ETC CM Report 2026/2

Fluorinated greenhouse gases 2026

Data reported by companies on the production, import, export and destruction of fluorinated greenhouse gases in the European Union, 2007-2025



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Briefing

Introduction

Fluorinated greenhouse gases (F-gases) contribute to climate change; in 2024, they made up 2 % of total greenhouse gas emissions in the EU-27 (EEA, 2026a). F-gases have a range of applications, particularly in the refrigeration, air conditioning and heat pump sector. Most F-gases have much higher global warming potentials than other greenhouse gases. Even small amounts of F-gases negatively impact our climate; thus, it is important to reduce and eventually replace their use. This briefing outlines the important trends in the EU supply[1] of F-gases for the period 2007-2025 and provides an overview of EU's progress under the hydrofluorocarbons (HFC) phase-out and phase-down schemes of the EU F-gas Regulation and the Montreal Protocol.

Key messages

- The EU remains on track under the HFC phase-out of the EU F-gas Regulation. The maximum quantity for EU-wide placing on the market (POM) of HFCs increased by 14 % compared to 2024, due to the inclusion of metered dose inhalers (MDIs) under the quota obligation. Accounting for this inclusion, **HFC POM** increased by 15 % in 2025 compared to 2024, still remaining 2 % below the maximum quantity allowed by the F-gas Regulation.
- The **total supply of F-gases** to the EU in 2025, measured in CO_2 equivalents (CO_2e), was 12 % lower than in 2024, while remaining almost constant in tonnes of gas. Compared to 2015 levels, F-gases supply in 2025 was about 53 % lower (in CO_2e). The HFC phase-out, resulting in a decrease of HFC supply by about two thirds since 2015, is the key driver for this reduction. Compared to the previous year, HFC supply decreased by 15 %, while SF_6 supply decreased by 12 %. As SF_6 supply has been fluctuating at +/- 40 % since 2015, no clear medium-term trend is apparent.
- Refrigeration, air conditioning and heat pumps (RACHP) continue to be **key applications** for F- gases, accounting for more than 70 % of F-gases applications in 2025 measured in tonnes of gas, or 40 % in CO_2 equivalents. This is particularly the case for HFCs which account for about 50 % of 2025 EU F-gases supply measured in CO_2 equivalents (59 % in tonnes of gas). SF_6 is mainly used in electrical equipment and makes up 33 % of 2025 EU F-gases supply in CO_2 equivalents, while only 2 % in tonnes of gas. Further relevant applications of F-gases are semiconductor manufacturing (about 16 % of total supply 2025 in CO_2e, mostly NF_3 and PFCs), Aerosols (8 % in CO_2e, 10 % in tonnes, mostly HFCs), and foams (9 % in tonnes, low-GWP unsaturated HFCs, thus < 1 % in CO_2e). While HFC contribution to total F-Gas supply has fallen over time, others, e.g. F-gases in semiconductor manufacture, or SF_6 in switchgear, have become proportionally more relevant.
- Following increases in imports of **HFCs in pre-charged in RACHP equipment** between 2020 and 2022 and decreases in 2023 and 2024, import levels in 2025 were about 12 % higher (in CO_2e) than in 2024. The primary factors contributing to the increase in 2025 were the overall increased imports of stationary cooling and heating equipment, as well as heat pumps[2]. While there is an overall switch to gases with a lower GWP, the overall increase of imports outweighed the lower GWP. Moreover, SF_6 in imported electrical equipment also accounts for a quarter of the increase in equipment imports measured in CO_2e.

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1 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. For methodological details on the calculation of EU supply, please refer to Table 29 in section 10 of the Annex to this briefing, 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.

2 Please note that the data reported by companies cannot be used to assess imports of RACHP equipment containing non-fluorinated refrigerants as reporting on those 'natural' refrigerants is voluntary.

- The use of quota authorisations needed in 2025 to cover imports of RACHP equipment under the HFC phase-out followed the trend of the period from 2021-2024, and exceeded the amount of quota authorisations newly issued in the same year. This is possible due to unused quota authorisations banked by equipment importers. Compared to 2020, the amount of banked unused quota authorisations has decreased by 33 %. However, the current quota authorisation reserve still amounts to more than four times the amount of HFCs imported in RACHP equipment imported in 2025.
- Under the Kigali Amendment to the Montreal Protocol, the EU is subject to an international HFC phase-down. In 2025, EU consumption of HFCs was at 34 % of the limit set under the Montreal Protocol, placing the EU many years ahead of its global obligations.

Trends in physical tonnes reflect the use of F-gases across EU industries, while the total amounts of F-gases expressed in carbon dioxide equivalents (CO_2e) indicate their potential relevance for climate policy and the HFC phase-out. HFCs account for the majority of F-gas emissions. To reduce HFC use, Regulation (EU) No 517/2014 introduced an EU HFC phase-down and quota system for companies. It was replaced by Regulation (EU) 2024/573, which applies since 11 March 2024. Since 2019, the EU is also subject to the HFC phase-down, agreed internationally under the Kigali Amendment to the Montreal Protocol.

Please also consult the annex to this briefing for more graphs and data tables.

Policy context

The Montreal Protocol was established in 1987 to cut the consumption and production of synthetic substances that destroy the protective ozone layer (ozone-depleting substances, ODS). In the EU, ODS are regulated separately under Regulation (EU) 2024/590 (Ozone Regulation). Phasing out ODS has led to replacement of the regulated ODS in some cases with the increased use of certain F-gases, most prominently in refrigeration and air conditioning, since the early 1990s, as these chemicals have similar properties to ODS but do not affect the ozone layer. Consequently, emissions of F-gases in the EU, of which about 90 % are HFCs[3], increased by more than 100 % between 1990 and 2014.

Because F-gases are potent greenhouse gases, the rapid increase in their use posed a climate threat that was subsequently addressed by the Kigali Amendment to the Montreal Protocol. They have been regulated in the EU since 2006. Total F-gas emissions have been in decline since peaking in 2014 and were about 41 % lower in 2024 in the EU-27 compared with 2014 (EEA, 2026a).

The 2014 EU F-gas Regulation (EU, 2014) introduced an EU-wide phase-down of HFCs, which started in 2015, with the aim to cut EU emissions of F-gases by two thirds by 2030 compared with 2014 levels. It also established annual reporting requirements for companies involved in the production, import, export and other activities involving HFCs and other F-gases and included all F-gases covered by the Kyoto Protocol: HFCs, perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), nitrogen trifluoride (NF_3) and others, such as unsaturated HFCs and HCFCs (hydrochlorofluorocarbons), often referred to as HFOs (hydrofluoroolefins).

Following a European Commission proposal in April 2022, the revised F-gas Regulation (Regulation (EU) 2024/573) was adopted in February 2024 and applies since 11 March 2024. It strengthens the HFC phase-down by introducing a steeper reduction of amounts of HFCs that importers and producers may place on the EU market and includes a phase-out of HFCs by 2050. It also introduces a number of new sectoral bans on high GWP equipment, in particular in the air conditioning sector. Furthermore, the new Regulation extends the scope of gases subject to reporting requirements, by including F-gases used as inhalation anaesthetics and others.

[3] In 2024, 92 % of emissions from fluorinated gases in the EU-27 were from HFCs.

Data for this report for the years up to 2023 were collected under Regulation (EU) No 517/2014, while data collection for transactions in 2024 and thereafter are collected under Regulation (EU) 2024/573.

The EU's overarching climate objective is to achieve climate neutrality by 2050, with a net greenhouse gas emission reduction target of 55 % by 2030 compared with 1990, as established by the European Climate Law. Reducing F-gas emissions and the use of high-GWP HFCs contributes to these objectives.

Key trends for HFCs

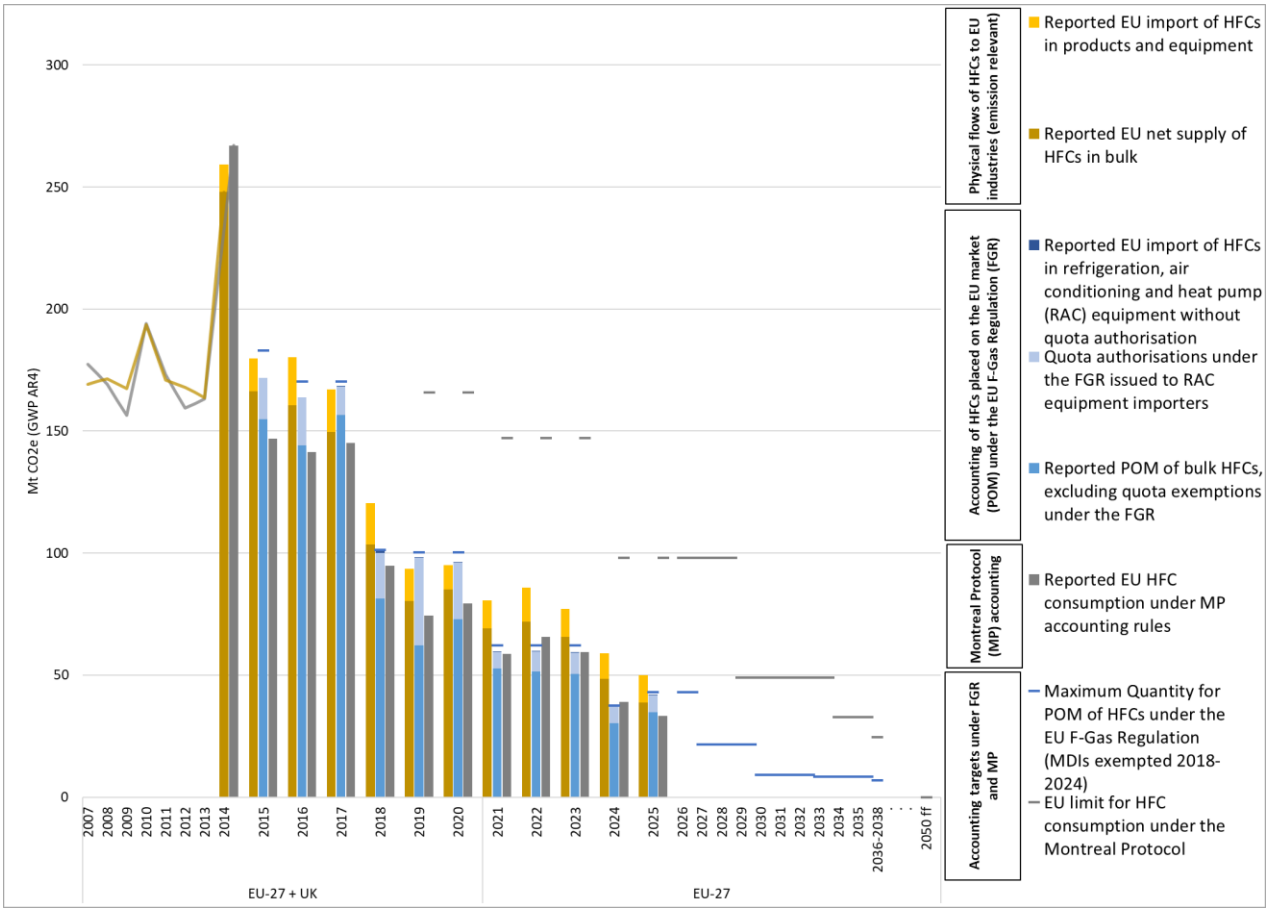
Developments in the EU use of HFCs are measured using three different metrics:

1) ***supply***, focusing on the physical use of HFCs by EU industries,
2) ***placing on the EU market*** (***POM***) measuring compliance with the EU HFC phase-out, and
3) ***consumption*** as defined under the Montreal Protocol HFC phase-down.

Due to differing definitions how imports, exports, stocks, destruction, exemptions etc. are accounted for, these metrics (all expressed in units of CO_2 equivalents) can deviate by more than 30 % for a given year. Please see Table 29 in the annex for detailed definitions.

Figure B-1 shows the EU HFC trends in the supply (yellow), POM (blue) and consumption (grey) metrics as well as the respective EU-internal and Montreal Protocol HFC phase-out / phase-down limits and schedules.

Figure B-1 EU HFC supply and progress of the HFC phase-out and phase-down under the EU F-gas Regulation and the Montreal Protocol



Notes: The geographical scope of the data presented (both reported data and phase-out and phase-down limits) is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27 + UK for 2020 and EU-27 for 2021 and subsequent years. Due to differing definitions, POM data (blue) as defined under the EU F-gas Regulation are not directly comparable with consumption data (grey) as defined under the Montreal Protocol.

Sources: EC, 2025; EEA, 2024 and 2026b.

EU HFC supply in 2025 was 15 % below 2024 levels, showing a continuous decrease since 2022. The maximum quantity for quota-relevant POM under the F-Gas Regulation 573/2024 increased in 2025

compared to 2024 due to the inclusion of MDIs[4]. Thus, while quota-relevant POM in the EU-27 increased by 15 % in 2025 compared to 2024, it remained 2 % below the limit for 2025. EU-27 HFC consumption as accounted under the Montreal Protocol (MP) decreased by 15 % compared to 2024 and was 66 % below the limit set for the EU under the MP in 2025.

More detailed information on the progress under the EU and MP reduction schemes as well as on supply of HFCs and other F-gases is given in the subsequent sections.

Phase-out of HFCs under the EU F-gas Regulation

The HFC phase-out under the F-gas Regulation is implemented by setting annual maximum quantitative limits (quotas) on the placing of HFCs on the EU market by producers and importers. The EU-wide maximum quantity for HFCs has been subject to a stepwise reduction since 2015, shown as blue lines in Figure B-1. In 2025, the EU-wide placing of HFCs on the market was 2 % below the 2025 overall market limit set by the quota system. Companies that did not fully use their quota counterbalanced the few cases of quota exceedance by importers of bulk HFCs and equipment importers.

As EU industries have moved to alternatives with low global warming potential (GWP), demand for HFCs has been decreasing. While demand for refrigerants remains high, there has been a shift to non-HFC alternatives with lower GWPs. Between 2015 and 2025, the placing on the market of bulk HFCs (dark blue bars in Figure B-1) was consistently below the maximum quantity imposed by the phase-out. The balance has largely been converted into quota authorisations (light blue bars in Figure B-1), which can be stored across years and have been required for imports of refrigeration, air conditioning and heat pump (RACHP) equipment containing HFCs since 2017.

The supply of HFCs for the manufacture of metered dose inhalers (MDIs) has been exempt from quotas from 2018 to 2024, and the respective amounts of approximately 10 Mt CO_2e per year are not included in the dark blue bars in that period. Under the 2024 revision of the F-gas Regulation, this exemption has been removed from 2025 onwards. This explains also why the 2025 maximum quantity for HFCs under the EU phase-out is higher than for 2024, so this is not a relaxation of the ambition level.

Until 2020, the supply of quota authorisations has exceeded quota-relevant RACHP equipment imports, leading to a growing 'bank' of unused quota authorisations, held by equipment importers. In 2021, the use of quota authorisations exceeded the amount of newly issued quota authorisations for the first time. This trend continued in the years thereafter, and in 2025, quota authorisations issued where at 66 % of authorisation use. Aggregated of the 2021 – 2025 period, newly issued quota authorisations covered about 67 % of the aggregated authorisation use. By the end of 2025, this led to a decrease in the quota authorisations bank by 7 % compared to 2024, or by 33 % compared to 2020. However, the reserve of unused quota authorisations available by the end of 2025 still represented more than four times the total volume of EU equipment imports in 2025. Nonetheless, the continuing decrease of the authorisation bank indicates that the reduction of available quotas under the EU phase-out has lately been quicker than the industry's response in demand reduction.

Illegal HFC imports outside the reporting and compliance system under the F-gas Regulation continue to be alleged by industry stakeholders and NGOs, and as in previous EEA reports these cannot be quantitatively accounted for in this briefing.

After significant increases in the number of companies applying for quotas until 2019, the European Commission's increased scrutiny of their legitimacy has reduced mass registrations (EU, 2019). Consequently, the number of quota-holding companies declined significantly between 2019 and 2020. The

[4] Supply of HFCs for the manufacture of metered dose inhalers (MDIs) was exempted from quota need from 2018 until 2024. Along with lifting the quota exemption for such HFC supply, the import of pre-charged MDIs became subject to a need for quota authorisation in 2025.

number of companies reporting on bulk HFC imports and quota authorisations also decreased between 2020 and 2022 and reached more or less 2018 levels again after more than doubling in 2019. Since 2023, however, the number of companies reporting on bulk HFC imports has been on the rise at growth rates of about 14 % in 2023 and 2024 and 32 % in 2025. In 2025, 1429 companies reported on bulk HFC imports, while 1725 companies reported on HFC-charged RACHP equipment imports, an increase of 32 % compared to 2024. The number of companies reporting on RACHP imports had remained at around 1000 since 2017 until 2023, but has seen a steep increase since. Due to changed registration and reporting requirements for companies in the revised Regulation (EU) 2024/573, the number of companies reporting on reclamation doubled from 14 for 2023 to 29 for 2024 and was at 28 in 2025. In addition, 56 companies reported under the new obligation on the receipt of quota-exempted HFCs in for the first time 2024, increasing to 77 in 2025. Of these 77 companies, 13 reported on receipt of exempted HFCs for MDIs and 64 on receipt of exempted HFCs for other purposes.

More graphs and data tables relating to compliance with the EU HFC phase-out are provided in the annex to this briefing.

EU contribution to the global phase-down of HFCs under the Montreal Protocol

The global HFC phase-down under the Montreal Protocol's Kigali Amendment introduced limits for the EU consumption of HFCs, starting in 2019 (grey lines in Figure B-1). 2025 HFC consumption (grey bars in Figure B-1) in the EU-27 was 15 % below 2024 values. EU HFC consumption was thus at 66 % below the limit set for the EU-27 under the Montreal Protocol's Kigali Amendment.

As visualised in Figure B-1, the ratio between HFC consumption (grey bars) and the quota limit under the EU F-gas Regulation (blue bars) has been strongly fluctuating over many years. The most important differences between definitions of 'consumption' and 'POM' in this context are the accounting of the quota exemption for MDIs and of HFCs in imports of precharged equipment. Furthermore, variations in end-of-year stocks of HFCs not yet placed on the market can play a role.

More graphs and data tables relating to the EU HFC phase-down under the Kigali Amendment to the Montreal Protocol are provided in the annex to this briefing.

Supply of F-gases in the EU

The total supply of F-gases[5] in the EU was reasonably stable from 2007 until it peaked in 2014, just before the HFC quota system entered into force. After 2015, a downwards trend reflected the effect of the EU HFC phase-down under the 2014 F-gas Regulation. While the years 2018 and 2019 show a sharp decrease, the trend was less pronounced in 2020 to 2023 with smaller subsequent decreases and increases. After a stronger decrease in 2024, the volume of EU total F-gases supply (i.e. both HFCs and other F-gases) in physical tonnes in 2025 was only about 1 % lower than supply in the previous year (Figure B-2), while the GWP of supplied F-gases was about 12 % lower than in 2024 (Figure B-3). Refrigeration and air conditioning (including heat pumps) continue to be key applications. With declining HFC supply to the RACHP sector, however, the relevance of other sectors is on the rise, in particular electrical equipment, semiconductor manufacture and aerosols (MDIs). An important detail is that statistics in physical tonnes reflect the use patterns of F-gases in EU industries (Figure B-2), while the amount of F-gases expressed in carbon dioxide equivalents (CO_2e) reflects their potential relevance for climate change policy and the HFC phase-out (Figure B-3).

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[5] While the previous subsections only discuss HFCs, this section includes trends for EU supply of *all F-gases* covered by F-gas regulation (EU) No 517/2014. Where supply is measured in units of tonnes, the major difference to HFC statistics is due to low-GWP unsaturated H(C)FCs. When measured in CO_2 equivalents, the difference is primarily due to very-high-GWPs gases SF_6, PFCs and NF_3.

F-gases supply in 2025 compared with 2024 shows changes in opposite directions for the different gas groups: while the supply of HFCs decreased by 7 % (-15 % in CO_2e), as well as that of SF_6 (-12 %, both in tonnes and in CO_2e), supply of PFCs increased by 28% and that of fluorinated ethers, ketones and alcohols increased by 47%. Please refer to section 10 on calculation methods for more information on how F-Gas supply is determined from its contributing factors.

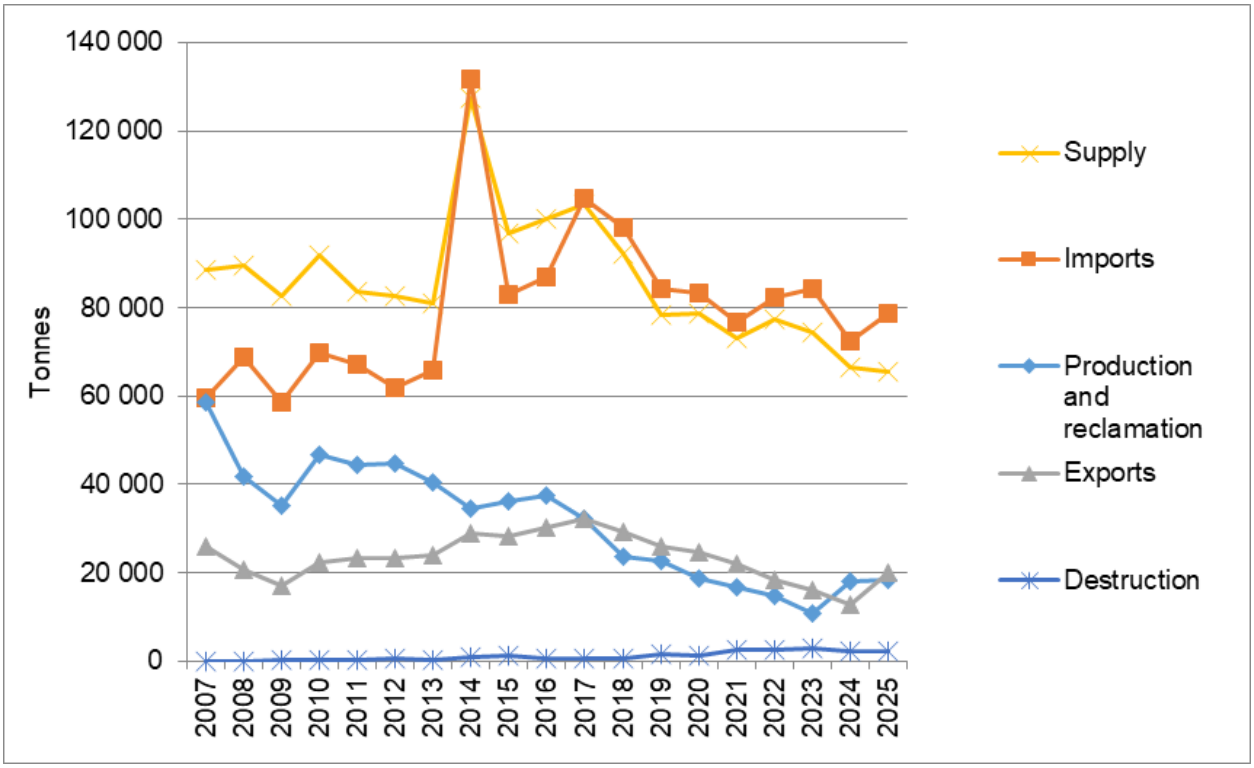
The 7 % decrease in HFC supply (-15 % in CO_2e) was influenced by different factors: a 8 % decrease in production (-19 % in CO_2e) and a 87 % increase in bulk exports (62 % in CO_2e) counterbalanced a 5 % (1 % in CO_2e) increase in bulk imports and a 16 % increase of imports of HFCs contained in pre-charged equipment (11 % in CO_2e). Reclamation of HFCs increased by 5 % (-2 % in CO_2e). Given the decline in EU HFC production, a large share of EU HFC exports are actually re-exports of HFCs previously imported, but not necessarily placed on the EU market under the quota system.

The 12 % decrease in the supply of SF_6 was mainly due to a 25 % increase in bulk exports. Further impacts were a 1 % decrease in SF_6 production and 10 % increase of SF_6 imports. Imports of SF_6 contained in equipment, mainly electrical switchgear, increased by 34 % after quadrupling in 2024 but still play a minor role compared to production and bulk imports. The increase is likely due to an anticipation of restrictions for electrical switchgear contained in the F-gas regulation, e.g. putting into operation of switchgear for primary and secondary distribution up to 24 kV, relying on fluorinated gases as insulation or breaking medium is prohibited from 1st January 2026. SF_6 exported in equipment is not subject to reporting, respective amounts are included in the 'total supply' metric. Reclamation of SF_6 decreased by 7 % (in tonnes and CO_2e) compared to 2024.

However, in terms of long-term trends, the supply of HFCs continues to be the most relevant driver of the changes in F-gases supply. Supply of SF_6 has been changing over the years but no clear trend is recognizable (Table 15 in the annex to this briefing provides an overview on EU supply for F-gases, including SF_6).

The supply of unsaturated HFCs and HCFCs with very low GWPs, replacing HFCs with significantly higher GWPs, has increased by 11 % and makes up 33 % of the EU total supply of fluorinated gases in 2025 in metric tonnes. When comparing the gases with the highest GWPs (next to SF_6) for the years 2024 and 2025, there was a 14 % increase for NF_3 and a 28 % increase for PFCs. Supply of other fluorinated compounds, reportable for 2024 for the first time, dropped by 60 % in 2025 compared to 2024 (73 % in GWP).

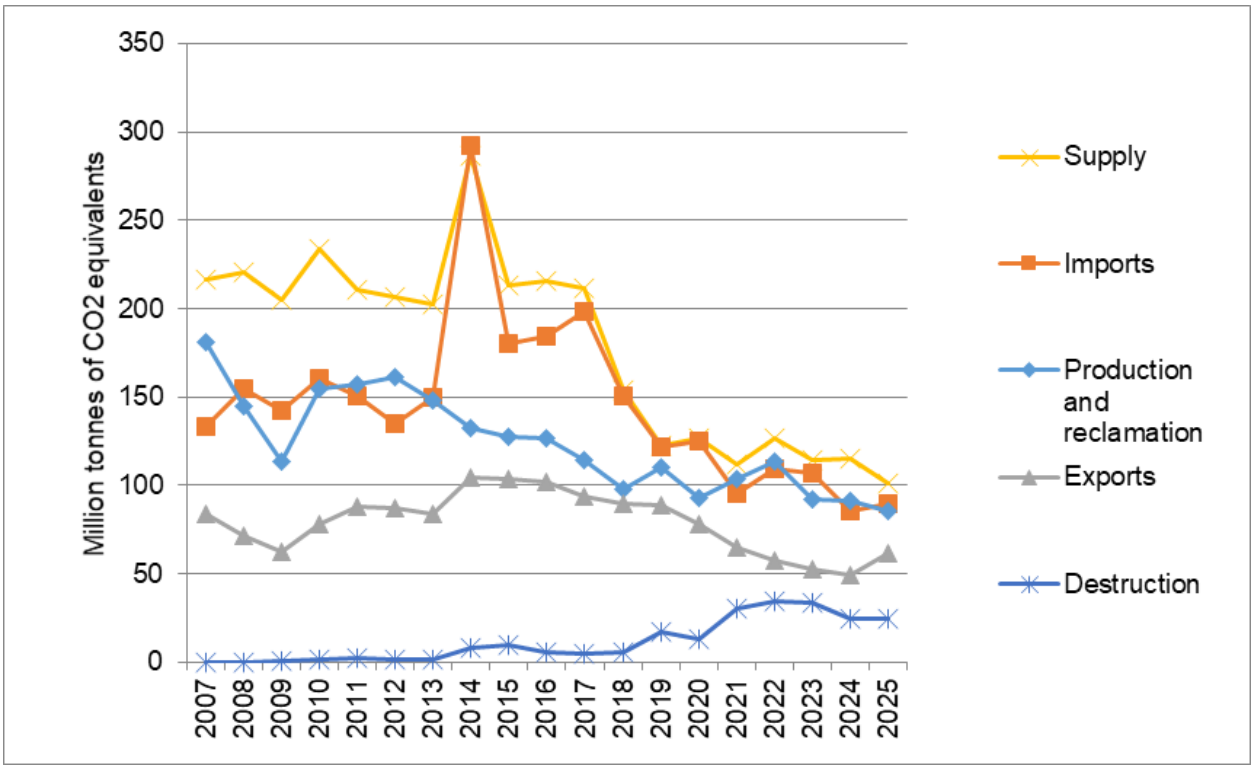
Figure B-2 Supply, production, import, export and destruction of F-gases (tonnes)



Notes: The geographical scope of the data presented is EU-27 and the UK (except Croatia) for 2007-2008, EU-27 and the UK for 2009-2020 and EU-27 for 2021 and subsequent years. The scope of F-Gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data presented for import and supply until 2013 are limited to bulk import and bulk supply. Export is limited to bulk export for the whole time series. Data available for Croatia for the period 2009-2012 are limited to HFCs and do not cover PFCs and SF_6. Starting in 2019, produced amounts include non-captured by-production and destroyed amounts cover destruction of these amounts.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Figure B-3 Supply, production, import, export and destruction of F-gases (CO_2e)



Notes: The geographical scope of the data presented is EU-27 and the UK (except Croatia) for 2007-2008, EU-27 and the UK for 2009-2020 and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data presented for import and supply until 2013 are limited to bulk import and bulk supply. Export is limited to bulk export for the whole time series. Data available for Croatia for the period 2009-2012 are limited to HFCs and do not cover PFCs and SF_6. Starting in 2019, produced amounts include non-captured by-production and destroyed amounts cover destruction of these amounts.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

The trend in F-gas supply in the EU reflects trends in physical flows of F-gases: production, reclamation, imports, exports and destruction in the EU.

- **Production** of F-gases has been declining more or less steadily since 2012. In 2025, EU production of HFCs decreased again in volume (-8 %) compared with 2024. However, the inclusion of unsaturated HFC-1132a (GWP: 0,052) into Annex II of the revised Regulation (EU) 2024/573, and the subsequent reporting on its production for feedstock use (see below), led to 2024 F-gas production being 66 % above that in 2023 when measured in tonnes of gas and more or less remaining at the same level in 2025. F-gases production in terms of CO_2e has decreased by 7 %, however, mainly due to a 19 % decrease in HFC production and a 1 % decrease in SF_6 production.
- Following the termination of EU production of HFC-365mfc after 2023, EU HFC production remains in place for HFC-143a and HFC-227ea. The largest share in remaining EU HFC-production (52 % in tonnes, 81 % in CO_2e), however, is reported for HFC-23 which occurs as by-product in the production of HCFC-22, a feedstock for the production of fluoropolymers. In consequence of the closure of one plant, the HFC-23 by-production in 2025 was 28 % below 2024 levels.
- The quantities (in tonnes) reported as **reclaimed** F-gases increased by about 5 %. EU HFC reclamation in 2025 increased also by 5 % and contributed 88 % of total F-gas reclamation (62 % in CO_2e). Reclamation of SF_6 decreased by 7 % and makes up 38 % of total F-gases reclamation in CO_2e (5 % in tonnes). Due to the new reporting obligation for reclamation companies under the 2024 revision of the F-gas Regulation (FGR), and the doubling of reporting companies, reported

reclamation amounts more than doubled in 2024 compared to 2023. The consolidation of the trend in reclamation shows that the 2024 increase was most likely due to a more complete reporting on reclamation activities.

- **Reclaimed** HFC amounts have surpassed the EU production of virgin HFCs by 13 %in 2025, due to a reduction in production and a significant increase in reclamation. In terms of CO_2e, reclaimed amounts are at23 % of production, due to mostly HFCs with high GWP being produced. Reclaimed amounts contribute about 6 % to the total EU HFC supply (~10 % as CO_2e).
- Total F-gas **imports** in 2025 increased by 9 % compared with 2024, and by 5 % in CO_2e. The increase in tonnes of gas was mainly driven by a 8 % increase in HFC imports and an 11 % increase in unsaturated H(C)FCs, while the increase in terms of GWP was strongly influenced by imports of HFCs, SF_6 and NF_3. New reportable gases under the 2024 revision of the F-gas Regulation contribute about 4 % to 2025 reported imports in tonnes and about 3 % in CO_2e.
- While the increase in total imports is driven by both bulk imports and imports of F-gases contained in products and equipment, the trends differ: bulk imports increased by 8 % in tonnes and only 3 % in CO_2e, due to unsaturated H(C)FCs making up almost two thirds of the imported amounts. **Imports of F-Gases in products and equipment** showed a steeper rise: equipment imports into EU in 2025 were reported about 14 % higher than in 2024 (12 % higher than 2024, if measured in CO_2e). A strong 34 % increase was for SF_6 albeit from a very low level.
- **Gases contained in products and equipment** imported in 2025 were roughly 90 % HFCs, 7 % unsaturated H(C)FCs and 3 % inhalation anaesthetics (measured in CO_2e, the most relevant shares are: 86 % HFCs, 11 % SF_6 and 3 % inhalation anaesthetics). While imports of stationary equipment for cooling and heating showed an increase of 19 %, imports of mobile air conditioning equipment showed a 13% decrease, inversing the previous year's trend. For HFCs and unsaturated H(C)FCs, higher imports of F-gases in medical equipment (including aerosols) were reported, and SF_6 was mainly in switchgear.
- In 2025, after a continuous decline observed since 2017, overall **bulk exports** of F-gases from the EU increased by 56 % in volume compared with 2024, while the increase in CO_2e was about 25 %. The increase measured in tonnes was driven by strong increases (more than 100 %) in the exports of HFC-32 and HFC-134a as well as a 25 % increase in SF_6 export, which outweighed a 44 % increase in exports of unsaturated HFCs/HCFCs. The increase of exports measured in CO_2e (+25 %) is less prominent due to a decrease in the average GWP of exports. Given the decline of F-Gas production in the EU, a large share of exports are actually re-exports of gases previously imported, but not necessarily placed on the EU market under the quota system. Exports of **F-gases contained in products and equipment** are not subject to obligatory reporting.
- **Destruction** of F-gases is mainly reported for HFCs. After a steep increase in 2019[6] and a continuous increase in 2021-2023, the amounts destroyed decreased by about 39 % in 2024 and again by 5 % in 2025. Destruction of non-HFCs continued to increase strongly for PFCs (+67 %) and NF_3 (+69 %), but destruction of SF_6 decreased by 20 % compared to 2024. However, the total amount (in tonnes as well as in **CO_2** equivalents) of non-HFCs destroyed was at about a third of the amount of destroyed HFCs.

More graphs and tables summarising data reported by companies on the production, import, export and destruction of F-gases in the EU, for the period 2007-2025, are contained in the annex to this briefing. The annex also documents the methodology used, in particular for the calculation of the supply, placing on the market and consumption metrics, and institutional arrangements.

[6] The increase in 2019 had mostly been due to the systematic inclusion of unwanted or off-grade gases destroyed after production before sale in the reporting scope.

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Fluorinated greenhouse gases 2026

Data reported by companies on the production, import, export and destruction of fluorinated greenhouse gases in the European Union, 2007-2025

ANNEX

ETC CM Report 2026/2

European Environment Agency
European Topic Centre
Climate change mitigation

1 Introduction to the Annex

PLEASE NOTE: On 11 March 2024, the new F-gas Regulation (EU) 2024/573 came into force. This report presents data reported in spring 2025 by companies on their transactions in 2024 in the context of the new regulation. Data collected in years prior to 2024 was subject to the old F-gas Regulation (EU) No 517/2014.

1.1 Annex structure

The annex to this briefing 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 section*s* 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. Section 10 outlines the calculation methods used.

1.2 Scope

The data contained in this annex is based on submissions for the year 2024 as received by 4 July 2025 (which includes some late reports and corrections received after the legal deadline on 31 March 2025). Data for previous years were changed slightly after some corrections were submitted.

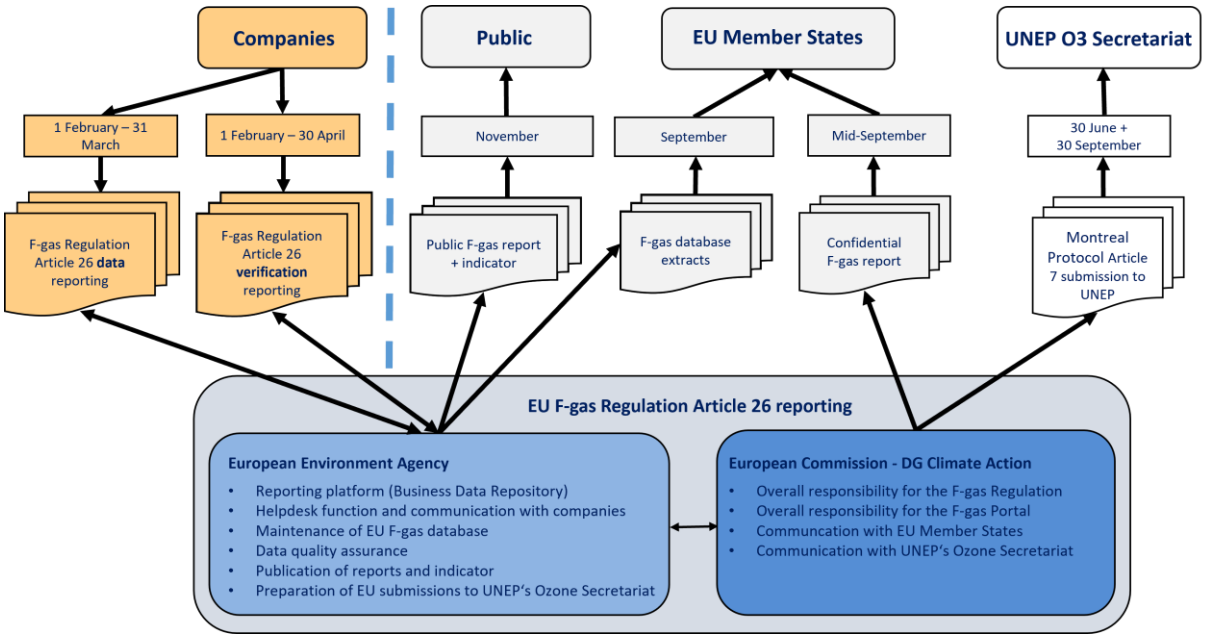
Data for 2007-2013 are covered by the 2006 F-gas regulation and data for 2014-2023 are covered by Regulation (EU) No 517/2014, while data for 2024 and onwards are covered by Regulation (EU) 2024/573. Due to the different reporting frameworks, data from the three periods are not always directly comparable.

The geographical scope for data presented for the years until 2019 is the EU-28. Data for 2020 relates to the EU-27 and the United Kingdom and data for 2021 and subsequent years relates to the EU-27.

1.3 Institutional arrangements

Companies that need to report are obliged to register with the European Commission's F-gas portal[7] pursuant to Article 20 of the 2024 F-gas Regulation.

Figure 1-1 Institutional arrangements and products



Source: EEA.

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 (ETC CM)[8].

1.4 Confidentiality

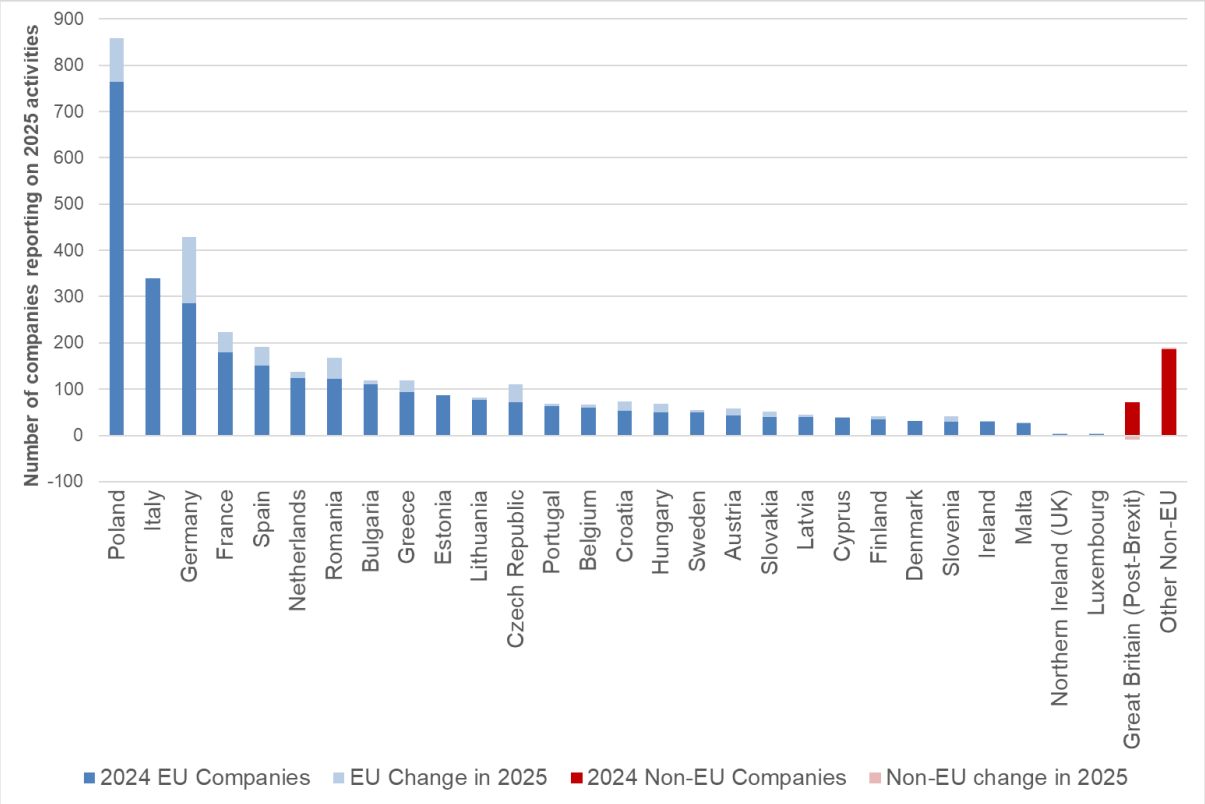
The F-gas Regulation requires that the confidentiality of the information submitted by companies is protected (Article 20(7)). The EEA takes appropriate measures to protect confidentiality and prevent publication of commercially sensitive information. These measures include public reporting of F-gases 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.

7 https://fgas-licensing.ec.europa.eu/fgas/resources/home/

8 https://www.eionet.europa.eu/etcs/etc-cm

2 Figures on companies reporting in 2024

Figure 2-1 Reporting companies by Member State



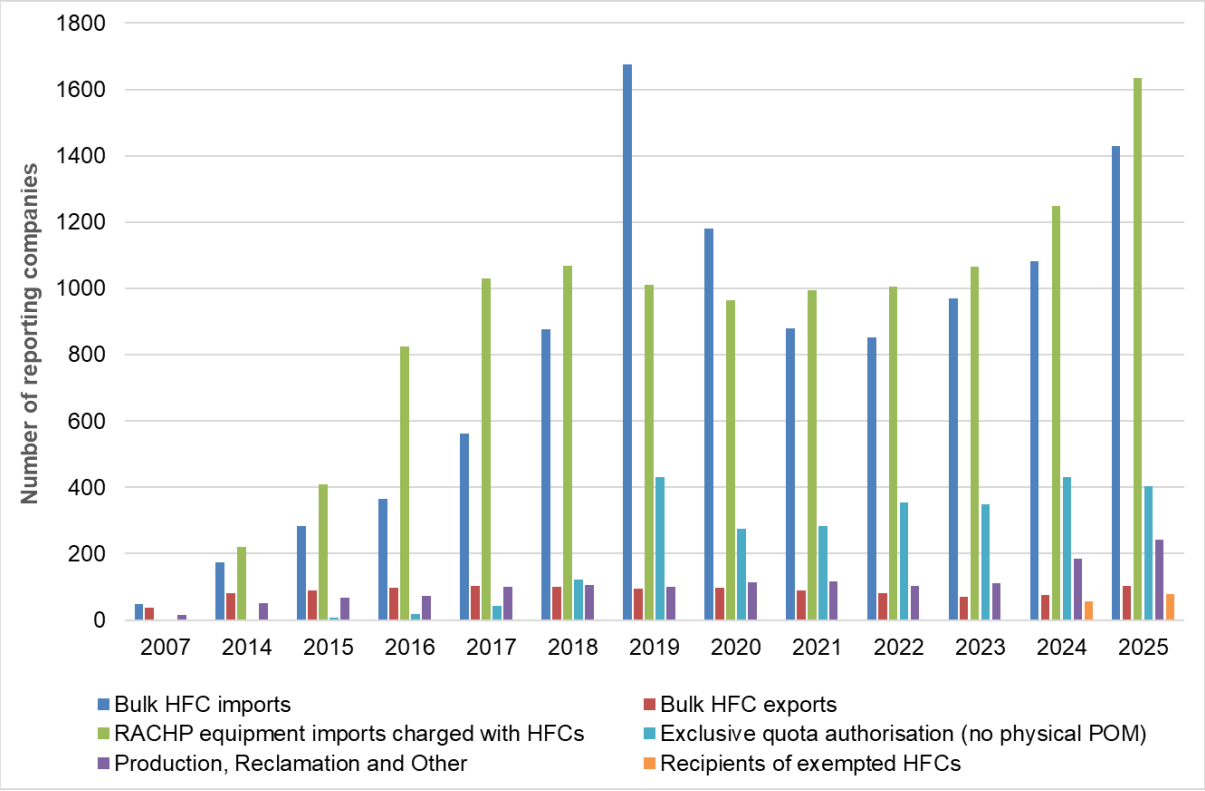
Note: Nil reports not included.

Other Non-EU countries: United Arab Emirates, Albania, Australia, Belarus, Canada, Switzerland, China, Hong Kong, India, Japan, Republic of Korea, Liechtenstein, Monaco, Marshall Islands, Malaysia, Norway, Serbia, Russian Federation, Saudi Arabia, Türkiye, Ukraine, United States.

Source: EEA, 2026b.

Table 23 in Section 7 (Data tables, page 75) presents a breakdown of reporting companies by countries and reported activities for 2025.

Figure 2-2 Reported activities, 2007-2025



Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

For a more detailed breakdown of reported activities over time, please refer to Table 25 in Section 7 (Data tables, page 77).

3 Figures on F-gas activity in the European Union

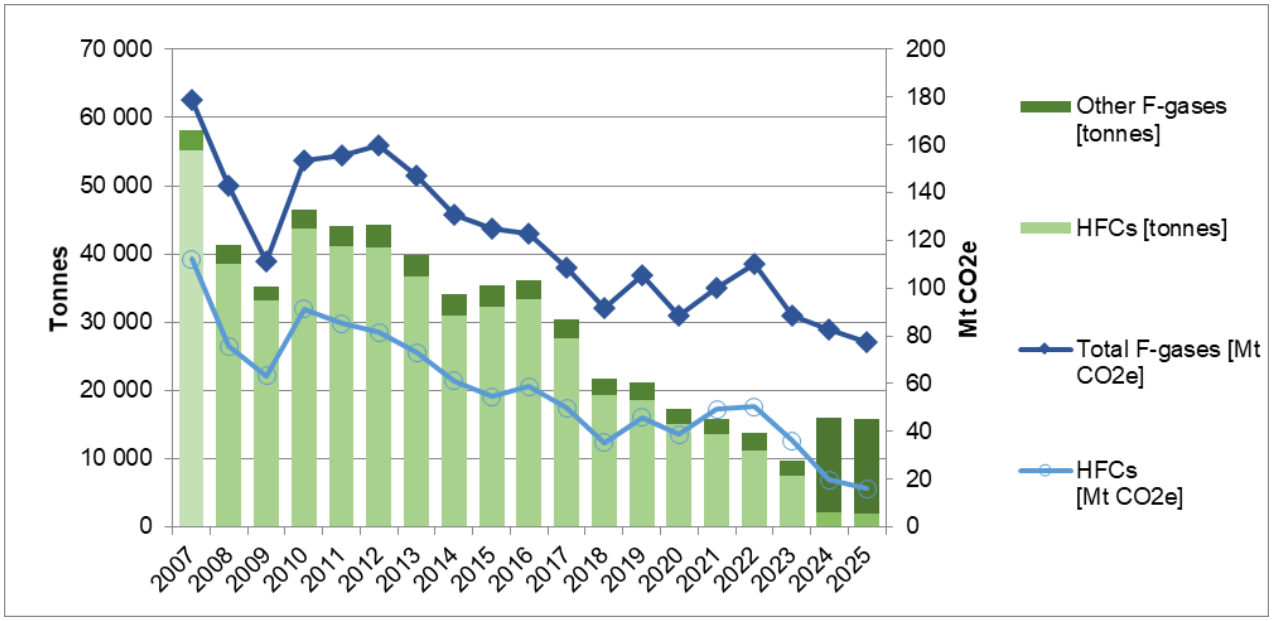
This chapter presents data reported by companies on:

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

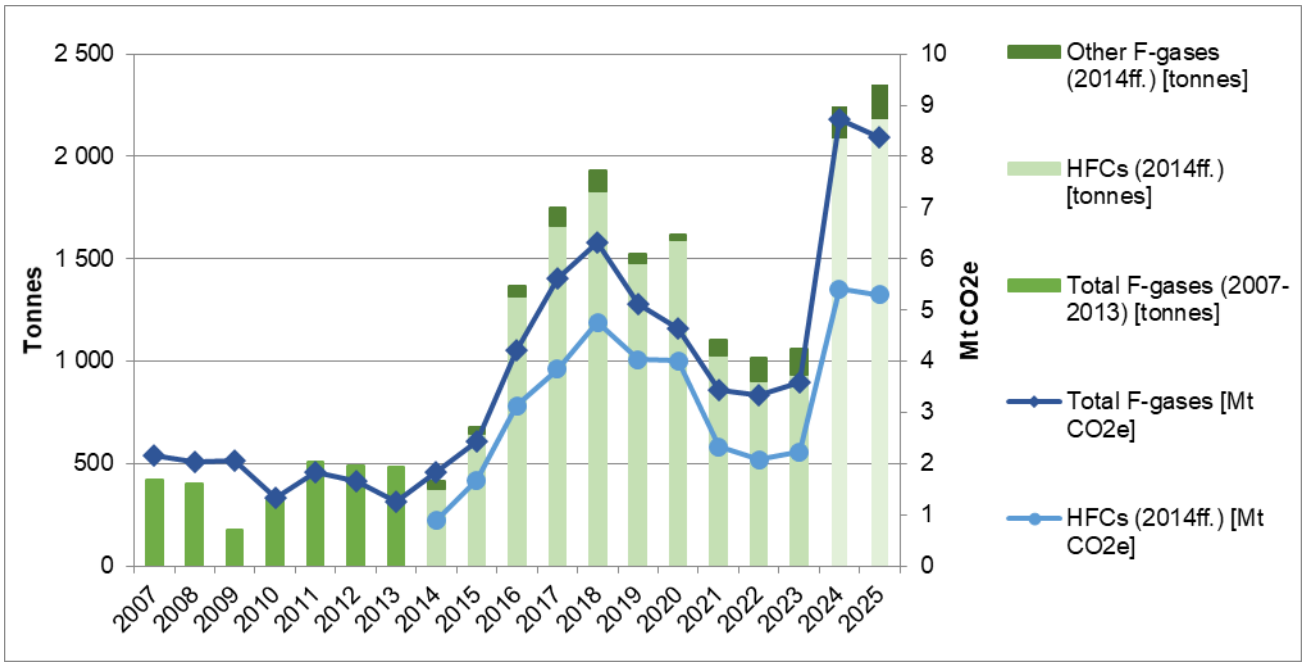


Note: The geographical scope of presented data is the EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

A tabular overview on F-gases produced in the EU since 2007 in tonnes and CO_2e is given in Table 1 and Table 2 in section 7 (Data tables, page 48f.).

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, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024.

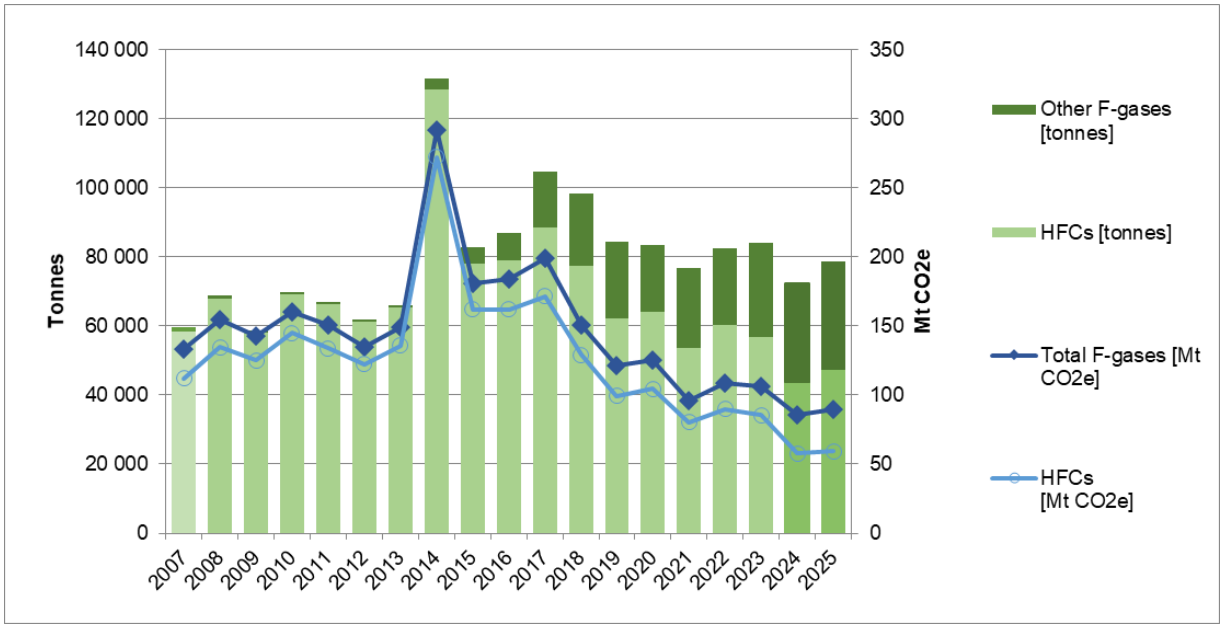
Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

3.2 Imports and exports

3.2.1 Imports

Detailed data on total imports can be found in Table 5 and in section 7 (Data tables, page 52f.).

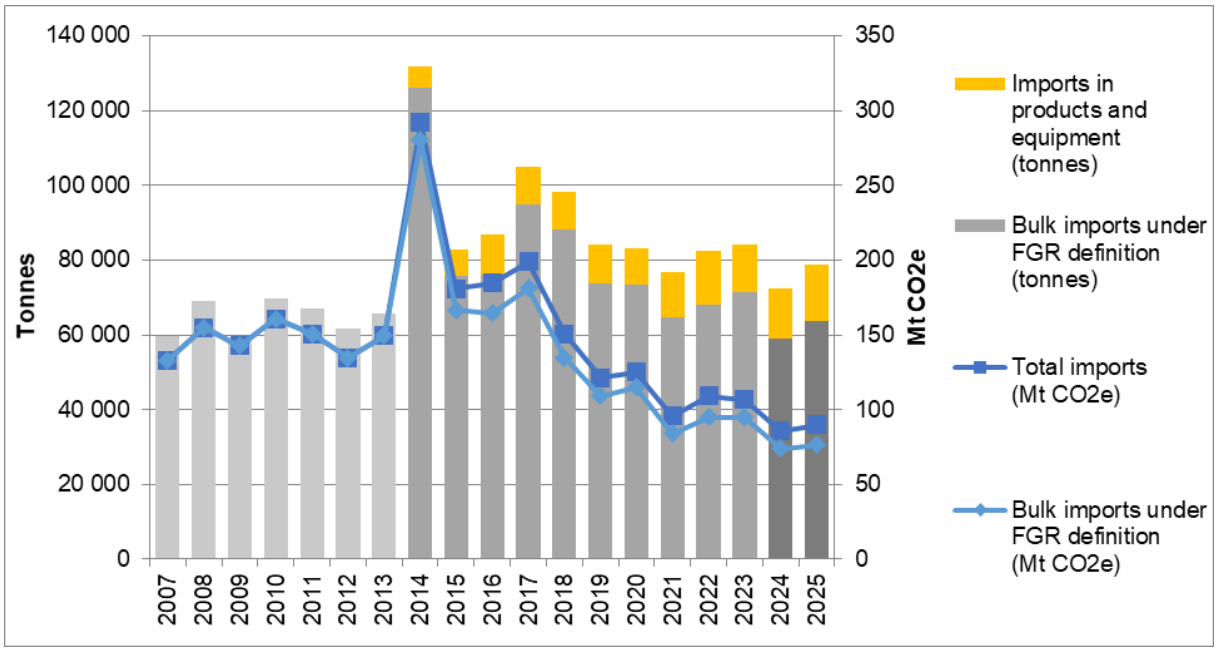
Figure 3-3 EU imports of fluorinated gases



Note: The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Figure 3-4 EU imports by type

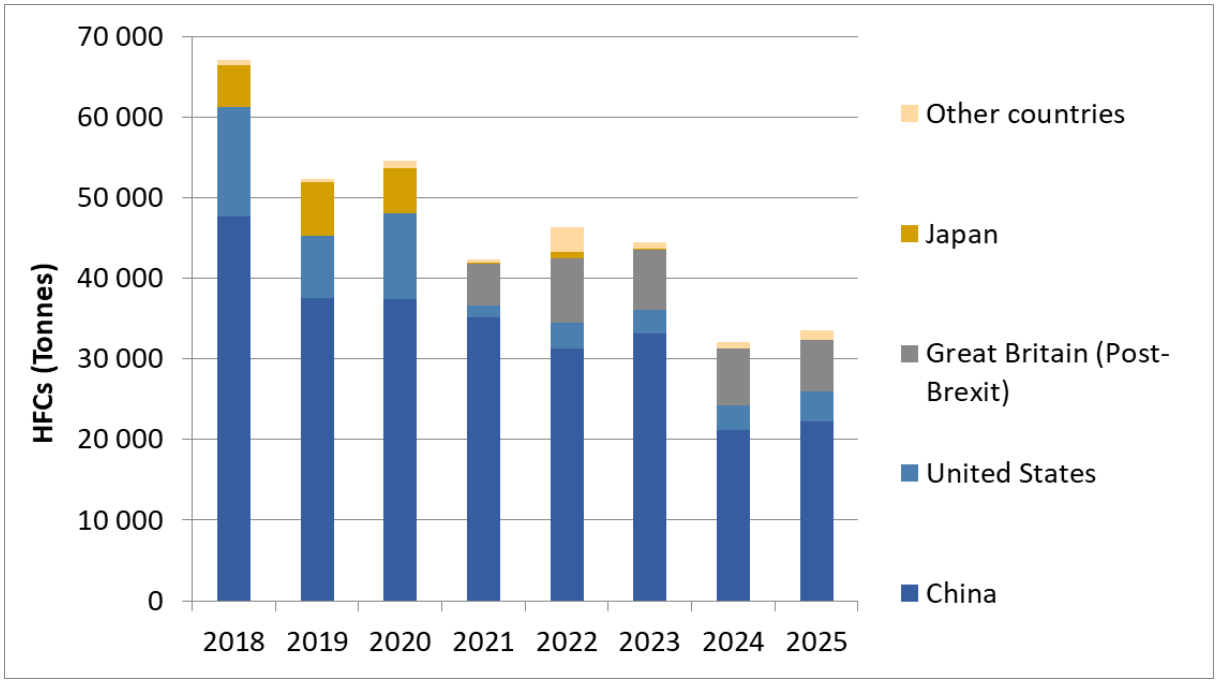


Note: The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6. 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, 2024 and 2026b.

3.2.2 Bulk Imports

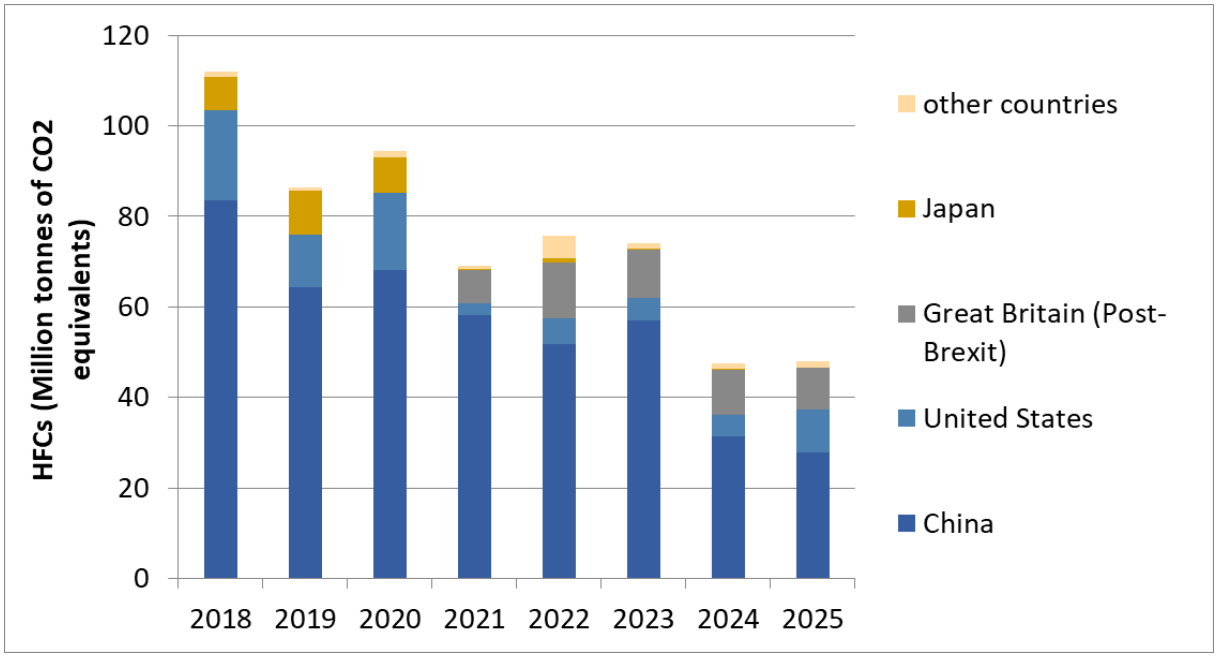
Figure 3-5 Origin of bulk HFC imports (tonnes)



Note: The geographical scope of presented data is EU-28 for 2018-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

Sources: EEA, 2024 and 2026b.

Figure 3-6 Origin of bulk HFC imports (CO_2e)



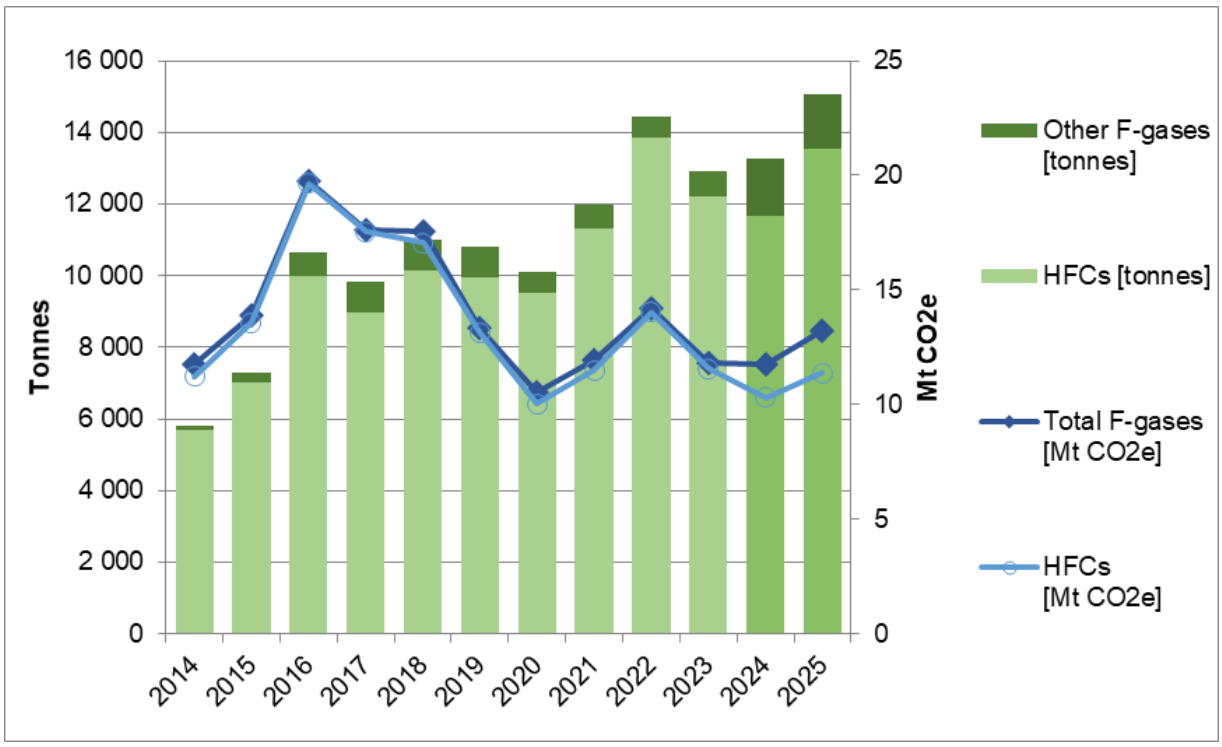
Note: The geographical scope of presented data is EU-28 for 2018-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

Sources: EEA, 2024 and 2026b.

Detailed data on bulk F-gas imports is contained in Table 7 and Table 8 in section 7 (Data tables, page 54f.).

3.2.3 *Imports contained in products and equipment*

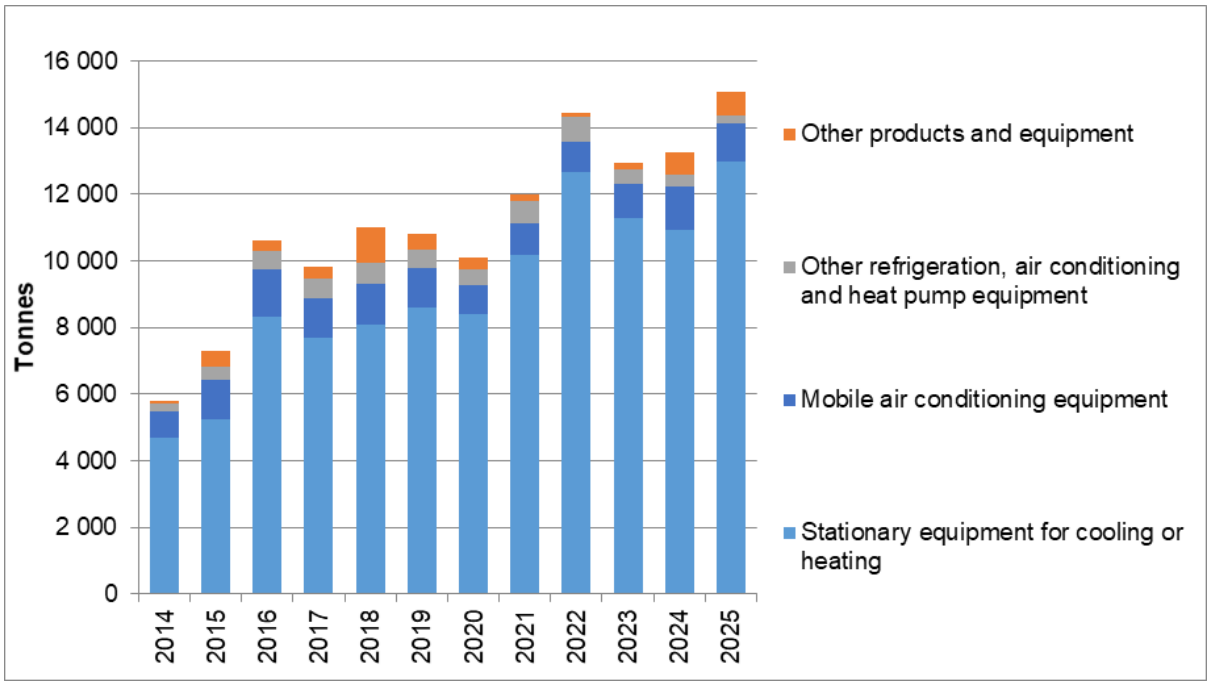
Figure 3-7 EU imports of fluorinated gases within products and equipment



Note: The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Imports of pre-blended polyols are not included in the data shown.

Sources: EEA, 2024 and 2026b.

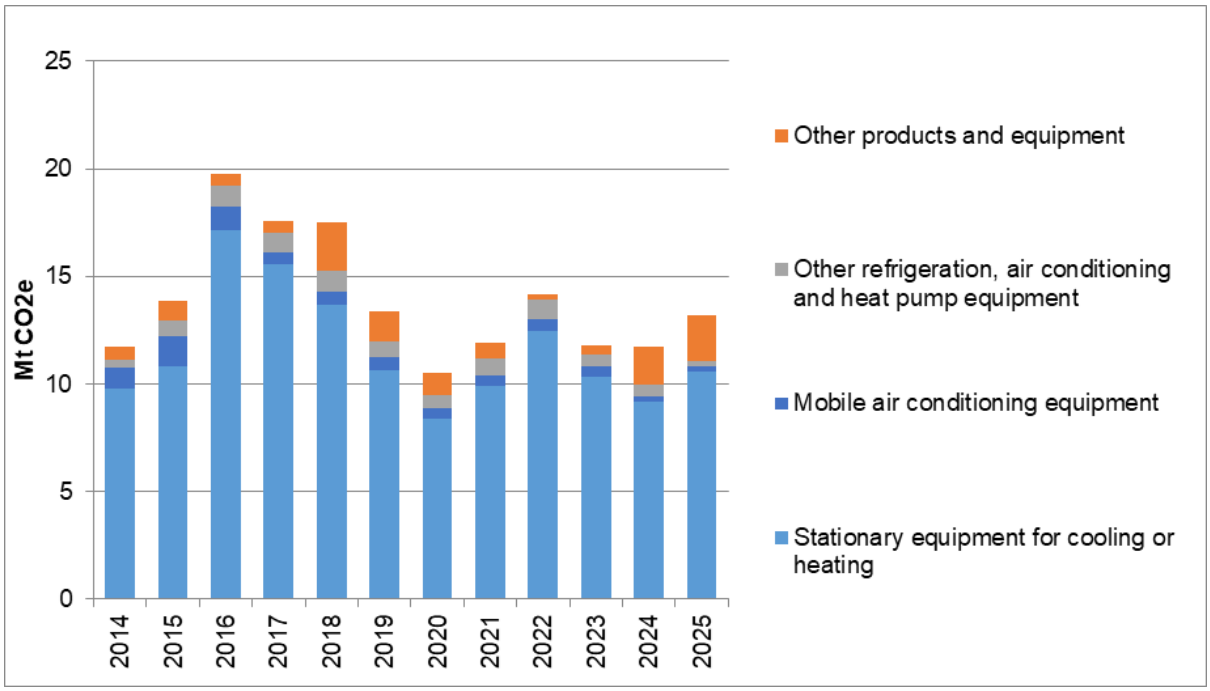
Figure 3-8 Categories of EU supply in products and equipment of fluorinated gases (tonnes)



Note: The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Imports of pre-blended polyols are included since 2018.

Sources: EEA, 2024 and 2026b.

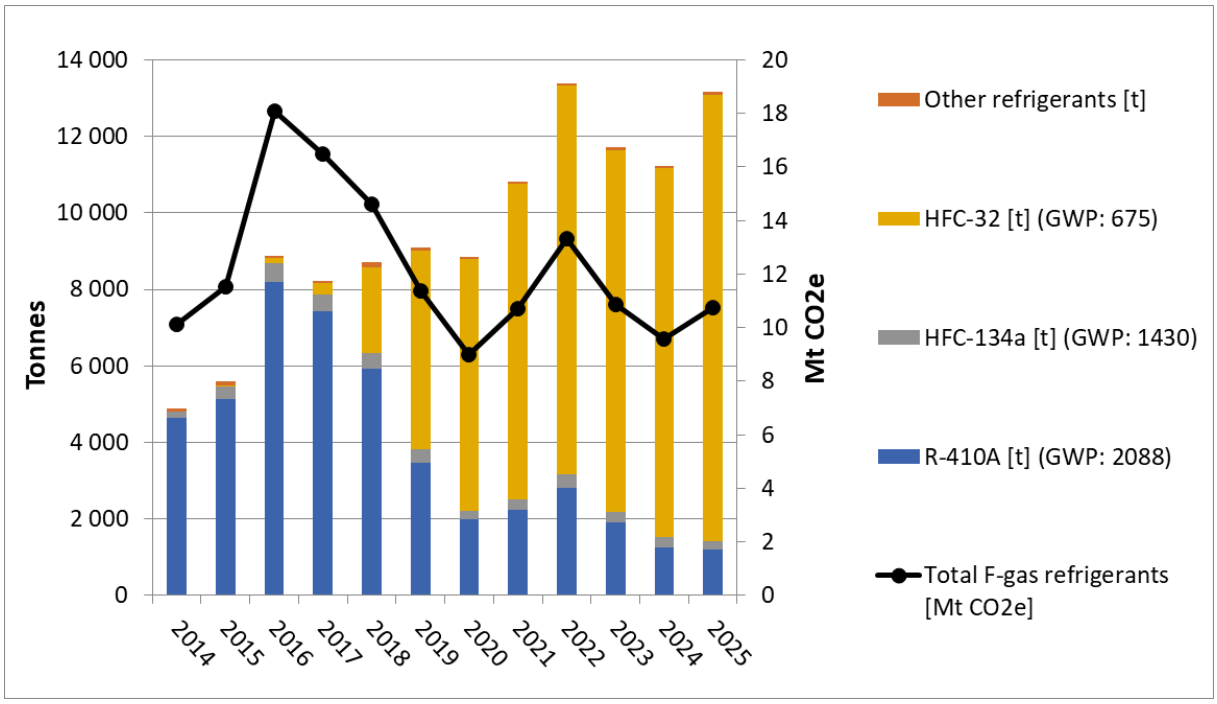
Figure 3-9 Categories of EU supply in products and equipment of fluorinated gases (CO_2e)



Note: The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Imports of pre-blended polyols are included since 2018.

Sources: EEA, 2024 and 2026b.

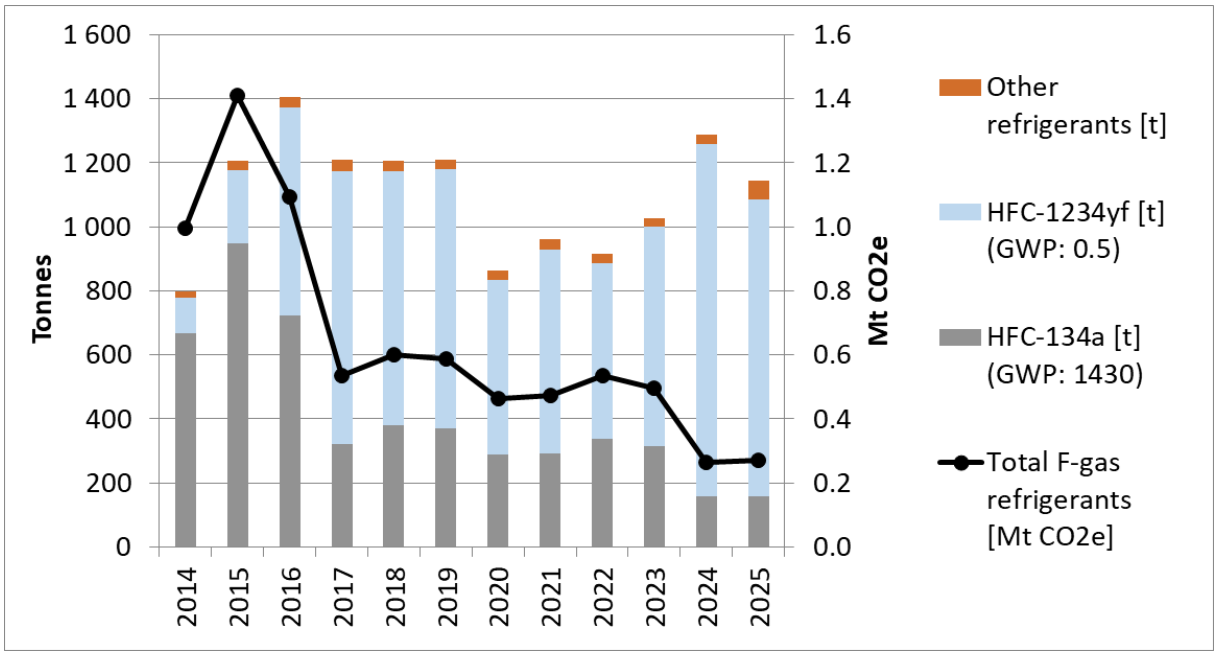
Figure 3-10 Refrigerants in imported stationary RACHP equipment



Note: The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years.

Sources: EEA, 2024 and 2026b.

Figure 3-11 EU imports of fluorinated gases within air conditioning equipment for vehicles



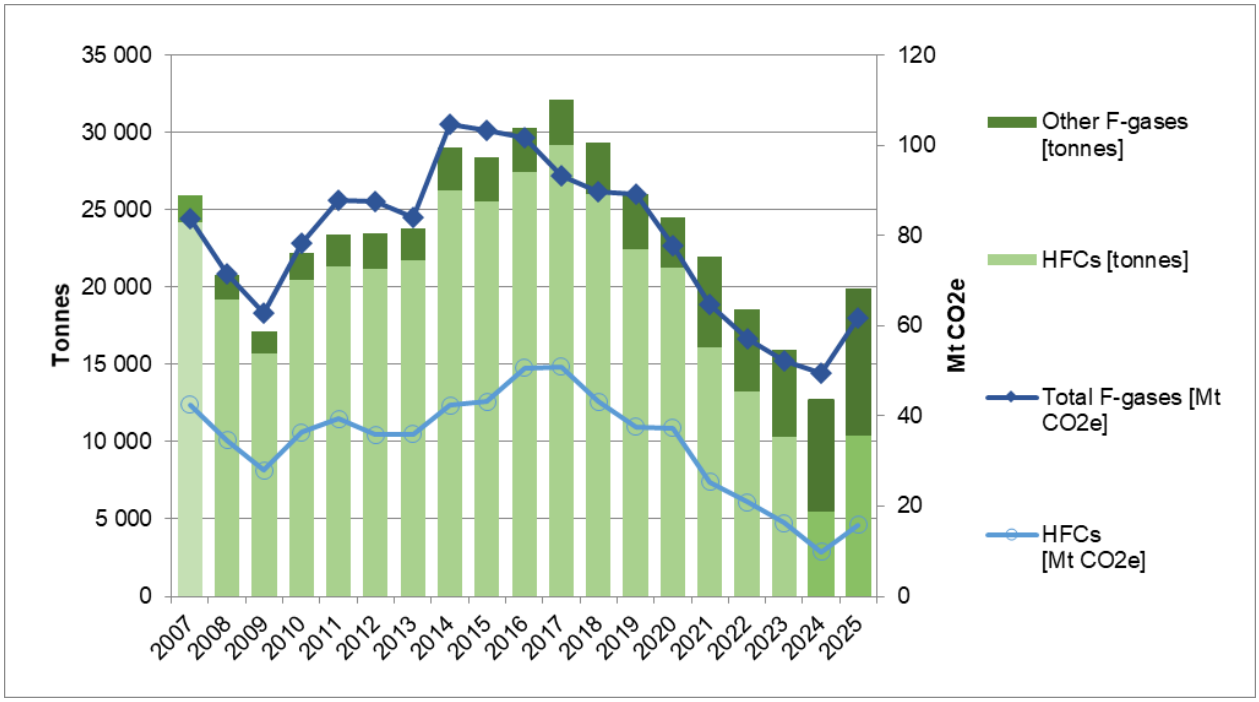
Note: The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years.

Sources: EEA, 2024 and 2026b.

Detailed data on F-gases in imported products and equipment are listed in Table 9 and Table 10 in section 7 (Data tables, page 56f.). Equipment imports by equipment category are given in Table 11 and Table 12 (page 58f.).

3.2.4 *Exports*

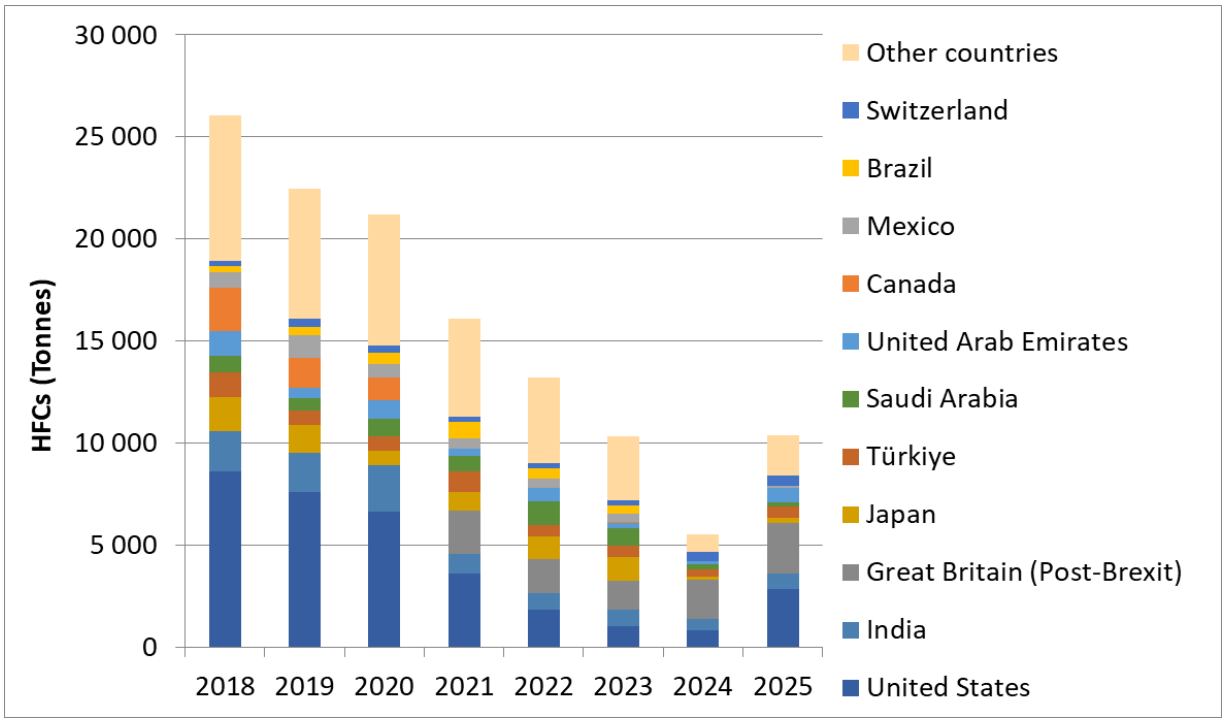
Figure 3.12 EU bulk exports of fluorinated gases



Note: The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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 SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

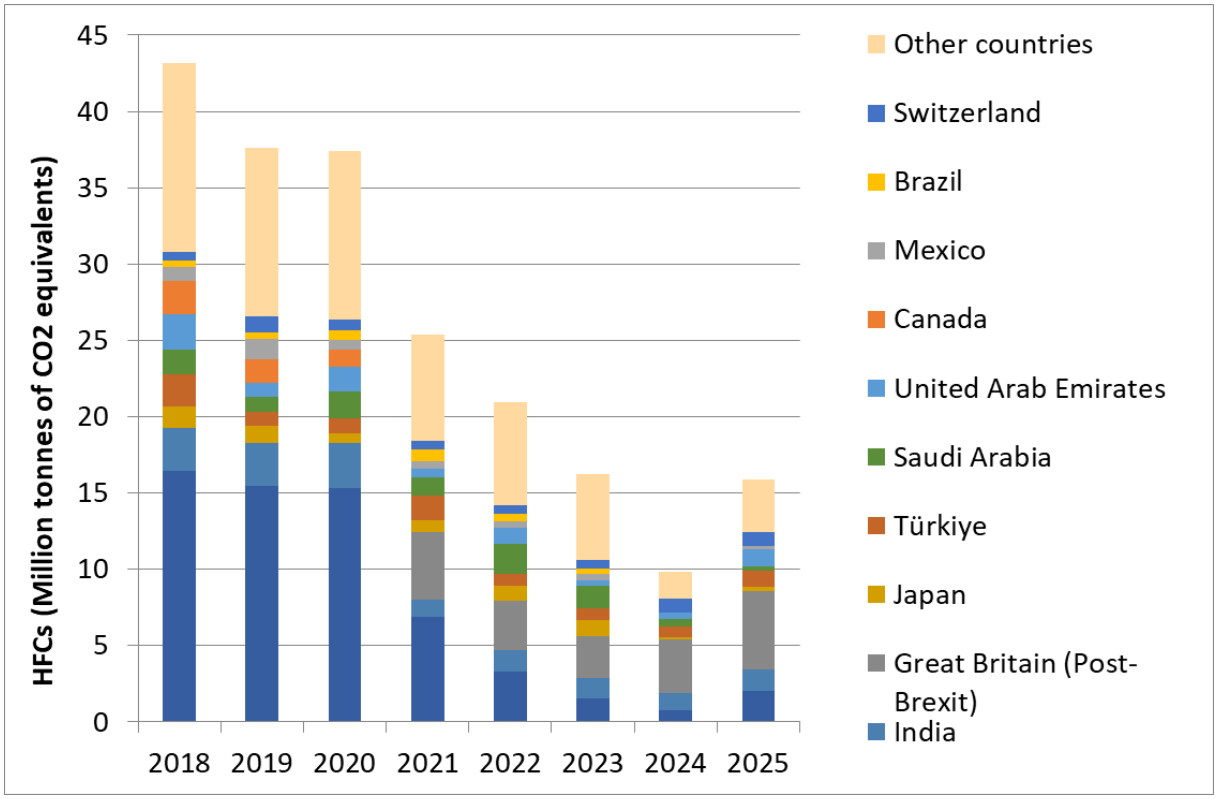
Figure 3-13 Destination of bulk HFC exports (tonnes)



Note: The geographical scope of presented data is EU-28 for 2018-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

Sources: EEA, 2024 and 2026b.

Figure 3-14 Destination of bulk HFC exports (CO_2e)



Note: The geographical scope of presented data is EU-28 for 2018-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Bulk imports presented here are cleared of imports of pre-blended polyols and thus compatible with the MP definition.

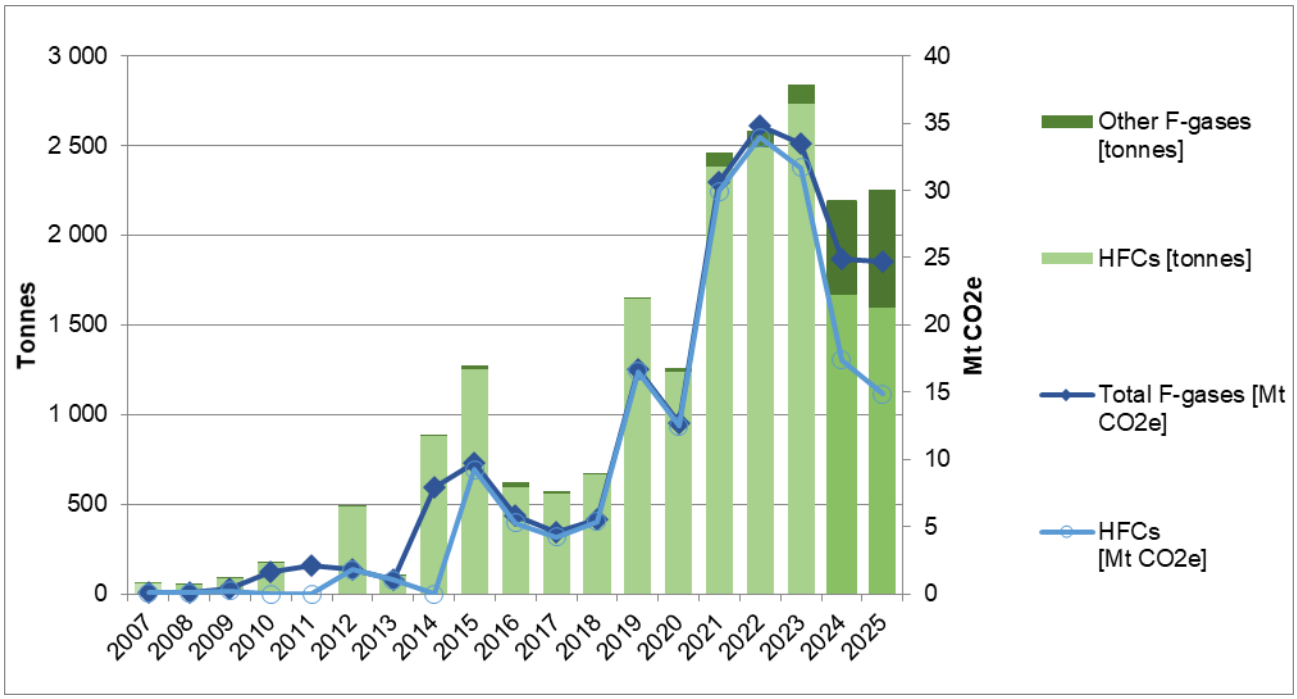
Sources: EEA, 2024 and 2026b.

Detailed data on exports can be found in in Table 13 and Table 14 in section 7 (Data tables, page 60f.).

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, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024.

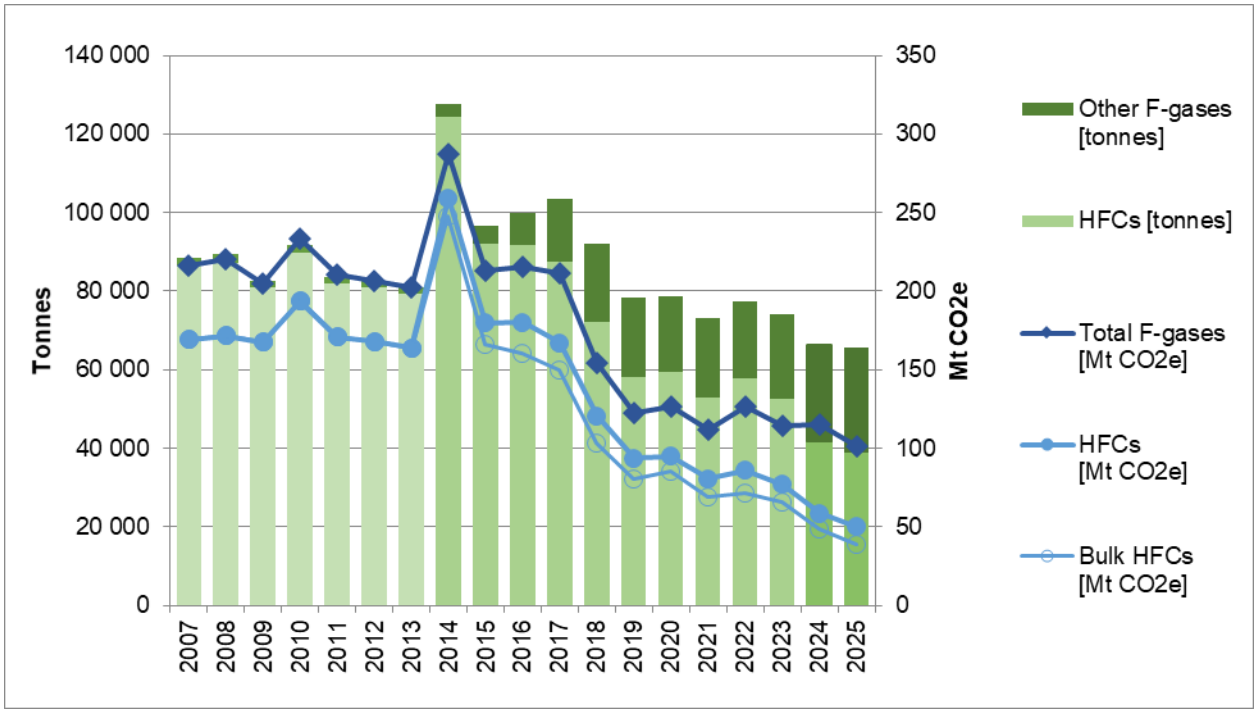
Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

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[9].

4.1 Trends in the EU supply by gas

Figure 4-1 EU supply of fluorinated gases

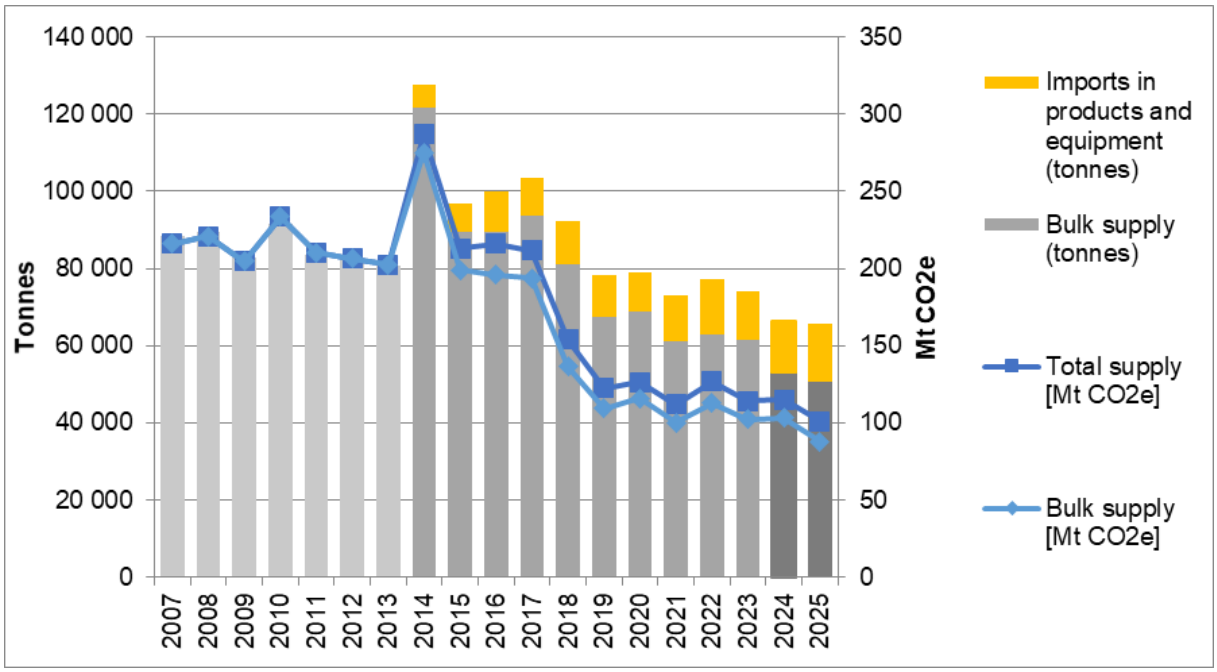


Note: The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

[9] For methodological details on the calculation of EU supply, please refer to section 10, 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.

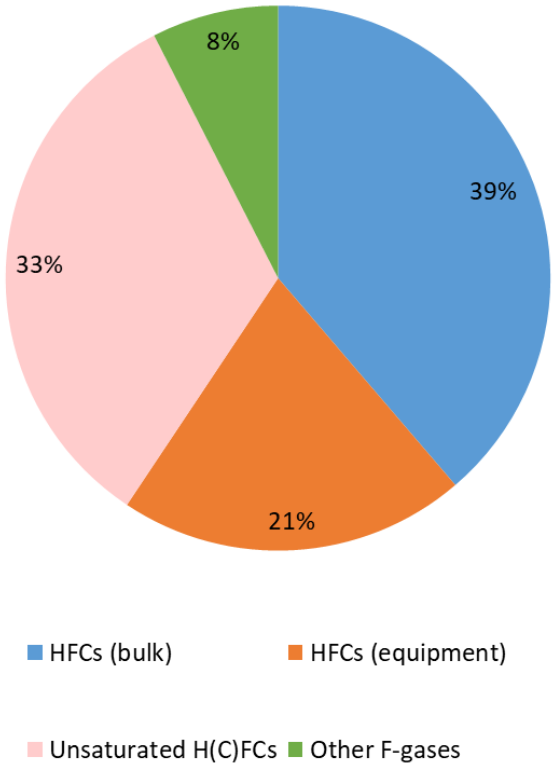
Figure 4-2 EU supply of fluorinated gases by types



Note: The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6. Imports of pre-blended polyols, available since 2018, were assigned to the supply in products and equipment.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

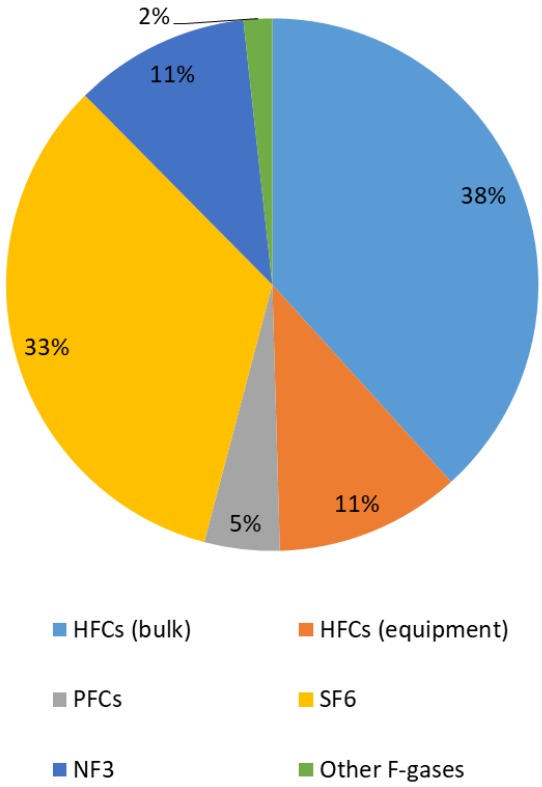
Figure 4-3 **2025 total supply by types and groups of fluorinated gases (% tonnes)**



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

Source: EEA, 2026b.

Figure 4-4 **2025 total supply by types and groups of fluorinated gases (% CO_2e)**



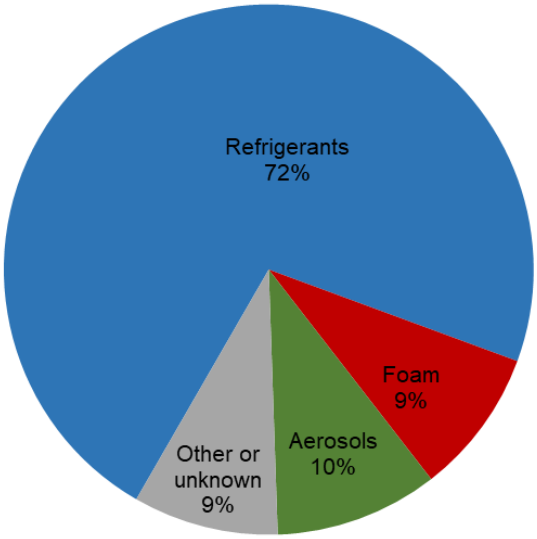
Note: The geographical scope of presented data is EU-27.

Source: EEA, 2026b.

Detailed data on total supply and bulk supply are given in Table 15 and Table 18 in section 7 (Data tables, page 62f.). For supply in imports and equipment, please refer to Table 9 and Table 12 (page 56f).

4.2 Intended applications of EU supply of F-gases

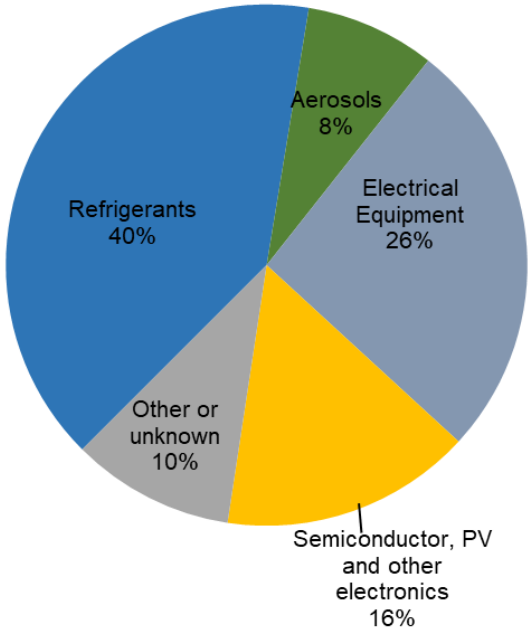
Figure 4-5 **2025 EU F-gases supply by intended applications (% tonnes)**



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

Source: EEA, 2026b.

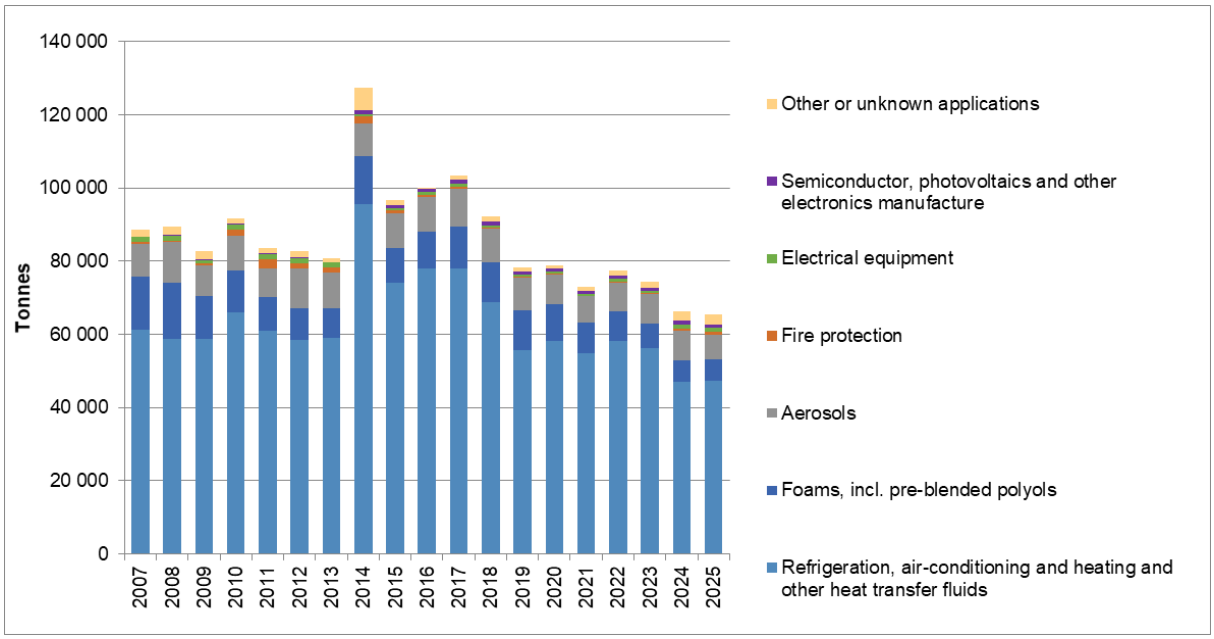
Figure 4-6 **2025 EU F-gases supply by intended applications (% CO_2e)**



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

Source: EEA, 2026b.

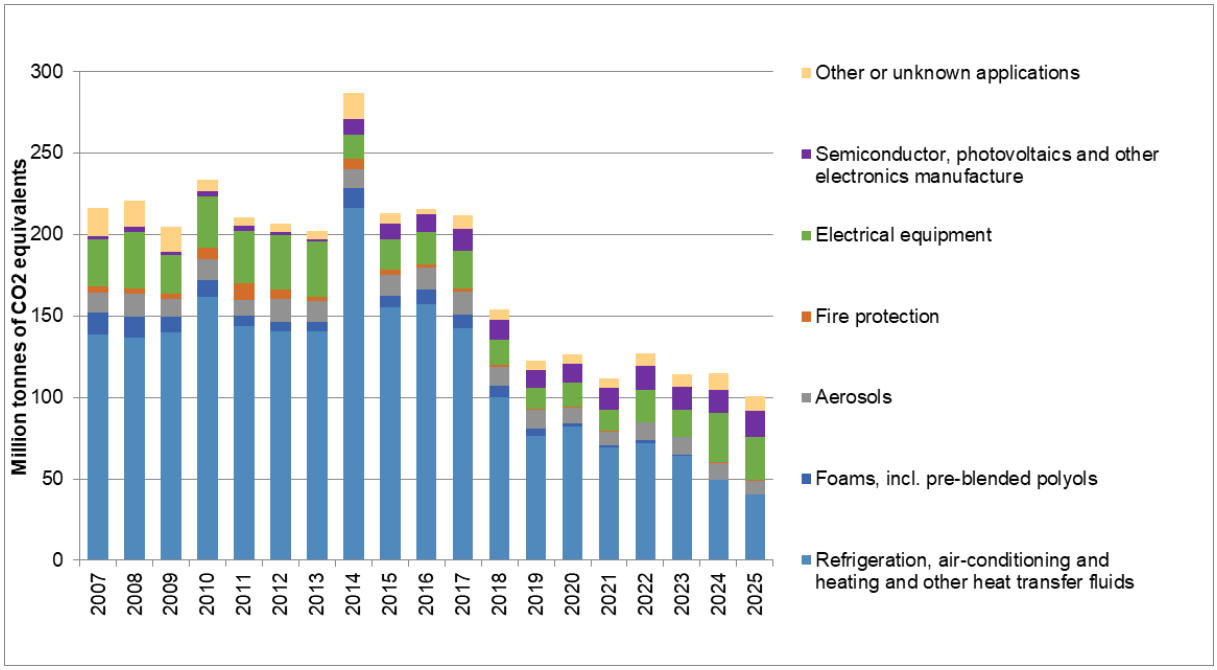
Figure 4-7 Intended applications of EU total supply of fluorinated gases (tonnes)



Note: The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Figure 4-8 Intended applications of EU total supply of fluorinated gases (CO_2e)



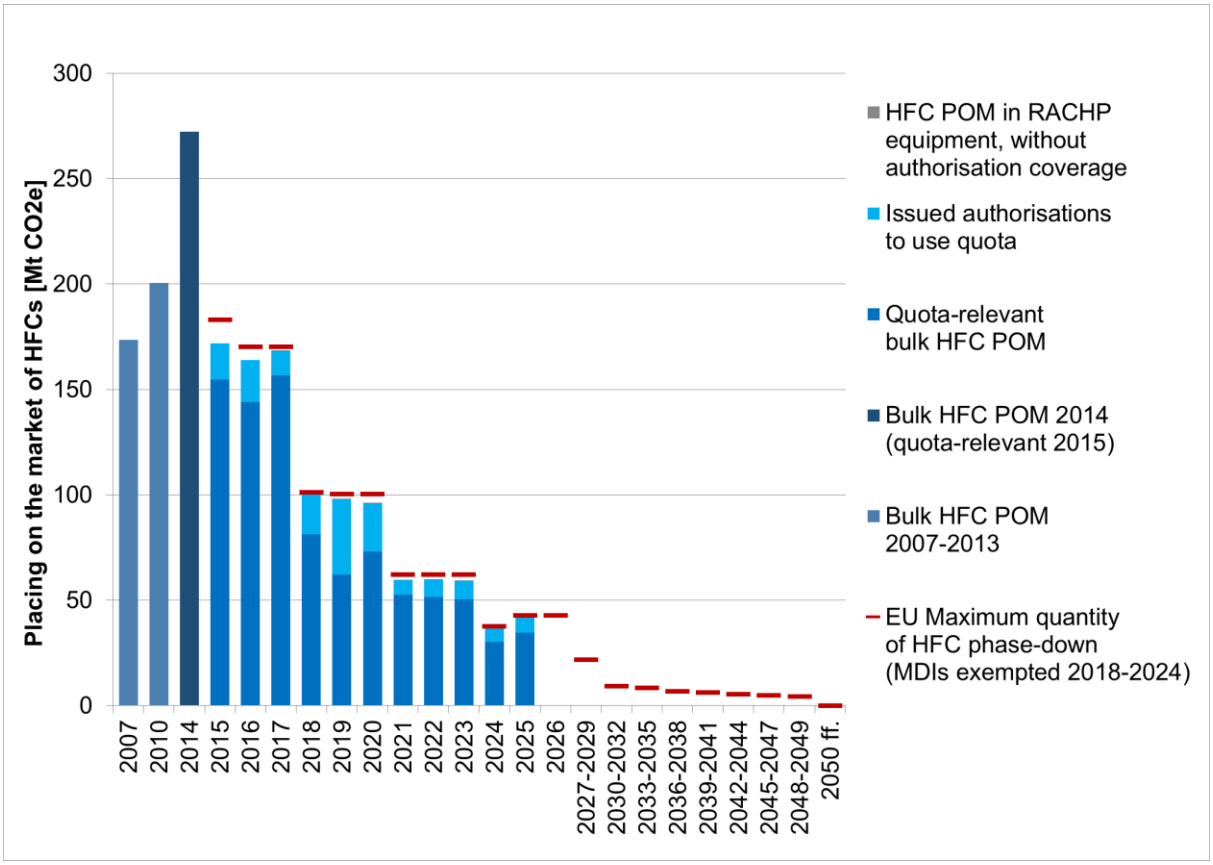
Note: The geographical scope of presented data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Detailed data on intended applications can be found in tables Table 19 to Table 20 in section 7 (page 70f). For categories of supply in products and equipment, please refer to Table 11 and Table 12 (page 58f). For details of the calculation methods, please refer to section 10.

5 Figures on the progress of the EU HFC phase-out

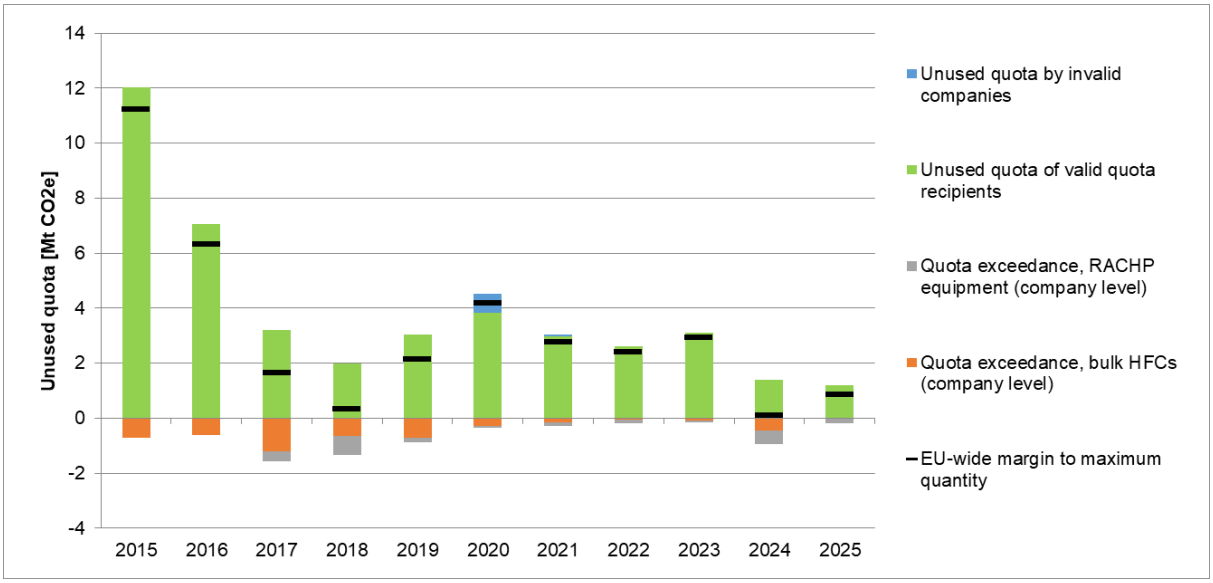
Figure 5-1 Progress of the EU HFC phase-out



Notes: POM, placing on the market. Values from 2007 to 2013 are based on the reporting obligations of the first F-gas Regulation (EC) No 842/2006 and are therefore not fully comparable with data from 2014 onwards (based on the obligations of the F-gas Regulation (EU) No 517/2014) and 2024 (under Regulation (EU) 2024/573). The geographical scope of presented POM data is EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. The maximum quantities of the EU HFC phase-down shown for 2015-2019 are given for the EU-28, the maximum quantity for 2020 applies to the EU-27 and the United Kingdom. Maximum quantities for 2021 onwards are given for the EU-27.

Sources: EC, 2011, 2014 and 2020; EEA, 2024 and 2026b.

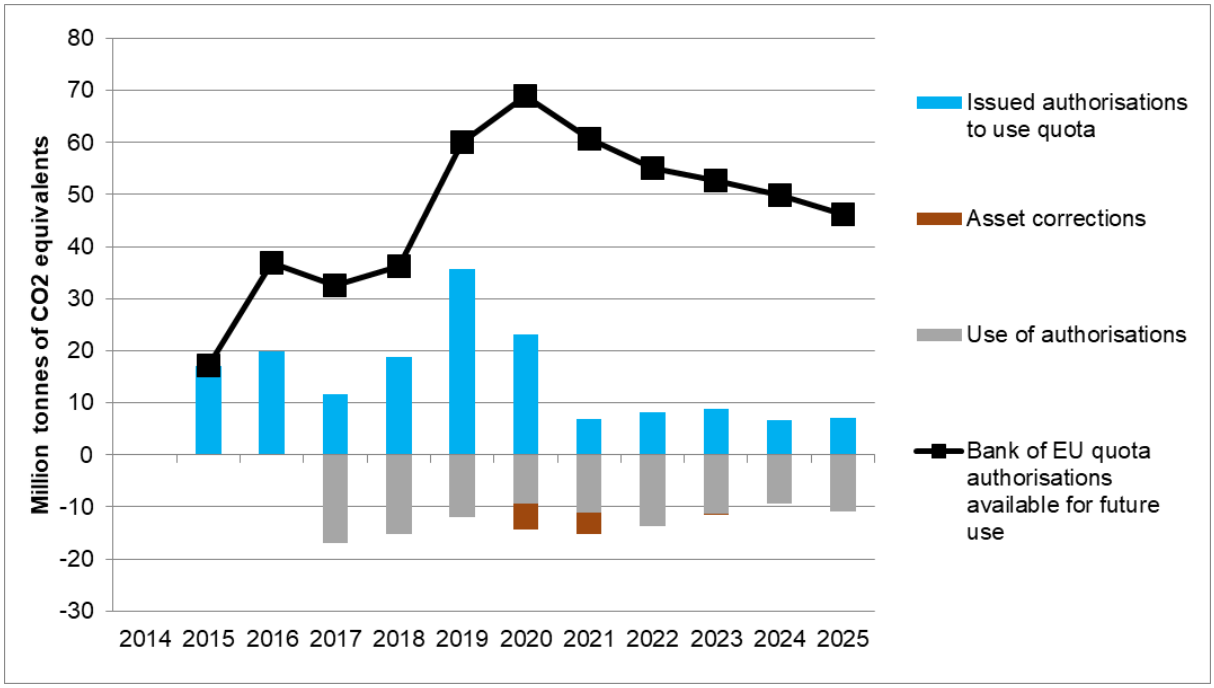
Figure 5-2 Balance between placing on the market of HFCs and related quotas at EU level



Note: Scrutiny by the European Commission is not yet finalized for 2023 data. The geographical scope of presented data is EU-28 for 2015-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years.

Sources: EC, 2023; EEA, 2024 and 2026b.

Figure 5-3 Bank of authorisations for HFCs in RACHP equipment imports



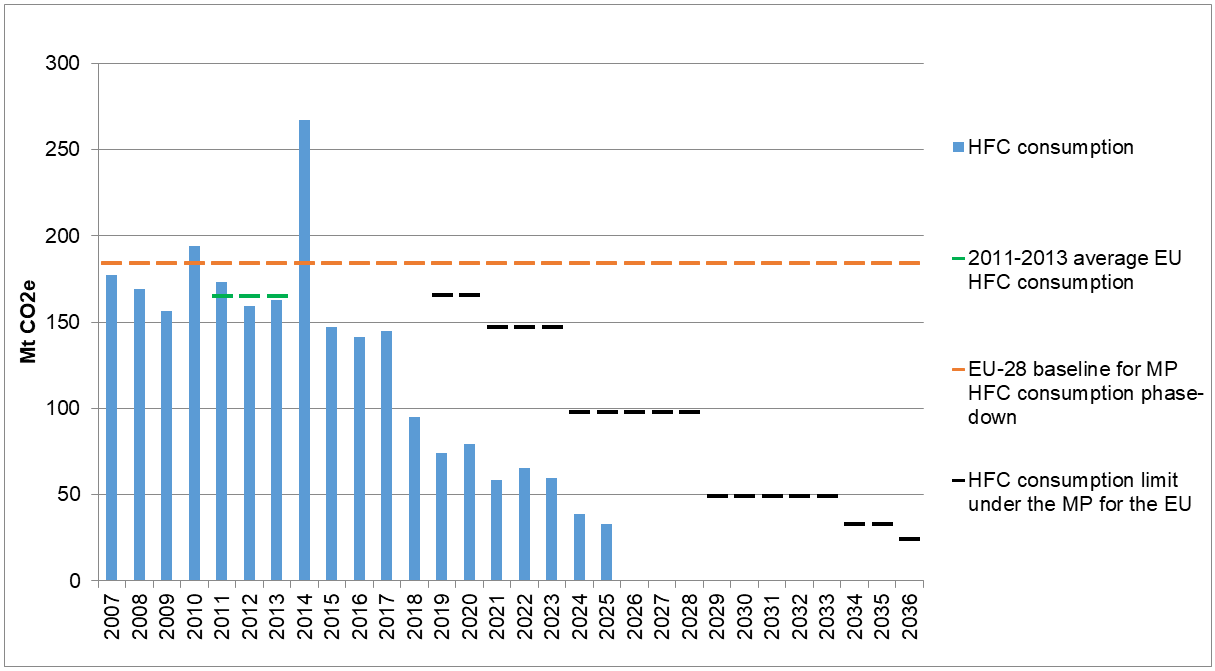
Notes: RACHP: refrigeration, air conditioning and heat pumps. The geographical scope of presented data is EU-28 for 2015-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. 2020 and 2021 asset corrections due to Brexit.

Sources: EC, 2023 and EEA, 2026b.

A tabular data overview related to the progress of the HFC phase-out under the FGR is given in Table 21 in section 7 (Data tables, page 72).

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 (EU) No 517/2014, except HFC-161 (see 1). The geographical scope of presented HFC consumption data EU-28 except Croatia for 2007-2008, EU-28 for 2009-2019, EU-27+UK for 2020 and EU-27 from 2021 and subsequent years.

The HFC consumption limit is shown for EU-27+UK for 2019 and 2020 and for EU-27 from 2021 and subsequent years.

Sources: EC, 2011, and 2014; EEA, 2024 and 2026b.

A tabular overview of HFC consumption is given in Table 22 section 7 (Data tables, page 74).

7 Data tables

7.1 Measures to protect confidential data

The EEA takes appropriate steps to protect the confidentiality of commercially sensitive information in accordance with Article 20(7) of F-gas Regulation (EU) 2024/573. 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_6) may be deduced if there are figures published for perfluorocarbons (PFCs) as well as a total for SF_6 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.

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

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

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

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group								**Tonnes**						
HFCs	I	55 235	31 050	32 339	33 380	27 713	19 270	18 499	15 009	13 560	11 177	7 410	2 086	1 922
PFCs	II	C	C	209	217	328	322	C	C	C	140	C	C	C
SF_6	III	C	C	C	C	C	C	C	C	C	C	C	C	C
NF_3	IV	n.a.	-	-	-	-	-	-	-	-	-	-	-	-
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	-	C	C	C	C	-	-	-	-	-	C	C
Fluorinated ethers, ketones and alcohols	VI	n.a.	-	-	-	-	-	-	-	C	C	C	-	-
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Total fluorinated gases		**58 098**	**34 049**	**35 377**	**36 159**	**30 345**	**21 787**	**21 160**	**17 219**	**15 714**	**13 724**	**9 630**	**15 947**	**15 886**
average GWP		*3 081*	*3 844*	*3 538*	*3 397*	*3 580*	*4 204*	*4 984*	*5 142*	*6 354*	*8 021*	*9 164*	*5 178*	*4 858*

Notes: '**-**': no data reported, 'n.a.', not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 2 EU production of fluorinated gases (CO_2e)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group		**Million tonnes of CO_2 equivalents**												
HFCs	I	112.2	61.1	54.6	58.6	49.6	35.3	45.8	38.6	49.3	50.2	36.0	19.7	15.9
PFCs	II	C	C	1.9	2.0	3.0	3.0	C	C	C	1.4	C	C	C
SF_6	III	C	C	C	C	C	C	C	C	C	C	C	C	C
NF_3	IV	n.a.	-	-	-	-	-	-	-	-	-	-	-	-
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	-	C	C	C	C	-	-	-	-	-	C	C
Fluorinated ethers, ketones and alcohols	VI	n.a.	-	-	-	-	-	-	-	C	C	C	-	-
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Total fluorinated gases		**179.0**	**130.9**	**125.2**	**122.8**	**108.6**	**91.6**	**105.5**	**88.6**	**99.8**	**110.1**	**88.3**	**82.6**	**77.2**
average GWP		*3 081*	*3 844*	*3 538*	*3 397*	*3 580*	*4 204*	*4 984*	*5 142*	*6 354*	*8 021*	*9 164*	*5 178*	*4 858*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 3 EU reclamation of fluorinated gases (tonnes)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group								**Tonnes**						
HFCs	I	C	377	647	1 314	1 659	1 829	1 478	1 590	1 026	905	931	2 086	2 181
PFCs	II	-	C	C	C	C	C	C	-	-	-	C	-	-
SF_6	III	C	C	C	C	69	C	C	C	C	C	C	C	127
NF_3	IV	n.a.	-	-	-	C	-	-	-	-	-	-	-	-
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	-	C	C	C	C	C	C	C	C	C	20	C
Fluorinated ethers, ketones and alcohols	VI	n.a.	-	-	-	-	-	-	-	-	-	-	-	-
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Total fluorinated gases		**417**	**416**	**679**	**1 364**	**1 751**	**1 934**	**1 523**	**1 619**	**1 100**	**1 015**	**1 056**	**2 242**	**2 351**
average GWP		*5 150*	*4 391*	*3 597*	*3 082*	*3 204*	*3 273*	*3 357*	*2 860*	*3 120*	*3 292*	*3 387*	*3 895*	*3 566*

Notes: '**-**': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 4 EU reclamation of fluorinated gases (CO_2e)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group		**Million tonnes of CO_2 equivalents**												
HFCs	I	C	0.9	1.7	3.1	3.8	4.8	4.0	4.0	2.3	2.1	2.2	5.4	5.3
PFCs	II	-	C	C	C	C	C	C	-	-	-	C	-	-
SF_6	III	C	C	C	C	1.7	C	C	C	C	C	C	C	3.1
NF_3	IV	n.a.	-	-	-	C	-	-	-	-	-	-	-	-
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	-	C	C	C	C	0.0	C	C	C	C	0.0	C
Fluorinated ethers, ketones and alcohols	VI	n.a.	-	-	-	-	-	-	-	-	-	-	-	-
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Total fluorinated gases		**2.1**	**1.8**	**2.4**	**4.2**	**5.6**	**6.3**	**5.1**	**4.6**	**3.4**	**3.3**	**3.6**	**8.7**	**8.4**
average GWP		*5 150*	*4 391*	*3 597*	*3 082*	*3 204*	*3 273*	*3 357*	*2 860*	*3 120*	*3 292*	*3 387*	*3 895*	*3 566*

Notes: '**-**': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 5 Total EU imports of fluorinated gases (tonnes)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group								**Tonnes**						
HFCs	I	58 519	128 452	78 026	78 938	88 531	77 286	62 272	64 064	53 612	60 255	56 638	43 787	47 156
PFCs	II	253	350	409	363	498	416	397	341	304	502	495	352	388
SF_6	III	747	430	382	420	565	420	410	416	151	179	215	508	568
NF_3	IV	n.a.	333	305	492	C	412	454	398	487	571	616	556	634
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	14 609	C	C	C	C	C	C	24 620	27 377
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	396	288
Total fluorinated gases		**59 518**	**131 794**	**82 910**	**86 878**	**104 836**	**98 223**	**84 293**	**83 290**	**76 748**	**82 461**	**84 176**	**72 306**	**78 762**
average GWP		*2 235*	*2 215*	*2 179*	*2 122*	*1 896*	*1 533*	*1 440*	*1 501*	*1 248*	*1 322*	*1 265*	*1 186*	*1 139*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 6 Total EU imports of fluorinated gases (CO_2e)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group		**Million tonnes of CO_2 equivalents**												
HFCs	I	112.2	272.1	161.9	161.9	171.7	129.0	99.5	104.5	80.5	89.7	85.6	57.8	59.4
PFCs	II	2.7	3.5	4.0	3.6	4.7	4.0	3.9	3.3	2.9	4.8	4.7	3.2	3.5
SF_6	III	18.1	10.5	9.3	10.2	13.7	10.2	10.0	10.1	3.7	4.3	5.2	12.3	13.8
NF_3	IV	n.a.	5.8	5.3	8.6	C	7.2	7.9	6.9	8.5	9.9	10.7	9.7	11.0
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	0.0	C	C	C	C	C	C	0.0	0.0
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	0.1
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	0.6
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2.0	1.4
Total fluorinated gases		**133.0**	**291.9**	**180.6**	**184.4**	**198.7**	**150.5**	**121.4**	**125.0**	**95.8**	**109.0**	**106.5**	**85.8**	**89.7**
average GWP		*2 235*	*2 215*	*2 179*	*2 122*	*1 896*	*1 533*	*1 440*	*1 501*	*1 248*	*1 322*	*1 265*	*1 186*	*1 139*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential; The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 7 EU bulk imports of fluorinated gases (tonnes)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group								**Tonnes**						
HFCs	I	58 519	122 781	70 993	68 971	79 577	67 152	52 317	54 540	42 300	46 390	44 443	32 123	33 623
PFCs	II	253	C	388	355	496	416	396	341	303	501	494	351	388
SF_6	III	747	C	377	417	563	400	401	395	135	173	205	464	509
NF_3	IV	n.a.	333	305	492	C	412	454	398	487	571	616	556	634
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	C	C	C	C	C	C	C	23 476	26 302
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	396	288
Total fluorinated gases		**59 518**	**125 986**	**75 606**	**76 247**	**95 013**	**87 221**	**73 475**	**73 171**	**64 752**	**68 021**	**71 254**	**59 052**	**63 698**
average GWP		*2 235*	*2 224*	*2 206*	*2 159*	*1 906*	*1 525*	*1 471*	*1 564*	*1 295*	*1 394*	*1 329*	*1 254*	*1 201*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential; The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Bulk imports under FGR definition. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 8 EU bulk imports of fluorinated gases (CO_2e)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group		**Million tonnes of CO_2 equivalents**												
HFCs	I	112.2	260.9	148.3	142.3	154.1	111.9	86.4	94.5	69.0	75.6	74.0	47.5	48.0
PFCs	II	2.7	C	3.8	3.5	4.7	4.0	3.9	3.2	2.9	4.8	4.6	3.2	3.5
SF_6	III	18.1	C	9.2	10.1	13.7	9.7	9.7	9.6	3.3	4.2	5.0	11.3	12.4
NF_3	IV	n.a.	5.8	5.3	8.6	C	7.2	7.9	6.9	8.5	9.9	10.7	9.7	11.0
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	C	C	C	C	C	C	C	0.0	0.0
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2.0	1.4
Total fluorinated gases		**133.0**	**280.2**	**166.8**	**164.6**	**181.1**	**133.0**	**108.1**	**114.4**	**83.9**	**94.8**	**94.7**	**74.0**	**76.5**
average GWP		*2 235*	*2 224*	*2 206*	*2 159*	*1 906*	*1 525*	*1 471*	*1 564*	*1 295*	*1 394*	*1 329*	*1 254*	*1 201*

Notes: '**-**': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. Bulk imports under FGR definition. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

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

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group								**Tonnes**					
HFCs	I	5 671	7 033	9 967	8 954	10 134	9 955	9 524	11 313	13 865	12 195	11 664	13 533
PFCs	II	C	C	7	2	1	1	1	1	1	1	1	1
SF_6	III	C	6	2	2	19	9	21	16	6	10	44	59
NF_3	IV	-	-	-	-	-	-	-	-	-	-	-	-
Unsaturated hydro(chloro)fluorocarbons	V	C	C	C	C	C	C	C	C	C	C	1 144	1 075
Fluorinated ethers, ketones and alcohols	VI	-	C	C	C	C	C	C	C	C	C	C	C
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Total fluorinated gases		**5 808**	**7 304**	**10 631**	**9 823**	**11 002**	**10 818**	**10 118**	**11 996**	**14 440**	**12 922**	**13 253**	**15 064**
average GWP		*2 020*	*1 899*	*1 860*	*1 792*	*1 594*	*1 236*	*1 043*	*993*	*983*	*915*	*886*	*876*

Notes: '**-**': no data reported, 'C': Confidential. The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Imports of pre-blended polyols are not included.

Sources: EEA, 2024 and 2026b.

Table 10 EU imports of fluorinated gases within products and equipment (CO_2e)

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group		**Million tonnes of CO_2 equivalents**											
HFCs	I	11.2	13.6	19.7	17.5	17.1	13.1	10.0	11.5	14.0	11.6	10.3	11.4
PFCs	II	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SF_6	III	C	0.1	0.1	0.1	0.5	0.2	0.5	0.4	0.1	0.2	1.1	1.4
NF_3	IV	-	-	-	-	-	-	-	-	-	-	-	-
Unsaturated hydro(chloro)fluorocarbons	V	C	C	C	C	C	C	C	C	C	C	0.0	0.0
Fluorinated ethers, ketones and alcohols	VI	-	C	C	C	C	C	C	C	C	C	C	C
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Total fluorinated gases		**11.7**	**13.9**	**19.8**	**17.6**	**17.5**	**13.4**	**10.5**	**11.9**	**14.2**	**11.8**	**11.7**	**13.2**
average GWP		*2 020*	*1 899*	*1 860*	*1 792*	*1 594*	*1 236*	*1 043*	*993*	*983*	*915*	*886*	*876*

Notes: '**-**': no data reported, 'C': Confidential. The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. Imports of pre-blended polyols are not included.

Sources: EEA, 2024 and 2026b.

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

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Categories of products and equipment							**Tonnes**					
Stationary equipment for cooling or heating	4 698	5 239	8 325	7 681	8 093	8 584	8 402	10 165	12 648	11 283	10 929	12 989
Mobile air conditioning equipment	798	1 205	1 405	1 210	1 206	1 210	863	960	916	1 028	1 288	1 126
Other refrigeration, air conditioning and heat pump equipment	208	363	570	559	628	530	463	669	755	450	363	249
Other products and equipment	104	496	331	373	1 076	494	391	201	121	162	673	701
Total supply in products and equipment	**5 808**	**7 304**	**10 631**	**9 823**	**11 002**	**10 818**	**10 118**	**11 996**	**14 440**	**12 922**	**13 253**	**15 064**

Notes: The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. 'n.a.': not applicable: Imports of pre-blended polyols were not subject to separate reporting before 2018. '-': no data reported.
Sources: EEA, 2024 and 2026b.

Table 12 Categories of imports of fluorinated gases in products and equipment (CO_2e)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Categories of products and equipment	**Million tonnes of CO_2 equivalents**											
Stationary equipment for cooling or heating	9.8	10.8	17.1	15.6	13.7	10.6	8.4	9.9	12.5	10.3	9.2	10.6
Mobile air conditioning equipment	1.0	1.4	1.1	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.3	0.3
Other refrigeration, air conditioning and heat pump equipment	0.4	0.7	1.0	1.0	1.0	0.8	0.6	0.8	0.9	0.6	0.5	0.2
Other products and equipment	0.6	0.9	0.6	0.6	2.3	1.4	1.1	0.7	0.3	0.4	1.8	2.1
Total supply in products and equipment	**11.7**	**13.9**	**19.8**	**17.6**	**17.5**	**13.4**	**10.5**	**11.9**	**14.2**	**11.8**	**11.7**	**13.2**

Notes: The geographical scope of presented data is EU-28 for 2014-2019, EU-27+UK for 2020, and EU-27 for 2021 and subsequent years. 'n.a.': not applicable: Imports of pre-blended polyols were not subject to separate reporting before 2018. '-': no data reported.
Sources: EEA, 2024 and 2026b.

Table 13 EU bulk exports of fluorinated gases (tonnes)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group								**Tonnes**						
HFCs	I	24 162	26 239	25 577	27 414	29 224	26 039	22 475	21 222	16 081	13 214	10 329	5 541	10 384
PFCs	II	83	91	95	132	176	C	297	212	94	92	84	73	23
SF_6	III	1 670	2 522	2 426	2 012	1 669	1 862	2 000	1 572	1 571	1 444	1 437	1 476	1 851
NF_3	IV	n.a.	C	C	C	10	6	C	C	C	C	C	C	22
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	C	C	1 246	1 504	4 198	3 753	3 992	5 073	7 325
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	8	C	10	C	C	C	C	C	241	256
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	38
Total fluorinated gases		**25 915**	**29 065**	**28 417**	**30 274**	**32 105**	**29 350**	**26 033**	**24 528**	**21 961**	**18 522**	**15 938**	**12 725**	**19 898**
average GWP		*3 237*	*3 599*	*3 635*	*3 363*	*2 907*	*3 055*	*3 426*	*3 175*	*2 950*	*3 084*	*3 281*	*3 880*	*3 104*

Notes: '**-**': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 14 EU bulk exports of fluorinated gases (CO_2e)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group		**Million tonnes of CO_2 equivalents**												
HFCs	I	42.5	42.4	43.2	50.7	50.9	43.2	37.6	37.4	25.4	20.9	16.2	9.8	15.9
PFCs	II	0.8	0.8	0.9	1.3	1.7	C	2.8	2.0	0.9	0.9	0.8	0.7	0.2
SF_6	III	40.6	61.3	58.9	48.9	40.5	45.3	48.6	38.2	38.2	35.1	34.9	35.9	45.0
NF_3	IV	n.a.	C	C	C	0.2	0.1	C	C	C	C	C	C	0.4
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	C	0.0	C	C	C	C	C	0.0	0.0
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	0.3
Total fluorinated gases		**83.9**	**104.6**	**103.3**	**101.8**	**93.3**	**89.7**	**89.2**	**77.9**	**64.8**	**57.1**	**52.3**	**49.4**	**61.8**
average GWP		*3 237*	*3 599*	*3 635*	*3 363*	*2 907*	*3 055*	*3 426*	*3 175*	*2 950*	*3 084*	*3 281*	*3 880*	*3 104*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Data available for Croatia 2009-2012 is limited to HFCs and does not cover PFCs and SF_6.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 15 Total EU supply of fluorinated gases (tonnes)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas	**Gas Group**	Tonnes												
HFC-23	I	247	94	78	63	95	54	45	40	45	32	29	36	33
HFC-32	I	3 987	11 060	9 384	11 022	12 053	15 535	14 488	17 065	17 765	19 970	20 513	17 376	19 411
HFC-41	I	C	C	2	1	1	1	1	2	3	4	2	4	4
HFC-125	I	12 371	25 476	17 916	18 701	17 409	13 770	9 582	9 950	8 406	8 562	7 910	5 027	3 835
HFC-134	I	C	-	C	C	-	-	-	-	-	-	-	-	0
HFC-134a	I	49 080	60 771	46 282	44 184	40 912	33 750	25 734	25 988	22 362	24 036	21 494	16 893	13 349
HFC-143	I	C	-	-	-	-	-	-	-	-	-	-	-	-
HFC-143a	I	8 998	13 512	7 069	7 205	6 006	843	1 268	1 519	844	775	334	441	359
HFC-152a	I	4 292	6 227	3 914	3 431	3 552	3 245	3 157	2 733	2 569	1 832	1 258	1 171	1 212
HFC-227ea	I	789	2 695	1 948	1 753	1 628	1 501	1 252	777	450	697	716	717	704
HFC-236fa	I	C	52	40	42	37	C	C	18	C	20	C	C	C
HFC-245ca	I	-	-	-	C	-	-	-	-	-	-	-	-	-
HFC-245fa	I	C	C	C	C	C	C	876	C	C	C	114	C	4
HFC-365mfc	I	C	C	C	C	C	C	C	C	C	C	C	0	C
HFC-43-10mee	I	C	C	C	C	C	C	C	C	C	C	C	C	C
PFC-14	II	C	147	168	152	196	170	143	157	164	162	175	160	183
PFC-116	II	C	157	164	129	148	137	156	108	121	122	108	89	104
PFC-218	II	112	41	59	37	23	32	20	C	C	C	C	98	84
PFC-c-318	II	C	14	27	C	C	C	C	C	C	C	C	C	59
PFC-3-1-10	II	C	C	C	C	C	C	C	C	-	-	-	C	C
PFC-4-1-12	II	-	C	C	C	-	-	-	-	-	-	-	-	-
PFC-5-1-14	II	C	C	C	117	C	C	C	C	C	C	C	C	C
Perfluorodecalin	II	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
perfluoro-2-methylpentane	II	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
SF_6	III	1 810	716	909	1 004	1 225	843	727	831	778	1 157	966	1 577	1 391
NF_3	IV	n.a.	321	339	381	492	C	C	C	C	C	C	542	620
HCFC-1233xf	V	n.a.	-	-	C	C	-	-	-	-	-	C	-	C

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas	**Gas Group**							Tonnes						
HCFC-1233zd	V	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
HFC-1234yf	V	n.a.	C	C	5 214	10 574	11 451	10 296	8 860	9 741	9 972	C	C	11 545
HFC-1234ze	V	n.a.	C	C	C	C	C	C	C	C	C	C	C	3 172
HFC-1336mzz	V	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
HCFC-1224yd	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
HFC-1132a	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
1,1,1,2,3,4,5,5,5-nonafluoro-4-(trifluoromethyl)pent-2-ene	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	90
1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)pent-2-ene	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C
HFC-1336mzz(E)	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
HFC-1336mzz(Z)	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
1,1,1,3,3,3-Hexafluoropropan-2-ol (bis(trifluoromethyl)-methanol)	VI	n.a.	C	C	C	C	C	C	C	C	C	-	C	42
HFE-236fa	VI	n.a.	-	-	-	C	-	-	-	-	-	-	-	-
HFE-245fa1	VI	n.a.	-	-	C	-	-	-	-	-	-	-	-	-
HFE-347mcc3	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	0
HFE-347pcf2	VI	n.a.	-	-	-	C	-	C	C	C	C	-	C	C
HFE-356 mec3	VI	n.a.	-	-	-	-	-	-	-	-	-	-	3	C
HFE-356mmz1	VI	n.a.	-	-	-	-	-	-	C	-	-	-	-	C
HFE-449s1	VI	n.a.	C	C	C	90	C	C	C	C	C	C	157	104
HFE-569sf2	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
2,2,3,3,3-pentafluoropropan-1-ol	VI	n.a.	-	C	C	C	C	C	C	C	-	-	-	-
PFPMIE	VI	n.a.	C	-	-	-	C	C	-	-	C	C	C	C
HFE-7300	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
i-HFE-7100	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
i-HFE-7200	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C
1,1,1,3,4,4,4-Heptafluoro-3-(trifluoromethyl) butan-2-one	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
Perfluoro(2-methyl-3-pentanone)	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	411	721
HFE-236ea2	VII	n.a.	-	-	-	-	-	-	-	-	-	-	C	C

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas	**Gas Group**	Tonnes												
HCFE-235da2	VII	n.a.	-	-	-	-	-	-	-	-	-	-	C	C
HFE-347mmz1	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Heptafluoroisobutyronitrile	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	7
sulfuryl fluoride (SO2F2)	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	324	250
PFTBA	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
perfluoro-N-methylmorpholine	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
Perfluorotripropylamine	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Gas group														
HFCs	I	86 477	124 408	92 062	91 592	87 583	72 179	58 021	59 509	53 043	57 677	52 637	41 740	38 925
PFCs	II	299	480	524	464	649	563	436	358	386	399	372	399	509
SF_6	III	1 810	716	909	1 004	1 225	843	727	831	778	1 157	966	1 577	1 391
NF_3	IV	n.a.	321	339	381	492	C	C	C	C	C	C	542	620
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	6 305	13 400	17 767	18 353	17 380	17 899	17 210	19 183	19 597	21 716
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	303	127	C	C	C	C	C	C	C	918
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	624	C
Total fluorinated gases		**88 586**	**127 547**	**96 750**	**100 049**	**103 476**	**92 179**	**78 303**	**78 848**	**73 027**	**77 420**	**74 261**	**66 369**	**65 573**
average GWP		*2 441*	*2 250*	*2 202*	*2 158*	*2 044*	*1 672*	*1 566*	*1 603*	*1 531*	*1 640*	*1 538*	*1 735*	*1 541*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 16 Total EU supply of fluorinated gases (CO_2e)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas	**Gas Group**	**Million tonnes of CO_2 equivalents**												
HFC-23	I	3.7	1.4	1.2	0.9	1.4	0.8	0.7	0.6	0.7	0.5	0.4	0.5	0.5
HFC-32	I	2.7	7.5	6.3	7.4	8.1	10.5	9.8	11.5	12.0	13.5	13.8	11.7	13.1
HFC-41	I	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HFC-125	I	43.3	89.2	62.7	65.5	60.9	48.2	33.5	34.8	29.4	30.0	27.7	17.6	13.4
HFC-134	I	C	-	C	C	-	-	-	-	-	-	-	-	0.0
HFC-134a	I	70.2	86.9	66.2	63.2	58.5	48.3	36.8	37.2	32.0	34.4	30.7	24.2	19.1
HFC-143	I	C	-	-	-	-	-	-	-	-	-	-	-	-
HFC-143a	I	40.2	60.4	31.6	32.2	26.8	3.8	5.7	6.8	3.8	3.5	1.5	2.0	1.6
HFC-152a	I	0.5	0.8	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.2
HFC-227ea	I	2.5	8.7	6.3	5.6	5.2	4.8	4.0	2.5	1.5	2.2	2.3	2.3	2.3
HFC-236fa	I	C	0.5	0.4	0.4	0.4	C	C	0.2	C	0.2	C	C	C
HFC-245ca	I	-	-	-	C	-	-	-	-	-	-	-	-	-
HFC-245fa	I	C	C	C	C	C	C	0.9	C	C	C	0.1	C	0.0
HFC-365mfc	I	C	C	C	C	C	C	C	C	C	C	C	0.0	C
HFC-43-10mee	I	C	C	C	C	C	C	C	C	C	C	C	C	C
PFC-14	II	C	1.1	1.2	1.1	1.4	1.3	1.1	1.2	1.2	1.2	1.3	1.2	1.4
PFC-116	II	C	1.9	2.0	1.6	1.8	1.7	1.9	1.3	1.5	1.5	1.3	1.1	1.3
PFC-218	II	1.0	0.4	0.5	0.3	0.2	0.3	0.2	C	C	C	C	0.9	0.8
PFC-c-318	II	C	0.1	0.3	C	C	C	C	C	C	C	C	C	0.6
PFC-3-1-10	II	C	C	C	C	C	C	C	C	-	-	-	C	C
PFC-4-1-12	II	-	C	C	C	-	-	-	-	-	-	-	-	-
PFC-5-1-14	II	C	C	C	1.0	C	C	C	C	C	C	C	C	C
Perfluorodecalin	II	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
perfluoro-2-methylpentane	II	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
SF_6	III	44.0	17.4	22.1	24.4	29.8	20.5	17.7	20.2	18.9	28.1	23.5	38.3	33.8
NF_3	IV	n.a.	5.6	5.9	6.6	8.6	C	C	C	C	C	C	9.4	10.8
HCFC-1233xf	V	n.a.	-	-	C	C	-	-	-	-	-	C	-	C

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas	**Gas Group**	**Million tonnes of CO_2 equivalents**												
HCFC-1233zd	V	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
HFC-1234yf	V	n.a.	C	C	0.0	0.0	C	0.0	C	C	C	C	C	0.0
HFC-1234ze	V	n.a.	C	C	C	C	C	C	C	C	C	C	C	0.0
HFC-1336mzz	V	n.a.	-	-	-	-	-	-	-	-	-	-	-	-
HCFC-1224yd	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
HFC-1132a	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
1,1,1,2,3,4,5,5,5-nonafluoro-4-(trifluoromethyl)pent-2-ene	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	0.0
1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)pent-2-ene	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C
HFC-1336mzz(E)	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
HFC-1336mzz(Z)	V	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
1,1,1,3,3,3-Hexafluoropropan-2-ol (bis(trifluoromethyl)-methanol)	VI	n.a.	C	C	C	C	C	C	C	C	C	-	C	0.0
HFE-236fa	VI	n.a.	-	-	-	C	-	-	-	-	-	-	-	-
HFE-245fa1	VI	n.a.	-	-	C	-	-	-	-	-	-	-	-	-
HFE-347mcc3	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	0.0
HFE-347pcf2	VI	n.a.	-	-	-	C	-	C	C	C	C	-	C	C
HFE-356 mec3	VI	n.a.	-	-	-	-	-	-	-	-	-	-	0.0	C
HFE-356mmz1	VI	n.a.	-	-	-	-	-	-	C	-	-	-	-	C
HFE-449s1	VI	n.a.	C	C	C	0.0	C	C	C	C	C	C	0.1	0.0
HFE-569sf2	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
2,2,3,3,3-pentafluoropropan-1-ol	VI	n.a.	-	C	C	C	C	C	C	C	-	-	-	-
PFPMIE	VI	n.a.	C	-	-	-	C	C	-	-	C	C	C	C
HFE-7300	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
i-HFE-7100	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
i-HFE-7200	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	C
1,1,1,3,4,4,4-Heptafluoro-3-(trifluoromethyl) butan-2-one	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
Perfluoro(2-methyl-3-pentanone)	VI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.0	0.0
HFE-236ea2	VII	n.a.	-	-	-	-	-	-	-	-	-	-	C	C
HCFE-235da2	VII	n.a.	-	-	-	-	-	-	-	-	-	-	C	C
HFE-347mmz1	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas	**Gas Group**	**Million tonnes of CO_2 equivalents**												
Heptafluoroisobutyronitrile	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	0.0
sulfuryl fluoride (SO2F2)	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.5	1.2
PFTBA	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
perfluoro-N-methylmorpholine	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	-
Perfluorotripropylamine	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Gas group														
HFCs	I	169.3	259.2	179.8	180.4	167.2	120.6	93.6	95.2	80.6	85.9	77.2	58.9	50.0
PFCs	II	3.0	4.6	5.0	4.4	6.0	5.4	4.2	3.3	3.7	3.8	3.5	3.7	4.6
SF_6	III	44.0	17.4	22.1	24.4	29.8	20.5	17.7	20.2	18.9	28.1	23.5	38.3	33.8
NF_3	IV	n.a.	5.6	5.9	6.6	8.6	C	C	C	C	C	C	9.4	10.8
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	0.0	0.0	C	0.0	0.0	0.0	0.0	0.0	0.0
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	0.0	C	0.1	C	C	C	C	C	0.1
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	1
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4	1
Total fluorinated gases		**216**	**287**	**213**	**216**	**212**	**154**	**123**	**126**	**112**	**127**	**114**	**115**	**101**
average GWP		*2 441*	*2 250*	*2 202*	*2 158*	*2 044*	*1 672*	*1 566*	*1 603*	*1 531*	*1 640*	*1 538*	*1 735*	*1 541*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 17 EU bulk supply of fluorinated gases (tonnes)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group								**Tonnes**						
HFCs	I	86 477	118 737	85 028	81 625	78 629	62 044	48 066	49 986	41 731	43 812	40 442	30 076	25 392
PFCs	II	299	472	503	457	647	562	435	357	386	398	371	398	508
SF_6	III	1 810	C	903	1 001	1 223	824	718	810	762	1 151	956	1 533	1 332
NF_3	IV	n.a.	321	339	381	492	C	C	C	C	C	C	542	620
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	C	C	C	C	C	C	C	18 453	20 641
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	624	C
Total fluorinated gases		**88 586**	**121 739**	**89 446**	**89 418**	**93 653**	**81 177**	**67 485**	**68 730**	**61 031**	**62 980**	**61 339**	**53 115**	**50 508**
average GWP		*2 441*	*2 261*	*2 226*	*2 193*	*2 071*	*1 683*	*1 619*	*1 686*	*1 637*	*1 790*	*1 669*	*1 946*	*1 739*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Imports of pre-blended polyols are not included since 2018.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 18 EU bulk supply of fluorinated gases (CO_2e)

		2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gas group		**Million tonnes of CO_2 equivalents**												
HFCs	I	169.3	248.0	166.3	160.7	149.6	103.5	80.5	85.1	69.1	71.9	65.6	48.6	38.7
PFCs	II	3.0	4.5	4.8	4.3	6.0	5.4	4.2	3.3	3.7	3.8	3.4	3.7	4.6
SF_6	III	44.0	C	22.0	24.3	29.7	20.0	17.5	19.7	18.5	28.0	23.2	37.3	32.4
NF_3	IV	n.a.	5.6	5.9	6.6	8.6	C	C	C	C	C	C	9.4	10.8
Unsaturated hydro(chloro)fluorocarbons	V	n.a.	C	C	C	C	C	C	C	C	C	C	0.0	0.0
Fluorinated ethers, ketones and alcohols	VI	n.a.	C	C	C	C	C	C	C	C	C	C	C	C
Fluorinated substances used as inhalation anaesthetics	VII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	C	C
Other fluorinated compounds	VIII	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4.1	1.1
Total fluorinated gases		**216.3**	**275.2**	**199.1**	**196.1**	**193.9**	**136.6**	**109.3**	**115.8**	**99.9**	**112.8**	**102.4**	**103.4**	**87.8**
average GWP		*2 441*	*2 261*	*2 226*	*2 193*	*2 071*	*1 683*	*1 619*	*1 686*	*1 637*	*1 790*	*1 669*	*1 946*	*1 739*

Notes: '-': no data reported, 'n.a.': not applicable, 'C': Confidential: The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). Imports of pre-blended polyols are not included since 2018.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

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

	2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Intended applications of bulk supply							**Tonnes**						
Refrigeration, air-conditioning and heating and other heat transfer fluids	61 377	95 688	74 024	78 016	78 012	68 676	55 620	58 324	54 790	58 078	56 290	47 115	47 394
Foams, incl. pre-blended polyols	14 286	12 967	9 597	10 179	11 521	11 083	11 041	9 816	8 360	8 080	6 717	5 773	5 827
Aerosols	9 090	8 954	9 356	9 397	10 300	9 109	8 964	8 205	7 250	8 053	8 121	7 989	6 532
Fire protection	649	1 858	862	596	502	324	130	150	112	133	105	619	890
Electrical equipment	1 197	622	745	813	951	640	534	616	539	813	687	1 243	1 095
Semiconductor, photovoltaics and other electronics manufacture	127	1 057	715	755	924	897	781	796	887	973	916	928	1 033
Other or unknown applications	1 861	6 402	1 452	294	1 266	1 450	1 232	942	1 088	1 291	1 425	2 701	2 663
Total fluorinated gases - Total supply	**88 586**	**127 547**	**96 750**	**100 049**	**103 476**	**92 179**	**78 303**	**78 848**	**73 027**	**77 420**	**74 261**	**66 369**	**65 435**

Notes: '-': no data reported. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). '*' 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.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 20 Intended applications of EU total supply of fluorinated gases (CO_2e)

	2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Intended applications of bulk supply	**Million tonnes of CO_2 equivalents**												
Refrigeration, air-conditioning and heating and other heat transfer fluids	138.5	216.4	155.3	157.0	142.2	100.2	76.5	81.9	69.5	72.0	64.4	49.2	40.5
Foams, incl. pre-blended polyols	13.4	11.7	7.3	8.9	8.4	6.7	4.7	2.1	1.0	1.9	0.3	0.1	0.1
Aerosols	12.2	11.7	12.9	13.8	14.4	11.7	11.2	10.0	8.5	10.5	10.8	10.2	8.1
Fire protection	4.0	6.6	3.2	2.2	1.8	1.1	0.5	0.5	0.7	0.5	0.4	0.8	0.8
Electrical equipment	29.1	15.1	18.1	19.8	23.1	15.6	13.0	14.9	13.0	19.7	16.6	30.2	26.4
Semiconductor, photovoltaics and other electronics manufacture	1.6	9.6	10.0	10.8	13.4	12.6	11.2	11.6	13.2	14.8	14.0	14.2	15.7
Other or unknown applications	17.6	15.9	6.3	3.5	8.2	6.3	5.6	5.5	6.0	7.6	7.8	10.4	9.4
Total supply Total fluorinated gases	**216.3**	**286.9**	**213.0**	**215.9**	**211.6**	**154.1**	**122.7**	**126.4**	**111.8**	**127.0**	**114.2**	**115.1**	**101.0**

Notes: '**-**': no data reported. The scope of F-gases in the data presented is determined by Regulation (EU) No 842/2006 until 2013, Regulation (EU) No 517/2014 from 2014 until 2023 and by Regulation (EU) 2024/573 starting in 2024. 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022). '*' 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.

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 21 HFCs placed on the market and quota compliance

			2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	POM category		**Million tonnes of CO_2 equivalents**												
(1)	Bulk HFC POM 2007-2013		173.5												
(2)	Bulk HFC POM 2014 onwards			279.4	162.6	158.2	165.8	102.5	83.8	92.7	67.5	67.3	64.4	42.1	36.1
	thereof:														
(3)	*for exempted uses Art.16(2)a-e:*			*7.0*	*7.9*	*14.2*	*9.2*	*11.1*	*11.2*	*C*	*C*	*C*	*C*	*C*	*C*
(4)	*Pharmaceutical MDIs*			*C*	*8.6*	*9.2*	*9.6*	*10.0*	*10.3*	*C*	*C*	*C*	*C*	*C*	*C*
(5)	Quota-relevant bulk HFC POM 2015 onwards	*= (2) - (3); starting 2018: = (2) - ((3)+(4))*			154.7	144.0	156.7	81.4	62.3	73.0	52.6	51.5	50.3	29.7	26.4
(6)	POM of HFCs in equipment 2014 onwards:	*= (7) + (9)*		11.2	13.6	19.7	17.5	15.4	12.2	9.6	11.3	14.0	11.5	10.3	11.4
	thereof:														
(7)	*HFC POM in RACHP equipment*			*11.1*	*12.8*	*19.2*	*17.0*	*15.3*	*12.0*	*9.5*	*11.2*	*13.9*	*11.4*	*10.0*	*11.1*
(8)	*thereof: without quota authorisation coverage, 2017 onwards*						*0.4*	*0.7*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.4*	*0.2*
(9)	*HFC POM in other equipment*			*0.1*	*0.7*	*0.5*	*0.5*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.3*	*0.3*
(10)	Total physical HFC POM 2014 onwards (bulk + equipment)	*= (2) + (6)*		290.6	176.2	177.8	183.4	117.9	96.0	102.2	78.8	81.4	75.9	52.4	47.5
(11)	Quota authorisations issued 2015 onwards				17.1	19.9	11.6	18.8	35.7	23.0	6.8	8.2	8.9	6.7	7.2
(12)	Bank of EU quota authorisations available for future use				17.1	37.0	32.5	36.2	60.1	69.0	60.7	55.1	52.8	49.8	46.1
(13)	Quota-relevant POM 2015 onwards	*= (5) + (8) + (11)*			171.8	163.9	168.6	100.8	98.1	96.1	59.5	59.8	59.3	36.7	33.7
(14)	Maximum quantity of HFC phase-down				183.1	170.3	170.3	101.2	100.3	100.3	62.3	62.3	62.3	37.5	42.9
	Quota compliance 2015 onwards:														
(15)	Unused quota (company level)				12.0	7.1	3.2	2.0	3.0	4.5	3.0	2.6	3.1	1.6	1.2
(16)	*thereof: unused quota reserved for invalid companies*				-	-	-	-	-	*0.7*	*0.1*	-	-	-	-
(17)	Quota exceedance (company level)				0.7	0.6	1.6	1.4	0.9	0.3	0.3	0.2	0.2	0.5	0.2
(18)	*thereof: production / bulk import of HFCs*	*= (17) - (8)*			*0.7*	*0.6*	*1.2*	*0.6*	*0.7*	*0.3*	*0.1*	*0.1*	*0.1*	*0.1*	*0.0*
(19)	EU-wide margin to maximum quantity	*= (14) - (13)*			11.2	6.3	1.6	0.4	2.2	4.2	2.8	2.4	2.9	0.8	9.2

Notes: '-': no data reported, 'C': Confidential; 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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).
Sources: EC, 2011, 2014 and 2020; EEA, 2024 and 2026b.

Table 22 Consumption of HFCs covered under the Montreal Protocol

	2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Million tonnes of CO_2 equivalents												
EU consumption of HFCs covered under the Montreal Protocol	177.5	267.0	146.9	141.4	145.1	94.8	74.4	79.4	58.7	65.6	59.4	39.0	33.2

Note: The geographical scope of presented data is EU-28 except Croatia for 2007, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).

Sources: EC, 2011 and 2014; EEA, 2024 and 2026b.

Table 23 Companies reporting on 2025 by Member State and reported activities

Country	Total	thereof:						
		Producers	Importers	Exporters	Equipment importers	Feedstock users	Destruction companies	Quota authorisers
Austria	59	-	19	3	36	-	1	5
Belgium	66	-	17	10	46	-	-	6
Bulgaria	119	-	40	2	55	1	-	30
Croatia	74	-	13	4	59	-	-	11
Cyprus	40	-	12	-	22	-	-	7
Czech Republic	111	-	29	3	70	-	1	3
Denmark	30	-	10	2	15	-	-	5
Estonia	87	-	40	1	13	-	1	51
Finland	41	-	16	2	21	-	-	5
France	224	2	45	10	146	1	8	14
Germany	429	2	63	61	278	-	8	15
Greece	119	-	17	2	85	-	-	16
Hungary	69	-	15	3	48	-	-	4
Ireland	31	-	15	1	15	-	-	2
Italy	338	1	148	12	141	-	3	54
Latvia	45	-	34	-	6	-	-	19
Lithuania	81	-	60	1	18	-	-	14
Luxembourg	3	-	1	1	1	-	-	1
Malta	27	-	5	-	17	-	-	3
Northern Ireland (UK)	5	-	3	-	2	-	-	-
Netherlands	138	1	38	4	96	1	1	7
Poland	859	-	593	9	160	-	1	146
Portugal	68	-	16	-	50	-	-	5
Romania	167	-	64	-	81	-	-	9
Slovakia	52	-	31	-	14	-	-	14
Slovenia	41	-	2	1	36	-	-	2
Spain	192	-	38	16	120	-	-	24
Sweden	55	-	11	3	39	-	2	4
EU Total	3 570	6	1 395	151	1 690	3	26	476
Great Britain (Post-Brexit)	63	-	19	1	18	-	-	31
Other Non-EU	190	n.a.	91	5	17	n.a.	n.a.	96

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, 2026b.

Table 24 Non-EU companies reporting on 2025 by location of Only Representative

EU Country of Only Repre-sentative	Total repre-sented non-EU com-panies	Thereof from:																								
		United Arab Emirates	Albania	Australia	Brazil	Belarus	Canada	Switzerland	China	Hong Kong	India	Japan	Korea, Republic of	Liechtenstein	Monaco	Marshall Islands	Malaysia	Norway	Russian Federation	Serbia	Saudi Arabia	Thailand	Türkiye	Taiwan	Great Britain (Post-Brexit)	United States
Austria	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	16	2	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	1	-	-	1	-	1	-	7	1
Bulgaria	4	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Estonia	98	1	-	-	-	26	1	1	14	2	-	-	-	-	-	-	-	-	2	-	-	-	21	-	26	4
France	13	-	-	-	-	-	1	2	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	5
Germany	18	-	-	-	-	-	-	4	1	1	-	1	1	-	-	-	1	-	-	-	-	-	-	1	5	3
Hungary	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	56	-	1	-	-	-	-	-	49	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-
Italy	8	1	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	3	-
Lithuania	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	17	-	-	-	-	-	-	4	-	-	-	1	4	-	-	-	1	3	-	-	-	1	-	-	3	-
Poland	5	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Spain	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-
Sweden	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
EU Total	253	4	1	1	1	26	2	14	69	7	2	3	5	1	2	1	2	6	**3**	**1**	1	1	22	1	63	14

Note: '-': no data reported
Source: EEA, 2026b.

Table 25 Activities reported 2007–2025

	2007	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Data Reports Received	**77**	**468**	**780**	**1284**	**1729**	**2138**	**3159**	**2482**	**2220**	**2253**	**2438**	**3252**	**3823**
of which mention:													
Production of F-gases	6	10	9	9	8	8	9	9	9	8	8	8	6
thereof: HFC production	*4*	*6*	*6*	*6*	*5*	*5*	*7*	*7*	*8*	*7*	*7*	*8*	*5*
Bulk import of F-gases	55	187	293	379	577	895	1693	1197	895	872	996	1134	1505
thereof: bulk HFC import	*48*	*173*	*282*	*366*	*563*	*877*	*1674*	*1179*	*879*	*851*	*969*	*1081*	*1429*
Bulk export of F-gases	44	92	99	111	119	115	112	113	107	98	90	108	157
thereof: bulk HFC export	*37*	*81*	*89*	*98*	*104*	*100*	*94*	*97*	*89*	*80*	*71*	*76*	*104*
Import of products or equipment pre-charged with F-gases	n.a.	228	427	840	1040	1079	1022	976	1004	1015	1082	1309	1725
thereof: RACHP equipment charged with HFCs	*n.a.*	*220*	*409*	*826*	*1029*	*1067*	*1012*	*965*	*993*	*1004*	*1066*	*1249*	*1635*
Destruction	6	10	15	13	13	17	18	18	18	19	17	25	26
Feedstock use	2	3	3	3	3	5	2	3	2	3	2	5	3
Reclamation	7	9	15	16	22	25	23	19	15	17	14	29	28
Recipients of exempted HFCs for MDIs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	14	13
Recipients of exempted HFCs for other purposes	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	42	64
Supply of quota authorisation	n.a.	n.a.	17	34	94	335	842	357	339	450	480	607	603
thereof: quota authorisation without any EU production, import or export	*n.a.*	*n.a.*	*8*	*18*	*41*	*114*	*424*	*266*	*262*	*330*	*329*	*402*	*359*
Nil Reports received	n.a.	**336**	**363**	**805**	**1019**	**2156**	**1633**	**2139**	**2384**	**2479**	**2904**	**3686**	**5280**

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, EU-28 for 2010-2019, EU-27+UK for 2020 and EU-27 for 2021 and subsequent years. For reasons of clarity, the years 2008-2013 are not shown in this table. The values can be found in the Public Briefing of 2022 (EEA, 2022).
Companies may report on more than one activity. RACHP equipment: refrigeration, air conditioning, and heat pumps.

Sources: EEA, 2026b.

8 Terminology

Fluorinated gases (F-gases)

F-gases covered by this report are the gases listed in Annex I, Annex II and Annex III of the EU F-gas Regulation 2024/573 and are listed in Table 26 in section 1 of 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 I, Section 1 of the F-gas Regulation 2024/573 and its predecessor Regulation (EU) No 517/2014. All HFCs, except HFC-152 and HFC-161, were previously covered by the first EU 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 VI of the F-gas Regulation 2024/573.

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 26 of the F-gas Regulation (EU) No 2024/573, 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 section 1, unless indicated otherwise.

Annex VI gases

Annex VI of the new F-gas Regulation 2024/573 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 section 1 of this annex (Table 27). For all other substances included in a mixture, a default value of 0 is used for the calculation the GWP. A GWP of 1 is used for CO_2 as a constituent of mixtures.

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_2e.

The GWPs used under the new F-gas Regulation 2024/573 are in line with those published in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) (IPCC, 2007) for HFCs. For other gases, the F-gas Regulation 2024/573 applies GWPs of the IPCC's Sixth Assessment Report (AR6) (IPCC, 2021). The previous F-gas Regulation (EU) No 517/2014 relied fully on GWPs of the AR4 (IPCC, 2007). The first 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 and EEA reports and briefings in 2015-2024 relied fully on AR4 GWPs.

Quantities of F-gases are reported in physical tonnes. Conversion of the figures into CO_2e 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 section 1. GWPs of mixtures are calculated according to Annex VI of the new F-gas Regulation (EU, 2024).

9 Gases covered by Regulation (EU) No 2024/573

Table 26 depicts the reportable gases under the F-gas Regulation (EU) 2024/573 and identifies GWPs and the allocation to the annexes of the present F-gas Regulation, coverage in predecessor Regulations, allocation to gas groups used in the present briefing and coverage under the Montreal Protocol.

Table 26 Reportable F-gases in Regulation (EU) No 2024/573

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
HFC-23	14 800	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group II	x	x
HFC-32	675	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-41	92	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-125	3 500	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-134	1 100	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-134a	1 430	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-143	353	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-143a	4 470	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-152	53	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	
HFC-152a	124	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-161	12	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs		x	
HFC-227ea	3 220	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
HFC-236cb	1 340	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-236ea	1 370	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-236fa	9 810	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-245ca	693	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-245fa	1 030	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-365mfc	794	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
HFC-43-10mee	1 640	AR4	Annex I, Section 1	Hydrofluorocarbons (HFCs)	I	HFCs	F - Group I	x	x
PFC-14	7 380	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs		x	x
PFC-116	12 400	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs		x	x
PFC-218	9 290	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs		x	x
PFC-c-318	10 200	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs		x	x
PFC-3-1-10	10 000	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs		x	x
PFC-4-1-12	9 220	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs		x	x
PFC-5-1-14	8 620	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs		x	x
Perfluorodecalin	7 480	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs			

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
Perfluoro-2-methylpentane	7 370	AR6	Annex I, Section 2	Perfluorocarbons (PFCs)	II	PFCs			
SF_6	24 300	AR6	Annex I, Section 3	Other (per)fluorinated compounds and fluorinated nitriles	III	SF_6		x	x
Heptafluoroisobutyronitrile	2 750	AR6	Annex I, Section 3	Other (per)fluorinated compounds and fluorinated nitriles	VIII	Other fluorinated compounds of Annexes I, II & III			
HCFC-1233xf	1	Default value (*****)	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons		x	
HCFC-1233zd	4	AR6	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons		x	
HFC-1234yf	1	AR6	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons		x	
HFC-1234ze	1	AR6	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons		x	
HCFC-1224yd	0	(*)	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons			
HFC-1132	1	AR6	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons			
HFC-1132a	0	AR6	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons			
1,1,1,2,3,4,5,5,5-nonafluoro-4-(trifluoromethyl)pent-2-ene	1	Default value (*****)	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons			

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)pent-2-ene	1	Default value (*****)	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons			
HFC-1336mzz(E)	18	AR6	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons			
HFC-1336mzz(Z)	2	AR6	Annex II, Section 1	Unsaturated hydro(chloro)fluorocarbons	V	Unsaturated hydro(chloro) fluorocarbons			
HFE-236ea2	2 590	AR6	Annex II, Section 2	fluorinated substances used as inhalation anaesthetics	VII	Fluorinated substances used as inhalation anaesthetics		x	
HCFE-235da2	539	AR6	Annex II, Section 2	fluorinated substances used as inhalation anaesthetics	VII	Fluorinated substances used as inhalation anaesthetics		x	
HFE-347mmz1	195	AR6	Annex II, Section 2	fluorinated substances used as inhalation anaesthetics	VII	Fluorinated substances used as inhalation anaesthetics			
HCFE-235ca2	654	AR6	Annex II, Section 2	fluorinated substances used as inhalation anaesthetics	VII	Fluorinated substances used as inhalation anaesthetics			
nitrogen trifluoride	17 400	AR6	Annex II, Section 3	other fluorinated substances	IV	NF_3		x	
sulfuryl fluoride	4 630	AR6	Annex II, Section 3	other fluorinated substances	VIII	Other fluorinated compounds of Annexes I, II & III			
1,1,1,3,3,3-Hexafluoropropan-2-ol (bis(trifluoromethyl)-methanol)	206	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-125	14 300	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
HFE-134	6 630	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-143a	616	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-227ea	7 520	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-236ca12 (HG-10)	6 060	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-236fa	1 100	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-245cb2	747	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-245fa1	934	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-245fa2	878	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-254cb2	328	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-263mf	2	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-329 mcc2	3 770	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-338 mcf2	1 040	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	x
HFE-338mmz1	3 040	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
HFE-338pcc13 (HG-01)	3 320	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-347 mcc3 (HFE-7000)	576	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-347 mcf2	963	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-347mmy1	392	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-347pcf2	980	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-356 mec3	264	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-356mmz1	8	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-356pcc3	277	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-356pcf2	831	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-356pcf3	484	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE 365 mcf3	2	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-374pc2	13	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-43-10pccc124 (H-Galden 1040x) HG-11	3 220	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
HFE-449s1	460	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-569sf2 (HFE-7200)	61	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
2,2,3,3,4,4,5,5-octafluorocyclopentan-1-ol	14	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
2,2,3,3,3-pentafluoropropan-1-ol	34	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
perfluoropolymethylisopropylether (PFPMIE)	10 300	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols		x	
HFE-7300	405	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols			
n-HFE-7100	544	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols			
i-HFE-7100	437	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols			
i-HFE-7200	34	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols			
1,1,1,3,4,4,4-Heptafluoro-3-(trifluoromethyl) butan-2-one	0	(**)	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols			
Perfluoro(2-methyl-3-pentanone)	0	AR6	Annex III, Section 1	Fluorinated ethers, ketones and alcohols	VI	Fluorinated ethers, ketones and alcohols			
Perfluorocyclopropane (c-C_3F_6) (******)	9 200	(***)	Annex III, Section 2	Other fluorinated compounds	II	PFCs		x	
Trifluoromethyl sulphur pentafluoride	18 500	AR6	Annex III, Section 2	Other fluorinated compounds	VIII	Other fluorinated compounds of Annexes I, II & III		x	

Gas	GWP used under F-gas Regulation 2024/573	Source of GWP	Annex of F-gas Regulation 2024/573	Section name in F-Gas Regulation	Gas group allocation in present EEA briefing	EEA gas group name	Coverage in Montreal Protocol (Annex)	Covered under F-gas Regulation No 517/2014	Covered under F-gas Regulation No 842/2006
Perfluorotributylamine	8 490	AR6	Annex III, Section 2	Other fluorinated compounds	VIII	Other fluorinated compounds of Annexes I, II & III			
Perfluoro-N-methylmorpholine	8 800	(****)	Annex III, Section 2	Other fluorinated compounds	VIII	Other fluorinated compounds of Annexes I, II & III			
Perfluorotripropylamine	9 030	AR6	Annex III, Section 2	Other fluorinated compounds	VIII	Other fluorinated compounds of Annexes I, II & III			

Notes : (*) Tokuhashi, K., T. Uchimaru, K. Takizawa, & S. Kondo (2018), Rate Constants for the Reactions of OH Radical with the (E)/(Z) Isomers of CF3CF=CHCl and CHF2CF=CHCl. The Journal of Physical Chemistry A 122:3120–3127. ; (**) Ren et al. (2019), Atmospheric Fate and Impact of Perfluorinated Butanone and Pentanone. Environ. Sci. Technol. 2019, 53, 15, 8862–8871.; (***) WMO et al. (2018). Scientific Assessment of Ozone Depletion.; (****) REACH registration dossier, https://echa.europa.eu/registration-dossier/-/registered-dossier/10075/5/1.; (*****) Default value applied in F-gas Regulation 2024/573, global warming potential not yet available.; (******) Perfluorocyclopropane (c-C_3F_6) is a substance reportable as a PFC in national greenhouse gas inventories under the UNFCCC; thus allocated to 'PFCs' (gas group II) for the purpose of the present briefing.

Sources: EU, 2006, 2014, 2024; Montreal Protocol.

Table 27 Non-fluorinated gases in Annex VI of Regulation (EU) 2024/573

According to Annex VI of the new F-gas Regulation (EU) 2024/573, the GWP of mixtures containing gases outside the scope of Annexes I, II and III of Regulation (EU) 2024/573 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 is used.

Substance	Formula	GWP 100 (AR6)
methane	CH_4	27.9
nitrous oxide	N_2O	273
dimethyl ether	CH_3OCH_3	1(1)
methylene chloride	CH_2Cl_2	11.2
methyl chloride	CH_3Cl	5.54
chloroform	$CHCl_3$	20.6
R-170 (ethane)	CH_3CH_3	0.437
R-290 (propane)	$CH_3CH_2CH_3$	0.02
R-600 (butane)	$CH_3CH_2CH_2CH_3$	0.006
R-600A (isobutane)	$CH(CH_3)_2CH_3$	0(2)
R-601 (pentane)	$CH_3CH_2CH_2CH_2CH_3$	0(2)
R-601A (isopentane)	$(CH_3)_2CHCH_2CH_3$	0(2)
R-610 (ethoxyethane, diethyl ether)	$CH_3CH_2OCH_2CH_3$	4(1)
R-611 (methyl formate)	$HCOOCH_3$	11(3)
R-702 (hydrogen)	H_2	6(1)
R-717 (ammonia)	NH_3	0
R-1150 (ethylene)	C_2H_4	4(1)
R-1270 (propene)	C_3H_6	0(2)
cyclopentane	C_5H_{10}	0(2)
R-744 (carbon dioxide) *	CO_2 *	1

Notes: (1): AR4; (2): WMO et al. (2018) Scientific Assessment of Ozone Depletion, where value is given as <<1; (3): WMO et al. (2018) Scientific Assessment of Ozone Depletion; * CO_2 is not listed in Annex VI of the F-gas Regulation; nevertheless, a GWP of 1 is used for the calculation of the GWP of mixtures containing CO_2.

Source: EU, 2024.

10 Calculation methods

This section provides documentation for:

- Calculation of EU imports (page 89)

HFC imports reported from intermediate storage under customs warehousing after inward processing are not considered for the EU imports statistics. This data is available from 2018 until 2023. However such data is relevant for the calculation of amounts placed on the market (POM). Data reported on the purchase and sale of gases under special customs procedures (available since 2024) is not considered for the calculation of imports.

- Calculation of EU exports (page 89)
- Calculation of EU supply (page 89); Calculation of HFC amounts placed on the market (POM) under the EU HFC (page 91) and
- Calculation of HFC consumption under the international HFC phase-down under the Montreal Protocol (page 91).

Table 29 (page 95) 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 from 2018 until 2023. However such data is relevant for the calculation of amounts placed on the market (POM). Data reported on the purchase and sale of gases under special customs procedures (available since 2024) is not considered for the calculation of imports.

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 from 2018 until 2023. 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 (2F) and exports (3J) 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).

Since 2024 amounts reported as purchased or sold under special customs procedures are included in the calculation: Amounts purchased (2G) are added and amounts sold (2H) are subtracted.

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 F-gas Regulation 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 (2F) 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).

Since 2024, amounts purchased under special customs procedures (2G) are added and amounts sold under special customs procedures (2H) are subtracted in the calculation of 6X.

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. From leakage amounts (6U), emissions from the production process reported in section 1 are subtracted, first (production emissions = production not captured (1Aa) minus production not captured & destroyed (1A_a) minus production not captured, used as feedstock (1C_a1)).

3 Apply the proportions determined in step 1 to the remainder of bulk or total supply. In cases where leakage amounts reported in (6U) are the only intended application reported for the sum calculated in step 1, those amounts are considered in this step separately.
4 Assign any remainder to the category 'Other or unknown applications' (6T).
5 Assign all net exports of pre-blended polyols (3J-2F) to the intended application 6G (pre-blended polyols), except for cases where the bulk supply is zero for a given gas.

Calculation of HFC amounts placed on the market (POM) under the EU HFC phase-out

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

Bulk HFCs physically placed on the market (4M), converted into CO_2e

minus

Exemptions under Article 15(2) (5A + (5B) + 5C_exempted + 5D + 5E), converted into CO_2e (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_2e

plus

HFC imports, converted into CO_2e

minus

HFC exports, converted into CO_2e

plus

1 January HFC stocks, converted into CO_2e

minus

31 December HFC stocks, converted into CO_2e

minus

HFCs used for feedstock, converted into CO_2e

minus

HFC supplies intended for feedstock use, converted into CO_2e.

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 F-gas Regulation No 2024/573 (see Table 26, page 80), 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 und exports to dependent overseas territories are not considered. A list of dependent territories is given in Table 28 (page 93). However, for the calculation of HFC consumption

starting 2021, marking the end of the Brexit transition period, trade with UK overseas territories was considered for EU consumption.

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

minus

uncaptured HFC production (1Aa), converted into CO_2e

plus

destroyed uncaptured HFC production (1A_a), converted into CO_2e

plus

uncaptured HFC production used as feedstock (1C_a1), converted into CO_2e

HFC consumption in 2018 is calculated as follows:

HFC production (1A), converted into CO_2e

minus

HFC production for feedstock use within the Union (1A_fs), converted into CO_2e

minus

HFC production for other uses exempted under the Montreal Protocol (1C_b), converted into CO_2e (1C_b is not yet applicable as no exemptions have been agreed upon under the Montreal Protocol so far)

plus

HFC imports (2A), converted into CO_2e

minus

HFC imports of pre-blended polyols (2F), converted into CO_2e

minus

imports of used, recycled or reclaimed HFCs (2C), converted into CO_2e

minus

virgin HFC imports for feedstock use (2D), converted into CO_2e

minus

virgin HFC imports exempted under the Montreal Protocol (2E), converted into CO_2e (2E is not yet applicable as no exemptions have been agreed so far under the Montreal Protocol)

minus

HFC exports (3A), converted into CO_2e

plus

HFC exports of pre-blended polyols (3J), converted into CO_2e

plus

exports of used, recycled or reclaimed HFCs (3G), converted into CO_2e

plus

virgin HFC exports for feedstock use (3H), converted into CO_2e

plus

virgin HFC exports exempted under the Montreal Protocol (3I), converted into CO_2e (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_2e.

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_2e

plus

HFC imports (2A), converted into CO_2e

minus

HFC exports (3A), converted into CO_2e

plus

HFC exports for recycling (3D), converted into CO_2e

plus

HFC exports for reclamation (3E), converted into CO_2e

plus

HFC exports for destruction (3F), converted into CO_2e

minus

HFC feedstock use (7A), converted into CO_2e

minus

Total HFC destruction (8D), converted into CO_2e.

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

HFC production, converted into CO_2e

plus

HFC imports, converted into CO_2e

minus

HFC exports, converted into CO_2e

plus

HFC exports for recycling, reclamation or destruction, converted into CO_2e

minus

Reporting companies' own HFC destruction, converted into CO_2e

minus

HFC amounts supplied by reporting companies to third parties for destruction, converted into CO_2e

minus

HFCs used for feedstock, converted into CO_2e

minus

HFC supplies intended for feedstock use, converted into CO_2e

Table 28 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

Territory	MS Dependency relation
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

Note: Dependent overseas territories of the United Kingdom were considered for the calculation of HFC consumption of the EU for the years until 2019, and for joint EU-27 and UK consumption in the year 2020.

Comparison of supply, POM and consumption metrics

Table 29 Scope of supply, POM, and consumption metrics

			Supply	Placing on the market (POM), relevant for compliance with the EU HFC phase-out	Consumption, relevant for compliance with the MP HFC phase-down
Transactions covered		**Type of contribution**	*See covered gases per metric and applicable units at the bottom of the table.*		
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 (transaction applicable only 2019-2023)	yes (transaction applicable only 2019-2023)	no (transaction applicable only 2019-2023)
	from dependent overseas territories	plus	yes	yes	no
	from other origins	plus	yes	yes	yes (except import of recycled and used bulk HFCs)
Purchase of gases under special customs procedures		plus	yes	yes	no
Sale of gases under special customs procedures		minus	yes	yes	no
Emissions of gases held under special customs procedures		minus	no	yes	no
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
	MDIs	plus	yes	2015-2024: no starting 2025: 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-out	Consumption, relevant for compliance with the MP HFC phase-down
Transactions covered		**Type of contribution**	*See covered gases per metric and applicable units at the bottom of the table.*		
Bulk exports	into EU intermediate storage under customs warehousing after inward processing	minus	no	exports from own production and exports from own imports (starting 2024: exports from own imports or own purchase under special customs procedures, not yet placed on the market) are subtracted. Other bulk exports subtracted if directly supplied by the importer/producer to the exporter (exemption Art. 16(2)c)	no
	to dependent overseas territories	minus	yes		no
	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	no
	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)	no
Destruction	of EU production, destroyed before placing on the market and imports for destruction	minus	yes	yes (exemption Art. 16(2)a)	yes (starting 2024: where destruction technologies approved under the MP were used)
	of used gases recovered within the EU	minus	no	No	yes (starting 2024: where destruction technologies approved under the MP were used)
Feedstock use		minus	yes	yes (exemption Art. 16(2)b)	yes (HFC production for feedstock use in the Union and HFC import for feedstock use)
Supplies to military uses		minus	no	yes (exemption Art. 16(2)d)	no
Supplies to semiconductor industry		minus	no	yes (exemption Art. 16(2)e)	no
Supplies to pharmaceutical MDIs		minus	no	not considered 2015-2017, considered 2018 -2024 (exemption Art. 15(2)f of FGR (EU) No 517/2014), not considered 2025 onwards	no

		Supply	Placing on the market (POM), relevant for compliance with the EU HFC phase-out	Consumption, relevant for compliance with the MP HFC phase-down
Transactions covered	**Type of contribution**	*See covered gases per metric and applicable units at the bottom of the table.*		
1 January stocks	plus	full EU-based stocks from own production or own import or own purchases under special customs procedures considered, stocks under customs warehousing not considered, stocks from EU purchases not considered	only those EU-based stocks from own production or own import or own purchases under special customs procedures considered that have not yet been placed on the market, stocks from EU purchases and stocks from own imports/own purchase under special customs procedures/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
	covered gases	*applicable to total F-gases and single gases/gas groups (e.g. HFCs)*	*HFCs of Annex I, Section 1 of EU F-gas Regulation 2024/573, including HFC shares and non-HFC shares of HFC-containing mixtures*	*HFCs of Annex I, Section 1 of EU F-gas Regulation 2024/573 except HFC-161, including HFC shares of HFC-containing mixtures*
	units used	*both physical tonnes and t CO_2e (GWP as defined in the EU F-gas Regulation 2024/573: AR4 for HFCs, AR6 for other F-gases)*	*t CO_2e (GWP: AR4)*	*t CO_2e (GWP: AR4)*

List of abbreviations

Abbreviation	Name
AR4	Fourth Assessment Report of the IPCC
AR6	Sixth Assessment Report of the IPCC
BDR	Business Data Repository of the EEA
CFC	Chlorofluorocarbon
CO_2	Carbon dioxide
CO_2e	CO_2 equivalent
DG CLIMA	Directorate-General for Climate Action of the European Commission
EEA	European Environment Agency
EC	European Commission
ETC CM	European Topic Centre for Climate change mitigation
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
F-gases	Fluorinated gases
FGR	F-gases Regulation
GWP	Global warming potential
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
HFE	Hydrofluoroether
HFO	Hydrofluoroolefin
IPCC	Intergovernmental Panel on Climate Change
kg	Kilogramme
kt	Kilotonne
MP	Montreal Protocol
Mt	Megatonne
NF_3	Nitrogen trifluoride
ODS	Ozone-depleting substances
PFCs	Perfluorocarbons
PFPMIE	Perfluoropolymethylisopropylether
POM	Placing on the market
QA/QC	Quality assurance/quality control

Abbreviation	Name
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_6	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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