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F-gas phase-out: Navigating regulations for a sustainable future

What are F-gases?

Over the past 20 years, fluorinated gases - known as F-gases - have been used extensively in cooling systems throughout the world, from domestic refrigerators to large industrial refrigeration systems. These gases have become ubiquitous for a number of reasons, including their high efficiency, relative safety thanks to low toxicity and flammability, and the lack of ozone-depleting properties compared to chlorofluorocarbons (CFCs).

Fluorinated gases account for around 2% of the EU's total greenhouse gas emissions, but their use has increased by 60% since 1990, unlike other greenhouse gases, which have been reduced.

Driven by the need to overcome environmental challenges, new restrictions are being put in place, such as the phasing out of F-gases like hydrofluorocarbons (HFCs) by 2050.

Phasing out F-gas

Although fluorinated gases do not have the ozone-depleting properties of the CFCs they have largely replaced, they nevertheless have a high global warming potential (GWP). Their impact can be thousands of times greater than that of CO_2, and when they are released into the atmosphere, they can linger for several thousand years.

Recent regulations impose a gradual reduction in F-Gas based on their GWP, to encourage equipment manufacturers and refrigeration system operators to adopt more environmentally friendly alternatives. The gradual elimination of F-gas takes several forms :

1. Gradual reduction in sales

By 2030, the amount of F-gas marketed in the EU will be reduced by almost 95% compared to 2015 levels. Ban on use in new equipment where less harmful alternatives exist.

2. Tightened restrictions on refrigeration systems

Since 1 January 2025, equipment containing F-gas with a GWP above 2,500 will no longer be allowed to be serviced or recharged, with exceptions for very low temperature applications.

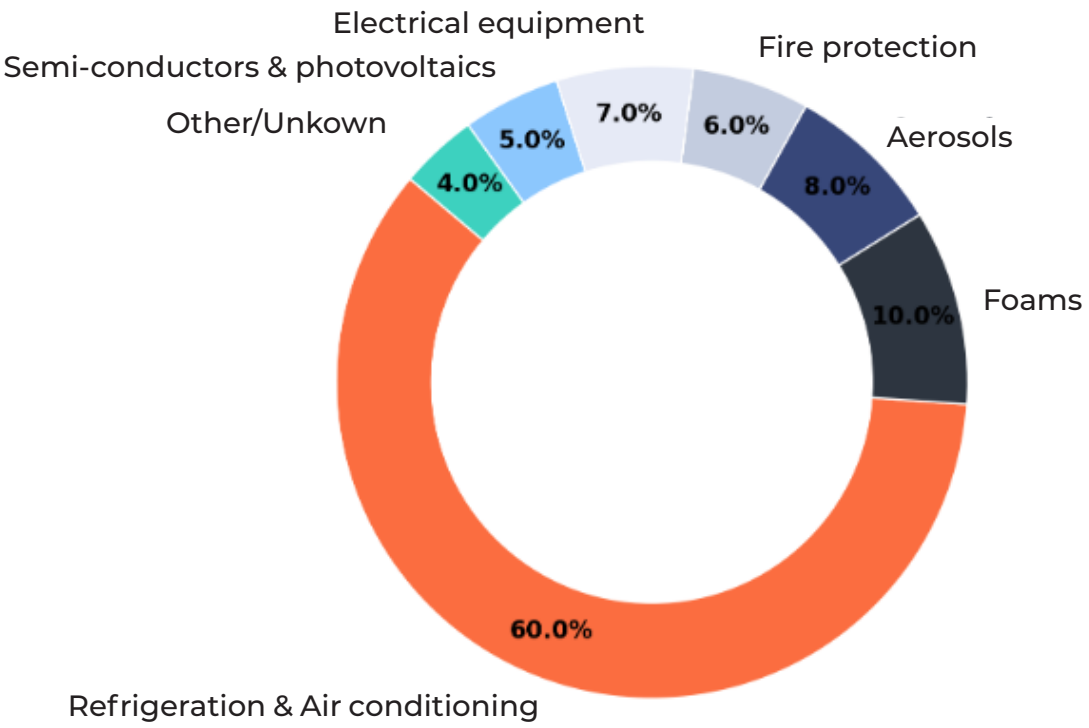
3. Strict rules on leaks and emissions

Companies risk fines in the event of refrigerant gas leaks, with the obligation to install leak detectors and comply with increased inspection frequencies.

How does this impact different sectors ?

While the F-gas phase-out impacts many sectors, such as chemical and pharmaceutical companies, construction and services, manufacturers, and data centres are likely to be among those most affected. Many require low temperatures in order to keep storage and processing systems at optimum conditions and have invested heavily in refrigeration systems.

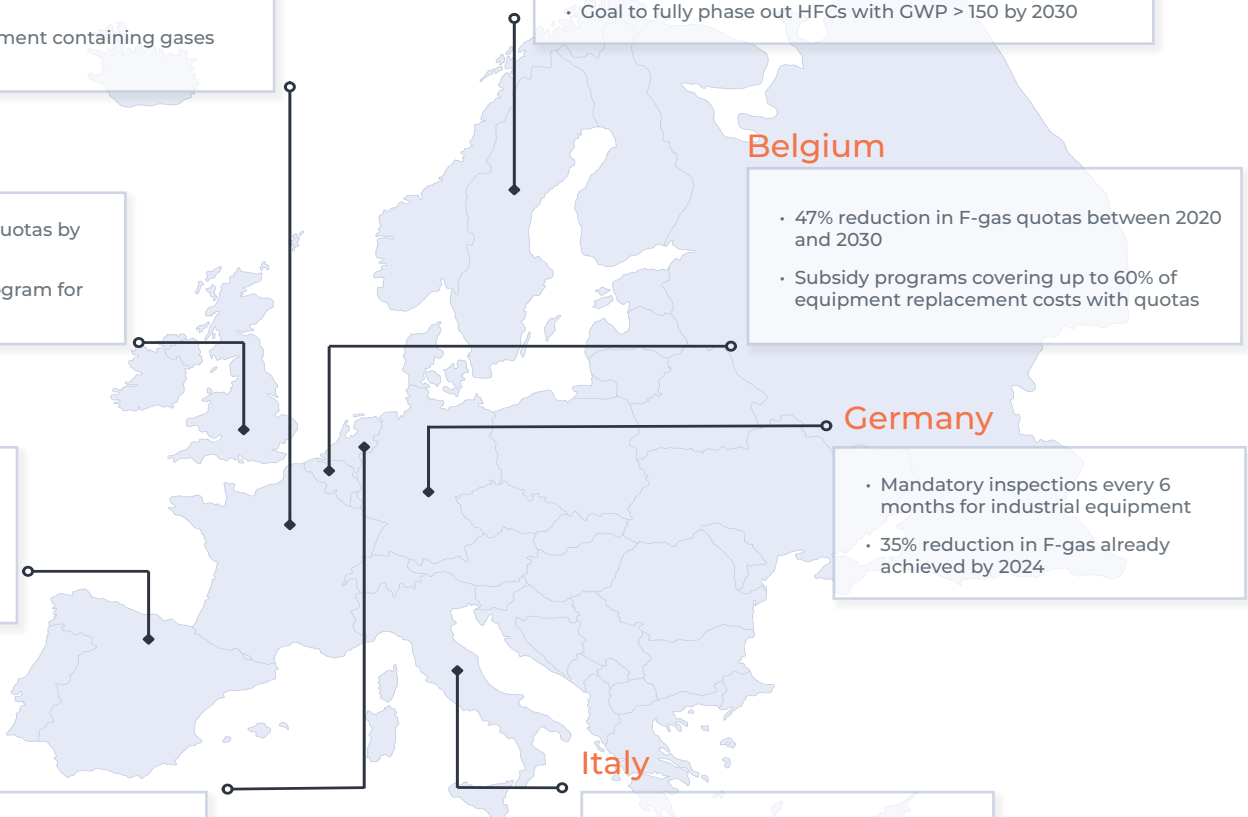
Breakdown of F-Gas Supply in the EU :



Service and maintenance restrictions

Since 2020, operators are no longer allowed to use many F-gases to recharge or refill existing cooling systems.
With the new restrictions in place, a major leak could render equipment completely unusable, while a gradual leak could also compromise its proper operation over the long term.

What's more, since 1 January 2025, certain additional bans has coming, notably on refrigeration equipment containing F-gas with a GWP greater than 2,500, except for specific very low-temperature applications.These regulations are a strong incentive for manufacturers to anticipate and plan for the transition to low environmental impact alternatives.



France

- 95% reduction in fluorinated gases by 2030 (compared to 2015)
- From 2025, ban on equipment containing gases with GWP > 2,500

Nordic Countries

- Gradual 70% reduction in HFCs by 2029. Carbon tax on F-gases: €55/ton CO_2 equivalent in Sweden, €52 in Norway, quotas by 2030
- Goal to fully phase out HFCs with GWP > 150 by 2030

United Kingdom

- 79% reduction in F-gas quotas by 2033
- £40 million incentive program for low-carbon alternatives

Belgium

- 47% reduction in F-gas quotas between 2020 and 2030
- Subsidy programs covering up to 60% of equipment replacement costs with quotas

Spain

- Mandatory replacement of systems with GWP > 1,500 by 2027
- Higher F-gas tax, up to €30/ton CO_2 equivalent

Germany

- Mandatory inspections every 6 months for industrial equipment
- 35% reduction in F-gas already achieved by 2024

Netherlands

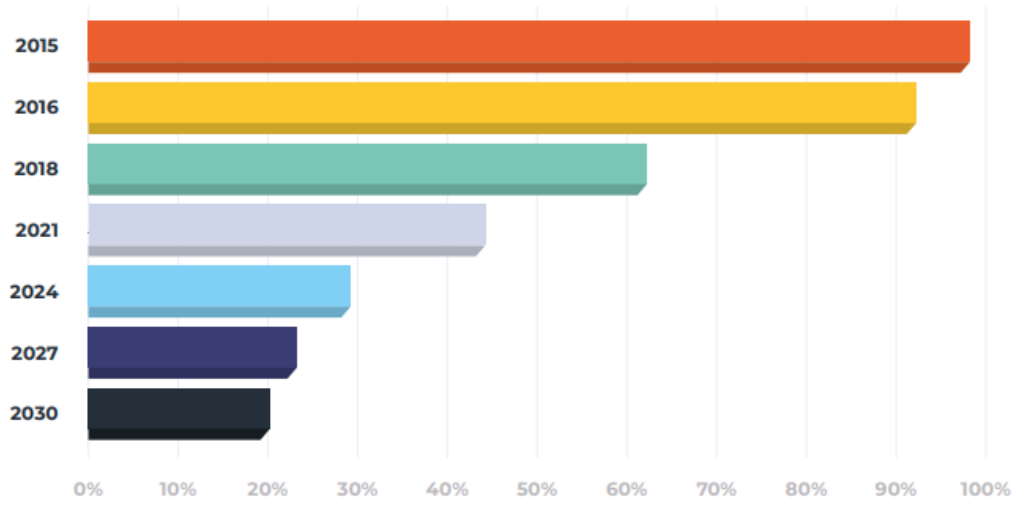
- Compliance checks every 2 years for refrigeration systems
- Financial penalties up to €50,000 for non-compliance

Italy

- Gradual 70% reduction in HFCs by 2029
- Fines up to €100,000 for non-compliance

Phase-out timeline

While the regulations aren't calling for a ban on any particular type of F-gas, they instead limit the total GWP of the F-gases placed on the market. This means that the highest GWP gases will likely be eliminated from the market first, as they will become prohibitively expensive.



Refrigerants most at risk

The production of fluorinated gases in the EU has evolved in recent years, with a significant increase in the average GWP, rising from 3,012 in 2007 to 8,336 in 2023. Most F-gases are between 1,000 and 20,000 times more impactful than CO_2 in terms of GWP. This puts even more pressure on refrigerants with a high environmental impact.

GAS	R134A	R404A	R407A	R407C	R410A	R422D	R427A	R438A	R507
GWP	1430	3922	2107	1774	2088	2729	2138	2265	3985

Those with the highest GWP are most at risk from regulations, particularly R404A and R507, whose GWP values far exceed 3,900.
With rising costs and increasing restrictions, recharging a large-volume system using these gases may become prohibitively expensive making plans for phasing them out now.

Planning for the phase-out

There are a number of factors that need to be taken into account to ensure that your site complies with the new F-gas regulations :

Anticipating price rises

If your site is still using F-gas, you should be aware that F-gas prices will continue to rise sharply over the coming years. This applies in particular to gases with a high GWP, which could become very difficult to obtain as a result of the progressive restrictions.

Restriction on servicing and maintenance

From 1 January 2025, the servicing and refilling of equipment using fluorinated gases with a GWP greater than 2,500 will be prohibited, with rare exceptions for certain specific applications. A simple leakage incident could render a refrigeration system unusable, resulting in considerable loss of time and money for operators.

Environmental reputation

Industries are coming under increasing scrutiny for their environmental commitment.
A leak of high-GWP fluorinated gas can cost much more than a simple fine because of the impact on a company's image.Rapidly adopting more environmentally-friendly alternatives can demonstrate a genuine commitment to ecological transition and boost the confidence of stakeholders.

Access to finance

Whether it's to purchase new equipment or modify existing systems, compliance with the F-gas regulation requires significant initial investment. It is therefore essential to integrate these costs into the budget strategy and to explore the financial aid and subsidies available to facilitate this transition.

Impact of new F-gas regulations on contractors

If you are contractors specialising in refrigeration, air conditioning, and heat pump systems, here is what to expect with the new F-gas regulations in Europe, effective from 1 January 2025. These strict restrictions on the use of fluorinated gases with high global warming potential (GWP) will have significant implications for your business.

Key obligations and challenges

Ban on maintenance and refilling:

Equipment with fluorinated gases having a GWP over 2,500 cannot be serviced or refilled, except for specific low-temperature uses. You must learn about low-GWP alternatives and plan for equipment upgrades or replacements.

Leak detection and repair:

Companies must install leak detectors and adhere to increased inspection frequencies to prevent fluorinated gas emissions. You will need to be trained in the use of these technologies and the implementation of rigorous maintenance protocols.

Reduction of quotas and cost increases:

Fluorinated gas quotas will be significantly reduced, leading to higher prices for refrigerants. You will need to anticipate these cost increases and advise your clients on the best strategies to manage these expenses.

Opportunities for Contractors

Transition to ecological alternatives:

The new regulations encourage the adoption of natural refrigerants like CO_2 and propane. You can position yourself as experts in sustainable solutions, offering conversion and retrofit services for existing systems.

Training and certification:

The regulations require specific certifications for professionals handling fluorinated gases. You can benefit from training programmes to obtain these certifications, thereby increasing your credibility and competitiveness in the market.

Technological innovation:

The new rules drive innovation in cooling and air conditioning technologies. Invest in cutting-edge equipment and offer innovative solutions to strengthen your position as industry leaders.

The new F-gas regulations pose significant challenges for contractors, but also offer opportunities for those who adapt and innovate. By complying with regulations and adopting sustainable practices, you can minimise non-compliance risks and enhance your market reputation and competitiveness.

How Aggreko can support transition to lower GWP refrigerants

Aggreko has already successfully supported numerous companies, particularly in the chemical and pharmaceutical, construction, manufacturing and data centres sectors, in their transition towards refrigerants with lower Global Warming Potential (GWP). Our expert teams of specialised sales engineers and project managers proactively design and implement customised cooling solutions tailored precisely to your operational needs.

Our comprehensive portfolio of high-performance cooling systems ensures full compliance with evolving F-gas regulations, while providing reliability and operational efficiency. Aggreko is uniquely positioned to address complex regulatory challenges with flexible, market-adapted solutions.

We also collaborate closely with operational teams to proactively identify potential risks and establish robust contingency plans. In critical environments where even brief downtime can result in substantial financial impacts, our forward-looking planning and rapid response capabilities ensure business continuity and peace of mind.

Our exclusive Greener Upgrades™ programme helps you smoothly transition to more sustainable cooling solutions with energy-efficient technologies.
Designed to minimise your environmental impact, reduce operational costs, and ensure ongoing regulatory compliance, Greener Upgrades™ enables your business to stay competitive and future-ready.

GREENER UPGRADES™

Aggreko has proactively adapted its equipment and solutions to anticipate and exceed the demands of increasingly strict F-gas regulations. We have invested significant resources and conducted extensive research to ensure our customers experience a smooth transition to compliant refrigerants and technologies.

Retrofitting existing equipment :

By retrofitting our existing chillers, such as the VLTC350 models, with lower GWP refrigerants, Aggreko has significantly
reduced refrigerant emissions. Retrofitting efforts are currently expanding across Europe, particularly for our 800kW chillers. Approximately 50% of our 400kW chillers are also eligible for retrofitting.

Natural refrigerant solutions :

Our new VLTV550 chillers use a non-flammable, non-toxic natural refrigerant (CO2) with an impressively low refrigerant charge of only 40kg. This technology is unique in the market, providing a reliable, future-proof solution.

Through these efforts, Aggreko has reduced refrigerant emissions across our fleet by between 50% and 71%, underscoring our proactive approach and commitment to sustainability.

Screw Compressors

1500kW Chiller

Before retrofitting
Gas R134A
GWP 1430

After retrofitting :
Gas R513A
GWP 629

800kW Chiller

Before retrofitting
Gas R134A
GWP 1430

After retrofitting :
Gas R513A
GWP 629

Low Temperature

VLTC 350

Before retrofitting
Gas R507
GWP 3985

After retrofitting :
Gas R449A
GWP 1397

VLTC550

New Product

Natural
Refrigerant $C0_2$
GWP : 1

CONCLUSION

Partnering with you to navigate the f-gas transition

At Aggreko, we understand that the ongoing tightening of F-gas regulations presents significant challenges for your business. Our mission is to proactively support you at every step of your journey towards compliance and operational excellence.

By leveraging our specialised expertise, tailored solutions, and ongoing investment in our equipment fleet, we ensure that your transition to lower-GWP refrigerants is seamless, effective, and aligned with your operational priorities. Choosing Aggreko means choosing a trusted partner committed to your success, helping you minimise risk, avoid downtime, and protect your long-term competitiveness.