

Reduction of Fluorinated Greenhouse Gases in the European Union (Part III)

This article presents an analysis of the **supply of fluorinated greenhouse gases (F-gases) to the EU**, based on reported data on production, imports, and exports.

The assessment of F-gas supply within the EU shows that the overall trend remained almost stable between **2007 and 2013**, as illustrated in **Figure 1**. During this period, the total supply of F-gases stayed below **91,749 tonnes**, with an **average global warming potential (GWP) of 2,464**, varying between **2,410** and **2,521**. It should be noted that the data for 2007–2013 cover only **bulk deliveries** of F-gases, excluding gases contained in **products and equipment**.

The **maximum supply** of F-gases occurred in **2014**, when the total amount reached **127,547 tonnes** with an average GWP of **2,241**. Between **2015 and 2017**, a slight increase in total supply was observed, although it remained well below the 2014 peak. Thereafter, a **significant decrease** in F-gas supply was reported for the **2017–2019** period.

This decline in supply after 2014 is directly associated with the entry into force of new **regulations restricting the use of F-gases**. The total F-gas supply decreased by **15%** in 2019 compared with 2018, and by **25%** compared with 2017. The **average GWP** of supplied gases also fell from **2,027 in 2017** to **1,552 in 2019**, reflecting a clear shift toward lower-GWP substances.

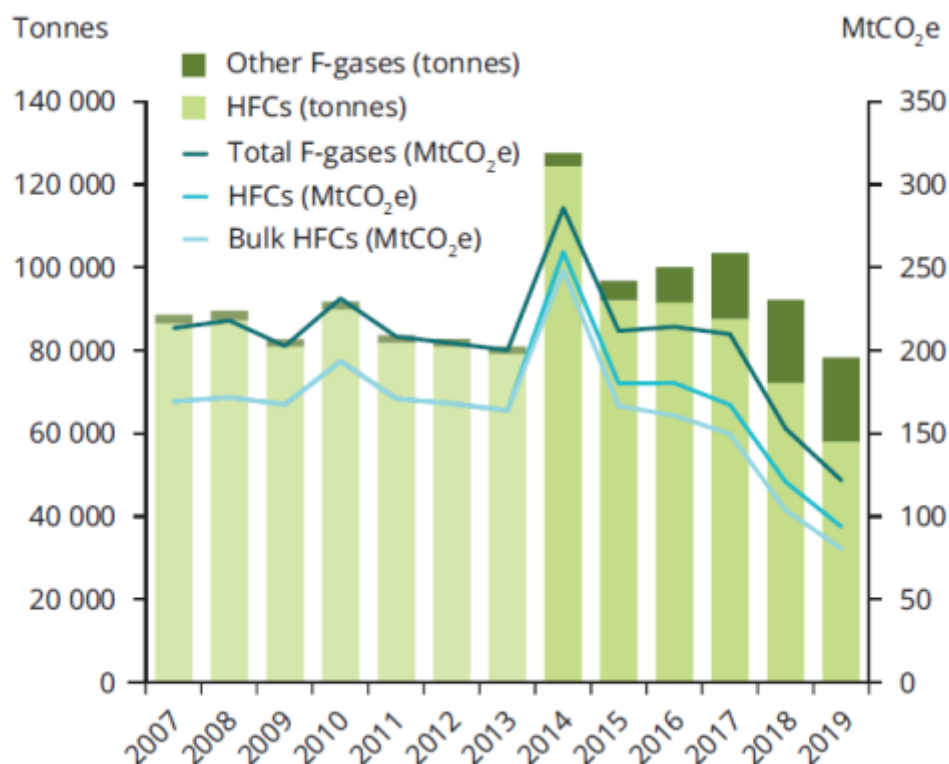


Figure 1. *Supply of F-gases to the EU [1].*

Among hydrofluorocarbons (HFCs), **R134a** accounted for the largest share of fluorinated gas deliveries. In **2014**, R134a represented **52%** of the total supply of F-gases to the EU, and its share further increased to **67%** in **2019**, emphasizing its significant contribution to global warming. Details of the 2019 supply distribution are shown in **Figure 2**.

The data reveal that **61%** of the total fluorinated gases supplied to the EU in 2019 were **hydrofluorocarbons (HFCs)** delivered in bulk form. The second largest category was **unsaturated fluorocarbons (HFOs)**, accounting for **23%**. Approximately **13%** of HFCs were supplied **within products and equipment**. A comparison between the distribution by **mass (tonnes)** and by **CO₂-equivalent** demonstrates the prominent influence of **SF₆**, **NF₃**, and **PFCs** on overall GWP, even though these substances represent only a minor fraction of total supply by weight.

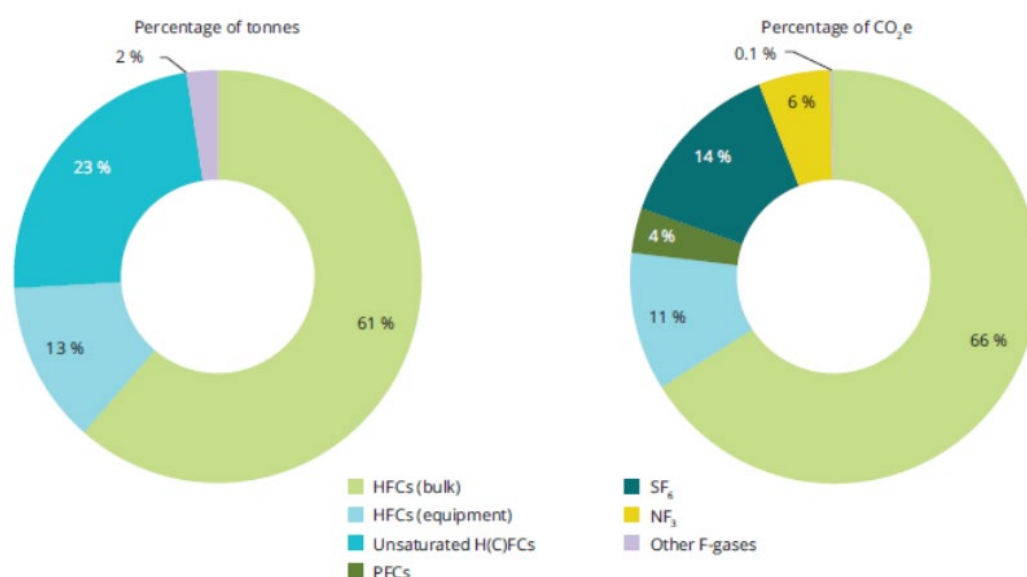


Figure 2. Total F-gas supply to the EU in 2019, broken down by type and gas group [1].

The **intended applications** of the total EU F-gas supply for the period **2007–2019** are presented in **Figure 3**. As in Figure 1, the discontinuity observed between **2013 and 2014** results from **changes in reporting requirements**, which caused a temporary peak in the 2014 statistics.

Among all reported applications, F-gas supply was **dominated by the refrigeration, air-conditioning, and heating sectors**. These accounted for **71%** of the total supply by mass and **63%** by CO₂-equivalent in 2019. The total supply of F-gases to this sector amounted to **55,600 tonnes** in 2019, representing a **19% decrease** compared with 2018.

The **second-largest application** was **foam-blowing**, which contributed **14%** of total supply in 2019. It is also important to note that although certain specialized applications use relatively **small quantities** of F-gases, their **climate impact** remains substantial because of their **high GWP values**. These applications primarily involve the use of **SF₆**, **PFCs**, and **NF₃** in **electrical equipment, semiconductors, and photovoltaic manufacturing**. On a positive note, the total F-gas supply to these sectors decreased by **15%** in 2019 compared with 2018.

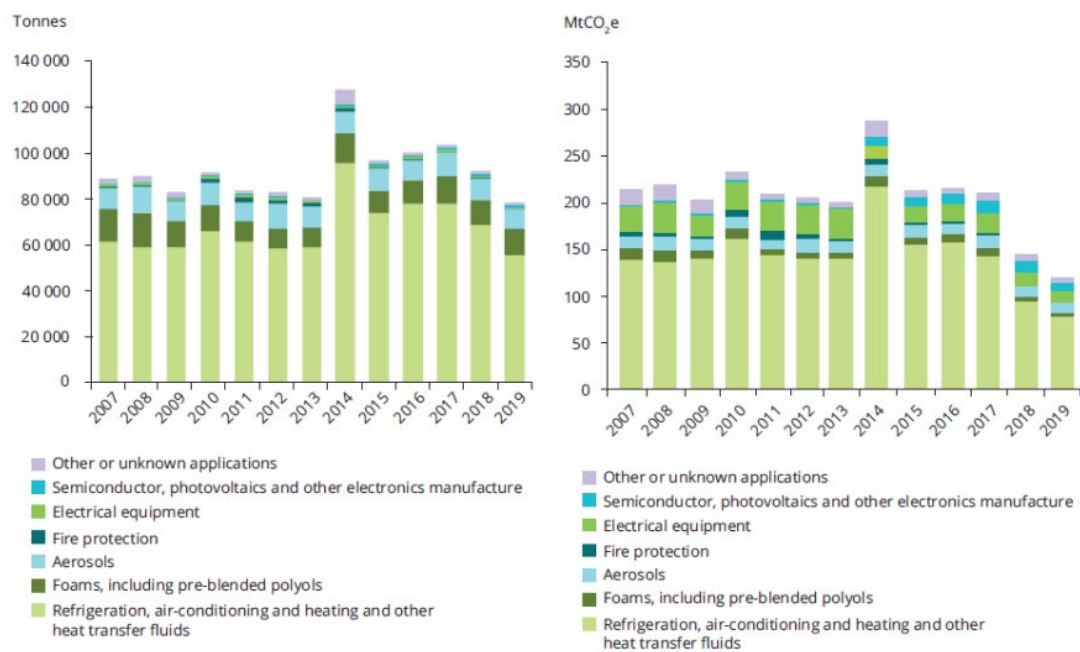


Figure 3. *Intended applications of total F-gas supply in the EU [1].*

Reference

European Environment Agency. *Fluorinated Greenhouse Gases 2020*. EEA Report No. 20/2020, Copenhagen, 2020.