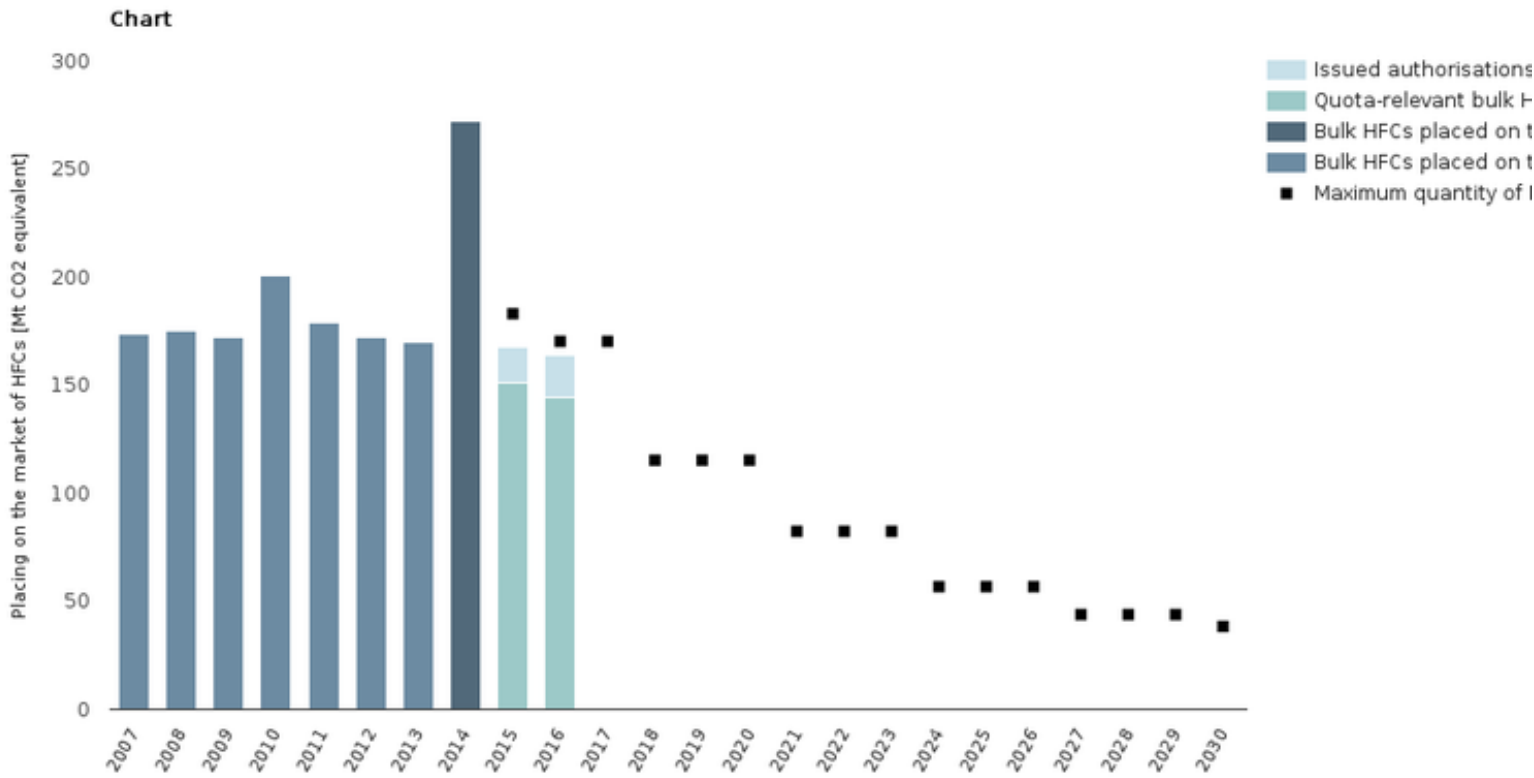


Emissions and supply of fluorinated greenhouse gases



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Emissions and supply of fluorinated greenhouse gases

Key messages

Fluorinated greenhouse gases (F-gases) are amongst the most powerful greenhouse gases, with a global warming effect up to 23 000 times greater than carbon dioxide (CO₂).

Hydrofluorocarbons (HFCs) account for 85 % of present F-gases supply. They are used primarily as refrigerants in refrigeration, air conditioning and heat pump equipment. Foam blowing and aerosols are other important uses of HFCs. The other F-gases are perfluorocarbons (PFCs), mainly used as a protective gas in electrical equipment and as etching agents in electronics manufacture, as well as sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

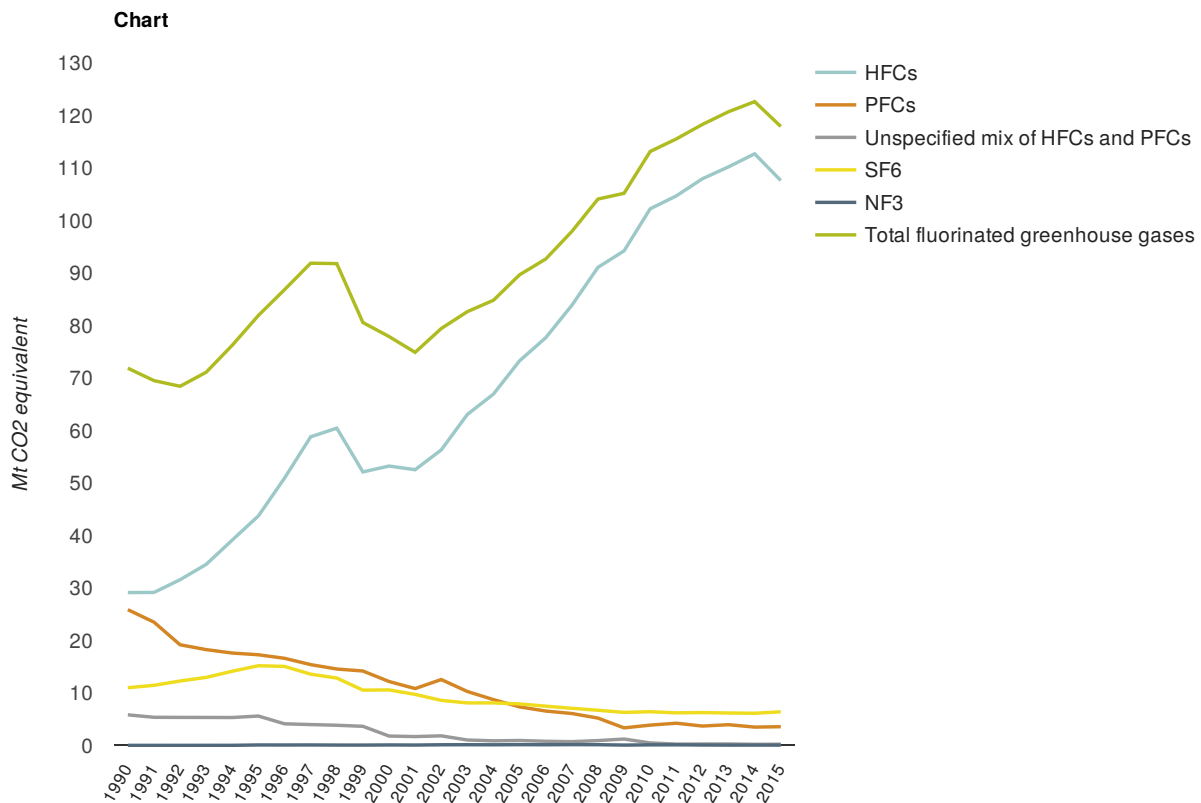
As part of its actions to fight climate change and reduce greenhouse gas emissions, the European Union is phasing down the use of HFCs. The supply of F-gases to the EU, measured in CO₂ equivalents, has been overall decreasing since 2010 (HFC imports were extraordinarily high in 2014, prior to the EU-wide HFC phase-down coming into effect in 2015). Since 2015, the EU has complied with its annual targets under the EU F-Gas Regulation 517/2014 and is approaching the HFC consumption limit, which comes into effect in 2019 under the Montreal Protocol.

Emissions of F-gases mainly occur by means of leakage of gases contained in products or equipment, or at the end of the lifetime of the product/equipment, where contained F-gases are not fully recovered and destroyed or re-used. Therefore, most applications of F-gases are characterised by a significant time lag between the supply of F-gases to their industrial uses and their emissions.

For the first time in 2015, a decrease in the EU emissions of fluorinated greenhouse gases (F-gases) reported under the United Nations Framework Convention on Climate Change (UNFCCC) was observed, following 13 years of increases.

What progress is being made in reducing emissions of fluorinated greenhouse gases?

Fig. 1: Emissions of fluorinated gases (F-gases)



Note:

The figure shows the emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). Emissions are represented as CO₂ equivalent using the Global Warming Potential (GWP) values of the IPCC Fourth Assessment Report (AR4).

[Explore chart interactively](#)



Data sources:

- National emissions reported to the UNFCCC and to the EU Greenhouse Gas Monitoring Mechanism provided by **United Nations Framework Convention on Climate Change (UNFCCC)**

Following 13 years of increases in EU emissions of fluorinated greenhouse gases (F-gases) reported under the United Nations Framework Convention on Climate Change (UNFCCC), 2015 was the first year to see a decrease in emissions (Figure 1). Hydrofluorocarbons (HFCs) account for more than 90 % of present CO₂ equivalent F-gas

emissions, weighted by their respective global warming potentials (GWPs). The remainder are perfluorinated F-gases, i.e. perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

Between 1990 and 2014, total emissions of F-gases have seen an overall increase of about 70 %. The brief downturn after 1998 reflected a significant drop in emissions of HFC-23, which occurs as a by-product of the production of refrigerant HCFC-22, itself an ozone-depleting substance (ODS) controlled under the Montreal Protocol. The drop in emissions followed the installation of abatement systems and a decrease in HCFC-22 production. HFC emissions have more than tripled since 1990. The share of HFCs in total fluorinated greenhouse gas emissions rose from 41 % in 1990 to 91 % in 2015.

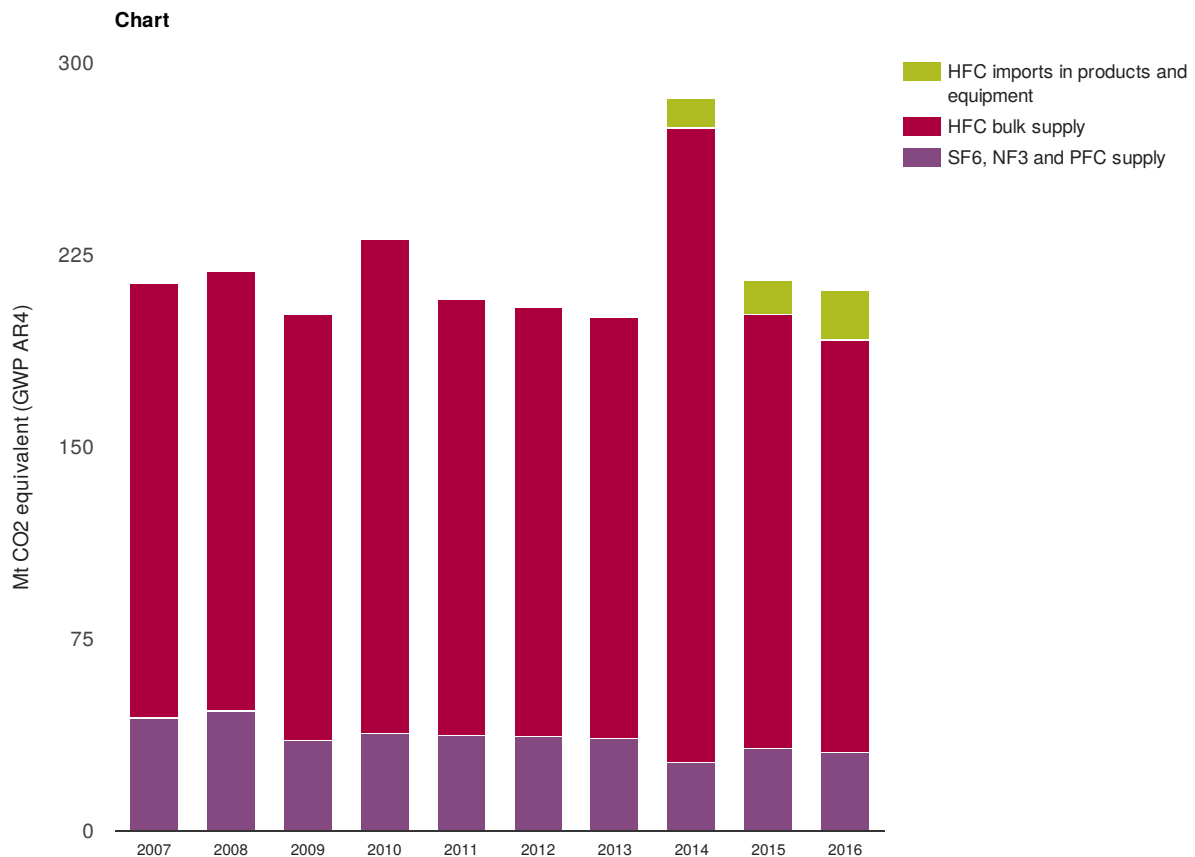
The overall growth in total HFC emissions had two main drivers: 1) the substitution of ozone-depleting hydrochlorofluorocarbons (HCFCs) with HFCs in applications such as refrigeration and air conditioning, and 2), the growth of the refrigeration and air conditioning sector as a whole. The demand for cooling and air conditioning has been increasing, especially in retail sector refrigeration, and building and vehicle air conditioning. The drop in HFC emissions observed in 2015 is the result of EU-wide policies and measures, in particular the EU F-gas Regulations 842/2006 and 517/2014 and complementary Member State actions, targeted to reduce HFC leakage from refrigeration and air conditioning equipment. These policies and measures encourage the recovery of gases at the end of the equipment's lifetime, promoting a shift to non-HFC refrigerants, banning certain specific uses and capping the EU-wide HFC supply from 2015.

In contrast to the rising trend in fluorinated greenhouse gas emissions as a whole, emissions of PFCs and SF₆ have decreased by 86 % and 42 %, respectively, since 1990. NF₃ emissions represent approximately 0.1 % of F-gas totals.

Other fluorinated gases, such as unsaturated HFCs and HCFC or hydrofluoroethers (HFEs), which are covered in Annex II of the F-gas Regulation (EU) 517/2014, are not subject to emission reporting under the UNFCCC.

How is the supply of fluorinated greenhouse gases to the EU market developing?

Fig. 2: EU supply of fluorinated greenhouse gases



Note:

Supply is represented as CO₂ equivalent using GWPs of the IPCC AR4.

For 2007–2013, the scope of data is limited to HFCs, PFCs and SF₆ supplied in bulk, i.e. produced within the EU or imported in gas containers. Starting in 2014, NF₃ supply and imports of F-gases contained in products or equipment were included.

Data from Croatia are only included from 2013 onwards.

[Explore chart interactively](#)



Data sources:

- Fluorinated greenhouse gases provided by **European Environment Agency (EEA)**

The statistics on the supply of F-gases, measured in CO₂ equivalents, reveal declining trends for bulk supply for

the period 2010-2013 and for total supply (including equipment imports) since 2014 (Figure 2). The year 2014 was characterised by extraordinarily high imports of bulk HFCs. This was the last year before the EU-wide HFC cap came into effect under the HFC phase-down established in the F-gas Regulation (EU) 517/2014.

The rise in HFC imports in equipment since 2014 primarily reflects more complete reporting by importing companies following the introduction of the reporting obligation. HFCs contained in imported refrigeration, air conditioning and heat pump (RACHP) equipment were not limited by the HFC phase-down before 2017. In 2016, HFCs accounted for 85 % of the global warming potential (GWP) weighted supply of F-gases, while perfluorinated gases (PFCs, SF₆ and NF₃) accounted for 15 %.

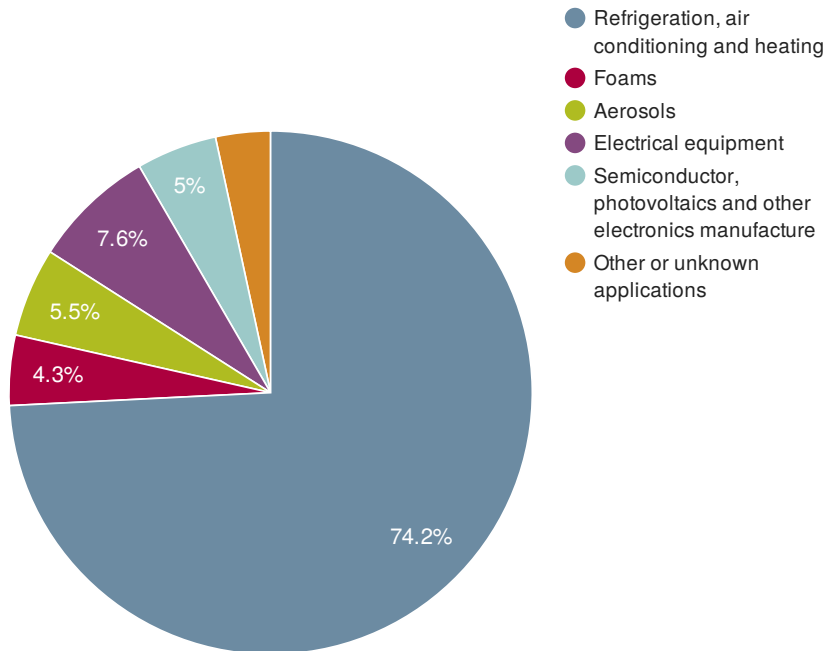
Note that the scope of gases covered in Figure 2 is consistent with emissions, as shown in Figure 1, and does not include other fluorinated gases reported by companies under the F-gas Regulation (EU) 517/2014. Among those, unsaturated HFCs and HCFCs are of particular relevance as low-GWP substitutes for HFCs. The EU supply of unsaturated HFCs has approximately doubled each year from 2014 to 2016. The use of non-halogenated refrigerants, which also serve as HFC substitutes, is not covered by reporting under the F-gas Regulation.

Most applications of F-gases are characterised by a significant time lag between the supply of F-gases to their industrial uses and emissions. Emissions mainly occur by means of leakage of gases contained in products or equipment, or at the end of the lifetime of the product/equipment, where contained F-gases are not fully recovered and destroyed or re-used.

In which sectors are fluorinated greenhouse gases used?

Fig. 3: Intended application of F-gases supplied to the EU in 2016

Chart



Note:

Shares of 2016 EU supply represented as CO₂ equivalent using GWPs of the IPCC AR4.

F-gases scope covers HFCs, PFCs, SF₆ and NF₃ and includes equipment imports.

[Explore chart interactively](#)



Data sources:

- Fluorinated greenhouse gases provided by **European Environment Agency (EEA)**

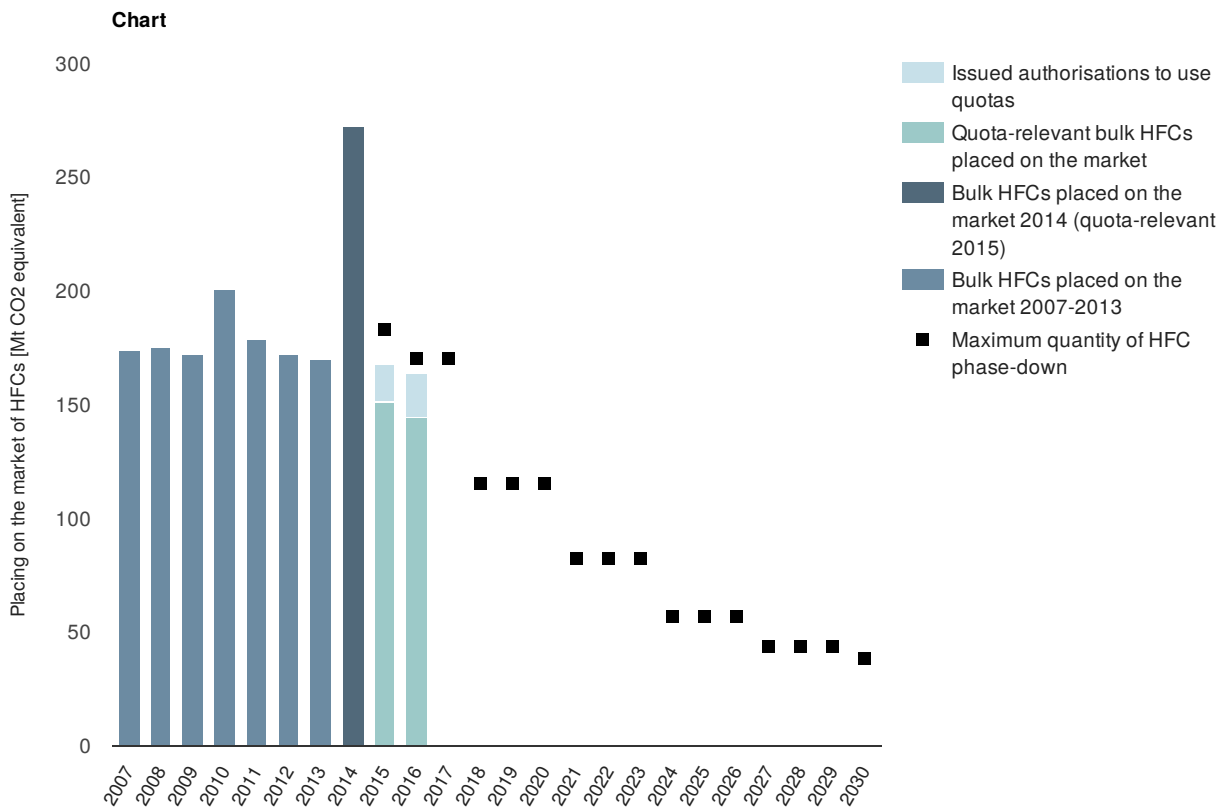
The use of F-gases as refrigerants in refrigeration, air conditioning and heat pump equipment accounted for three quarters of EU, GWP-weighted, F-gas supply in 2016 (Figure 3). Other relevant use sectors are foams, aerosols, electrical equipment, and semiconductor photovoltaics as well as the manufacture of and other electronics.

Recent use patterns of F-gases differ strongly between HFCs and perfluorinated gases (PFCs, SF₆ and NF₃).

HFCs are mainly used as refrigerants and, to a lesser extent as foam blowing agents and in aerosols. Perfluorinated F-gases freshly supplied to the EU are mainly used as a protective gas in electrical equipment and as etching agents in electronics manufacture.

What is the EU progress in phasing-down HFCs?

Fig. 4: Progress under the EU-wide HFC phase-down set out in the F-gas Regulation



Note:

POM: Placing on the market.

Data shown for 2016 are preliminary and subject to further validation by the European Commission. Values from 2007-2013 are based on the reporting obligations of the old F-Gas Regulation 842/2006 and are therefore not fully comparable to data from 2014 onwards (based on obligations of the new F-Gas Regulation 517/2014). Similarly, the maximum quantities of the EU HFC phase-down will be recalculated for 2018 and are for indicative purposes only.

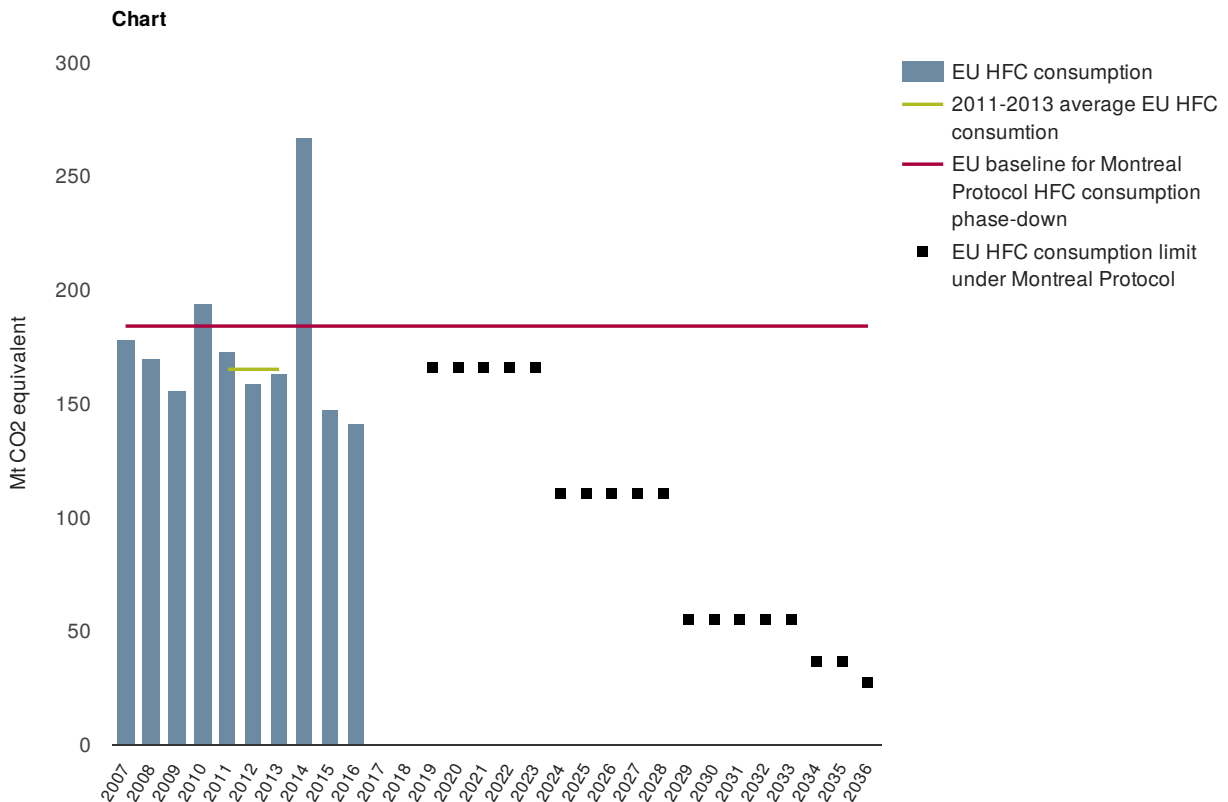
[Explore chart interactively](#)



Data sources:

- Fluorinated greenhouse gases provided by **European Environment Agency (EEA)**

Fig. 5: EU Progress towards the worldwide HFC consumption phase-down under the Montreal Protocol



Note:

HFCs covered under the Montreal Protocol do not include HFC-161.

The baseline for the Montreal Protocol HFC phase-down is defined as the average HFC consumption during 2011-2013, plus 15 % of the hydrochlorofluorocarbons (HCFC) baseline in 1989, all expressed in CO2 equivalents. As set out in the Montreal Protocol, the HCFC baseline also includes 2.8 % of the 1989 chlorofluorocarbons (CFC) consumption.

[Explore chart interactively](#)



Data sources:

- Fluorinated greenhouse gases provided by **European Environment Agency (EEA)**

Phase down schemes for HFCs were first established in the EU under the F-gas Regulation 517/2014 and later globally under the 2016 Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (MP).

The HFC phase-down under the EU F-gas Regulation

The EU is on track to meet the F-gas Regulation HFC phase-down (Figure 4). HFCs on the market were well below the maximum quantity since the phase-down started in 2015. For 2015, an over-achievement of 8 % can be observed. For 2016 (preliminary data), the figure was 4 %.

Under the F-gas Regulation phase-down, the amount of HFCs that can be placed annually on the EU market (POM) is capped. The HFC quota is then progressively reduced, hence the term 'phase-down'. Companies that deal in HFCs annually receive quotas that are transferrable under certain conditions, but unlike emissions allowances, under the EU ETS, they are not freely tradable. In order to legally place HFC bulk gases on the EU market, companies must hold sufficient quotas. Quotas are expressed in CO₂ equivalents, rather than physical tonnes of gases, in order to create an incentive to use gases with lower GWPs. From 2017 onwards, HFCs contained in refrigeration, air conditioning and heat pump (RACHP) equipment are also covered by the F-gas Regulation quota mechanism. In order to import such equipment, importers must acquire authorisations to use quotas from quota-holding companies. Notably, it is the sale of authorisations by the quota holder and not the actual import of RACHP equipment by the authorised party that counts as 'placing on the market' (POM). Thus, equipment imports can physically occur in a later year, while the sale of authorisations must be covered by quotas for the year of the sale. Contrary to authorisations, quotas are time-stamped for a specific year and unused quotas cannot be carried over to the following year.

EU progress towards the worldwide HFC phase-down under the Montreal Protocol

The EU is on track to comply with its obligations under the Montreal Protocol (MP) HFC consumption phase-down, coming into effect in 2019. EU consumption in 2016 was already 14 % below the amount allowed for 2019 (Figure 5). EU consumption of HFCs covered under the Montreal Protocol (MP) has been declining since 2010 with the exception of 2014, where high HFC consumption reflects the situation observed for HFC supply.

The Montreal Protocol on Substances that Deplete the Ozone Layer (MP) was amended to regulate HFCs in October 2016 in Kigali, Rwanda, ('Kigali Amendment'). Both developed and developing countries have taken on mandatory commitments to reduce the production and consumption of HFCs in the next three decades. Under the amended Protocol, for the EU and other developed countries, HFC consumption is limited to 90 % of the baseline starting in 2019, with further reduction steps until a 15 % level is reached from 2036 onwards.

Indicator specification and metadata

Indicator definition

The indicator tracks trends since 1990 in anthropogenic emissions of the fluorinated greenhouse gases listed below. The indicator also tracks trends since 2007 in the supply of fluorinated greenhouse gases. Furthermore, the shares of major intended applications of EU supply are given for the latest available reporting year.

EU supply is a parameter derived from company reporting under the F-gas Regulation that provides information on the actual use of fluorinated greenhouse gases by EU industries. It is focussed on potentially emission-relevant supplies of gases to EU industries and thus does not cover supplies intended for feedstock use or destruction.

The lists of gases covered in the supply part of the indicator differ between the 2007-2013 time period and the time period starting 2014. For the time period 2007-2013, only data on supply in bulk are available. (The term 'bulk' refers to shipments of gases contained in gas containers of all sizes, ranging from large ISO containers of several tonnes to small gas bottles of a few grams). Since 2014, supply within products and equipment has been recorded. Both of these add up to total EU supply.

Bulk supply is calculated by first adding reported amounts for

- production
- bulk imports
- reclamation
- stocks from own production or imports held on 1 January of the reporting year

and then subtracting the following reported amounts:

- bulk exports
- amounts used as feedstock
- amounts imported for destruction
- amounts from own production sent for destruction before sales
- stocks from own production or imports held on 31 December of the reporting year.

Supply in products and equipment is the gas content of products and equipment imported and placed on the EU market.

List of gases

All listed gases are tracked for emissions since 1990. Gases given in **bold** are not tracked for supply in all years since 2007. Gases beyond the supply scope only for 2007-2013 are given in *italics*.

Hydrofluorocarbons (HFCs)	Perfluorocarbons (PFCs)	Other perfluorinated gases
HFC-23	PFC-14 (CF ₄)	SF ₆
HFC-32	PFC-116 (C ₂ F ₆)	<i>NF₃</i>
HFC-41	PFC-218 (C ₃ F ₈)	
HFC-43-10mee	PFC-3-1-10 (C ₄ F ₁₀)	
HFC-125	PFC-318 (c-C ₄ F ₈)	
HFC-134	PFC-4-1-12 (C ₅ F ₁₂)	

Hydrofluorocarbons (HFCs)	Perfluorocarbons (PFCs)	Other perfluorinated gases
HFC-134a	PFC-5-1-14 (C6F14)	
HFC-143	PFC-9-1-18 (C10F18)	
HFC-143a	<i>PFC-216 (c-C3F6)</i>	
<i>HFC-152</i>		
HFC-152a		
<i>HFC-161</i>		
HFC-227ea		
HFC-236cb		
HFC-236ea		
HFC-236fa		
HFC-245ca		
HFC-245fa		
HFC-365mfc		

Where the gases above are used or emitted as part of a mixture of gases, the respective shares are accounted for. For tracking HFC consumption under the Montreal Protocol, only the HFC shares of HFC-containing mixtures are accounted for. HFC-161 is excluded from the scope of the Montreal Protocol.

Units

The units used in this indicator are:

Mt CO₂ equivalent (GWP AR4). Million tonnes of CO₂ equivalent calculated with the global warming potentials (GWPs) as given in the IPCC 4th Assessment Report. For tracking progress under the HFC phase-down of the EU F-gas Regulation, mixtures containing HFCs are included in the scope of the phase-down. The GWP of the mixture includes the GWP of non-HFC constituent gases according to Annex IV of the Regulation (EU) No 517/2014 (F-gas Regulation).

Intended applications. Percentages based on GWP AR4 weighted tonnage.

Rationale

Justification for indicator selection


Emissions of fluorinated greenhouse gases contribute to global warming and are included in the basket of greenhouse gases addressed in the UNFCCC Kyoto Protocol. Fluorinated greenhouse gases presently account for around 3 % of EU-28 overall greenhouse gas emissions, with a long-term rising trend. At the European level, policy measures have been implemented since 2006 to reduce emissions, by:

- targeting the 'leak-tightness' of equipment containing fluorinated gases
- encouraging increased reclamation of used gases
- banning the use of certain high-GWP gases in some applications in which more environmentally superior alternatives are available

Furthermore, phase-down schemes for the use of HFCs have been agreed within the EU in 2014 and globally under the Montreal Protocol in 2016.

As future emissions of fluorinated greenhouse gases are strongly determined by today's use, this indicator also looks at supply.

Scientific references

-  Preparatory study for a review of Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases; Final Report & Annexes to the Final Report Prepared for the European Commission in the context of Service Contract No 070307/2009/548866/SER/C4. Authors: Schwarz et al. 2011: Schwarz, W., Gschrey, B., Leisewitz, A., Herold, A., Gores, S. Papst, I., Usinger, J., Oppelt, D., Croiset, I, Pedersen, P.-H, Colbourne, D. , Kauffeld, M., Kaar, K., Lindborg, A.
- Intergovernmental Panel on Climate Change (IPCC), 2007, Fourth Assessment Report - Climate Change

Policy context and targets

Context description

Fluorinated gases contribute to global warming and emissions of fluorinated gases, which are not covered by the Montreal Protocol, are included under the UNFCCC. Since 2015, emission reporting for the full time series since 1990 has been made according to the 2006 IPCC guidelines and uses the GWPs of the 4th IPCC Assessment report (AR4). For a list of fluorinated gases reportable under the UNFCCC, please refer to the indicator definition. Companies reporting under the 'old' EU F-gas Regulation (Regulation (EC) No 842/2006, applicable 2007-2014) and under the revised 'new' F-gas Regulation (Regulation (EU) No 517/2014, applicable since 2015), cover an extended list of fluorinated gases. In order to maintain consistency, in this indicator only those fluorinated gases are tracked for supply which are also reportable under the UNFCCC.

At the European level two key legislative instruments focus on fluorinated gases:

- Regulation No 517/2014 on fluorinated greenhouse gases and repealing Regulation No 842/2006 (F-gas Regulation); and
- Directive 2006/40/EC relating to emissions from air-conditioning systems in motor vehicles (MAC Directive)

The F-gas Regulation follows several tracks:

- Improving the 'leak-tightness' of equipment containing F-gases. Measures comprise: labelling of equipment containing fluorinated gases, training and certification of personnel and companies handling these types of gas, containment of gases within equipment and proper recovery of gases from equipment that is no longer used.
- Avoiding the use of fluorinated gases in some applications in which more environmentally superior alternatives are already cost-effective: Measures include restrictions on the use and marketing of fluorinated gases in these cases.
- Large reductions in F-gas use and emissions are expected from a new measure, which will progressively cap allowed sales of HFCs on the EU market ('phase-down').
-

The MAC Directive requires gradual phase-out of F-gases with GWP > 150 in new systems in the period 2011-2017

in the EU.

At the global level, the Montreal Protocol on Substances that Deplete the Ozone Layer (MP) was amended to regulate HFCs in October 2016 in Kigali, Rwanda, ('Kigali Amendment'). Both developed and developing countries have taken on mandatory commitments to reduce production and consumption of HFCs in the next three decades. Under the amended Protocol, for the EU and other developed countries, HFC consumption is limited to 90 % of the baseline starting in 2019, with further reduction steps until a 15 % level is reached from 2036 onwards.

Targets

In the framework of the UNFCCC and the Kyoto Protocol, no separate target for fluorinated greenhouse gases has been specified.

In the EU context, the revised 'new' F-gas Regulation 517/2014 aims to reduce emissions by two-thirds of the 2010 level by 2030.

Related policy documents

- Directive 2006/40/EC

Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EEC

- Kyoto Protocol to the UN Framework Convention on Climate Change

Kyoto Protocol to the United Nations Framework Convention on Climate Change; adopted at COP3 in Kyoto, Japan, on 11 December 1997

- Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases

The 'old' F-gases regulation follows two tracks of action: Improving the prevention of leaks from equipment containing F-gases. Measures comprise: containment of gases and proper recovery of equipment; training and certification of personnel and of companies handling these gases; labeling of equipment containing F-gases; reporting on imports, exports and production of F-gases. Avoiding F-gases in some applications where environmentally superior alternatives are cost-effective. Measures include restrictions on the marketing and use of certain products and equipment containing F-gases. The Regulation has been supplemented by 10 implementing acts or 'Commission Regulations' (see Documentation tab above). Furthermore, reporting provisions have been introduced to facilitate monitoring of the Regulation's measures and ensure that its objectives are being met.

- Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006

The 'new' F-Gas Regulation 517/2014 maintains many measures of the 'old' F-Gas Regulation 842/2006, in particular related to leak prevention, recovery, certification of technicians and selected restrictions on the use and marketing of F-gases. Large reductions in F-gas use and emissions are expected from a new measure, which will progressively cap allowed sales of HFCs on the EU market ('phase-down'). Reductions are also expected from bans of F-gases with a high Global Warming Potential (GWP).

-  The Montreal Protocol on Substances that Deplete the Ozone Layer

The Vienna Convention for the Protection of the Ozone Layer: The Montreal Protocol on Substances that Deplete the Ozone Layer

Methodology

Methodology for indicator calculation

The indicator presents GWP-weighted emissions of fluorinated gases as officially reported by the EU-28 Member States.

Furthermore, the indicator presents the aggregated EU supply in units of million tonnes of CO₂ equivalents, which is the physical amount of supplied gases, multiplied by their respective global warming potential. Data are based on company reporting under Article 6 of the 'old' F-gas Regulation 842/2006 and Article 19 of the 'new' F-gas Regulation 517/2014.

For the time period 2007-2013 (reporting under the 'old' F-gas Regulation 842/2006), only data on supply in bulk are available. Since 2014 (reporting under the 'new' F-gas regulation 517/2014), supply within products and equipment is recorded as well, both add up to total EU supply.

Bulk supply is calculated by first adding reported amounts for

- production
- bulk imports
- reclamation
- stocks from own production or imports held on 1 January of the reporting year

and then subtracting the following reported amounts:

- bulk exports
- amounts used as feedstock
- amounts imported for destruction
- amounts from own production sent for destruction before sales
- stocks from own production or imports held on 31 December of the reporting year.

Supply in products and equipment is the gas content of products and equipment imported and placed on the EU market.

For progress under the EU HFC-phase-down, quota relevant placing on the market (POM) is calculated as follows for all HFCs and mixtures containing HFCs, physical mass converted into CO₂ equivalents using the GWPs of the 4th IPCC Assessment Report.

- Quota relevant POM = quota-relevant physical POM + issued authorisations + imported refrigeration, air conditioning and heat pump (RACHP) equipment, where not covered by quota authorisations held by the importer
 - quota relevant physical POM (relevant starting 2015) = physical POM as given in section 4M of the reporting questionnaire – exempted quantities as given in section 5J of the reporting questionnaire
 - Issued authorisations (relevant starting 2015) are given in section 9A of the reporting questionnaire
 - imported refrigeration, air conditioning and heat pump (RACHP) equipment, where not covered by quota authorisations held by the importer (relevant starting 2017) = calculated amount of imported hydrofluorocarbons in need of authorisation to use HFC quota (as given in section 13D of the reporting questionnaire) - available authorisations, including delegations of authorisations (as given in section 13A of the reporting questionnaire)

Under the Montreal Protocol, the HFC phase-down is framed for consumption of HFCs. Consumption is calculated

as production + bulk imports – bulk exports – destruction – feedstock use of HFCs.

All information provided to the European Commission and the EEA on transactions of F-gases in the EU is treated as strictly confidential. The Commission and the EEA have established procedures to ensure that all of the data relating to individual companies will be kept strictly confidential. No company-specific information is disclosed to the public; all company data are aggregated before publication. These procedures limit the release of data that might significantly rely on reports from less than three company groups. To this end, company groups that contribute to less than 5 % do not count towards the '3-company-rule'. Concerns over confidentiality can be addressed to the European Commission or to the entity designated by the European Commission.

Methodology for gap filling

No methodology for gap filling has been specified. Probably this info has been added together with indicator calculation.

Methodology references

No methodology references available.

Uncertainties

Methodology uncertainty

No uncertainty has been specified

Data sets uncertainty

No uncertainty has been specified

Rationale uncertainty

No uncertainty has been specified

Data sources

- National emissions reported to the UNFCCC and to the EU Greenhouse Gas Monitoring Mechanism provided by **Directorate-General for Environment (DG ENV)** , **United Nations Framework Convention on Climate Change (UNFCCC)**
- Fluorinated greenhouse gases provided by **European Environment Agency (EEA)**

Generic metadata

Topics:

Climate change mitigation

DPSIR: Driving force

Typology: Policy-effectiveness indicator (Type D)

Indicator codes

- CSI 044

- CLIM 048

1990-2036

Contacts and ownership

EEA Contact Info

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