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Application of the EU Emissions Trading Directive

Analysis of national responses under Article 21 of the EU ETS Directive in 2015

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European Environment Agency

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This report

Directive 2003/87/EC (EU, 2003) of the European Parliament and of the Council of the European Union (EU) established the EU Emissions Trading System (EU ETS), which is a key EU policy instrument aimed at reducing greenhouse gas emissions.

Article 21 of the EU ETS Directive stipulates that, each year, Member States should report on the application of the Directive. These reports should be based on the 'Article 21 questionnaire', which was adopted by the European Commission in Implementing Decision 2014/166/EU (EU, 2014a).

Article 21 further stipulates that, on the basis of the Member States' reports, the Commission should publish a report on the application of this directive. This document serves as input in this regard.

This EEA report considers whether or not the implementation of this directive is on track, if there is potential for improvement in certain areas and whether or not further information is required to determine the status of implementation.

Executive summary

Synthesising Member State reporting on the application of the EU ETS Directive

The European Union Emissions Trading System (EU ETS) is one of the key climate policy instruments that has been implemented in the European Union (EU) to achieve its objectives of reducing greenhouse gas (GHG) emissions in a cost-effective manner.

The EU ETS covers certain activities that emit carbon dioxide (CO_2), nitrous oxide (N_2O) and perfluorocarbons (PFCs) ([1]). These activities are carried out by more than 11 000 energy-using installations. These installations include power stations and other combustion plants with a rated input of more than 20 megawatts thermal (MWth) ([2]) (except hazardous or municipal waste installations); oil refineries; coke ovens; iron and steel production facilities; and installations that are involved in the production of cement clinker, glass, lime, bricks, ceramics, pulp, paper and board, aluminium, petrochemicals, ammonia, nitric acid, adipic acid, glyoxal and glyoxylic acid. In addition, the EU ETS covers facilities involved in CO_2 capture, CO_2 transport in pipelines and the geological storage of CO_2. Moreover, the EU ETS includes nearly 600 aircraft operators, but, until December 2016, this coverage is limited to flights within the European Economic Area. In total, the EU ETS covers around 45 % of EU GHG emissions (EEA, 2015c). All 28 EU Member States, as well as Iceland, Liechtenstein and Norway (which are part of the broader European Economic Area), participate in the EU ETS.

The EU Emissions Trading Directive (EU, 2003; referred to hereafter as the 'EU ETS Directive'), specifically Article 21 of the Directive, states that EU Member States must report to the Commission every year on the application of the Directive. A Commission Implementing Decision (EU, 2014a) sets out a questionnaire to be used by the Member States for their annual Article 21 report. The present EEA report provides a synthesis of the country reports on the implementation of the EU ETS in 2014, as well as a comparison with the 2013 data (EEA, 2015a ([3])) in cases for which this is feasible. The data included in this EEA report are for 2014 unless indicated otherwise.

Evaluating the implementation of the EU ETS

The Article 21 questionnaire covers topics related to the national (or regional) implementation of the EU ETS Directive. The questionnaire also includes data that have been collated on the basis of reporting by installations and aircraft operators. This EEA report evaluates the implementation of the EU ETS Directive, based on the countries' questionnaire responses, and also presents analyses of the fuel consumption and emissions data reported.

Box ES1 EEA contributions to the EU's GHG emissions trading policy

The EEA publishes a data viewer and reports that are related to the implementation of the EU ETS Directive, in order to enable a better understanding of the effects of this main EU instrument for reducing GHG emissions. The EU ETS data viewer (EEA, 2015b) provides easy access to the emission-trading data contained in the European Union Transaction Log (EUTL) public website. Moreover, the EEA's annual reports on 'trends and projections' (EEA, 2015d, 2015e) assess both EU ETS emission trends, and supply and demand balances of allowances. The EEA also conducts analyses of the consistency of EU ETS data with GHG inventory reporting.

([1]) These activities are listed in Annex I of the EU ETS Directive. There is the potential for further GHGs to be included (see Article 24 and Annex II of the EU ETS Directive).
([2]) A 'megawatt thermal' (MWth) is a unit of thermal (rather than electrical) energy used by the power industry.
([3]) Data for 2013 are more up to date in certain instances than those in EEA's Technical report No 3/2015 (EEA, 2015a).

The deadline for national responses in 2015 was 30 June. Out of 31 countries, 25 submitted their responses by this time. This represents a substantial improvement on 2014, in which only 19 of the countries reported by the deadline. A further four countries (Austria, Belgium, Latvia and Spain) reported in July 2015. Germany submitted its response in August 2015, and Italy submitted its response in September 2015.

Installations, aircraft and their emissions

The EU ETS regulates two types of operators: installation operators and aircraft operators. These are the operators of the two emission sources in the EU ETS, namely stationary technical units and aircraft (if they perform activities listed in Annex I of the EU ETS Directive). There are requirements with regard to the reporting of GHG emissions and these requirements differ for different types of fuel emissions, such as fossil fuels, waste or biomass ([4]). Biomass is treated as a fossil fuel if sustainability criteria apply but are not satisfied. However, biomass is given an emission factor of zero (i.e. it is zero rated) if sustainability criteria apply and are satisfied, or if no sustainability criteria apply (i.e. solid biomass and biogas).

The number of installations in the EU ETS, as reported in response to the Article 21 questionnaire, decreased by 2 % between 2013 and 2014, from 11 384 to 11 187. Installations are required to have a GHG emissions permit, issued by a competent authority (CA). These permits must be updated if changes to the functioning of the installation occur ([5]). In 2014, 2 695 permit updates were reported (France did not respond with regard to permit updates) for a total 11 187 installations. This is a 39 % decrease from the 4 434 updates that were reported in 2013 (when all countries responded). The data provided do not detail the type of changes that led to these permit updates.

Total fuel consumption and emissions, based on installation operator emission reports, decreased by 9 % and 4 %, respectively, to 19 276 petajoules (PJ) ([6]) and 1 557 megatonnes (Mt) CO_2, between 2013 and 2014. Solid fuels accounted for more than half of the emissions covered by the EU ETS. Emissions from waste used as a fuel or input material increased by 39 % to 18 Mt CO_2 between 2013 and 2014. This increase is likely to be at least in part because of improved reporting rather than because of a substantial increase in waste use.

The biomass missions from stationary installations in the EU ETS in 2014 amounted to 297 Mt CO_2, 99 % of which satisfied the sustainability criteria (if applicable ([7])) or was not subject to sustainability criteria. Zero-rated energy content made up 99 % of the reported biomass energy content in the EU ETS in 2014 (3 798 petajoules (PJ)), with only 32 PJ of non-zero rated biomass. The combustion sector contributed 79 % of the 'zero-rated' emissions from biomass across all reporting countries. The number of installations using biomass increased by 50 %, from 1 432 to 2 149, for all EU ETS participants between 2013 and 2014; however, these numbers are not directly comparable as more countries reported on biomass emissions in 2014.

The number of aircraft operators in the EU ETS in 2014 was 596 ([8]), and there were similar numbers of commercial (52 %) and non-commercial (48 %) aircraft operators. More than half (56 %) of all reported operators are small emitters ([9]). In 2014, the total emissions reported from aviation in the EU ETS amounted to 54.9 Mt CO_2, 20 % of which was from domestic aviation.

Areas in which the EU ETS Directive and related requirements were implemented well

Based on the data and information submitted by countries on the application of the EU ETS Directive in 2014, and comparison with the 2013 data, the EEA found a number of areas in which the directive was implemented well, and has also identified a number of areas in which improvements could be made.

([4]) The definition of biomass under the Monitoring and Reporting Regulation (MRR) (EU, 2012b) has been aligned with the Renewable Energy Sources (RES) Directive (EU, 2009a) as 'the biodegradable fraction of products, waste and residues from biological origin from agriculture, forestry and related industries, industrial and municipal waste'. It includes bioliquids and biofuels.

([5]) National law in Member States, set up to implement Articles 6 and 7 of the EU ETS Directive, dictates when a permit must be updated.

([6]) A petajoule (PJ) is one quadrillion joules (i.e. 10^{15} joules).

([7]) Sustainability criteria apply to biofuels and bioliquids. No sustainability criteria apply to solid biomass or gaseous biomass (except biogas for road transport).

([8]) This number will differ from the number in the accompanying database, as Latvia and Portugal did not officially resubmit in time to correct the data in the database.

([9]) A small emitter is an air transport operator (1) whose flights in aggregate emit less than 25 000 tonnes of CO_2 per annum; or (2) that operates fewer than 243 flights per period for three consecutive 4-month periods. A small emitter can take advantage of a simplified procedure to monitor its emissions of CO_2 from its flight activity.

Flexibilities

The EU ETS Directive stipulates that all installations and aircraft operators must undertake regular and accurate reporting. However, countries can make use of 'flexibilities' to apply exclusion criteria in some cases. These flexibilities can reduce the administrative burden for relatively small emitters. For example, countries can exclude installations from the system on the basis of certain size thresholds (according to Article 27 of the EU ETS Directive and subject to no objection from the European Commission), or can allow installations or aircraft operators flexibility with regard to certain obligations within the system (according to Article 47 of the Monitoring and Reporting Regulation (MRR) (EU, 2012b)). Flexibilities that have allowed installations to be excluded from the EU ETS (under Article 27 of the EU ETS Directive) are not thought to have affected the environmental integrity of the EU ETS, and represented only 0.2 % of ETS emissions in 2014, which is the same as the percentage reported for the year 2013. In addition, installations that have been excluded under Article 27 must achieve equivalent contributions to emission reductions.

Monitoring methodologies

Articles 26 and 41 of the MRR stipulate that operators must apply the highest tier monitoring methodology, as stated in Annex VIII of the MRR. If an operator can prove that it would be technically unfeasible or incur unreasonable costs, an operator would be allowed to apply a methodology that is one tier lower for large installations (category C) or two tiers lower for small and medium installations (categories A and B). The proportion of medium (category B) installations using the highest tier methodologies remained at 72 % in 2014, whereas the proportion of large (category C) installations using the highest tier methodologies increased from 84 % to 86 % between 2013 and 2014. This shows that there was a small overall improvement in the methodologies used by the larger source streams. Countries could investigate areas in which further improvements would be possible. Emissions estimated using the fall-back approach increased by 6 % between 2013 and 2014, but still only accounted for 0.3 % of total EU ETS emissions.

Aviation emissions

In the case of aviation emission reporting, conservatively estimated emissions for aircraft operators were very low (0.01 %), indicating good reporting by the operators.

Sampling plans

There was an improvement in the completeness of the submission of sampling plans by installations: in 2014, 25 countries indicated that sampling plans were always prepared and approved, which was a slight increase from 22 countries in the 2013 reporting period.

Compliance

Compliance in terms of surrendered allowances is very good in the EU ETS; in 2014, 99.5 % ([10]) of stationary operators and aircraft operators surrendered as many allowances as their verified emissions or more.

Completeness of country reporting on the application of the EU ETS Directive

Overall, the reporting of data improved in the aspects of the Article 21 questionnaire outlined below.

- Methodology improvement reports: In 2014, 28 countries reported on the number of installations that were required to submit and that actually submitted improvement reports, which is a significant improvement on the six countries that reported in 2013. However, this may be as a result of the timing of reporting rather than because of actual progress (the first phase-3 improvement reports were not required until June 2014).
- Combustion and process installation emissions by Common Reporting Format (CRF) sector: If countries reported a higher CRF sector total of emissions than explained by the sum of combustion and process emissions, a third category of 'undefined' emissions was calculated by the European Topic Centre for Air Pollution and Climate Change Mitigation

([10]) Percentage calculated on the basis of verified emission data and surrendered allowances as available in the excel file (4 May 2015) on compliance data for 2014 from http://ec.europa.eu/clima/policies/ets/registry/documentation_en.htm.

(ETC/ACM). This occurred in fewer countries in the 2014 reporting period than in the 2013 reporting period. Overall, while this points to an improvement in data collection and reporting, significant gaps still remain. The Flemish Region of Belgium, the Czech Republic, the Netherlands, Norway, Portugal and Sweden did not provide data.

- Waste and biomass installation emissions: More countries reported data on these two aspects of emissions in 2014 than in 2013 (31 and 29, respectively, in 2014 compared with 29 and 25, respectively, in 2013).

- Literature and default values: In the 2014 reporting period, 25 countries reported using literature or default values instead of sampled data from installations, an increase from 22 in the 2013 reporting period. It is likely that this increase is because of improved reporting rather than because of the wider use of literature and default values.

Areas for improvement

The EEA's analysis also found areas for which improvements are possible with regard to the application of the EU ETS Directive and its related requirements.

Changes to the capacity, activity levels or operation of installations

Ten countries (Austria, Belgium, the Czech Republic, Denmark, France, Italy, Latvia, Poland, Spain, and Sweden) reported that there were some planned or effective changes to the capacity, activity levels or operation of installations that the CA was not notified about. While this is a decrease from 15 countries in the 2013 reporting period and therefore an improvement, more complete reporting of such changes to CAs is necessary.

Improvement reports

Out of the 28 countries that provided data, 13 reported that at least one installation operator, when asked, did not submit plans to the CA regarding how to improve their methodologies. This suggests non-compliance with Article 69 of the MRR.

Simplified monitoring plans

Article 13 of the MRR makes provisions for countries that allow installations and aircraft operators to use simplified monitoring plans, irrespective of the scale of their operations and emissions. There have been relatively few instances of the use of this provision by countries. Only six countries (Belgium (the Flemish Region), Croatia, France, Hungary, Liechtenstein and Lithuania) reported the use of simplified monitoring plans for installations and only three countries (Croatia, Finland and Iceland) reported the use of such plans for aircraft operators.

Six countries (Belgium, Croatia, France, the Netherlands, Spain and the United Kingdom) reported simplified compliance for installations with low emissions (less than 25 000 tonnes CO_2-equivalent ([11]) per year, and six countries (Belgium, Croatia, Finland, Germany, Italy, and the United Kingdom) reported simplified compliance for small emitters related to aviation ([12]). This simplification involved measures such as customised guidance, simplified monitoring plan templates and workshops for small emitters. In the aviation sector, 71 small emitters did not use the Small Emitters Tool (SET) to estimate fuel consumption. Whether or not more needs to be done to reduce the administrative burden on small emitters should be further investigated. The consistency of the data reported on small emitters in the aviation sector also needs to improve, especially with regard to the information on the methods used to determine aviation emissions.

Verifiers

The number of complaints about verifiers increased. Almost all complaints were resolved in 2014. While this may simply indicate the better reporting of complaints, pursuing the resolution of complaints about verifiers remains important in order to improve the quality of verifications.

The number of outstanding issues highlighted in verification reports decreased by 37 % between 2013

([11]) CO_2-equivalent is a measurement unit to indicate the global warming potential of GHGs. CO_2 is the reference gas against which other GHGs are measured.

([12]) As defined by Article 54(1) of the MRR: 'Aircraft operators operating fewer than 243 flights per period for three consecutive four-month periods and aircraft operators operating flights with total annual emissions lower than 25 000 tonnes CO_2 per year shall be considered small emitters.'

and 2014. Checks of verification reports by CAs are generally widespread and recommended. A very small number of verification reports were rejected.

Penalties

In the 2014 reporting period, nine countries (Greece, Hungary, Italy, the Netherlands, Poland, Romania, Slovakia, Spain, and the United Kingdom) imposed fines on installation operators for non-compliance, pursuant to Article 16(1) of the EU ETS Directive, which is an increase from the eight countries that imposed fines in 2013. The number of fines issued to installation operators increased from 26 to 35 between 2013 and 2014. Despite this increase, the number of fines remained low, considering that there are over 11 000 installations in the EU ETS. The most common infringement (in four countries: Poland, Romania, Slovakia, and the United Kingdom) was the failure to submit a verified emissions report in due time. Ten installation operators, across seven countries (Germany, the Netherlands, Poland, Portugal, Romania, Spain, and the United Kingdom), received excess emission penalties, pursuant to Article 16(3) of the EU ETS Directive, which is a 58 % decrease on the number of operators that received excess emission penalties in 2013.

Three countries (Italy, Poland, and Sweden) imposed fines on aircraft operators for non-compliance, pursuant to Article 16(1) of the EU ETS Directive. Of the 596 aircraft operators, 63 (i.e. more than 10 %), across four countries (Germany, Italy, Sweden, and the United Kingdom), received excess emission penalties pursuant to Article 16(3) of the EU ETS Directive. However, the numbers reported may refer to several years instead of just 2014.

In addition, Member States reported a total of 62 additional aircraft operators ([13]) that should have complied with requirements under the EU ETS Directive, because they performed flights to or from an ETS-participating country, but did not. In most cases, these operators were not located within the European Economic Area.

The first year in which aircraft operators had to surrender allowances for aviation activity under the current scope was 2015 ([14]). Reporting in the aviation sector is developing and is expected to further improve in the coming years.

The largest installation operator penalty (of EUR 19 760 900) reported for 2014 was imposed by Italy for a failure to notify the relevant CA of planned or effective changes to the capacity, activity levels or operation of an installation in due time. In contrast, three out of the other eight countries (Greece, Slovakia, and the United Kingdom) that imposed installation fines did not impose any fines of more than EUR 30 000. The largest aircraft operator penalty (of EUR 12 129 257) reported for 2014 was also imposed by Italy, pursuant to Article 16(1) of the EU ETS Directive. The other two countries (Poland and Sweden) that imposed aircraft penalties did not impose any fines of more than EUR 66 000.

([13]) This number might be overestimated. Reported numbers partly refer to aircraft operators which are excluded from the EU ETS and which should not have been reported.

([14]) Due to the changes in the scope of the ETS Directive (i.e. the inclusion of aviation), the surrender of emission allowances and reporting for aircraft operators in 2013 was not required until 2015. Therefore, there was a combined compliance cycle for the years 2013 and 2014, which made the reporting under Article 21 of the ETS Directive ambiguous in some instances.

1 Introduction

1.1 What is greenhouse gas emissions trading?

The EU Emissions Trading System (EU ETS) is a cap and trade scheme for GHG emissions from EU Member States and Iceland, Liechtenstein and Norway (EEA-31). It aims to promote 'reductions of GHG emissions in a cost-effective and economically efficient manner' (EU, 2003). The EU ETS sets a cap on the total amount of carbon dioxide (CO_2) and other GHGs ([15]) that can be emitted by power plants, manufacturing installations and aircraft operators in the system. The cap reduces over time so that total annual GHG emissions, covered by the system, decrease (see Figure 1.1). The EU ETS covers approximately 45 % of total EU GHG emissions (EEA, 2015c).

Within the system, companies can receive or buy emission allowances that they can trade. They can also buy limited amounts of international credits from GHG emission-saving projects. Each allowance gives the holder the right to emit 1 tonne (t) of CO_2, or the equivalent amount of nitrous oxide (N_2O) or perfluorocarbons (PFCs).

After each year, a company must surrender enough allowances to cover all of its verified emissions subject to the EU ETS, otherwise fines are imposed. If a company reduces its emissions, it can keep the resulting spare allowances to cover its future needs or sell these allowances to another company that is short of allowances.

1.2 The EU ETS Directive and related policy developments

The EU ETS was established by the Emissions Trading Directive (EU, 2003). So far, emissions trading under the EU ETS has taken place as part of three 'trading periods': phase 1 (2005–2007), phase 2 (2008–2012) and phase 3 (2013–2020). Phase 4 is planned for the period 2021–2030 ([16]) (EC, 2015a). Table 1.1 presents an overview of these phases and Figure 1.1 presents an overview of the EU ETS cap across the trading periods.

1.2.1 Differences in the third trading period (2013–2020)

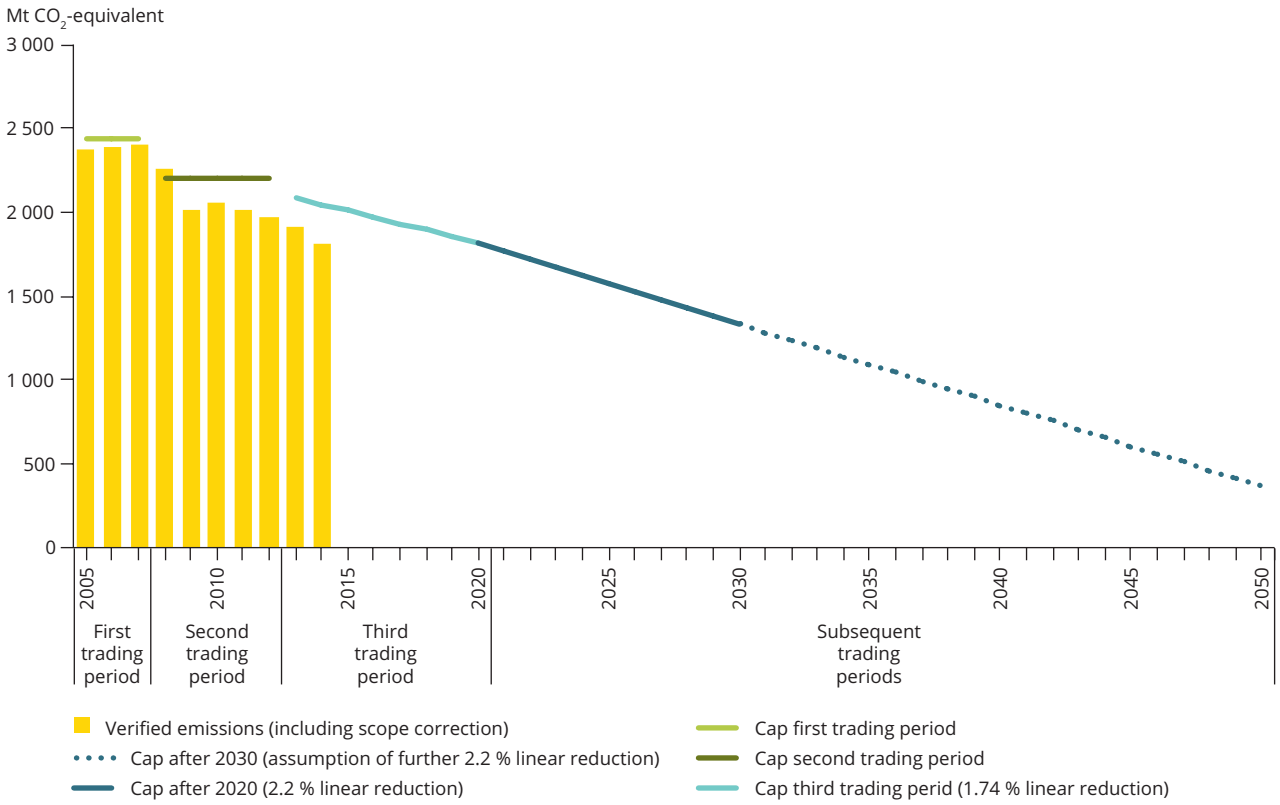
The EU ETS Directive was amended in 2009 (EU, 2009b) to improve and extend the EU ETS. Although the major revision in 2009 strengthened the EU ETS, the impact of the economic crisis was unprecedented and resulted in the accumulation of a surplus of allowances and a weak price signal. Measures to postpone the auctioning of 900 million emission allowances (known as 'back-loading') from 2013–2015 to 2019–2020 and the Market Stability Reserve aim to address these issues.

Table 1.1 Phases of the EU ETS

Phase	1	2	3	4 (proposed)
Period	2005–2007	2008–2012	2013–2020	2021–2030
Note	This was a learning phase with free allocations	There was a 10 % reduction of allocations in this phase; free allocations	A major reform of the system is occurring and there is an EU-wide cap on emissions (which is reduced by 1.74 % each year). Auctioning is the default mode of allocation	It is proposed that the cap will be reduced by 2.2 % each year in this phase

([15]) Nitrous oxide (N_2O) and perfluorocarbons (PFCs), but also other GHGs under Annex II of the EU ETS Directive.
([16]) In July 2015, the European Commission presented a legislative proposal for the revision of the EU ETS for Phase 4.

Figure 1.1 The change in the EU ETS cap between 2005 and 2050



Source: EEA, 2015d.

The main differences in the third trading period, compared with previous trading periods, are outlined below.

- A single, EU-wide cap on emissions now applies in place of the previous system of national caps.
- Auctioning, not free allocation, is now the default method for allocating allowances. In 2013, more than 40 % of allowances were auctioned (EC, 2013), and this proportion is rising progressively.
- For allowances allocated for free, harmonised allocation rules, which are based on EU-wide benchmarks of emissions performance, apply.
- Additional activities and gases (including N_2O from production of nitric, adipic, glyoxal and glyoxylic acids; PFCs from primary aluminium production; capture, transport and geological storage of GHG emissions; CO_2 emissions from petrochemicals, ammonia and aluminium production; and CO_2 emissions from non-ferrous metal production/ processing) have been included.
- The aviation sector has been included in the EU ETS since 1 January 2012 (EU, 2009b). Originally, this was to include all flights departing **and**/**or** arriving at airports within EU ETS-participating countries. However, since 2012, only flights departing **and** arriving at airports in these countries have been included in the EU ETS because of the 'Stop the clock' decision (EU, 2013a). This was to facilitate the negotiation of a global market-based mechanism for aviation emissions, which should be finalised in 2016 and implemented in 2020. The surrender of emission allowances and reporting for 2013 was not required until 2015, and the inclusion of flights to and from countries outside the European Economic Area has been postponed until after 31 December 2016 (EU, 2014b).
- Regulations for accreditation and verification (EU, 2012a), and for monitoring and reporting, have now been adopted (EU, 2012b).
- Croatia joined the EU ETS for stationary installations at the start of phase 3 (i.e. in 2013), six months before its accession to the EU. Since

1 January 2014, Croatia has also participated fully in the aviation part of the EU ETS.

In October 2014, the European Council concluded that 'a well-functioning, reformed ETS' will be the main instrument with which to achieve the EU target of at least a 40 % reduction, compared with 1990, in GHG emissions by 2030 (European Council, 2014).

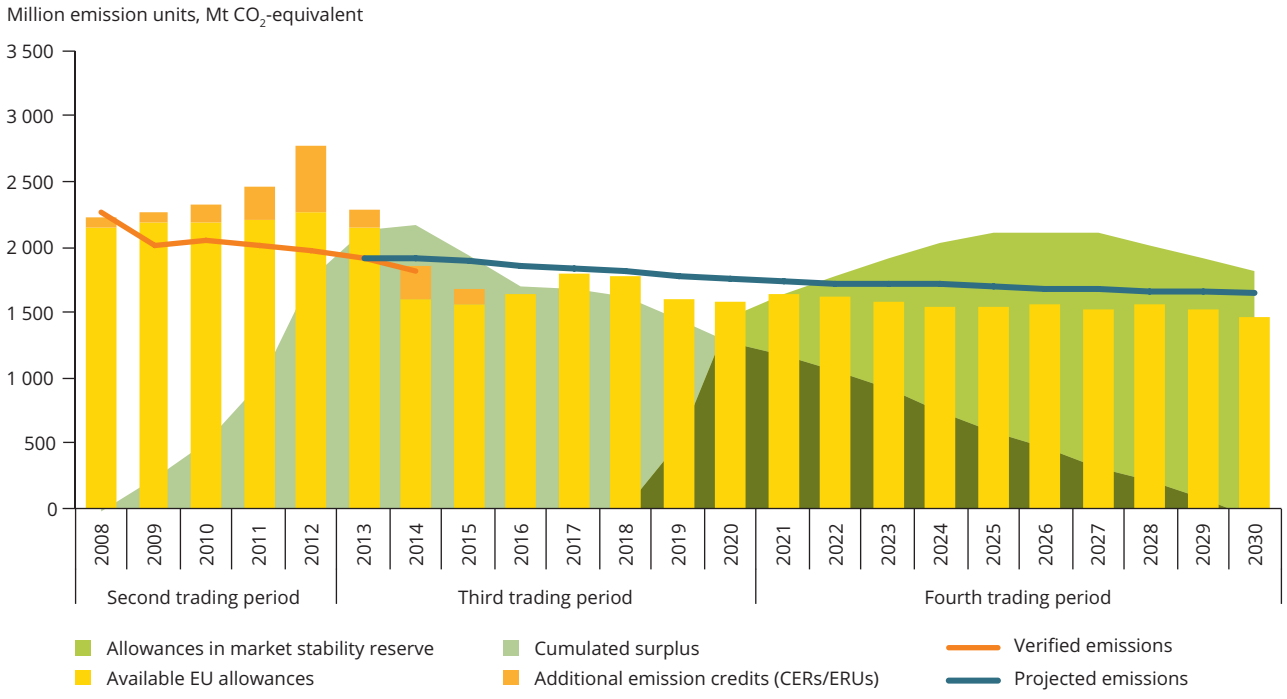
In July 2015, the European Commission presented a legislative proposal for the revision (EC, 2015a) of the EU ETS for the fourth trading period (i.e. 2021–2030). The proposed changes include an increase in the pace of emissions cuts (the overall number of allowances will decline at an annual rate of 2.2 % from 2021 onwards, compared with 1.74 % currently), the better targeted and more dynamic allocation of free allowances, and several support mechanisms to help the industry and power sectors meet the innovation and investment challenges of the transition to a low-carbon economy. Figure 1.2 presents an outlook on the number of allowances in the EU ETS up to 2030.

1.3 Reporting on the application of the EU ETS Directive in accordance with Article 21

There are two main requirements with regard to reporting on the application of the EU Emissions Trading Directive. The first, defined by Article 21(1) of the EU ETS Directive, stipulates that Member States must submit annual reports to the European Commission on how this Directive is being applied in their country. Some aspects of this issue were also recently addressed by the European Court of Auditors (ECA) for phase 2 of the EU ETS (ECA, 2015; see also Box 1.1).

The reports are based on the questionnaire that is set out in Commission Implementing Decision 2014/166/EU (EU, 2014a). The questionnaire pays particular attention to the coordination among competent authorities (CAs); the arrangements for the allocation of allowances; registries; the application of implementing measures on monitoring and reporting, verification and accreditation;

Figure 1.2 Outlook on the supply and demand of allowances up to 2030



Notes: Cumulated surplus is the build-up of unused allowances each year. CERs and ERUs are types of carbon credits that participants are allocated after emission reductions are achieved by investing in low-carbon technologies in developing countries. The projected emissions are reported by country. CER, certified emission reduction unit; ERU, emission reduction unit.

Source: EEA, 2015d.

Box 1.1 Implementation of the EU ETS

The requirement for Member States to report on the application of the EU ETS Directive is part of the effort to improve the implementation of the EU ETS. The issue of the implementation of the EU ETS was also considered by the ECA in Special Report No 6/2015 (ECA, 2015). The ECA's report focused on phase 2 (i.e. 2008–2012) and made recommendations which are relevant to the implementation of the ETS in phase 3 (i.e. 2013–2020). The EEA's reports on the application of the EU ETS Directive can inform, with regard to some aspects, on the progress made in phase 3 in relation to the findings and recommendations of the ECA.

Issues addressed by the ECA that are also analysed by this year's report include:

- the systems for the monitoring, reporting and verification (MRV) of emissions; these systems are addressed in Chapter 2 of EEA's 2016 report on the application of the EU ETS Directive;
- the checks made by competent authorities regarding the work carried out by verifiers; such checks are discussed in Sections 2.5, 3.4, and A4.4;
- the monitoring of Member States' implementation and annual implementation reporting; Member State and EEA reports on the application of the EU ETS Directive, as well as the European Commission's report on the functioning of the European carbon market (EC, 2015b), all constitute part of the monitoring framework;
- information on sanction systems and penalty procedures; Sections 2.5 and 3.5 include related information.

issues related to compliance with the EU ETS Directive; and the fiscal treatment of allowances.

In addition to the 28 EU Member States, this EEA report also covers submissions by three more EEA member countries (Iceland, Liechtenstein and Norway). These three countries are part of the European Economic Area and also participate in the EU ETS.

The second main requirement, defined by Article 21(2), is that the European Commission publishes a report on the application of the EU ETS on the basis of the completed questionnaires submitted by EU Member States. This document serves as input in this regard.

In November 2015, the European Commission published a report (EC, 2015b) on the functioning of the European carbon market in compliance with the reporting obligations under Article 10(5) and Article 21(2) of the EU ETS Directive.

1.4 The purpose and structure of this report

The purpose of this report is to summarise and analyse the responses of countries to the questionnaire on the implementation of the EU ETS in 2015. This national reporting allows the evaluation of implementation of the EU ETS, which has been identified by the European Council as the main EU instrument with which to achieve the EU GHG emissions reduction target (European Council, 2014). The evaluation has enabled consideration of the implementation of the administrative requirements of the EU ETS Directive, and, to a certain extent, the Monitoring and Reporting Regulation (MRR) (EU, 2012b). The national answers provided in response to this questionnaire can provide insight into how the EU ETS could be further improved or whether or not there are areas in which further guidance or support to Member States, for improved application of the EU ETS Directive, would be useful.

It is important to note that the information in this report is limited to the time at which countries submitted their reports (see Appendix 1 for details), and by the quality of the information provided by the reporting countries. Data for 2013 may differ from the data presented in the 2015 EEA technical report on the implementation of the EU ETS (EEA, 2015a), as some countries have submitted corrected data since then.

The chapters of this report cover the following:

- Chapter 2 covers the implementation of the EU ETS Directive in 2014;
- Chapter 3 covers aviation;
- Chapter 4 covers the data reported and their analyses;
- Chapter 5 provides conclusions and an outlook.

The appendices present additional information collected in the questionnaires and additional resources that may aid the interpretation of this report. Appendix 2 provides links to country submissions of Article 21 reports. Appendix 3 lists the questions in the Article 21 questionnaire that are covered in different chapters of this report. Tables of the other reported data and information can be found in Appendix 4.

Not all of the questions of the Article 21 questionnaire are covered in this report. However, the areas not included here may be assessed in future reports. A database of the data submitted by all 31 countries, covering 11 187 stationary installations and 596 aviation operators, is available on the EEA website ([17]) ([18]).

1.5 National responses in 2015

The deadline for national responses was 30 June 2015. Twenty-five countries submitted their responses by this time. This is an improvement on the 19 countries that reported by the legal deadline in the previous year.

A further four countries reported in July 2015. Germany submitted its responses in August 2015 and Italy submitted in September 2015. Given that, in 2015, all countries submitted reports under Article 21, this was an improvement on phase 2 of the EU ETS. This full reporting satisfies the ECA recommendation that Article 21 reporting should be improved (see Box 1.1).

The Article 21 reports submitted in 2015 are generally more complete than those submitted in 2014. Table 1.2 gives a completeness percentage per country based on the 66 mandatory high-level questions in the questionnaire. The full summary of national responses to the questions is shown in Table A1.2 in Appendix 1.

The average completeness of reporting for the 28 EU Member States, and the EEA-31, increased from 97 % to 98 % between 2014 and 2015. The range of completeness values across countries decreased in 2015: in 2014, 86 % was the lowest value, whereas in 2015, 94 % was the lowest value.

The completeness scores in Table 1.2 for 2014 reporting may be different from those presented in the 2015 technical report (EEA, 2015a) because of the inclusion of late submissions and more complete resubmissions.

Table 1.2 Completeness (%) of national responses in 2014 and 2015

Country	2014	2015
Austria	97	97
Belgium	100	98
Bulgaria	92	97
Croatia	100	100
Cyprus	98	98
Czech Republic	100	100
Denmark	100	98
Estonia	97	97
Finland	98	98
France	92	95
Germany	98	95
Greece	97	97
Hungary	100	100
Iceland	97	97
Ireland	100	100
Italy	100	97
Latvia	100	100
Liechtenstein	95	94
Lithuania	98	100
Luxembourg	94	97
Malta	95	95
Netherlands	100	98
Norway	97	100
Poland	89	98
Portugal	86	100
Romania	100	100
Slovakia	100	100
Slovenia	95	97
Spain	100	100
Sweden	98	98
United Kingdom	98	100
EU	97	98
EEA-31	97	98

Note: Green corresponds to a country answering all the high-level questions (100 %). Red would correspond to an empty report or non-submission (0 %), but this is not applicable in this report. Shades of yellow correspond to differing levels of completeness; the lighter the yellow, the more complete the report.

([17]) The permalink to this database is http://www.eea.europa.eu/data-and-maps/data/ds_resolveuid/12cbb5d08641493ca1a1c0a7b3227336.

([18]) It is important to note that the data in this database may differ slightly from the data presented in this report. This report reflects comments received in consultation with countries. Not all countries officially resubmitted their data on the European Environment Information and Observation Network (Eionet) Central Data Repository (CDR) in time for inclusion in the database on the EEA website.

2 Implementation of the EU ETS Directive in 2014

The EU ETS regulates two types of operators: installation operators and aircraft operators. These are the operators of the two emission sources in the EU ETS, namely stationary source units and aircraft that perform activities listed in Annex I of the EU ETS Directive. This chapter covers the implementation of the EU ETS Directive by stationary installations and installation operators. The implementation of the directive by aircraft operators is addressed in Chapter 3.

2.1 Coordination among competent authorities with regard to the implementation of the EU ETS

Box 2.1 Coordination — summary

Cooperation among competent authorities

To assist with the effective implementation of the EU ETS, the coordination of activities among the CAs of a number of countries could be improved. As in 2013, in 2014, 18 out of the 25 countries with multiple CAs reported at least one method of coordinating the work of the CAs, as required by Article 10 of the MRR (EU, 2012b).

Cooperation between competent authorities and national accreditation bodies

The number of countries that have reported cooperation between CAs and national accreditation bodies (NABs) is satisfactory. Only five countries have reported no methods of information exchange in addition to the ones required.

2.1.1 Cooperation among competent authorities

The success of EU ETS implementation is affected by how well CAs within a country's administrative system can coordinate their activities. For efficient EU ETS implementation, this coordination can be both formal and informal in arrangement.

Table A4.1 in Appendix 4 lists the CAs for all countries, and Tables A4.2 and A4.3, in the same appendix, show the roles of different CAs for installations and aircraft operators, respectively. This list could be used to support trans-national administrative cooperation.

Article 10 of the MRR (EU, 2012b) stipulates that countries with multiple CAs (described in Article 18 of the EU ETS Directive) should coordinate the work of the CAs involved in the EU ETS. Of the 25 countries with multiple CAs, 18 reported at least one measure for coordinating the administrative work of these CAs in 2014. The most popular coordination measure (reported by 11 countries) was to establish regular CA working groups. The coordination measures reported in 2014 remained largely the same as those reported for the 2013 period.

It should be noted that the data reported under Article 21 do not enable an assessment of the effectiveness of the coordination and cooperation measures. The EU ETS Compliance Forum, among other coordination mechanisms, provides the potential to further address this issue (see Box 2.2). However, the main focus of the Compliance Forum is to provide a platform for sharing information between, rather than within, countries.

Box 2.2 The EU ETS Compliance Forum, a platform for implementation of the EU ETS

The EU ETS Compliance Forum is a forum for sharing information, learning and experience, with the goal of supporting the effective implementation of the EU ETS.

The Compliance Forum was set up in 2009 as an initiative of the European Commission and several Member States. The forum consists of a steering committee which operates as the executive body responsible for Compliance Forum management. Its secretariat provides administrative support to the steering committee and its task forces. The Compliance Forum and the task forces facilitate learning from experiences of EU ETS implementation in Member States, and they facilitate the exchange of information on emerging developments related to the scheme.

There are specific task forces which comprise representatives from Member State CAs. Compliance Forum conferences are utilised to share experiences and facilitate dialogue amongst Member States.

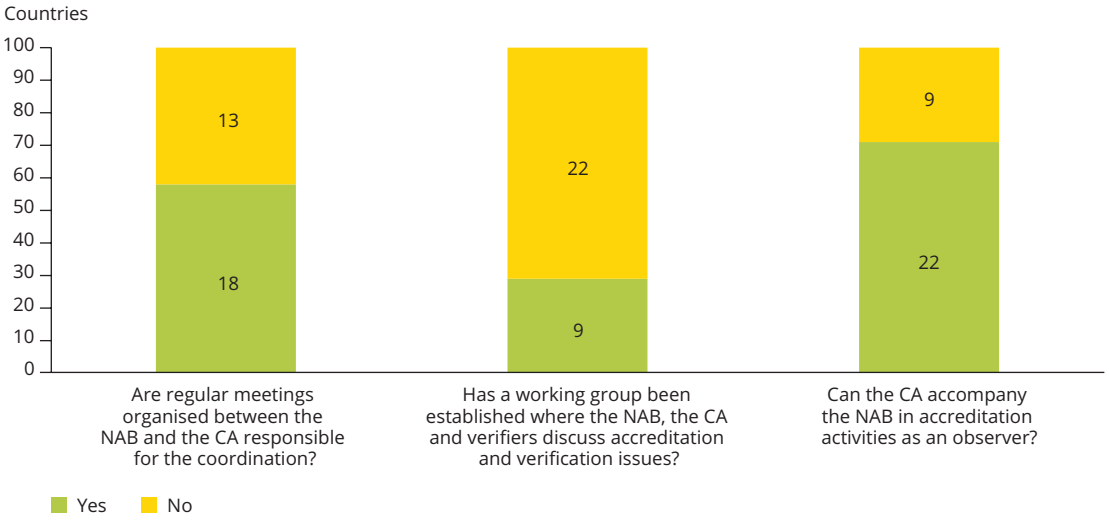
Source: Based on EC, 2014a.

2.1.2 Cooperation between competent authorities and national accreditation bodies

Formal information exchange between the CAs and national accreditation bodies (NABs) ([19]) is a requirement under Article 69 of the Accreditation and Verification Regulation (AVR) (EU, 2012a). These information exchanges relate to the quality and thoroughness of the verification process and should identify areas in which problems may be occurring.

The Article 21 questionnaire asks countries to report on additional types of data exchange. As in the previous reporting period, only Bulgaria, Cyprus, Italy, Luxembourg and Poland reported that no additional methods of information exchange occurred in 2014 ([20]). Liechtenstein reported there was no information exchange, as there were no accredited verifiers in Liechtenstein. The additional types of information exchange reported for 2014 have not changed significantly from 2013, and are summarised in Figure 2.1. In addition to the formal avenues, some countries reported the use of additional informal methods of information exchange, such as ad hoc meetings instead of regular meetings or established working groups.

Figure 2.1 Information exchange between the NABs and CAs in the EEA-31 in 2014



Note: All countries reported.

([19]) Or the national authority entrusted with the certification of verifiers.
([20]) Poland noted that a representative of the Institute of Environmental Protection (KOBiZE) is a member of the Technical Committee of the Specialist Committee for the Environment (KTS) at the Polish Centre for Accreditation.

2.2 Coverage of activities and installations

Box 2.3 Coverage — summary

The number of installations within the EU ETS, reported under Article 21 of the EU ETS Directive, decreased by 2 % between 2013 and 2014, from 11 384 to 11 187. There were decreases in the number of installations with medium, high and very high emissions, but a slight increase in the number of installations with low emissions. There has been little change in the number of permits issued by countries for each activity listed in Annex I of the EU ETS Directive. The number of GHG emissions permit updates, required for installations in the EU ETS, decreased by 39 % between 2013 and 2014 (from 4 434 to 2 695). Permit updates are required if changes to the functioning of the installation occur, and these would be expected to be less frequent after the first year (i.e. 2013) of phase 3, at which time installations were expected to meet new regulatory requirements.

Flexibilities that allow installations to be excluded from the EU ETS (under Article 27 of the EU ETS Directive) were not found to affect the environmental integrity of the EU ETS, and represented only 0.2 % of ETS emissions in 2014. In any case, these excluded installations are still required to achieve equivalent emission reductions.

2.2.1 Reported installations

Countries reported the number of installations in each category defined in Articles 19 and 47 of the MRR. These categories are described below.

- **Category A** installations have medium (≤ 50 000 t of CO_2 equivalents ([21])) or low annual emissions (< 25 000 t of CO_2-equivalent). Installations with low annual emissions are a subset of category A installations.
- **Category B** installations have high annual emissions (> 50 000 t and ≤ 500 000 t of CO_2-equivalent).
- **Category C** installations have very high annual emissions (> 500 000 t of CO_2-equivalent ([22])).

A total of 11 187 installations were reported, representing a 2 % decrease from 2013 installation numbers. The proportion of the different installation categories did not change significantly between 2013 and 2014. In 2014, 72 % of all installations were category A (compared with 71 % in 2013), 21 % were category B installations (as in 2013) and 7 % were category C installations (compared with 8 % in 2013). The subset of installations with low emissions was 51 % of the total in 2014. Figures 2.2 and 2.3 show the number of installations by category across countries, and the overall changes between the reporting years 2013 and 2014.

2.2.2 Permits

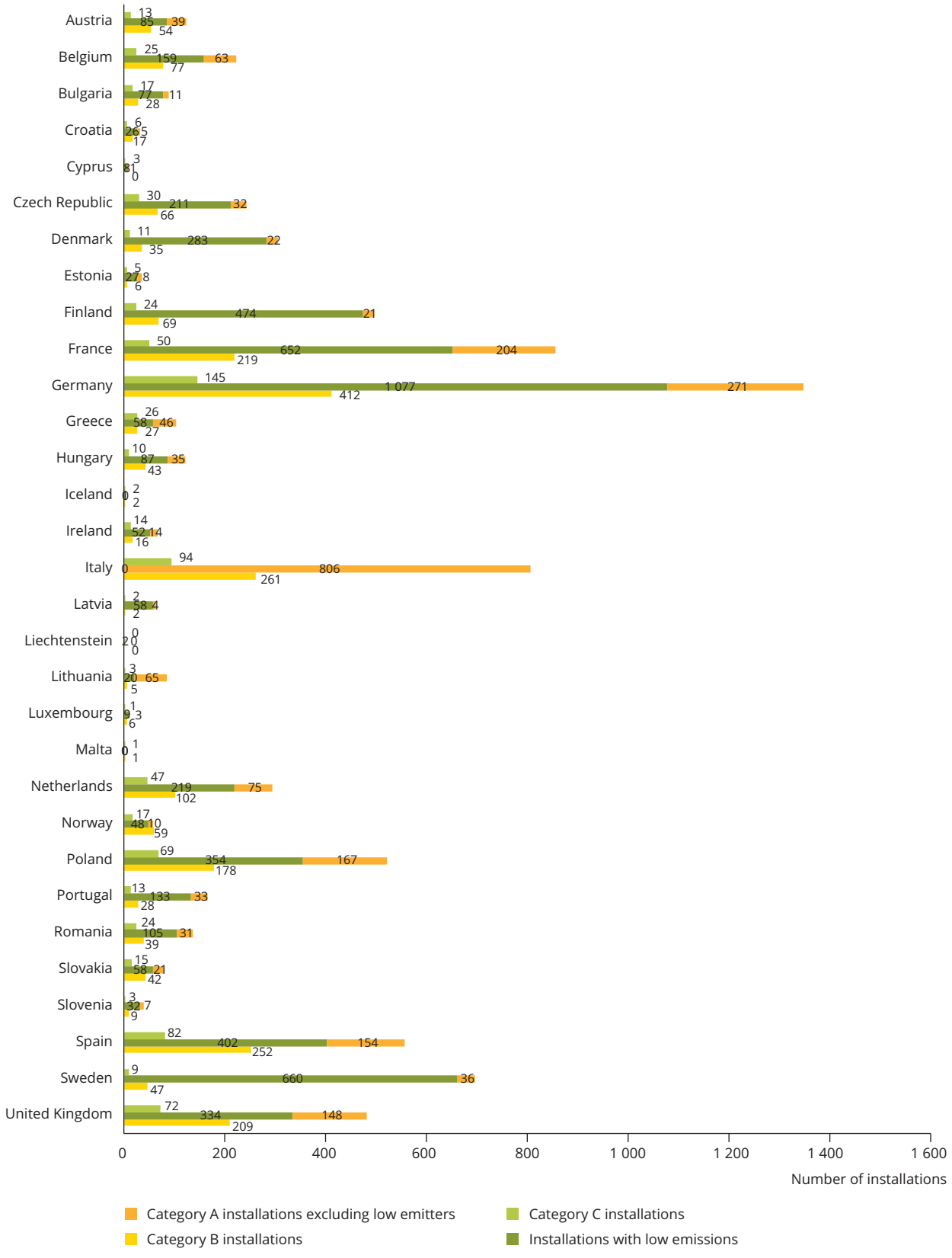
Installations that operate in the EU ETS are required to have a GHG emissions permit, issued by the CA in accordance with Articles 5 and 6 of the EU ETS Directive. These permits must be updated if changes to the functioning of the installation occur ([23]). In 2014, 2 695 permit updates were reported (France did not respond), out of a total 11 187 installations. This is a 39 % decrease from the 4 434 updates that were reported in 2013 (all countries responded). Permit updates are expected to be less frequent after the first year of phase 3 (i.e. 2013) as installations respond to new regulatory requirements. The data provided do not detail the type of changes that led to these permit updates, but it is reasonable to conclude that the administrative burden involved is decreasing.

However, two countries (Germany and Luxembourg) reported no permit updates in both 2013 and 2014. Germany commented that data on the number of permits are not recorded, because of technical restrictions. It should also be noted that Article 6(c) of the EU ETS Directive allows a monitoring plan to be updated without the need to update a permit.

Countries indicated the industrial sectors for which they have issued permits under the EU ETS Directive. These sectors are called Annex I activities, which refer to activities covered in Annex I of the EU ETS Directive. There has been little change in the pattern of issued permits in different sectors since the previous reporting period. The largest change was seen for 'production of pulp', with three fewer countries issuing permits in 2014 than in 2013. The overview of permits issued in the EU ETS in 2014 is presented in Figure 2.4.

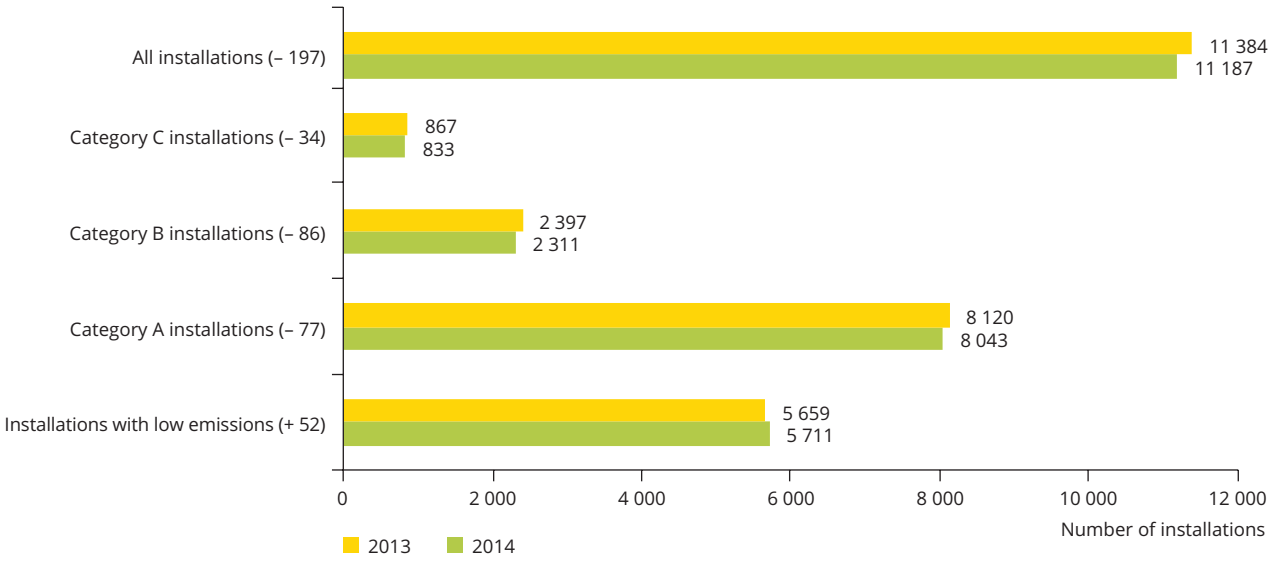
([21]) CO_2-equivalent is a measurement unit to indicate the global warming potential of GHGs. CO_2 is the reference gas against which other GHGs are measured.
([22]) This refers to the amount of CO_2 that would have the same level of radiative forcing (global warming potential) as a given mixture of GHGs.
([23]) National law in Member States dictates when a permit is required to be updated. As such, requirements can vary across countries.

Figure 2.2 Number of installations by type in 2014 in the EEA-31



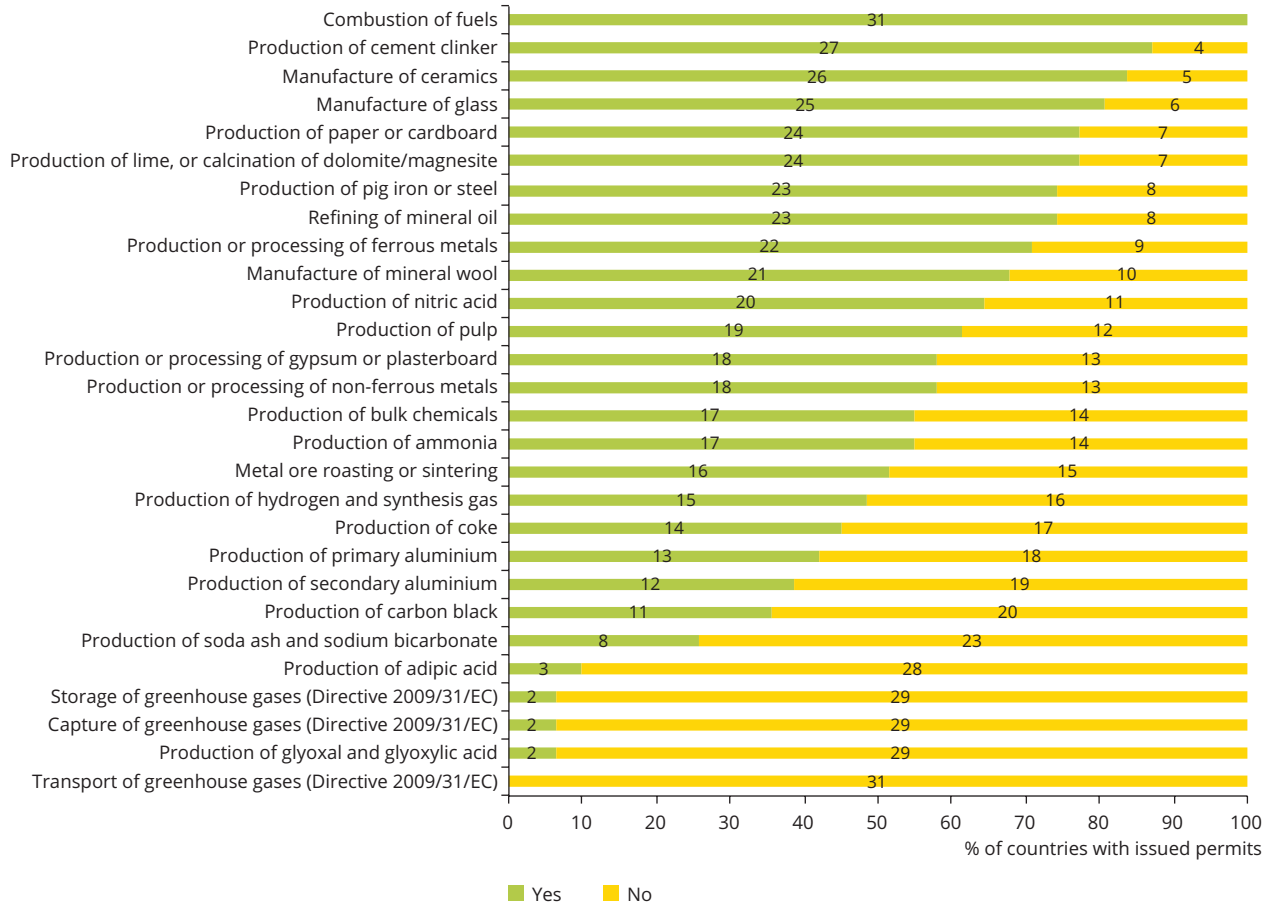
Note: All countries reported. No category A installations excluding low emitters were reported by Iceland, Liechtenstein and Malta. No category B installations were reported by Cyprus and Liechtenstein. No category C installations were reported by Liechtenstein. No installations with low emissions were reported by Italy and Malta

Figure 2.3 EU ETS installation numbers for 2013 and 2014 in the EEA-31



Note: All countries reported in both years. The change in installation numbers between 2013 and 2014 is shown in parenthesis after each category name.

Figure 2.4 Annex I activity permits issued in 2014 in the EEA-31



Note: All countries reported. The numbers on the green and yellow bars indicate the number of countries replying 'yes' or 'no', respectively.

2.2.3 Excluded installations

Article 27 of the EU ETS Directive (EU, 2003) allows countries to exclude installations from the EU ETS if they report emissions of less than 25 000 t CO_2-equivalent, have a rated thermal input ([24]) below 35 megawatts (MW) and carry out combustion activities. However, countries must confirm that sufficient monitoring of emissions is still in place for such excluded installations. This can be simplified for installations with annual emissions of less than 5 000 t CO_2-equivalent.

The option for exclusion under Article 27 was used by the same eight countries in 2014 as in the previous reporting period (i.e. Croatia, France, Germany, Iceland, Italy, Slovenia, Spain and the United Kingdom). The total proportion of excluded emissions was 0.2 % of total ETS emissions reported ([25]). The excluded emissions ranged from 10 kilotonnes (kt) of CO_2-equivalent for Germany to 1 996 kt of CO_2-equivalent for the United Kingdom. The total amount of excluded emissions reported by the eight countries in 2014 was 3 901 kt of CO_2-equivalent, a decrease from the 4 635 kt of CO_2-equivalent excluded in 2013. These exclusions were not found to affect the environmental integrity of the EU ETS, and represented only 0.2 % of ETS emissions in 2014. In addition, these excluded installations are still required to achieve equivalent reductions in emissions. This is considered an appropriate application of Article 27.

2.3 General implementation of the monitoring and reporting processes

Box 2.4 Monitoring and reporting — summary

Sampling plans, as required under Article 33 of the MRR, were not always completed in six of the ETS countries in 2014. This is a slight improvement from 2013, in which eight countries reported that sampling plans were not drawn up in all cases. However, two more countries (10 countries in total) reported other issues with sampling plans in 2014 than in 2013. This suggests that more improvements can still be made with regard to sampling plans.

Integration of permits

The integration of reporting requirements for the EU ETS, the European Pollutant Release and Transfer Registry (E-PRTR) and the GHG inventory is widespread. Integrating reporting requirements, if possible, is recommended in order to reduce the administrative burden on installation operators and regulatory bodies. Data quality checks can be improved by comparing the available EU ETS, E-PRTR and GHG inventory data sets. There is a good integration of EU ETS permits and Industrial Emissions Directive (IED) permits, with almost all countries reporting either formal integration or informal coordinated processes. These coordination processes can take various formats, but often involve regulators of the IED giving advice to the ETS CAs during the permitting procedures.

2.3.1 Additional national legislation or guidance

The MRR (EU, 2012b) establishes the monitoring methodologies and reporting requirements for the installations and aircraft operators covered by the EU ETS. Box 2.5 explains some of the monitoring aspects covered by the MRR. The MRR is binding. In some areas, the MRR provides room for Member States to complement the MRR with additional legislation. Additional national guidance may also be made available. Ten countries reported that neither additional national legislation nor guidance had been implemented. The additional national guidance and legislation remains largely unchanged from the previous reporting period.

([24]) Rated thermal input refers to the rate at which fuel can be burned at the maximum continuous rating (e.g. the maximum output a generator is capable of producing continuously, under normal conditions, for a year) of the appliance, multiplied by the gross calorific value of the fuel. Rated thermal input is expressed as megawatts thermal, and can usually be taken from the manufacturer's rated input for that appliance or design.

([25]) Total verified ETS emissions per country for 2014 have been obtained from the EEA ETS data viewer (EEA, 2015b).

Box 2.5 Monitoring under the EU ETS

Emissions monitoring under the EU ETS is regulated by the MRR. To monitor the emissions of an installation, the operator can choose to apply either a calculation-based methodology (via a standard or mass-balance methodology) or a measurement-based methodology. The latter consists of determining emissions from emission sources by continuously measuring the concentration of the relevant GHG in the flue gas and the flue-gas flow. This methodology has to be applied for emissions of N_2O from activities involving nitric acid and for the quantification of CO_2 transferred from one installation to another.

The use of a continuous emission monitoring system (CEMS) can be a particular advantage if source streams are complex, for example if emission sources are highly non-homogeneous. However, the CEMS approach can be less suitable and more costly, for example in the case of refineries with many stacks, fugitive emission sources, or if biomass is involved, in which case emissions might be zero-rated in the ETS context.

The MRR utilises up to four different tier levels (numbered from 1 to 4) to determine the level of accuracy by which installations need to determine their emissions. The higher the tier, the higher the exactness of the emission determination and the lower the uncertainty.

If **calculation-based methodologies** are applied, operators must apply minimum tiers to determine activity data (depending on source stream type) and calculation factors, such as emission factors, net calorific value, oxidation factors and biomass fractions. Tier 3 requires that calculation factors are determined by analysis, whereas lower tiers require country-specific or standard calculation factors, or factors derived from literature sources.

For category A installations or for source streams of commercial standard fuels, lower tiers may be applied.

For all other installations, in general, the highest tier has to be used. If it is technically not feasible to use the highest tier or it incurs unreasonable costs, category C installations may be allowed to apply a tier that is one level lower, and category B installations may be allowed to apply a tier that is up to two levels lower. Category A installations must apply at least tier 1 or higher if possible.

If a **measurement-based methodology** is chosen, the definition of the necessary tier depends on the quantity of emissions. If an emission source emits more than 5 000 tonnes CO_2-equivalent/year or contributes to more than 10 % of the total emissions of an installation, the highest tier must be applied. For all other emission sources, a tier that is one level lower may be applied.

Again, if the use of these tiers is technically not feasible or incurs unreasonable costs, a next lower tier may be allowed.

2.3.2 Sampling plans

Article 33 of the MRR stipulates that operators must prepare a sampling plan for each fuel or material, for which the calculation factor ([26]) is determined by analyses ([27]). The sampling plan should include information on responsibilities, locations, frequencies and quantities, and methodologies for the storage and transport of samples. Countries were asked to indicate cases in which, although required under Article 33, such a plan had not been drawn up, and to provide the reasons why and the circumstances in which this occurred.

Twenty-five countries indicated that sampling plans were always prepared and approved in 2014, a slight increase from 22 countries in the 2013 reporting period. In 2014, sampling plans were not always drawn up in France, Liechtenstein, Poland, Spain, Sweden and the United Kingdom.

([26]) 'Calculation factor' is an overarching term for parameters such as carbon content, conversion factor, biomass fraction, emission factor, net calorific value and oxidation factor.

([27]) Calculation factors have to be determined either as default values or determined by (chemical) laboratory analyses. Laboratory analyses provide more accurate data but are more demanding than using default values. If determined by analyses, the laboratory must preferably demonstrate accreditation according to EN ISO 17025 or equivalent and the operator must develop sampling plans to be approved by the CA to ensure that the way in which samples are collected for analysis achieves representative results.

Countries were also requested to indicate any problems and issues identified in relation to sampling plans, or general problems encountered during the approval process of sampling plans. Ten countries reported at least one type of issue, an increase from eight countries reporting such issues in the previous reporting period. This may be because of improved reporting rather than an actual increase in issues. The following problems with sampling plans were encountered:

- sampling plans were brief, incomplete or missing (in France, Germany, Hungary, the Netherlands, Norway, Sweden and the United Kingdom);
- the necessary frequencies of analyses were not met (in Austria and Croatia);
- the dates of samples to be analysed had not been specified (in Spain).

In these instances of incomplete or unapproved sampling plans, the requirements of the MRR were not met. Sweden commented that the situation seemed to have improved since the last reporting period because operators have gained more experience with the MRR.

Germany and the United Kingdom reported that they had taken action on the non-compliance of some sampling plans by communicating directly with the operator, and ensuring that the verifier raise a non-compliance in the verification opinion statement (VOS). This is an example of good practice with regard to resolving monitoring and reporting issues.

2.3.3 Integration of reporting requirements

To ensure a coordinated approach, Article 8 of the EU ETS Directive requires coordination of the procedures for EU ETS permits and Industrial Emissions Directive (IED) (EU, 2010) permits if installations are subject to both pieces of legislation. This can also reduce the administrative burden on installation operators with regard to obtaining and managing permits if both directives apply. Nine countries reported the formal integration of the IED and EU ETS permits; this was the same number as in the 2013 reporting period.

Of the 22 countries that did not have any formal integration of these procedures, all reported at least one method of coordination between the EU ETS and IED permits. The most common method of coordination reported (by 19 countries) was that the legislation that transposes the IED does not include emission or concentration limits for CO_2. This is a mandatory requirement under EU ETS legislation.

The question of integration is of interest because the majority of EU ETS installations are too small to be covered by the IED (although national legislation may go beyond in some instances, such as Germany's Federal Emission Control Act). This is mainly because the threshold for a combustion activity in the context of the IED is 50 megawatts thermal (MWth) ([28]) (i.e. large combustion plants), whereas it is only 20 MWth for the EU ETS. The integration of some of the requirements of these directives can, therefore, provide comprehensive coverage of small and large stationary installations in the EU.

The integration of reporting requirements was widespread among countries, although the degree of integration varied. Only Liechtenstein reported no measures to integrate the EU ETS requirements with other existing reporting mechanisms, such as GHG inventory reporting and the European Pollutant Release and Transfer Register (E-PRTR) ([29]). All other countries reported that EU ETS data were used in at least one approach to support GHG reporting or E-PRTR reporting, and these uses remain largely unchanged from the 2013 reporting period.

Integrating reporting requirements, if possible, is recommended in order to reduce the administrative burden on installation operators and regulatory bodies (see also the example presented in Box 2.6). Data quality checks can be improved by comparing the data sets available for the EU ETS, E-PRTR and GHG inventories.

([28]) A 'megawatt thermal' (MWth) is a unit of thermal energy used by the power industry.
([29]) A Europe-wide register containing environmental data from industrial facilities in EU Member States and Iceland, Liechtenstein, Norway, Serbia and Switzerland.

Box 2.6 Portugal's Single Environment Permit

Economic activities can have an environmental impact on, for example, water, air and ecosystems. Environmental regulation aims to address such impacts by, inter alia, issuing permits for economic activities. A large number of permits are issued on a daily basis for activities that must conform to several legal requirements. In Portugal, this led to a complex environmental permitting system.

Therefore, the Portuguese Environment Agency carried out an analysis of environmental laws, permits and their implementation in order to simplify environmental legislation while maintaining high standards. This analysis showed the need to address the following issues, which are relevant to environmental permits:

- the harmonisation of concepts and definitions;
- the improvement of information quality;
- the streamlining of permitting procedures;
- the improvement of the integration between the approval of permits for environmental and economic activities.

This work led to the approval, in 2015, of the first ever Portuguese Single Environment Permit (SEP) (Ministério do Ambiente, 2015). The SEP covers all the main permits, including those relating to environmental impact assessments, the prevention of serious accidents ([a]), the EU ETS, waste management and certain water resources.

The SEP aims to improve the efficiency and effectiveness of environmental procedures. It allows the simultaneous coordination of several procedures, based on a single application. It also permits information to be managed, therefore allowing a transparent and uniform process that avoids the duplication of work.

The SEP was developed on the existing environmental permitting information technology (IT) platform SILiAmb. The platform includes a solution for the management of procedures using a dynamic simulator and form. Through the simulator, the operator can find out which environmental permits have already been applied, the correct licensing entity, the deadline for obtaining the license and the fee. The dynamic forms contain all the information needed by the permitting authority to issue the permit.

At the end of the process, a single permit is issued. This single permit contains all the decisions (under specific environmental legislation) and conditions that need to be fulfilled by the installation before its exploitation.

The SEP represents a paradigm shift in the application of environmental policy in Portugal. Portugal is currently at an early stage of the implementation of the SEP. Other challenges remain, such as the coordination within and between authorities. Ultimately, the SEP aims to improve the decision-making process, support civil servants in carrying out their tasks and, crucially, make life easier for citizens, while ensuring high levels of environmental protection.

Note: ([a]) A catastrophic accident in the Italian town of Seveso in 1976 led to the development of EU legislation on the prevention and control of industrial accidents.

2.4 The application of simplifications allowed within the monitoring and reporting rules

Box 2.7 Simplification — summary

Under particular circumstances, the MRR allows simplifications or variations of default methods within general monitoring and reporting rules. In general, there have been only small changes in the application of these simplifications between the 2013 and 2014 reporting periods:

- fewer countries reported the simplification of monitoring plans for installations with low emissions in 2014 (six countries) than in 2013 (eight countries);
- the proportion of medium (category B) installations using the highest tier methodologies remained at 72 %, whereas the proportion of large (category C) installations using the highest tier methodologies increased from 84 % to 86 %, between 2013 and 2014;
- emissions estimated using the fall-back approach (a methodology not based on the tiered system) increased by 6 %, but these emissions still only represented a small proportion of overall ETS emissions (0.3 %);
- more countries reported using default or literature values instead of sampled data in 2014 (25 countries) than in 2013 (22 countries).

Out of 28 countries that provided data, 12 reported that at least one installation operator did not submit plans to the CA, when required, with regard to how to improve their methodologies. This reflects non-compliance with Article 69 of the MRR.

Under particular circumstances, the MRR allows simplifications or variations of default methods within general monitoring and reporting rules. Examples of such simplifications or variations are:

- the simplification of monitoring plans (see Section 2.4.1);
- the use of lower than the highest tier ([30]) methods for some activities by large emitters (see Section 2.4.2);
- the option to use fall-back approaches ([31]) instead of the tiers provided in the MRR (see Section 2.4.3);
- the use of literature values/type 1 default values ([32]) instead of sampled data (see Section 2.4.4).

These provisions are foreseen in order to avoid high burdens under specific circumstances, including in the case of relatively small emitters of GHGs. It is important to monitor whether or not such flexibilities are, in practice, applied for only exceptional cases and do not replace general rules.

2.4.1 Simplified monitoring requirements and simplified compliance for installations with low emissions

Six countries (Belgium, Croatia, France, the Netherlands, Spain, and the United Kingdom) reported that they had used one or more additional ways to simplify compliance for installations with low emissions ([33]), among which were customised guidance (four countries ([34])), simplified templates (three countries ([35])) and workshops (two countries ([36])). Additional measures were implemented in Belgium and the United Kingdom. This has not changed since the previous reporting period.

Article 13 of the MRR makes provisions for countries in order to allow installations to use simplified monitoring plans, after performing a simplified risk assessment, but there has been little use of this. Six countries (Belgium (specifically the Flemish Region), Croatia, France, Hungary, Liechtenstein and Lithuania) reported the use of simplified monitoring plans, as allowed by Article 13 of the MRR (see also Box 2.8). This is a decrease from the eight countries that reported the use of simplified monitoring plans in 2013.

([30]) 'Tiers' are sets of requirements for determining calculation factors, activity data and emissions. Higher tiers have more stringent requirements and produce more accurate data.
([31]) Operators can apply the 'fall-back approach' for estimating emissions for selected source streams or emission sources if applying at least a tier 1 approach is technically not feasible or would incur unreasonable costs, provided certain conditions regarding uncertainties are met. See EU, 2012b (for specific details refer to Article 22).
([32]) Type 1 default values concern either the standard values listed in Annex VI of the MRR or other constant values, in accordance with Article 31(1) (d) and (e) of the MRR; that is, values that are guaranteed by the supplier with regard to carbon content and a 95 % confidence interval of less than or equal to 1 %, or on the basis of analyses carried out in the past but which are still valid.
([33]) As referred to in Article 47(2) of the MRR.
([34]) Belgium, the Netherlands, Spain and the United Kingdom.
([35]) Belgium, Croatia and the United Kingdom.
([36]) France and the United Kingdom.

Box 2.8 Standardised and simplified monitoring plans (MRR Article 13)

Article 13 of the MRR stipulates that countries may allow installation operators and aircraft operators to use standardised or simplified monitoring plans. Countries may publish templates for these monitoring plans, but the CA must first carry out a simplified risk assessment. The risk assessment then determines whether or not the proposed control activities and procedures are agreeable with identified inherent risks in order to justify the use of the simplified monitoring plan.

2.4.2 Top-tier compliance

Articles 26 and 41 of the MRR stipulate that operators should apply the highest tier monitoring methodology, as stated in Annex VIII of the MRR. If the operator can prove it would be technically unfeasible or would incur unreasonable costs, it may apply methodology that is one tier lower for large installations (category C) or two tiers lower for small and medium installations (categories A and B). The number of medium and large installations (categories B and C) using the highest tier methodologies decreased by 3 % and 14 %, respectively, between 2013 and 2014. However, as the number of installations decreased overall, there was actually an improvement in the methodologies used for large source streams.

The number of category B installations that did not apply the highest tier methodology decreased from 673 to 650 between 2013 and 2014. As the total number of category B installations also decreased, the proportion of total category B installations that applied the highest tier methodology remained at 72 % in 2014. The number of category C installations that did not apply the highest tier methodology decreased from 138 to 118 in 2014. However, the number of total category C installations also decreased, and so this equates to an increase in the proportion (from 84 % to 86 %) of total category C installations that applied the highest tier methodology in 2014, compared with 2013.

2.4.3 The fall-back approach

Article 22 of the MRR allows installation operators to use a monitoring methodology that is not based on tiers, known as the fall-back approach, under certain circumstances. In 2014, 13 countries (the same number as in 2013) reported using the fall-back approach for the estimation of emissions from selected source streams or emission sources. Between 2013 and 2014, the number of installations in the EU ETS using the fall-back approach decreased by 6 %, from 33 to 31, whereas the emissions estimated with this approach increased by 6 %, from 5 208 to 5 518 kt CO_2-equivalent. The highest proportion of a country's total EU ETS emissions estimated using fall-back methodology was 4 %, in Finland.

Across all countries participating in the EU ETS, the reported application of the fall-back approach is still an appropriate use of the MRR flexibility. In 2014, the proportion of EU ETS installation emissions estimated using a fall-back approach was low (0.3 %) relative to total ETS emissions.

2.4.4 Default and literature values

Article 31 of the MRR states that installation operators can use type 1 default values or literature values for calculation factors instead of sampled data. Twenty-five countries reported using literature or default values, an increase from 22 in the 2013 reporting period. It is likely that this increase is because of improved reporting rather than because of the wider use of literature and default values. Bulgaria, Estonia, Greece, Liechtenstein, Malta and Slovenia did not report the use of any default or literature values for calculation factors. However, this is considered unlikely in practice, and may reflect inaccurate reporting.

Twenty-two countries reported using type 1 default values, as referred to in Article 31(1)(a) of the MRR ([37]). France reported the highest use of these type 1 default (in 910 cases). Of the 22 countries using type 1 default values, 14 reported fewer than 50 occurrences of their use. Under the provisions of Article 31(1)(c), (d) and (e) of the MRR ([38]), Germany reported the most instances of using literature values and default values (4 492 instances). In contrast, 14 of the 25 countries reported fewer than 50 occurrences.

([37]) These refer to the standard emission factors and stoichiometric factors listed in Annex VI of the MRR.
([38]) These refer to literature values agreed with the CA, values guaranteed by the supplier of a material and values based on past analyses if it can be demonstrated that those values are representative of future batches of the same material.

Countries that reported relatively high usage of Article 31(1)(c),(d) and (e) tended to report relatively low usage of Article 31(1)(a), and vice versa. This suggests that countries may favour one approach over the other; that is, countries prefer to use either standard values from the MRR Annex VI or values agreed with the CA.

Considering the vast number of different fuels and calculation factors, the application of type 1 default values and literature values is, in general, considered appropriate. The high usage of literature values could lead to inaccurate calculation factors, as there is no actual sampling of individual facilities in these instances. However, for minor and *de minimis* source streams, this is acceptable because of the otherwise disproportionate financial costs.

2.4.5 The submission of monitoring methodology improvement reports

Article 69 of the MRR stipulates that operators must regularly ([39]) check whether or not their monitoring methodology could be improved and submit reports describing how they plan to implement any recommended improvements to the CA. Twenty-eight countries reported on the number of installations that were required to submit, and that actually submitted, improvement reports, a significant improvement in reporting given that only six countries reported on this in 2013. However, this may be because of the timing of reports rather than an actual improvement (the first phase-3 improvement reports were not required until June 2014). Sweden reported on the number of improvement reports submitted, but not on the number required. Latvia, Liechtenstein and Lithuania reported no data.

Fifteen countries reported that all reports required were actually submitted. For the 12 countries for which some improvement reports were not submitted, eight reported that over half of the improvement reports were submitted. No reports were submitted as required in Luxembourg. Italy, Spain and the United Kingdom reported the highest number of required methodology improvement reports (505, 549 and 504 reports, respectively).

2.5 Arrangements for verification, compliance and penalties

Box 2.9 Verification, compliance and penalties — summary

On the basis of the data reported by countries under the Article 21 questionnaire, the framework for the verification system seems to be in place. However, it is not possible to conclude on how well the verification system is functioning in practice. The number of accredited verifiers appears to be sufficient and there is widespread use of verifiers from other countries. This helps to provide sufficient verifier capacity. The number of complaints about verifiers increased between 2013 and 2014, but almost all were resolved. The number of outstanding issues raised in verification reports decreased by 37 % between 2013 and 2014. Checks of verification reports by CAs are generally widespread and recommended. A very small number of verification reports were rejected.

In the future, more data, collected over several years, will allow analysis of whether or not penalties, aimed at ensuring installation operator compliance, are 'effective, proportionate, and dissuasive' (Article 16(1) of the ETS Directive). Nine countries imposed fines on operators, and seven countries imposed excess emission penalties. The largest fine was imposed by Italy (of nearly EUR 20 million) for the failure to notify the relevant CA of planned or effective changes to the capacity, activity levels or operation of an installation in due time.

The AVR (EU, 2012a) sets out the process by which operators' annual emissions reports should be verified every year (see Appendix 4 of this report for further information). The verifiers performing this task must be suitably accredited. Twenty-six countries have at least one accredited verifier, whilst five (Cyprus, Iceland, Lithuania, Luxembourg and Malta) do not have any.

The number of accredited verifiers appears to be sufficient, and there is widespread use of verifiers from other countries (in 25 countries; no responses from France or Greece). This indicates that the requirement for the mutual recognition of verifiers is, in all likelihood, being implemented correctly and this is helping to provide sufficient verifier capacity.

([39]) By 30 June, every year for category C installations, every 2 years for category B installations and every 4 years for category A installations. CAs may set an alternative date for submission of the report.

The number of complaints against verifiers increased between 2013 and 2014. This can largely be explained by the 130 complaints about verifiers accredited in the United Kingdom in 2014, whereas, in 2013, the United Kingdom did not have data available. However, all complaints were resolved, except one in Denmark and one in the Netherlands. The number of verifier non-conformities remained stable between 2013 and 2014, with a slightly higher proportion of non-conformities resolved in 2014 (34 % were resolved in 2014 and 31 % were resolved in 2013).

2.5.1 Site visits waived

Verifiers must conduct a site visit during the verification process to assess whether or not the operator's emission report contains material misstatements. Under Article 31 of the AVR, operators can ask for CAs to waive a verifier's site visit under certain circumstances ([40]). Five countries reported waiving site visits for some installations with emissions of more than 25 000 t CO_2-equivalent, an increase from three countries in the previous year, but the numbers waived in each country decreased. Fourteen countries waived site visits for installations with low emissions ([41]), an increase from eight countries in the previous year. Sweden waived the highest number of visits (234 visits, i.e. 35 % of their installations with low emissions) and Denmark waived the highest proportion of visits (44 % of their installations with low emissions).

2.5.2 Verification reports

Verifiers must report any identified and outstanding non-material misstatements, non-conformities, non-compliance issues and recommendations for improvement in the verification report (Article 27 of the AVR). Only outstanding and unresolved issues are reported. Between 2013 and 2014, there was a 37 % decrease in the number of installations with issues identified in their verification reports, but a 17 % increase in the number of different issues. This implies a greater variety of issues across reports in 2014 (see Table A4.9 in Appendix 4 for more information).

In 2014, 25 verification reports, across six countries, were rejected for non-compliance, a 39 % increase from 2013. However, this is still a low number relative to the total number of verification reports. This could reflect good compliance with the AVR or a limited appreciation of verification requirements by CAs. Without further data to corroborate conclusions, the reality is likely to be somewhere in between, with issues in some sectors and some countries, but, in general, satisfactory compliance.

2.5.3 Compliance and penalties in the EU ETS

Adequate compliance and enforcement systems in countries are required for full implementation of the EU ETS Directive. Article 16 of the EU ETS Directive covers penalties for failing to comply with the requirements under the EU ETS Directive. Article 16(1) stipulates that penalties set by countries for infringements of national provisions related to the EU ETS Directive should be 'effective, proportionate and dissuasive'.

Penalties are an important aspect of EU ETS Directive implementation. Most countries reported maximum fines for non-compliance (the largest possible maximum fine was reported by Ireland at EUR 15 million), and slightly fewer countries reported minimum fines (the largest possible minimum fine was reported by Slovenia at EUR 75 000). The fees and penalties have remained largely unchanged from the previous reporting period.

In 2014, nine countries imposed fines on installation operators during the reporting period. Italy imposed the largest fine (of EUR 19.76 million) for failure to notify planned or effective changes to the capacity, activity levels or operation of an installation in due time. The most common reason for imposing fines was the failure to submit a verified emissions report in due time. No prison sentences have been imposed on an installation operator by any country.

Seven countries imposed excess emission penalties (EUR 100 per tonne CO_2-equivalent indexed) on installation operators (a maximum of three per country) for failing to surrender sufficient allowances. This is a similar number to the previous reporting period.

([40]) To waive a site visit, the verifier's risk analysis must allow a waiver, and one of four conditions must be fulfilled. Of the five countries that reported waived site visits, they had all been approved under two of these conditions — conditions I and IV. Condition I covers Category A and B installations which have a single source stream using natural gas or a *de minimis* source stream, and for which monitoring is based on fiscal metering by the gas supplier and a default emission factor is used. Condition IV covers remote or inaccessible sites that transmit data directly to a centralised location.

([41]) As referred to in Article 47(2) of the MRR.

2.6 Changes in allocations

Box 2.10 Changes in allocations — summary

In the 2014 reporting period, the size (in emission allowances and tonnes of CO_2-equivalent) of the EU ETS decreased by approximately 112 million emission allowances allocated compared with the 2013 reporting period. There is the potential for improved data exchange between operators and CAs with regard to planned changes in capacity, although the situation appears to have improved.

Balancing the supply and demand of the emission allowances covered by the ETS cap is necessary for the proper functioning of the EU ETS (see Section 1.2 for more details). The data collected from Article 21 questionnaire responses may provide further information on changes to the allocations and emission allowances.

All countries, except Iceland and Liechtenstein, reported changes to allocations and emission allowances in the 2014 reporting period, compared with the 2013 reporting period. Several countries noted that they did not have complete data for all categories of changes, but reported the data that were available. Table 2.1 summarises the changes in EU ETS allocations and the corresponding emission allowances for the 2014 reporting period, compared with the 2013 reporting period.

The reported data, representing the 2014 trading period, show that there were 1 432 changes to installations, corresponding to a net decrease of 112 100 732 emission allowances, in the EU ETS, compared with 2013. This corresponds to a decrease of approximately 112 megatonnes (Mt) CO_2-equivalent in the EU ETS between 2013 and 2014.

Some countries provided details of how they had reported the data. It is evident that there are some inconsistencies among countries. Some countries reported the number of changes and corresponding emission allowances for periods other than the reporting period, because of discrepancies between the actual time of a change and the agreed/recorded time of a change, and difficulties in obtaining the data. Some countries reported the deviation from planned national allocations. The inconsistencies in reporting across countries limit the validity of deeper analysis. Regardless, partial cessation ([42]) accounts for the largest number of changes to installations and the largest change in the quantity of emission allowances, as for the 2013 reporting period.

Ten countries reported that there were some planned or effective changes to the capacity, activity levels or operation of an installation that the CA had not been notified about. This is a decrease from 15 countries in the 2013 reporting period. Assuming that all non-notifications were discovered, this may reflect a slight improvement in this situation. The most common way of identifying these cases was through the detection of changes by verifiers in the installations' annual emissions reports.

([42]) Under Article 23 of the Commission Decision on rules for harmonised free allocation of emission allowances (EU, 2011). 'Partial cessation' refers to installations that have a sub-installation (which contributes at least 30 % of free emission allowances or more than 50 000 allowances) that reduces its activity level in a calendar year by at least 50 %.

Table 2.1 Changes in installation allocations and emission allowances in the EU ETS for the 2014 reporting period, compared with the 2013 reporting period

Reason for the change in the allocation	Number of changes in the reporting period	Changes as a percentage of the total number of ETS installations	Quantity of emission allowances corresponding to all changes in the reporting period (thousands)	Changes as a percentage of the total 2014 verified ETS emissions (%)
Significant capacity extensions	+ 132	1 %	+ 82 287	5 %
Significant capacity reductions	– 67	1 %	– 7 275	< 1 %
Cessation as referred to in Article 22(1)(a)– (d) of Decision 2011/278/EU	– 215	2 %	– 9 224	1 %
Cessation as referred to in Article 22(1)(e) of Decision 2011/278/EU	– 83	1 %	– 8 199	< 1 %
Allocation to new installations/ sub-installations	+ 69	1 %	+ 3 473	< 1 %
Partial cessation	– 866	8 %	– 173 162	10 %
Sum of extensions	+ 201	2 %	+ 85 760	5 %
Sum of reductions	– 1 231	11 %	– 197 861	11 %
Net change	– 1 030	– 9 %	– 112 101	– 6 %

Note: The Czech Republic could not report all allowance data. Finland did not have data available for significant capacity reductions and partial cessations.

3 Aviation

3.1 Aviation in the EU ETS

Box 3.1 Aviation — summary

In 2014, there were 596 aircraft operators in the EU ETS. The total verified emissions from aviation in the EU ETS amounted to 54.9 Mt CO_2 in 2014, 20 % of which was from domestic aviation (i.e. flights within one country). Approximately one-third of the total EEA-31 aviation emissions reported to the UNFCCC in 2014 were covered under the scope of the EU ETS. The use of a conservative method for estimating aviation emissions was negligible in 2014, with only 0.01 % of total ETS aviation emissions estimated using the method described in Article 70 of the MRR.

Because of changes in the scope of the EU ETS Directive (i.e. the inclusion of aviation), the surrender of emission allowances and reporting for aircraft operators in 2013 was not required until 2015. This led to a combined compliance cycle for the years 2013 and 2014, which made reporting under the Article 21 questionnaire of the EU ETS Directive ambiguous for some questions.

Three countries imposed fines for infringements. A total of 63 aircraft operators in four countries received excess emission penalties 'during the reporting period'.

In almost all countries, CAs checked verified emission reports for completeness and consistency. In most countries, at least one measure to ensure that aircraft operators complied with the MRR, AVR and approved monitoring plans was reported.

More than half of all aircraft operators reported are small emitters, and most of them used the Small Emitters Tool (SET) from Eurocontrol for the simplified calculation of flight fuel consumption. Nevertheless, there were 71 small emitters that used non-simplified methods to determine fuel consumption. With only six countries reporting simplified compliance, more could be done to simplify compliance and reporting for small emitters.

Aviation has been included in the EU ETS since 2012, and monitored since 2010, based on an amendment of the EU ETS Directive adopted in 2008 (EU, 2008). The scope of aviation in the EU ETS covers EU and non-EU aircraft operators that operate to or from an airport in an EU ETS country. Several categories of flights are excluded, as described in Annex I of the EU ETS Directive, such as training, military and circular flights. All aircraft operators covered by the EU ETS must surrender emission allowances equal to their emissions.

To give time for negotiations on a global market-based measure on aviation in the context of the International Civil Aviation Organisation (ICAO), the scope of aviation included in the EU ETS was reduced to flights within Europe. As an initial reaction, the ETS requirements were suspended for flights to and from non-European airports in 2012 because of the 'stop the clock decision' (EU, 2013a).

In 2012, aircraft operators were allowed to choose the geographical scope for their compliance, complying either with the full scope of the EU ETS or for only flights within Europe. For the third trading period, the geographical scope has been harmonised based on an EU regulation adopted in 2014 (EU, 2014b). The inclusion of flights to and from countries outside the European Economic Area has been postponed until after 31 December 2016. An additional temporary exemption has also been adopted for non-commercial aircraft operators that emit less than 1 000 t CO_2 per year based on the full geographical scope of the EU ETS. Because of the changes in the scope of the EU ETS Directive with regard to the inclusion of aviation, the surrender of emission allowances and reporting for 2013 was not required until 2015 from aircraft operators.

To reduce administrative costs, each operator is administered by the Member State that issued their operating licence. Alternatively, the operator is

administered by the Member State with the greatest estimated attributed aviation emissions from that operator in the base year. Therefore, the allocation of aviation emissions to a single country does not reflect the amount of emissions emitted as a result of flights in this country. As such, there is no direct relationship between EU ETS aviation emissions and those reported in individual national GHG inventories. The only valid comparison is one of aggregated aviation emissions from EEA-31 GHG inventories, both for domestic and international aviation emissions.

The aviation sector has an allowance cap that is separate from the allowance cap for stationary installations. The cap on total EU aviation allowances (EUAA) for phase 3 has been set to 95 % of 'historical' emissions, which have been defined as the annual average of aviation emissions in the European Economic Area between 2004 and 2006. Unlike stationary installations, aircraft operators will continue to receive the large majority (82 %) of their emission allowances for free throughout phase 3, 15 % will be auctioned and 3 % will be held in a special reserve for later distribution to fast-growing aircraft operators and new entrants in the market. The free allocation is calculated by multiplying benchmark values established in 2011 (EEA JC, 2011) by aircraft operators' verified tonne-kilometre ([43]) data for 2010 (reduced in proportion to the reduction of the aviation scope between 2013 and 2016). Throughout phase 3, an airline will receive 0.6422 allowances per 1 000 tonne-kilometres flown.

Because of the different allocation rules and the separate cap for aviation emissions, EUAAs cannot be used for compliance of stationary installations, whereas aircraft operators can use EU allowances (EUAs) for their compliance.

3.2 Coverage of aircraft operators

Information on aviation, reported under Article 21 (1) of the EU ETS Directive, has been analysed for the first time in this report. For 2014, 596 aircraft operators have been reported ([44]). The United Kingdom administered the most operators (161 operators). Only Liechtenstein administers no aircraft operators. There were almost equal proportions of commercial (52 %) and non-commercial (48 %) aircraft operators. More than half of all reported operators (56 %) were small emitters ([45]) (see Figure 3.1).

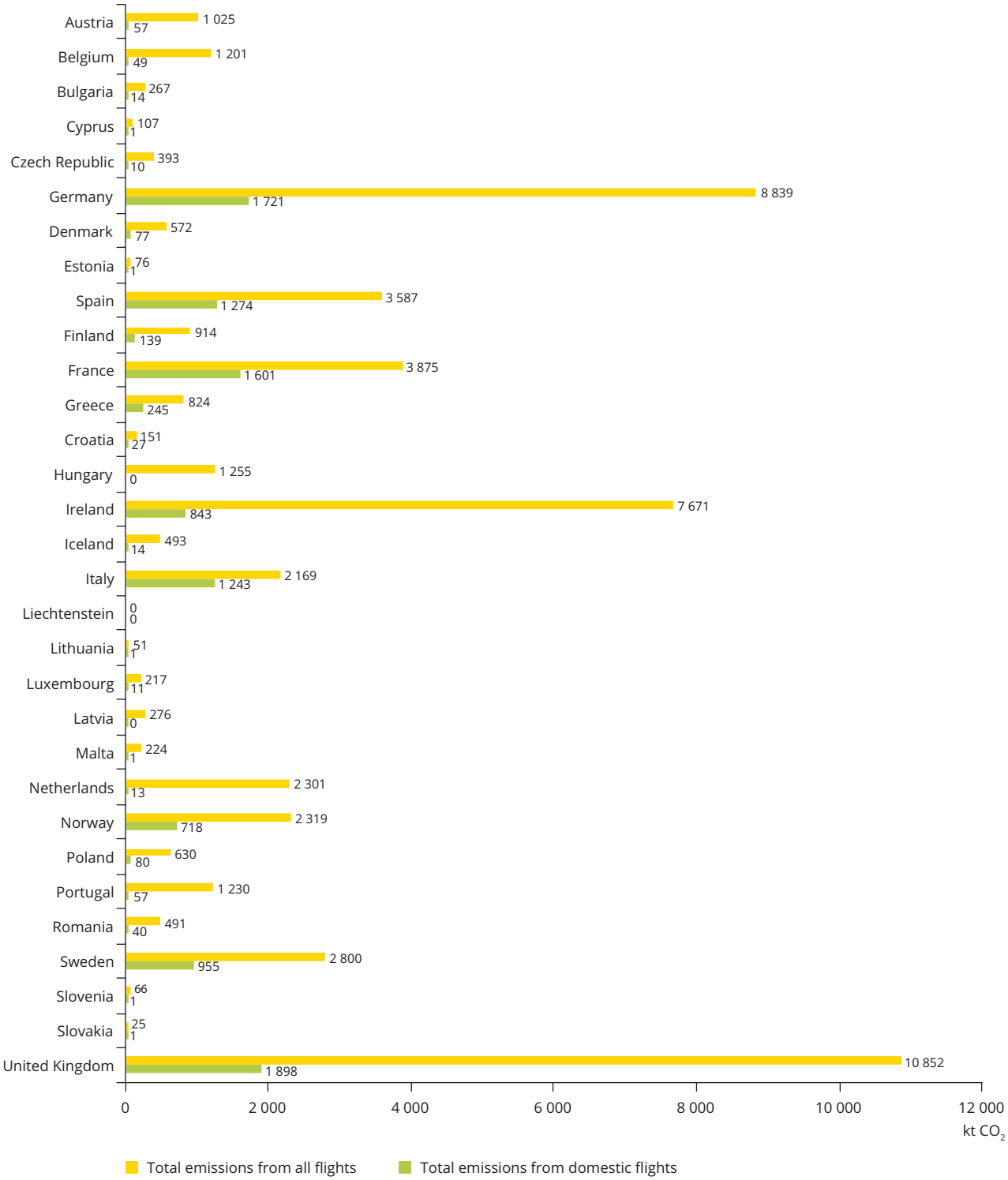
Twelve countries reported that they are aware of a total of 62 aircraft operators that should have complied with requirements under the EU ETS Directive because they performed flights within the European Economic Area. During the analysis of country reporting, it became evident that the reported numbers sometimes include aircraft operators that are excluded from the EU ETS and, therefore, should not have been reported. For example, this was the case for at least 10 aircraft operators reported by Romania. Member States indicated that, in most cases, these operators are not located within the European Economic Area.

In 2014, aviation emissions in the EU ETS amounted to a total of 54.9 Mt CO_2, which was approximately 3 % of the total EU ETS for that year (see Figure 3.2). Domestic and international aviation emissions reported in GHG inventories have remained relatively stable, at approximately 150 Mt CO_2, between 2009 and 2013, which means that slightly more than one-third of aviation emissions are included under the current scope of the EU ETS. Since 2004, total aviation emissions (including non-EU ETS aviation emissions) in all of the EEA-31 countries, which participate in the EU ETS, have accounted for 3 % of their total GHG emissions.

The proportion of emissions from domestic ([46]) aviation ranges from 0 % (Hungary) to 57 % (Italy). This proportion largely depends on how aircraft operators are allocated to administering countries (see Figure 3.2) and has no relation to domestic emissions in national GHG inventories. In total, 11 Mt CO_2 (20 %) of aviation emissions resulted from domestic flights in 2014, according to data reported under the Article 21 questionnaire. Information on the proportion of domestic emissions can only be derived directly from annual emission reports (AERs) for aircraft operators ([47]), which are available to only designated authorities. A further verification of this number is therefore not possible in the context of this report.

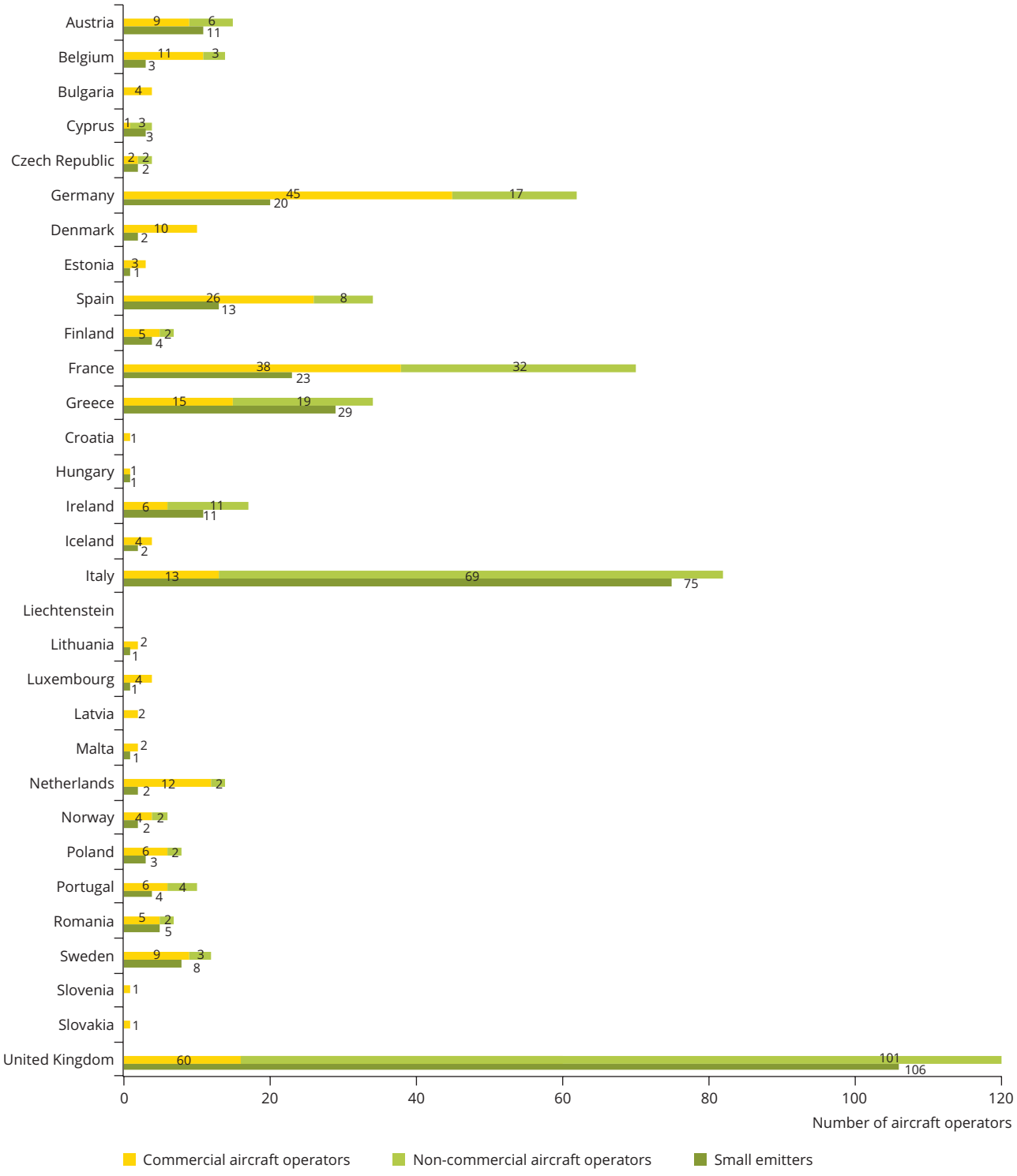
([43]) A 'tonne-kilometre' is a tonne of payload carried for one kilometre.
([44]) Numbers will differ from the data in the accompanying database, as Latvia and Portugal did not officially resubmit in time to correct the data in the database.
([45]) A small emitter is an air transport operator (1) whose flights, in aggregate, emit less than 25 000 tonnes of CO_2 per annum; or (2) which operates fewer than 243 flights per period for three consecutive 4-month periods. A small emitter can take advantage of a simplified procedure to monitor its CO_2 emissions from flight activity.
([46]) The emissions of a flight are defined as domestic if the departure country is the same as the arrival country.
([47]) A template is available online (http://ec.europa.eu/clima/policies/ets/monitoring/docs/t5_aer_aircraft_en.xls).

Figure 3.1 EU ETS emissions of aircraft operators in 2014



Note: All countries reported. Liechtenstein administers no aircraft operators.

Figure 3.2 Number of aircraft operators by type in 2014



Note: All countries reported. Liechtenstein administers no aircraft operators. The total number of aircraft operators in each country is the sum of commercial and non-commercial operators. Small emitters are a subset of both categories. Information on the proportion of small emitters that are commercial operators and the proportion that are non-commercial operators is not available.

No non-commercial aircraft operators were reported by Bulgaria, Croatia, Estonia, Hungary, Iceland, Latvia, Lithuania, Luxemburg, Malta, Slovakia and Slovenia.

3.3 Calculation of aviation emissions under the EU ETS

Aircraft operators under the EU ETS have to determine the fuel consumption for each flight and for each fuel, including the fuel consumed by the auxiliary power unit, using one of two methods (A or B ([48])). These methods differ mainly in the time at which fuel contained in tanks is measured, but not necessarily in the type of aircraft. Operators should use the method which provides the most complete and timely data, combined with the lowest uncertainty, without incurring unreasonable costs. Small emitters may estimate fuel consumption using a simplified methodology, allowed under Article 54(2) of the MRR, by applying tools provided by Eurocontrol or another relevant organisation.

Most (237) aircraft operators use method B, 53 use method A and 21 operators use both methods. The application of the normal methodology (either method A or B), rather than a simplified method, for determining fuel consumption was reported by 71 small emitters across 14 countries.

Nevertheless, the use of the SET is the most common way of determining fuel consumption by small emitters. Countries reported that the SET was used for the large majority of small emitters; more than 40 % of small emitter emission reports were reported to be exclusively based on the SET and generated from the EU ETS support facility independently from any input from the aircraft operator. Countries interpreted the questionnaire in different ways with regard to the use of methods for small emitters. Therefore, the answers of certain Member States are partly inconsistent across different questions. This suggests that the introduction of automatised sense checks in reporting questionnaires would be helpful in order to avoid such inconsistencies.

The SET is also often used to estimate the emissions of flights for which fuel consumption data are missing (236 operators out of 596 in 2014). In these cases, method A or B could not be applied because of data loss or delivery errors with regard to consumption numbers of single flights. Aircraft operators might also use an alternative method, in accordance with Article 65(2) of the MRR, which applies surrogate data instead of the SET. This has been reported for 76 aircraft operators.

Only Sweden reported the use of biofuel, and this was used by only one aircraft operator. There are initiatives that aim to increase the use of alternative aviation biofuels, but these appear to be mostly in the testing phase.

3.4 Monitoring and verification

As with operators of stationary installations, aircraft operators in the EU ETS are required to monitor and report their annual emissions in accordance with the MRR. Reported emissions are also affected by obligations under the AVR.

3.4.1 Standardised or simplified monitoring plans

Countries may allow operators of stationary installations and aircraft operators to use standardised or simplified monitoring plans. Before the approval of these plans, Article 13(2) of the MRR stipulates that the CA must carry out a simplified risk assessment. The aircraft operator may be required to perform the risk assessment in some countries. In three countries (Croatia, Finland and Iceland), a simplified approach has been allowed under Article 13(2). In these countries, the risk assessment was carried out by the operator using the SET (Finland) or a tool for risk assessment (Croatia and Iceland).

3.4.2 Conservative estimates

If aircraft operators fail to report emissions as required, the CAs must make a conservative estimate of the operator's emissions. Conservative estimates were made by CAs for 42 aircraft operators in seven countries, mainly by extracting information from the ETS support facility. Four of these countries (Belgium, Iceland, Romania and the United Kingdom) had provided emissions data. Conservatively estimated aviation emissions totalled only 6 kt CO_2 in 2014. This is 0.01 % of total ETS aviation emissions in 2014.

3.4.3 Verification issues and improvement reports

In 19 countries, a total of 108 emission reports included records of non-material misstatements and non-conformities that did not lead to a negative VOS

([48]) As described in Annex III of the MRR. The formula for method A is 'Actual fuel consumption for each flight [t] = Amount of fuel contained in aircraft tanks once fuel uplift for the flight is complete [t] – Amount of fuel contained in aircraft tanks once fuel uplift for subsequent flight is complete [t] + Fuel uplift for that subsequent flight [t]'. The formula for method B is 'Actual fuel consumption for each flight [t] = Amount of fuel remaining in aircraft tanks at block-on at the end of the previous flight [t] + Fuel uplift for the flight [t] – Amount of fuel contained in tanks at block-on at the end of the flight [t]'.

(or non-compliance with the MRR). Recommendations for improvements were included in 149 emission reports. Only two issues related to tonne-kilometre reports were reported (by Bulgaria).

Article 69(1) of the MRR, which relates to regular checks of whether or not the monitoring methodology can be improved, applies to aircraft operators. Only in cases of outstanding non-conformities or recommendations are aircraft operators obliged to submit an improvement report to the CA detailing how the recommended improvements are to be implemented. The reporting on these improvement reports should relate to the previous period, to allow a final statement on how many aircraft operators submitted an improvement report in practice, in cases in which these were required.

As there was no compliance cycle for aviation in the previous period (i.e. in 2013), very few improvement reports should have been reported. Nevertheless, 12 countries reported a total of 82 aircraft operators that were required to submit an improvement report. 21 reports were submitted in practice. It can be assumed that most of the reported improvement reports belonged to the actual period, which explains the low number of reports submitted in practice.

In 26 countries (not Estonia, Latvia, Liechtenstein ([49]), Slovakia, and Slovenia), CAs carried out checks on verified aircraft emission reports. In 25 of these 26 countries, CAs performed at least one check of all emission reports, by, for example, checking the completeness of the monitoring plan or performing cross-checks with other data sources. However, checking 100 % of reports is not necessarily best practice, as checking using a risk-based approach may be more practical if resources are constrained. A total of 70 site visits have been waived for small emitters in 11 countries, most of which are in the United Kingdom.

3.5 Compliance and penalties

Most countries indicated that at least one measure was used to ensure that aircraft operators complied with the MRR, AVR and approved monitoring plans. Cyprus, Germany, Iceland and Italy did not report on any measure. The most commonly applied measure was the prohibition of sales of allowances (reported by 17 countries), followed by regular meetings (reported by 16 countries), the publishing of operator names (reported by 13 countries) and spot-checks (reported by 11 countries). Only six countries (Belgium, Croatia, Finland, Germany, Italy, and the United Kingdom) have mentioned innovative ways of simplifying compliance for small emitters (mostly by customised guidance, but also by using simplified monitoring plan templates).

The provisions for infringement penalties, pursuant to Article 16(1) of the EU ETS Directive, vary broadly from no penalty to EUR 15 million (in Ireland). Prison sentences for aircraft infringements are also possible in Cyprus, Denmark, Ireland, Luxemburg, Norway and Sweden. These prison sentences can vary from 3 to 12 months, but none was imposed in the reporting period. In contrast, fines were imposed during this period in three countries (Italy, Poland and Sweden). Italy reported the largest penalty imposed on an aircraft operator (EUR 12 129 257) for failure to surrender sufficient emission allowances. The fines imposed in the other two countries were no higher than EUR 69 200.

Excess emission penalties were imposed on 63 aircraft operators, pursuant to Article 16(3) of the EU ETS Directive, in four countries (Germany, Italy, Sweden and the United Kingdom). This corresponds to more than 10 % of all aircraft operators. However, it is understood that countries were still issuing fines for 2012 in 2015, and, therefore, with the combined compliance cycle for 2013 and 2014, this reporting may correspond to several years. The excess emission penalty (EUR 100 for each excess tonne of CO_2-equivalent) is the same for all aircraft operators, and increases in accordance with the European index of consumer prices.

Countries can request an operating ban from the European Commission, in accordance with Article 16(10) of the EU ETS Directive. A ban is often considered a sanction of last resort.

([49]) Liechtenstein did not report any aircraft operators, see Figure 3.1.

4 Reported data and analysis

This chapter summarises the information provided by the completed Article 21 questionnaires on fuel consumption and related emissions in the EU ETS for installations. The detailed Article 21 questionnaire data can provide additional information on the fuel consumption of EU ETS installations and a basis for the further analysis of emission trends.

4.1 Reported fuel consumption and emissions data

Box 4.1 Activity and emissions — summary

The total combustion fuel emissions and consumption, based on installation operator emission reports, decreased by 4 % and 9 %, respectively, between 2013 and 2014, to 1 556 834 kt CO_2 and 19 276 354 TJ. The difference in these changes is explained by the fact that the decrease in consumption was dominated by the change (a decrease of 18 %) in natural gas consumption, which is a fuel with a significantly lower emission intensity than that of other fuels. Hard coal was the most significant fuel with regard to emissions (accounting for 27 % of emissions). Solid fuels accounted for more than half of the emissions covered by the EU ETS.

Some countries divided their emissions data into combustion and process emission data; from this, it is apparent that the majority of EU ETS emissions were combustion emissions.

As part of their responses to the Article 21 questionnaire, countries reported their total aggregate fuel consumption (in terajoules (TJ)) from EU ETS installations and the total emissions (in kt CO_2) related to these fuels.

4.1.1 Fuel consumption and emissions

Between 2013 and 2014, the reported emissions and consumption in the EU ETS decreased by 4 % and 9 %, respectively. Figure 4.1 shows the changes in fuel consumption and emissions by EU ETS installations, disaggregated by fuel, between 2013 and 2014. Figure 4.2 shows the changes in fuel consumption and emissions in the EU ETS, by country, between 2013 and 2014. Tables A4.4–A4.7 in Appendix 4 present emissions and fuel consumption data, by country, for the years 2013 and 2014.

In 2014, natural gas remained the most significantly consumed fuel (6 149 180 TJ), despite an 18 % decrease in consumption from 2013. Hard coal was still the fuel associated with the largest emissions (423 112 kt CO_2) in the EU ETS in 2014, despite an 11 % decrease in emissions from 2013. Natural gas decreased the most in absolute terms, with regard to fuel consumption. The fact that natural gas has one of the lowest implied emission factors (IEFs) ([50]) of all the fossil fuels explains why the consumption of this fuel decreased more than related emissions between 2013 and 2014. For the EU ETS overall, the changes in fuel emissions and consumption (see Figure 4.1) were relatively large in some cases.

There have also been some substantial changes in reported data at the country level. For example, the Czech Republic reported a large increase in emissions but a large decrease in consumption (see Figure 4.2). This is corroborated by IEFs for certain fuels being significantly different from the EU ETS average ([51]). Four other countries (Bulgaria, Iceland, Romania, and Spain) reported similar patterns, but to a lesser extent. These inconsistencies give rise to questions regarding the data quality which need further investigation.

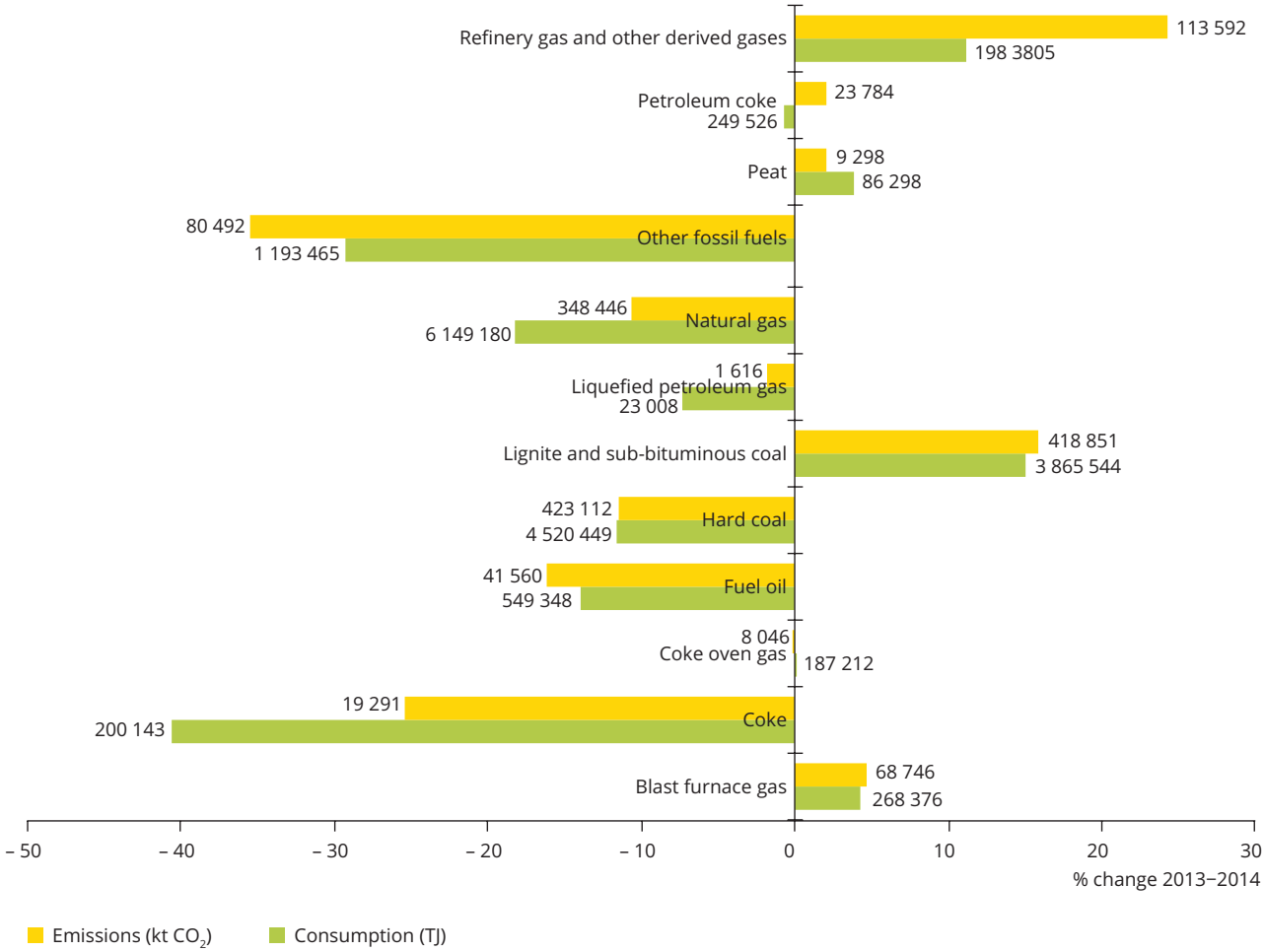
([50]) Calculated by dividing emissions by a measure of activity, such as fuel consumption.
([51]) The Czech Republic acknowledged that total fuel consumption was not always calculated, because of incomplete operator reporting, and that net calorific values were sometimes incorrect.

Germany reported the highest fuel consumption (4 510 625 TJ), followed by the United Kingdom (2 327 051 TJ). The most significant emitters are Germany (414 635 kt CO_2), the United Kingdom (181 727 kt CO_2) and Poland (179 444 kt CO_2). The Czech Republic reported the largest percentage and absolute change in emissions (an increase of 26.7 kt CO_2 or 83 %), and Liechtenstein reported the largest percentage change in consumption (a decrease of 66 %). Issues related to data inconsistencies may have contributed to this observed change for the Czech Republic (see above).

The fuel consumption data for Belgium, the Czech Republic, Germany, Iceland, the Netherlands and Poland are incomplete because some operators did not report the net calorific values ([52]) required for the conversion of fuel mass to TJ ([53]). Several countries experienced limitations with regard to the validation of the classification of all reported source streams. It is important to address these issues in the future to allow a meaningful comparison and analysis across countries.

The overall pattern of fuel consumption and emissions did not change significantly between 2013 and 2014, but there have been significant changes in some countries in the reported data.

Figure 4.1 Percentage change (between 2013 and 2014) in consumption (in TJ) and emissions (in kt CO_2) in the EU ETS by fuel type

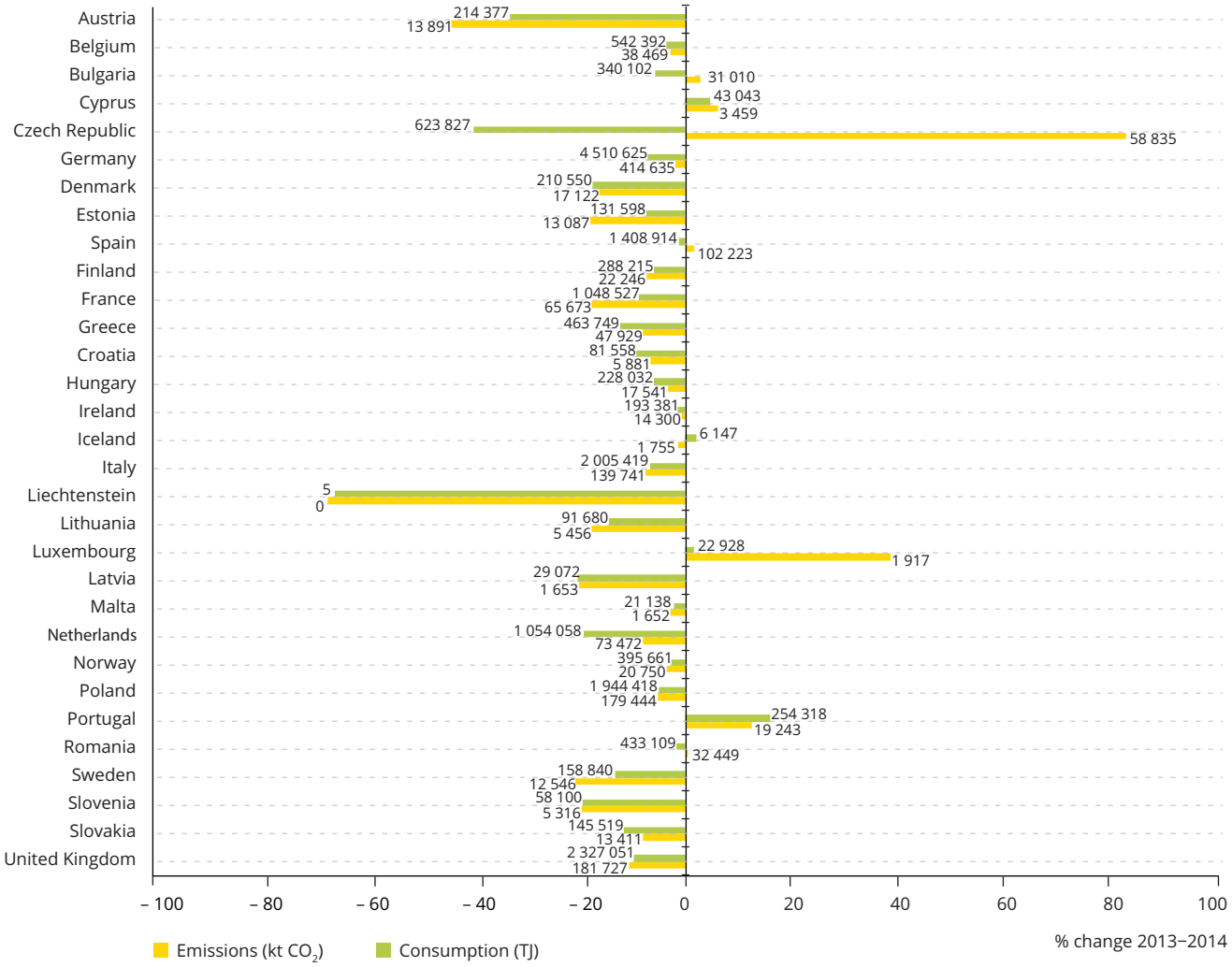


Note: All countries reported for both years.

([52]) The net calorific value of a fuel is the heat generated from the complete combustion of the fuel, minus the latent heat of water vapour produced during combustion.

([53]) Germany estimates that 3 % of its source streams are affected by this issue.

Figure 4.2 **Percentage change (between 2013 and 2014) in fuel consumption (in TJ) and emissions (in kt CO_2) in the EU ETS by country**



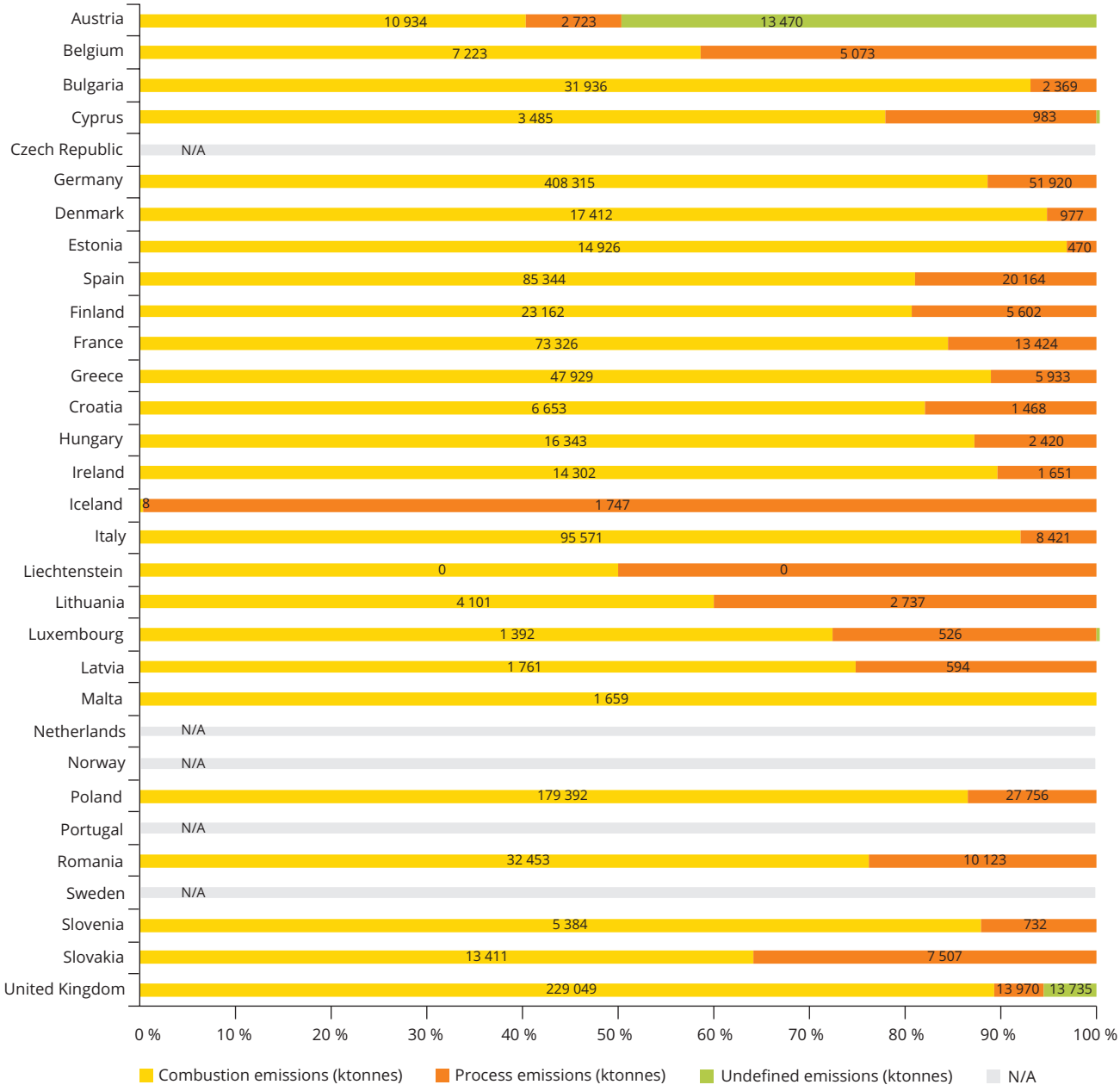
Note: All countries reported for both years. Reporting of the value zero is not represented.

4.1.2 Combustion and process emissions

Article 73 of the MRR stipulates that operators must report emissions from Annex I activities in their installations in accordance with codes from the Common Reporting Format (CRF) ([54]) used for national GHG inventory systems. For the Article 21 questionnaire, 26 countries reported aggregations of this operator data in 2014, including the division of emission data into process or combustion CRF categories ([55]). This is an improvement on the 21 countries that reported such aggregations of data for the 2013 reporting period (Figure 4.3 ([56])). The Flemish Region of Belgium, the Czech Republic, the Netherlands, Norway, Portugal and Sweden did not provide such data ([57]). If countries reported a higher sector total than that explained by the sum of combustion and process emissions, a third category of

([54]) National GHG inventories are divided into sectors that are assigned a CRF category for easy identification. For example, Public Electricity and Heat Production has the CRF category 1A1a.
([55]) Combustion emissions arise from the combustion of fuel in order to generate energy. Process emissions cover all emissions from industry, except those from fuel combustion, which includes those from chemical and metal production, and mineral products such as lime and cement.
([56]) Twenty-six countries are shown in the graph. Liechtenstein reported 0.309 kt CO_2 for process, combustion and total emissions.
([57]) Some of these countries explained that the reporting of emissions by CRF codes was not mandatory in the annual emissions report templates provided by the European Commission; therefore, most operators did not include the data. The data are mandatory in the new templates for 2016.

Figure 4.3 Percentage share of combustion and process emissions per country in 2014



Note: Belgium's data do not include the Flemish Region. The United Kingdom acknowledged some double counting in emissions (58.9 Mt CO_2-equivalent), but could not rectify this error. 'Undefined emissions' refer to emissions in excess of the sum of the reported combustion and process emissions. Countries which did not report are shown as N/A.

'undefined emissions' is shown, based on a calculation by the European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM). This occurred in fewer countries in 2014 than in the previous reporting period, which points to an improvement in data collection and reporting.

The objective of including CRF codes in the Article 21 questionnaire is to assist countries, and the EU as a whole, with the improvement of data quality in national inventories and to assess the consistency between EU ETS data and the national inventory data reported to the United Nations Framework Convention on Climate Change (UNFCCC). Some countries reported that they did not have the relevant data available at the time of questionnaire submission, since Member States also have to report proxy inventory data by 31 July (Article 8(1) of the Greenhouse Gas Monitoring Mechanism Regulation (EU, 2013b)), after the deadline for this questionnaire, which was 30 June. A better alignment of data collection with reporting schedules is therefore necessary in these countries.

4.2 Emissions from waste used as fuel or input material

Box 4.2 Emissions from waste — summary

The emissions from waste as fuel or input material in 2014 totalled 18 072 kt CO_2. The use of waste as a fuel or input material varied substantially across countries. Waste as a fuel can include scrap tyres, solvents, and residues of organic syntheses and waste from the pulp industry, amongst many others. As for the previous reporting period, Germany reported the most emissions and Sweden reported the most as a percentage of their total EU ETS emissions. More than half (17) of the countries reported that emissions from waste were less than 2 % of their total EU ETS emissions.

In 2014, 24 countries, one more than in 2013, reported having CO_2 emissions from waste used for fuel or input material. These data were reported by operators in their verified emissions reports. In 2014, total EU ETS emissions from waste as fuel or input material were equivalent to 18 072 kt CO_2, a 39 % increase from 2013. This large increase is considered to be a reflection of improved reporting rather than a significant increase in waste use.

Figure 4.4 provides the aggregated emissions for each country in 2014 and 2013. Germany reported the most emissions (5 995 kt CO_2). Sweden was the only country to report that emissions from waste used as fuel or input material were more than 10 % (i.e. 12 %) of their total EU ETS emissions. Austria, Denmark, Latvia and Slovakia reported emissions of between 2 % and 7 % of their EU ETS totals. The other 18 countries had emissions from waste used as fuel or input material of less than 2 % of their total emissions. Of the 22 countries that reported in both 2013 and 2014, four reported a decrease and 18 reported an increase in such emissions.

It is still not possible to analyse this waste data by the type of waste because there is an insufficient level of consistency with regard to the use of waste names and codes.

4.3 Emissions from biomass

Box 4.3 Emissions from biomass — summary

The total biomass emissions from stationary installations, reported under Article 21, in the EU ETS in 2014 amounted to 297 223 kt CO_2, 99 % of which satisfied sustainability criteria (if applicable) or was not subject to sustainability criteria. In 2014, zero-rated energy content made up 99 % of the reported biomass energy content in the EU ETS in 2014 (3 798 PJ), with only 32 PJ of non-zero rated biomass..

The combustion sector contributes 79 % of the zero-rated emissions from biomass across all of the countries reporting. The number of reported installations using biomass increased by 50 %, from 1 432 to 2 149 installations, in the EU ETS between 2013 and 2014; however, these numbers are not directly comparable, as more countries reported biomass emissions in 2014. In the aviation sector, one aircraft operator reported the use of biofuel but did not quantify it.

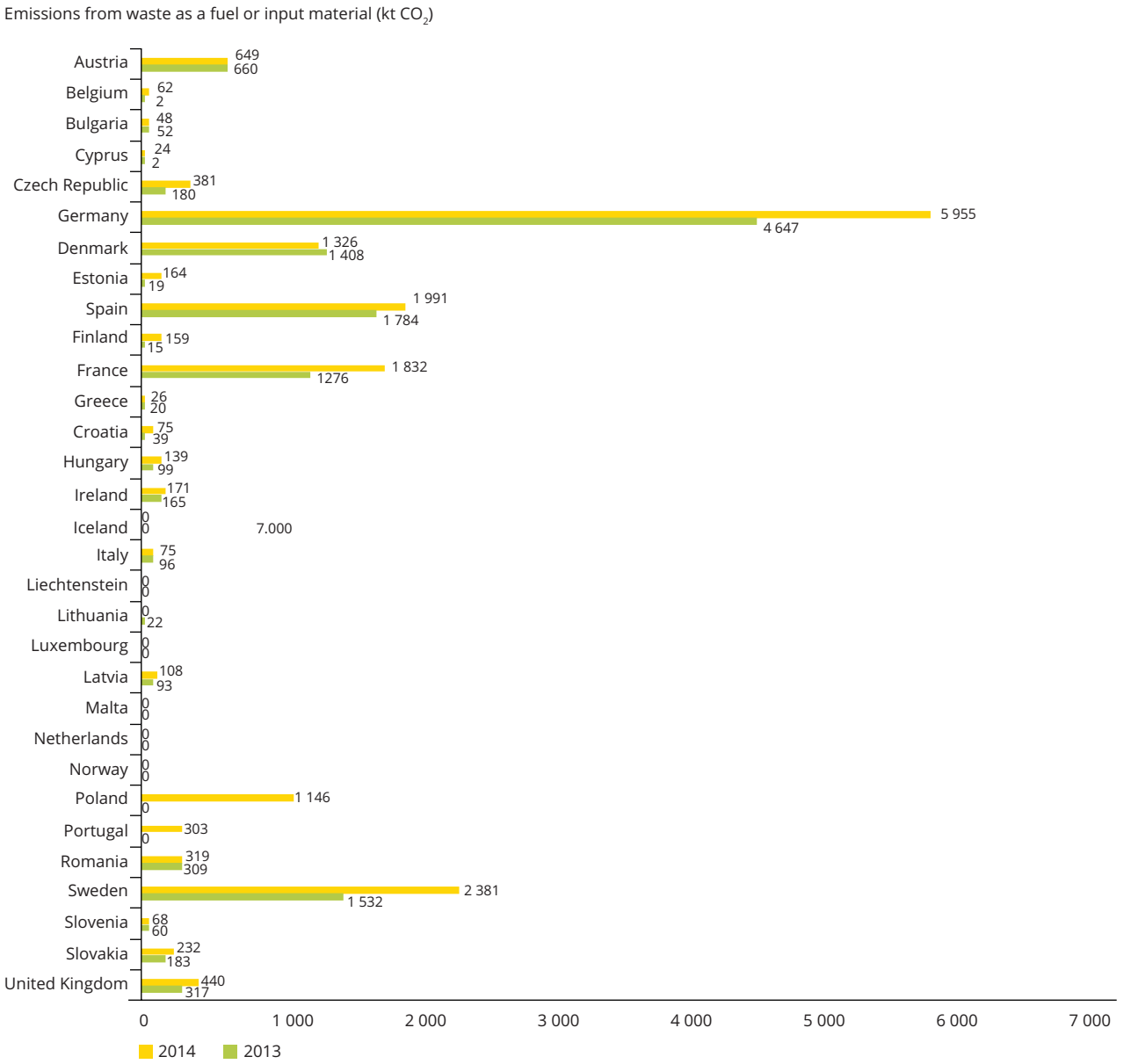
In 2014, emissions data related to the burning of biomass were reported by all countries except Liechtenstein and Malta (see also Figure 4.5). This is an improvement on the 25 countries that reported on biomass emissions in the previous year. The emissions from biomass ([58]) in the EU ETS in 2014 totalled 297 223 kt CO_2, 99 % of which was reported to be zero-rated ([59]). In 2013, 98 % of biomass emissions was zero-rated. Of the reported energy content of biomass in EU ETS installations, 99 % (i.e. 3 798 268 TJ) was zero-rated. Two countries (Romania and Spain) reported the energy content of non-zero-rated biomass, but did not report corresponding emissions data. Three countries (Denmark, Latvia and Lithuania) reported the energy content of zero-rated biomass, but did not report corresponding emissions data.

In order to appreciate the significance of biomass emissions from installations (see Box 4.4 for a further explanation of the definition of biomass), they can be compared with fossil fuel emissions from

([58]) The definition of biomass for the EU ETS, under the MRR (EU, 2012b), has been aligned with the RES Directive (EU, 2009a) and is 'the biodegradable fraction of products, waste and residues from biological origin from agriculture, forestry and related industries, industrial and municipal waste'. It includes bioliquids and biofuels.

([59]) The entry of a preliminary emission factor leads to the calculation of actual emission from zero-rated biomass.

Figure 4.4 Emissions (in kt CO_2) from waste as a fuel or input material in the EU ETS in 2013 and 2014

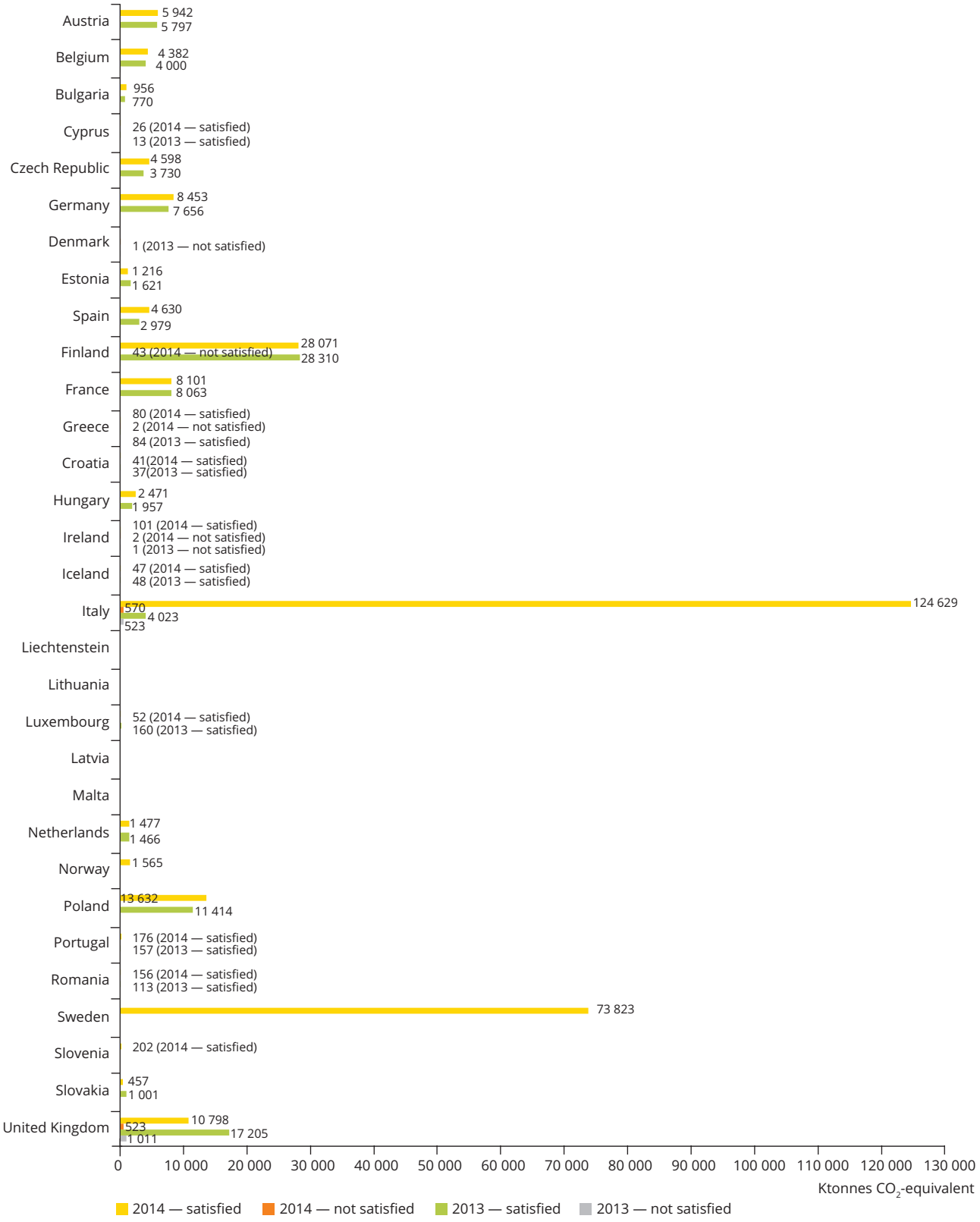


Note: Poland did not report for 2013. Iceland, Liechtenstein, Luxembourg, Malta, the Netherlands, Norway and Portugal reported zero emissions from waste as a fuel or input material for 2013. All countries reported for 2014. Iceland, Liechtenstein, Lithuania, Luxembourg, Malta, the Netherlands and Norway reported zero emissions from waste as a fuel or input material for 2014.

installations. Sixteen countries reported emissions from biofuels and bioliquids, which were reported to fulfil sustainability criteria, that were equivalent to less than 5 % of their fossil fuel emissions from installations. Eight countries reported that such emissions were equivalent to between 5 % and 10 % of their fossil fuel emissions, and six countries reported that such emissions were equivalent to more than 10 % of their fossil fuel emissions. Sweden reported more emissions from biomass (nearly four times as much) than from fossil fuels in EU ETS installations.

In all countries, the emissions from sustainability-compliant biofuels and bioliquids were significantly higher than emissions from biofuels and bioliquids for which sustainability criteria were not satisfied. In no country was the proportion of non-sustainable biofuels and bioliquids higher than 1 % of fossil fuel emissions from installations. Across all reporting countries, all emissions reported from biomass (in cases in which sustainability criteria did apply and were satisfied, were not satisfied or did not apply) in the EU ETS in 2014 were equivalent to 16 % of total EU ETS emissions.

Figure 4.5 Installation emissions from biomass (in kt CO_2) in 2013 and 2014



Note: Malta, Norway and Sweden did not report 2013 data. Liechtenstein and Slovenia reported zero emissions in 2013. Lithuania and Latvia reported installations but zero emissions for 2013 and 2014 (Latvia noted that operators usually reported only consumption data, not emission data, for biomass). Liechtenstein and Malta did not report the use of any biomass in 2014. Sweden did not report the use of any non-sustainable biomass in 2014.

In the EU ETS, the combustion sector accounted for 79 % of the zero-rated biomass emissions across all reporting countries. However, in a few countries, other sectors contributed more substantially with regard to zero-rated biomass emissions; for example, Cyprus, Iceland, Ireland, Portugal and Romania reported sustainable biomass emissions for only the cement clinker sector, even though this sector represents only 2 % of zero-rated biomass emissions in the EU ETS overall. Cement clinker also accounts for most of the non-sustainable biomass: 443 kt CO_2 in the United Kingdom and 345 kt CO_2 in Italy.

The number of reported installations using biomass increased by 50 %, from 1 432 to 2 149 installations, in the EU ETS between 2013 and 2014. However, the numbers for 2013 and 2014 are not directly comparable as more countries reported in 2014. In 2014, category A installations were the most likely to use biomass in all countries.

Box 4.4 Biomass and the sustainability criteria of biofuels and bioliquids in the EU ETS

The MRR contains specific requirements related to the treatment of biomass ([a]) for the accounting of emissions under the EU ETS. Sustainability criteria apply to only biofuels and bioliquids ([b]). If no sustainability criteria apply (i.e. for sustainable biomass as defined by the (RES) Directive), the emissions factor of biomass is considered to be zero under the EU ETS ([c]). In that case, such emissions are 'zero-rated'.

If sustainability criteria do apply, these must be complied with in order to use the emission factor of zero. If these criteria are not met, then biofuels and bioliquids are treated in the same way as a fossil fuel source (i.e. the emission factor is greater than zero and all released CO_2 emissions from combustion must be accounted for). The burden of proof with regard to biofuels and bioliquids meeting sustainability criteria lies with the EU ETS operator.

For example, wood is a type of solid biomass and no sustainability criteria apply; therefore, it is zero-rated. Sustainability criteria apply to materials such as rape seed oil, and for this to be zero-rated sufficient evidence must be provided to show that the sustainability criteria have been satisfied, otherwise it must be treated in the same way as a fossil fuel source.

Note: ([a]) The definition of biomass, under the MRR, has been aligned with the RES Directive (EU, 2009a) and is 'the biodegradable fraction of products, waste and residues from biological origin from agriculture, forestry and related industries, industrial and municipal waste'. It includes bioliquids and biofuels.

([b]) Biofuels are liquid or gaseous fuels for transport produced from biomass. Bioliquids are liquid fuel for energy purposes other than transport, including for electricity, and for heating and cooling, produced from biomass.

([c]) This assumes that the same amount of CO_2 was sequestered during the sustainable growth of the biomass as will be released when the biomass fuels are combusted.

5 Conclusions and outlook

This report presents recent data regarding the implementation of the EU ETS Directive. This information will be useful for policymakers and public administrators, and should help to inform improvements to the EU ETS. Overall, the reporting by countries has improved with regard to completeness and timeliness; this increases the validity of EU ETS-wide analysis.

5.1 Competent authorities

To assist with the effective implementation of the EU ETS, the coordination of activities among the CAs of a number of countries could be improved. As in 2013, 18 of the 25 countries with multiple CAs reported at least one method of coordinating the work of the CAs within the EU ETS in 2014. The data reported under Article 21 do not enable an assessment of the effectiveness of these coordination and cooperation measures. The EU ETS Compliance Forum, along with other coordination mechanisms, provides the opportunity to address this issue (see Box 2.2).

There is good integration of EU ETS permits with IED permits; almost all countries reported either formal integration or informal coordinated processes.

5.2 Coverage of the EU ETS

The number of installations reported in the EU ETS decreased by 2 % between 2013 and 2014, from 11 384 to 11 187 installations. Total combustion fuel consumption and emissions, according to operator emission reports, decreased by 9 % and 4 %, respectively, to 19 276 354 TJ and 1 556 834 kt CO_2 between 2013 and 2014. The number of aircraft operators in the EU ETS in 2014 was 596. Total emissions from aviation in the EU ETS amounted to 54.9 Mt CO_2, 20 % of which was from domestic aviation.

The number of GHG emissions permit updates reported in 2014 decreased by 39 % from 2013 (i.e. from 4 434 to 2 695 permit updates). The data provided do not detail the type of changes that led to these permit updates, but it is reasonable to conclude that the administrative burden involved has decreased.

Flexibilities that allow installations to be excluded from the EU ETS (under Article 27 of the EU ETS Directive) were not found to affect the environmental integrity of the EU ETS, and represented only 0.2 % of ETS emissions.

5.3 Implementation of the Monitoring and Reporting Regulation

Several improvements with regard to the implementation of the MRR were reported in 2014. The proportion of medium (category B) installations using the highest tier methodologies remained at 72 %, whereas the proportion of large (category C) installations using the highest tier methodologies increased from 84 % to 86 % between 2013 and 2014. This suggests a slight improvement in the methodologies used for large installations. However, 118 out of a total of 833 (i.e. 14 %) category C installations still did not entirely apply the highest tier methodology. Installation emissions that were estimated using the fall-back approach accounted for only 0.3 % of total EU ETS emissions in 2014. The reporting of calculated aviation emissions data was good, with only 0.01 % of aviation emissions being conservatively estimated.

In 2014, more countries reported that sampling plans were always prepared and approved than in 2013, suggesting that there has been an improvement in the completeness and submission of sampling plans. The number of outstanding issues in verification reports decreased by 37 % between 2013 and 2014.

There are, however, areas of MRR implementation that still need to be improved. In 2014, there were 62 additional aircraft operators across 12 countries that should have complied with requirements of the EU ETS Directive but did not. This number might be an overestimate, as the reported numbers partly refer to aircraft operators that are excluded from the EU ETS and, therefore, should not have been included

in the reports. This will be analysed in more detail in subsequent reports.

Article 13 of the MRR includes provisions that allow installations and aircraft operators to use simplified monitoring plans, irrespective of the scale of the operations and emissions; however, there have been few uses of this. Only six countries reported the use of simplified monitoring plans for installations, and three countries reported the use of simplified monitoring plans for aircraft operators. Six countries reported simplified compliance for installations with low emissions (less than 25 000 t CO_2-equivalent per year), and six countries reported such compliance for small aircraft emitters. This simplification involved measures such as customised guidance, simplified monitoring plan templates and workshops for small emitters. In 2014, 71 small aircraft emitters did not use the SET to estimate fuel consumption. These findings suggest that further investigation is required in order to determine whether or not the burden of requirements on small emitters could be reduced by countries.

5.4 Verification and penalties

On the basis of the data reported by countries under the Article 21 questionnaire, the framework for the verification system seems to be well established. However, it is not possible to make any conclusion with regard to how well the verification system functions in practice. The number of accredited verifiers appears to be sufficient and there is widespread use of verifiers from other countries. Checks of verification reports by CAs are generally widespread and recommended. Only a very small number of verification reports were rejected.

Nine countries imposed fines on stationary installation operators, and seven countries imposed excess emission penalties. The largest fine (almost EUR 20 million) was imposed by Italy for a failure to declare planned or effective changes to the capacity, activity levels or operation of an installation in due time. In such cases, the effectiveness of the measures used to ensure compliance could be reviewed by countries. Three countries imposed fines on aircraft operators. In total, just over 10 % of aircraft operators received excess emission penalties. However, this number may reflect penalties covering several years, rather than just 2014, because of the drawn-out process of issuing penalties.

5.5 Outlook on the future reporting on the application of the EU ETS Directive

The first year in which aviation activities were reported in the EU ETS was 2015 (and this 2015 reporting related to activities carried out in 2014); it is anticipated that improvements to reporting will be seen in future rounds of reporting as operators gain experience of the reporting requirements. This relates, in particular, to inconsistencies between the reported methods used to calculate verified emissions and the numbers of operators. Because of the changes in scope in recent years, inconsistent reporting of excluded aircraft operators might have been even more pronounced than it was for stationary installations in 2013. In addition, there may have been inconsistencies with regard to the interpretation of the reporting period, especially given that 2015 was the end of the combined compliance cycle in the aviation sector for 2013 and 2014, and, therefore, some answers may correspond to several years rather than only one. The EEA will work on clarifying these aspects of reporting for future rounds. Because of the changes in the scope of aviation in the EU ETS in recent years, year-on-year analysis is limited in the current report.

Trend analysis of implementation data for the stationary and aviation sector will be performed across multiple years in future reports and, with enhanced data quality assurance and checks, further analysis is expected to be provided with each Article 21 reporting round. Therefore, with each year of reporting, a further step towards a harmonised and consistent application of the EU Emissions Trading Directive will be taken.

Acronyms and country codes

Acronyms

AAU	Assigned amount unit
AER	Annual emission report
AVR	Accreditation and Verification Regulation
CA	Competent authority
CDR	Central Data Repository
CEMS	Continuous emission monitoring system
CH_4	Methane
CO_2	Carbon dioxide
CRF	Common Reporting Format
EC	European Commission
ECA	European Court of Auditors
EEA	European Environment Agency
EEA-31	European Union Member States and Iceland, Liechtenstein and Norway
Eionet	European Environmental Information and Observation Network
E-PRTR	European Pollutant Release and Transfer Register
ETC	European Topic Centre for Air Pollution and Climate Change Mitigation
EU	European Union
EUA	European Union allowance
EUAA	European Union aviation allowance
EU ETS	European Union Emissions Trading System
EUTL	European Union Transaction Log
GHG	Greenhouse gas
HFC	Hydrofluorocarbon

ICAO	International Civil Aviation Organisation
IED	Industrial Emissions Directive
IEF	Implied emission factor
IPCC	Intergovernmental Panel on Climate Change
kt	Kilotonnes
LPG	Liquefied petroleum gas
MRR	Monitoring and Reporting Regulation
MRV	Monitoring, reporting and verification
Mt	Megatonnes
MW	Megawatts
MWth	Megawatts thermal
N_2O	Nitrous oxide
NAB	National accreditation body
PFC	Perfluorocarbon
PJ	Petajoules
RES	Renewable Energy Source
SEP	Single Environment Permit
SET	Small Emitters Tool
SF_6	Sulphur hexafluoride
t	tonnes
TJ	Terajoules
UNFCCC	United Nations Framework Convention on Climate Change
VOS	Verification opinion statement

Country codes

AT	Austria	IT	Italy
BE	Belgium	LI	Liechtenstein
BG	Bulgaria	LT	Lithuania
CY	Cyprus	LU	Luxembourg
CZ	Czech Republic	LV	Latvia
DE	Germany	MT	Malta
DK	Denmark	NL	Netherlands
EE	Estonia	NO	Norway
EL	Greece	PL	Poland
ES	Spain	PT	Portugal
FI	Finland	RO	Romania
FR	France	SE	Sweden
HR	Croatia	SI	Slovenia
HU	Hungary	SK	Slovakia
IE	Ireland	UK	United Kingdom
IS	Iceland		

Glossary

Allocation	Assignment of emissions allowances in a specific way, which could be to a specific party, according to predetermined rules.
Annex I activity	Annex I of the European Union Emissions Trading System (EU ETS) Directive lists the activities that installations may carry out, such as the production of paper or cardboard. Installations need permits to perform Annex I activities. Activities are not sector classifications.
Calculation factor	An overarching term for parameters such as carbon content, conversion factor, biomass fraction, emission factor, net calorific value and oxidation factor.
Cap	The maximum amount of greenhouse gas (GHG) emissions allowed to be emitted in the system by the participants of the EU ETS. A cap is used in combination with a trading element in an emissions trading system to allow the participants to meet their emissions reduction obligations through a least-cost mean.
Carbon dioxide equivalent (CO_2-equivalent)	A measurement unit used to indicate the global warming potential of GHGs. Carbon dioxide (CO_2) is the reference gas against which other GHGs are measured. GHGs, other than CO_2, that are reported as CO_2-equivalents are: methane (CH_4) nitrous oxide (N_2O) sulphur hexafluoride (SF_6) perfluorocarbons (PFCs) hydrofluorocarbons (HFCs). CO_2 is the main GHG covered by the EU ETS; N_2O and PFCs are also covered for selected industry sectors.
Combustion emissions	GHG emissions that result from the exothermic reaction of a fuel with oxygen.
Competent authority (CA)	An organisation within a Member State that is responsible for implementing the EU ETS.
Continuous emission measurement	A set of operations that have the objective of determining the value of a quantity by means of periodic measurements, applying either measurements in the stack or extractive procedures with a measuring instrument located close to the stack, while excluding measurement methodologies based on the collection of individual samples from the stack.
CRF (Common Reporting Format)	National GHG inventories submitted to the United Nations Framework Convention on Climate Change (UNFCCC) are reported using Common Reporting Format (CRF) tables. These disaggregate national emission into activity sectors, using a hierarchical code for more detailed sectors.

Determined by analyses

Calculation factors have to be determined either using default values or by laboratory (chemical) analyses (i.e. 'determined by analyses'). Laboratory analyses provide more accurate data but are more time consuming and labour intensive than using default values. If determined by analyses, the laboratory must demonstrate competence and the operator must develop sampling plans for approval by the CA to ensure that the way in which samples are taken from the material/fuel for analysis will achieve representative results.

Emission allowance

The permission to emit 1 tonne (t) of CO_2 or CO_2-equivalent in a specified period of time. Emission allowances are given to participating installations and aircraft operators in the EU ETS, and to countries with a quantified GHG emissions reduction target under the Kyoto Protocol. EU ETS allowances are called EU allowances (EUAs) and allowances for aircraft operators are called EU aviation allowances (EUAAs). Kyoto allowances are called assigned amount units (AAUs). One EUA or one AAU corresponds to a permission to emit 1 t of CO_2-equivalent. Allowance units are freely allocated or auctioned to members of the EU ETS and can then be sold or purchased through the carbon market.

Emission factor

An emission factor is the average emission rate of a given GHG from a given source, relative to units of activity.

Emissions trading

A market-based approach that provides flexibility for participants with regard to meeting their emissions reduction objectives with the least-cost means, while ensuring that emissions reduction targets are still achieved. Participants that reduce their GHG emissions more than required can trade their excess allowances with participants that have a shortage of allowances. Trading can take place at national or international level, or between companies. The achievement of environmental targets is ensured, while providing relevant parties with flexibility in realising those targets.

Fall-back approach

An approach for estimating emissions that can be applied to selected source streams or emission sources for which applying at least a tier 1 approach is technically not feasible or would incur unreasonable costs, provided certain conditions regarding uncertainties are met.

Greenhouse gases (GHGs)

A group of gases that contribute to global warming and climate change. The Kyoto Protocol covers six GHGs:

- the non-fluorinated gases:
  - CO_2
  - CH_4
  - N_2O
- the fluorinated gases:
  - HFCs
  - PFCs
  - SF_6.

Quantifying GHGs in terms of CO_2-equivalent makes it possible to directly compare emission levels and to determine their individual and total contributions to global warming.

Implied emission factor (IEF)

Calculated by dividing emissions by the measure of activity, such as fuel consumption.

Inherent CO_2	Inherent CO_2 is CO_2 that results from an Annex I activity and is part of a gas that is considered a fuel. This could be natural gas, a waste gas (including blast furnace gas) or coke oven gas.
Installation types	Installation types are defined by the average verified annual emissions of the trading period immediately preceding the current trading period, with the exclusion of CO_2 that stems from biomass, and before subtraction of transferred CO_2. Installation types can be categorised as follows: • category A installations emit equal to or less than 50 000 t CO_2-equivalent; • category B installations emit more than 50 000 t CO_2-equivalent and equal to or less than 500 000 t CO_2-equivalent; • category C installations emit more than 500 000 t CO_2-equivalent. Installations with low emissions emit less than 25 000 t CO_2-equivalent (and are thus included in category A installations).
Intergovernmental Panel on Climate Change (IPCC) default emission factor	The average emission factor considered suitable for calculating emissions if country-specific emission factors are unavailable.
IPCC guidelines	Guidelines provided by the IPCC for compiling national GHG inventories. These guideline set out methodologies and reporting formats for reliable estimation of emissions.
Market stability reserve	Created to address the imbalance between supply and demand of emission allowances, and to improve the system's resilience to major shocks by adjusting the supply of allowances to be auctioned.
National accreditation body	An organisation within a Member State that is responsible for accrediting verifiers to a suitable standard.
Net calorific value	The specific amount of energy released as heat when a fuel or material undergoes complete combustion with oxygen under standard conditions minus the heat of vaporisation of any water formed.
Oxidation factor	This is the fraction of carbon that is oxidised during combustion.
Process emissions	GHG emissions other than combustion emissions that occur as a result of intentional and unintentional reactions between substances or their transformation, including the chemical or electrolytic reduction of metal ores, the thermal decomposition of substances, and the formation of substances for use as product or feedstock.
Registry	A database that shows who owns what emission allowances and performs transactions between accounts. Account balances can be viewed and transactions can be initiated online through a registry. A registry is not a trading platform; it does not support the statement of sale and purchase orders, or prices.
Rated thermal input	Refers to the rate at which fuel can be burned at the maximum continuous rating (e.g. the maximum output a generator is capable of producing continuously, under normal conditions, for a year) of the appliance, multiplied by the gross calorific value of the fuel. Rated thermal input is expressed as 'megawatts thermal', and can usually be taken from the manufacturer's rated input for that appliance or design.

Tiers	Sets of requirements for determining calculation factors, activity data and emissions. Higher tiers have more stringent requirements and produce more accurate data.
Trading period	The period in which EU ETS emissions allowances are issued. Initially, two trading periods were defined: 2005–2007 and 2008–2012. This has been further extended by the addition of a third trading period, from 2013 to 2020, and a fourth trading period proposed for 2021–2030.
UNFCCC	The UNFCCC has 196 parties and has the objective of stabilising GHG concentrations in the atmosphere in order to prevent dangerous human-related effects on the climate.

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Appendix 1 Data collection processes and outcomes

A summary of reporting on the implementation of the EU ETS Directive is shown in Table A1.1.

A1.1 Data quality, data checks and quality assurance

In general, there was an improvement in data quality and completeness in the 2014 reporting period compared with 2013. An increase in the number of data checks and communications between ETC/ACM and the reporting countries has helped to identify errors in submitted data and has enabled resubmissions to correct to data if necessary.

The data quality of the countries' Article 21 reports was assessed through various transparency, timeliness, accuracy, completeness, consistency and comparability (TTACCC) checks, as explained below.

- Transparency: Are full contact details provided? Are there any explanatory comments provided in question 14?
- Timeliness: Was the report submitted by the deadline?
- Accuracy: Cross-check of some data with other sources, such as installation category data with the European Union Transaction Log (EUTL) data set.
- Completeness: Assess the percentage of questions answered in the questionnaire.
- Consistency: Determine the percentage change of some numerical questions year on year, such as the percentage change in emissions calculated using the 'fall-back' method between 2013 and 2014.
- Comparability: Assess the percentage change of some numerical questions year on year, and how the country compares with other countries.

Calculations of IEFs, which divide emissions by fuel consumption for each fuel type, enabled data quality checks if a country's IEF was regarded as significantly

Table A1.1 National submissions in 2015

Country	Submission date (uploaded to the Central Data Repository of Eionet)	Resubmission dates
AT	17.07.2015	18.09.2015; 13.10.2015
BE	07.07.2015	
BG	29.06.2015	29.01.2016
CY	29.06.2015	17.07.2015
CZ	30.06.2015	
DE	06.08.2015	02.09.2015
DK	30.06.2015	
EE	30.06.2015	29.01.2016
EL	19.06.2015	
ES	06.07.2015	31.07.2015; 27.01.2016
FI	17.06.2015	19.10.2015
FR	24.06.2015	
HR	30.06.2015	10.07.2015
HU	30.06.2015	17.09.2015
IE	29.06.2015	
IS	26.06.2015	28.07.2015
IT	30.09.2015	
LI	18.06.2015	
LT	02.06.2015	
LU	30.06.2015	
LV	02.07.2015	30.12.2015
MT	25.06.2015	
NL	30.06.2015	10.07.2015; 28.01.2016
NO	26.06.2015	10.07.2015
PL	30.06.2015	
PT	30.06.2015	
RO	30.06.2015	
SE	29.06.2015	14.01.2016
SI	30.06.2015	
SK	29.06.2015	
UK	30.06.2015	16.07.2015

Note: The country codes used are defined in the 'Acronyms and country codes' section.

different from other ETS countries. On numerous occasions, this prompted data corrections.

The completeness of reporting has increased since the previous reporting period, as presented in Section 1.5. This allows more extensive comparisons among countries. Timeliness also improved, with 25 countries submitting by the deadline compared with only 19 in the previous year. All countries had submitted reports by the end of October 2015, that is, within 3 months of the deadline. This is also an improvement on the previous reporting period, in which it was 9 months after the deadline before all countries had submitted. This increases the validity of EU ETS analysis, as all countries had presented data in time for analysis.

However, the data presented in this report is limited to the data that was submitted by countries, and, although errors and limitations of the data have been acknowledged by some reporting countries they have not always been possible to correct. Such caveats to the data have been noted, if possible, throughout this report.

It is planned that these TTACCC checks will be repeated for data obtained in the next reporting year in an attempt to further improve the quality of the data reported.

A1.1.1 Specific data quality comments

With regard to the emissions and fuel consumption data presented in Section 4.1, further consideration of the underlying data suggests that the changes may be more significant than they first seem. For example, three fewer countries reported data related to peat in 2014 than in 2013, but, nevertheless, emissions and consumption increased. On the other hand, two more countries reported data for other fossil fuels in 2014 than in 2013, although emissions and consumption decreased substantially; however, this may be because of the mixed nature of this fuel group. Furthermore, the average ETS IEFs of blast furnace gas and peat decreased by 13 % each between 2013 and 2014, meaning that there were fewer emissions per TJ of combustion; however, the emissions and consumption of both of these fuels increased, suggesting that the change in activity may actually be larger than initially presented.

Numerous countries reported difficulties with assigning only one CRF category to each source stream, as the related emissions often fall into more than one category. The dominant activity should be reported in these cases. Some countries commented that the reporting of CRF categories by operators was not mandatory, so unless countries change their data reporting processes, it is unlikely that a disaggregation of emissions by CRF categories will be possible in future years.

Table A1.2 shows which countries responded to which mandatory questions of the Article 21 questionnaire. This demonstrates whether or not any information was submitted for at least some of the questions, but does not indicate the validity or completeness of the response.

Table A1.2 Summary of national responses to the Article 21 questionnaire in 2015

Question	AT	BE	BG	CY	DE	DK	EE	EL	FI	FR	IS	IT	LI	LU	MT	NL	PL	SE	SI
1	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2.1a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2.1b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2.1c	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2.1d	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2.3a	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	no	yes	yes
2.3b	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2.4	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3.1a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3.1b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3.2a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3.2c	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3.3a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3.3b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
4.1	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
4.2a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
4.2b	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.1a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.1b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.2	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.3a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.3b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.4	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.6	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.7a	yes	yes	no	yes	yes	yes	no	no	yes	yes	yes	yes	no	yes	no	yes	yes	yes	no
5.7b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.8a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.8b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.12	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.14	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.16	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.17a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	yes	yes	yes	yes
5.17b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.18	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.19	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.20	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.21	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.22	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.23	yes	no	yes	yes	yes	yes	no	no	yes	yes	no	no	no	no	yes	no	yes	yes	no
5.24	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.25	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.26	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5.27	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6.1	yes	yes	yes	no	yes	yes	yes	yes	no	yes	no	yes	yes	no	no	yes	yes	yes	yes
6.4	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Table A1.2 Summary of national responses to the Article 21 questionnaire in 2015 (cont.)

Question	AT	BE	BG	CY	DE	DK	EE	EL	FI	FR	IS	IT	LI	LU	MT	NL	PL	SE	SI
6.5	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes
6.6a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6.6b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6.8	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6.9	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6.10	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
7.3	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
8.2	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
8.3	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
9	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
10.1	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
10.2	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
11.1	yes	yes	yes	yes	no	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
11.5	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
11.9	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
12.3a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
12.3b	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
12.3c	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
12.4	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
14.2	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Responses provided (%)	97	98	97	98	95	98	97	97	98	95	97	97	94	97	95	98	98	98	97

Note: The country codes used are defined in the 'Acronyms and country codes' section.

Croatia, the Czech Republic, Hungary, Ireland, Latvia, Lithuania, Norway, Portugal, Romania, Slovakia, Spain and the United Kingdom responded to all the questions.

Appendix 2 Links to country submissions

The national responses can be viewed in full by following the links in Table A2.1

Table A2.1 Country submission links, 2015

Country	Link to html file submitted
AT	http://cdr.eionet.europa.eu/Converters/run_conversion?file=at/eu/emt/envvh0tfg/at-eu-emt-envu5hdwa_2014data.xml&conv=527&source=remote
BE	http://cdr.eionet.europa.eu/Converters/run_conversion?file=be/eu/emt/envvvyi3a/be-eu-emt-envu6gexg.xml&conv=527&source=remote
BG	http://cdr.eionet.europa.eu/Converters/run_conversion?file=bg/eu/emt/envvqs1rg/bg-eu-emt-envu5blw_corrected28012016.xml&conv=527&source=remote
CY	http://cdr.eionet.europa.eu/Converters/run_conversion?file=cy/eu/emt/envvai2oa/cy-eu-emt-envu56yia-2014.xml&conv=527&source=remote
CZ	http://cdr.eionet.europa.eu/Converters/run_conversion?file=cz/eu/emt/envvunqng/Article_21_questionnaire_CZ_2014.xml&conv=527&source=remote
DE	http://cdr.eionet.europa.eu/Converters/run_conversion?file=de/eu/emt/envvebpjw/Article21_2015.xml&conv=527&source=remote
DK	http://cdr.eionet.europa.eu/Converters/run_conversion?file=dk/eu/emt/envvw7ssg/dk-eu-emt-envu3s7ma.xml&conv=527&source=remote
EE	http://cdr.eionet.europa.eu/Converters/run_conversion?file=ee/eu/emt/envvouz5a/Article_21_questionnaire_1.xml&conv=527&source=remote
EL	http://cdr.eionet.europa.eu/Converters/run_conversion?file=gr/eu/emt/envvuhwba/gr-eu-emt-envu5b8zg.xml&conv=527&source=remote
ES	http://cdr.eionet.europa.eu/Converters/run_conversion?file=es/eu/emt/envvqjtbg/es-eu-emt-envvqavba.xml&conv=527&source=remote
FI	http://cdr.eionet.europa.eu/Converters/run_conversion?file=fi/eu/emt/envvis7ra/fi-eu-emt-envu47saw.xml&conv=527&source=remote
FR	http://cdr.eionet.europa.eu/Converters/run_conversion?file=fr/eu/emt/envvwifzg/fr-eu-emt-envu9u0ra.1.xml&conv=527&source=remote
HR	http://cdr.eionet.europa.eu/Converters/run_conversion?file=hr/eu/emt/envvz9qw/hr-eu-emt-envu5voha.xml&conv=527&source=remote
HU	http://cdr.eionet.europa.eu/Converters/run_conversion?file=hu/eu/emt/envvccnhq/hu-eu-emt-envu7fcdw.xml&conv=527&source=remote
IE	http://cdr.eionet.europa.eu/Converters/run_conversion?file=ie/eu/emt/envvvr2ra/ie-eu-emt-envu34roq.xml&conv=527&source=remote
IS	http://cdr.eionet.europa.eu/Converters/run_conversion?file=is/eu/emt/envvbztva/V2-is-eu-emt-envu5hsza.xml&conv=527&source=remote
IT	http://cdr.eionet.europa.eu/Converters/run_conversion?file=it/eu/emt/envvazbmq/it-eu-emt-envu6l9jg.xml&conv=527&source=remote
LI	http://cdr.eionet.europa.eu/Converters/run_conversion?file=li/eu/emt/envvyafgw/li-eu-emt-envu5f9mg.xml&conv=527&source=remote
LT	http://cdr.eionet.europa.eu/Converters/run_conversion?file=lt/eu/emt/envvwmqgg/lt-eu-emt-envu4czrq.xml&conv=527&source=remote

Table A2.1 Country submission links, 2015 (cont.)

Country	Link to html file submitted
LU	http://cdr.eionet.europa.eu/Converters/run_conversion?file=lu/eu/emt/envvw7_wa/lu-eu-emt-envu56ba.xml&conv=527&source=remote
LV	http://cdr.eionet.europa.eu/Converters/run_conversion?file=lv/eu/emt/envvxbkag/Article_21_questionnaire_2014.xml&conv=527&source=remote
MT	http://cdr.eionet.europa.eu/Converters/run_conversion?file=mt/eu/emt/envvo2f9a/Article_21_questionnaire__1.xml&conv=527&source=remote
NL	http://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/emt/envvqoqqq/nl-eu-emt-envu4m2vw-2014data.xml&conv=527&source=remote
NO	http://cdr.eionet.europa.eu/Converters/run_conversion?file=no/eu/colp0r8w/colsjs89w/envvz_clw/no-eu-colp0r8w-colsjs89w-envvabh7q.xml&conv=527&source=remote
PL	http://cdr.eionet.europa.eu/Converters/run_conversion?file=pl/eu/emt/envvto0a/pl-eu-emt-envu6p9ya.xml&conv=527&source=remote
PT	http://cdr.eionet.europa.eu/Converters/run_conversion?file=pt/eu/emt/envvwhh7a/pt-eu-emt-envu42kpq.xml&conv=527&source=remote
RO	http://cdr.eionet.europa.eu/Converters/run_conversion?file=ro/eu/emt/envvwlbww/ro-eu-emt-envu4laqw.xml&conv=527&source=remote
SE	http://cdr.eionet.europa.eu/Converters/run_conversion?file=se/eu/emt/envvpe0dg/se-eu-emt-envu5vqcg.xml&conv=527&source=remote
SI	http://cdr.eionet.europa.eu/Converters/run_conversion?file=si/eu/emt/envvxg5g/si-eu-emt-envu60klg.xml&conv=527&source=remote
SK	http://cdr.eionet.europa.eu/Converters/run_conversion?file=sk/eu/emt/envvt44bq/sk-eu-emt-envvocnjw.xml&conv=527&source=remote
UK	http://cdr.eionet.europa.eu/Converters/run_conversion?file=gb/eu/emt/envvaufkw/gb-eu-emt-envu42pbg.xml&conv=527&source=remote

Note: The country codes used are defined in the 'Acronyms and country codes' section.

Appendix 3 Summary of how the chapters correspond with different questions in the Article 21 questionnaire

For convenience, Table A3.1 summarises which questions in the Article 21 questionnaire have provided data for the different sections of this report. Table A3.2 lists the questions and topics of the Article 21 questionnaire that are not covered in this report. The data related to these questions are available to view in the accompanying database.

Table A3.1 Summary of how the report chapters correspond with different questions in the Article 21 questionnaire

Report chapter	Relevant Article 21 questionnaire question numbers
2.1	2.1, 2.3, 2.4
2.2	3.1, 3.2, 4.2
2.3	4.1, 5.1, 5.2. 5.3, 5.4, 5.8
2.4	5.7, 5.9, 5.10, 5.11, 5.12, 5.13, 5.19, 5.20
2.5	6.2, 6.5, 6.6, 11.1, 11.2, 11.3, 11.4
2.6	8.1, 8.2
3.1	—
3.2	3.3, 5.22
3.3	5.21, 5.23, 5.24
3.4	5.25, 5.26, 6.7, 6.8, 6.9, 6.10
3.5	5.27, 11.5, 11.6, 11.8, 11.7, 11.8, 11.9
4.1	5.5, 5.6
4.2	5.18
4.3	5.17
A4.1	2.2, 2.3
A4.2	5.5
A4.3	5.9
A4.4	6.1, 6.4
A4.5	5.14, 5.15

Table A3.2 Questions in the Article 21 questionnaire not covered in this report

Subject area	Question numbers
Stationary installation CEMS	5.16
Conservative estimation of stationary installations	6.3
Registries	7.1, 7.2
Article 10(c) of the EU ETS Directive	8.3
Use of ERUs and CERs	9.1
Fees of installations and aircraft operators	10.1, 10.2, 10.3
Fiscal and legal nature of emission allowances	12.1, 12.2, 12.3, 12.4
Fraud	13.1, 13.2, 13.3

Note: CER, certified emission reduction unit; ERU, emission reduction unit.

Appendix 4 Other data and information reported

A4.1 Administration arrangements

Table A4.1 lists the CAs for each country and the abbreviation entered in the table of CA roles.

Table A4.1 List of CAs and their abbreviations, 2014

Country	CA	Abbreviation
AT	CA responsible for the permitting of installations (local administrative bodies, in some cases federal state governments)	Local permitting authority
	The Austrian Treasury	OeBFA
	Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, Division I/4 — Climate Change and Air Quality	**BMLFUW**
BE	BRU: Government of the Brussels-Capital Region	BRU-GBC/BHG
	FL: Flemish Competent Authority (Environment, Nature and Energy Department/ Air, Nuisance, Risk Management, Environment and Health Division/Climate Unit)	FL-CA
	FED: The Registry Administrator (Federal Public Service of Public Health, Food Chain Safety and Environment/DG Environment, Climate Change Division/the registry administrator)	FED-REG
	WA: Municipalities	WA-WM
	WA: Département des Permis et Autorisation	WA-DPA
	WA: Département de la Police et des Contrôles	WA-DPC
	WA: Walloon Air and Climate Agency	**WA-AwAC**
	WA: Walloon Government	WA-GW
	WA: Walloon Air and Climate Agency	WA
	FL: Flemish Government	FL-FG
	FL: Flemish Minister of the Environment	FL-FME
	FL: Benchmarking Verification Bureau of Flanders	FL-VBBV
	FL: Flemish Business Agency	FL-FBA
	FL: Provincial Executive(s) of the Provincial Council(s)	FL-PE
	BRU: Brussels Institute for Management of the Environment	BRU-IBGE/BIM
	FED: General Directorate Air Transport	FED-DGTA/DGLV
BG	Executive Environment Agency	ExEA
	Ministry of Environment and Water	MOEW
	Council of Ministers of the Republic of Bulgaria	CMRB
	Regional Inspectorates of Environment and Water и води	RIEW

Table A4.1 List of CAs and their abbreviations, 2014 (cont.)

Country	CA	Abbreviation
CY	Ministry of Agriculture, Rural Development and Environment, Department of Environment	MARDE_DoE
	Ministry of Energy, Commerce, Industry and Tourism, Energy Service	MECIT_ES
	Ministry of Labour and Social Insurance, Department of Labour Inspection	MLSI_DLI
	Cyprus Scientific and Technical Chamber	ETEK
	Ministry of Finance	MoF
	Ministry of Communication and Works, Department of Civil Aviation	MCW_DCA
	Federation of Environmental and Ecological Organisations of Cyprus	FEEO
	Cyprus Energy Regulatory Authority	CERA
	Ministry of Agriculture, Natural Resources and Environment, Department of Environment	MANRE_DoE
	Cyprus Stock Exchange	CSE
CZ	**Ministry of the Environment**	**MoE**
	OTE, a.s.	OTE
	Czech Environmental Inspectorate	CIZP
DE	**German Emissions Trading Authority (Deutsche Emissionshandelsstelle im Umweltbundesamt**)	**DEHSt**
	Various German federal state (Bundesland) authorities and, in some cases, municipal authorities; national law has devolved responsibility for emission permits to the authorities responsible for issuing permits under the IED — the German federal states have adopted rules on competencies that diverge in many procedural and substantive respects	Federal state/municipal authorities
DK	**Danish Energy Agency (Energistyrelsen)**	**DEA (ENS)**
EE	**Ministry of the Environment (Keskkonnaministeerium**)	**KeM**
EL	Athens Stock Exchange S.A. (ΧΡΗΜΑΤΙΣΤΗΡΙΟ ΑΘΗΝΩΝ Α.Ε.)	Χ.Α.
	Ministry of Environment, Energy and Climate Change (ΥΠΕΚΑ)/Directorate-General for Energy/Directorate for Electricity Production (ΥΠΕΚΑ/ΓΕΝ.ΓΡΑΜ ΕΝΕΡΓΕΙΑΣ/Δ/ΝΣΗ ΗΛΕΚΤΡΟΠΑΡΑΓΩΓΗΣ)	ΥΠΕΚΑ (ΔΙΕΥΘΥΝΣΗ ΗΛΕΚΤΡΟΠΑΡΑΓΩΓΗΣ ΥΠΕΚΑ)
	Ministry of Infrastructure, Transport and Networks/Hellenic Civil Aviation Authority (ΥΠΟΥΡΓΕΙΟ ΜΕΤΑΦΟΡΩΝ ΥΠΟΔΟΜΩΝ ΚΑΙ ΔΙΚΤΥΩΝ/ΥΠΗΡΕΣΙΑ ΠΟΛΙΤΙΚΗΣ ΑΕΡΟΠΟΡΙΑΣ)	ΥΠΑ (ΥΠΑ)
	Emissions Trading Office (ΓΡΑΦΕΙΟ ΕΜΠΟΡΙΑΣ ΔΙΚΑΙΩΜΑΤΩΝ ΕΚΠΟΜΠΩΝ)	**GEDE (ΓΕΔΕ)**
ES	Government Departments of the Autonomous Communities (Consejerías de las Comunidades Autónomas)	CCAA
	The Designated National Authority for mechanisms based on projects under the Kyoto Protocol (La Autoridad Nacional Designada para los mecanismos basados en proyectos del Protocolo de Kioto)	DNA (AND)
	Central State Administration (Administración General del Estado)	AGE
	Climate Change Policy Coordination Committee (body coordinating between CAs of the Central State Administration and the Autonomous Communities) (Comisión de Coordinación de Políticas de Cambio Climático (Órgano de coordinación entre autoridades competentes de la Administración General del Estado y las Comunidades Autónomas))	CCPCC
	Inter-Ministerial Group on Climate Change (body coordinating between CAs of the Central State Administration) (Grupo Interministerial de Cambio Climático (Órgano de coordinación entre autoridades competentes de la Administración General del Estado))	GICC
	Spanish Climate Change Office, Ministry of Agriculture, Food and the Environment (Oficina Española de Cambio Climático. Ministerio de Agricultura Alimentación y Medio Ambiente)	OECC — MAGRAMA

Table A4.1 List of CAs and their abbreviations, 2014 (cont.)

Country	CA	Abbreviation
FI	The National Government of Aland (for Traditional ETS)	NGA
	Energy Authority (for Traditional ETS)	**EV**
	Finnish Transport Safety Agency (for ETS on Aviation)	Trafi
	Ministry of Employment and the Economy (for Traditional EU ETS)	TEM
	Ministry of the Transport and the Communications (for ETS on Aviation)	LVM
FR	**Ministry of Ecology, Sustainable Development and Energy (Ministère de l'Écologie, du développement durable et de l'Énergie)**	**MEDDE**
	French vehicle testing authorities (Directions Régionales de l'Environnement, de l'Aménagement et du Logement)	DREAL
HR	Croatian Agency for the Environment and Nature (Hrvatska agencija za okoliš i prirodu)	CAEN (HAOP)
	Environmental Protection and Energy Efficiency Fund (Fond za zaštitu okoliša i energetsku učinkovitost)	EPEEF (FZOEU)
	Ministry of Finance (Ministarstvo financija)	MFIN
	Ministry of Environmental and Nature Protection (Ministarstvo zaštite okoliša i prirode)	**MENP (MZOIP)**
HU	National Inspectorate for Environment and Nature	NIEN
	Ministry for National Economy	MFIN
	Ministry of National Development	**MND**
IE	**Environmental Protection Agency**	**EPA**
IS	**The Environment Agency of Iceland**	**EAI**
IT	National Committee for the management of Directive 2003/87/EC and to support the management of the activities project of the Kyoto Protocol (Comitato Nazionale per la gestione della Direttiva 2003/87/CE e e per il supporto nella gestione delle attivita' di progetto del Protocollo di Kyoto)	Comitato ETS
	Manager of Energy Services (Gestore dei Servizi Energetici S.p.A.)	GSE
LI	**Office for the Environment (Amt für Umwelt)**	**AU**
LT	Environmental Protection Agency under the Ministry of the Environment (Aplinkos apsaugos agentūra prie Aplinkos ministerijos)	EPA (AAA)
	Regional environmental protection departments (Regionų aplinkos apsaugos departamentai)	REPD (RAAD)
	Ministry of Finance of the Republic of Lithuania (Lietuvos Respublikos finansų ministerija)	MoF (FM)
	Ministry of Energy of the Republic of Lithuania (Lietuvos Respublikos energetikos ministerija)	MoEne (EM)
	Ministry of Agriculture of the Republic of Lithuania (Lietuvos Respublikos žemės ūkio ministerija)	MoA (ŽŪM)
	Ministry of Transport and Communications of the Republic of Lithuania (Lietuvos Respublikos susisiekimo ministerija)	MoTC (SM)
	Ministry of the Economy of the Republic of Lithuania (Lietuvos Respublikos ūkio ministerija)	MoEc (ŪM)
	Ministry of the Environment of the Republic of Lithuania (Lietuvos Respublikos aplinkos ministerija)	**MoEn (AM)**
	The State Environmental Protection Service (Valstybinė aplinkos apsagugos tarnyba)	VAAT
	Lithuanian Environmental Investment Fund (Lietuvos aplinkos apsaugos investicijų fondas)	LEIF (LAAIF)

Table A4.1 List of CAs and their abbreviations, 2014 (cont.)

Country	CA	Abbreviation
LU	Ministry of Sustainable Development and Infrastructure — Environment Department (Ministère du Developpement durable et des Infrastructures — Département de l'environnement)	(MDDI)
	State Treasury (Trésorie de l'Etat)	(TS)
	Ministry of Sustainable Development and Infrastructure — Environment Administration (Ministère du Developpement durable et des Infrastructures — Administration de l'environnement)	(AEV)
LV	State Revenue Service (Valsts ieņēmumu dienests)	VID
	Ministry of Environmental Protection and Regional Development (Vides aizsardzības un reģionālās attīstības ministrija)	VARAM
	State Environmental Service (Valsts vides dienests)	VVD
	Civil Aviation Agency (Civilās aviācijas aģentūra)	CAA
	Latvian National Accreditation Bureau (Latvijas Nacionālais akreditācijas birojs)	**LATAK**
	Latvian Environmental, Geological and Meteorological Centre (Latvijas Vides, ģeoloģijas un meteoroloģijas centrs)	LVĢMC
	The State Office for Environmental Monitoring (Vides pārraudzības valsts birojs)	VPVB
MT	Treasury Department — Ministry for Finance	TD-MFIN
	Malta Resources Authority	**MRA**
NL	Netherlands Enterprise Agency (Rijksdienst voor Ondernemend Nederland)	RVO.nl
	Netherlands Emissions Authority (Nederlandse Emissieautoriteit)	**NEa**
	Ministry of Infrastructure and Environment, Department of Climate, Air and Noise (Ministerie van Infrastructuur en Milieu, Directie Klimaat, Lucht en Geluid)	IenM, KLG
NO	Ministry of Climate and Environment	KLD
	Norwegian Environment Agency	**NEA**
PL	CA in charge of the issuance of permits for the participation in the trading scheme (district governor (DG) or Province Marshal (PM)). Province Marshal in the case of facilities with installations classified as projects likely to have significant impact on the environment, for which it is obligatory to prepare an environmental impact assessment report. Organ właściwy do wydawania zezwoleń na udział w handlu (starosta — S lub Marszałek Województwa — MW). Marszałek Województwa dla zakładów, gdzie jest eksploatowana instalacja, która jest kwalifikowana jako przedsięwzięcie mogące znacząco oddziaływać na śr	DG/PM (S/MW)
	Institute of Environmental Protection — National Research Institute, National Centre for Emissions Management (Instytut Ochrony Środowiska — Państwowy Instytut Badawczy, Krajowy Ośrodek Bilansowania i Zarządzania Emisjami)	KOBiZE
	Provincial Environmental Protection Inspector (Wojewódzki inspektor ochrony środowiska)	PEPI (WIOŚ)
	Minister for the Environment (Minister Środowiska)	**ME (MŚ)**
	Council of Ministers (Rada Ministrów)	CM (RM)
PT	**Portuguese Environment Agency, Public Institut**	**APA. I.P.**
	Regional Directorate of the Environment of Azores (Direção Regional do Ambiente)	DRA
	The Portuguese Treasury and Government Debt Agency (Agência de Gestão da Tesouraria e da Dívida Pública)	IGCP
	General Inspection of Agriculture, Sea, Environment and Spatial Planning (Inspeção-Geral da Agricultura, do Mar, do Ambiente e do Ordenamento do Território)	IGAMAOT
	Regional Directorate of Spatial Planning and Environment of Madeira (Direção Regional do Ordenamento do Território e Ambiente)	DROTA

Table A4.1 List of CAs and their abbreviations, 2014 (cont.)

Country	CA	Abbreviation
RO	Ministry of Environment and Climate Change	MECC
	National Environmental Guard	NEG
	Romanian Aeronautical Civil Authority	RACA
	Ministry of Transport	MT
	Ministry of Environment, Waters and Forests	MEWF
	Romanian Accreditation Association	**RENAR**
	Ministry of Public Finance	MPF
SE	**Swedish Environmental Protection Agency (Naturvårdsverket)**	**NV**
	Finansinspektionen	FI
	Swedish National Debt Office (Riksgäldskontoret)	RG
	County Administrative Boards (Länsstyrelsen)	LST
SI	Slovenian Environment Agency	ARSO
	Inspectorate of RS for Agriculture and the Environment	Inspectorate
	Ministry of the Environment and Spatial Planning	MOP
	Ministry of Agriculture, Forestry and Food	**MKO**
SK	**Ministry of the Environment of the Slovak Republic**	**MoE**
	72 District Offices	DO
	Export-Import Bank of the Slovak Republic (Exportno-importná banka Slovenskej republiky)	EXIM
UK	Department of Energy and Climate Change	DECC
	Environment Agency	**EA**
	Scottish Environment Protection Agency	SEPA
	Northern Ireland Environment Agency	NIEA
	Natural Resources Wales	NRW
	Department of Energy and Climate Change — Offshore Oil and Gas Environment and Decommissioning	DECC — OGED

Note: If a country has stated its focal CA, this is highlighted in bold. The country codes used are defined in the 'Acronyms and country codes' section.

Table A4.2 CAs and their tasks with regard to installations, 2014

	Issuance of permits	Free allocation to stationary installations	Auctioning	Financial measures related to indirect carbon leakage	Issuance of allowances	Approval of the monitoring plan	Receiving and assessing verified emissions reports and verification reports	Making a conservative estimation of emissions	Approval of improvement reports	Approval of waiving a verifier's site visit	Inspection and enforcement	Providing information to the public	Administration of the unilateral inclusion of activities and gases	Administration of installations excluded under Article 27	Total number of CAs
		BMLFUW	OeBFA		BMLFUW	Local permitting authority	BMLFUW	BMLFUW	Local permitting authority	BMLFUW	BMLFUW, Local permitting authority	BMLFUW	BMLFUW		3
AT	Local permitting authority														
BE (WA)	WM, DPA	GW	FED-REG		GW	AwAC	AwAC	AwAC	AwAC	AwAC	AwAC, DPC	AwAC, FED-REG			15 (6)
BE (BRU)	IBGE/BIM	IBGE/BIM	FED-REG		IBGE/BIM	IBGE/BIM	IBGE/BIM	IBGE/BIM	IBGE/BIM	IBGE/BIM	IBGE/BIM	IBGE/BIM, FED-REG			15 (2)
BE (FL)	PE	CA	FED-REG	FBA	FME	CA	CA	CA	CA	CA	CA	CA, FED-REG			15 (5)
BG	ExEA	MOEW,CMRB	MOEW		MOEW, ExEA	ExEA	ExEA	ExEA	ExEA	ExEA	ExEA, RIEW	MOEW, ExEA			4
CY	MARDE_ DoE	MARDE_DoE	CSE	MARDE_ DoE	MARDE_ DoE	MARDE_ DoE	MARDE_ DoE	MARDE_ DoE	MARDE_ DoE	MARDE_ DoE	MARDE_DoE	MARDE_DoE	MARDE_ DoE	MARDE_ DoE	2
CZ	MoE	MoE, OTE	OTE		MoE, OTE	MoE	MoE	MoE	MoE	MoE	CIZP	MoE, OTE			3
DE	Land/local authorities	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt	1+
DK	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	1
EE	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM	1
EL	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	XA (Χ.Α.)	ΥΠΕΚΑ (ΥΠΕΚΑ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	3
ES	CCAA	AGE	AGE	AGE	AGE	CCAA	CCAA	CCAA	CCAA	CCAA	CCAA,AGE	CCAA, AGE, AND, OECC (MAGRAMA), CCPCC, GICC	AGE	CCAA	6
FI	EV, NGA	TEM	EV	TEM	EV	EV, NGA	EV, NGA	EV, NGA	EV, NGA	EV, NGA	EV, NGA	EV, TEM, NGA	TEM		3
FR	MEDDE	MEDDE									MEDDE	MEDDE	MEDDE	MEDDE	1
HR	MZOIP	MZOIP	FZOEU	MZOIP	MZOIP, HAOP	MZOIP, HAOP	HAOP	MZOIP, HAOP	MZOIP, HAOP	MZOIP, HAOP	MZOIP	MZOIP, HAOP	MZOIP	MZOIP	3
HU	NIEN	MNE	MNE	MNE	NIEN	NIEN	NIEN	NIEN	NIEN	NIEN	NIEN	NIEN, MNE			2
IE	EPA	EPA	EPA	N/A	EPA	EPA	EPA	EPA	EPA	EPA	EPA	EPA			1
IS	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI	1

Table A4.2 CAs and their tasks with regard to installations, 2014 (cont.)

	Issuance of permits	Free allocation to stationary installations	Auctioning	Financial measures related to indirect carbon leakage	Issuance of allowances	Approval of the monitoring plan	Receiving and assessing verified emissions reports and verification reports	Making a conservative estimation of emissions	Approval of improvement reports	Approval of waiving a verifier's site visit	Inspection and enforcement	Providing information to the public	Administration of the unilateral inclusion of activities and gases	Administration of installations excluded under Article 27	Total number of CAs
		Comitato ETS	GSE	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	
IT															2
LI	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	1
LT	AAA	AM, ÜM	FM	ÜM	LAAIF	AAA	AAA	AAA	AAA	AAA	RAAD, VAAT	RAAD, AAA, AM	AM	AM	7
LU	AEV	AEV	TS	MDDI	AEV	AEV	AEV	AEV	AEV	AEV	AEV, MDDI	AEV, MDDI	AEV	AEV	3
LV		VARAM	VARAM	VARAM	LVĢMC	VVD	VVD	VVD	VVD	VVD	VVD	VARAM, VVD	VARAM	VARAM	3
MT	MRA	MRA	TD-MFIN		MRA	MRA	MRA	MRA	MRA	MRA	MRA	MRA			2
NL	NEa	IenM, NEa	NEa	RVO.nl	NEa	NEa	NEa	NEa	NEa	NEa	NEa	NEa	NEa	NEa	3
NO	NEA	NEA	KLD	NEA	NEA	NEA	NEA	NEA	NEA	NEA	NEA	NEA			2
PL	S, W	RM	KOBiZE		KOBiZE	S, W	KOBiZE	WIOŚ	S, W	S, W	PEPI	MŚ, KOBiZE, S, W			6
PT	APA. I.P., DRA, DROTA	APA. I.P.	IGCP	APA. I.P.	APA. I.P.	APA. I.P., DRA, DROTA	APA. I.P., DRA, DROTA	APA. I.P., DRA, DROTA	APA. I.P., DRA, DROTA	APA. I.P.	IGAMAOT	APA. I.P., DRA, DROTA			5
RO	MEWF	MEWF	MPF		MEWF	MEWF	MEWF	MEWF	MEWF	MEWF	NEG	MEWF	MEWF		3
SE	LST	NV	RG	NV	NV	LST	NV	NV	NV	NV	NV	NV	NV		3
SI	ARSO	MOP	MOP	MOP	ARSO	ARSO	MOP, ARSO	MOP	ARSO	ARSO	Inspectorate	MOP, ARSO, Inspectorate	MOP	MOP, ARSO	3
SK	DO	MoE	EXIM	MoE	MoE	DO	DO	DO	DO	DO	DO	MoE, DO	DO		3
UK	EA, SEPA, NIEA, NRW, DECC — OGED	DECC	DECC		EA	EA, SEPA, NIEA, NRW, DECC — OGED	EA, SEPA, NIEA, NRW, DECC — OGED	EA, SEPA, NIEA, NRW, DECC — OGED	EA, SEPA, NIEA, NRW, DECC — OGED	EA, SEPA, NIEA, NRW, DECC — OGED	EA, SEPA, NIEA, NRW, DECC — OGED	EA, SEPA, NIEA, NRW, DECC — OGED		EA, SEPA, NRW, NIEA	5

Note: The country codes used are defined in the 'Acronyms and country codes' section. Numbers in parentheses refer to total numbers of CAs reported for the Belgian regions Brussels-Capital, Flanders and Wallonia.

Table A4.3 CAs and their roles with regard to aircraft operators, 2014

	Free allocation pursuant to Article 3(e) and 3(f) of Directive 2003/87/EC	Auctioning	Financial measures related to indirect carbon leakage	Issuance of allowances	Approval of the monitoring plan	Receiving and assessing verified emissions reports and verification reports	Making a conservative estimation of emissions	Approval of improvement reports	Approval of the operator's application to waive a verifier's site visit	Inspection and enforcement	Providing information to the public	Total number of CAs
AT	BMLFUW	OeBFA		BMLFUW	BMLFUW	BMLFUW	BMLFUW	BMLFUW		BMLFUW	BMLFUW	3
BE (WA)	GW	FED-REG		GW	AwAC	AwAC	AwAC	AwAC	AwAC	AwAC	AwAC	15 (6)
BE (BRU)		FED-REG								DGTA/DGLV	FED-REG	15 (2)
BE (FL)	CA	FED-REG		FME	CA	CA	CA	CA	CA	CA	CA	15 (5)
BG	MOEW	MOEW		MOEW, ExEA	ExEA	ExEA	ExEA	ExEA		ExEA	MOEW, ExEA	4
CY	MARDE_DoE	CSE	MARDE_DoE	MARDE_DoE	MARDE_DoE	MARDE_DoE	MARDE_DoE	MARDE_DoE	MARDE_DoE	MARDE_DoE	MARDE_DoE	2
CZ	MoE, OTE	OTE		MoE, OTE	MoE	MoE	MoE	MoE		CIZP	MoE, OTE	3
DE	DEHSt	DEHSt	N/A	DEHSt	DEHSt	DEHSt	DEHSt	DEHSt		DEHSt	DEHSt	1
DK	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)	DEA (ENS)		DEA (ENS)	DEA (ENS)	1
EE	KeM	KeM	KeM	KeM	KeM	KeM	KeM	KeM		KeM	KeM	1
EL	GEDE (ΓΕΔΕ)	XA (Χ.Α.)		GEDE (ΓΕΔΕ)	YPA	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)	GEDE (ΓΕΔΕ)		GEDE (ΓΕΔΕ), YPA	GEDE (ΓΕΔΕ), YPA	3
ES	AGE	AGE	AGE	AGE	AGE	AGE	AGE	AGE		AGE	AGE, OECC (MAGRAMA), CCPCC, GICC	6
FI	Trafi				Trafi	Trafi	Trafi	Trafi		Trafi	Trafi	3
FR	MEDDE											1
HR	MZOIP	FZOEU	MZOIP	MZOIP, HAOP	MZOIP, HAOP	HAOP	MZOIP, HAOP	MZOIP, HAOP	MZOIP	MZOIP	MZOIP, HAOP	3
HU	MNE	MNE	MNE	NIEN	NIEN	NIEN	NIEN	NIEN		NIEN	NIEN, MNE	2
IE	EPA	EPA	N/A	EPA	EPA	EPA	EPA	EPA		EPA	EPA	1
IS	EAI	EAI	EAI	EAI	EAI	EAI	EAI	EAI		EAI	EAI	1
IT	Comitato ETS	GSE	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS	Comitato ETS		Comitato ETS	Comitato ETS	2
LI												1
LT	AM, SM	FM	ŪM	LAAIF	AAA	AAA	AAA	AAA		AAA	AM, AAA	7
LU	AEV	TS	MDDI	AEV	AEV	AEV	AEV	AEV		AEV, MDDI	AEV, MDDI	3
LV	VARAM	VARAM	VARAM	LVĢMC	CAA	CAA	CAA	CAA		CAA	VARAM, CAA	3

Table A4.3 CAs and their roles with regard to aircraft operators, 2014 (cont.)

	Free allocation pursuant to Article 3(e) and 3(f) of Directive 2003/87/EC	Auctioning	Financial measures related to indirect carbon leakage	Issuance of allowances	Approval of the monitoring plan	Receiving and assessing verified emissions reports and verification reports	Making a conservative estimation of emissions	Approval of improvement reports	Approval of the operator's application to waive a verifier's site visit	Inspection and enforcement	Providing information to the public	Total number of CAs
MT	MRA	TD-MFIN		MRA	MRA	MRA	MRA	MRA		MRA	MRA	2
NL	NEa	NEa	RVO.nl	NEa	NEa	NEa	NEa	NEa		NEa	NEa	2
NO	NEA	KLD	NEA	NEA	NEA	NEA	NEA	NEA		NEA	NEA	2
PL	MŚ	KOBiZE		KOBiZE	MŚ	KOBiZE	WIOŚ	MŚ		PEPI	MŚ	6
PT	APA. I.P.	IGCP	APA. I.P.	APA. I.P.	APA. I.P.	APA. I.P.	APA. I.P.	APA. I.P.		IGAMAOT	APA. I.P.	5
RO	MEWF	MPF		MEWF	MEWF	MEWF	MEWF	MEWF		NEG	MEWF	3
SE	NV	RG	NV	NV	LST	NV	NV	NV		NV	NV	3
SI	ARSO	MOP	MOP	ARSO	ARSO	MOP, ARSO	MOP	ARSO		Inspectorate	ARSO	3
SK	MoE	EXIM	MoE	MoE	MoE	MoE	MoE	MoE		MoE	MoE	3
UK	EA, SEPA, NRW	DECC		EA	EA, SEPA, NRW		EA, SEPA, NRW	EA, SEPA, NRW	EA, SEPA, NRW	EA, SEPA, NRW	EA	5

Note: The country codes used are defined in the 'Acronyms and country codes' section. Numbers in parentheses refer to total numbers of CAs reported for the Belgian regions Brussels-Capital, Flanders and Wallonia.

A4.2 Reported activity and emissions data

Table A4.4 Fuel consumption (in TJ) reported in the Article 21 questionnaire, 2014

	Blast furnace gas	Coke	Coke oven gas	Fuel oil	Hard coal	Lignite and sub-bituminous coal	LPG	Natural gas	Other fossil fuels	Peat	Petroleum coke	Refinery gas and other derived gases
AT	0	4 212	0	12 389	31 113	1 978	9	129 598	9 296	0	1 524	24 258
BE	18 000	38 118	11 145	5 315	66 471	8 376	45	269 125	1 739	0	3 937	120 121
BG	0	166	0	1 727	39 668	207 957	0	68 475	212	0	11 530	10 365
CY	0	0	0	32 462	0	96	18	0	5 234	0	5 233	0
CZ	22 336	1 274	18 279	3 297	73 379	399 940	2	67 225	10 803	0	3 394	23 898
DE	81 257	6 256	59 292	47 561	1 197 548	1 478 800	295	1 037 511	373 930	1	3 997	224 177
DK	0	574	0	5 501	105 924	0	61	67 423	16 432	0	6 687	7 948
EE	0	0	0	29	1 689	0	0	8 288	119 211	1 795	0	586
EL	0	0	0	52 349	2 411	275 553	177	58 806	16 883	0	21 107	36 463
ES	11 245	2 041	691	135 145	271 661	147 179	380	625 272	60 272	0	50 939	104 091
FI	0	603	712	12 932	87 651	6	5 820	85 302	11 983	54 497	1 475	27 234
FR	18 906	1 768	475	76 690	155 661	3 531	2 611	408 406	237 608	0	24 155	118 716
HR	0	1 052	0	5 796	25 544	752	142	35 463	654	0	4 959	7 196
HU	3 522	14 438	3 893	940	22	64 935	7	106 169	3 569	0	1 088	29 449
IE	0	0	0	4 917	43 508	0	75	109 316	2 464	23 591	4 739	4 771
IS	0	0	0	87	0	0	21	0	6 039	0	0	0
IT	2	48 357	2 752	51 789	7 766	508 195	3 491	998 046	69 844	0	57 330	257 847
LI	0	0	0	2	0	0	0	3	0	0	0	0
LT	0	365	0	4 219	0	0	0	69 517	4 486	13	1	13 080
LU	0	0	0	76	1 751	125	0	20 200	690	0	86	0
LV	0	0	0	0	1 411	0	0	27 416	245	0	0	0
MT	0	0	0	18 836	0	0	0.00	0	2 302	0	0	0
NL	25 896	938	0	3 130	255 598	481	78	508 587	6 818	0	0	252 532
NO	0	13 840	0	3 395	19 467	0	3 793	13 148	74 187	0	9 476	258 355
PL	16 688	23 958	54 465	32 890	997 583	514 374	70	223 157	14 177	0	0	67 056
PT	0	0	0	0	108 058	0	58	85 438	16 451	0	16 360	27 953
RO	277	225	0	1 998	27 262	186 290	7	176 218	3 538	0	13 768	23 525
SE	6 684	702	502	16 973	17 978	0	1 634	3 278	76 893	6 117	1 624	26 455
SI	0	631	0	1 106	249	41 579	4	13 036	1	0	1 495	0
SK	12 936	527	10 442	6 598	26 225	25 396	0	42 844	3 364	284	3 247	13 656
UK	50 627	40 099	24 564	11 197	954 851	0	4 212	891 914	44 140	0	1 374	304 073
Total (all)	268 376	200 143	187 212	549 348	4 520 449	3 865 544	23 008	6 149 180	1 193 465	86 298	249 526	1 983 805
Total (EU)	268 376	186 303	187 212	545 864	4 500 982	3 865 544	19 194	6 136 029	1 113 239	86 298	240 050	1 725 450

Note: The country codes used are defined in the 'Acronyms and country codes' section.

Table A4.5 Fuel consumption (in TJ) reported in the Article 21 questionnaire, 2013

	Blast furnace gas	Coke	Coke oven gas	Fuel oil	Hard coal	Lignite and sub-bituminous coal	LPG	Natural gas	Other fossil fuels	Peat	Petroleum coke	Refinery gas and other derived gases
AT	0	19 336	0	14 369	99 948	1 699	2	158 217	366	0	1 591	23 688
BE	18 000	37 137	12 876	8 522	73 045	7 855	46	285 881	1 604	0	4 418	112 440
BG	0	33	0	1 960	36 177	194 779	153	102 904	163	0	13 313	10 988
CY	0	0	0	26 637	0	0	38	0	10 038	0	4 347	0
CZ	21 151	1 418	15 995	3 391	55 985	161 282	2	750 067	6 562	0	1	19 556
DE	80 012	5 517	57 027	73 363	1 271 446	1 544 023	720	1 090 821	507 198	1	3 906	219 237
DK	0	0	0	7 576	134 059	521	31	76 440	16 129	0	6 065	14 006
EE	0	0	2 727	27	1 464	0	0	10 354	125 299	1 118	172	541
EL	0	0	0	54 418	2 190	292 600	214	104 982	15 469	0	18 058	40 182
ES	10 918	8 926	819	103 208	244 565	135 701	144	645 671	120 351	103	48 676	106 302
FI	0	696	686	12 260	108 397	5	5 334	95 888	1 013	51 205	1 885	28 353
FR	17 113	830	288	92 324	266 626	3 334	1 016	464 020	147 144	0	32 159	121 486
HR	0	500	0	6 970	26 685	805	114	42 340	654	0	4 200	7 444
HU	2 654	11 243	3 622	2 425	30	68 515	5	114 838	18 640	0	2 378	17 713
IE	0	0	0	6 558	43 696	0	116	111 408	3 473	21 928	3 736	5 131
IS	0	0	0	116	0	0	27	0	5 877	0	0	0
IT	18	57 897	2 418	67 070	12 169	127 687	6 559	1 095 277	498 837	0	62 728	214 780
LI	0	0	0	8	0	0	0	6	0	0	0	0
LT	0	474	0	6 007	0	0	2	72 661	5 420	54	3	22 412
LU	0	0	0	43	2 703	95	0	19 320	337	0	29	0
LV	0	0	0	362	1 747	0	0	32 169	2 122	42	0	0
MT	0	0	0	19 130	0	0	0.00	0	2 473	0	0	0
NL	24 925	7 663	0	13 855	222 648	1 090	89	653 626	0	410	0	377 835
NO	0	13 852	0	3 539	17 971	0	4 486	13 090	77 371	0	9 525	266 131
PL	13 851	22 127	54 066	37 187	1 080 051	537 187	74	218 309	11 026	0	0	71 421
PT	0	0	0	0	106 794	0	60	71 996	17 085	0	14 540	8 743
RO	0	496	0	3 147	12 429	201 058	10	185 380	3 697	0	11 007	23 018
SE	6 327	729	1 151	24 476	21 924	0	3 636	7 293	84 012	7 618	1 402	24 161
SI	0	630	0	333	217	54 400	10	14 837	1	0	1 458	3
SK	12 121	480	9 784	9 102	26 214	27 665	0	56 953	3 687	587	3 405	14 257
UK	50 211	146 575	25 406	40 086	1 243 657	0	1 921	1 030 491	2 018	0	2 264	33 853
Totals (all)	257 301	336 559	186 865	638 469	5 112 837	3 360 301	24 810	7 525 239	1 688 066	83 066	251 266	1 783 681
Totals (EU)	257 301	322 707	186 865	634 806	5 094 866	3 360 301	20 297	7 512 143	1 604 818	83 066	241 741	1 517 550

Note: The country codes used are defined in the 'Acronyms and country codes' section.

Table A4.6 Total emissions by fuel (in kt CO_2) reported in the Article 21 questionnaire, 2014

	Blast furnace gas	Coke	Coke oven gas	Fuel oil	Hard coal	Lignite and sub-bituminous coal	LPG	Natural gas	Other fossil fuels	Peat	Petroleum coke	Refinery gas and other derived gases
AT	0.0	439.7	0.0	1 001.3	2 874.6	191.9	0.6	7 181.0	775.1	0.0	143.9	1 282.6
BE	4 600.0	4 112.8	457.7	408.4	6 253.8	818.6	2.9	15 190.3	139.5	0.0	377.0	6 108.4
BG	0.0	18.5	0.0	133.2	3 794.9	21 539.1	0.0	3 765.7	15.6	0.0	1 092.4	651.0
CY	0.0	0.0	0.0	2 567.1	0.0	9.1	1.1	0.0	387.2	0.0	493.9	0.0
CZ	5 797.6	491.1	802.8	271.0	6 768.1	38 190.4	0.1	3 691.5	1 010.4	0.0	311.1	1 500.8
DE	21 319.8	799.9	2 433.0	3 712.9	112 297.0	173 785.9	19.6	58 058.2	28 761.2	0.1	382.9	13 064.9
DK	0.0	62.5	0.0	458.8	9 972.9	0.0	3.8	4 099.2	1 441.2	0.0	625.3	458.3
EE	0.0	0.0	0.0	2.2	162.1	0.0	0.0	463.6	12 279.7	96.1	0.0	83.8
EL	0.0	0.0	0.0	4 005.0	225.7	33 954.8	11.1	4 036.5	1 331.1	0.0	1 988.1	2 376.5
ES	2 947.8	204.7	29.3	9 280.3	25 636.1	14 368.8	24.1	35 211.4	3 727.7	0.0	4 790.1	6 002.6
FI	0.0	64.6	31.1	1 018.2	8 085.2	0.8	376.9	4 688.3	577.7	5 789.8	137.9	1 476.0
FR	4 326.6	175.3	22.3	5 909.2	14 518.7	344.0	146.3	23 034.2	7 913.2	0.0	2 488.2	6 794.8
HR	0.0	112.5	0.0	448.8	2 405.5	72.5	8.9	1 960.4	41.8	0.0	467.0	363.4
HU	862.4	1 539.8	184.6	71.7	2.0	7 015.5	0.4	5 938.6	302.3	0.0	101.2	1 522.2
IE	0.0	0.0	0.0	386.3	4 025.9	0.0	4.8	6 212.5	212.7	2 760.5	439.7	257.9
IS	0.0	79.5	0.0	6.7	272.6	0.0	1.3	0.0	1 394.9	0.0	0.0	0.0
IT	0.4	5 412.9	114.5	4 076.8	764.0	47 723.4	228.6	56 163.6	5 396.7	0.0	5 402.4	14 458.0
LI	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
LT	0.0	39.9	0.0	343.3	0.0	0.0	0.0	3 875.3	424.2	1.3	0.1	772.1
LU	0.0	0.0	0.0	5.6	251.0	12.2	0.0	1 151.9	494.0	0.0	2.8	0.0
LV	0.0	0.0	0.0	0.0	129.9	0.0	0.0	1 505.0	18.1	0.0	0.0	0.0
MT	0.0	0.0	0.0	1 483.0	0.0	0.0	0.0	0.0	168.6	0.0	0.0	0.0
NL	5 927.1	97.5	0.0	233.4	24 159.6	52.1	5.2	28 699.7	687.9	0.0	0.0	13 609.4
NO	0.0	1 242.4	0.0	255.4	1 879.9	0.0	240.6	733.8	3 225.4	0.0	987.5	12 184.8
PL	4 068.7	2 599.0	2 432.3	2 560.1	93 428.1	56 968.1	4.4	12 375.4	1 280.8	0.0	0.0	3 727.3
PT	0.0	0.0	0.0	0.0	10 049.1	0.0	3.6	4 788.7	1 325.8	0.0	1 529.7	1 545.9
RO	74.2	23.3	0.0	159.4	2 503.4	16 948.9	0.5	9 799.4	318.7	0.0	1 271.5	1 349.4
SE	2 048.2	71.7	21.0	1 291.7	1 698.8	0.0	194.2	339.7	4 618.5	623.1	152.2	1 486.8
SI	0.0	67.5	0.0	82.7	24.2	4 270.9	0.2	720.8	0.0	0.0	149.2	0.0
SK	3 309.1	57.0	433.1	513.5	2 538.1	2 584.3	0.0	2 393.6	286.6	26.9	309.2	959.9
UK	13 464.2	1 579.0	1 084.0	874.6	88 390.2	0.0	336.9	52 367.2	1 935.2	0.0	140.6	21 555.6
Totals (All)	68 746	19 291	8 046	41 560	423 112	418 851	1 616	348 446	80 492	9 298	23 784	113 592
Totals (EU)	68 746	17 969	8 046	41 298	420 959	418 851	1 374	347 712	75 872	9 298	22 796	101 407

Note: The country codes used are defined in the 'Acronyms and country codes' section.

Table A4.7 Total emissions by fuel (in kt CO_2) reported in the Article 21 questionnaire, 2013

	Blast furnace gas	Coke	Coke oven gas	Fuel oil	Hard coal	Lignite and sub-bituminous coal	LPG	Natural gas	Other fossil fuels	Peat	Petroleum coke	Refinery gas and other derived gases
AT	0.0	3 657.4	0.0	1 566.1	9 197.8	165.3	0.1	8 771.1	26.2	0.0	151.3	1 258.3
BE	4 600.0	4 014.9	529.3	700.6	6 979.1	771.6	2.9	15 649.1	127.3	0.0	426.2	5 729.5
BG	0.0	3.5	0.0	151.2	3 461.6	20 180.7	10.0	4 321.3	11.8	0.0	1 253.0	733.2
CY	0.0	0.0	0.0	2 106.2	0.0	0.0	2.4	0.0	743.9	0.0	406.0	0.0
CZ	5 495.1	156.4	709.3	277.7	5 098.0	15 314.4	0.2	3 596.0	281.1	0.0	0.1	1 257.2
DE	20 873.8	708.4	2 329.8	5 780.4	118 786.2	170 143.0	46.7	61 342.0	29 480.2	0.1	372.8	12 839.1
DK	0.0	0.0	0.0	581.3	12 575.1	56.3	2.0	4 353.7	1 459.9	0.0	564.1	815.0
EE	0.0	0.0	160.0	2.0	140.4	0.0	0.0	580.9	14 822.2	117.2	15.9	83.9
EL	0.0	0.0	0.0	4 166.6	205.8	36 113.5	12.8	5 804.6	1 418.1	0.0	1 673.3	2 669.5
ES	2 838.8	999.9	36.4	7 491.7	23 384.5	13 036.8	9.2	36 305.5	6 478.5	10.2	4 235.5	5 721.1
FI	0.0	74.3	28.2	965.4	10 007.5	0.8	345.2	5 268.9	73.7	5 449.0	176.2	1 592.0
FR	3 816.3	198.4	13.5	7 134.6	24 736.6	326.2	65.0	26 256.6	7 302.9	0.0	2 968.0	6 872.4
HR	0.0	52.5	0.0	537.6	2 482.9	75.1	7.2	2 332.3	40.3	0.0	387.3	376.2
HU	667.5	1 226.6	171.8	191.1	2.8	7 369.4	0.3	6 411.9	1 114.8	0.0	219.9	770.3
IE	0.0	0.0	0.0	513.7	4 098.9	0.0	7.4	6 340.5	215.0	2 582.0	347.2	275.2
IS	0.3	92.0	0.0	8.9	295.4	0.0	2.5	0.0	1 379.8	0.0	0.0	1.0
IT	12.1	6 392.0	110.7	5 262.2	1 195.8	11 926.1	437.6	61 816.9	46 246.4	0.0	5 898.7	11 848.8
LI	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
LT	0.0	51.7	0.0	482.3	0.0	0.0	0.1	4 050.4	512.1	5.6	0.2	1 518.4
LU	0.0	0.0	0.0	3.2	255.5	9.2	0.0	1 091.7	21.1	0.0	2.8	0.0
LV	0.0	0.0	0.0	27.3	163.2	0.0	0.0	1 774.7	92.5	4.3	0.0	0.0
MT	0.0	0.0	0.0	1 516.3	0.0	0.0	0.0	0.0	181.0	0.0	0.0	0.0
NL	5 554.2	976.6	0.0	1 064.4	21 001.9	124.6	5.9	36 749.4	0.0	81.0	0.0	14 187.1
NO	0.0	1 249.6	0.0	269.0	1 750.1	0.0	284.6	730.9	3 664.6	0.0	988.6	12 550.5
PL	3 407.7	2 409.6	2 427.3	2 871.3	101 089.6	59 737.5	5.5	12 120.3	981.4	0.0	0.0	3 979.9
PT	0.0	0.0	0.0	0.0	9 942.0	0.0	4.0	5 120.6	268.8	0.0	1 363.6	410.6
RO	0.0	39.3	0.0	249.2	1 156.9	17 997.9	0.6	10 167.0	322.6	0.0	1 021.4	1 331.8
SE	1 930.7	75.3	51.1	1 728.2	2 067.7	0.0	236.9	414.5	7 044.1	799.9	130.4	1 321.7
SI	0.0	68.2	0.0	25.3	20.6	5 518.2	0.7	820.4	0.1	0.0	142.9	0.1
SK	3 100.5	52.6	405.8	714.1	2 590.9	2 850.3	0.0	3 166.4	293.0	55.6	326.4	1 007.3
UK	13 376.1	3 334.9	1 082.0	3 144.9	115 144.3	0.0	155.2	64 572.6	104.2	0.0	226.6	2 224.0
Totals (All)	65 673	25 834	8 055	49 533	477 831	361 717	1 645	389 930	124 708	9 105	23 298	91 374
Totals (EU)	65 673	24 493	8 055	49 255	475 785	361 717	1 358	389 199	119 663	9 105	22 310	78 823

Note: The country codes used are defined in the 'Acronyms and country codes' section.

A4.3 Application of the simplifications allowed within the Monitoring and Reporting Regulation

A4.3.1 Frequency of analysis

Annex VII of the MRR stipulates the minimum frequencies that are allowed for the analysis of listed fuels and materials. However, under Article 35(2)(b) of the MRR, CAs can allow operators to analyse fuels and materials at a different frequency if the frequency in Annex VII would 'incur unreasonable costs'. Sixteen countries reported that at least one installation had been permitted to apply such flexibility, compared with 15 in the 2013 reporting period. The United Kingdom allowed this flexibility in the highest number of instances (271 cases). Process gas ([60]) was the most common fuel for which a different frequency of analysis was allowed for cost reasons (213 instances in 10 countries), followed by natural gas (71 instances in 7 countries).

There has been little change in the number of instances in which CAs have allowed different frequencies within countries between the 2013 and 2014 reporting periods; the largest decrease was in Croatia (from 24 instances in 2013 to 4 instances in 2014), and the largest increases were in Belgium and Spain (2 to 7 instances, and 22 to 27 instances, respectively). Across all countries, the total number of instances in which a different frequency of analysis was allowed decreased by 8 % between 2013 and 2014.

A4.4 Arrangements for verification

A4.4.1 The EU ETS verification process

Data verification under the EU ETS is part of the MRV system, which is crucial for the promotion of trust in emission trading and to ensure transparency. Every year, installation and aircraft operators are required to submit an AER, in line with the MRR, to the relevant CA.

The AER is the main document used to state the quantities of emitted GHGs in a given year and, therefore, it must be verified by an independent, accredited verifier in line with the AVR by 31 March in any given year. Once this document has been verified, operators must surrender an equal number of allowances by 30 April of that year. The AVR helps operators, regulators and verification bodies to perform their verifications in a consistent manner by providing practical information and advice on the requirements for annual verification.

A4.4.2 Verifier scopes

Verifiers are accredited for the verification of individual EU ETS activities. Verifiers can be accredited for more than one activity. The verifier scope refers to the activities for which a verifier is accredited. Table A4.8 provides an overview of the scope of the accredited verifiers across all of the countries that reported. The scope with the largest number of accredited verifiers (133) is scope 1a, which concerns fuel combustion; scope 1a is also the most widespread amongst countries (25 countries have accredited verifiers for scope 1a). Fuel combustion is the only activity for which all countries have permits. The lowest number of verifiers (with only five verifiers for each) are for scope categories 10 and 11 (which relate to the capture, transport and storage of GHGs). Only France and Norway reported having installations with permits for the capture and storage of GHGs, and only Germany reported having accredited verifiers for the capture, transport and geological storage of GHGs.

A4.4.3 Verification reports that identified issues

Table A4.9 presents the number of outstanding issues in verification reports by the type of issue, and the change between 2013 and 2014.

([60]) This covers blast furnace gas, coke oven gas, converter gas and refinery mixed gas.

Table A4.8 Number of accredited verifiers by Annex I scope, 2014

Scope		Verifiers	Number of countries
1a	Fuel combustion of commercial standard fuels in installations, or of natural gas in category A or B installations	133	25
1b	Fuel combustion in installations without restrictions	130	23
2	Refining of mineral oil	78	22
3	Production of coke; metal ore; pig iron or steel	93	21
4	Production/processing of ferrous metals; secondary aluminium; non-ferrous metals	90	20
5	Production of primary aluminium (CO_2 and PFC emissions)	39	16
6	Production of cement clinker; lime, dolomite, magnesite; glass; ceramic products; mineral wool; drying/calcination of gypsum or production of plaster boards/other gypsum products	120	24
7	Production of pulp; paper or cardboard	105	21
8	Production of carbon black; ammonia; bulk organic chemicals; hydrogen; soda ash; sodium bicarbonate	89	22
9	Production of nitric acid; adipic acid; glyoxal and glyoxylic acid; caprolactam	47	17
10	Capture of GHGs from installations for transport and geological storage; transport of GHGs by pipelines for geological storage	5	1
11	Geological storage of GHGs	5	1
12	Aviation activities	57	19
98	Other activities pursuant to Article 10(a) of Directive 2003/87/EC	67	13
99	Other activities, included by a Member State pursuant to Article 24 of Directive 2003/87/EC, to be specified in detail in the accreditation certificate	17	3

Note: All countries reported in 2014.

Table A4.9 Outstanding issues in verification reports, 2013–2014

Type of issue	2014	2013	Change from 2013 to 2014 (%)
Non-material misstatements	396	685	– 42
Non-conformities that do not lead to a negative VOS	983	1 721	– 43
Non-compliance with Commission Regulation 601/2012 (EU, 2012b)	677	1 161	– 42
Recommendations for improvement	1 958	2 784	– 30
Total	**4 160**	**6 351**	**– 37**

Note: All countries reported for both years.

A4.5 Transfer of inherent carbon dioxide and permanent storage of carbon dioxide

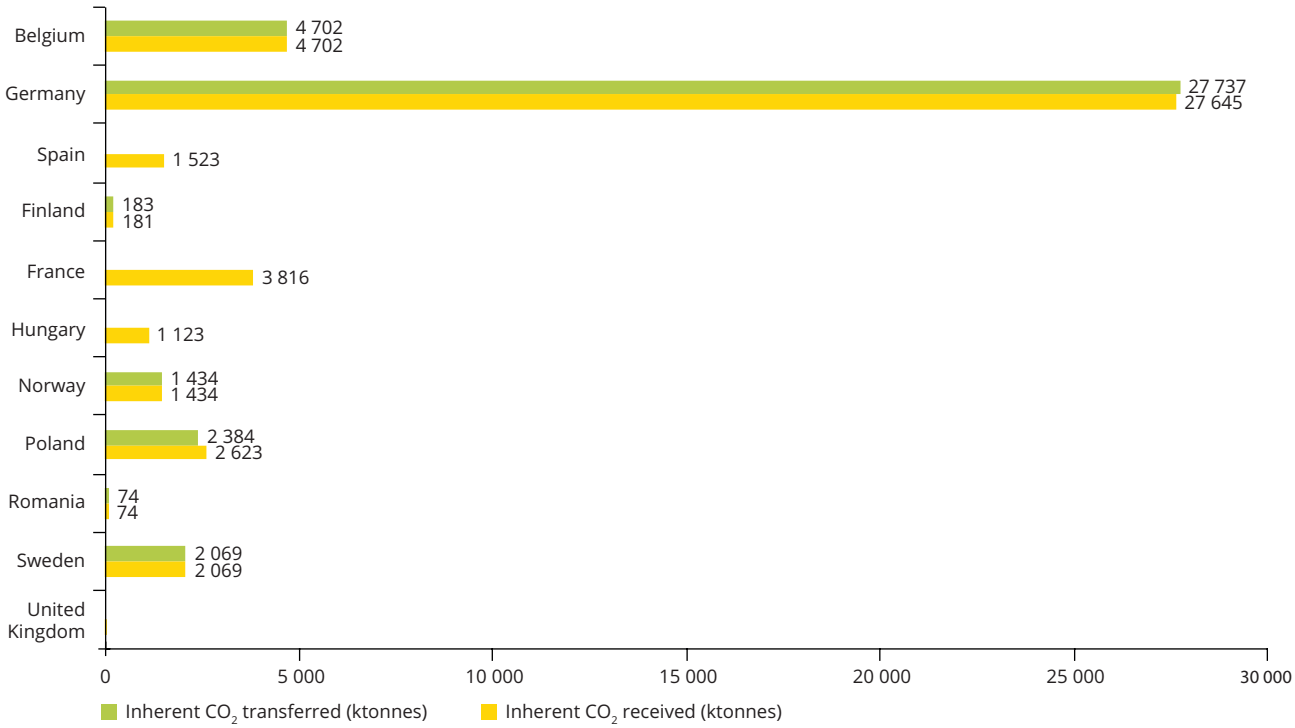
A4.5.1 Transfer of inherent carbon dioxide

Article 48 of the MRR covers the transfer of inherent CO_2 or CO_2 from installations that perform activities covered by Annex I of the EU ETS Directive. Inherent CO_2 is CO_2 that results from an EU ETS activity and is contained in a gas that is transferred to other installations as a fuel ([61]); for example, blast furnace gas or coke oven gas is generated as a by-product in blast furnaces in the iron and steel industry, and can be sold to an electricity or heat plant in which it can be used as a fuel and in which the production of emissions eventually occurs. If transfers of inherent CO_2 take place between EU ETS installations, the CO_2 transferred should not be counted as emissions for the installation of origin, but for the installation from which it is finally emitted. However, if the transfer occurs to an installation outside the scope of the EU ETS, the transferring installation has to account for the emissions.

In 2014, 12 countries reported a transfer of inherent CO_2, which was an increase from the 10 countries reporting such transfers in 2013. However, the number of installations involved in such transfers decreased from 140 to 136 between 2013 and 2014. The quantity of inherent CO_2 transferred decreased by 6 %, but the amount received increased by 12 %.

As shown in Figure A4.1, Germany reported the highest total amounts of CO_2 transferred (27 737 kt CO_2) and received (27 645 kt CO_2). Belgium reported the second largest amount of CO_2 transferred (4 702 kt CO_2), and this amount was transferred between only EU ETS installations. In some pairs of transfers and receipts, the differences between the amounts of CO_2 transferred and the amounts received were higher than the differences for Germany and Belgium; however, from the data available, it is not possible to determine the reasons for these higher differences, and it could also be the case that some of the CO_2 was transferred to another EU ETS installation and some was transferred occurred to an installation outside the EU ETS.

Figure A4.1 Total amounts of inherent CO_2 (in kt) transferred and received from EU ETS installations per country, 2014



([61]) This could be natural gas, a waste gas including blast furnace gas, or coke oven gas.

A4.5.2 Permanent storage of carbon dioxide

Article 49 of the MRR allows CO_2 emissions to be subtracted from the total installation emissions covered by the EU ETS if the CO_2 is transferred for the purpose of long-term geological storage. Only Norway reported the use of this option and transferred a total of 1 245 kt CO_2 from two installations to long-term storage sites.

Recital 13 of the MRR states that Article 49 of the MRR should not exclude possible future innovations. In order to determine whether or not Article 49 of the MRR may need to be adapted in the future, countries were asked if innovative technologies, which could be applied to the permanent storage of CO_2, are foreseen. Only Iceland and Norway reported the development of such technologies ([62]).

([62]) Iceland provided a link to a website (https://www.or.is/en/prjects/carbfix) for a project in which the natural CO_2 storage process will be imitated in basaltic rocks in Icelandic geothermal fields. Norway briefly described using 4D seismology and stated that this is the technology that they consider best for monitoring stored CO_2.

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