (96 plants under article 5(3)(a) and 83 plants under article 5(3)(b)). The Member State with the largest number of reported derogated plants was Germany. Most Member States reported more plants derogated under Article 59(2) than under Article 59(3), except for Bulgaria, Finland, and the UK.

Figure 3-34 Number of plants with derogations under Article 59(2) and Article 59(3)

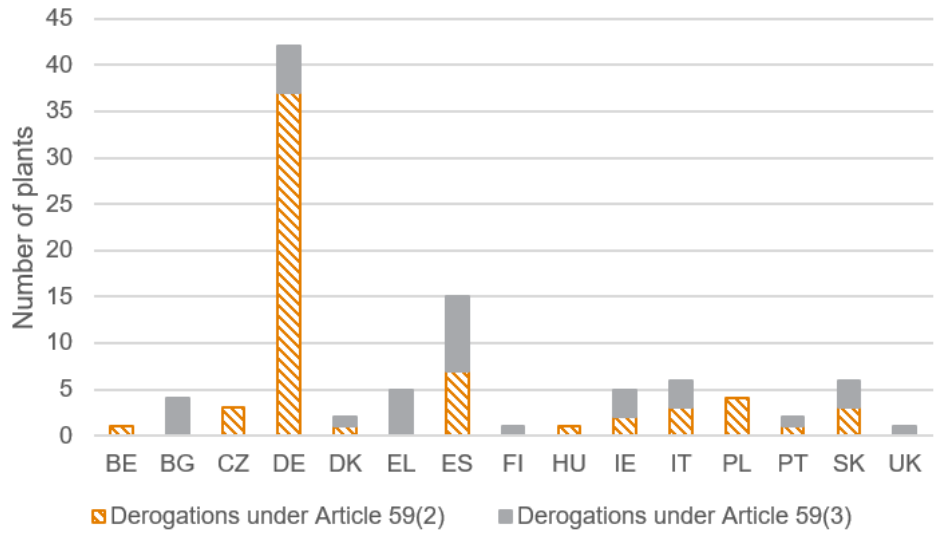
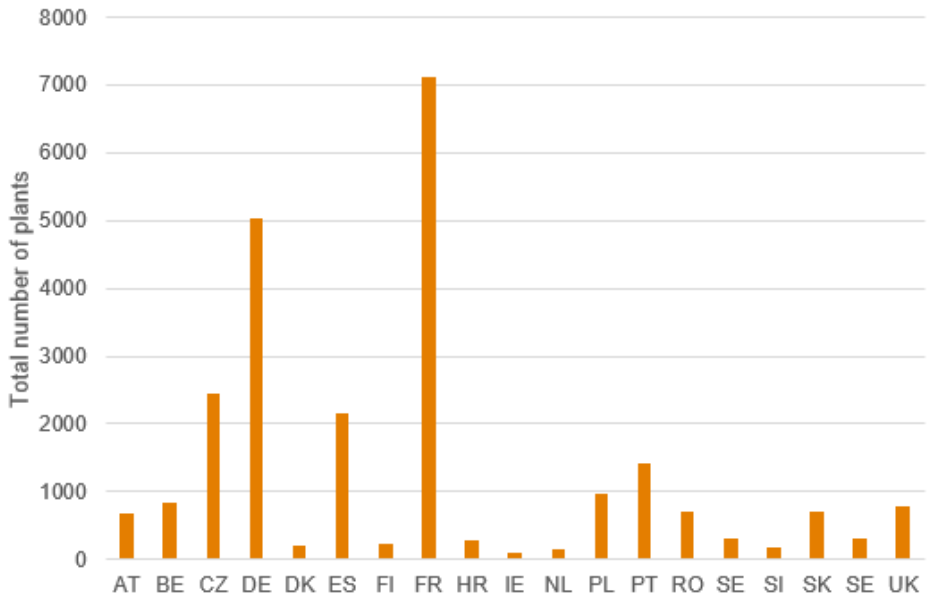


Figure 3-35 Total number of solvent emission plants in Member States with derogations



Note: Only Member States that apply a reduction scheme were required to report total number of plants.

A variety of different reasons for derogations were reported by Member States and reported justifications were grouped into five categories: i) Technically not feasible, ii) economically not feasible, iii) no serious health or environmental consequences, iv) BAT is already applied, v) Other. A summary of the number of justifications given in each category are shown in Table 3-11.

Table 3-11 Summary of justifications for derogations given

	Technically not feasible	Economically not feasible	No serious health or environmental consequences	BAT is applied	Other	Reason not given
Article 59(2)	24	23	9	10	15	4
Article 59(3)	24	3	0	5	1	4

Note: More than one derogation justification was reported for many plants

For both derogations granted under Article 59(2) and Article 59(3), the most common justification for derogation was BAT being technically not feasible. In the case of Article 59(3), this often related to it not being possible to undertake coating activities in a confined space, normally due to the bulky nature of the items being coated. For Article 59(2), plants were also commonly reported to be derogated due to BAT being not economically feasible. Reasons classified as "Other" included plants that were reported to have applied a reduction scheme. For four derogated plants under both Article 59(2) and Article 59(3), no justification for derogation was reported.

4 Conclusions and recommendations

4.1 Enhanced picture of IED implementation in Member States and across the EU (Module 1)

All Member States have reported on implementation of the IED for Modules 1, 3 and 4 of Annex II of the Commission Implementing Decision 2012/795/EU[14]. The responses provided have overall been judged as complete and of sufficient quality to allow assessment of the progress in implementation of the IED. Reporting against Module 1 was the most complete out of all Modules reflecting the fact that it only included two questions and thus required the least inputs from Member States.

The majority of Member States have made some changes to the way they implement the IED since the last reporting period. The two areas where most Member States implemented changes concerned environmental inspections and site closures. Nine Member States reported issues associated with the implementation of the IED. However, there were no common themes on the nature of the issues reported across the Member States.

In contrast, as part of a separate contract for DG ENV on "Implementation support for the Industrial Emissions Directive"[15], 18 Member States provided information on the issues and challenges they face in implementation of the Directive. This can suggest that Member States were either not willing to report to the Commission on the difficulties they face as part of the official reporting, or that the representatives of Member State authorities in charge of official reporting did not have information on the challenges experienced by permitting and inspection authorities in their countries (which are often at a different level of administration to the reporting authorities).

4.2 Implementation of BATC in the iron and steel and glass manufacturing sectors (Module 3)

Following consultation with Member States, reporting against Module 3 was assessed as mostly complete. Outstanding gaps relate to:

- Lack of monitoring frequencies reported for the Iron and Steel industry by Croatia and gaps of monitoring frequencies reported by Italy;
- Unavailable permit links for all German installations with permits issued before the implementation of the IED;
- Some outstanding broken or unavailable permit links reported by Italy;
- Links leading to general portal reported by the Netherlands. Discrepancies in the numbers of derogations and ELVs set in the derogations. Ambiguity with regards to delays with permit reconsiderations;

In some instances, Member States provided links to general portals containing all permits issued under the IED. These were asked to provide bespoke permit links during the consultation stage but many of them came back with instructions on how to navigate these portals. In these instances, their responses were considered complete.

The availability of permit links is clearly an area for improvement ahead of the next round of Member State reporting according to Decision (EU) 2018/1135 which will require Member States to provide URLs to permits for all installations covered by Annex I of the Decision. It should be noted however that Annex II to the Implementing Decision 2012/795/EU did not require Member States to provide links to

[14] All Member States except from Greece used the electronic reporting tool to report against all Modules.

[15] https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/dfb9868a-88bf-43d5-a3fb-7b94978309ee/details

permits in any question of Module 3 – this requirement was included as an option for Member States in the electronic reporting tool pre-empting a future alignment to Commission Implementing Decision 2018/1135/EU. The provision of links to permits in Decision (EU) 2018/1135 is mandatory. This is expected to have a positive influence on the quality of reporting of the permit links in future Member State reporting.

In addition, in Module 3 Member States were also asked to provide geographical coordinates of the installations. This data was generally complete and correct (i.e. when mapped, coordinates were showing locations within the boundaries of a Member State). For the majority (approximately 70%) of the installations it was possible to correlate the installation reported with facilities in the E-PRTR. However, some installations could not be identified in the E-PRTR or vice versa i.e. were present in the E-PRTR and not in the Member State reporting. The reasons for these discrepancies could be two-fold:

- Facilities may not be reporting each year to the E-PRTR if they emit less than the pollutant thresholds set in the E-PRTR Regulations. For that reason, for the purpose of the assessment the list of facilities used covered reporting for years 2013- 2016.
- The iron and steel and glass manufacturing activities are not the "Main activity" of the facility in the E-PRTR. This means that an installation reported in Module 3 may be present in the E-PRTR but be listed with a different main activity (Module 3 required information for all Iron and Steel and Glass Manufacturing installations operating under the activities listed in question 3, regardless of whether these are main or secondary).

The information reported by the Member States allows drawing the following conclusions on the implementation of BATC in the iron and steel and glass manufacturing sectors:

- The Iron and Steel and Glass Manufacturing industries are present in 25 Member States.
- A large proportion of the reporting Member States (18) used supplementary sources other than the BATCs to set the conditions of installations permits. The most commonly reported additional sources were other emission standards and own measurements.
- Furthermore, nine Member States (Austria, Belgium, Germany, Denmark, France, Luxembourg, Netherlands and the United Kingdom) reported setting permit conditions in the absence of BAT in the BATCs or in consultation with operator. The most reported reason for that (in six cases) was that the BATCs for the Glass manufacturing sector did not cover some emission sources. Other reasons included that the BATCs did not cover the process in question, did not cover indirect releases or that the installation implemented innovative production processes not covered by the BATCs.
- Eight Member States have set different emission limit values under Article 15(3), all of which have done so for emissions to air. Three Member States did not provide clear information on how the ELVs differed (Germany, Netherlands, United Kingdom). In some cases, the different ELVs were set due to the adoption of alternative monitoring approaches. Other cases related to setting different reference conditions or stricter emission limits for some pollutants.
- 15 Member States have granted Article 15(4) derogations in the Iron and Steel and Glass manufacturing sectors. Most derogations were granted in Italy and the United Kingdom (14 each), Germany (10) and the Czech Republic (7). For 38 out of all 81 derogations, detailed information has been provided, including BAT, pollutants concerned and emission limit value set (for the remaining 43 installations, Member States chose to report links to permits which were not analysed as part of the study). On the basis of this information, it has become evident that BAT 20 Dust has been the most frequently derogated BAT in the iron and steel sector, and BAT 17 NOx and BAT 19 SOx in the glass Manufacturing sector.
- A detailed analysis of the environmental impact caused by the derogations has been performed only for the glass manufacturing sector at this stage due to clarifications pending from Member States on the information reported for the Iron and Steel sector. The estimates showed that in

some instances, the annual pollutant emissions arising from the derogations are 2-3 times the reported pollutant emissions from the sector in 2016 reported in the E-PRTR data (particularly for dust, SOx, NOx). The estimated annual damage cost for dust, SOx and NOx alone was shown to be EUR 4.3 million.

- Only three Member States (Spain, Netherlands and Italy) reported granting temporary derogations for the testing of emerging techniques. Two of these cases related to the Iron and Steel industry and one to the Glass Manufacturing industry.
- A total of 226 permits (out of a total of 777 in both sectors) across 17 Member States were not reconsidered by the deadline of 8 March 2016. Of these, 144 were in the Glass manufacturing industry (31%) and 82 in the Iron and Steel industry (25%). The most commonly reported reasons related to delays in the implementation of the BATCs, procedural delays or late applications by operators. Most permit reconsiderations were set to be reviewed in 2016 but after the March deadline, or in 2018.
- Finally, 11 Member States provided no feedback under question 10 and one (Croatia) specified that information on the practical difficulties encountered in the implementation of the IED was not currently available. Out of the Member States that reported information, six reported no problems encountered whereas the remaining seven provided feedback on issues that had been experienced. The issues generally differed across the Member States. Some key reasons included difficulties with assessing the compliance of installations with BAT, having stricter national emissions standards, or lack of clarity in some of the text and the footnotes of the BATCs.

4.3 Implementation of IED provisions with regard to waste incineration and solvents emissions (Module 4)

Reporting against Module 4 was also considered complete. The main shortcomings of Member State responses were, as with Module 3, providing links to installation permits and in reporting authorisations granted under Article 51. As with Module 3, the Implementing Decision 2012/795/EU did not require Member States to provide links to permits in any question – this requirement has been added as an option for Member States in the reporting tool.

With regard to **waste incineration**, Germany has by far the largest number of incineration and co-incineration plants across EU Member States. In most countries there are more incineration than co-incineration plants except for in Austria, Sweden, Spain and Finland. The amount of non-hazardous waste and total waste incinerated in the EU has increased between 2013 and 2016, yet quantities of hazardous waste incinerated remained relatively constant during that period.

The majority of plants applying different conditions under Article 51 are located in Germany, Denmark, Italy and Sweden. There has been a small increase in the number of plants applying different conditions under Article 51 since the previous 2013 reporting.

With regard to **solvents emissions**, Germany and France have the largest number of plants applying a reduction scheme. There has been a small decrease across the EU Member States in the number of plants applying an emission reduction scheme compared with 2013 reporting. There are more derogations granted under Article 59(2) than 59(3), and the majority of these have been issued in Germany and Spain. Compared to the previous reporting period the number of derogated plants decreased.

4.4 Recommendations

Recommendations on the future reporting on the implementation of the IED are presented in Table 4-1.

Table 4-1 Issues and recommendations on the future reporting on IED implementation

Issue	Description and recommendations
Data extraction tool	The format of the Excel files in which data from the reporting tool was extracted prevents automatic compilation of all files into a single repository. In future, it would be useful if the data was exported in a table, with questions always presented in the same column and row. This may be resolved as a part of the transition to the EU registry.
Question structure	Questions 5.1, 7.1, 9.1 and 12.2 require for the Member State to list all installations to which certain provision applies. In cases where no answer was provided by the Member State, this was interpreted to mean that no installations were affected by the provision in question. To improve clarity, it would be useful if such questions are preceded by a yes/no question (e.g. as in question 1 of Module 1) that asks whether the provision was applied in this Member State. Only if yes is selected, the Member State can fill in additional information.
Guidance on the use of the reporting tool	The "FINAL Data Documentation- of Modules 1, 3 and 4 of Implementing Decision 2012/795/EU establishing the type, format & frequency of information to be reported on the IED implementation" provides useful information on how the reporting tool works and what information was requested by the Member States. One area for improvement would be to better describe which data was mandatory and which optional. The current guidelines used 'Multiplicity' coded as "0" or "1", which allowed understanding which questions were considered mandatory and optional in the reporting tool. However, the meaning of 'Multiplicity' was not explained anywhere in the document. In future guidelines this should be made more explicit (e.g. mandatory fields could be in **bold** or annotated with letter **"M")**. Supporting documentation for future reporting tools and questionnaires should clearly explain the motivations behind each question, linking to the requirements of the Implementing Decisions and the information that is expected to be reported. This would aid Member States with their interpretation of each question and potentially help to avoid inconsistencies between countries in the way in which they respond to different questions.
Coordinates data (requested in question	When comparing the installations reported in Module 3 to installations reporting to E-PRTR based on geographical coordinates, a key limitation was identified. In some cases, E-PRTR installations matching reporting entries from this study were excluded as their specified main IED activity was not covered by the 'Sectoral Spotlight' module (e.g. Activity 2.3) and the E-PRTR did not list other activities taking place on-site.

Issue	Description and recommendations
Links to permits (requested in Module 3 and 4)	Providing an option to the Member States to report the permits prevented the scope of the analysis in some cases, for example regarding environmental impacts of Article 15(4) derogations. Significant effort is required to extract and analyse the information from the permits which do not follow a uniform structure and are published in national languages. It is therefore recommended that in future reporting Member States are not provided an option to provide a link to permits instead of actual information.
Automatic validation of certain data fields in the reporting tool	Extension of automatic validation of the information reported in the tool would have prevented Member States from entering data with mistakes. Such validation could have been extended to the units when reporting derogated ELVs and authorisations under Article 51 and 51(1).
Question specific recommendations	
Question 1 Implementation changes	Some Member States reported very small changes to the legislation that may not be significant for the overall implementation of the IED. It might be that small changes have been made in other Member States however have not been reported as they did not consider them significant. Qualification of the types of changes to the legislation that should be reported by the Member States would facilitate more consistent reporting.
Question 2 Implementation difficulties	This question could be further expanded to ask Member States to report on the support that would help them resolve the issues they face with implementation of the IED. This would provide valuable inputs to ongoing Commission initiatives to improve implementation of environmental legislation, including specific actions on the IED.
Question 7.1 Different ELVs (Article 15(3)(b))	The phrasing of the question is unclear regarding where information about the requirements specified by BAT-AEL should be included, and where the actual authorised conditions should be mentioned.
Question 7.1 Different ELVs (Article 15(3)(b))	No analysis of environmental impacts could be performed since Member States could choose to respond with one illustrative example per sector. Requesting information for all plants would allow estimation of the environmental impacts of
Question 8.1 (Monitoring frequencies)	The phrasing of the question is ambiguous regarding to effect of selecting a media, i.e. whether this means that monitoring frequencies set for this media are different to BATC or in line with BATC. The different wording of the question on monitoring frequencies of other relevant process parameters compared to monitoring frequencies of emissions to all media could lead to mistakes in reporting.
Question 11.1 Authorised conditions under Article 51(1), (2) or (3)	In some cases, Member States have provided information about authorised operating conditions under Article 50(1) and 50(3) that deal with incineration plants, for plants that were not incineration plants. It would be useful if the reporting tool is designed in such a way that the cells requesting Article 50(1) and 50(3) information are only available where the plant has been selected as an incineration plant.

5 References

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Appendix 1: Member State level assessment

Provided as a separate file

Appendix 2: Permit links

Provided as a separate file

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