Ozone-depleting substances 2019

Aggregated data reported by companies on the import, export, production, destruction, feedstock and process agent use of ozone-depleting substances in the European Union, 2006-2018

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European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark

Tel.: +45 33 36 71 00
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

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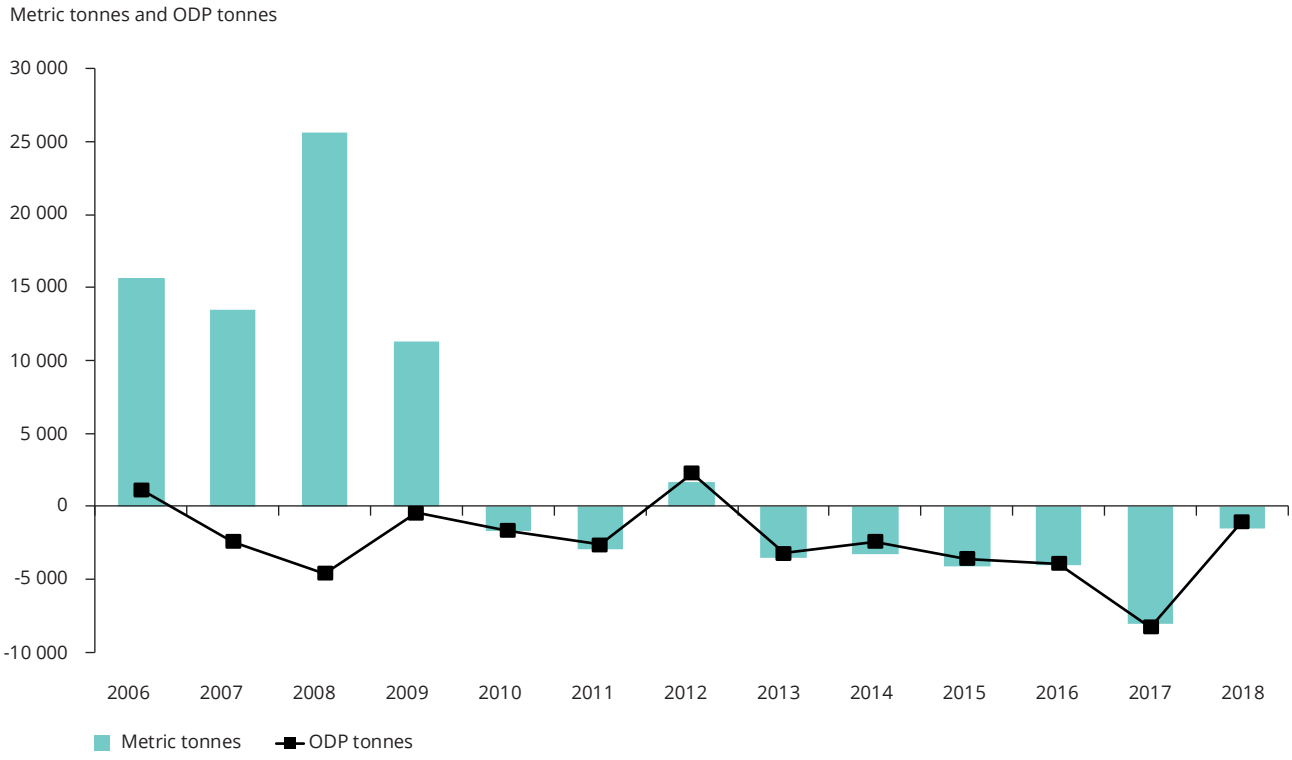
Executive summary

The EU continues to phase out ozone-depleting substances and is meeting its commitments under the Montreal Protocol

The 2019 edition of the European Environment Agency (EEA) report on ODS confirms that the EU has already achieved its goals on the phase-out of such substances under the Montreal Protocol. In particular, the report shows that in 2018, the consumption of ODS (an aggregated parameter that integrates imports, exports, production and destruction of ODS, except those for feedstock use) in the EU was negative (-1 505 metric tonnes), which means that more ODS were destroyed or exported than produced or imported. This was the case since 2010 with the exception of 2012. These negative values are the result of the phase-out according to Regulation (EC) No 1005/2009, which, in many aspects, goes further than the Montreal Protocol, in combination with rather high destruction rates and decreasing stocks. Companies in the EU have been consuming relatively small amounts of ODS under the Montreal Protocol.

More details on 2018 transfers of controlled substances in the EU are provided in the following paragraphs.

Figure ES.1 Consumption of controlled substances within the EU



Note: The calculation of the consumption of controlled substances under the Montreal Protocol excludes non-virgin imports and exports, substances intended for feedstock and process agent use, as well as new substances.

Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

Imports of controlled substances

In 2018, imports of controlled substances into the EU amounted to 8 712 metric tonnes, which represents a 39 % increase compared with 2017. Following an increase from 2016 to 2017, this was the second increase observed since 2011. The imported controlled substances were almost entirely virgin substances and 64 % of the quantities were imported from China. Almost half of the imported virgin quantities were HCFCs. Controlled substances were mostly imported for feedstock use. Imports of nonvirgin controlled substances amounted to less than 1 % of total imports. Expressed in ODP tonnes, imports of CTC, halons and CFCs were largest.

Exports of controlled substances

In 2018, exports of controlled virgin substances from the EU increased again after a period of decline in previous years. These exports amounted to 10 257 metric tonnes, a 61 % increase compared with 2017. The largest exported quantities were of HCFCs either previously imported or produced in the EU (59 % of total exports) and CTCs produced in the EU. Virgin HCFCs were mostly exported for feedstock and refrigeration, and CTCs were almost exclusively exported for feedstock use and, to a very small extent, for laboratory use. As with imports, controlled non-virgin substances were exported out of the EU to a much lesser extent than controlled virgin substances, amounting to 4 % of total exports when expressed in metric tonnes. Expressed in ODP tonnes, exports of HCFCs and CTC were largest.

Production of controlled substances

In 2018, the production of controlled substances in the EU amounted to 187 037 metric tonnes, a 4 % increase compared with 2017. This included mostly HCFCs, CTC and TCA. Only minor quantities of halons, HBFCs and BCM, and no CFCs or MB, were produced. Expressed in ODP tonnes, production of CTC and HCFCs was largest (71 % and 15 % of total production, respectively). Controlled substances were produced almost exclusively for feedstock use inside the EU (95 % of the produced quantity in metric tonnes). While the production for feedstock use inside the EU decreased by 1 % in 2018 compared with 2017, the production for other uses, which is the one accounted for in the estimation of the consumption of controlled substances (see below), increased by 126 % in 2018 compared with 2017.

Destruction of controlled substances

In 2018, a total of 9 056 metric tonnes of controlled substances was destroyed, a 7 % decrease compared with 2017. The largest quantities destroyed were of CTC, CFCs and HCFCs (85 %, 8 % and 6 % of total destruction, respectively). Expressed in ODP tonnes, the largest quantities destroyed were of CTC and CFCs (91 % and 8 % of total production, respectively).

Consumption of controlled substances

Consumption is an aggregated parameter calculated for data reported under the Montreal Protocol. It integrates the statistics on import, export, production and destruction of controlled substances into one single metric, excluding non-virgin imports and exports. Amounts that are produced for feedstock and process agent use are not included in the consumption, which is in line with the calculations applied under the Montreal Protocol. New substances listed in Annex II to the ODS regulation are also excluded from the consumption.

In brief, consumption is calculated as:

consumption = adjusted production + adjusted import – export – destruction

In 2018, the consumption of controlled substances amounted to -1 505 metric tonnes, a markedly higher level than in 2017. The consumption of controlled substances has been negative every year since 2010, except in 2012. Expressed in ODP tonnes, consumption amounted to -1 048 ODP tonnes.

Feedstock use of controlled substances

A number of ODS serve as feedstock for the manufacture of other products such as refrigerants, foam blowing agents, polymers, pharmaceuticals and agricultural chemicals. In 2018, feedstock use amounted to 173 367 tonnes, a 3 % decrease

compared with 2017. This predominantly comprised HCFCs (70 % of total use), CTC and TCA. Expressed in ODP tonnes, CTC, HCFCs and halons represented the largest quantities used for feedstock.

In 2018, the emission rate from feedstock uses was 0.03 %. The 2018 average emission rate was comparable to the emission rate in 2017 and much lower than the emission rate for earlier years. This appears to point towards improvements in emission control by industry.

Process agent use of controlled substances

A process agent is a substance that either facilitates or inhibits a chemical reaction in an industrial process. In 2018, make-up ([1]) and emissions stayed well below restrictions imposed by both the Montreal Protocol and the ODS Regulation.

New substances

The ODS Regulation is more stringent than the rules of the Montreal Protocol and additionally encompasses new substances (halon 1202, n-PB, EB, TFIM and MC). In 2018, the production of new substances amounted to 1 132 795 metric tonnes, a 3 % increase compared with 2017. The production of new substances was almost exclusively for feedstock use and predominantly comprised MC (99.6 % of total production), nPB and EB. Expressed in ODP tonnes, the production of MC was also largest (98 % of total production).

In 2018, the production of new substances was almost seven times higher than the production of controlled substances expressed in metric tonnes. However, when expressed in ODP tonnes, the production of new substances accounted for 32 % of both controlled and new substances in the same year.

About this report

The 2019 edition of the annual European Environment Agency (EEA) report, Ozone-depleting substances, provides an updated aggregated overview of key data on ozone-depleting substances in the European Union. The report also presents the major trends observed since 2006. The report is based on the data on import, export, production, destruction, and feedstock and process agent use of ODS, reported by companies in accordance with the EU Regulation on ODS for 2018.

Since the potential to harm the ozone layer varies among substances, the data presented in this report are expressed not only in metric tonnes but also in 'ozone-depleting potential' (ODP), which show quantities in terms of their potential impact on the ozone layer.

In 1989, the Montreal Protocol on Substances that Deplete the Ozone Layer entered into force. Its objective is to protect the stratospheric ozone layer by phasing out the production of **ozone-depleting substances (ODS)**. The protocol covers over 200 individual substances with a high ozone-depleting potential (ODP), including chlorofluorocarbons (CFCs), halons, carbon tetrachloride (CTC), 1,1,1-Trichloroethane (TCA), hydrochlorofluorocarbons (HCFCs), hydrobromofluorocarbons (HBFCs), bromochloromethane (BCM) and methyl bromide (MB), all of which are referred to as 'controlled substances'.

Within the European Union (EU), the use of and trade in controlled substances is regulated by Regulation (EC) No 1005/2009 (known as the ODS Regulation). This regulation stipulates that each company producing controlled substances, importing them into and/or exporting them out of the EU, as well as feedstock users, process agent users and destruction facilities, must report their activities concerning controlled substances annually. The ODS Regulation also encompasses five additional substances that are not covered by the Montreal Protocol but have an ODP (these are referred to as 'new substances'). Producers, importers and exporters have to report their activities for new substances. These new substances are halon 1202, methyl chloride (MC), ethyl bromide (EB), trifluoroiodomethane (TFIM) and *n*-propyl bromide (n-PB).

The data reported on production, import and export are presented to parties of the Montreal Protocol, so that compliance with the Montreal Protocol and progress in phasing out ODS can be monitored. The EU has already achieved its phase-out goals under the

([1]) See Annex 3 for the definition of the term 'make-up'.

Montreal Protocol and is currently mostly reporting exempted, essential and critical uses of ODS.

Data submitted by companies are commercially confidential, and a number of rigorous measures have been applied to protect that confidentiality.

EEA reports

This report is part of an annual series of EEA reports on ozone-depleting substances under the Montreal Protocol and on fluorinated greenhouse gases. All EEA reports are available at: https://www.eea.europa.eu.

About the EEA

The EEA is an agency of the EU. It aims to support sustainable development and to help achieve significant and measurable improvement in Europe's environment by providing timely, targeted, relevant and reliable information to policymaking agents and the public. It is supported in its work by the European environment information and observation network (Eionet), a network of 39 European countries.

Authors

This report was prepared for the European Environment Agency (EEA) by its European Topic Centre on Climate Change Mitigation and Energy (ETC/CME). The ETC/CME is a consortium of European institutes that assist the EEA in its support to EU policy in the field of climate change mitigation and energy.

The authors are David Behringer and Felix Heydel (ETC/CME partner Öko-Recherche GmbH). The EEA report coordinator is Peder Gabrielsen and the ETC/CME task manager is Felix Heydel (Öko-Recherche GmbH). François Dejean (EEA) and the European Commission Directorate-General for Climate Action are thanked for their support in finalising the report.

1 Introduction

1.1 Background

In 1989, the Montreal Protocol on Substances that Deplete the Ozone Layer entered into force. Its objective is to protect the stratospheric ozone layer by phasing out the production of ozone-depleting substances (ODS). The protocol covers over 200 individual substances with a high ozone-depleting potential (ODP), including chlorofluorocarbons (CFCs), halons, carbon tetrachloride (CTC), 1,1,1-Trichloroethane (TCA), hydrochlorofluorocarbons (HCFCs), hydrobromofluorocarbons (HBFCs), bromochloromethane (BCM) and methyl bromide (MB), all of which are referred to as 'controlled substances'.

Within the European Union (EU), the use of and trade in controlled substances is regulated by Regulation (EC) No 1005/2009 (known as the ODS Regulation) (EC, 2009). This regulation stipulates that each company producing controlled substances, importing them into and/or exporting them out of the EU, as well as feedstock users, process agent users and destruction facilities, must report their activities concerning controlled substances annually. The ODS Regulation also encompasses five additional substances that are not covered by the Montreal Protocol but have an ODP (these are referred to as 'new substances'; see Section 1.6). Producers, importers and exporters have to report their activities for new substances. These new substances are halon 1202, methyl chloride (MC), ethyl bromide (EB), trifluoroiodomethane (TFIM) and *n*-propyl bromide (n-PB).

The data reported on production, import and export are presented to parties of the Montreal Protocol, so that compliance with the Montreal Protocol and progress in phasing out ODS can be monitored. The EU has already achieved its phase-out goals under the Montreal Protocol and is currently mostly reporting exempted, essential and critical uses of ODS.

This document summarises the most recent data (covering 2018) reported by companies under the ODS Regulation and looks at the trends since 2006 (EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019). Data for the period 2012-2017 were also updated, based on the reports resubmitted after the reporting deadlines for these years. Data tables in Annex 1 provide additional details.

Results are expressed in both metric tonnes and ODP tonnes. The observed trends can differ significantly depending on the unit used. Controlled substances with a high ODP (e.g. CFCs and CTC) exhibit a different trend from those with a low ODP (e.g. HCFCs).

1.2 Report structure

This report contains background information and information on institutional arrangements, the reporting procedure and key terminology (Chapter 2 and Annex 3). The aggregation results and the methodology used also are summarised in Chapters 3-10. Results are included for the following ODS (controlled substances) transactions: production, import, export, consumption, destruction, feedstock use and process agent use. Production, import and export data of new substances are also presented.

1.3 Institutional arrangements

In 2019, companies reported on 2018 activities, which was the eighth reporting year under the ODS Regulation. Since the reporting year 2011, the European Environment Agency (EEA) has been responsible for collecting, archiving, checking and

aggregating information contained in the companies' reports. The EEA also supports the undertakings in fulfilling their reporting obligations.

Since 2012, technical support to the ODS reporting process has been provided by the EEA's European Topic Centre on Climate Change Mitigation and Energy (ETC/CME). In previous years, collection, quality control, analysis and support were performed by consultants under service contracts with the European Commission.

1.4 Reporting procedure

Since 2012, reporting on ODS has been performed via an online platform, the Business Data Repository (BDR; see https://bdr.eionet.europa.eu). This multilingual online platform is a password-protected environment that hosts, among other things, an online questionnaire for submission of the company reports under the ODS Regulation. It ensures that reporting by companies is documented transparently, while providing the required level of security and confidentiality of the reported data. Reporters received support both for the reporting procedure and for technical questions from the EEA and the ETC/CME support team, and via manuals and additional guidance documents.

Data reported by companies were subject to automated and manual quality checks. The latter were carried out by the ETC/CME support staff. Reporters also have the option to autonomously run the automated quality-checking procedure, in order to check their questionnaire before submission. Where necessary, reporters were contacted to submit a revised report via the BDR. This process was repeated until submissions passed all quality checks.

The ODS Regulation sets the reporting deadline as 31 March of each year. Based on information available on companies present in the market of ODS, the EEA sent out invitation emails in February 2018, reminding companies of their reporting obligations under the ODS Regulation. Invited companies that considered themselves exempt from the reporting obligation of the ODS Regulation were asked to communicate these circumstances using the online questionnaire. They were thus requested to submit a NIL report ([2]) in which they explicitly indicated why they considered themselves not covered by the reporting obligation.

In total, 216 companies responded to the invitation to report. Of these, 49 companies sent in a NIL report and 167 companies submitted an ODS report containing data. Submissions were received from 27 February 2019. Most companies submitting an ODS report were located in the larger Member States, notably Germany, the United Kingdom, France and Italy.

1.5 Data covered by this report

This report focuses on transactions that occurred during 2018, which were due to be submitted by the reporting deadline of 31 March 2019, while depicting trends and presenting data over the period 2006-2018 ([3]). Data are reported every year and, at the same time as submitting their data, companies have the opportunity to resubmit reports of previous transaction years in order to correct reporting errors ([4]). Therefore, the data presented here may differ from those in previous reports. To protect confidential information (see Section 1.7), the reported data are aggregated by transaction as follows: import, export, production, destruction, consumption, feedstock availability and process agent use. Likewise, data on the production, import and export of new substances are aggregated.

Data submitted by companies are commercially confidential and a number of rigorous measures have been applied to prevent sensitive information being made available. These measures are explained in detail in Annex 2.

1.6 Confidentiality

Data reported under the ODS Regulation are protected by strict confidentiality provisions. Hence, the EEA has applied measures to prevent the deduction of commercially sensitive information in this document. The measures include the aggregation of data for substance groups (where applicable), protection of data that are the result of reports from fewer than three corporate groups, and additional measures to prevent deduction of sensitive information. A detailed account of the confidentiality measures applied throughout the report is included in Annex 2.

([2]) See Annex 3 for an explanation of the term 'NIL report'.
([3]) Production data are available from 2000 onwards; therefore, trends extend back to that year for production.
([4]) Companies have the opportunity to resubmit reports for previous reporting cycles to address inconsistencies that span multiple years.

2 Imports of controlled substances

2.1 Data presented

Companies reported the quantity imported for each combination of substance, use, customs procedure and source country. Where possible from a confidentiality perspective, quantities were provided separately for each country of origin. The consumption calculation takes into account imports of virgin substances only, and the aggregation results presented therefore focus on such imports.

2.2 Results

2.2.1 Imports of controlled virgin substances

Imports of controlled virgin substances into the EU have shown a general decline over the years since 2007 (Figure 2.1). From 2012 to 2016, imports of controlled virgin substances have declined by an average of 14 %. Since 2016, imports are increasing again and the trend continues in 2018.

In 2018, imports amounted to 8 712 metric tonnes, an increase of 39 % compared with 2017. The controlled substances imported in the largest quantities in 2018 were HCFCs (4 968 metric tonnes, 57 % of the total imports), CTC ([5]), CFCs ([5]), BCM ([5]) and MB ([5]).

Due to the increase of imported HCFCs, CFCs and halons, the 2018 imports increased substantially compared with 2017 when expressed in ODP tonnes (from 2 955 ODP tonnes in 2017 to 4 391 OPD tonnes in 2018) and mainly consisted of CTC ([5]), halons, CFCs ([5]), MB ([5]), HCFCs (203 metric tonnes) and BCM.

HCFCs were mostly imported for feedstock and re-export for refrigeration. CTC was imported largely for feedstock and to a minor extent for laboratory use. Virgin halons were exclusively imported for feedstock use. Imported virgin CFCs, BCM and MB were placed on the EU market for feedstock and laboratory use (to a minor extent).

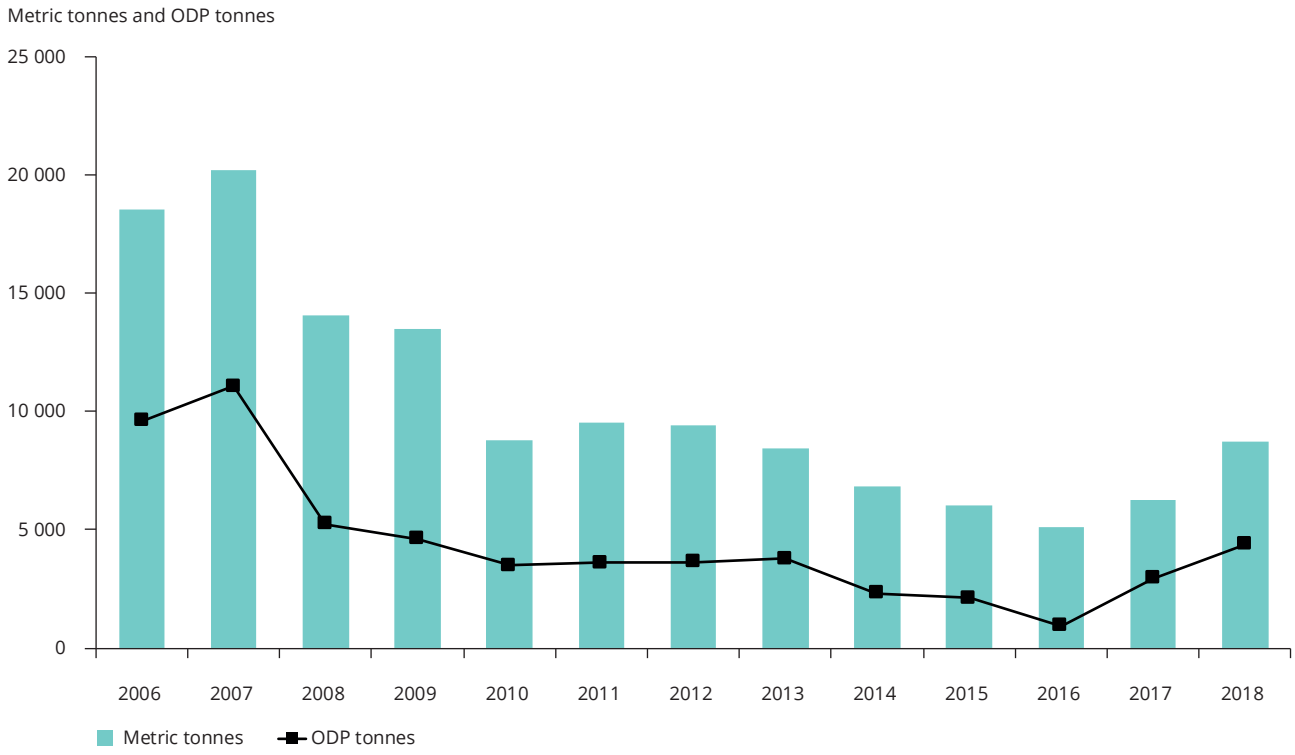
Imports of controlled virgin substances originated from seven source countries. When expressed in metric tonnes, imported controlled substances mostly originated from China (64 %) and the United States (23 %). The remaining 13 % came from Israel, India, the Russian Federation, Japan and Saudi Arabia, given in their order of importance.

2.2.2 Imports of controlled non-virgin substances

Controlled non-virgin substances were imported into the EU to a much lesser extent than controlled virgin substances, and amounted to 0.3 % of total imports when expressed in metric tonnes. In 2018, non-virgin imports were limited to HCFCs ([5]), halons ([5]), CFCs ([5]) and MB ([5]). Imports of non-virgin substances decreased by 16 metric tonnes in 2018.

([5]) For reasons of confidentiality, data are not included.

Figure 2.1 Trend in imports of controlled virgin substances into the EU (expressed in metric tonnes and ODP tonnes)



Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

3 Exports of controlled substances

3.1 Data presented

Reported exports are presented in an aggregated form for all ODS. Exports to overseas countries and territories were included in the total exports. Where possible from a confidentiality perspective, quantities were provided separately for each destination country. As with imports, the aggregation results focus on exports of virgin substances.

3.2 Results

3.2.1 Exports of controlled virgin substances

In 2018, exports of controlled virgin substances from the EU (including re-export) increased again after a long period of declining exports that started in 2006 and followed a continuous downward trend until 2017 (Figure 3.1).

In 2018, exports increased again to 10 257 metric tonnes (3 884 metric tonnes higher than in 2017). The largest exported quantities were of HCFCs previously imported or produced (59 % of total exports) and CTC produced in the EU (40 % of total exports). The overall increase in exports can largely be explained by the fact that CTC exports increased from 1 320 metric tonnes in 2017 to 4 140 in 2018. HCFC exports also showed an increase of 1 062 metric tonnes compared with 2017.

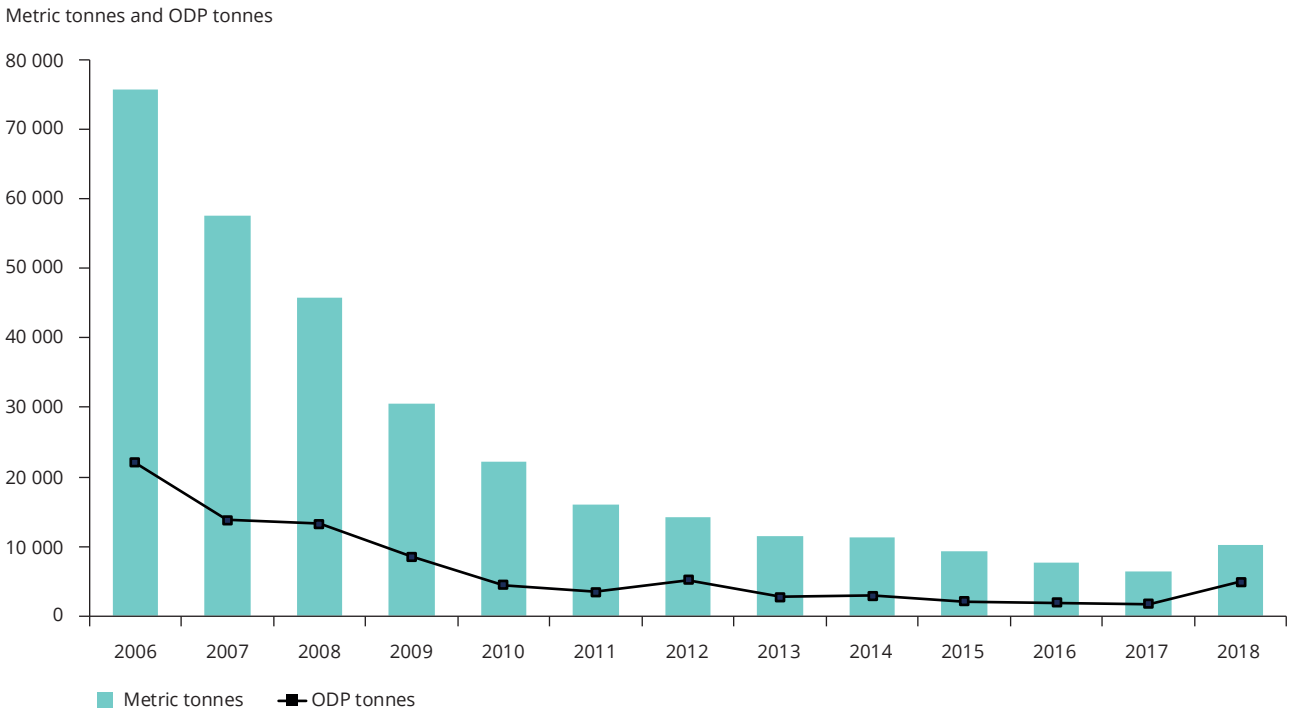
Expressed in ODP tonnes, total exports amounted to 4 920 ODP tonnes in 2018 (up by 180 % compared with 2017). Exports of CTC and HCFCs were largest when expressed in ODP tonnes. The larger increase in exports when expressed in ODP tonnes rather than in metric tonnes is mainly because exports of CTC (with a high ODP) changed significantly between 2017 and 2018.

HCFCs were mostly exported for feedstock and refrigeration, and CTC was almost exclusively exported for feedstock use and to a very small extent for laboratory use. Controlled virgin substances were exported to 42 destination countries. The most significant quantities were exported to the United States, Japan, Saudi Arabia and the United Arab Emirates (in order of importance when expressed in metric tonnes).

3.2.2 Exports of controlled non-virgin substances

As with imports, controlled non-virgin substances were exported out of the EU to a much lesser extent than controlled virgin substances, amounting to 4 % of total exports when expressed in metric tonnes. In both 2017 and 2018, non-virgin exports were limited to HCFCs (438 metric tonnes in 2018) and halons (19 metric tonnes in 2018). In 2018, exports of non-virgin HCFCs decreased by 162 metric tonnes (down by 27 %) but still accounted for 96 % of total non-virgin exports. This significant share of non-virgin HCFC exports in total non-virgin exports can be explained by a prohibition set out in Article 13 of the ODS Regulation, which entered into force in 2015. The prohibition states that the placing on the market and use of non-virgin HCFCs for the maintenance or servicing of existing refrigeration, air-conditioning and heat pump equipment are prohibited in the EU. It is therefore likely that in 2018 only amounts reclaimed from old equipment or taken from stocks were exported out of the EU.

Figure 3.1 Trend in exports of controlled virgin substances out of the EU



Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

4 Production of controlled substances

4.1 Data presented

Aggregated data on the EU production of controlled substances are provided both as a total and for the most important uses. The proportion of the EU production that is intended for feedstock use over time is presented separately. Production data also include data on unintentional by-production.

4.2 Results

In 2018, production of controlled substances was at a similar level to that in previous years. The production of controlled substances has been declining since 2006 but remains relatively stable since 2010 with yearly variations (Figure 4.1). A significant dip in production occurred in 2009, linked to the economic downturn in Europe in that year.

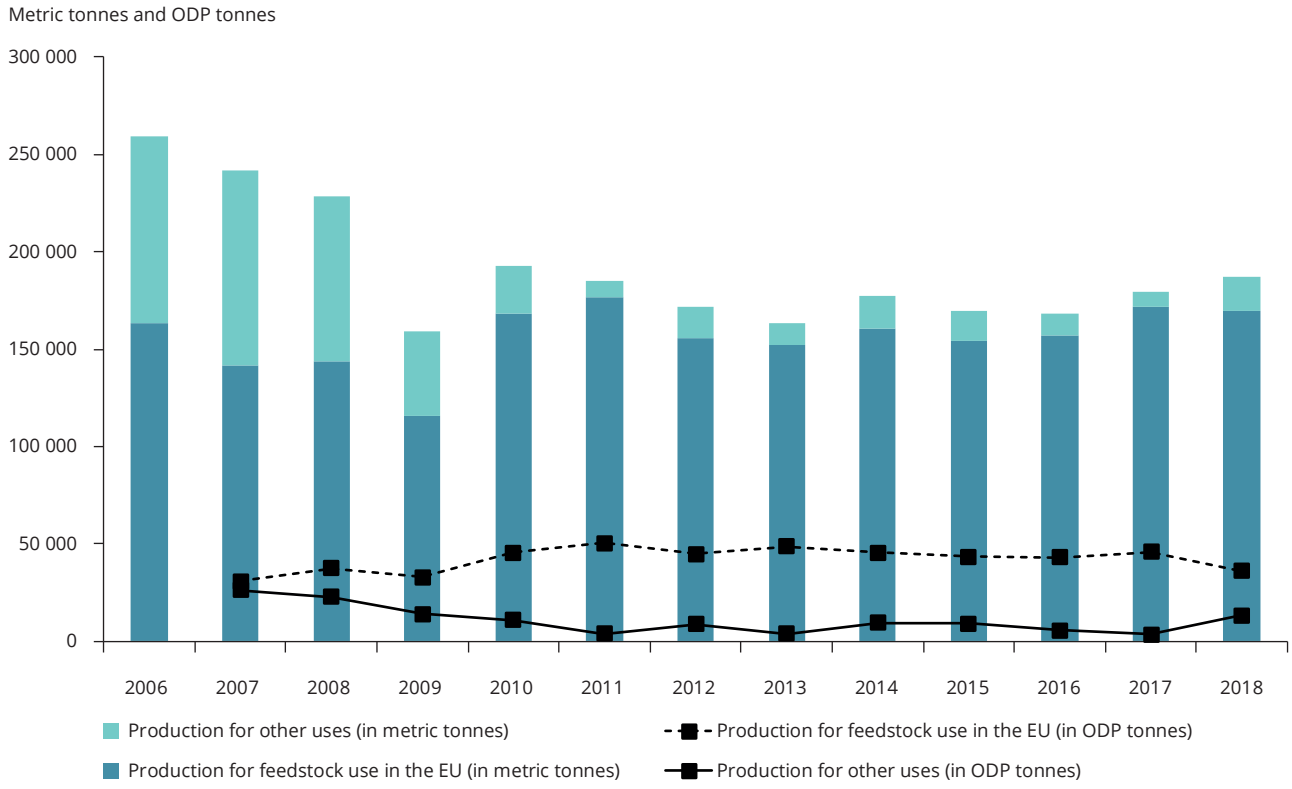
In 2018, a total of 187 037 metric tonnes of controlled substances was produced. Production was thus slightly higher than in 2017, with a year-on-year increase of 4 %. Controlled substances produced in the EU predominantly comprised HCFCs (69 % of total production), CTC (17 % of total production) and TCA ([5]). Increases in the production of TCA and HCFCs relative to 2017 are the main reason for the overall increase in total production. Only minor quantities of BCM, halons and HBFCs, and no CFCs or MB, were produced. Note that produced controlled substances are, by definition, virgin.

When expressed in ODP tonnes, production of controlled substances is much lower than when expressed in metric tonnes (Figure 4.1). This discrepancy can be explained by the above-mentioned high proportion of HCFCs (which have low ODPs) in the total production. Expressed in ODP tonnes, the production level of CTC was the largest (71 % of total production).

The controlled substances that were produced were almost exclusively intended for feedstock use (95 % of the produced quantity in metric tonnes or 83 % of the total production in ODP tonnes). Most of the production for feedstock use was intended for companies located within the EU (95 % of total production in metric tonnes, or 88 % in ODP tonnes). The remaining production in the EU in 2018 was the result of unintentional by-production (intended for subsequent destruction) or was intended for process agent use or refrigeration. For refrigeration, all the produced quantities were exported.

As can be seen in Figure 4.1, following a decline the production since 2010 was relatively stable. Neither production for feedstock use inside the showed a EU, nor production for uses other than feedstock in the EU (e.g. refrigeration, unintentional by-production and feedstock use outside the EU) showed a continuous trend throughout this period.

Figure 4.1 Trend in the production of controlled substances within the EU



Note: Production data in ODP tonnes are only available from 2007 onwards.

Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

5 Destruction of ozone-depleting substances

5.1 Data presented

Aggregated data on destruction activities in the EU are provided. The total quantity of ODS destroyed at each destruction facility was calculated based on:

- the quantity of waste originating from the reported amount of controlled substance produced, purchased or imported by the company that was destroyed at the company's own destruction facility;
- the quantity of waste sent to other destruction facilities.

Some companies were only able to report the destruction of mixtures. Such quantities were excluded from this report (see Annex 3 for terminology and the definition of 'mixtures').

5.2 Results

The destruction of controlled substances in 2018 was lower than in 2017 (Figure 5.1). For ODS destruction data, there is no long-term trend visible in the last decade.

In 2018, a total of 9 056 metric tonnes of controlled substances was destroyed, a 7 % decrease compared with 2017. The 2018 decrease in destruction can, to a large extent, be explained by the decreased destruction of unintentionally produced CTC (down by 413 metric tonnes or 5 %), HCFCs (down by 158 metric tonnes, down by 27 %) and CFCs (down by 120 metric tonnes, down by 16 %) compared with the amount destroyed in 2017. The largest quantities destroyed were of CTC, CFCs and HCFCs (85 %, 8 % and 6 % of total destruction, respectively). In addition, 67 metric tonnes of mixtures with an unknown composition were destroyed ([6]).

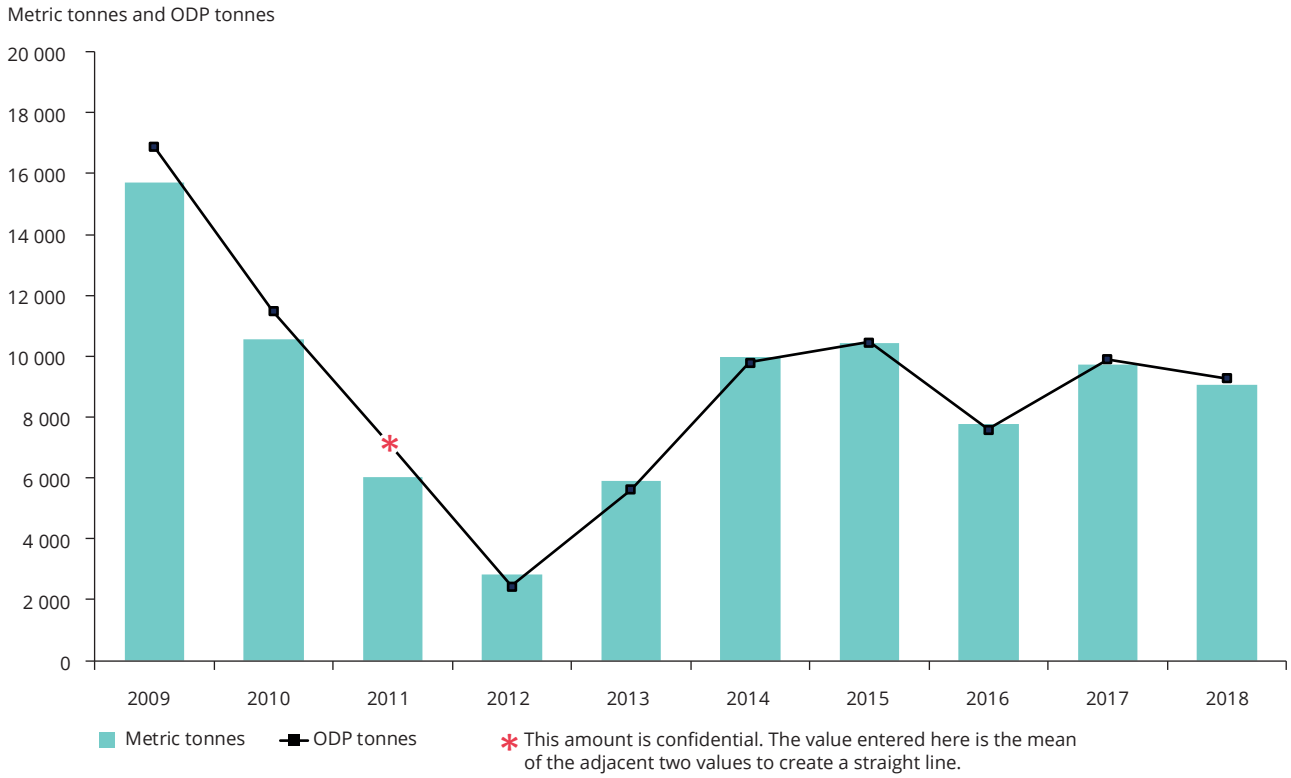
The above-mentioned high proportion of CTC (which has a high ODP) in the overall quantity being destroyed explains why the figures for destruction are similarly high when expressed in metric or ODP tonnes. Expressed in ODP tonnes, the largest quantities destroyed were of CTC and CFCs (91 % and 8 % of total production, respectively). Also for previous years, CTC accounted for the largest share of substances being destroyed, leading to the high ODP values presented in Figure 2.4.

For the period 2009-2012, the declining trend in destruction of controlled substances was mainly the result of unintentionally produced CTC that was stockpiled ([7]) and subsequently destroyed during 2013 and 2014.

([6]) Because the composition of the waste is unknown and can consist of both ODS and other substances (e.g. fluorinated greenhouse gases such as hydrofluorocarbons), they are not included in the total destruction. For a definition of 'mixtures', see Annex 3 on terminology.

([7]) Stockpiles are stocks held by producers at the end of the year, resulting from production during the reporting year. Stocks at the end of the year resulting from imports, purchases or production in previous years are not included.

Figure 5.1 Trend in the destruction of controlled substances within the EU



Note: Destroyed mixtures of controlled substances are excluded. The amount for 2011 in ODP tonnes (marked with *) is excluded for reasons of confidentiality. Prior to 2009, destruction facilities did not have to report to the European Commission; data collection and aggregation were carried out differently.

Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

6 Consumption of controlled substances

6.1 Data presented

Consumption of controlled substances is a key metric for the implementation of the Montreal Protocol. It is a parameter that gives an idea of the presence of ODS on the market and tracks progress that has been made in phasing out these chemicals.

It is an aggregated metric that is calculated for each calendar year in the following way:

$$Consumption = P_{total} - P_{FDST\ in\ EU} - P_{PAU} + I_{total} - I_{FDST\ in\ EU} - I_{PAU} - E_{total} - D$$

P_{total} is the total production, $P_{FDST\ in\ EU}$ production for feedstock inside the EU, P_{PAU} production for process agent use, I_{total} total imports of virgin ODS, $I_{FDST\ in\ EU}$ imports of virgin ODS for feedstock use inside the EU, I_{PAU} imports of virgin ODS for process agent use, E_{total} total exports of virgin ODS and D destruction of virgin and non-virgin ODS.

The result of this formula can be a negative number when substances are produced and imported in quantities that do not compensate for the amounts that are exported or destroyed. This usually happens when exports or destruction affect quantities that were in the market in previous years (stocks). If the parameter is calculated in ODP tonnes — note that substances have very different ODP values — a negative value is obtained when production or imports affect low-ODP substances and exports or destruction affect high-ODP substances.

This approach for calculating consumption is in line with that applied by the United Nations Environment Programme (UNEP) Ozone Secretariat (UNEP, 2016). It ensures that amounts that were not intended to be used inside the EU are not included in the resulting consumption figure. This is achieved by subtracting virgin exports for feedstock and process agent use outside the EU from the production of these uses outside the EU. Further, production and virgin imports for feedstock use inside the EU use are excluded from the calculation since they exhibit low emissions and are entirely chemically converted in the feedstock process. Also, quantities used as process agents are excluded from the calculation since these uses are subject to annual limits set out by the Montreal Protocol. Lastly, non-virgin imports and exports are not included in the calculation of the consumption.

6.2 Results

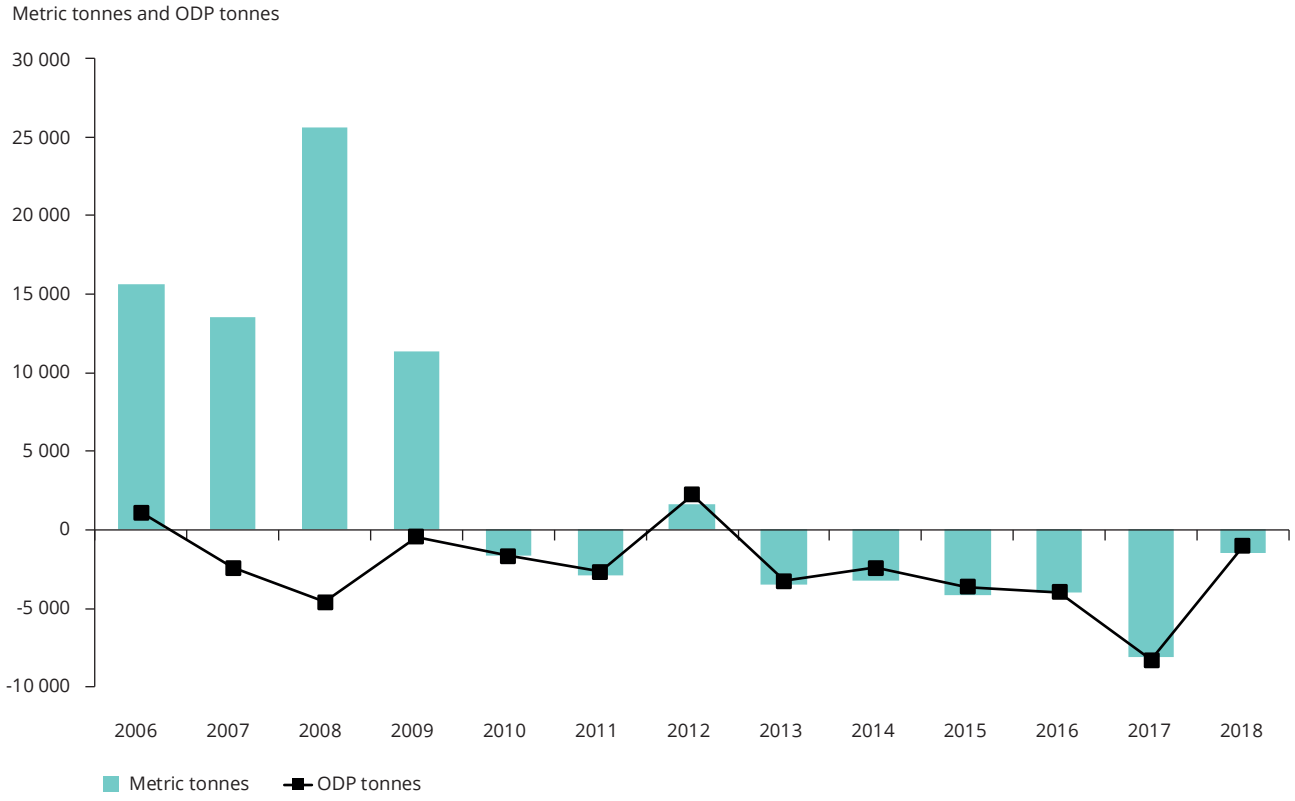
In 2018, the consumption of controlled substances in the EU was below zero (-1 505 metric tonnes) and was significantly higher than in 2017 (-8 075 metric tonnes, which was the lowest consumption since 2006) ([6]). Consumption of controlled substances has been below zero since 2010, except in 2012 (Figure 6.1). In recent years, the consumption of controlled substances has largely been driven by CTC, HCFCs and CFC consumption.

The relationship between stockpiling and destruction of unintentionally produced CTC largely determines CTC consumption and can have an effect on the overall consumption of controlled substances. In 2012, for example, the negative consumption trend was broken owing to a rather high level of stockpiling of unintentionally produced CTC. Destruction of surplus CTC then ensued in the following years, thereby lowering consumption (see Section 6).

Expressed in ODP tonnes, consumption in 2018 amounted to -1 048 ODP tonnes, an 87 % increase compared with 2017. In general, the consumption trend in the EU is different when expressed in metric tonnes and not in ODP tonnes, especially in the period of 2006-2009 (Figure 6.1).

In particular, 2008 was an exceptional year. Consumption was at its highest in metric tonnes, while it was at its lowest in ODP tonnes. The high consumption in 2008 (expressed in metric tonnes) was largely determined by a very high consumption of controlled substances with a low ODP (mainly HCFCs). On the other hand, the negative consumption of controlled substances with a high ODP (mainly

Figure 6.1 Trend in the consumption of controlled substances within the EU

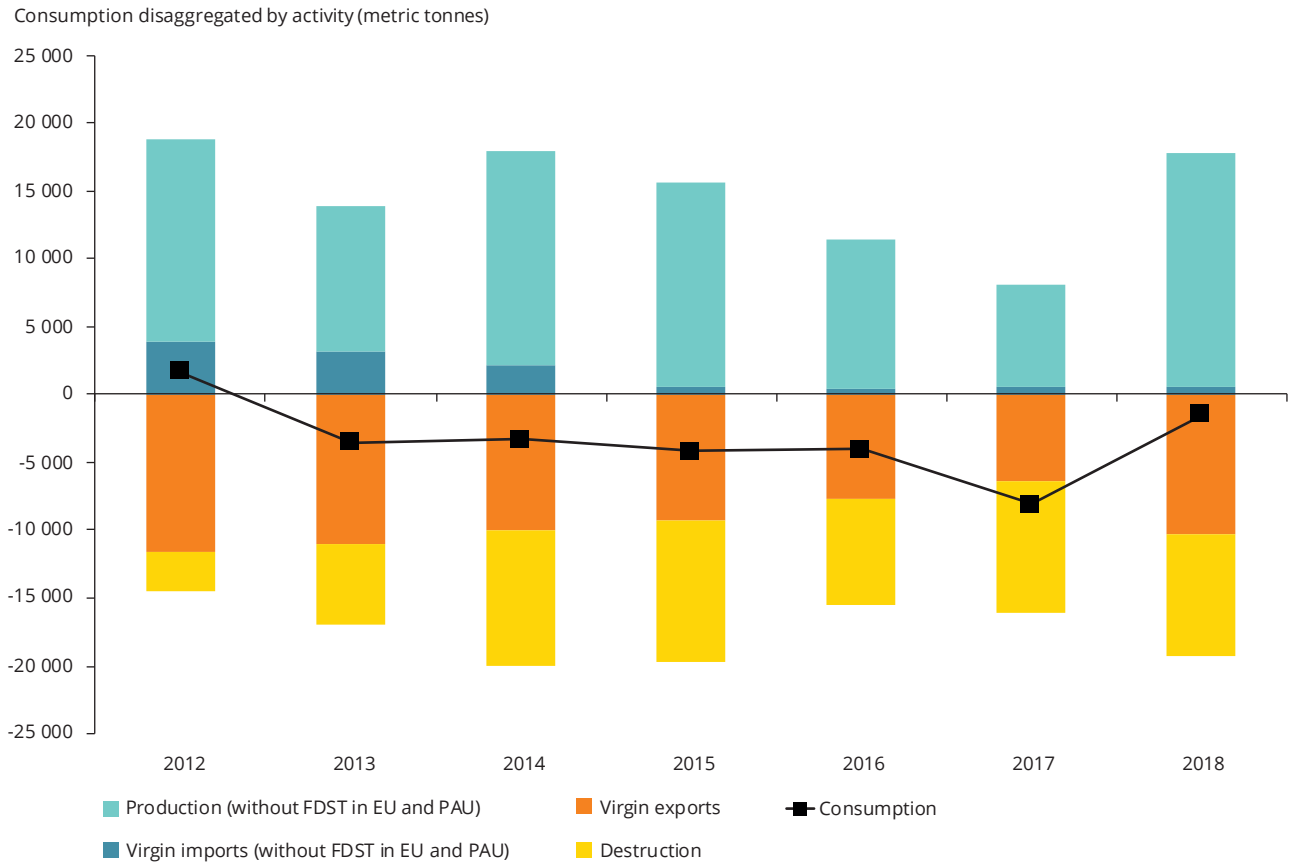


Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

CTC and CFCs) led to a negative consumption when expressed in ODP tonnes.

The single activities that contribute to the ODS consumption are shown in Figure 6.2. If the sum of production and import exceeds the sum of exports and destruction, the consumption is positive, and vice versa. Following the calculation of the consumption, Figure 6.2 depicts exports and destruction as negative numbers. Production relevant for consumption was the single biggest contributor and showed large variations between years. Virgin imports relevant for the consumption decreased considerably since 2014. As for production, virgin exports and destruction (except the year 2012) showed variations throughout this period.

Figure 6.2 Trend in the consumption of controlled substances within the EU



Note: Data for the calculation of the disaggregated consumption is only available for the years from 2012 onwards.

Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

7 Feedstock use of controlled substances

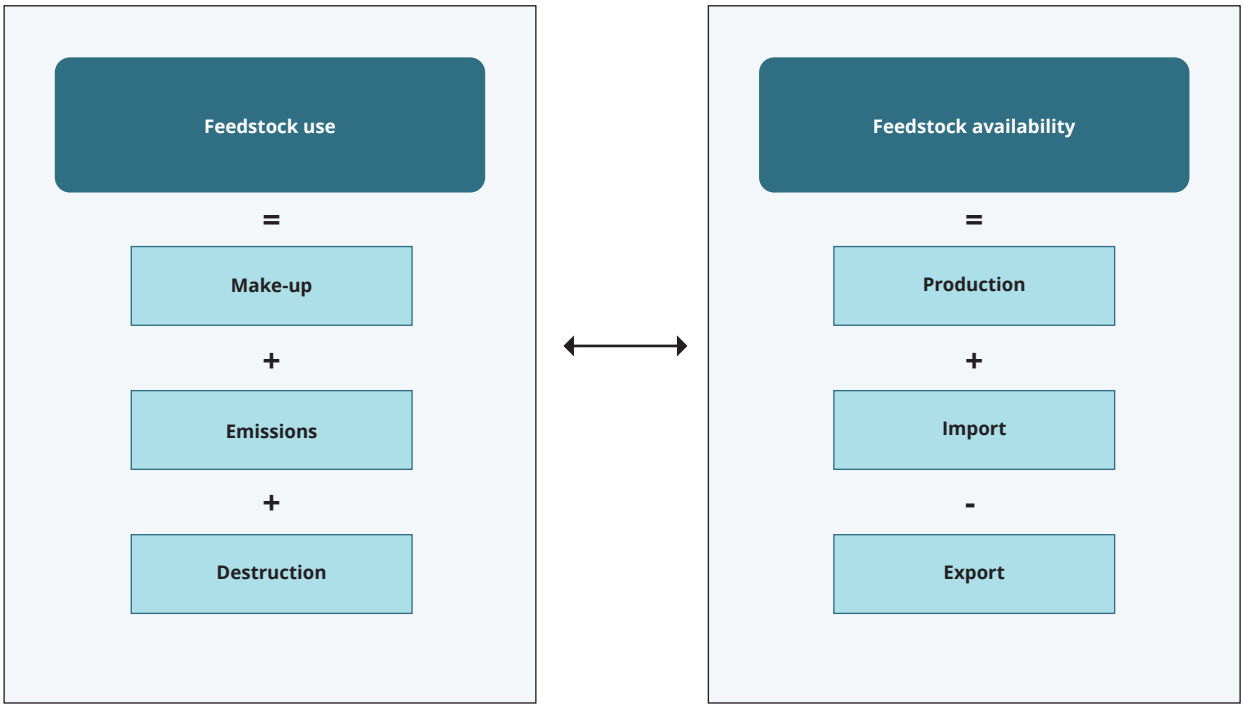
7.1 Data presented

The reporting obligation of the ODS Regulation (which came into force in 2010) allows for a direct calculation of the amount of controlled substances used as feedstock agents. Therefore, based on the data reported, this aggregated value, called *feedstock use*, is available only from 2010 onwards. It is calculated as the reported make-up plus quantities sent for destruction by feedstock users (Figure 7.1). Prior to that, it was only possible to infer *feedstock availability*, calculated as the production for feedstock use inside the EU plus the imports for feedstock use inside the EU. While feedstock use sheds light on the amounts of controlled substances used by feedstock users in the EU, feedstock availability highlights the amounts of feedstock available on the EU market. A comparison of both metrics allows for an assessment of how complete the reporting for feedstock uses is. In other words, discrepancies between feedstock availability and use can indicate relevant uses that have not been captured by the reporting system so far.

It is only since the present ODS Regulation came into force in 2010 (reporting year 2009) that feedstock users have been obliged to report the use of, stocks of and emissions from each specific feedstock process. Since then it has been possible to calculate the use of controlled substances as feedstock directly, as companies have to report the make-up and quantities destroyed or sent for destruction. Feedstock use in the EU (U_{FDST}) is thus calculated as:

$$U_{FDST} = M_{FDST} + EM_{FDST} + D_{FDST}$$ ([8])

Figure 7.1 Comparing feedstock use and feedstock availability



([8]) A similar calculation was carried out in the four previous annual summary reports, although, in the previous reports, UFDST was calculated as MFDST + EMFDST – DFDST.

where M_{FDST} is the quantity used as make-up for feedstock, EM_{FDST} is the emissions of controlled substances during their use as feedstock and D_{FDST} is the quantity of ODS intended for feedstock use sent to a destruction facility by feedstock users.

Before 2009, the availability of feedstock in the EU could be determined only by using production, import and export statistics. The availability of controlled substances for feedstock use in the EU (A_{FDST}) is calculated as:

$$A_{FDST} = P_{FDST\text{-}EU} + I_{FDST}$$

where $P_{FDST\text{-}EU}$ is the quantity produced for feedstock use inside the EU ([9]) and I_{FDST} is the quantity imported for feedstock use.

In this report, both calculation methods are utilised to check compliance with the reporting obligation by feedstock users.

7.2 Results

7.2.1 Feedstock use

The amount of controlled substances used as feedstock was 173 367 metric tonnes in 2018 (down by 3 % relative to 2017; Figure 7.2) and reached the second highest level since 2010. Feedstock use predominantly comprised HCFCs, CTC and TCA. Feedstock availability was 177 448 metric tonnes in 2018 (up by 0.2 % from 2017). In total, feedstock use was 2 % lower than feedstock availability. This difference is higher and reversed compared to the difference observed in 2017. Still, it can be assumed that all large feedstock users reported figures for 2018.

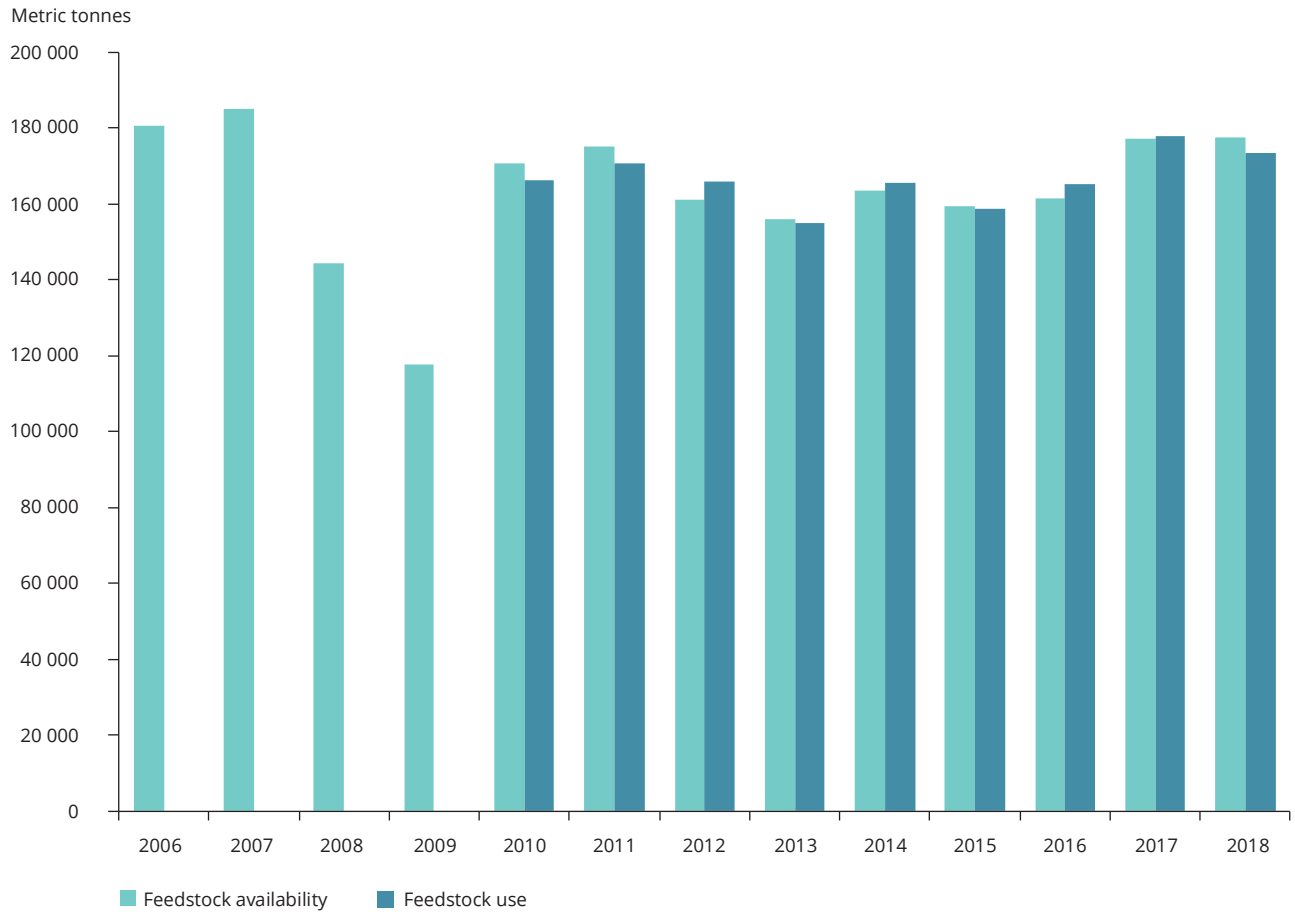
A look at the feedstock availability trend in the period from 2006 to 2018 reveals that feedstock availability varies considerably across years (Figure 7.2). After the dip in feedstock availability in 2008-2009, it has increased again and levels have more or less been constant since 2010. Feedstock use closely followed the trend in feedstock availability in the period from 2010 to 2018. Overall, this indicates that there has been increasing consistency of reporting by companies over the years.

7.2.2 Emissions from feedstock use

Emissions of controlled substances from their use as feedstock decreased from 62 metric tonnes in 2017 to 56 metric tonnes in 2018 (down by 10 %). This resulted in an average emission rate of 0.03 % (calculated as the ratio of the total ODS emissions to the quantities used as make-up), which was the same as the average emission rate in 2017 but much lower than the emission rates for the period between 2012 and 2014. The overall decrease in the relative emission rate suggests that improvements have been made in the control of emissions in industry in recent years and that these measures are still in effect today.

([9]) Producers report amounts produced for feedstock in the EU and outside the EU separately.

Figure 7.2 Trend in the feedstock availability and use of controlled substances within the EU



Note: The reporting obligation of the ODS Regulation allows for a direct calculation of feedstock use. Therefore, based on the data reported, this aggregated value is available only from 2010 onwards.

Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

8 Use of controlled substances as process agents

8.1 Data presented

Since the reporting year 2001, process agent users in the EU have been required to report the consumption and emissions of controlled substances resulting from their use as process agents. Only the aggregated totals of make-up ([10]) and quantities of emissions are presented.

8.2 Results

A process agent is a substance that either facilitates or inhibits a chemical reaction in an industrial process. In 2018, make-up and emissions stayed well below restrictions imposed by both the Montreal Protocol and the ODS Regulation.

([10]) See Annex 3 for terminology and the definitions of 'make-up' and 'new substances'.

9 New substances

9.1 Data presented

This report contains aggregated data on the production, import and export of the five new substances ([11]). Based on these metrics, the availability of new substances on the EU market (A_{NEW}) is calculated as:

$$A_{NEW} = P_{NEW} + I_{NEW} - E_{NEW}$$

where P_{NEW}, I_{NEW} and E_{NEW} relate to the quantities of new substances produced, imported and exported, respectively.

9.2 Results

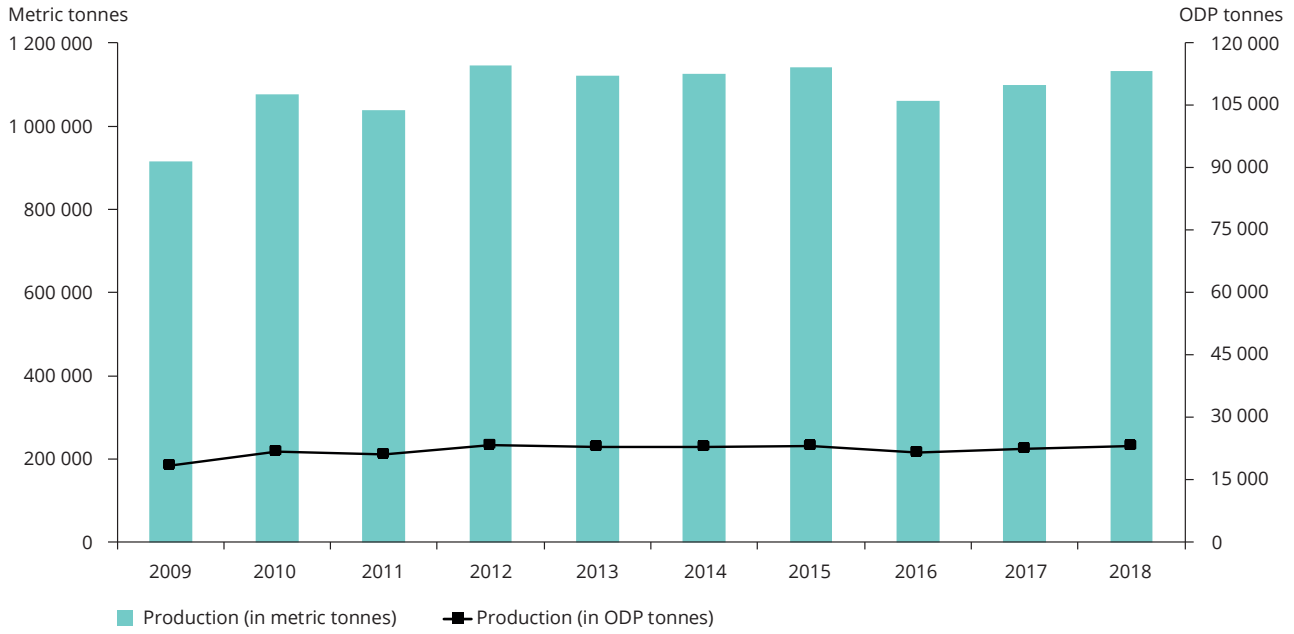
According to the ODS Regulation, producers, importers and exporters of new substances (not to be confused with virgin substances; see Annex 3 for definition of virgin substances) have to report information on these substances, which are not included in the Montreal Protocol.

The production of new substances has been rather constant since 2012 (Figure 9.1. In 2018, it was 3 % higher than in 2017, with 1 132 795 metric tonnes (23 060 ODP tonnes) and comprised MC (99.6 % of total production), nPB and EB. Imports of new substances increased slightly in 2018 (419 metric tonnes, up by 41 % compared with 2017). Likewise, exports of new substances showed a slight increase (up by 5 %) and amounted to 8 772 metric tonnes compared with 2017. As has been the case in previous years, the quantities produced in the EU were significantly higher than the quantities imported and exported ([12]). To conclude, the availability of new substances (i.e. production + import – export) is primarily driven by production and almost unaffected by import and export in the EU.

The production of new substances (expressed in metric tonnes) in 2018 was six times higher than the production of controlled substances (similar to previous years). This proportion is even more pronounced when looking at quantities produced for feedstock use. Production of new substances for feedstock use in the EU (99.5 % of total production of new substances) was almost seven times higher than the quantity of controlled substances produced for feedstock use in the EU. However, owing to the lower ODP of new substances ([13]), the picture is different when production quantities are compared in ODP tonnes (see Figure 9.1). Nevertheless, the production of new substances accounted for 32 % of both controlled and new substances in 2018 when expressed in ODP tonnes.

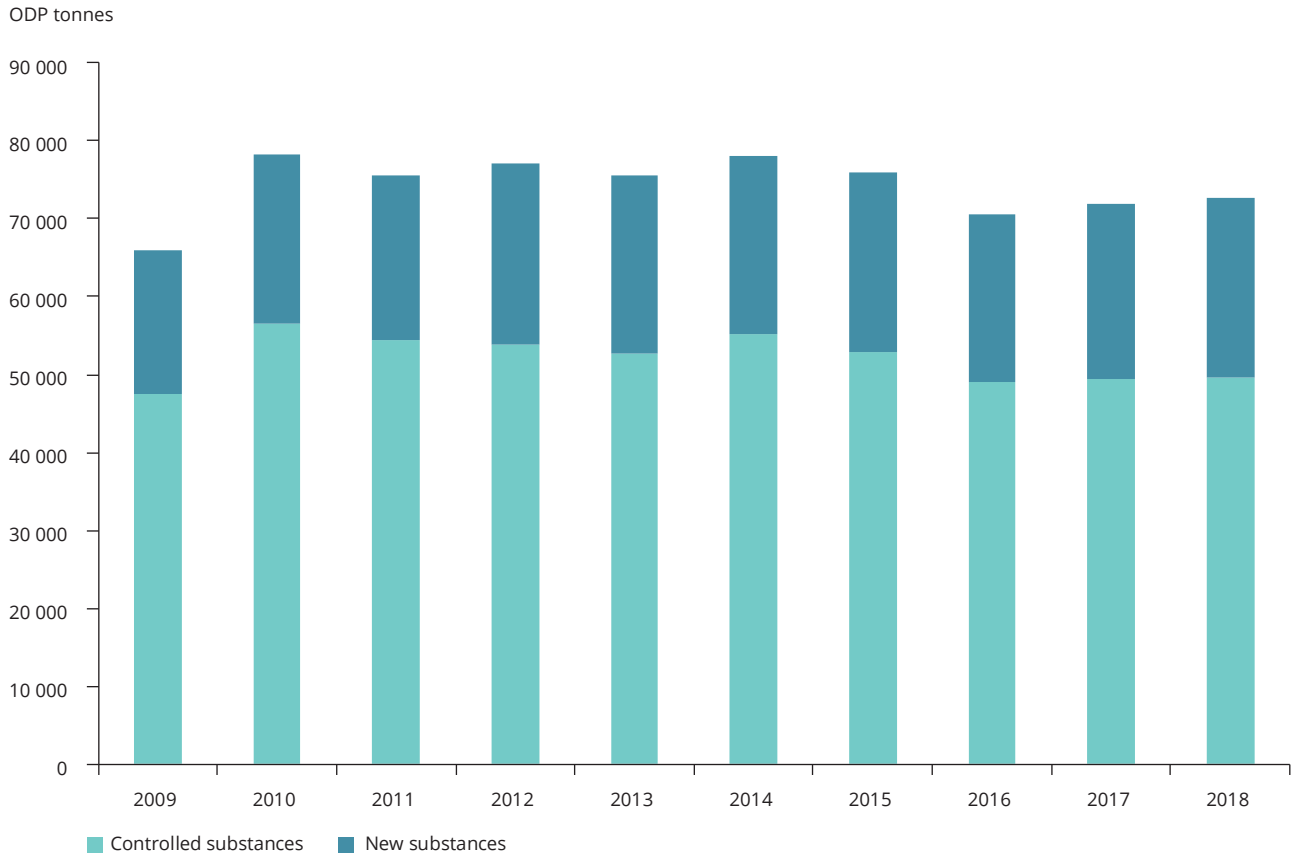
([11]) See Annex 3 for terminology and the definitions of 'make-up' and 'new substances'.
([12]) Note that new substances are not covered by the Montreal Protocol and no consumption is calculated. A differentiation of the imports and exports of new substances into virgin and non-virgin substances has therefore been omitted.
([13]) For some new substances, the ODP is expressed as a range in the ODS Regulation. In these cases, the highest value was used for conversion from metric tonnes to ODP tonnes.

Figure 9.1 Trend in the production of new substances within the EU



Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

Figure 9.2 Comparison of the production of new and controlled substances within the EU



Sources: EC, 2010, 2011; EEA, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

List of abbreviations

A_{FDST}	Feedstock availability in the EU
A_{NEW}	Availability of new substances in the EU
BCM	Bromochloromethane
BDR	Business Data Repository
CFC	Chlorofluorocarbon
CTC	Carbon tetrachloride (tetrachloromethane)
D_{FDST}	Destruction of controlled substances originally produced for feedstock use
EB	Ethyl bromide (bromoethane)
EC	European Commission
EEA	European Environment Agency
EM_{FDST}	Emissions of controlled substances during their use as feedstock
E_{NEW}	Exports of new substances
ETC/CME	European Topic Centre on Climate Change Mitigation and Energy
EU	European Union
HBFC	Hydrobromofluorocarbon
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
I_{FDST}	Imports of controlled substances for feedstock use
I_{NEW}	Imports of new substances
MB	Methyl bromide (bromomethane)
MC	Methyl chloride (chloromethane)
M_{FDST}	Controlled substances used as make-up for feedstock
n-PB	*n*-propyl bromide (1-bromopropane)
ODP	Ozone-depleting potential

ODS	Ozone-depleting substances
$P_{FDST-EU}$	Production of controlled substances for feedstock use in the EU
P_{NEW}	Production of new substances
QPS	Quarantine and pre-shipment services
TCA	1,1,1-Trichloroethane (methyl chloroform)
TFIM	Trifluoroiodomethane (trifluoromethyl iodide)
U_{FDST}	Feedstock use in the EU
UNEP	United Nations Environment Programme

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Annex 1 Data tables

Table A1.1 Production, import, export and destruction of controlled and new substances in the EU in 2018 (in metric tonnes)

	Production	Import (virgin)	Export (virgin)	Destruction (*)
CFCs	-	C	C	739.09
Halons	C	C	-	C
Other CFCs	-	-	-	C
CTC	31 906.61	C	C	7 708.02
TCA	C	< 0.01	C	C
HCFCs	129 593.57	4 967.62	C	577.98
HBFCs	C	0.65	C	C
BCM	C	C	C	-
MB	-	C	8.92	C
Total controlled substances	**187 037.22**	**8 711.97**	**10 256.62**	**9 056.25**
Halon 1202	-	C	C	-
MC	1 128 007.78	C	C	-
EB	C	C	C	-
TFIM	-	C	C	-
n-PB	C	C	C	-
Total new substances	**1 132 795.38**	**1 439.60**	**8 771.66**	**-**

Notes: Mixtures of CFCs, HCFCs and hydrofluorocarbons (HFCs) were destroyed in 2018, but are not included in the data. C, data are not included for reasons of confidentiality; -, no data reported.

(*) The destruction of new substances is not subject to reporting obligations under the ODS Regulation (Regulation (EC) No 1005/2009).

Table A1.2 Production, import, export and destruction of controlled and new substances in the EU in 2018 (in ODP tonnes)

	Production	Import (virgin)	Export (virgin)	Destruction (*)
CFCs	-	C	C	735.71
Halons	C	C	-	C
Other CFCs	-	-	-	C
CTC	35 094.27	C	C	8 478.82
TCA	C	< 0.01	C	C
HCFCs	7 486.65	202.58	C	30.43
HBFCs	C	0.48	C	C
BCM	C	C	C	C
MB	-	C	5.35	C
Total controlled substances	**49 579.24**	**4 391.28**	**4 919.72**	**9 281.80**
Halon 1202	-	C	C	-
MC	C	C	C	-
EB	22 560.16	C	C	-
TFIM	C	C	C	-
n-PB	-	C	C	-
Total new substances	**23 060.37**	**82.96**	**450.95**	**-**

Notes: Mixtures of CFCs, HCFCs and HFCs were destroyed in 2018, but are not included in the data. C, data are not included for reasons of confidentiality; -, no data reported.

(*) The destruction of new substances is not subject to reporting obligations under the ODS Regulation (Regulation (EC) No 1005/2009).

Table A1.3 Import of controlled virgin substances in the EU in 2018

Source country	Import in metric tonnes	Import in ODP tonnes
China (excluding Hong Kong and Macau)	5 547.95	1 368.22
India	459.62	1 019.78
United States	2 002.19	1 797.16
Other (*)	702.20	206.12

Note (*) 'Other' refers to Israel, Japan, Russia and Saudi Arabia.

Table A1.4 Export of controlled virgin substances in the EU in 2018

Destination country	Export in metric tonnes	Export in ODP tonnes
Israel	11.23	2.17
Switzerland	21.16	5.59
Other (*)	10 224.23	4 911.96

Note (*) 'Other' refers to the following 40 countries: Antigua and Barbuda, Armenia, Bahamas, Bahrain, Barbados, China, Côte D'ivoire Egypt, Guyana, Haiti, Hong Kong, India, Iraq, Japan, Jordan, Korea, Lebanon, Liberia, Marshall Islands, Morocco, Nigeria, Norway, Oman, Pakistan, Panama, Russia, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, South Africa, Tanzania, Thailand, Tunisia, Turkey, United Arab Emirates, United States, Uruguay and Vietnam.

Table A1.5 Production, import, export and destruction of controlled substances in the EU in 2012-2018 (in metric tonnes)

	2012	2013	2014	2015	2016	2017	2018
Metric tonnes							
Total production	171 421.43	163 664.49	177 058.65	169 890.12	168 081.50	179 287.82	187 037.22
For feedstock use in EU	155 738.00	152 376.40	160 846.26	154 508.35	156 771.80	171 474.21	169 398.43
For other uses	15 683.43	11 288.09	16 212.39	15 381.76	11 309.70	7 813.61	17 638.79
Relevant for consumption (*)	14 963.11	10 792.93	15 804.85	15 073.76	11 042.58	7 538.11	17 304.15
Import (virgin)	9 410.25	8 460.82	6 843.15	6 045.74	5 127.48	6 287.20	8 711.97
Relevant for consumption (*)	3 844.04	3 148.78	2 141.80	550.07	422.95	502.15	503.53
Export (virgin)	14 301.41	11 569.20	11 247.44	9 320.32	7 741.79	6 372.53	10 256.62
Destruction	2 844.58	5 882.44	9 968.59	10 439.34	7 753.36	9 742.74	9 056.25
Consumption	1 661.15	-3 509.94	-3 269.38	-4 135.83	-4 029.62	-8 075.01	-1 505.19
ODP tonnes							
Production	53 877.76	52 739.48	55 223.25	52 825.41	49 127.27	49 438.36	49 579.24
For feedstock use in EU	44 833.30	48 604.80	45 501.44	43 526.75	43 276.70	45 812.80	36 085.07
For other uses	9 044.46	4 134.69	9 721.81	9 298.65	5 850.56	3 625.56	13 494.17
Relevant for consumption (*)	8 252.11	3 590.00	9 273.51	8 959.85	5 556.73	3 322.51	13 126.07
Import (virgin)	3 637.36	3 785.64	2 307.40	2 112.72	925.62	2 954.56	4 391.28
Relevant for consumption (*)	1 684.84	1 499.93	975.74	33.97	26.84	27.81	27.70
Export (virgin)	5 233.22	2 715.99	2 888.20	2 151.57	1 930.72	1 757.86	4 919.72
Destruction	2 452.47	5 613.89	9 791.52	10 455.55	7 603.97	9 892.40	9 281.80
Consumption	2 251.27	-3 239.95	-2 430.46	-3 613.30	-3 951.12	-8 299.93	-1 047.75

Note (*) For production and imports, quantities intended for feedstock use, use as process agents and quarantine and pre-shipment service are excluded from the calculation of consumption. The consumption can be calculated as Production (relevant for consumption) + Import (relevant for consumption) – Export – Destruction.

Table A1.6 Feedstock availability of controlled substances in the EU in 2012-2018 (in metric tonnes)

	Feedstock availability
2012	161 013.02
2013	156 043.05
2014	163 546.33
2015	159 422.51
2016	161 434.47
2017	177 032.80
2018	177 447.98

Table A1.7 Production, import and export of new substances in the EU in 2012-2018 (in metric and ODP tonnes)

	2012	2013	2014	2015	2016	2017	2018
In metric tonnes							
Production	1 146 200.28	1 122 116.61	1 126 402.41	1 140 487.55	1 059 802.92	1 099 539.36	1 132 795.38
Import	2 168.46	11 613.54	1 838.97	1 943.02	489.65	1 020.63	1 439.60
Export	6 472.40	5 898.49	4 361.58	5 842.29	6 031.34	8 382.34	8 771.66
In ODP tonnes							
Production	23 258.49	22 798.42	22 842.85	23 118.01	21 503.15	22 401.66	23 060.37
Import	136.18	359.17	121.95	209.60	64.91	114.99	82.96
Export	260.48	304.43	212.83	318.48	237.47	363.40	450.95

Annex 2 Measures to protect confidential data

Article 27(8) of the ODS Regulation states that appropriate steps need to be taken to protect the confidentiality of the information submitted according to this piece of EU law. Hence, the EEA, in agreement with the European Commission, has applied measures to prevent the deduction of commercially sensitive information. These measures apply to the production, import, export, destruction and consumption of ODS and (where applicable) new substances, as well as to process agent and feedstock uses.

The measures include:

1. application of the '3-company group rule', whereby the data presented in the report must be the result of reporting by at least three company groups (i.e. corporate groups);

2. application of the '5 % significance rule', whereby company groups whose reported data add up to less than 5 % of the total amount reported for any data point represented in the report are ignored for counting under the '3-company group rule';

3. application of additional measures to prevent the deduction of sensitive information.

All measures apply for amounts reported in both metric tonnes and ODP tonnes. Each of the measures is explained in more depth below.

A2.1 The '3-company group rule'

This measure concerns the treatment of data reported by different legal entities across the EU that belong to the same company group. For that purpose, company groups are defined as 'one or more companies legally belonging to the same corporate group'. The agreed principle is that companies belonging to the same corporate group need to be seen as a single entity when it comes to confidentiality rules. Once such company groups are determined, at least three must contribute to each reported value. This measure replaces the old '3-company rule' as applied by the EEA in previous public ODS reports, which did not take into account possible corporate relationships.

A2.2 The '5 % significance rule'

As a second measure, company groups are included in the above count only if they contributed significantly to the reported value. This means that the smallest contributors, that is, those groups with an accumulated share of less than 5 %, are not considered when applying the '3-company group rule', explained above. This ensures that at least three corporate entities contribute significantly to each reported transaction value.

A2.3 Preventing deduction of sensitive data

Additional measures were applied to prevent the deduction of confidential data.

A2.3.1 All transactions

Deduction might have been possible in cases where transaction data for certain substances or substance groups (i.e. CFCs, halons, other CFCs, CTC, TCA, HCFCs, HBFCs, BCM or MB) remained confidential, yet data for other substances or substance groups, along with a total for the transaction in question, were published. Confidential data that were at risk of such deduction were protected by hiding additional data as confidential (although these additional values had been identified as non-confidential according to the '3-company group rule' and the '5 % significance rule'), so that values for at least three (or none) of the substances or substance groups were confidential in the published data for that transaction.

A2.3.2 Aggregated transactions

Finally, transaction data were hidden because other confidential transaction data could be deduced from their publication. In order to understand this

Box A2.1 A practical guide to applying the '3-company group rule' and '5 % significance rule' measures to data

Operationalisation of the combined '3-company group rule' and '5 % significance rule'

Step 1: All values reported by companies of a given company group for a given transaction year were added up for a given transaction and substance or substance group.

$$\sum Xi = X1 + X2 + \cdots Xn$$

$$Xi = individual\ reported\ value\ by\ a\ single\ reporting\ undertaking$$

$$\sum Xi = sum\ of\ individual\ reported\ values\ by\ reporting\ undertakings\ belonging\ to\ the\ same\ company\ group$$

Step 2: The sum of all absolute contributions ($\sum|\sum Xi|$) across company groups was calculated.

Step 3: The percentage of step 1 in relation to step 2 was calculated for each company group.

$$\% = \frac{|\sum Xi|}{\sum|\sum Xi|} . 100$$

Step 4: The company groups were sorted in ascending order of the percentages calculated in step 3.

Step 5: An accumulated percentage was calculated across the sorted company groups.

Step 6: The number of company groups for which the accumulated percentage was larger than 5 % was counted.

If the number of company groups counted in step 6 was one or two, the full aggregated value across company groups was hidden as confidential. If the number was three or more, the full aggregated value across company groups was reported and was thus not confidential.

additional measure, it should be remembered that the consumption of ODS is a calculated transaction that involves corrected production, import, export and destruction data for each substance or substance group.

For the reader, this rather complicated calculation can be simplified as:

Consumption =
production + import – export + remainder

The 'remainder' may appear irrelevant, and a confidential value for production, for instance, could be deduced based on non-confidential information on consumption, import and export. In such cases, data are published only in cases where the 'remainder' exceeds 5 % of the consumption.

A2.3.3 Treatment of historical data

For the present report, the above-mentioned measures were also applied to the reported values for reporting years since 2011. Data related to earlier reporting years were not subject to these more rigorous measures, as the commercial relevance of data is decreasing over time. Instead, data from these earlier reporting years continue to be protected by the '3-company rule' that has been applied in previous EEA reports on ODS.

Annex 3 Terminology

Ozone-depleting substances

ODS are substances, mainly compounds containing chlorine and/or bromine, that reach the stratosphere of the Earth and whose breakdown products react with the stratospheric ozone. This reduces the concentration levels of ozone in that region of the atmosphere (commonly known as the ozone layer) and thus the capacity of the atmosphere to filter ultraviolet light. Most known ODS are regulated under the Montreal Protocol.

Controlled substances

Controlled substances are ODS that are listed in Annex I of the ODS Regulation and are subject to the reporting obligation of Article 7 of the Montreal Protocol.

Mixtures

Throughout this report, the term 'mixtures' refers to gas mixtures consisting of multiple substances, at least one of which is a controlled substance. Destruction facilities are required to report the quantities of individual substances destroyed each year. In certain cases, however, companies were only able to report on the destruction of mixtures of controlled substances with an unknown composition. Therefore, these mixtures are not included in the data presented in this document and are not reported under the Montreal Protocol.

New substances

The term 'new substances' refers to the five additional substances covered by the ODS Regulation that are not included within the scope of the Montreal Protocol: halon 1202, n-propyl bromide (n-PB), ethyl bromide (EB), trifluoroiodomethane (TFIM) and methyl chloride (MC). Companies in the EU are obliged to report on the import, export and production of these substances in line with the ODS Regulation's higher level of ambition than that of the Montreal Protocol. New substances should not be confused with virgin substances (see below).

Virgin substances

These are substances that have been produced and have not been previously used. Newly produced substances are, by definition, virgin.

Non-virgin substances

These are substances that have been previously used and subsequently recovered from products and equipment, and/or been recycled or reclaimed.

Unintentional by-production

Unintentional by-production of controlled substances usually involves volumes that are taken out of the process cycle and are, at least temporarily, stored (e.g. in a buffer tank) before being destroyed, used, placed on the market, exported or sent for destruction in a facility outside the production site.

Feedstock

A number of ODS serve as chemical building blocks for the manufacture of other chemicals (i.e. as 'feedstock'). They are used (directly or indirectly) for the manufacture of a diverse range of products including refrigerants, foam blowing agents, solvents, polymers, pharmaceuticals and agricultural chemicals.

Process agent

A process agent is a substance that either facilitates or inhibits a chemical reaction in an industrial process.

Make-up

Make-up is the quantity of virgin, recovered or reclaimed controlled substances that has not been used in the process cycle before, and that is fed into the process cycle for the first time. For feedstock and process agent uses of controlled substances, make-up has to be reported, including the emissions generated during their use.

NIL report

Invited companies that consider themselves exempt from the reporting obligation of the ODS Regulation were asked to confirm these circumstances by submitting a 'Not obliged to report' (referred to as a NIL report) via the BDR.

Ozone-depleting potential

The ozone-depleting potential (ODP) of a substance refers to the relative amount of ozone depletion caused by it. It is the ratio of the impact on ozone of the emission of a chemical substance to the impact of a similar emission by mass of CFC-11. The quantity in metric tonnes of a particular controlled substance is multiplied by its ODP to give its overall potential to deplete the ozone layer. The ODPs of controlled and new substances are listed in Annexes I and II of the ODS Regulation. Some new substances have a range, rather than a single ODP value. In this report, the highest value of the ODP value range is used.

Quarantine and pre-shipment services

Quarantine and pre-shipment service (QPS) applications of methyl bromide (MB) are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control.

European Environment Agency

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European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark

Tel.: +45 33 36 71 00
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

Publications Office

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