# Update of the F-Gas Regulation Underway

As we all know, the use of **fluorinated refrigerants in Europe** is regulated by the **F-gas Regulation (EU 517/2014)**. The first version of this regulation was adopted as early as **2006**, and the currently applicable regulation[1] has been in force since **1 January 2015**. In summary, it includes:

- A **gradual reduction in the quantity of F-gases** that may be sold within the EU, reaching **21% of the 2015 sales level by 2030**, expressed in $CO_2$ equivalents.
- **Bans on the use of F-gases in certain types of new equipment** where less harmful alternatives are available.
- **Requirements for inspection, servicing, and recovery of refrigerant** when equipment is decommissioned.

As a result of the regulation, emissions of F-gases are expected to **decrease by up to two-thirds by 2030**, compared with 2014 levels.

## Revision of the Regulation

A **revision of the F-gas Regulation** has been underway for some time, and a proposal for a new version was expected in **April 2022**, provided no delays occur[2]. An evaluation of how the previous regulation has functioned has already been carried out and published[3], and stakeholders have been able to submit comments on this report. The public and companies also had the opportunity to provide feedback during a **consultation process in autumn 2020**, and a **virtual workshop** on the evaluation was held in May this year.

According to the report[3], **F-gas emissions have increased by 60% since 1990**, and F-gases now account for **2.5% of the EU's total greenhouse gas emissions**. The report also notes that the **restrictions on F-gas use adopted in 2016 under the Kigali Amendment to the Montreal Protocol** may reduce global warming by **up to 0.4°C by the year 2100**. This clearly illustrates the significant impact that F-gases have on global warming.

The report also emphasizes that **additional tightening of European legislation will be required** to meet the commitments under the Montreal Protocol after 2030.

The objectives of the update, as mentioned in the report, are threefold:

- **Harmonization with the Montreal Protocol**, including additional phase-down measures after 2030.
- **Higher ambition levels**, in line with decisions under the **European Green Deal**, which could lead to bans on F-gases in more applications than before.
- **Stricter monitoring and enforcement**, including better oversight of implementation, measures to reduce illegal imports, and actions against non-compliant operators. Under this point, proposals also include **training requirements for work with refrigerants that are not F-gases**.

## Debate on PFAS Substances

Since last summer, there has also been an increasing debate about the **phase-out of PFAS substances**. PFAS is a large group of highly fluorinated compounds with many areas of application. These substances are **extremely persistent in the environment**, and animal studies have established that some of them have **negative health effects**. They may disrupt hormones, affect the immune system, the liver, reproduction, and may also be **carcinogenic**[4].

It is still unclear which substances within the PFAS group are harmful, but work is ongoing within the EU that will likely result in **stricter legislation** for these substances. There are several definitions of PFAS, but there is little doubt that many **HFC and HFO refrigerants currently in use** would fall within the PFAS category. This does **not necessarily mean they are harmful to health**, however.

Some voices have suggested that **PFAS should also be included in the new F-gas Regulation**. This would represent a departure from the original purpose of the F-gas Regulation: **to reduce global warming by limiting fluorinated greenhouse gases**. The regulatory framework would become considerably more complex if it also addressed the **potential environmental and health risks of different refrigerants**.

It is therefore more likely that **separate legislation will be developed specifically for PFAS substances**, which is already underway. Those interested in learning more about PFAS are referred to the website of the **Swedish Chemicals Agency (Kemikalieinspektionen)**[4].

# Industry Opinions on the New Regulation

Work on the new F-gas Regulation is currently in an **intensive phase**, and organizations and stakeholders have expressed views on what the new regulation should include. Below we summarize opinions from two different sources. It should be emphasized that the organizations behind these statements are **not neutral**, but represent groups with their own interests and therefore attempt to influence the design of the new regulation.

## Shecco Report

**Shecco**, a company promoting the increased use of **natural refrigerants**, recently published a report titled *"F-gas Regulation Revision: Industry Wants More Ambition"*[5] (also available at varmtochkallt.se). The report presents the results of a market survey in which **125 individuals from more than 80 companies active in the EU** were asked about their views on a new F-gas Regulation. Not only companies working with natural refrigerants were included, but that group was likely **overrepresented**.

Key findings included:

- **77% of respondents** believed that the phase-down could proceed **more quickly**.
- Strong support for **more ambitious targets** for limiting F-gases in certain applications.
- **75% supported mandatory training** for work with natural refrigerants and the inclusion of such requirements in the F-gas Regulation.
- A large majority favored **higher ambition levels** in the next regulation, including more bans, faster phase-down, and stronger measures against **illegal refrigerant trade**.

- Strong support for **enhanced measures to combat illegal refrigerant trading**.

## EPEE Position Paper

Another report comes from **EPEE**, an association of more than **50 companies**, including many producers of **HFC and HFO refrigerants**. The report is titled *"Position Paper – Revision of the EU F-Gas Regulation"*[6].

Some key conclusions from this report include:

- Extend requirements for **recovery of used refrigerant** to **all refrigerants**, including non-fluorinated ones.
- Introduce **electronic logbooks** to monitor refrigerant quantities in systems and thereby reduce leakage.
- Introduce **harmonized EU certification requirements** for refrigeration technicians, regardless of refrigerant type.
- Establish **EU-wide minimum penalties** for violations of the regulation.
- National legislation deviating from EU rules on refrigerants should **not be allowed**.
- **Further bans on additional refrigerant types should be avoided.**
- The ambition level of the current F-gas Regulation **should not be increased**.

The report also argues that the **increased use of heat pumps reduces $CO_2$ emissions from combustion**, and claims that the European Commission focuses too strongly on the climate impact of F-gases while overlooking the **positive climate effects of expanded heat pump use**.

This argument is illustrated in **Figure 1**, which shows the expected development of **direct and indirect greenhouse gas emissions** from refrigeration systems and heat pumps under current legislation, as well as the **reduction in $CO_2$ emissions** achieved when heat pumps replace fossil-based heating. However, the report does **not explain the assumptions underlying the figure**.

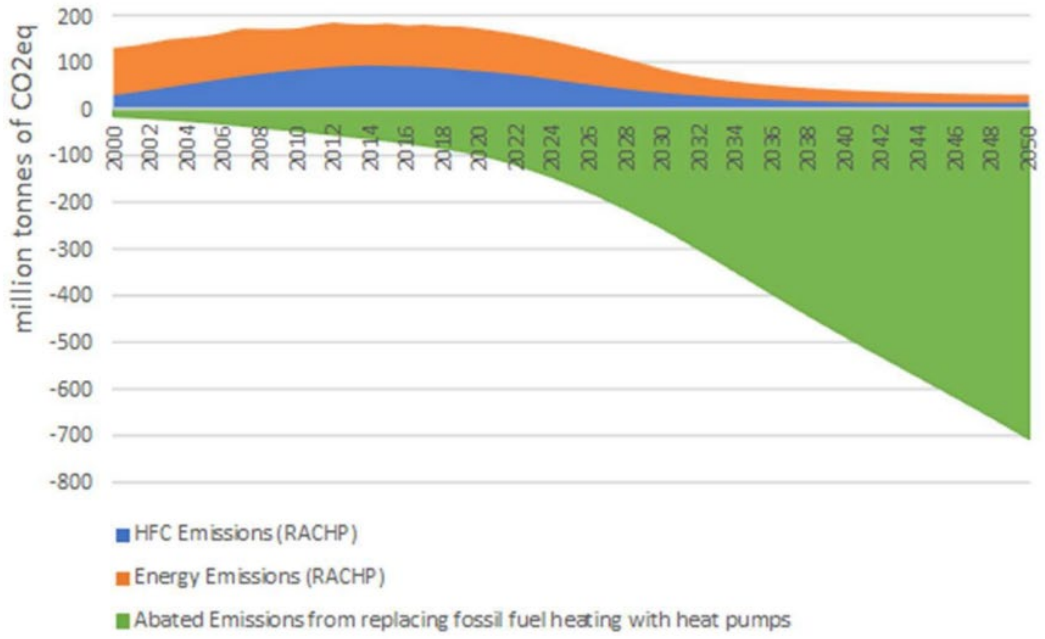



**Figure 1.** *Expected greenhouse gas emissions from refrigeration systems and heat pumps, and the reduction in $CO_2$ emissions resulting from the transition from fossil fuels to electrically driven heat pumps (from [6]).*

---

# Concluding Remarks

In summary, the two reports share several conclusions:

- **Certification and mandatory training** for refrigeration technicians regardless of refrigerant type
- **Stronger legislation to prevent illegal refrigerant trade**

However, they reach **diametrically opposite conclusions** regarding the **ambition level of the phase-down of fluorinated refrigerants**. These issues and arguments are also discussed within **EHPA's refrigerant working group**.

We will certainly return to the **update of the F-gas Regulation** in a future column.

Earlier articles in this series can be found at:
https://www.energy.kth.se/sv/applied-thermodynamics/publications/publications-1.916668