

# EU F-Gas Regulation Guidance

## Information Sheet 28: The HFC Phase Down Process

### Target audience for this Information Sheet

This information sheet is aimed at all organisations that may be affected by the phase down of HFC supply that is defined in the 2014 EU F-Gas Regulation. This includes end users, maintenance contractors and equipment manufacturers. It is also of relevance to F-Gas producers, importers and exporters.

## 1. Background

This guidance is for organisations affected by the 2014 EU F-Gas Regulation (517/2014). The F-Gas Regulation creates controls on the use and emissions of fluorinated greenhouse gases (F-Gases) including HFCs, PFCs and SF<sub>6</sub>. The 2014 EU F-Gas Regulation replaces the 2006 Regulation, strengthening all of the 2006 requirements and introducing a number of important new measures.

A crucial aspect of the 2014 Regulation is the introduction of the phase down in the supply of HFCs within the EU market. This Information Sheet provides guidance on how the phase down process will occur and the impact that this will have on the current market for HFCs.

A wide range of further guidance is available for other aspects of the EU F-Gas Regulation – see Information Sheet 30 for a full list and a glossary of terms.

## 2. Why an HFC Phase Down?

HFCs are used in a range of applications such as refrigeration, air-conditioning, heat pumps, foam insulation and aerosols. HFCs are very powerful greenhouse gases – the most commonly used HFCs have a global warming potential (GWP) between 1,000 and 4,000 times higher than CO<sub>2</sub>.

The HFC phase down is being introduced to drive the market towards use of lower GWP alternatives<sup>1</sup>. Many lower GWP alternatives already exist and are “near market” but they are not in widespread use in current HFC markets. The phase down will force technology change and make a substantial contribution towards lower greenhouse gas emissions.

The proposed phase down will lead to a 79% cut in current levels of HFC sales by 2030. This is a very significant cut and will only be achieved with widespread action from fluid suppliers, equipment and product manufacturers, installation and maintenance contractors and end users.

It is important to note that this is a phase down not a phase out. 21% of current sales can be placed on the market after 2030. This is because there are some end uses where there are currently no safe, cost-effective or environmentally beneficial alternatives to HFCs.

The phase down is based on a series of cuts in supply from a “baseline”. It is based on a “GWP-weighted” process, which will encourage the rapid phase down of the highest GWP HFCs. A quota system will be introduced to control sales in the EU market.

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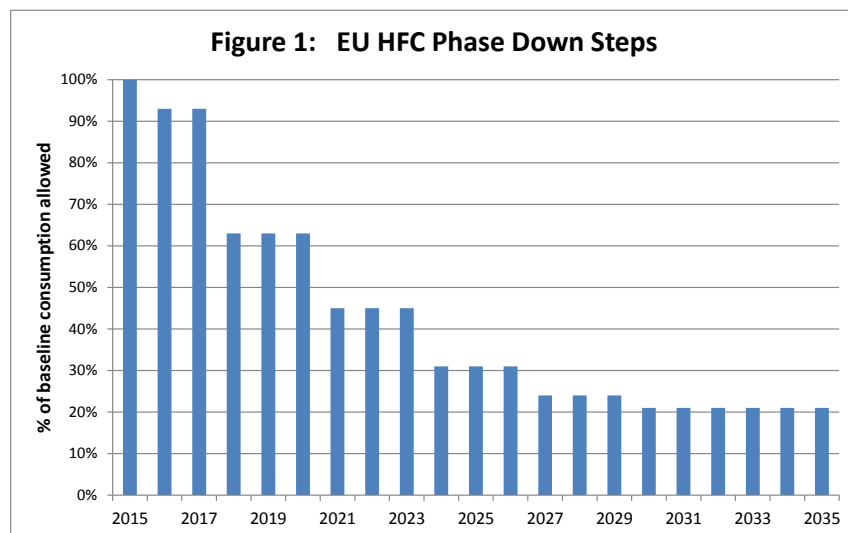
<sup>1</sup> See Information Sheet 29 for guidance on low GWP alternatives

### 3. HFC Baseline

The baseline for the HFC phase down process is the average consumption of HFCs on the EU market during the years 2009 to 2012. Under the 2006 EU F-Gas Regulation, all producers, importers and exporters of F-Gases had to report annual data for quantities of bulk HFCs. The baseline is calculated in terms of “CO<sub>2</sub> equivalent<sup>2</sup>”. The baseline amount is 183 million tonnes CO<sub>2</sub> equivalent.

### 4. Phase Down Steps

The phase down starts in 2015 with a series of cuts from the baseline amount, as shown in Figure 1.



It is worth noting:

- The start of the process is fairly gentle, with 100% of baseline sales allowed in 2015 and a 7% cut in 2016 and 2017.
- There is a “hidden step” in 2017 as all imported pre-charged equipment must use HFCs from the EU quota from 2017 onwards. Under business-as-usual this will add a further 11% to EU demand. This makes the cut in 2017 equivalent to 18%.
- There is a very big cut in 2018. As shown in Figure 1, the cut is 37%. However, the pre-charged imports must be taken into account – this makes the cut equivalent to 48%. It is clear that HFC users are going to need to significantly reduce their demand by 2018 to avoid supply shortages. Early action is vital!
- By 2024 the cut is nearly 70% and from 2030 onwards the cut is 79%.

### 5. A GWP Weighted Process

The annual quantities in the baseline and the phase down steps are based on “GWP tonnes”. This means the physical tonnage of each gas sold multiplied by its GWP (global warming potential). This is very important, as it will put most pressure on the refrigerants with the highest GWP. Table 1 illustrates the GWPs of a number of common HFCs.

Two commonly used HFCs are HFC 404A and HFC 134a. As shown in Table 1, these have GWPs of 3,922 and 1,430 respectively. HFC 404A has a very high GWP – it is 2.7 times higher than the GWP of HFC 134a. This means that selling 1 kg of HFC 404A will “use up” 2.7 times as much of the allowed HFC allocation as selling 1 kg of HFC 134a.

<sup>2</sup> See Information Sheet 25 “Understanding CO<sub>2</sub> thresholds”

It is reasonable to expect that the prices of HFCs will rise considerably as supplies become constrained. It is also reasonable to expect that this price rise will be GWP weighted – there will clearly be greatest phase down pressures on HFC 404A and HFC 507.

**Table 1: Example GWPs** (based 100 year GWP values in Annex I of the 2014 F-Gas Regulation)

Refrigerant	GWP
HFC 507	3,985
HFC 404A	3,922
HFC 227ae	3,220
HFC 407C	1,774
HFC 134a	1,430
HFC 245fa	1,030
HFC 32	675
HFO 1234yf	4
Propane	3
CO <sub>2</sub>	1
Ammonia	0

The first 7 fluids in Table 1 are HFCs – these are all affected by the phase down. It is important to note that there are many other HFCs not shown in Table 1 also affected. The last 4 fluids in Table 1 are not affected by the phase down as they are not HFCs – they are included to illustrate some of the ultra-low GWP alternatives that are available.

## 6. An EU-Wide Process

It is important to be aware that the phase down process is for the whole EU. There is no guarantee that UK will get pro-rata share of the phase down amounts.

## 7. The Sales Quota System

The phase down process is being implemented via a sales quota system. Only companies with an HFC quota, received from the European Commission, will be allowed to produce HFCs or import them into the EU. Most of the quotas are being given to the companies that produced or imported HFCs during the baseline period (2009 to 2012). A small proportion (11%) is allocated to “new entrants”.

## 8. Imports of Pre-charged Equipment

From 2017 onwards, any refrigeration, air-conditioning or heat pump equipment imported into the EU that is pre-charged with HFCs, must use HFCs obtained from the EU quota. Importers will need to prove to the authorities that the equipment they import complies with this requirement.

Non-EU manufacturers will have the option of:

- a) Purchasing their required HFCs from an EU quota holder (the quota holder would deliver actual HFC fluids to the non-EU manufacturer)
- b) Obtain an authorisation from an EU quota holder to use a specified amount of their quota (the non-EU manufacturer will then be able to source the actual HFC fluid from a local supplier)

EU-based manufacturers of pre-charged equipment must also use HFCs from the EU quota.

## 9. Exports of Bulk HFCs and Pre-charged Equipment

Exports of bulk HFCs are outside the EU quota mechanism. If a quota holder exports some of their product, it does not count as “placing on the EU market”. If a quota holder sells HFCs to a 3<sup>rd</sup> party who then exports the bulk gas, the quota holder can receive an “export credit” providing the exporter informs the quota holder about the amount exported.

Exports of pre-charged equipment are included within the quota system where the HFCs are purchased on the EU market. However, an equipment manufacture is allowed to import HFCs for filling into pre-charged equipment and subsequent re-export – this will be outside the quota mechanism if the correct customs processes are used.

## 10. Responding to the Phase Down

The phase down will clearly put pressure on manufacturers and users of HFC based products and equipment. To achieve the required cuts, users of HFCs will need to combine 4 strategies:

- a) **For existing refrigeration systems**, consider the possibility of replacing high GWP refrigerant with a “medium GWP” HFC. For example, use HFC 407F in place of HFC 404A. This will create a 50% cut in GWP weighted demand. This is a realistic example as HFC 407F can often be “retrofitted” into existing HFC 404A equipment.
- b) **For existing systems**, reduce the quantity of HFCs used by reducing leakage. A good leak reduction strategy can often reduce annual leak rates by at least 50%.
- c) **For new systems**, carefully consider which HFCs to use. Very high GWP HFCs such as HFC 404A and HFC 507 should be avoided immediately – there are virtually no refrigeration applications that still need these high GWP refrigerants in new systems. If possible use one of the “ultra-low” GWP refrigerants in Table 1 (e.g. ammonia, CO<sub>2</sub>, HFO 1234yf) – these fall outside the scope of the phase down. If that is not possible, there are various new “moderate GWP” refrigerants that will come on the market over the next few years. These have GWPs in the 200 to 700 range (see Information Sheet 29 for further guidance).
- d) **For new systems**, ensure a low leakage design. Spending a little extra on good quality components and design strategies that avoid problems like vibration of pipework can keep leakage to a minimum – this will be a good investment as the prices of HFCs rise in response to the phase down.

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**This Information Sheet has been prepared by Gluckman Consulting**

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