

# Fluorinated greenhouse gases 2021

Data reported by companies on the production, import, export and destruction of fluorinated greenhouse gases in the European Union, 2007-2020

## ANNEX TO PUBLIC BRIEFING



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# 1 Introduction

## 1.1 About this annex

This document serves as an annex to the public briefing on fluorinated gases 2021 by the EEA. It contains additional figures and data tables on several aspects of the supply of F-gases in the EU for the years 2007-2020 and progress under the HFC phase-down schemes of the F-gas Regulation and of the Montreal Protocol.

The document was prepared by Sylvie Ludig, Nora Wissner and Wolfram Jörß for the European Environment Agency (EEA) under the European Topic Centre on Climate Change Mitigation and Energy (ETC/CME, partner Öko-Institut e.V.).

## 1.2 Document structure

This annex includes the following sections:

This introductory section 1 outlines legal arrangements and their implementation.

### Figures

*Section 2* contains figures on reporting companies.

*Section 3* presents figures on production, imports, exports and destruction of fluorinated greenhouse gases as reported by companies. *Section 4* presents key indicators for the EU, based on reported data about the supply of F-gases to the EU market and their intended applications.

*Section 5* shows figures on progress under the EU HFC phase-down, while *section 6* shows figures on progress under the global HFC phase-down under the Montreal Protocol.

### Data Tables

*Section 7* provides detailed data tables for the figures presented in sections 2 to 6.

### Additional Information

*Section 8* briefly explains the terminology used throughout the document, *section 9* details the gases covered by the EU F-gas Regulation and thus this document and *section 10* outlines the calculation methods used.

## 1.3 Scope

The data contained in this annex is based on submissions for the year 2020 as received by 27 July 2021 (which includes some late reports and corrections received after the legal deadline on 31 March 2021). Data for previous years were changed slightly after some corrections were submitted.

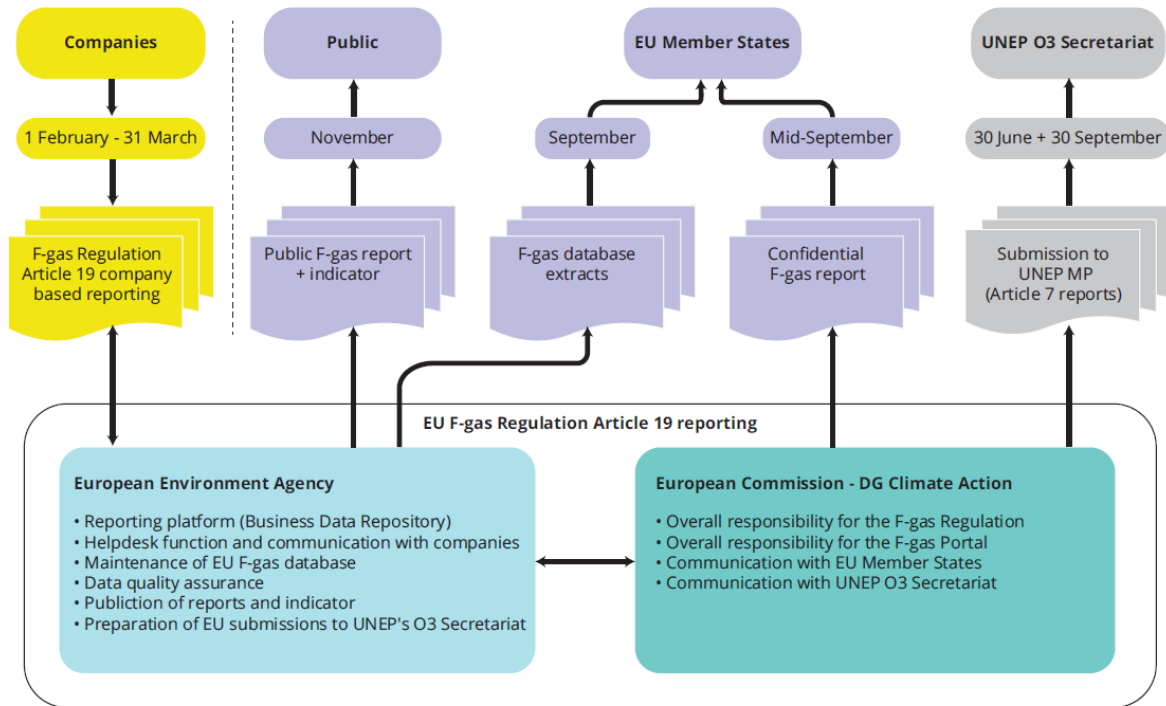
Data for 2007-2013 are covered by the old 2006 F-gas Regulation, while data for 2014 and onwards are covered by the new 2014 Regulation. Due to the different reporting frameworks, data from the two periods are not always directly comparable.

The geographical scope for data presented for the years until 2018 is the EU-28. Data for 2019 onwards relates to the EU-27 and the United Kingdom.

## 1.4 Institutional arrangements

Companies that need to report are obliged to register with the European Commission’s F-gas portal <sup>(1)</sup>, which also hosts the HFC registry pursuant to Article 17 of the 2014 F-gas Regulation.

**Figure 1.1 Institutional arrangements**



Source: EEA, 2020.

Since 2012, the European Commission has given the responsibility for collecting, archiving and evaluating the data reported by companies to the European Environment Agency (EEA). The reporting process is executed through the EEA’s online platform, the Business Data Repository (BDR), while technical support for the F-gas reporting process is provided by the EEA’s European Topic Centre on Climate Change Mitigation and Energy (ETC/CME) <sup>(2)</sup>.

## 1.5 Confidentiality

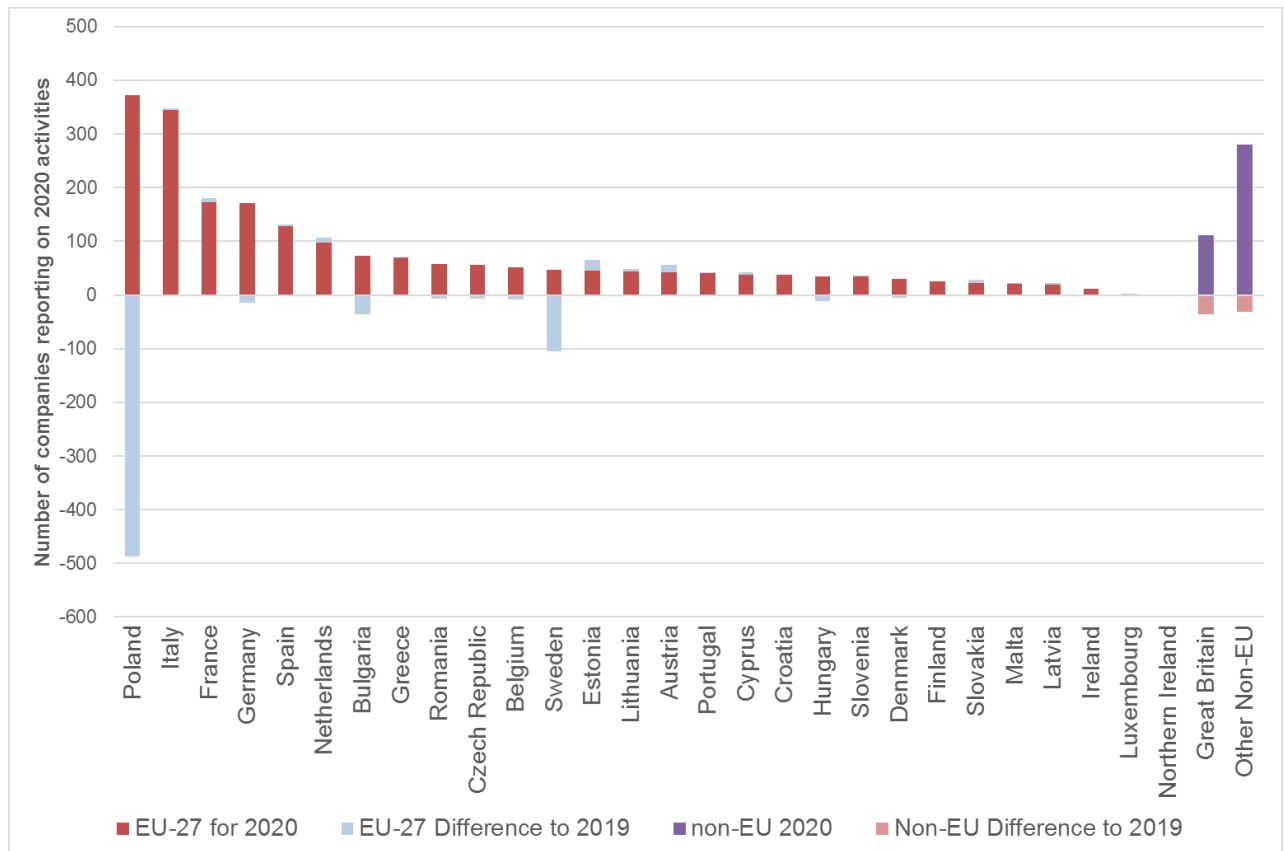
The F-gas Regulation requires that the confidentiality of the information submitted by companies is protected (Article 19(8)). The EEA takes appropriate measures to protect confidentiality and prevent publication of commercially sensitive information. These measures include public reporting of F-gases data only at higher levels of aggregation, to protect data that are the result of reports from fewer than three corporate groups, and additional steps to prevent deduction of sensitive information. It is for confidentiality reasons that some of the statements about F-gas activity in this report are of a general nature and do not refer to exact figures or percentages. A summary of the confidentiality measures applied to the data published in this report is included at the beginning of section 7.

<sup>(1)</sup> <https://webgate.ec.europa.eu/ods2/>

<sup>(2)</sup> <https://www.eionet.europa.eu/etcs/etc-cme>

## 2 Figures on companies reporting in 2021

Figure 2.1 Reporting companies by Member State



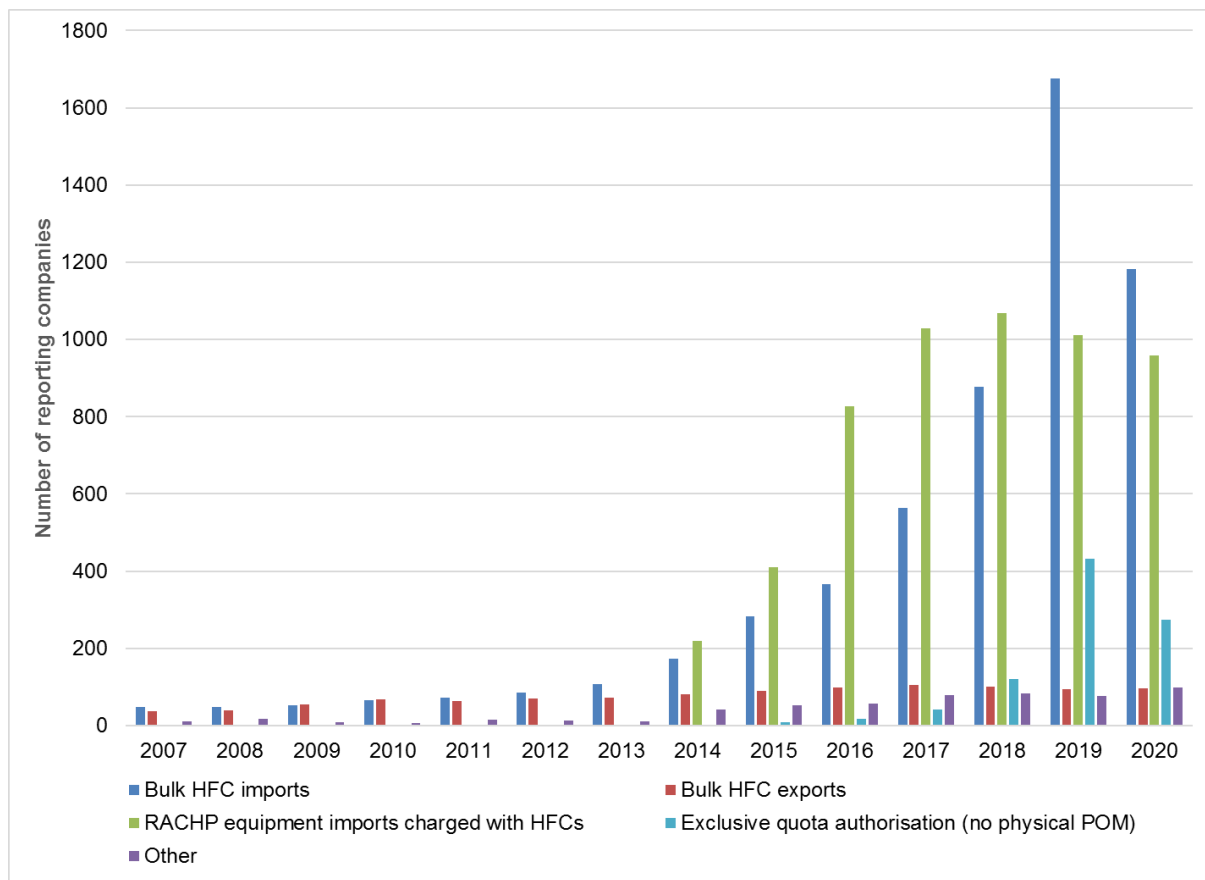
**Note:** Nil reports not included.

*Other Non-EU* countries: Brazil, British Virgin Islands, Canada, China, Egypt, Gibraltar, Hong Kong, India, Japan, Korea, Malaysia, Marshall Islands, Mexico, Monaco, Norway, Russia, Saudi Arabia, Serbia, Singapore, Switzerland, South Africa, Taiwan, Turkey, United States, United Arab Emirates.

**Source:** EEA, 2021.

Table 23 in Section 7 (Data tables, page 49) presents a breakdown of reporting companies by countries and reported activities for 2020.

**Figure 2.2 Reported activities, 2007-2019**



**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

For a more detailed breakdown of reported activities over time, please refer to Table 25 in Section 7 (Data tables, page 52).

### 3 Figures on F-gas activity in the European Union

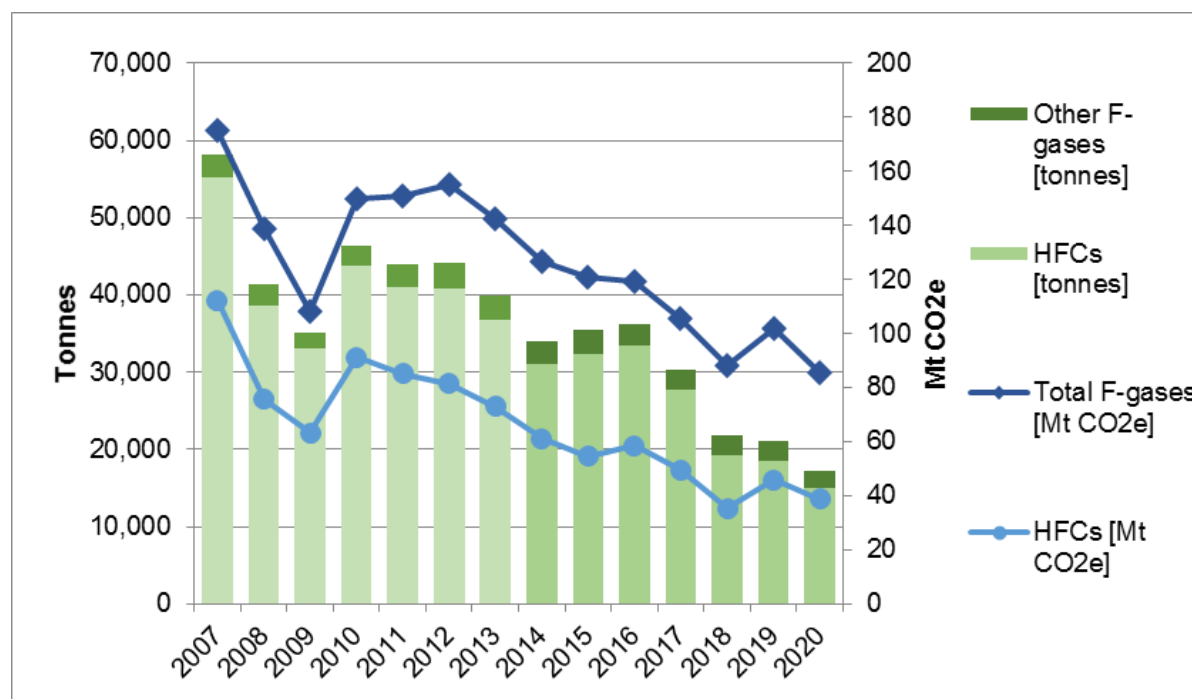
This chapter presents data reported by companies on:

- production and reclamation (Section 3.1);
- imports, both bulk and in products/equipment, and bulk exports (Section 3.2);
- destruction and feedstock use (Section 3.3).

#### 3.1 Production and reclamation

‘Production’ refers to the production of virgin F-gases. The F-gas Regulation defines ‘reclamation’ as ‘the reprocessing of a recovered fluorinated greenhouse gas in order to match the equivalent performance of a virgin substance, taking into account its intended use’. Note that reclaimed HFCs do not count as ‘placed on the market’ and are not subject to the limits of the HFC phase-down.

**Figure 3.1 EU production of fluorinated gases**

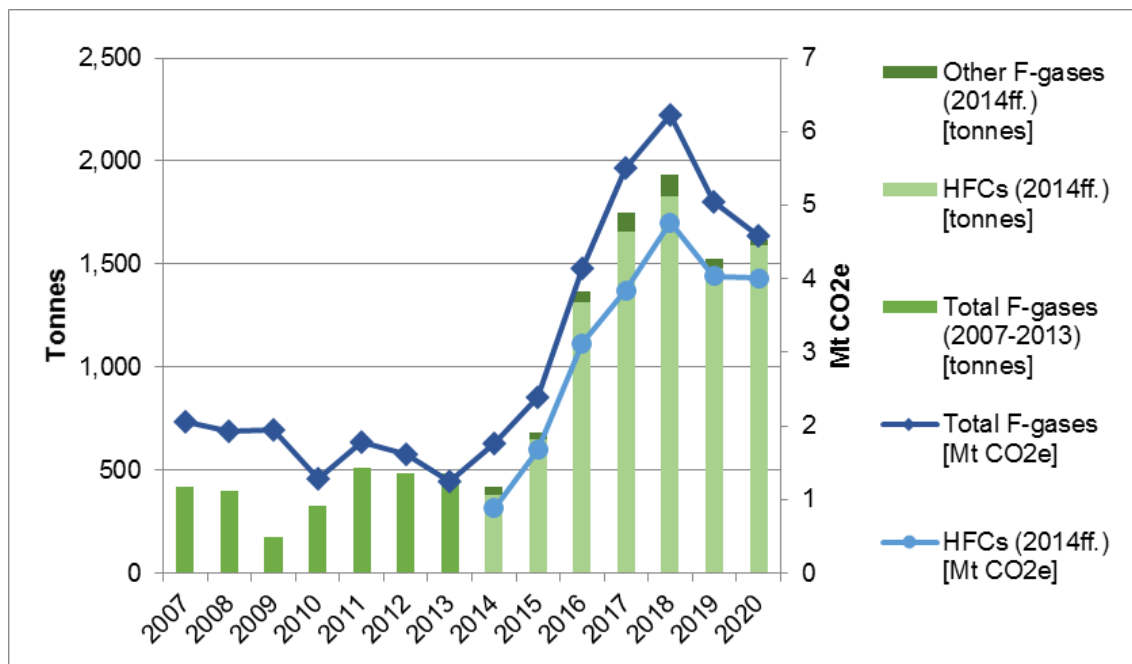


**Note:** The geographical scope of presented data is the EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

A tabular overview on F-gases produced in the EU since 2007 in tonnes and CO<sub>2e</sub> is given in Table 1 and Table 2 in section 7 (Data tables, page 29f.).

**Figure 3.2 EU reclamation of fluorinated gases**



**Note:** The geographical scope of presented data is the EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and  $\text{NF}_3$  and other perfluorinated compounds) were not subject to reporting for the years 2007-2013.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

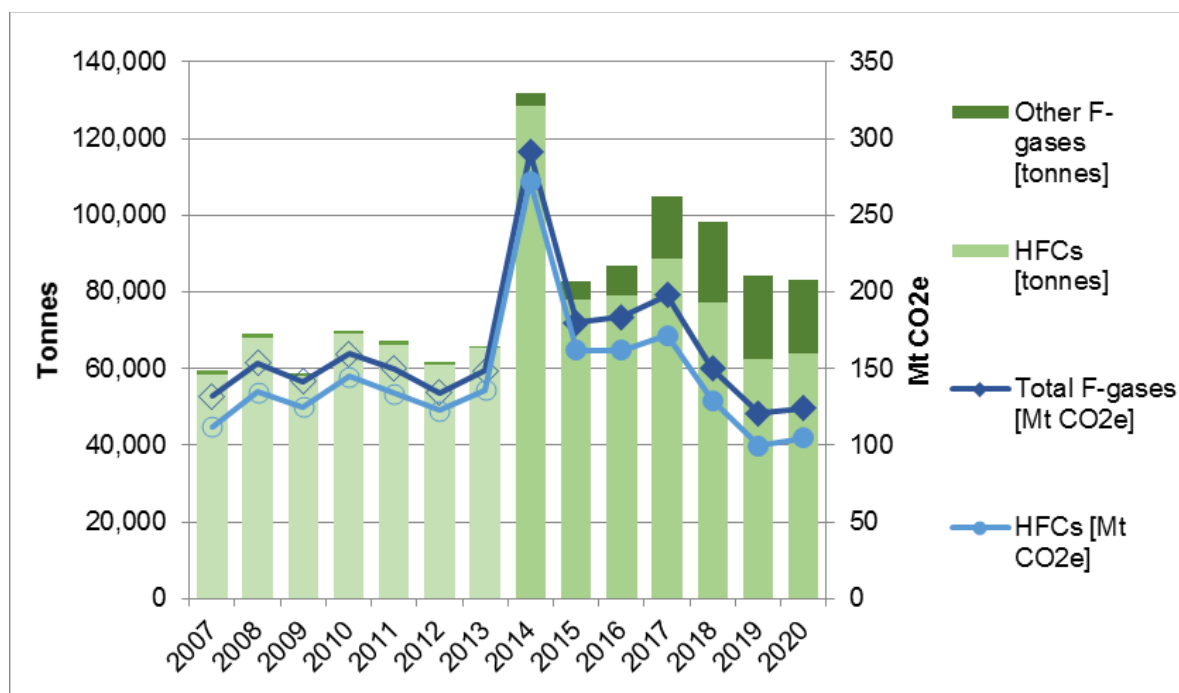


## 3.2 Imports and exports

### Imports

Detailed data on total imports can be found in Table 5 and Table 6 in section 7 (Data tables, page 33f.).

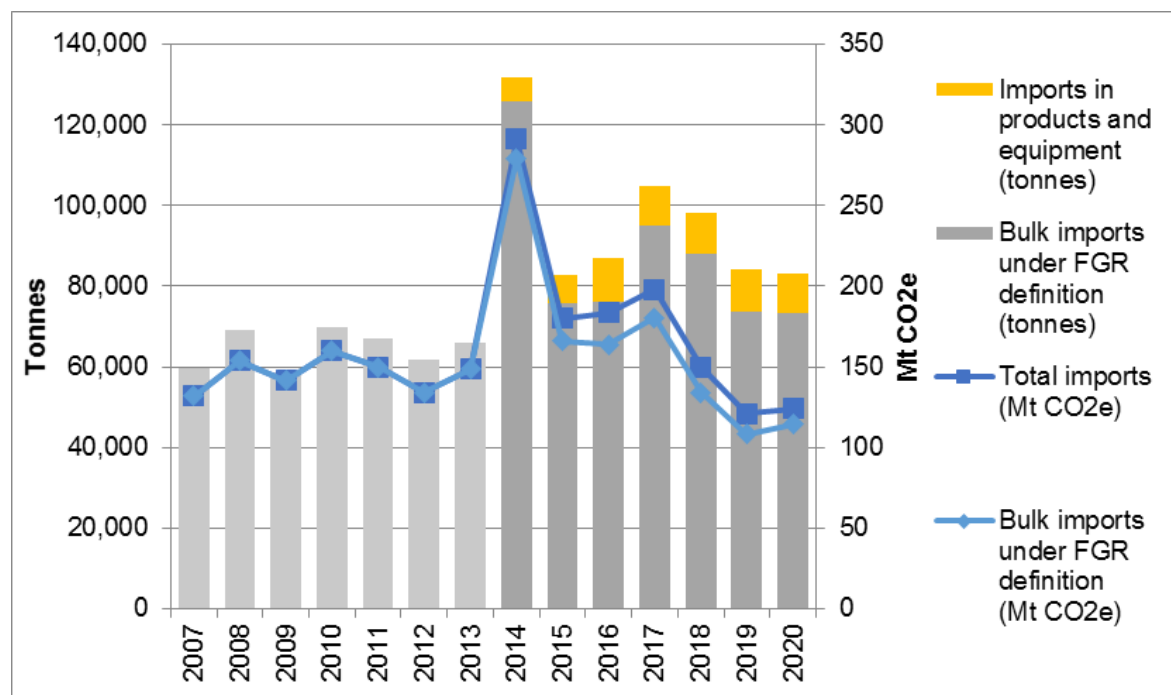
**Figure 3.3 EU imports of fluorinated gases**



**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and  $\text{NF}_3$  and other perfluorinated compounds) and HFCs, PFCs and  $\text{SF}_6$  imported in products and equipment were not subject to reporting for the years 2007-2013. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and  $\text{SF}_6$ .

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

Figure 3.4 EU imports by type

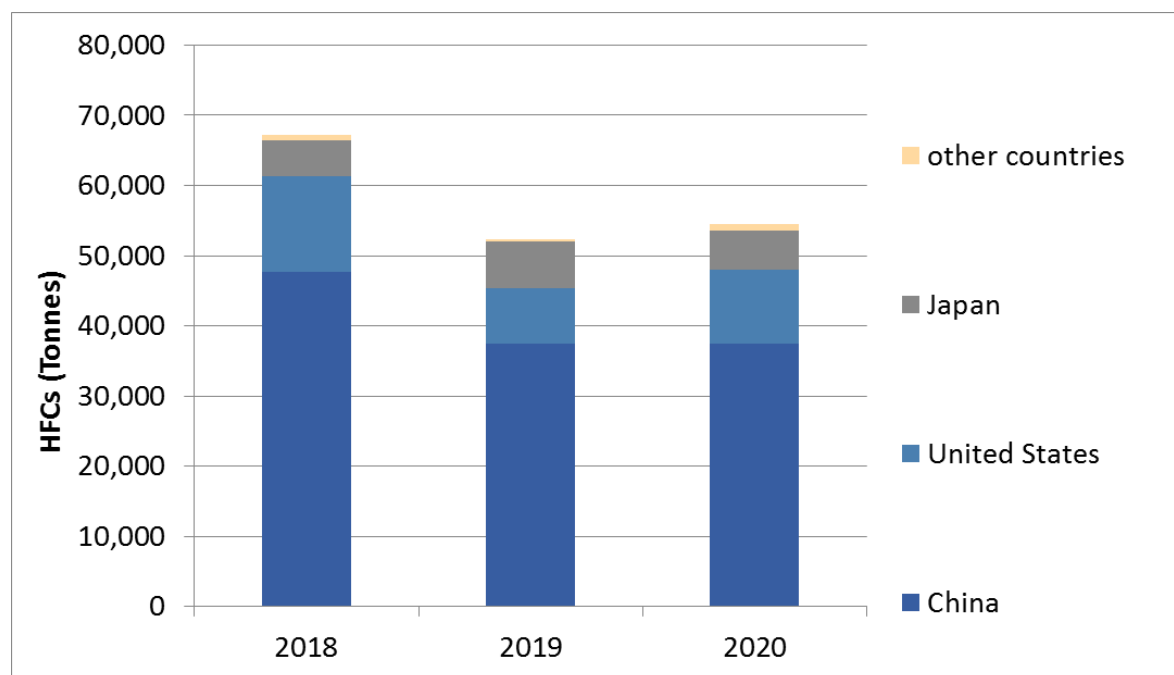


**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> imported in products and equipment were not subject to reporting for the years 2007-2013. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>. Bulk imports under FGR definition starting 2014 do include imports of pre-blended polyols which are thus not included in the amounts shown for imports in products and equipment.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

## Bulk Imports

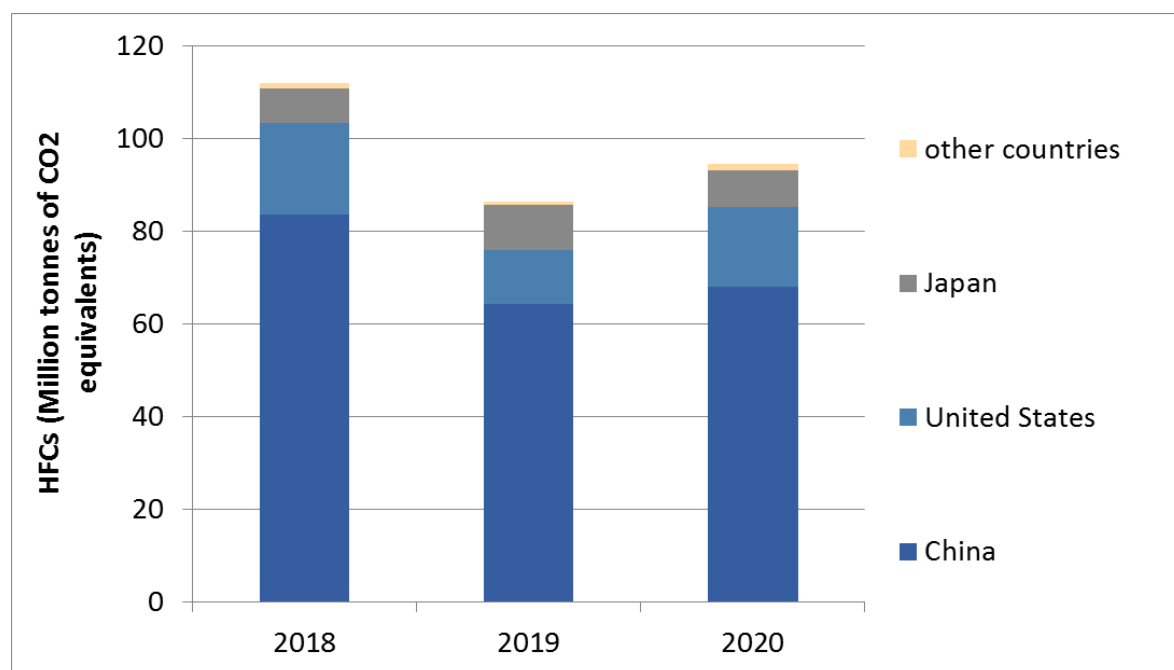
**Figure 3.5 Origin of bulk HFC imports (tonnes)**



**Note:** The geographical scope of presented data is EU-27+UK. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

**Sources:** EEA, 2020 and 2021.

**Figure 3.6 Origin of bulk HFC imports (GWP)**



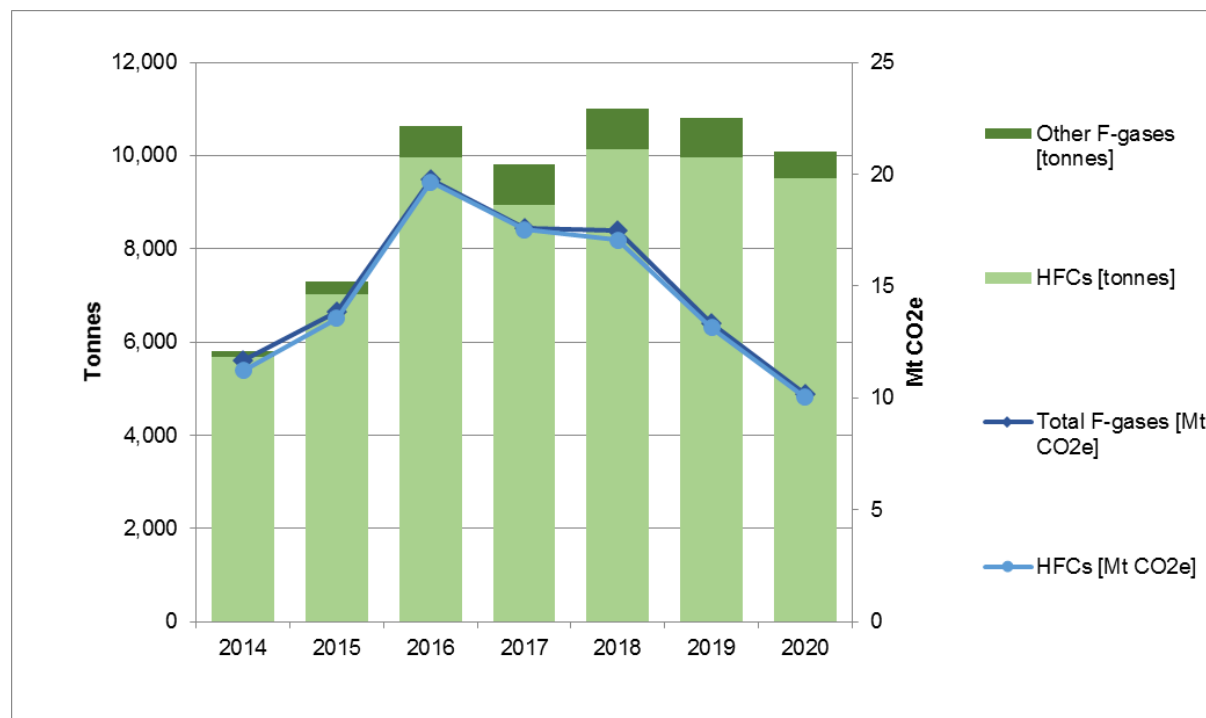
**Note:** The geographical scope of presented data is the EU-27+UK. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

**Sources:** EEA, 2020 and 2021.

Detailed data on bulk F-gas imports is contained in Table 7 and Table 8 in section 7 (Data tables, page 35f.).

## Imports contained in products and equipment

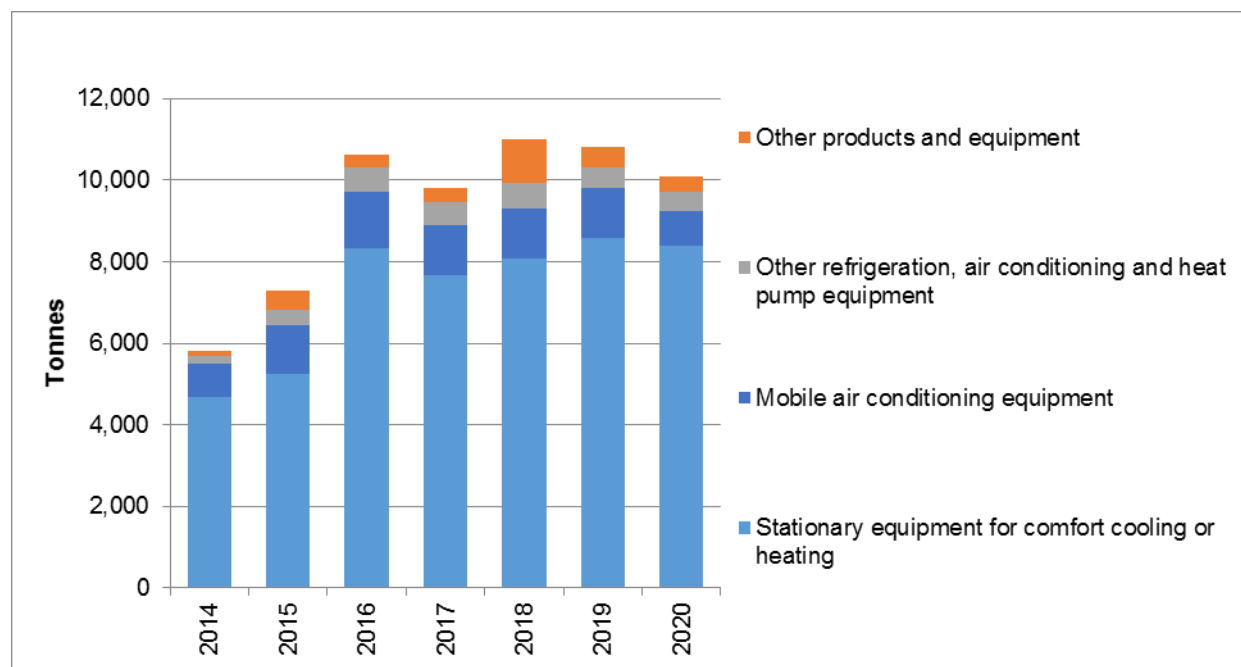
**Figure 3.7 EU imports of fluorinated gases within products and equipment**



**Note:** The geographical scope of presented data is the EU-27+UK. Imports of pre-blended polyols are not included in the data shown.

**Sources:** EEA, 2020 and 2021.

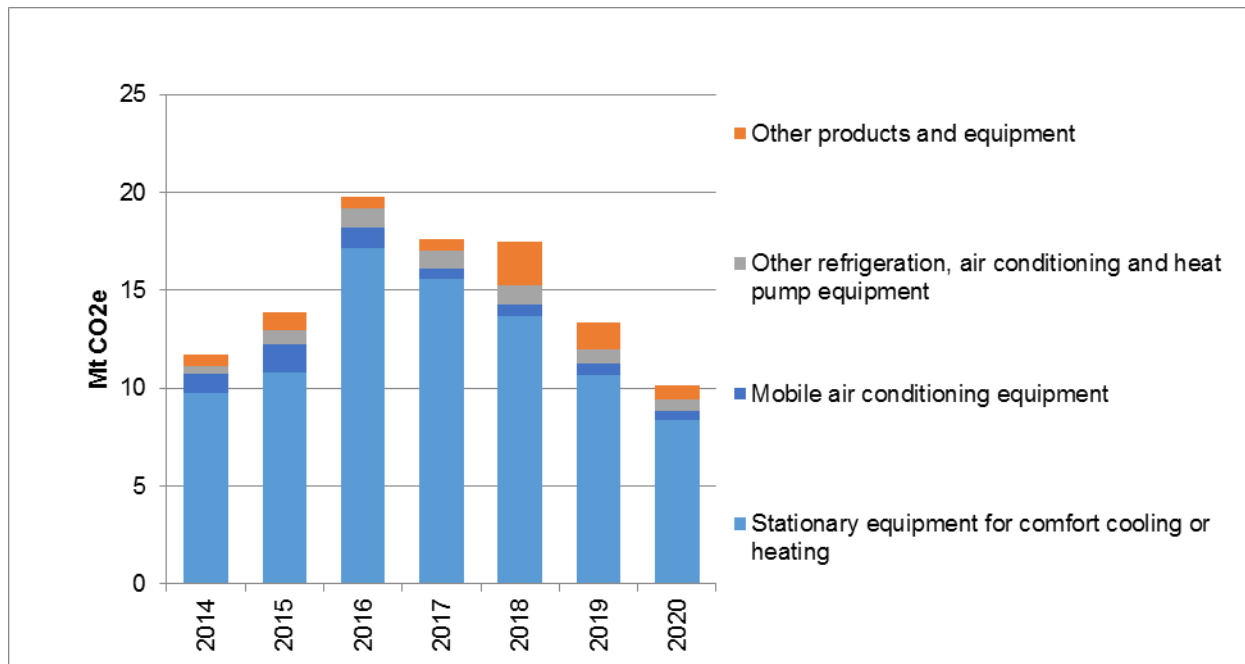
**Figure 3.8 Categories of EU supply in products and equipment of fluorinated gases (tonnes)**



**Note:** The geographical scope of presented data is EU-27+UK. Imports of pre-blended polyols are included since 2018.

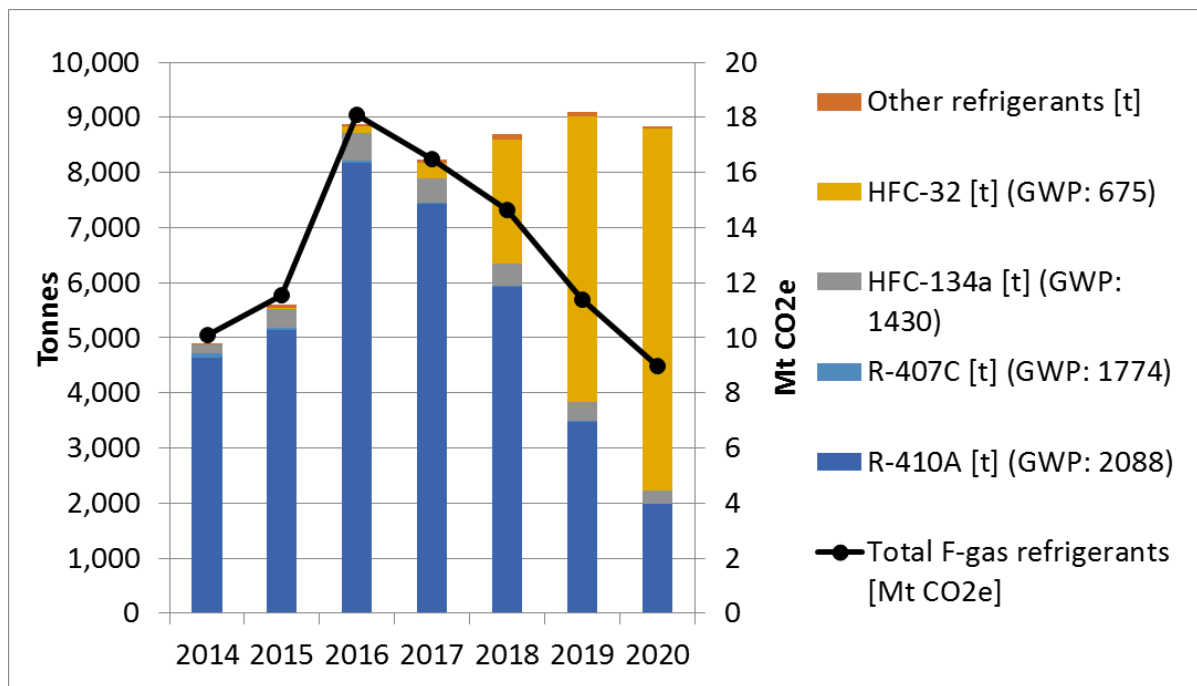
**Sources:** EEA, 2020 and 2021.

**Figure 3.9 Categories of EU supply in products and equipment of fluorinated gases (CO<sub>2</sub>e)**



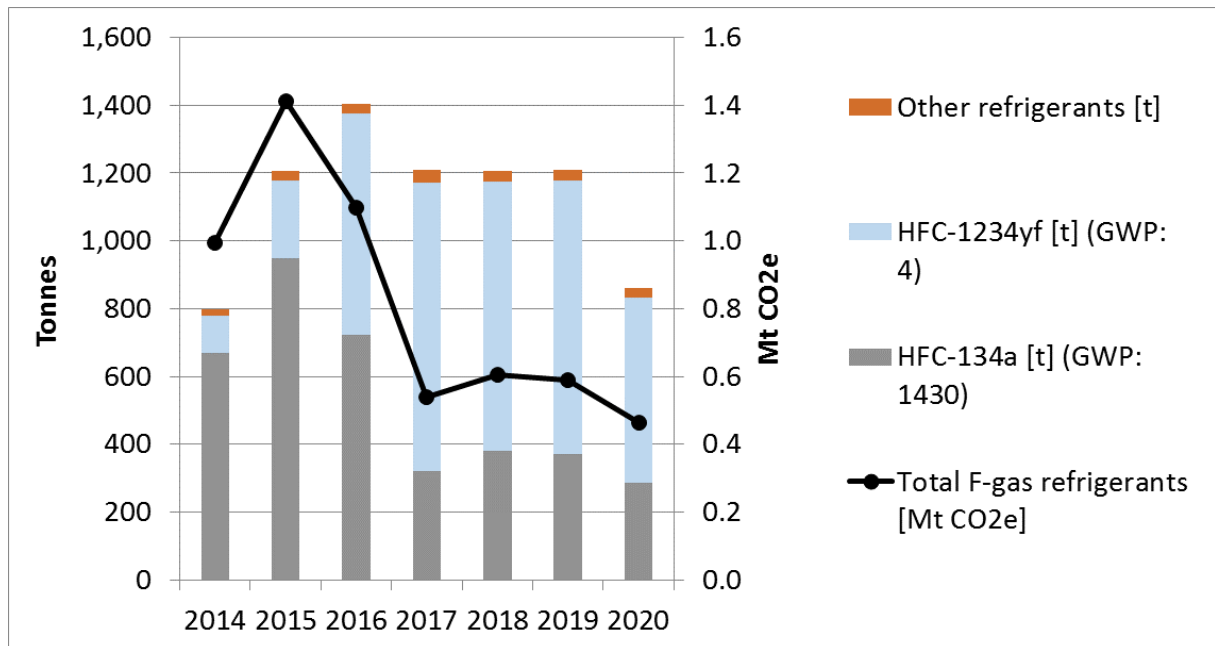
**Note:** The geographical scope of presented data is EU-27+UK. Imports of pre-blended polyols are included since 2018.  
**Sources:** EEA, 2020 and 2021.

**Figure 3.10 Refrigerants in imported stationary RACHP equipment (tonnes)**



**Note:** The geographical scope of presented data is EU-27+UK.  
**Sources:** EEA, 2020 and 2021.

**Figure 3.11 EU imports of fluorinated gases within air conditioning equipment for vehicles**



**Note:** The geographical scope of presented data is EU-27+UK.

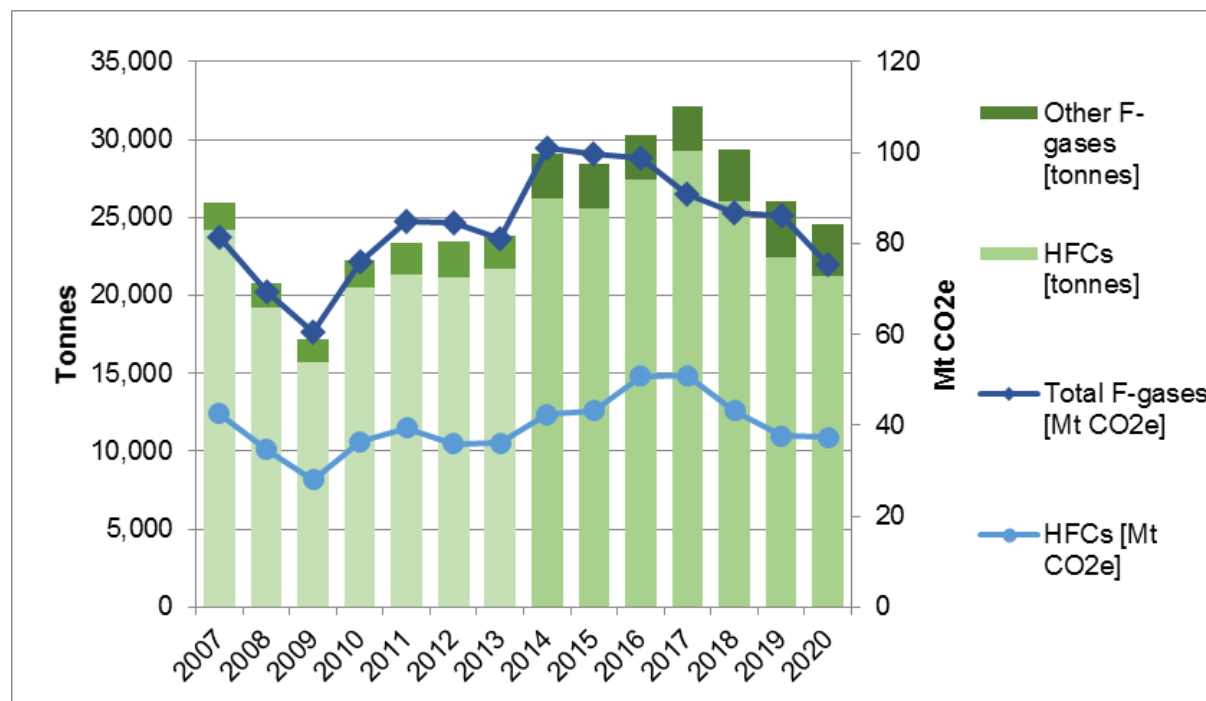
**Sources:** EEA, 2020 and 2021.

Detailed data on F-gases in imported products and equipment are listed in Table 9 and Table 10 in section 7 (Data tables, page 37f.). Equipment imports by equipment category are given in Table 11 and Table 12 (page 38f.).

## Exports

Detailed data on exports can be found in Table 13 and Table 14 in section 7 (Data tables, page 39f.).

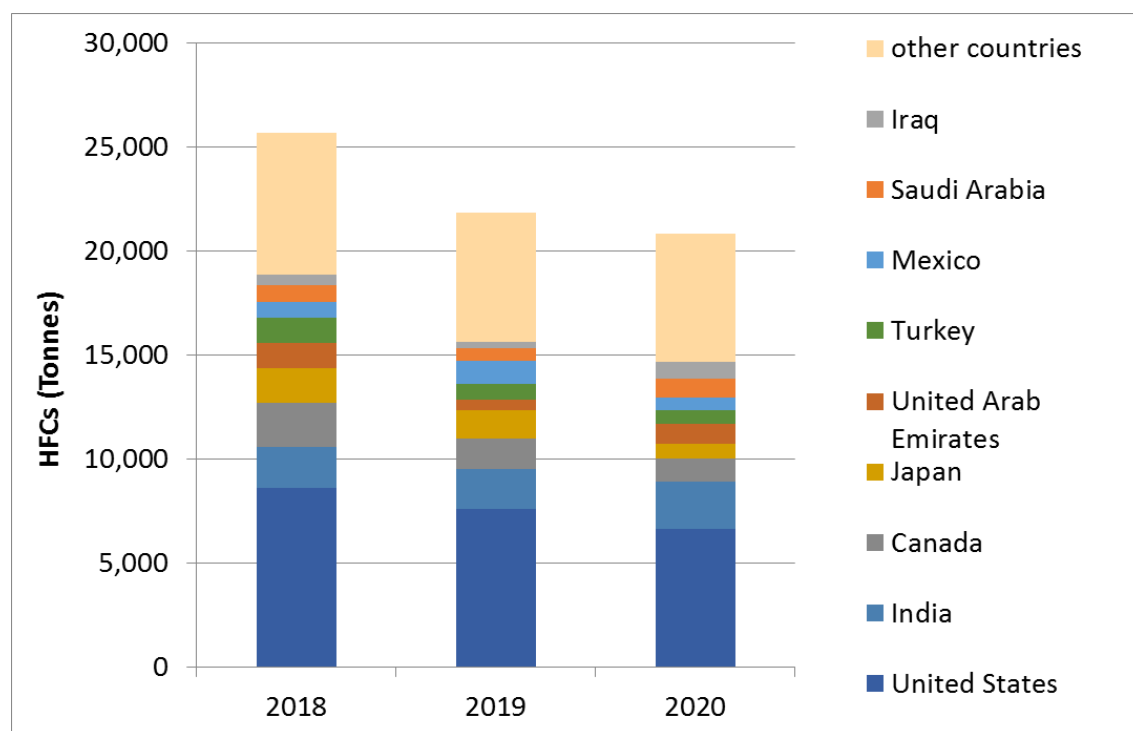
**Figure 3.12 EU bulk exports of fluorinated gases**



**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and  $\text{NF}_3$  and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. Bulk exports shown for 2014-2017 include gases exported in pre-blended polyols. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and  $\text{SF}_6$ .

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

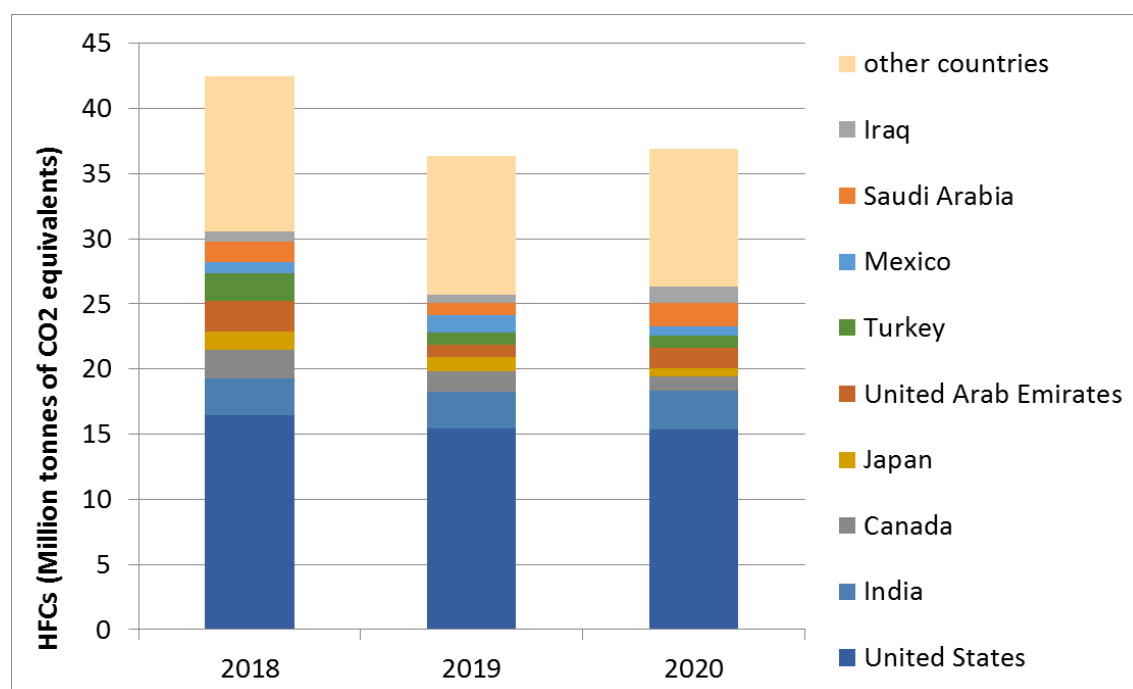
**Figure 3.13 Destination of bulk HFC exports (tonnes)**



**Note:** The geographical scope of presented data is EU-27+UK. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

**Sources:** EEA, 2020 and 2021.

**Figure 3.14 Destination of bulk HFC exports (GWP)**



**Note:** The geographical scope of presented data is EU-27+UK. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

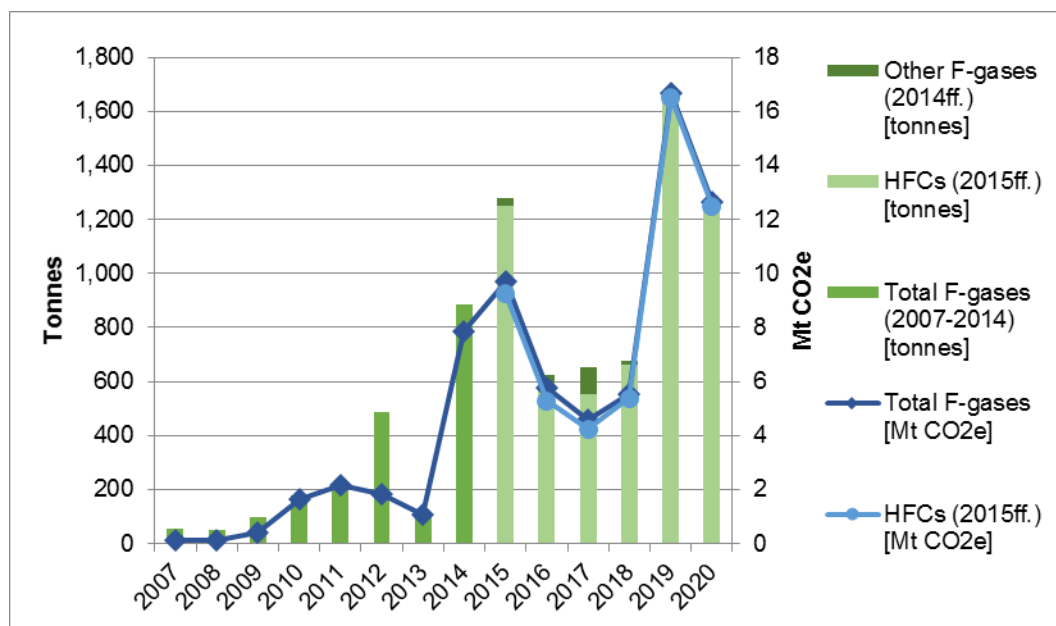
**Sources:** EEA, 2020 and 2021.



### 3.3 Destruction of fluorinated gases

This section presents the amounts of F-gases reported as destroyed.

**Figure 3.15 EU destruction of fluorinated gases**



**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013.

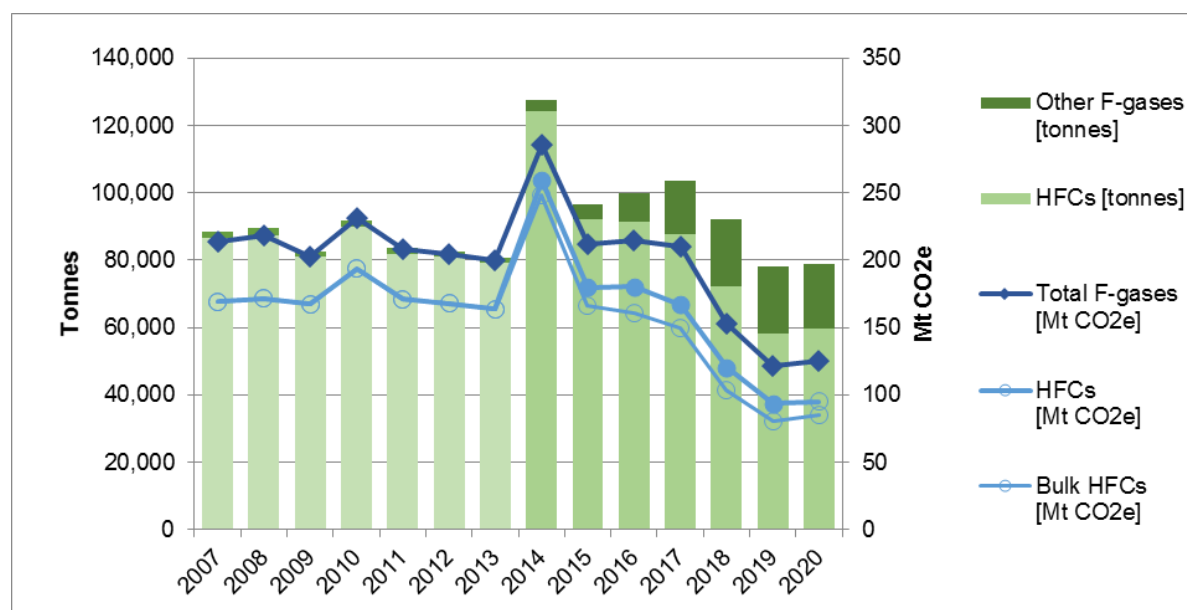
**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

## 4 Figures on the supply of fluorinated gases to the EU

Supply of fluorinated gases is a metric used by the EEA that provides information on the actual use of fluorinated gases by EU industries. It is calculated primarily from reported production, imports and exports <sup>(3)</sup>.

### 4.1 Trends in the EU supply by gas

Figure 4.1 EU supply of fluorinated gases

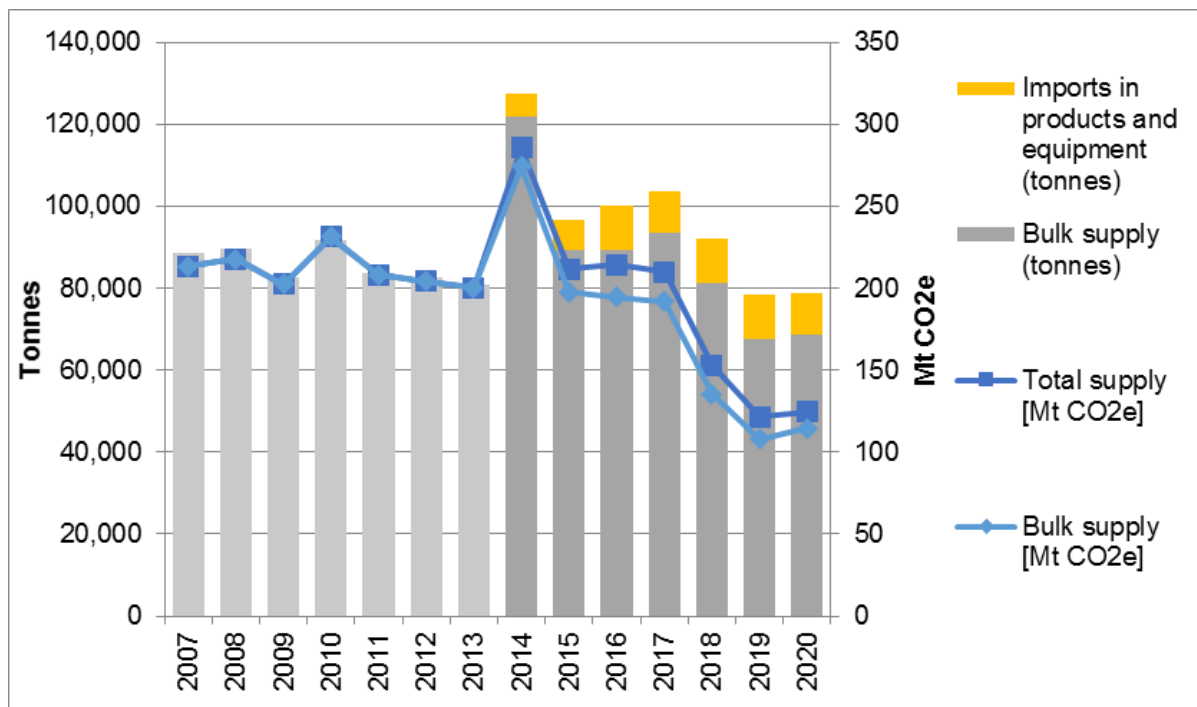


**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> imported in products and equipment were not subject to reporting for the years 2007-2013. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

<sup>(3)</sup> For methodological details on the calculation of EU supply, please refer to section 10, in particular Table 27 (page 93), which explains the difference between the metrics of ‘EU supply’, ‘placing on the market’, and ‘consumption’, which are relevant for different aspects of the legal framework.

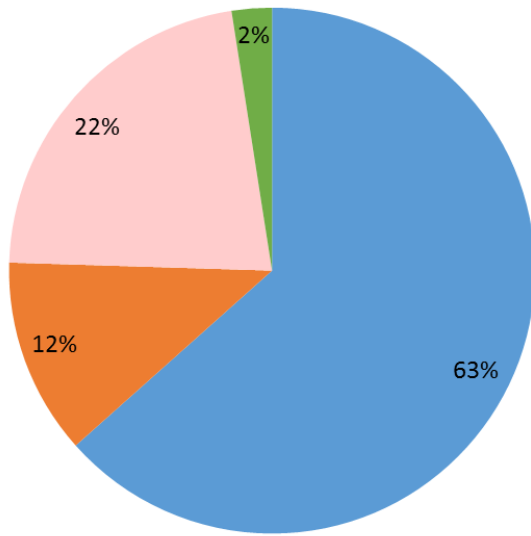
**Figure 4.2 EU supply of fluorinated gases by types**



**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> imported in products and equipment were not subject to reporting for the years 2007-2013. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>. Imports of pre-blended polyols, available since 2018, were assigned to the supply in products and equipment.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

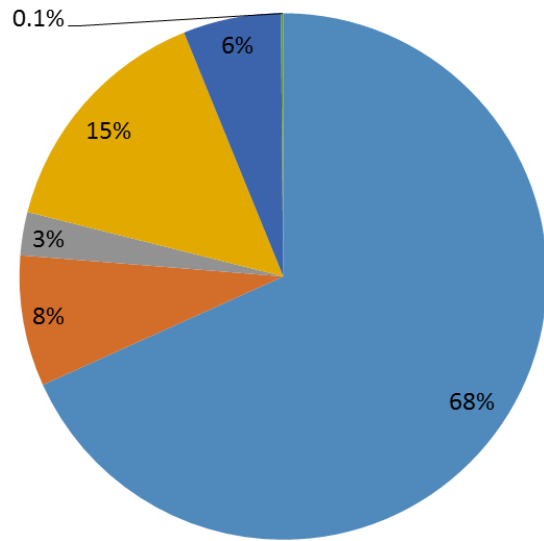
**Figure 4.3 2020 total supply by types and groups of fluorinated gases (% tonnes)**



■ HFCs (bulk)      ■ HFCs (equipment)  
 ■ Unsaturated H(C)FCs      ■ Other F-gases

**Note:** The geographical scope of presented data is EU-27+UK.  
**Source:** EEA, 2021.

**Figure 4.4 2020 total supply by types and groups of fluorinated gases (% CO<sub>2</sub>e)**



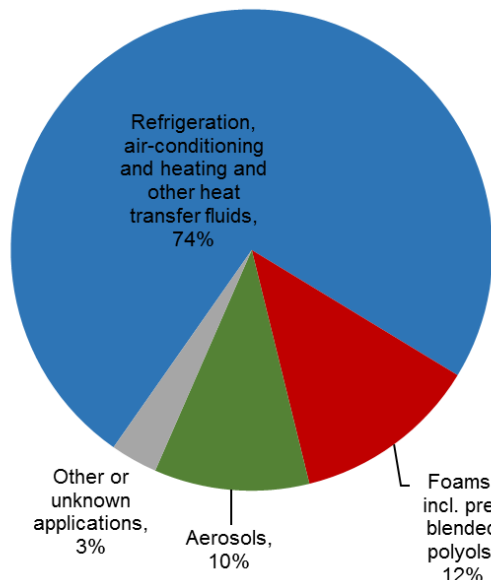
■ HFCs (bulk)      ■ HFCs (equipment)  
 ■ PFCs      ■ SF6  
 ■ NF3      ■ Other F-gases

**Note:** The geographical scope of presented data is EU-27+UK.  
**Source:** EEA, 2021.

Detailed data on total supply and bulk supply are given in Table 15 Table 18 in section 7 (Data tables, page 41f.). For supply in imports and equipment, please refer to Table 9 and Table 10 (page 37f).

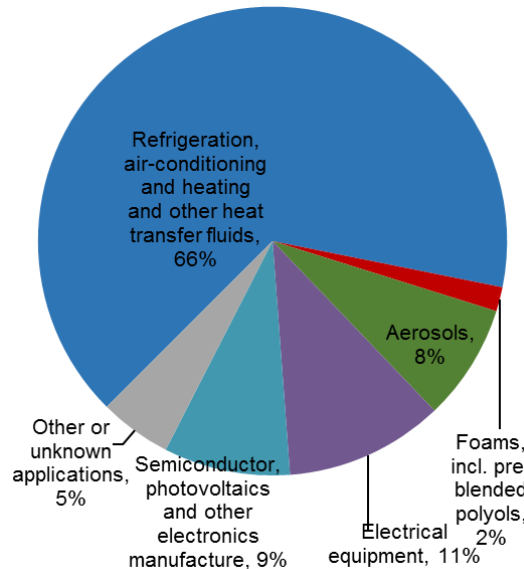
## 4.2 Intended applications of EU supply

**Figure 4.5 2020 EU supply by intended applications (% tonnes)**



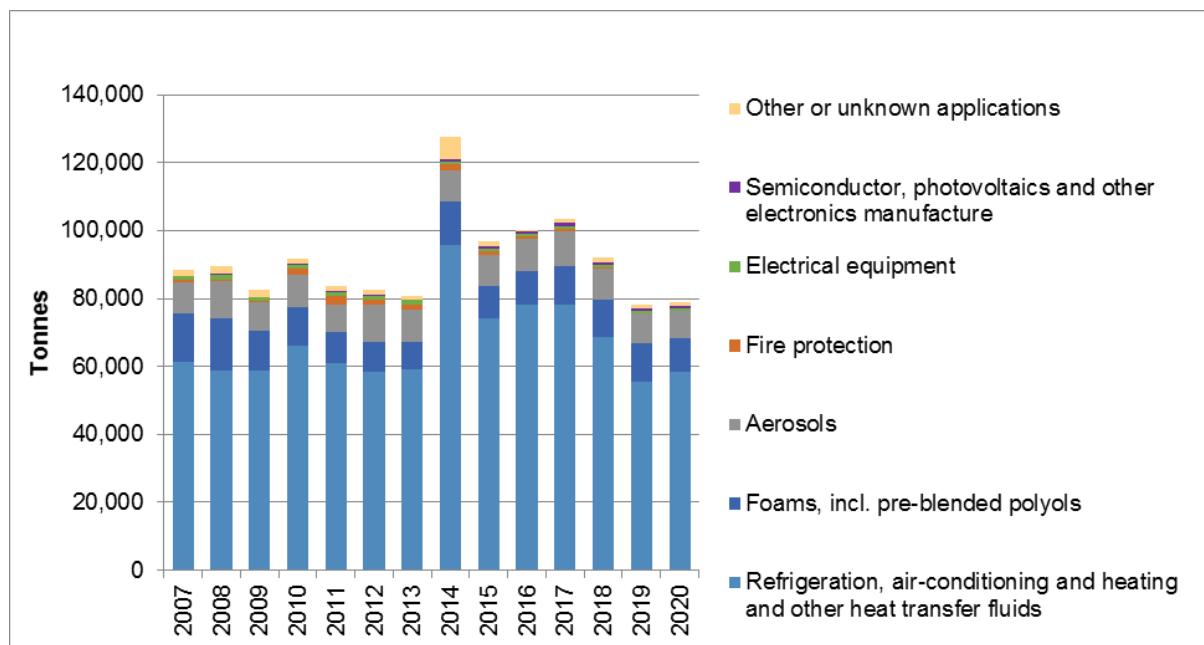
**Note:** The geographical scope of presented data is EU-27+UK.  
**Source:** EEA, 2021.

**Figure 4.6 2020 EU supply by intended applications (% CO<sub>2</sub>e)**



**Note:** The geographical scope of presented data is EU-27+UK.  
**Source:** EEA, 2021.

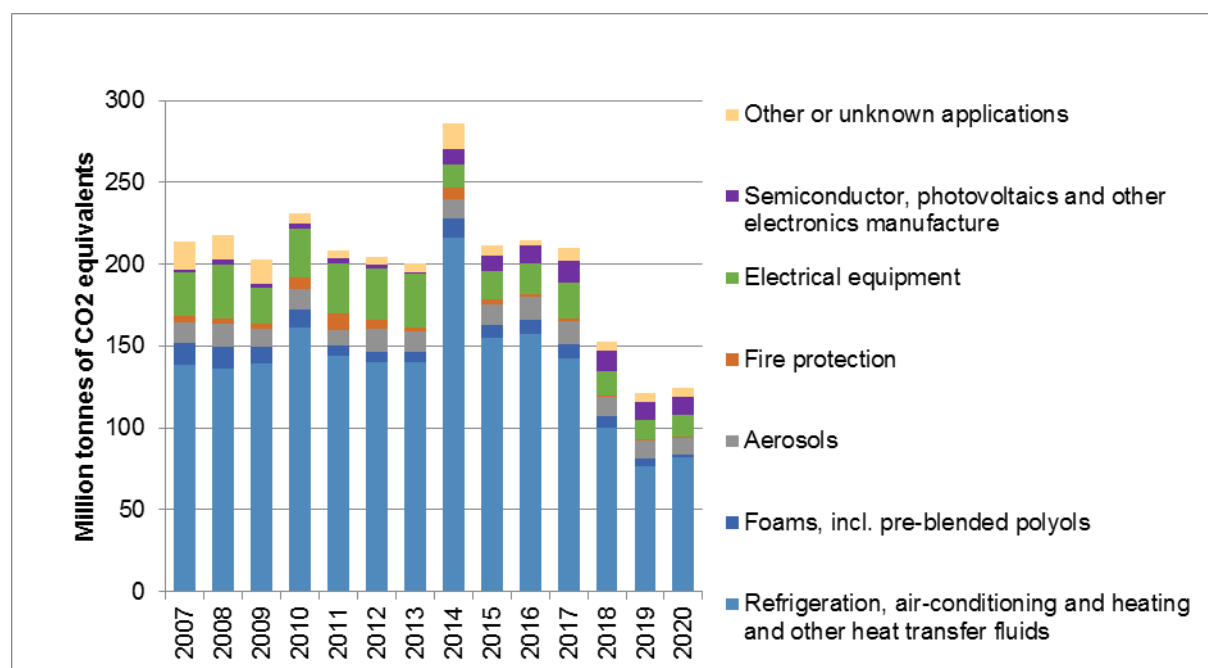
**Figure 4.7 Intended applications of EU total supply of fluorinated gases (tonnes)**



**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> imported in products and equipment were not subject to reporting for the years 2007-2013. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Figure 4.8 Intended applications of EU total supply of fluorinated gases (CO<sub>2</sub>e)**



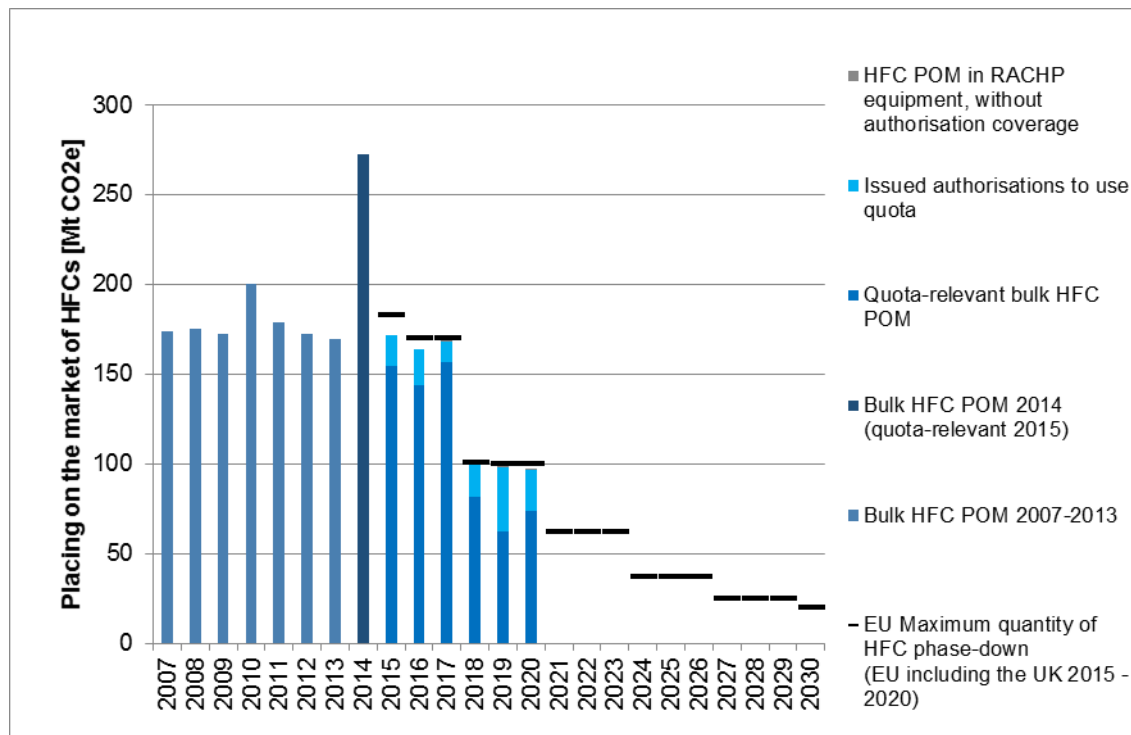
**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> imported in products and equipment were not subject to reporting for the years 2007-2013. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

Detailed data on intended applications can be found in Table 19 and Table 20, in section 7 (page 45f). For categories of supply in products and equipment, please refer to Table 11 and Table 12 (page 38f). For details of the calculation methods, please refer to section 10.

## 5 Figures on the progress of the EU HFC phase-down

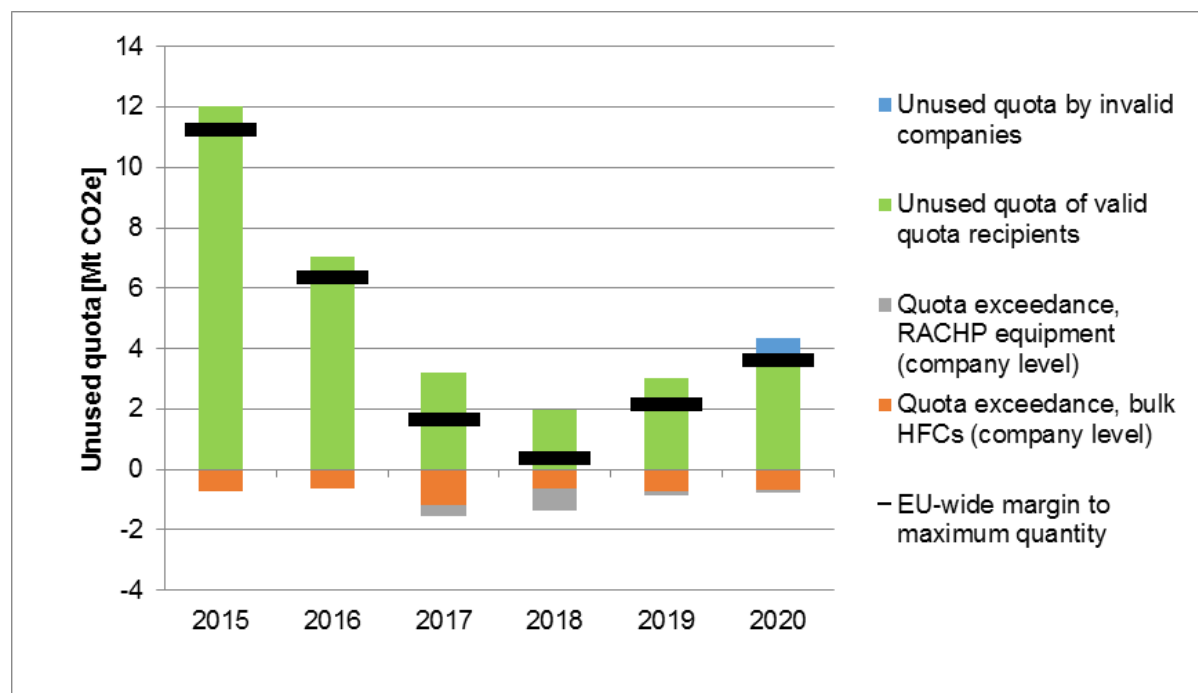
Figure 5.1 Progress of the EU HFC phase-down



**Notes:** POM, placing on the market. Values from 2007 to 2013 are based on the reporting obligations of the old F-Gas Regulation (EC) No 842/2006 and are therefore not fully comparable with data from 2014 onwards (based on the obligations of the new F-Gas Regulation (EU) No 517/2014). The geographical scope of presented POM data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. The maximum quantities of the EU HFC phase-down shown for 2019 onwards are given for the EU-27 and the United Kingdom. EU-27 maximum quantities for 2021 have been recalculated for the period after the Brexit transition period.

**Sources:** EC, 2011, 2014 and 2020; EEA, 2020 and 2021.

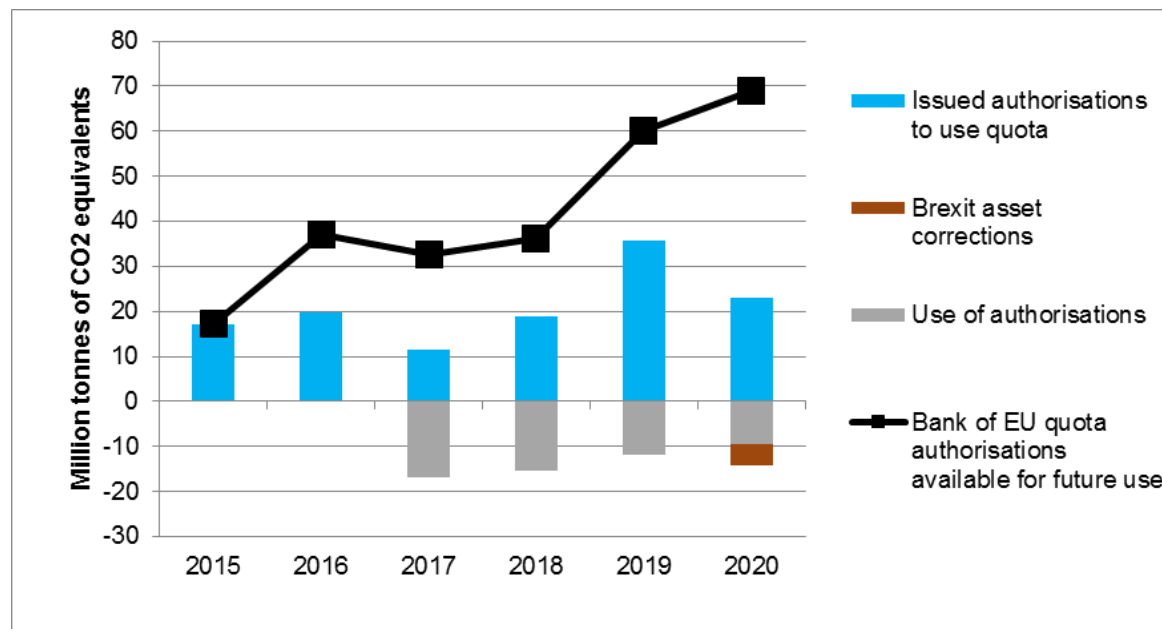
**Figure 5.2 Balance between placing on the market of HFCs and related quotas at EU level**



**Note:** The data for 2020 have not yet undergone scrutiny by the European Commission. The geographical scope of presented data is the EU-27+UK.

**Sources:** EC, 2020; EEA, 2020 and 2021.

**Figure 5.3 Bank of authorisations for HFCs in RACHP equipment imports**



**Notes:** RACHP: refrigeration, air conditioning and heat pumps. The geographical scope of presented data is the EU-27+UK.

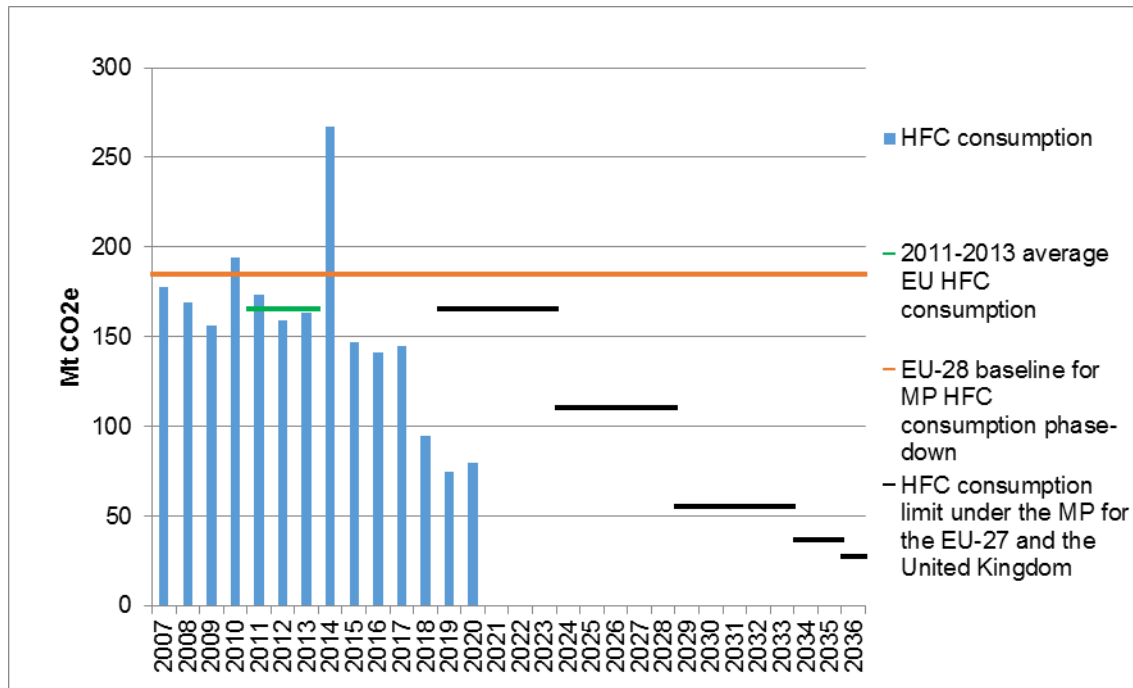
**Sources:** EC, 2020 and EEA, 2021.

A tabular overview data related to the progress of the HFC phase-down under the FGR is given in Table 21 in section 7 (Data tables, page 47).



## 6 Figures on the international HFC phase-down under the Montreal Protocol

Figure 6.1 EU progress under the Montreal Protocol HFC phase-down



**Notes:** MP, Montreal Protocol. HFCs covered under the Montreal Protocol include all HFCs covered under EU F-gas Regulation No 517/2014, except HFC-161 (see 9). The geographical scope of presented HFC consumption data EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

**Sources:** EC, 2011, and 2014; EEA, 2020 and 2021.

A tabular overview of HFC consumption is given in Table 22 in section 7 (Data tables, page 48).

# 7 Data tables

## ***Measures to protect confidential data***

The EEA takes appropriate steps to protect the confidentiality of commercially sensitive information in accordance with Article 19(8) of the new F-gas Regulation. Throughout the report, three rules are applied to all numbers and figures to determine whether a data item must remain confidential.

**Three-company group rule.** This rule stipulates that any value that is published must be the sum of at least three different companies. In addition, companies are invited to specify affiliates in their report. These groups of affiliates, if mutually confirmed, count as one company for the purpose of this evaluation.

**5 % significance rule.** The contributions of small companies to any value may be insignificant, and larger companies' confidentiality may be compromised despite the first rule. Therefore, a value remains confidential if fewer than three companies make up more than 95 % of the total, discounting the smallest contributors that make up 5 % of the sum.

**Preventing deduction.** Deduction might be possible where a confidential value is part of a sum of substances or transactions. For example, a confidential value for sulphur hexafluoride (SF<sub>6</sub>) may be deduced if there are figures published for perfluorocarbons (PFCs) as well as a total for SF<sub>6</sub> and PFCs. In the case of metrics such as 'supply', a confidential value, e.g. for 'production', may be deduced if values for both 'import' and 'export' are known and the remainder of small transactions that make up 'supply' is very small. Therefore, two steps are taken:

- In cases where a sum across substances or transactions is published, and there is only one value contributing to that sum that is confidential according to the above rules, a second part of the sum is made confidential to make sure that the lone confidential value cannot be deduced from the sum and remaining parts.
- In the case of supply metrics, a second of the major contributors (production, import and export) is made confidential if one of them is confidential according to the above rules and the remainder of small transactions makes up less than 5 % of the total.

## **A practical guide to applying the 'three-company group rule' and '5 % significance rule' measures to data**

Operationalisation of the combined three-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.

$$\sum X_i = X_1 + X_2 + \dots + X_n$$

*X<sub>i</sub> = individual reported value by a single reporting undertaking*

$$\sum X_i = \text{sum of individual reported values by reporting undertakings}$$

*belonging to the same company group*

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

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

$$\% = \frac{|\sum X_i|}{\sum |\sum X_i|} \cdot 100$$

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.

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**Table 1 EU production of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>													
HFCs	55 235	38 519	33 106	43 792	41 040	40 854	36 708	31 050	32 339	33 380	27 713	19 270	18 499	15 009
PFCs	C	C	C	C	C	C	C	C	C	C	C	C	C	C
SF6	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C	C	C	C	-	-
HFES and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	-	-	-	-
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	-	-	-	-
<b>Total fluorinated gases</b>	<b>58 098</b>	<b>41 359</b>	<b>35 123</b>	<b>46 440</b>	<b>44 030</b>	<b>44 220</b>	<b>39 901</b>	<b>34 049</b>	<b>35 377</b>	<b>36 159</b>	<b>30 345</b>	<b>21 787</b>	<b>21 160</b>	<b>17 219</b>
<i>average GWP</i>	<i>3 012</i>	<i>3 361</i>	<i>3 088</i>	<i>3 226</i>	<i>3 432</i>	<i>3 508</i>	<i>3 573</i>	<i>3 723</i>	<i>3 419</i>	<i>3 293</i>	<i>3 470</i>	<i>4 054</i>	<i>4 820</i>	<i>4 970</i>

**Notes:** ‘-’: no data reported, ‘n.a.’: not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFES and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 2 EU production of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
HFCs	112.2	75.6	63.3	91.1	85.0	81.4	73.1	61.1	54.6	58.6	49.6	35.3	45.8	38.6
PFCs	C	C	C	C	C	C	C	C	C	C	C	C	C	C
SF6	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C	C	C	C	-	-
HFES and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	-	-	-	-
NF <sub>3</sub> and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	-	-	-	-
<b>Total fluorinated gases</b>	<b>175.0</b>	<b>139.0</b>	<b>108.4</b>	<b>149.8</b>	<b>151.1</b>	<b>155.1</b>	<b>142.6</b>	<b>126.8</b>	<b>121.0</b>	<b>119.1</b>	<b>105.3</b>	<b>88.3</b>	<b>102.0</b>	<b>85.6</b>
<i>average GWP</i>	<i>3 012</i>	<i>3 361</i>	<i>3 088</i>	<i>3 226</i>	<i>3 432</i>	<i>3 508</i>	<i>3 573</i>	<i>3 723</i>	<i>3 419</i>	<i>3 293</i>	<i>3 470</i>	<i>4 054</i>	<i>4 820</i>	<i>4 970</i>

**Notes:** ‘-’: no data reported, ‘n.a.’: not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFES and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 3 EU reclamation of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>													
HFCs	C	C	100	C	C	460	C	377	647	1 314	1 659	1 829	1 478	1 590
PFCs	-	-	-	-	-	C	-	C	C	C	C	C	C	-
SF6	C	C	77	C	C	C	C	C	C	C	69	C	C	C
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C	C	C	C	C	C
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	-	-	-	-
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	C	-	-	-
<b>Total fluorinated gases</b>	<b>417</b>	<b>398</b>	<b>177</b>	<b>326</b>	<b>508</b>	<b>487</b>	<b>484</b>	<b>416</b>	<b>679</b>	<b>1 364</b>	<b>1 751</b>	<b>1 934</b>	<b>1 523</b>	<b>1 619</b>
<i>average GWP</i>	<i>4 919</i>	<i>4 860</i>	<i>10 963</i>	<i>3 961</i>	<i>3 498</i>	<i>3 321</i>	<i>2 555</i>	<i>4 250</i>	<i>3 527</i>	<i>3 033</i>	<i>3 145</i>	<i>3 223</i>	<i>3 313</i>	<i>2 837</i>

**Notes:** ‘-’: no data reported, ‘n.a.’: not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 4 EU reclamation of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
HFCs	C	C	0.2	C	C	1.0	C	0.9	1.7	3.1	3.8	4.8	4.0	4.0
PFCs	-	-	-	-	-	C	-	C	C	C	C	C	C	-
SF6	C	C	1.8	C	C	C	C	C	C	C	1.6	C	C	C
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C	C	C	C	C	C
HFES and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	-	-	-	-
NF <sub>3</sub> and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	-	C	-	-	-
<b>Total fluorinated gases</b>	<b>2.1</b>	<b>1.9</b>	<b>1.9</b>	<b>1.3</b>	<b>1.8</b>	<b>1.6</b>	<b>1.2</b>	<b>1.8</b>	<b>2.4</b>	<b>4.1</b>	<b>5.5</b>	<b>6.2</b>	<b>5.0</b>	<b>4.6</b>
<i>average GWP</i>	<i>4 919</i>	<i>4 860</i>	<i>10 963</i>	<i>3 961</i>	<i>3 498</i>	<i>3 321</i>	<i>2 555</i>	<i>4 250</i>	<i>3 527</i>	<i>3 033</i>	<i>3 145</i>	<i>3 223</i>	<i>3 313</i>	<i>2 837</i>

**Notes:** ‘-’: no data reported, ‘n.a.’: not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFES and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.



**Table 5 Total EU imports of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>													
HFCs	58 519	67 951	57 946	69 089	66 269	61 102	65 221	128 452	78 026	78 938	88 530	77 286	62 276	64 056
PFCs	253	306	129	230	238	310	155	350	409	363	498	416	397	341
SF6	747	691	671	539	587	374	483	430	382	420	565	420	410	401
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1 900	3 413	6 356	14 609	19 235	20 437	17 730
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
<b>Total fluorinated gases</b>	<b>59 518</b>	<b>68 948</b>	<b>58 746</b>	<b>69 858</b>	<b>67 094</b>	<b>61 787</b>	<b>65 859</b>	<b>131 794</b>	<b>82 910</b>	<b>86 878</b>	<b>104 835</b>	<b>98 223</b>	<b>84 297</b>	<b>83 267</b>
<i>average GWP</i>	<i>2 215</i>	<i>2 227</i>	<i>2 412</i>	<i>2 287</i>	<i>2 232</i>	<i>2 172</i>	<i>2 257</i>	<i>2 209</i>	<i>2 170</i>	<i>2 113</i>	<i>1 887</i>	<i>1 525</i>	<i>1 432</i>	<i>1 489</i>

**Notes:** ‘-’: no data reported, ‘n.a.’: not applicable; Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> in products and equipment were not subject to reporting for the years 2007-2013. The data shown for 2007-2013 are thus limited to bulk imports. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 6 Total EU imports of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
HFCs	112.2	134.6	125.1	145.0	133.9	122.5	136.0	272.1	161.9	161.9	171.7	129.0	99.5	104.5
PFCs	2.6	3.2	1.4	2.5	2.5	3.2	1.6	3.4	3.9	3.6	4.7	4.0	3.8	3.2
SF <sub>6</sub>	17.0	15.8	15.3	12.3	13.4	8.5	11.0	9.8	8.7	9.6	12.9	9.6	9.3	9.2
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.0	0.0	0.0	0.1	0.1	0.1	0.1
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	0.0	C	C	C
NF <sub>3</sub> and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	8.5	C	C	C
<b>Total fluorinated gases</b>	<b>131.8</b>	<b>153.6</b>	<b>141.7</b>	<b>159.7</b>	<b>149.7</b>	<b>134.2</b>	<b>148.7</b>	<b>291.1</b>	<b>179.9</b>	<b>183.6</b>	<b>197.8</b>	<b>149.8</b>	<b>120.7</b>	<b>123.9</b>
<i>average GWP</i>	<i>2 215</i>	<i>2 227</i>	<i>2 412</i>	<i>2 287</i>	<i>2 232</i>	<i>2 172</i>	<i>2 257</i>	<i>2 209</i>	<i>2 170</i>	<i>2 113</i>	<i>1 887</i>	<i>1 525</i>	<i>1 432</i>	<i>1 489</i>

**Notes:** ‘-’: no data reported, ‘n.a.’: not applicable; Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> in products and equipment were not subject to reporting for the years 2007-2013. The data shown for 2007-2013 are thus limited to bulk imports. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 7 EU bulk imports of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>													
HFCs	58 519	67 951	57 946	69 089	66 269	61 102	65 221	122 781	70 993	68 971	79 577	67 152	52 319	54 540
PFCs	253	306	129	230	238	310	155	C	C	355	496	416	396	341
SF6	747	691	671	539	587	374	483	C	377	417	563	400	401	396
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
HFES and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
<b>Total fluorinated gases</b>	<b>59 518</b>	<b>68 948</b>	<b>58 746</b>	<b>69 858</b>	<b>67 094</b>	<b>61 787</b>	<b>65 859</b>	<b>125 986</b>	<b>75 606</b>	<b>76 247</b>	<b>95 013</b>	<b>87 221</b>	<b>73 477</b>	<b>73 172</b>
<i>average GWP</i>	<i>2 215</i>	<i>2 227</i>	<i>2 412</i>	<i>2 287</i>	<i>2 232</i>	<i>2 172</i>	<i>2 257</i>	<i>2 218</i>	<i>2 196</i>	<i>2 149</i>	<i>1 897</i>	<i>1 517</i>	<i>1 461</i>	<i>1 555</i>

**Notes:** '-': no data reported, 'n.a.': not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFES and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. Bulk imports under FGR definition. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 8 EU bulk imports of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
HFCs	112.2	134.6	125.1	145.0	133.9	122.5	136.0	260.9	148.3	142.3	154.1	111.9	86.4	94.5
PFCs	2.6	3.2	1.4	2.5	2.5	3.2	1.6	C	C	3.5	4.7	4.0	3.8	3.2
SF <sub>6</sub>	17.0	15.8	15.3	12.3	13.4	8.5	11.0	C	8.6	9.5	12.8	9.1	9.1	9.0
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
NF <sub>3</sub> and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	8.5	C	C	C
<b>Total fluorinated gases</b>	<b>131.8</b>	<b>153.6</b>	<b>141.7</b>	<b>159.7</b>	<b>149.7</b>	<b>134.2</b>	<b>148.7</b>	<b>279.4</b>	<b>166.0</b>	<b>163.8</b>	<b>180.2</b>	<b>132.3</b>	<b>107.4</b>	<b>113.8</b>
<i>average GWP</i>	<i>2 215</i>	<i>2 227</i>	<i>2 412</i>	<i>2 287</i>	<i>2 232</i>	<i>2 172</i>	<i>2 257</i>	<i>2 218</i>	<i>2 196</i>	<i>2 149</i>	<i>1 897</i>	<i>1 517</i>	<i>1 461</i>	<i>1 555</i>

**Notes:** ‘-’: no data reported, ‘n.a.’: not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. Bulk imports under FGR definition. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 9 EU imports of fluorinated gases within products and equipment (tonnes)**

	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>						
HFCs	5 671	7 033	9 967	8 953	10 134	9 957	9 515
PFCs	C	C	7	2	1	1	1
SF6	C	6	2	2	19	9	6
Unsaturated HFCs and HCFCs	C	C	C	C	C	C	C
HFES and alcohols	-	C	C	C	C	C	C
NF3 and other perfluorinated compounds	-	-	-	-	-	-	-
<b>Total fluorinated gases</b>	<b>5 808</b>	<b>7 304</b>	<b>10 631</b>	<b>9 823</b>	<b>11 002</b>	<b>10 820</b>	<b>10 095</b>
<i>average GWP</i>	<i>2 015</i>	<i>1 898</i>	<i>1 860</i>	<i>1 792</i>	<i>1 591</i>	<i>1 235</i>	<i>1 007</i>

**Notes:** '-': no data reported. The geographical scope of presented data is the EU-27+UK. Imports of pre-blended polyols are not included.

**Sources:** EEA, 2020 and 2021.

**Table 10 EU imports of fluorinated gases within products and equipment (CO<sub>2</sub>e)**

	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>						
HFCs	11.2	13.6	19.7	17.5	17.1	13.1	10.0
PFCs	C	C	0.1	0.0	0.0	0.0	0.0
SF6	C	0.1	0.1	0.1	0.4	0.2	0.1
Unsaturated HFCs and HCFCs	C	C	C	C	C	C	C
HFES and alcohols	-	C	C	C	C	C	C
NF3 and other perfluorinated compounds	-	-	-	-	-	-	-
<b>Total fluorinated gases</b>	<b>11.7</b>	<b>13.9</b>	<b>19.8</b>	<b>17.6</b>	<b>17.5</b>	<b>13.4</b>	<b>10.2</b>
<i>average GWP</i>	<i>2 015</i>	<i>1 898</i>	<i>1 860</i>	<i>1 792</i>	<i>1 591</i>	<i>1 235</i>	<i>1 007</i>

**Notes:** '-': no data reported. The geographical scope of presented data is the EU-27+UK. Imports of pre-blended polyols are not included.

**Sources:** EEA, 2020 and 2021.

**Table 11 Categories of imports of fluorinated gases in products and equipment (tonnes)**

	2014	2015	2016	2017	2018	2019	2020
<b>Categories of products and equipment</b>	<b>Tonnes</b>						
Stationary equipment for comfort cooling or heating	4 698	5 239	8 325	7 680	8 093	8 586	8 396
Mobile air conditioning equipment	798	1 205	1 405	1 210	1 206	1 210	861
Other refrigeration air conditioning and heat pump equipment	208	363	570	559	628	530	462
Other products and equipment	104	496	331	373	1 076	494	376
<b>Total supply in products and equipment</b>	<b>5 808</b>	<b>7 304</b>	<b>10 631</b>	<b>9 823</b>	<b>11 002</b>	<b>10 820</b>	<b>10 095</b>

**Notes:** The geographical scope of presented data is the EU-27+UK. 'n.a.': not applicable: Imports of pre-blended polyols were not subject to separate reporting before 2018. '-': no data reported.

**Sources:** EEA, 2020 and 2021.

**Table 12 Categories of imports of fluorinated gases in products and equipment (CO<sub>2</sub>e)**

	2014	2015	2016	2017	2018	2019	2020
<b>Categories of products and equipment</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>						
Stationary equipment for comfort cooling or heating	9.8	10.8	17.1	15.6	13.7	10.6	8.4
Mobile air conditioning equipment	1.0	1.4	1.1	0.5	0.6	0.6	0.5
Other refrigeration, air conditioning and heat pump equipment	0.4	0.7	1.0	1.0	1.0	0.8	0.6
Other products and equipment	0.6	0.9	0.6	0.5	2.2	1.4	0.7
<b>Total supply in products and equipment</b>	<b>11.7</b>	<b>13.9</b>	<b>19.8</b>	<b>17.6</b>	<b>17.5</b>	<b>13.4</b>	<b>10.2</b>

**Notes:** The geographical scope of presented data is the EU-27+UK. 'n.a.': not applicable: Imports of pre-blended polyols were not subject to separate reporting before 2018. '-': no data reported.

**Sources:** EEA, 2020 and 2021.

**Table 13 EU bulk exports of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>													
HFCs	24 162	19 187	15 720	20 455	21 330	21 171	21 699	26 239	25 577	27 414	29 224	26 039	22 475	21 222
PFCs	83	57	25	C	C	255	253	91	95	132	176	C	297	212
SF6	1 670	1 499	1 423	C	C	2 021	1 871	2 522	2 426	2 012	1 669	1 862	2 000	1 572
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	1 246	1 504
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	8	C	10	C	C
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	10	6	C	C
<b>Total fluorinated gases</b>	<b>25 915</b>	<b>20 742</b>	<b>17 168</b>	<b>22 233</b>	<b>23 383</b>	<b>23 448</b>	<b>23 822</b>	<b>29 065</b>	<b>28 417</b>	<b>30 274</b>	<b>32 105</b>	<b>29 350</b>	<b>26 033</b>	<b>24 528</b>
<i>average GWP</i>	<i>3 140</i>	<i>3 342</i>	<i>3 531</i>	<i>3 411</i>	<i>3 630</i>	<i>3 599</i>	<i>3 405</i>	<i>3 469</i>	<i>3 506</i>	<i>3 263</i>	<i>2 828</i>	<i>2 958</i>	<i>3 308</i>	<i>3 077</i>

**Notes:** '-': no data reported, 'n.a.': not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. Data given for 2014-2017 include gases exported in pre-blended polyols. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 14 EU bulk exports of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
HFCs	42.5	34.6	27.9	36.4	39.3	35.9	36.0	42.4	43.2	50.7	50.9	43.2	37.6	37.4
PFCs	0.8	0.5	0.2	C	C	2.4	2.4	0.8	0.9	1.3	1.7	C	2.8	2.0
SF6	38.1	34.2	32.4	C	C	46.1	42.7	57.5	55.3	45.9	38.0	42.5	45.6	35.8
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	0.0	C	0.0	0.0
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	0.0	C	C	C
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	0.2	0.1	C	C
<b>Total fluorinated gases</b>	<b>81.4</b>	<b>69.3</b>	<b>60.6</b>	<b>75.8</b>	<b>84.9</b>	<b>84.4</b>	<b>81.1</b>	<b>100.8</b>	<b>99.6</b>	<b>98.8</b>	<b>90.8</b>	<b>86.8</b>	<b>86.1</b>	<b>75.5</b>
<i>average GWP</i>	<i>3 140</i>	<i>3 342</i>	<i>3 531</i>	<i>3 411</i>	<i>3 630</i>	<i>3 599</i>	<i>3 405</i>	<i>3 469</i>	<i>3 506</i>	<i>3 263</i>	<i>2 828</i>	<i>2 958</i>	<i>3 308</i>	<i>3 077</i>

**Notes:** '-': no data reported, 'n.a.': not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. Data given for 2014-2017 include gases exported in pre-blended polyols. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.



**Table 15 Total EU supply of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>													
HFCs	86 477	87 311	81 005	89 924	81 829	80 982	79 215	124 408	92 062	91 592	87 582	72 179	58 025	59 501
PFCs	299	398	241	303	289	243	139	480	524	464	649	563	436	358
SF6	1 810	1 860	1 435	1 522	1 502	1 490	1 535	716	909	1 004	1 225	843	727	816
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	6 305	13 400	17 767	18 353	17 380
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	303	127	C	C	C
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	339	381	492	C	C	C
<b>Total fluorinated gases</b>	<b>88 586</b>	<b>89 569</b>	<b>82 681</b>	<b>91 749</b>	<b>83 620</b>	<b>82 715</b>	<b>80 889</b>	<b>127 547</b>	<b>96 750</b>	<b>100 049</b>	<b>103 475</b>	<b>92 179</b>	<b>78 307</b>	<b>78 825</b>
<i>average GWP</i>	<i>2 410</i>	<i>2 433</i>	<i>2 451</i>	<i>2 521</i>	<i>2 489</i>	<i>2 470</i>	<i>2 473</i>	<i>2 241</i>	<i>2 186</i>	<i>2 142</i>	<i>2 027</i>	<i>1 658</i>	<i>1 552</i>	<i>1 583</i>

**Notes:** '-': no data reported, 'n.a.': not applicable: Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> in products and equipment were not subject to reporting for the years 2007-2013. The data shown for 2007-2013 are thus limited to bulk supply. The geographical scope of presented data is the EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 16 Total EU supply of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
HFCs	169.3	171.5	167.4	193.5	171.0	167.9	163.7	259.2	179.8	180.4	167.2	120.6	93.6	95.2
PFCs	3.0	4.0	2.5	3.1	3.0	2.4	1.4	4.6	5.0	4.4	6.1	5.4	4.3	3.3
SF <sub>6</sub>	41.3	42.4	32.7	34.7	34.2	34.0	35.0	16.3	20.7	22.9	27.9	19.2	16.6	18.6
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	0.0	0.1	C	0.1	0.1
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	0.1	0.0	C	C	0.1
NF <sub>3</sub> and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	5.8	6.6	8.5	C	C	7.5
<b>Total fluorinated gases</b>	<b>213.5</b>	<b>218.0</b>	<b>202.6</b>	<b>231.3</b>	<b>208.2</b>	<b>204.3</b>	<b>200.1</b>	<b>285.8</b>	<b>211.5</b>	<b>214.3</b>	<b>209.8</b>	<b>152.8</b>	<b>121.5</b>	<b>124.8</b>
<i>average GWP</i>	<i>2 410</i>	<i>2 433</i>	<i>2 451</i>	<i>2 521</i>	<i>2 489</i>	<i>2 470</i>	<i>2 473</i>	<i>2 241</i>	<i>2 186</i>	<i>2 142</i>	<i>2 027</i>	<i>1 658</i>	<i>1 552</i>	<i>1 583</i>

**Notes:** '-': no data reported, 'n.a.': not applicable: Annex II F-gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and HFCs, PFCs and SF<sub>6</sub> in products and equipment were not subject to reporting for the years 2007-2013. The data shown for 2007-2013 are thus limited to bulk supply. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 17 EU bulk supply of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Tonnes</b>													
HFCs	86 477	87 311	81 005	89 924	81 829	80 982	79 215	118 737	85 028	81 625	78 629	62 044	48 068	49 986
PFCs	299	398	241	303	289	243	139	C	C	457	647	562	435	357
SF6	1 810	1 860	1 435	1 522	1 502	1 490	1 535	C	903	1 001	1 223	824	718	811
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
NF3 and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	339	381	492	C	C	C
<b>Total fluorinated gases</b>	<b>88 586</b>	<b>89 569</b>	<b>82 681</b>	<b>91 749</b>	<b>83 620</b>	<b>82 715</b>	<b>80 889</b>	<b>121 739</b>	<b>89 446</b>	<b>89 418</b>	<b>93 653</b>	<b>81 177</b>	<b>67 487</b>	<b>68 730</b>
<i>average GWP</i>	<i>2 410</i>	<i>2 433</i>	<i>2 451</i>	<i>2 521</i>	<i>2 489</i>	<i>2 470</i>	<i>2 473</i>	<i>2 251</i>	<i>2 210</i>	<i>2 176</i>	<i>2 052</i>	<i>1 667</i>	<i>1 603</i>	<i>1 667</i>

**Notes:** '-': no data reported, 'n.a.': not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>. Imports of pre-blended polyols are not included since 2018.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 18 EU bulk supply of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Gas group</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
HFCs	169.3	171.5	167.4	193.5	171.0	167.9	163.7	248.0	166.3	160.7	149.6	103.5	80.5	85.1
PFCs	3.0	4.0	2.5	3.1	3.0	2.4	1.4	C	C	4.3	6.1	5.4	4.2	3.3
SF <sub>6</sub>	41.3	42.4	32.7	34.7	34.2	34.0	35.0	C	20.6	22.8	27.9	18.8	16.4	18.5
Unsaturated HFCs and HCFCs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
HFEs and alcohols	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C	C	C	C	C	C
NF <sub>3</sub> and other perfluorinated compounds	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	5.8	6.6	8.5	C	C	C
<b>Total fluorinated gases</b>	<b>213.5</b>	<b>218.0</b>	<b>202.6</b>	<b>231.3</b>	<b>208.2</b>	<b>204.3</b>	<b>200.1</b>	<b>274.1</b>	<b>197.7</b>	<b>194.5</b>	<b>192.2</b>	<b>135.3</b>	<b>108.2</b>	<b>114.6</b>
<i>average GWP</i>	<i>2 410</i>	<i>2 433</i>	<i>2 451</i>	<i>2 521</i>	<i>2 489</i>	<i>2 470</i>	<i>2 473</i>	<i>2 251</i>	<i>2 210</i>	<i>2 176</i>	<i>2 052</i>	<i>1 667</i>	<i>1 603</i>	<i>1 667</i>

**Notes:** '-': no data reported, 'n.a.': not applicable: Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) were not subject to reporting for the years 2007-2013. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>. Imports of pre-blended polyols are not included since 2018.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 19 Intended applications of EU total supply of fluorinated gases (tonnes)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Intended applications of bulk supply</b>	<b>Tonnes</b>													
Refrigeration, air-conditioning and heating and other heat transfer fluids	61 377	58 720	58 678	65 964	61 045	58 574	58 999	95 688	74 024	78 016	78 012	68 676	55 613	58 314
Foams, incl. pre-blended polyols	14 286	15 284	11 709	11 503	9 234	8 526	8 202	12 967	9 597	10 179	11 521	11 083	11 041	9 815
Aerosols	9 090	11 131	8 425	9 547	7 808	10 950	9 690	8 954	9 356	9 397	10 300	9 109	8 964	8 204
Fire protection	649	491	531	1 677	2 508	1 451	1 385	1 858	862	596	502	324	130	150
Electrical equipment	1 197	1 422	969	1 290	1 344	1 362	1 419	622	745	813	951	640	534	602
Semiconductor, photovoltaics and other electronics manufacture	127	301	184	265	243	169	71	1 057	715	755	924	897	769	748
Other or unknown applications	1 861	2 219	2 185	1 501	1 437	1 684	1 124	6 402	1 452	294	1 266	1 450	1 255	992
<b>Total fluorinated gases - Total supply</b>	<b>88 586</b>	<b>89 569</b>	<b>82 681</b>	<b>91 749</b>	<b>83 620</b>	<b>82 715</b>	<b>80 889</b>	<b>127 547</b>	<b>96 750</b>	<b>100 049</b>	<b>103 475</b>	<b>92 179</b>	<b>78 307</b>	<b>78 825</b>

**Notes:** '-': no data reported. Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and data on products and equipment were not subject to reporting for the years 2007-2013. The data presented for these years thus equal data presented for bulk supply. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

'\*\*' Categories marked with an \* were not applicable (n.a.) for reporting on 2007 – 2013. Starting 2014, the category 'aerosols' was replaced by separate categories for medical and non-medical aerosols. Feedstock use does not appear in this table as it is excluded from the scope of EU total supply.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 20 Intended applications of EU total supply of fluorinated gases (CO<sub>2</sub>e)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Intended applications of bulk supply</b>	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
Refrigeration, air-conditioning and heating and other heat transfer fluids	138.5	136.5	139.6	161.6	143.7	140.3	140.4	216.5	155.3	157.0	142.3	100.2	76.3	81.9
Foams, incl. pre-blended polyols	13.4	12.9	9.8	10.4	6.5	6.1	5.9	11.7	7.3	8.9	8.4	6.8	4.7	2.1
Aerosols	12.2	14.5	11.2	12.5	9.9	14.1	12.7	11.7	12.9	13.8	14.4	11.7	11.3	10.0
Fire protection	4.0	3.0	3.2	7.5	9.7	5.8	2.6	6.6	3.2	2.2	1.8	1.1	0.5	0.5
Electrical equipment	27.3	32.4	22.1	29.4	30.7	31.0	32.4	14.2	17.0	18.5	21.7	14.6	12.2	13.7
Semiconductor, photovoltaics and other electronics manufacture	1.5	3.2	2.1	3.1	2.8	2.1	1.0	9.4	9.9	10.6	13.2	12.4	10.9	10.9
Other or unknown applications	16.7	15.4	14.7	6.7	4.9	4.9	5.2	15.8	6.0	3.2	7.9	6.0	5.7	5.7
<b>Total supply Total fluorinated gases</b>	<b>213.5</b>	<b>218.0</b>	<b>202.6</b>	<b>231.3</b>	<b>208.2</b>	<b>204.3</b>	<b>200.1</b>	<b>285.8</b>	<b>211.5</b>	<b>214.3</b>	<b>209.8</b>	<b>152.8</b>	<b>121.5</b>	<b>124.8</b>

**Notes:** '-': no data reported. Annex II gases (unsaturated HFCs and HCFCs, HFEs and alcohols, and NF<sub>3</sub> and other perfluorinated compounds) and data on products and equipment were not subject to reporting for the years 2007-2013. The data presented for these years thus equal data presented for bulk supply. The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF<sub>6</sub>.

'\*' Categories marked with an \* were not applicable (n.a.) for reporting on 2007 – 2013. Starting 2014, the category 'aerosols' was replaced by separate categories for medical and non-medical aerosols. Feedstock use does not appear in this table as it is excluded from the scope of EU total supply.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.

**Table 21 HFCs placed on the market and quota compliance**

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
POM category		Million tonnes of CO <sub>2</sub> equivalents													
(1)	Bulk HFC POM 2007-2013	173.5	174.9	172.4	200.6	179.0	172.0	169.5							
(2)	Bulk HFC POM 2014 onwards								279.4	162.6	158.2	165.8	102.5	83.8	93.2
	<i>thereof:</i>														
(3)	<i>for exempted uses Art. 15(2)a-f:</i>								C	16.5	23.3	18.8	21.1	21.6	19.7
(4)	<i>thereof: for exempted uses Art. 15(2)a-e:</i>								7.0	7.9	14.2	9.2	11.1	11.2	C
(5)	<i>thereof: Exemption Art. 15(2)f: Pharmaceutical MDIs</i>								C	8.6	9.2	9.6	10.0	10.3	C
(6)	Quota-relevant bulk HFC POM 2015 onwards									154.7	144.0	156.7	81.4	62.3	73.5
(7)	POM of HFCs in equipment 2014 onwards:								11.2	13.6	19.7	17.5	15.4	12.2	9.6
	<i>thereof:</i>														
(8)	<i>HFC POM in RACHP equipment</i>								11.1	12.8	19.2	17.0	15.3	12.0	9.5
(9)	<i>thereof: without quota authorisation coverage, 2017 onwards</i>											0.4	0.7	0.2	0.1
(10)	<i>HFC POM in other equipment</i>								0.1	0.7	0.5	0.5	0.2	0.2	0.1
(11)	Total physical HFC POM 2014 onwards (bulk + equipment)								290.6	176.2	177.8	183.4	117.9	96.0	102.8
(12)	Quota authorisations issued 2015 onwards									17.1	19.9	11.6	18.8	35.7	23.1
(13)	Quota-relevant POM 2015 onwards									171.8	163.9	168.6	100.8	98.1	96.6
(14)	Maximum quantity of HFC phase-down									183.1	170.3	170.3	101.2	100.3	100.3
	Quota compliance 2015 onwards:														
(15)	Unused quota (company level)									12.0	7.1	3.2	2.0	3.0	4.4
(16)	<i>thereof: unused quota reserved for invalid companies</i>									-	-	-	-	-	0.7
(17)	Quota exceedance (company level)									0.7	0.6	1.6	1.4	0.9	0.8
(18)	<i>thereof: production / bulk import of HFCs</i>									0.7	0.6	1.2	0.6	0.7	0.7
(19)	EU-wide margin to maximum quantity									11.2	6.3	1.6	0.4	2.2	3.6

**Notes:** '-': no data reported; n.a.: not applicable; POM: Placing on the market; RACHP: refrigeration, air conditioning, and heat pumps  
The geographical scope of presented POM data EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

**Sources:** EC, 2011, 2014 and 2020; EEA, 2020 and 2021.

**Table 22 Consumption of HFCs covered under the Montreal Protocol**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	<b>Million tonnes of CO<sub>2</sub> equivalents</b>													
EU consumption of HFCs covered under the Montreal Protocol	177.5	169.3	156.4	194.0	173.2	159.4	163.1	267.0	146.9	141.4	145.1	94.8	74.4	79.4

**Note:** The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

**Sources:** EC, 2011 and 2014; EEA, 2020 and 2021.



**Table 23 Companies reporting on 2020, by Member State and reported activities**

Country	Total	thereof:						
		Producers	Importers	Exporters	Equipment importers	Feedstock users	Destruction companies	Quota authorisers
Austria	43	-	28	-	14	-	-	-
Belgium	52	1	18	7	32	-	-	4
Bulgaria	73	-	36	1	32	-	-	6
Croatia	37	-	19	2	22	-	-	4
Cyprus	38	-	15	-	23	-	-	3
Czech Republic	56	-	25	1	28	-	1	4
Denmark	30	-	13	3	14	-	-	3
Estonia	46	-	34	-	9	-	-	7
Finland	26	-	7	1	16	-	2	3
France	173	3	48	12	119	1	1	16
Germany	171	3	55	20	102	2	7	13
Greece	70	-	22	4	40	-	-	1
Hungary	34	-	14	1	21	-	-	-
Ireland	11	-	5	-	7	-	-	-
Italy	344	-	240	12	97	-	-	10
Latvia	19	-	15	-	4	-	-	-
Lithuania	44	-	36	-	8	-	-	5
Luxembourg	1	-	1	1	-	-	-	-
Malta	20	-	8	1	12	-	-	-
Northern Ireland (UK)	1	-	1	-	-	-	-	-
Netherlands	97	1	44	6	53	-	1	8

Country	Total	thereof:						
		Producers	Importers	Exporters	Equipment importers	Feedstock users	Destruction companies	Quota authorisers
Poland	372	-	289	7	55	-	1	29
Portugal	41	-	15	3	25	-	-	1
Romania	58	-	16	-	39	-	-	1
Slovakia	23	-	11	-	8	-	1	2
Slovenia	34	-	8	-	25	-	-	-
Spain	128	-	54	14	68	-	-	5
Sweden	47	-	17	3	30	-	1	3
<b>EU Total</b>	<b>2089</b>	<b>8</b>	<b>1094</b>	<b>99</b>	<b>903</b>	<b>3</b>	<b>15</b>	<b>128</b>
Great Britain	111	1	51	12	52	-	2	18
<b>Other Non-EU</b>	<b>279</b>	<b>n.a.</b>	<b>56</b>	<b>2</b>	<b>13</b>	<b>n.a.</b>	<b>n.a.</b>	<b>211</b>

**Note:** Companies may report for more than one activity type. '-': no data reported, 'n.a.': not applicable: Non-EU companies are not eligible to report as producers, feedstock users, or destruction companies.

**Source:** EEA, 2021.

**Table 24 Non-EU companies reporting on 2020, by location of Only Representative**

EU Country of Only Representative	Total represented non-EU companies	Thereof from:																								
		United Arab Emirates	Canada	Switzerland	China	Egypt	Hong Kong	India	Japan	Korea, Republic of	Monaco	Marshall Islands	Mexico	Malaysia	Norway	Serbia	Saudi Arabia	Singapore	Turkey	Taiwan	United States	Virgin Islands,	South Africa	Russian Federation	Brazil	Great Britain
Belgium	20	2	-	-	-	1	1	-	1	-	-	-	-	-	1	-	1	-	2	-	1	-	1	-	1	8
Bulgaria	4	-	-	-	3	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Cyprus	33	-	-	-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France	22	-	1	1	-	-	-	1	-	-	1	-	1	-	-	-	-	-	-	-	10	-	-	-	-	7
Germany	28	-	-	-	4	-	2	-	2	2	-	-	-	1	-	-	1	-	-	1	4	-	-	-	-	11
Greece	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Ireland	180	-	-	-	164	-	-	1	-	-	-	1	-	-	-	-	-	1	-	-	1	-	-	-	-	12
Italy	8	1	-	2	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Lithuania	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	17	-	-	3	-	-	1	-	1	7	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	2
Poland	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Spain	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Sweden	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
<b>EU Total</b>	<b>331</b>	<b>3</b>	<b>1</b>	<b>6</b>	<b>206</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>10</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>15</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>56</b>

Note: '-': no data reported

Source: EEA, 2021.

**Table 25 Activities reported 2007–2020**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Reports Received</b>	<b>77</b>	<b>86</b>	<b>94</b>	<b>110</b>	<b>125</b>	<b>133</b>	<b>153</b>	<b>468</b>	<b>780</b>	<b>1284</b>	<b>1728</b>	<b>2137</b>	<b>3157</b>	<b>2479</b>
of which mention:														
Production of F-gases	6	11	7	7	9	9	8	10	9	9	8	8	9	9
<i>thereof: HFC production</i>	4	9	5	5	7	7	6	6	6	6	5	5	7	7
Bulk import of F-gases	55	53	58	70	77	91	112	187	293	379	577	895	1694	1201
<i>thereof: bulk HFC import</i>	48	47	53	66	73	86	107	173	282	366	563	877	1675	1182
Bulk export of F-gases	44	47	64	75	74	81	82	92	99	111	119	115	112	113
<i>thereof: bulk HFC export</i>	37	39	55	67	64	70	72	81	89	98	104	100	94	97
Import of products or equipment pre-charged with F-gases	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	228	427	840	1039	1079	1022	968
<i>thereof: RACHP equipment charged with HFCs</i>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	220	409	826	1028	1067	1012	958
Destruction	6	8	7	8	10	11	10	10	15	13	13	16	17	17
Feedstock use	2	2	2	2	1	1	1	3	3	3	3	5	2	3
Supply of quota authorisation	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	20	34	94	335	842	357
<i>thereof: quota authorisation without any EU production, import or export</i>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	9	18	41	114	424	268

**Note:** 'n.a.': not applicable: The reporting obligation for equipment importers applied for reporting on 2014 for the first time. Reporting on quota authorised to other companies has been applying since 2015.

The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019 and EU-27+UK for 2020.

Companies may report on more than one activity.

RACHP equipment: refrigeration, air conditioning, and heat pumps.

**Sources:** EEA, 2021.

## 8 Terminology

### Fluorinated gases (F-gases)

F-gases covered by this report can be grouped into:

- gases contained in Annex I of the new F-gas Regulation, as listed in Annex 1 of this report;
- gases contained in Annex II of the new F-gas Regulation, as listed in Annex 2 of this report.

Jointly, those gases are referred to in this report as ‘fluorinated gases’ or ‘F-gases’.

The list of reportable fluorinated gases under the old F-Gas Regulation was restricted to HFCs, PFCs and SF<sub>6</sub>, as identified in section 9 on page 55.

### Annex I F-gases

F-gases under Annex I of the new F-gas Regulation include HFCs, PFCs and SF<sub>6</sub>. The majority of these gases have high GWPs.

The gases of Annex I of the new F-gas Regulation are given in 9 to this report.

### Hydrofluorocarbons (HFCs)

HFCs are relatively short aliphatic organic compounds that contain fluorine, carbon and hydrogen. They are most commonly used as refrigerants. Nineteen HFCs and their GWPs are listed in Annex 1. All HFCs in Annex 1, except HFC-152 and HFC-161, were previously covered by the old F-gas Regulation (EC) No 842/2006. Any mixture (blend) that includes at least one HFC is considered an HFC under the F-gas Regulation and therefore is covered by the quota system. The GWP of such a mixture is calculated according to Annex IV of the F-gas Regulation.

### Perfluorocarbons (PFCs)

PFCs are relatively short aliphatic organic compounds that contain fluorine and carbon only. They are most commonly used in semiconductor manufacture. Seven PFCs and their GWPs are listed in Annex 1. All PFCs in Annex 1 were previously covered by the old F-Gas Regulation.

### Sulphur hexafluoride (SF<sub>6</sub>)

SF<sub>6</sub> is an inorganic compound; because it is an excellent electrical insulator, its main use is in the electrical industry. SF<sub>6</sub> is a potent greenhouse gas; its GWP is listed in Annex 1. SF<sub>6</sub> was also covered by the old F-gas Regulation.

### Annex II F-gases

‘Other fluorinated greenhouse gases’ are listed in Annex II of Regulation No 517/2014 and include:

- unsaturated hydro(chloro)fluorocarbons (Section 1 of Annex II);
- fluorinated ethers and alcohols (Section 2 of Annex II);
- other perfluorinated compounds, including NF<sub>3</sub> (Section 3 of Annex II).

All these gases and their GWPs are listed in 9 of this report. The Annex II F-gases were not covered by the reporting obligations under the old F-gas Regulation (EC) No 842/2006.

## **Bulk gases and gases contained in equipment**

Gases contained in gas containers, including bottles and isotanks, are referred to as bulk gases, irrespective of the absolute amounts of gases handled. Bulk gases are to be differentiated from gases contained in products or equipment, as different reporting obligations apply.

## **Mixtures**

Mixtures of fluorinated gases are often used in industrial applications. In their reports under Article 19 of the F-gas Regulation (EU) No 517/2014, companies report on their transactions (import, export, etc.) of such mixtures, while specifying their composition. For the purpose of the present aggregation report, the amounts of mixtures are recalculated as the proportions of their constituent fluorinated gases as listed in 9, unless indicated otherwise.

## **Annex IV gases**

Annex IV of the new F-gas Regulation lists some non-fluorinated greenhouse gases that have GWPs that also need to be considered when determining the GWP of a mixture. These gases and their GWPs are also listed in 9 of this report. For all other substances included in a mixture, a default value of 0 is used for the calculation the GWP.

## **Nil report**

A nil report is a notification by a company that it considers itself not obliged to report under the F-Gas Regulation.

## **Global warming potentials (GWPs)**

GWPs are used to make different gases comparable in terms of their potential impact on climate change. The multiplication of a quantity of a gas by its GWP results in that quantity expressed as CO<sub>2</sub>e.

The GWPs used under the new F-gas Regulation are in line with those published in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) (IPCC, 2007). The old F-gas Regulation (EC) No 842/2006 used the earlier set of GWPs published by the IPCC in its Third Assessment Report (TAR) (IPCC, 2001). Accordingly, previous EEA technical reports on fluorinated gases up to 2014 used TAR GWPs.

Quantities of F-gases are reported in physical tonnes. Conversion of the figures into CO<sub>2</sub>e based on gas-specific GWPs facilitates a focus on the potential warming effect caused by these gases after release to the atmosphere. Both metrics are used in this report when analysing the data.

The GWPs of gases used for the present report are listed in 9. GWPs of mixtures are calculated according to Annex IV of the new F-gas regulation (EU, 2014b).

## 9 Gases covered by Regulation (EU) No 517/2014

### Annex I of Regulation (EU) No 517/2014

Gas	GWP (AR4)	Gas group	Reference	Coverage in the 'old' F-gas Regulation 842/2006
HFC-23	14 800	HFCs	Annex I Section 1	covered
HFC-32	675	HFCs	Annex I Section 1	covered
HFC-41	92	HFCs	Annex I Section 1	covered
HFC-125	3 500	HFCs	Annex I Section 1	covered
HFC-134	1 100	HFCs	Annex I Section 1	covered
HFC-134a	1 430	HFCs	Annex I Section 1	covered
HFC-143	353	HFCs	Annex I Section 1	covered
HFC-143a	4 470	HFCs	Annex I Section 1	covered
HFC-152	53	HFCs	Annex I Section 1	not covered
HFC-152a	124	HFCs	Annex I Section 1	covered
HFC-161	12	HFCs	Annex I Section 1	not covered
HFC-227ea	3 220	HFCs	Annex I Section 1	covered
HFC-236cb	1 340	HFCs	Annex I Section 1	covered
HFC-236ea	1 370	HFCs	Annex I Section 1	covered
HFC-236fa	9 810	HFCs	Annex I Section 1	covered
HFC-245ca	693	HFCs	Annex I Section 1	covered
HFC-245fa	1 030	HFCs	Annex I Section 1	covered
HFC-365mfc	794	HFCs	Annex I Section 1	covered
HFC-43-10mee	1 640	HFCs	Annex I Section 1	covered
PFC-14 (CF <sub>4</sub> )	7 390	PFCs	Annex I Section 2	covered
PFC-116 (C <sub>2</sub> F <sub>6</sub> )	12 200	PFCs	Annex I Section 2	covered
PFC-218 (C <sub>3</sub> F <sub>8</sub> )	8 830	PFCs	Annex I Section 2	covered
PFC-3-1-10 (C <sub>4</sub> F <sub>10</sub> )	8 860	PFCs	Annex I Section 2	covered
PFC-4-1-12 (C <sub>5</sub> F <sub>12</sub> )	9 160	PFCs	Annex I Section 2	covered
PFC-5-1-14 (C <sub>6</sub> F <sub>14</sub> )	9 300	PFCs	Annex I Section 2	covered
PFC-c-318 (c-C <sub>4</sub> F <sub>8</sub> )	10 300	PFCs	Annex I Section 2	covered
SF <sub>6</sub>	22 800	SF <sub>6</sub>	Annex I Section 3	covered

Sources: EU, 2006; EU, 2014b.

**Annex II of Regulation (EU) No 517/2014 (not covered by old Regulation (EC) No 842/2006)**

<b>Gas</b>	<b>GWP (AR4)</b>	<b>Gas group</b>	<b>Reference</b>
HFC-1234yf	4	Unsaturated HFCs/HCFCs	Annex II Section 1
HFC-1234ze	7	Unsaturated HFCs/HCFCs	Annex II Section 1
HFC-1336mzz	9	Unsaturated HFCs/HCFCs	Annex II Section 1
HCFC-1233zd	5	Unsaturated HFCs/HCFCs	Annex II Section 1
HCFC-1233xf	1	Unsaturated HFCs/HCFCs	Annex II Section 1
HFE-125	14 900	HFEs and alcohols	Annex II Section 2
HFE-134	6 320	HFEs and alcohols	Annex II Section 2
HFE-143a	756	HFEs and alcohols	Annex II Section 2
HCFE-235da2 (isofluorane)	350	HFEs and alcohols	Annex II Section 2
HFE-245cb2	708	HFEs and alcohols	Annex II Section 2
HFE-245fa2	659	HFEs and alcohols	Annex II Section 2
HFE-254cb2	359	HFEs and alcohols	Annex II Section 2
HFE-347 mcc3 (HFE-7000)	575	HFEs and alcohols	Annex II Section 2
HFE-347pcf2	580	HFEs and alcohols	Annex II Section 2
HFE-356pcc3	110	HFEs and alcohols	Annex II Section 2
HFE-449sl (HFE-7100)	297	HFEs and alcohols	Annex II Section 2
HFE-569sf2 (HFE-7200)	59	HFEs and alcohols	Annex II Section 2
HFE-43-10pccc124	1 870	HFEs and alcohols	Annex II Section 2
HFE-236ca12 (HG-10)	2 800	HFEs and alcohols	Annex II Section 2
HFE-338pcc13 (HG-01)	1 500	HFEs and alcohols	Annex II Section 2
HFE-347mmy1	343	HFEs and alcohols	Annex II Section 2
2,2,3,3,3-pentafluoropropanol	42	HFEs and alcohols	Annex II Section 2
bis(trifluoromethyl)-methanol	195	HFEs and alcohols	Annex II Section 2
HFE-227ea	1 540	HFEs and alcohols	Annex II Section 2
HFE-236ea2 (desfluoran)	989	HFEs and alcohols	Annex II Section 2
HFE-236fa	487	HFEs and alcohols	Annex II Section 2
HFE-245fa1	286	HFEs and alcohols	Annex II Section 2
HFE 263fb2	11	HFEs and alcohols	Annex II Section 2
HFE-329mcc2	919	HFEs and alcohols	Annex II Section 2
HFE-338mcf2	552	HFEs and alcohols	Annex II Section 2
HFE-338mmz1	380	HFEs and alcohols	Annex II Section 2
HFE-347mcf2	374	HFEs and alcohols	Annex II Section 2
HFE-356mec3	101	HFEs and alcohols	Annex II Section 2
HFE-356mm1	27	HFEs and alcohols	Annex II Section 2
HFE-356pcf2	265	HFEs and alcohols	Annex II Section 2
HFE-356pcf3	502	HFEs and alcohols	Annex II Section 2
HFE 365mcf3	11	HFEs and alcohols	Annex II Section 2
HFE-374pc2	557	HFEs and alcohols	Annex II Section 2
- (CF <sub>2</sub> ) <sub>4</sub> CH(OH) -	73	HFEs and alcohols	Annex II Section 2
NF <sub>3</sub> (nitrogen trifluoride)	17 200	Other perfluorinated compounds	Annex II, Section 3
c-C <sub>3</sub> F <sub>6</sub> (perfluorocyclopropane)	17 340	Other perfluorinated compounds	Annex II, Section 3
PFPME	10 300	Other perfluorinated compounds	Annex II, Section 3
SF <sub>5</sub> CF <sub>3</sub>	17 700	Other perfluorinated compounds	Annex II, Section 3

**Note:** Annex II F-gases were not covered under the old F-gas Regulation (EC) No 842/2006.

**Source:** EU, 2014b.



**Non-fluorinated gases in Annex IV of Regulation (EU) No 517/2014 (not covered by the old Regulation (EC) No 842/2006)**

According to Annex IV of the new F-gas Regulation (EU) No 517/2014, the GWP of mixtures containing gases outside the scope of Annexes I and II of Regulation (EU) No 517/2014 are to be calculated using the GWPs given here for the non-fluorinated gases. For other constituents of mixtures that are not listed here (e.g. ODS), a GWP value of zero shall be used.

<b>Substance</b>	<b>Formula</b>	<b>GWP (AR4)</b>
R-170 (Ethane)	CH <sub>3</sub> CH <sub>3</sub>	6
R-290 (Propane)	CH <sub>3</sub> CH <sub>2</sub> CH <sub>3</sub>	3
R-600 (Butane)	CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	4
R-600A (Isobutane)	CH(CH <sub>3</sub> ) <sub>2</sub> CH <sub>3</sub>	3
R-601 (Pentane)	CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	5
R-601A (Isopentane)	(CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> CH <sub>3</sub>	5
C <sub>5</sub> H <sub>10</sub> (Cyclopentane)	C <sub>5</sub> H <sub>10</sub>	5
R-610 (Ethoxyethane, diethyl ether)	CH <sub>3</sub> CH <sub>2</sub> OCH <sub>2</sub> CH <sub>3</sub>	4
R-611 (Methyl formate)	HCOOCH <sub>3</sub>	25
R-702 (Hydrogen)	H <sub>2</sub>	6
R-717 (Ammonia)	NH <sub>3</sub>	0
R-744 (Carbon dioxide)	CO <sub>2</sub>	1
R-1150 (Ethylene)	C <sub>2</sub> H <sub>4</sub>	4
R-1270 (Propylene)	C <sub>3</sub> H <sub>6</sub>	2
E-170 (Dimethyl ether)	CH <sub>3</sub> OCH <sub>3</sub>	1
CH <sub>3</sub> Cl (Methyl chloride)	CH <sub>3</sub> Cl	13
CHCl <sub>3</sub> (Chloroform)	CHCl <sub>3</sub>	31
Methylene chloride	CH <sub>2</sub> Cl <sub>2</sub>	9
CH <sub>4</sub> (Methane)	CH <sub>4</sub>	25
N <sub>2</sub> O (nitrous oxide)	N <sub>2</sub> O	298

Source: EU, 2014b.

# 10 Calculation methods

This section provides documentation for:

- Calculation of EU imports (page 58)
- Calculation of EU exports (page 58)
- Calculation of EU supply (page 58);
- Calculation of HFC amounts placed on the market (POM) under the EU HFC phase-down (page 59) and
- Calculation of HFC consumption under the international HFC phase-down under the Montreal Protocol (page 60).

Table 27 (page 64) provides a summary comparison between the three metrics supply, POM, and consumption.

## Calculation of EU imports

HFC imports reported from intermediate storage under customs warehousing after inward processing are not considered for the EU imports statistics. This data is available since 2018. However such data is relevant for the calculation of amounts placed on the market (POM).

## Calculation of EU exports

HFC exports reported to intermediate storage under customs warehousing after inward processing are not considered for the EU exports statistics. This data is available since 2018. However such data is relevant for the calculation of amounts placed on the market (POM).

Data reported for the export of pre-blended polyols, available since 2018, is not considered for the EU statistics on bulk exports.

## Calculation of EU supply

### Total supply (TS)

‘EU total supply’ is a parameter that provides information on the actual use of fluorinated gases by EU industries. Notably, TS also includes gases that are contained in exported products and equipment. In the logic of the supply metrics used in this report, such gases count towards the gas demand of EU industries. ‘EU total supply’ is the sum of ‘EU bulk supply’ and ‘EU supply in products/equipment’. It is comparable to the net supply metric used in earlier EEA reports on F-gases.

### Bulk supply (BS)

The ‘bulk supply’ metric is focused on emission-relevant supplies of bulk gases to EU industries and therefore does not cover EU supplies intended for feedstock or destruction. Starting in 2014, BS has been defined as:

Bulk supply (BS) = production (1A) – destroyed (captured) production (1D) + full imports (2A) – full exports (3A) + 1 January stocks from own import/production (4B) – 31 December stocks from own import/production (4G) + reclamation (4K) – POM intended for destruction (6B) – feedstock use (7A).

Since 2018, the new reporting items on imports (2A\_pp) and exports (3A\_pp) of pre-blended polyols are considered: Imports of pre-blended are subtracted and exports of pre-blended polyols are added in the equation for BS.

Since 2019, the explicit inclusion of non-captured production in the reporting scheme was reflected in order to exclude the emissions of non-captured production from supply: non-captured production totals (1Aa) are subtracted and amounts of non-captured production used as feedstock (1A\_fs1) are added in the equation for BS. Furthermore, imports from and exports into EU intermediate storage under customs warehousing after inward processing were excluded from the BS calculation (those amounts are also excluded from the data shown in this report for imports and exports, respectively).

For the years 2007-2013, bulk supply (BS) is calculated as follows:

BS = Production + Imports – Exports + Stocks 1 January – Stocks 31 December + Reclamation – own feedstock use – intended application: feedstock.

### **EU supply in products/equipment**

The ‘EU supply in products/equipment’ (SPE) metric covers the amount of fluorinated gases that are imported into the EU within products or equipment and placed on the market. Exports of F-gases within products and equipment are not reported under the new F-gas Regulation (No 517/2014) or subtracted for the SPE metric. Thus, the SPE metric covers only imports and it is not intended to cover the net flows of F-gases within products or equipment across EU borders.

SPE is calculated as the sum of all gases reported in Section 11 of the reporting questionnaire. Since 2018, the new reporting item on imports of pre-blended polyols (2A\_pp) is added. No data on SPE were collected before 2014.

### **Intended applications of bulk or total supply**

In Section 6 of the reporting questionnaire, companies report on the intended applications of bulk gases supplied to the EU market (6X). This metric differs from bulk supply in the way it accounts for re-exports, amounts intended for destruction and feedstock. It is calculated as follows:

6X = (net) production (1E = 1A–1D) + full imports (2A) – re-exports within products of own bulk imports (2B) – bulk re-exports of own imports (3B) + 1 January stocks from own import/production (4B) – 31 December stocks from own import/production (4G) + reclamation (4K).

To estimate the intended applications of EU bulk or total supply, a five-step process is used:

1. Per gas, determine the proportion of each reported application in a subset of categories without export (6A), destruction (6B), leakage (6U) and accountancy adjustments (6V).
2. Assume leakage and accountancy adjustments in bulk or total supply to be equal to the amounts reported in Section 6 and subtract those from total bulk or total supply.
3. Apply the proportions determined in step 1 to the remainder of bulk or total supply.
4. Assign any remainder to the category ‘Other or unknown applications’ (6T).
5. Assign all net exports of pre-blended polyols (3A\_pp-2A\_pp) to the intended application 6G (pre-blended polyols).

### **Calculation of HFC amounts placed on the market (POM) under the EU HFC phase-down**

**The quota of relevant POM starting in 2015 is calculated as:**

Bulk HFCs physically placed on the market (4M), converted into CO<sub>2</sub>e  
minus  
Exemptions under Article 15(2) (5A + (5B) + 5C\_exempted + 5D + 5E), converted into CO<sub>2</sub>e  
(5F is included in the exemptions from 2017)  
plus  
Issued authorisations (9A).

For years where the POM compliance exercise by DG CLIMA has been completed, The POM amounts given are based on the POM established in the HFC registry.

**Bulk HFC POM 2007-2013 is calculated per year and per company based on data reported under the old F-gas Regulation as:**

HFC production, converted into CO<sub>2</sub>e  
plus  
HFC imports, converted into CO<sub>2</sub>e  
minus  
HFC exports, converted into CO<sub>2</sub>e  
plus  
1 January HFC stocks, converted into CO<sub>2</sub>e  
minus  
31 December HFC stocks, converted into CO<sub>2</sub>e  
minus  
HFCs used for feedstock, converted into CO<sub>2</sub>e  
minus  
HFC supplies intended for feedstock use, converted into CO<sub>2</sub>e.

Where the amount thus calculated is negative for a given company in a given year, the POM is set to zero before calculating the EU total as the sum of all companies.

**Calculation of HFC consumption under the international HFC phase-down under the Montreal Protocol**

The HFCs considered under the Montreal Protocol are all HFCs as listed in Annex I, Section 1 of the new F-gas Regulation No 517/2014 (see 9, page 55), except HFC-161.

**HFC consumption starting in 2019 is calculated as follows:**

Starting 2019, HFC consumption under the MP is calculated separately for HFC-23 (Annex F, Group II under the MP) and all other HFCs (Group I) covered by the MP:

For Group I HFCs, the calculation approach as depicted below for 2018 is continued with the additional element that imports from and exports to dependent overseas territories are not considered. A list of dependent territories is given in Table 26 (page 63).

For Group II HFCs / HFC-23, generated amounts not captured are not taken into account. In addition to the calculation scheme for Group I HFCs, the following data is thus subtracted/added:

minus  
uncaptured HFC production (1Aa), converted into CO<sub>2</sub>e  
plus  
destroyed uncaptured HFC production (1A\_a), converted into CO<sub>2</sub>e  
plus

uncaptured HFC production used as feedstock (1A\_fs1), converted into CO<sub>2</sub>e

**HFC consumption in 2018 is calculated as follows:**

HFC production (1A), converted into CO<sub>2</sub>e  
minus  
HFC production for feedstock use within the Union (1A\_fs), converted into CO<sub>2</sub>e  
minus  
HFC production for other uses exempted under the Montreal Protocol (1A\_ex), converted into CO<sub>2</sub>e  
(1A\_ex is not yet applicable as no exemptions have been agreed upon under the Montreal Protocol so far)  
plus  
HFC imports (2A), converted into CO<sub>2</sub>e  
minus  
HFC imports of pre-blended polyols (2A\_pp), converted into CO<sub>2</sub>e  
minus  
imports of used, recycled or reclaimed HFCs (2C), converted into CO<sub>2</sub>e  
minus  
virgin HFC imports for feedstock use (2D), converted into CO<sub>2</sub>e  
minus  
virgin HFC imports exempted under the Montreal Protocol (2E), converted into CO<sub>2</sub>e  
(2E is not yet applicable as no exemptions have been agreed so far under the Montreal Protocol)  
minus  
HFC exports (3A), converted into CO<sub>2</sub>e  
plus  
HFC exports of pre-blended polyols (3A\_pp), converted into CO<sub>2</sub>e  
plus  
exports of used, recycled or reclaimed HFCs (3G), converted into CO<sub>2</sub>e  
plus  
virgin HFC exports for feedstock use (3H), converted into CO<sub>2</sub>e  
plus  
virgin HFC exports exempted under the Montreal Protocol (3I), converted into CO<sub>2</sub>e  
(3I is not yet applicable as no exemptions have been agreed so far under the Montreal Protocol)  
minus  
Total HFC destruction (8D), converted into CO<sub>2</sub>e.

Imports reported from and exports reported to intermediate storage under customs warehousing after inward processing are not considered as imports or exports for the purpose of consumption under the MP.

**HFC consumption starting in 2014 - 2017 is calculated as follows:**

HFC production (1A), converted into CO<sub>2</sub>e  
plus  
HFC imports (2A), converted into CO<sub>2</sub>e  
minus  
HFC exports (3A), converted into CO<sub>2</sub>e  
plus  
HFC exports for recycling (3D), converted into CO<sub>2</sub>e  
plus  
HFC exports for reclamation (3E), converted into CO<sub>2</sub>e  
plus

HFC exports for destruction (3F), converted into CO<sub>2</sub>e  
minus  
HFC feedstock use (7A), converted into CO<sub>2</sub>e  
minus  
Total HFC destruction (8D), converted into CO<sub>2</sub>e.

**HFC consumption until 2013 is calculated from data reported under the old F-gas Regulation as follows:**

HFC production, converted into CO<sub>2</sub>e  
plus  
HFC imports, converted into CO<sub>2</sub>e  
minus  
HFC exports, converted into CO<sub>2</sub>e  
Plus  
HFC exports for recycling, reclamation or destruction, converted into CO<sub>2</sub>e  
minus  
Reporting companies' own HFC destruction, converted into CO<sub>2</sub>e  
minus  
HFC amounts supplied by reporting companies to third parties for destruction, converted into CO<sub>2</sub>e  
minus  
HFCs used for feedstock, converted into CO<sub>2</sub>e  
minus  
HFC supplies intended for feedstock use, converted into CO<sub>2</sub>e

**Table 26** Dependent overseas territories of the EU-27 and the United Kingdom

Territory	MS Dependency relation
Anguilla	UK
Aruba	NL
Bermuda	UK
Bonaire, Sint Eustatius and Saba	NL
British Indian Ocean Territory	UK
Cayman Islands	UK
Curaçao	NL
Falkland Islands (Malvinas)	UK
Faroe Islands	DK
French Polynesia	FR
French Southern Territories	FR
Gibraltar	UK
Greenland	DK
Guernsey	UK
Isle of Man	UK
Jersey	UK
Montserrat	UK
New Caledonia	FR
Pitcairn	UK
Saint Barthélemy	FR
Saint Helena, Ascension and Tristan da Cunha	UK
Saint Pierre and Miquelon	FR
Sint Maarten (Dutch part)	NL
South Georgia and the South Sandwich Islands	UK
Turks and Caicos Islands	UK
Virgin Islands, British	UK
Wallis and Futuna	FR

Source: EEA, 2021.

## Comparison of supply, POM and consumption metrics

**Table 27 Scope of supply, POM, and consumption metrics**

		Supply	Placing on the market (POM), relevant for compliance with the EU HFC phase-down	Consumption, relevant for compliance with the MP HFC phase-down	
	<i>covered gases</i>	<i>applicable to total F-gases and single gases/gas groups (e.g. HFCs)</i>	<i>HFCs of Annex I of EU F-gas Regulation 517/2014, including HFC shares and non-HFC shares of HFC-containing mixtures</i>	<i>HFCs of Annex I of EU F-gas Regulation 517/2014 except HFC-161, including HFC shares of HFC-containing mixtures</i>	
	<i>units used</i>	<i>both physical tonnes and t CO<sub>2</sub>e (GWP: AR4)</i>	<i>t CO<sub>2</sub>e (GWP: AR4)</i>	<i>t CO<sub>2</sub>e (GWP: AR4)</i>	
Transactions covered	Type of contribution				
Production	captured amounts	plus	yes	yes	yes
	Uncaptured amounts	plus	yes	yes	no
	Emissions of uncaptured amounts	minus	yes	no	not applicable
Reclamation	plus	yes	no	no	
Recycling	plus	no	no	no	
Bulk imports	from EU intermediate storage under customs warehousing after inward processing	plus	no	yes	no
	from dependent overseas territories	plus	yes	yes	no
	from other origins	plus	yes	yes	yes (except import of recycled and used bulk HFCs)
Imports in products and equipment	Pre-blended polyols	plus	yes	yes	no
	Refrigeration, air conditioning and heat pump (RACHP) equipment	plus	yes	2015-2016: no starting 2017, only amounts not covered by quota authorisations	no
	other products and equipment	plus	yes	no	no



		Supply	Placing on the market (POM), relevant for compliance with the EU HFC phase-down	Consumption, relevant for compliance with the MP HFC phase-down
		<i>covered gases</i>	<i>applicable to total F-gases and single gases/gas groups (e.g. HFCs)</i>	<i>HFCs of Annex I of EU F-gas Regulation 517/2014, including HFC shares and non-HFC shares of HFC-containing mixtures</i>
		<i>units used</i>	<i>both physical tonnes and t CO<sub>2</sub>e (GWP: AR4)</i>	<i>t CO<sub>2</sub>e (GWP: AR4)</i>
Transactions covered		Type of contribution		
Bulk exports	into EU intermediate storage under customs warehousing after inward processing	minus	no	exports from own production and exports from own imports are subtracted. Other bulk exports subtracted if directly supplied by the importer/producer to the exporter (exemption Art. 15(2)c)
	to dependent overseas territories	minus	yes	
	to other destinations	minus	yes	yes (except export of recycled and used bulk HFCs)
exports in products and equipment	Pre-blended polyols	minus	no	yes
	other products and equipment	minus	no	subtracted in case the contained gases had never been placed on the market after bulk import (re-export, reported in section 2B)
Destruction	of EU production, destroyed before placing on the market and imports for destruction	minus	yes	yes (exemption Art. 15(2)a)
	of used gases recovered within the EU	minus	no	no
Feedstock use		minus	yes	yes (exemption Art. 15(2)b)
Supplies to military uses		minus	no	yes (exemption Art. 15(2)d)
Supplies to semiconductor industry		minus	no	yes (exemption Art. 15(2)e)

		<b>Supply</b>	<b>Placing on the market (POM), relevant for compliance with the EU HFC phase-down</b>	<b>Consumption, relevant for compliance with the MP HFC phase-down</b>
	<i>covered gases</i>	<i>applicable to total F-gases and single gases/gas groups (e.g. HFCs)</i>	<i>HFCs of Annex I of EU F-gas Regulation 517/2014, including HFC shares and non-HFC shares of HFC-containing mixtures</i>	<i>HFCs of Annex I of EU F-gas Regulation 517/2014 except HFC-161, including HFC shares of HFC-containing mixtures</i>
	<i>units used</i>	<i>both physical tonnes and t CO<sub>2</sub>e (GWP: AR4)</i>	<i>t CO<sub>2</sub>e (GWP: AR4)</i>	<i>t CO<sub>2</sub>e (GWP: AR4)</i>
<b>Transactions covered</b>	<b>Type of contribution</b>			
Supplies to pharmaceutical MDIs	minus	no	not considered 2015-2017, considered 2018 onwards (exemption Art. 15(2)f)	no
1 January stocks	plus	full EU-based stocks from own production or own import considered, stocks under customs warehousing not considered, stocks from EU purchases not considered	only those EU-based stocks from own production or own import considered that have not yet been placed on the market, stocks under customs warehousing not considered, stocks from EU purchases and stocks from own imports/own production already placed on the market not considered	no
31 December stocks	minus			
HFC quota authorisations issued by producers/importers	plus	no	yes	no

# Abbreviations

BDR	Business Data Repository of the EEA
CFC	Chlorofluorocarbon
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent
EC	European Commission
DG CLIMA	Directorate-General for Climate Action of the European Commission
EEA	European Environment Agency
ETC/CME	European Topic Centre for Climate Change Mitigation and Energy
EU	European Union
EU-27	Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden
EU-28	Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom
AR4	Fourth Assessment Report of the IPCC
F-gases	Fluorinated gases
FGR	F-gases Regulation (EU) 517/2014
GWP	Global warming potential
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
HFE	Hydrofluoroether
IPCC	Intergovernmental Panel on Climate Change
kg	Kilogrammes
kt	Kilotonnes
MP	Montreal Protocol
Mt	Megatonnes
NF <sub>3</sub>	Nitrogen trifluoride
ODS	Ozone-depleting substances
PFCs	Perfluorocarbons
PFPME	Perfluoropolymethylisopropylether
POM	Placing on the market
QA/QC	Quality assurance/quality control
R-134a	Refrigerant classification of HFC-134a
R-404A	Refrigerant mixture of HFCs (52 % HFC-143a, 44 % HFC-125, 4 % HFC-134a)
R-407C	Refrigerant mixture of HFCs (52 % HFC-134a, 25 % HFC-125, 23 % HFC-32)
R-410A	Refrigerant mixture of HFCs (50 % HFC-125, 50 % HFC-32)
R-507A	Refrigerant mixture of HFCs (50 % HFC-143a, 50 % HFC-125)
RACHP	Refrigeration, air conditioning and heat pump
SF <sub>6</sub>	Sulphur hexafluoride
t	Tonne
TAR	Third Assessment Report of the IPCC

UNEP United Nations Environment Programme  
UNFCCC United Nations Framework Convention on Climate Change

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