Frequently asked questions (FAQs) March 2021

1. What is the EPA inventory of ODS and F-Gas equipment intended to do?

The purpose of this survey is to clarify the extent of use of fluorinated greenhouse gas (F-gas) and Ozone Depleting Substances (ODS) across IE, IPC and Waste licensed sites. This includes establishing the list of equipment at licenced sites that contains F-gas or ODS gas and assessing compliance with the following Regulations:

1. The EU-F-Gas Regulation: Regulation (EU) No. 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases. The European Union (Fluorinated Greenhouse Gas) Regulations 2016 (S.I. 658 of 2016), supports the implementation of Regulation (EU) 517/2014.
2. The ODS Regulation: Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer. The ODS Regulation was given further effect in Ireland by the Control of Substances that Deplete the Ozone Layer Regulations 2011 (S.I. No. 465 of 2011).

An inventory is considered good practice as it can provide a summary of all the equipment on site and can be used as a means of tracking equipment and collating relevant information in relation to both these Regulations.

This survey provides a framework for licensees to develop their own site inventory, to review ODS & F-gas operations on-site and to assess their compliance with the above Regulations.

2. What will the results be used for?

The results of this survey are intended to establish the status of compliance with the ODS & F-Gas Regulations at licensed sites. In particular, the inventory will provide:

- an understanding of how widespread the use of ODS and F-gases is across licensed activities;
- an understanding of the type of equipment containing F-gas and ODS and the quantities and types of F-gas and ODS used at licensed sites;
- an indication of general awareness and compliance levels in relation to the EU F-Gas and ODS Regulations at licensed sites particularly in relation to leak-checking;
- information on the current rollout of alternative refrigerants at licensed sites:

  The EU F-Gas Regulation requires a “phase down”, or progressive reduction, of HFCs placed on the EU market and a move towards the use of alternative gases with lower GWP. The EU F-Gas Regulation stipulates a stepwise decrease in HFC use of 79% by 2030 (compared to 2015 levels) through a quota system which is operated by the European Commission. This information will give us an indication of Ireland’s progress so far.

The survey will also allow us to deliver more effective enforcement of ODS and F-gas regulatory requirements at licensed sites, which will contribute to Ireland meeting our emissions reduction targets.

3. Will my report be kept confidential?

The information collected in this survey will not be published except in aggregated form.

Public Access to the licensing and enforcement information held by the EPA is made available in line with Ireland's obligations under the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters and in accordance with the following statutes:

- Environmental Protection Agency Act 1992 as amended
- Waste Management Act 1996 as amended
- Genetically Modified Organisms Regulations, 2003
- Access to Information on the Environment Regulations, 2007 to 2014
- Freedom of Information Act, 2014

Any request for access to information will be considered in line with GDPR and the Data Protection Acts.

4. If this inventory is not applicable to my installation, how do I inform the Agency?

If this inventory is not applicable to your installation, i.e.:

- The installation does not have stationary equipment containing F-gases or ODS and does not use F-gas in any manufacturing processes on-site, and
- The installation only has domestic fridges or hand-held fire extinguishers that contain F-gas or ODS on-site.

Please email m.lenihan@epa.ie and Agency records will be amended accordingly to reflect the above information.

5. What is a Greenhouse Gas?

A greenhouse gas is any gas that has the property of absorbing infrared radiation (net heat energy) emitted from Earth's surface and reradiating it back to Earth's surface, thus contributing to the greenhouse effect.

6. What are Fluorinated Greenhouse Gases (F-gases)?

Fluorinated Greenhouse Gases (F-gases) are very powerful greenhouse gases (GHG) that contribute to climate change if emitted to the atmosphere. Most F-gases have a relatively high Global Warming Potential (GWP), ranging up to 23,900 tonnes carbon dioxide equivalent. F-gases include hydrofluorocarbons (HFCs), sulphur hexafluoride (SF6), and perfluorocarbons (PFCs) which are listed in Annex I of the EU F-Gas Regulation. If a mixture of different gases contains one of these substances, the mixture is also subject to the EU F-Gas Regulation. There other F-gases listed in Annex II of the EU F-Gas Regulation e.g. nitrogen trifluoride which also place reporting obligations on producers, importers and exporters.

7. What does the term Global Warming Potential (GWP) mean?

The Global Warming Potential (GWP) is the climatic warming potential of a greenhouse gas relative to that of carbon dioxide ('CO2'), calculated in terms of the 100-year warming potential of one kilogram of a greenhouse gas relative to one kilogram of CO2, as set out in Annexes I, II and IV or in the case of mixtures, calculated in accordance with Annex IV of Regulation (EU) No. 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases Regulation (EU) No. 517/2014. The higher the GWP of an F-gas, the more damaging it is if released to the atmosphere.

8. What does the term tonnes of CO2 equivalent (tCO2eq) mean?

TCO2eq means a quantity of greenhouse gases expressed as the product of the weight of the greenhouse gases in metric tonnes multiplied by their global warming potential.

9. Can you provide a brief overview of the EU F-Gas Regulation?

Regulation (EU) No. 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases, hereinafter referred to as the EU F-Gas Regulation, came into force on 1st January 2015. The EPA are the competent authority for the enforcement of this Regulation nationally.

The objective of the EU F-Gas Regulation is to protect the environment and combat climate change by reducing and preventing emissions to atmosphere of F-gases and driving a switch to the use of low GWP F-gases or other non-F-gas alternatives. The EU F-Gas Regulation presents two strategies to reduce F-gas emissions:

1. ***Containment***: Prevent leakage and emissions through proactive leak checks on certain categories of equipment, repair of leaks within one month, training and recovery of F-gases during equipment decommissioning, and
2. ***Phase-Down***: Reduce the use of high GWP HFC refrigerants through the following measures

   2.a Placing on the Market Bans for Equipment Relying on F-gas Refrigerants for their function (Article 11, Annex III):

   Bans on the sale of specified categories of equipment by gas type and/or quantity are set for various dates from July 2007 until January 2025. For instance, stationary refrigeration that relies on refrigerant gases with a GWP ≥ 2,500 cannot be placed on the market from January 2020.

2.b Control of Use of HFC Refrigerants (Article 13):

The service and maintenance of refrigeration equipment containing ≥ 40 tCO2eq of F-gases with a GWP ≥ 2,500 will be prohibited from January 2020 for virgin gases with the use of recycled and reclaimed gases allowed until January 2030.

2.c Reduction in the Quantity (**"Phase Down"**) of HFC Refrigerants placed on the Market:

Since 2015, the amount of bulk HFC gases that can be placed on the market by importers or producers has been subject to quantitative limits. These limits will decrease in a series of step-downs until 2030 when the annual quantity of HFCs placed on the market and available to operators will be reduced by 79% of the baseline. Baseline data is the annual average of gas sales from 2009-2012.

These measures will lead to the adoption of low GWP F-gases or non-F-gas alternatives such as ammonia, hydrocarbons and carbon dioxide instead of the high GWP F-gases currently used. These measures will result in a significant reduction in greenhouse gas emissions.

The European Union (Fluorinated Greenhouse Gas) Regulations 2016 (S.I. 658 of 2016), supports the implementation of Regulation (EU) 517/2014.

For more information, refer to:
http://www.epa.ie/pubs/advice/air/ods/1irlsummaryguidancetocompliancewiththeodsandf-gasregulationsv10.html

10. How do I calculate tonnes CO2 eq of a Greenhouse Gas?

The tonnes of CO2 equivalent (tCO2eq) of an F-gas is calculated by multiplying the mass in tonnes by the Global Warming Potential (GWP) of that gas.

tCO2 equivalent = mass (in tonnes) * GWP

For example, the tonnes CO2 equivalent of 10 kg of the HFC refrigerant R-404A (which has a GWP of 3,922) is calculated as follows:

(0.01 T) * 3,922 GWP = 39.2 tonnes CO2 eq

Annex IV of Regulation (EU) No. 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases details the method of calculating the total GWP of a mixture.
https://www.epa.ie/pubs/legislation/air/ods/Regulation%20517%20of%202014%20Fgas.pd.

However, you can easily determine the GWP and T CO2 eq for F-gas, ODS and blends/mixtures using the following link:
https://www.unep.org/ozonaction/resources/gwp-odp-calculator/gwp-odp-calculator

or by downloading the app 'GWP-ODP Calculator' on your phone.

11. Why do I have to calculate tonne(s) of CO2 equivalent for each piece of equipment containing F-gas?

You need to know whether items of equipment in your control fall under the requirement for mandatory leak checking of equipment containing F-gas as set down in the EU F-gas Regulation. This is determined by the quantity of refrigerant charged into each item of equipment expressed in tCO2eq.

Each item of equipment that contains F-gas in quantities of 5 tonnes of CO2eq or more must be leak checked as outlined in **Table 1** below (Q.22).

12. Where can I get information on the HFC "Phase Down"?

A summary guide to the HFC phase down can be found at
http://www.epa.ie/pubs/advice/air/ods/6%20%20IRL%20Summary%20Guide%20to%20the%20HFC%20Phase%20Down%20V1.0.pdf.

See also Q.9.

13. What is the HFC phase down schedule?

The phase down will reduce the supply of HFCs on a tCO2eq basis. In 2015 the supply was set at 100% - measured as the baseline average supply during the period 2009 to 2012. The supply is being reduced in stages to: 93% in 2016, 63% in 2018, 45% in 2021, 31% in 2024, 24% in 2027 and finally 21% of baseline in 2030. The phase down means that by 2030 the annual quantity of HFCs placed on the market and available to operators of equipment containing HFC will be reduced by 79% when compared to 2015. The adoption of the Kigali Amendment to the Montreal Protocol means that a further reduction in HFC availability is likely be implemented soon. As a result of the HFC phasedown, the price of high GWP HFCs has increased in recent years and the ongoing availability of these gases is in doubt as manufacturers cease their production.

14. What are the most common HFCS for phase down?

The most common HFCs used in refrigeration, air conditioning and heat pump equipment include R404A, R134a, R507, R410A, R407A and R407C.

15. What is the definition of an operator under the EU F-Gas Regulation?

The operator is defined in the F-Gas Regulation as "*the natural or legal person exercising actual power over the technical functioning of products and equipment covered by this Regulation*". As a starting point the owner should assume responsibility for operator obligations under the F-Gas Regulation unless it is confirmed that the operator obligations have been transferred to a third party.

16. What are the General F-Gas Containment Requirements specified in the EU F-Gas Regulation?

There are three general F-gas containment requirements specified in the EU F-Gas Regulation outlined below:

- **I.** The intentional release of fluorinated greenhouse gases into the atmosphere shall be prohibited where the release is not technically necessary for the intended use.
- **II.** Operators of equipment that contains fluorinated greenhouse gases shall take precautions to prevent the unintentional release ('leakage') of those gases. They shall take all measures which are technically and economically feasible to minimise leakage of fluorinated greenhouse gases.
- **III.** Where a leakage of fluorinated greenhouse gases is detected, the operators shall ensure that the equipment is repaired without undue delay.

17. What is an operator required to do in the event that a F-gas leak is detected?

In the event that a F-gas leak is detected the operator is required to do the following:

- **a.** Where a leakage of fluorinated greenhouse gases is detected, the operators shall ensure that the equipment is repaired without undue delay by an F-gas certified technician.
- **b.** Where the equipment is subject to mandatory leak checks under Article 4(1) of the EU F-Gas Regulations, and a leak in the equipment has been repaired, the operators shall ensure that the equipment is checked by a certified technician within one month after the repair to verify that the repair has been effective. This recheck can take place on the same day that the leak is fixed once the system has been repaired and the system has returned to balanced, normal operation.
- **c.** Where the equipment is subject to leak checks under Article 4(1) of the EU F-Gas Regulations, specified records must be maintained for at least five years. It is recommended that similar records are maintained for equipment not subject to mandatory leak checking.

18. Am I required to keep Leak Checking Records for equipment containing F-gas?

The operator of equipment containing F-gases which is subject to mandatory leak checking is required to maintain specified records for each piece of equipment under Article 6 of the EU F-Gas Regulations. Copies of F-gas records shall be maintained for at least five years and shall be made available for inspection by the Environmental Protection Agency upon request. A copy of the records shall also be held by any contractor who carried out the work for a period of at least five years.

19. What information is required to be retained in Leak Checking Records?

The records must contain certain information specified by Article 6 of the EU F-Gas Regulations outlined below:

- **a)** The quantity and type of fluorinated greenhouse gases installed;
- **b)** The quantities of fluorinated greenhouse gases added during installation, maintenance or servicing or due to leakage;
- **c)** Whether the quantities of installed fluorinated greenhouse gases have been recycled or reclaimed, including the name and address of the recycling or reclamation facility and, where applicable, the certificate number;
- **d)** The quantity of fluorinated greenhouse gases recovered;
- **e)** The identity of the undertaking which installed, serviced, maintained and where applicable repaired or decommissioned the equipment, including, where applicable, the number of its certificate;
- **f)** The dates and results of mandatory leak checks carried out under Article 4(1) to (3);
- **g)** If the equipment was decommissioned, the measures taken to recover and dispose of the fluorinated greenhouse gases.
- **h)** Where the cause of a leakage has been identified, it shall be indicated in the equipment records.

Note:

It is considered best practice that records of the installation, servicing, maintenance, repairing, decommissioning and leak checking of stationary refrigeration, air conditioning, heat pumps and fire protection equipment which is not subject to statutory leak checking requirements as per Article 4(1) to (3) of the EU F-Gas Regulation are also maintained by the operator for at least five years. Likewise, it is considered best practice that copies of such records are maintained by any contractor undertaking any such work.

As the operator of equipment containing F-gas refrigerants, you are also required under Regulation 12(2)(b) of the European Union (Fluorinated Greenhouse Gas) Regulations 2016 to establish and maintain records of the movement of any waste refrigerant gas which arises.

20. What is a hermetically sealed system?

A hermetically sealed system is equipment in which all fluorinated greenhouse gas containing parts are made tight by welding, brazing or a similar permanent connection, which may include capped valves or capped service ports that allow proper repair or disposal, and which have a tested leakage rate of less than 3 grams per year under a pressure of at least a quarter of the maximum allowable pressure.

21. Are leak checks required on hermetically sealed equipment?

Hermetically sealed equipment containing less than 10 tCO2eq is not subject to leak checking provided the equipment is labelled as being hermetically sealed. Whether or not equipment is hermetically sealed should therefore be recorded in the inventory.

22. What is the leak checking requirements for refrigerant gas?

There are three main leak checking requirements for refrigerant gas:

- **I.** The threshold for mandatory leak checking is determined by the charge size of the refrigerant expressed in tonnes carbon dioxide equivalent (tCO2eq). The CO2 equivalent of an F-gas is calculated by multiplying the mass in tonnes by the GWP of that refrigerant gas.
- **II.** Stationary refrigeration, air conditioning and heat pump equipment containing 5 tCO2eq of F-gases or more (10t CO2eq or more if the refrigerant is hermetically sealed within the equipment) must be checked for refrigerant leakage by certified personnel at the following minimum frequencies outlined in table 1.
- **III.** Newly installed equipment should be checked for leakage immediately after they have been put into service.

Table 1.

F-Gas Mandatory Minimum Leak Checking Frequency		
Quantity of gas (tCO2 eq)	No leakage detection system fitted	With leakage detection system fitted
< 5 or <10 if hermetically sealed	None	None
5 to <50	12 monthly	24 monthly
50 to <500	6 monthly	12 monthly
≥ 500	3 monthly	6 monthly

23. Explain the term electrical switchgear?

In an electric power system, switchgear is composed of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgear is used both to de-energize equipment to allow work to be done and to clear faults downstream. This type of equipment is directly linked to the reliability of the electricity supply. This type of equipment often contains sulphur hexafluoride (SF6) as an electrical arc suppressant. SF6 is an F-gas subject to regulation by the EU F-Gas Regulation.

24. Are there any circumstances where leak checking is not required for electrical switchgear?

Electrical switchgear is not subject to mandatory leak checking provided the equipment complies with the following:

I. It has a tested leakage rate of 0.1 % per year as set out in technical specifications and is labelled accordingly;

II. It is equipped with a pressure or density monitoring device, or

III. It contains less than 6 kg of F-gas.

If these exemptions apply, mandatory equipment F-gas records are not required. However, it is recommended as best practice to maintain records which detail:

- The quantity of installed SF6 (i.e. the equipment's charge of SF6);
- monitoring for leakage;
- the detection and repair of leaks;
- the quantities of SF6 used to top-up equipment;
- the decommissioning of equipment and the recovery of SF6, and
- the name of the F-gas certified technician.

25. Explain the term 'Fire Protection Equipment'?

These are items of equipment and systems utilised in fire prevention or suppression applications. Note that hand-held fire extinguishers are not included in the scope of this inventory.

26. Are there any circumstances where leak checking is not required for fire protection equipment which contain F-Gases?

F-gas leak checking is not required for mobile fire protection equipment.

Leak-checking requirements for stationary fire protection equipment shall be deemed to be fulfilled provided the following two conditions are met:

a. The inspection regime meets ISO 14520 or EN 15004 (related to design and properties of fire extinguishing systems), and

b. The fire protection equipment is inspected in accordance with the frequencies outlined in Table 1. above as a minimum.

27. What is an automated leak detection system?

This is a calibrated mechanical, electrical or electronic device for detecting leakage of fluorinated greenhouse gases which, on detection of these gases, alerts the operator.

28. Am I required to install an automated leak detection system on equipment containing F-gas?

There are two criteria in the EU F-Gas Regulation for the mandatory installation of an automated leak detection system outlined below:

I. **CO2 eq:** Operators of stationary refrigeration, air conditioning, heat pump and fire protection equipment containing **500 tCO2eq of F-gases or more** shall ensure that the equipment is provided with a leak detection system which alerts the operator or a service company of any leakage. Leak detection systems must be checked at least once every 12 months to ensure their proper functioning and records of this should be maintained for at least 5 years.

II. **SF6:** Operators of electrical switchgear and organic rankine cycles containing **SF6 in quantities of 500 tCO2eq** or more and **installed from 1 January 2017** shall ensure that this equipment is provided with a leak detection system which alerts the operator or a service company of any leakage. Leak detection systems must be checked at least once every 6 years to ensure their proper functioning and it is recommended that records of this should be maintained for at least 5 years.

29. What are Ozone Depleting Substances (ODS)?

ODS are long-lived chemicals that contain chlorine and/or bromine and can deplete the stratospheric ozone layer. Commonly known ODS include CFCs, halons and HCFCs. HCFCs are still in use as refrigerants in old Refrigeration and Air Conditioning (RAC) equipment. The key requirement of the EU ODS Regulation is the phasing-out of the use of ODS. A ban on the use of all ODS for the maintenance or servicing of existing refrigeration, air conditioning and heat pump equipment is in place since 1st January 2015.

30. Can you provide a brief overview of the EU ODS Regulation?

The EU ODS Regulation (Regulation (EC) No. 1005/2009) sets out obligations relating to ODS and equipment containing ODS. The key objective of the EU ODS Regulation is the phasing-out of the use of ODS. A ban on the use of all ODS for the maintenance or servicing of existing refrigeration, air conditioning and heat pump equipment is in place since 1st January 2015. The EU ODS Regulation was given further effect in Ireland by the Control of Substances that Deplete the Ozone Layer Regulations 2011 (S.I. No. 465 of 2011) and the EPA are the competent authority for the enforcement of this Regulation nationally.

31. What is the definition of an ODS Undertaking?

An 'undertaking' in the EU ODS Regulation means any natural or legal person which:

a) produces, recovers, recycles, reclaims, uses or destroys controlled substances or new substances;

b) imports such substances;

c) exports such substances;

d) places such substances on the market; or

e) operates refrigeration, air conditioning or heat pump equipment, or fire protection systems, which contain controlled substances.

32. Are there general ODS containment requirements specified in the EU ODS Regulation?

There are six general ODS containment requirements specified in the EU ODS Regulation and outlined below:

I. Undertakings shall take all precautionary measures practicable to prevent and minimise any leakages and emissions of ODS.

II. Undertakings operating refrigeration, air conditioning or heat pump equipment, or fire protection systems, including their circuits, which contain controlled ODS shall ensure that the stationary equipment or system is leak checked by a certified person as a minimum at the mandatory frequencies outlined in table 2 below, which are determined by the refrigerant charge size of the equipment.

Table 2.

Mandatory leak checking frequency	Refrigerant charge for non-hermetically sealed systems (Kg)	Refrigerant charge for hermetically sealed systems (Kg)
None	< 3 kg	< 6 kg
Annual	3 kg to 30 kg	6 kg to 30 kg
6 monthly	30 kg to 300 kg	30 kg to 300 kg
Quarterly	>300 kg	> 300 kg

III. Where a leak of ODS is detected, the ODS Regulation requires operators to complete a repair as soon as possible and in any event within 14 days in order to minimise any further leakage. However, it should be noted that, while a unit of equipment which contains an ODS refrigerant can continue to be used after the 1st January 2015, it can no longer be topped up with ODS refrigerants (for example R12 and R22) in order to refill the unit or repair the system.

If a leak occurs in equipment containing ODS refrigerant that is currently in use, then either

- the refrigerant gas in the system must be completely replaced with an alternative non-ODS gas (if feasible), or
- the whole system would have to be replaced with an alternative system.

IV. The EU ODS Regulation requires that a repaired leak is checked by a certified person, within one month of the date of the repair, to ensure that the repair has been effective. Please note that this recheck can take place on the same day that the leak is fixed, once the system has been repaired and is back in balanced operation.

V. As specified by Article 23(3) of the ODS Regulations, the operator of equipment containing ODS is required to maintain records for each piece of equipment containing 3kg or more of ODS, up to and including its decommissioning. It is recommended that these records are maintained for at least five years.

VI. A person undertaking leak checking shall hold an appropriate certificate. In order to demonstrate compliance with this requirement, it is recommended that a copy of the refrigeration technician's certificate is obtained and retained on file for inspection. A certificate for leak-checking F-gases in similar equipment, such as the QQI (formerly FETAC) F-gas handling certificate or equivalent, is acceptable.

33. What are the important points to remember when filling out this Inventory?

Please note the following when filling out the ODS & F-gas inventory:

- You can record "Not Applicable (N/A)" in the first row of each non-applicable table where necessary.
- Please pay attention to the notes provided on table headings.
- Please ensure you clarify in **Tab 4. Electrical Switchgear** whether there is an electrical compound belonging to a third party, e.g. ESB Networks, within your licensed boundary.
- When completed, this spreadsheet should be saved using the naming format of your current licence registration number, e.g. PXXXX-XX Inventory, and should be submitted via Return on EDEN by the 16/04/21.
- If you have any queries, please email Maria Lenihan at m.lenihan@epa.ie.

34. Where can I get further information and guidance?

Further information and guidance are available at

www.fgases.ie

www.ozone.ie

https://ec.europa.eu/clima/policies/f-gas_en

http://www.epa.ie/pubs/advice/air/ods/1irlsummaryguidancetocompliancewiththeodsandf-gasregulationsv10.html

http://www.epa.ie/pubs/advice/air/ods/9irlsummaryguidanceoperatorsofequipmentcontainingsf6andpfcs.html

http://www.epa.ie/pubs/advice/air/ods/5irlsummaryguidetothenewleakcheckingrequirements.html

http://www.epa.ie/pubs/advice/air/ods/6irlsummaryguidetothehfcphasedownv10.html

http://www.epa.ie/pubs/advice/air/ods/4irlodsfgascontractorsguidancefireprotection.html

2015 Progress of Ireland towards the F-Gas Phase Down November 2017