



# Decoding the EU F-gas Regulation



Fluorinated gases regulation (EU 2024/573 “F-gas Regulation”) was published in the Official Journal of European Union on 20<sup>th</sup> February 2024. It entered into force on 11<sup>th</sup> March 2024. How to interpret the regulation and what are its implications for businesses and grid operators in the EU?

[se.com/sf6free](https://se.com/sf6free)

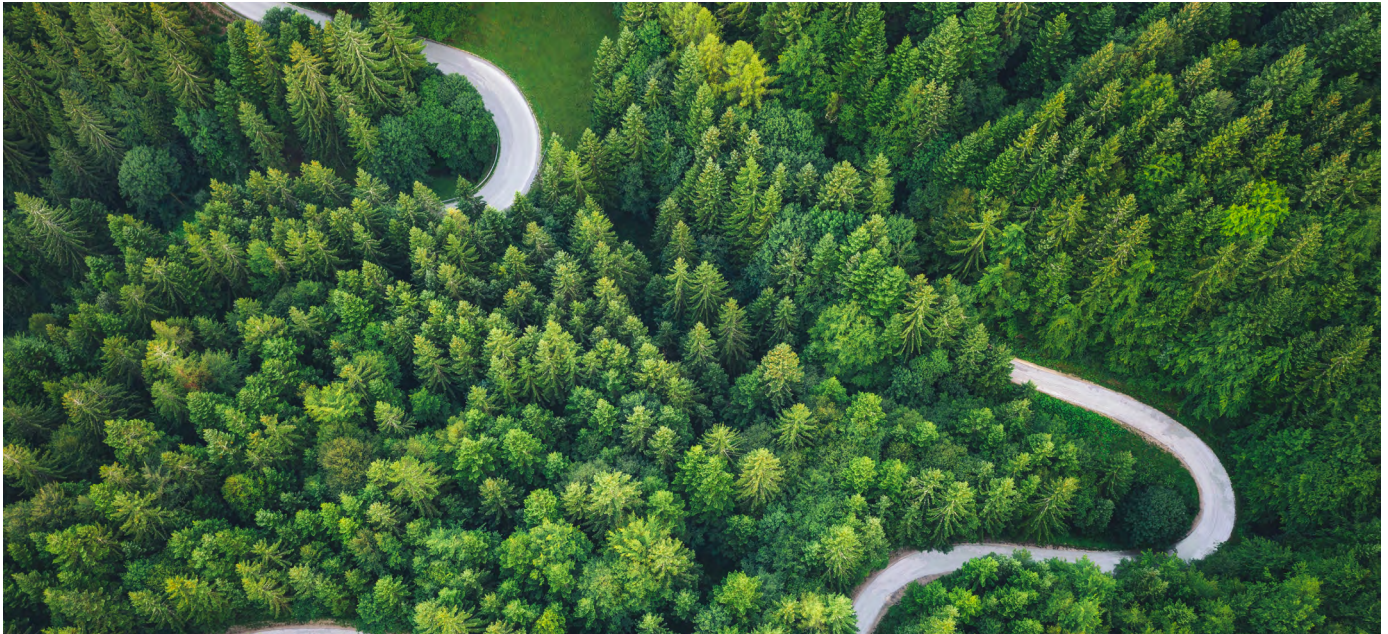
Life Is On

**Schneider**  
Electric



## 1 Executive summary

- Dates for the ban on using SF<sub>6</sub> in medium voltage (MV) equipment.
  - 1<sup>st</sup> January 2026: switchgear up to and including 24 kV
  - 1<sup>st</sup> January 2030: switchgear above 24 kV up to and including 52 kV
- New SF<sub>6</sub> switchgear must be put into operation before the date of the ban.
  - “Put into operation” means delivered, installed, cable-connected, tested, and ready for operation. Switchgear is ready for operation.
  - SF<sub>6</sub> switchgear orders should consider the date of putting the switchgear into operation, which must be before 31<sup>st</sup> December 2025.
- The operator of the switchgear is responsible for the compliance.
- The regulation bans the use of F-gases for MV switchgear.
  - All fluorinated gases will be banned: SF<sub>6</sub>, Fluoroketone C5, Fluoronitrile C4, HFO, etc.
  - Only F-gas-free equipment will be authorized: for example, mixture of nitrogen, oxygen, CO<sub>2</sub>, and other natural components of air.
- Derogations are possible if no F-gas-free offer available.
  - If no F-gas-free offer is available, the switchgear operator may purchase and put SF<sub>6</sub> switchgear into operation. That means if only one F-gas-free offer meets the customer's specifications, it must be chosen.
  - Note: It is also possible to offer F-gas with GWP < 1000 (Fluoroketone, Fluoronitrile, HFO, etc.) two years after the ban, but currently, no manufacturers in Europe offer such gases for MV switchgear.
- Derogation for SF<sub>6</sub> switchgear extension
  - Operators may add a SF<sub>6</sub> unit if no F-gas-free unit is compatible with the existing SF<sub>6</sub> switchgear and a full panel replacement would otherwise be required.
- Replacement of a unit inside SF<sub>6</sub> switchgear
  - A unit inside SF<sub>6</sub> switchgear may be replaced, provided the total amount of SF<sub>6</sub> does not increase.
- Second-hand and second-life of SF<sub>6</sub> switchgear
  - SF<sub>6</sub> switchgear may be removed from the field and put into operation at a different site within Europe.
- Administrative requirements for switchgear operator in case of derogation
  - Documentation proving the derogation must be retained by the operator for at least five years.
  - It must be made available to the competent authority of the Member State and to the Commission upon request.
  - The operator must notify the competent authority of the Member State where the switchgear is put into operation when applying the derogation..



## 2 What is the F-gas Regulation about?

The European Union (EU 2024/573) F-gas Regulation covers key applications in which fluorinated gases (F-gases), such as SF<sub>6</sub>, HFCs, PFCs, NF<sub>3</sub>, are used, following two tracks of action:

- Improving the prevention of leaks from equipment containing F-gases. Measures comprise the containment of gases and proper recovery of equipment, training and certification of personnel and companies handling these gases and labelling of equipment containing F-gases.
- Avoiding the use of F-gases where environmentally superior alternatives are cost-effective. Measures include restrictions on the use of certain products and equipment containing F-gases.

As a “regulation”, its application is mandatory in all 27 Member States from 11<sup>th</sup> March 2024.

## 3 Does the revision of the EU F-gas Regulation ban the use of SF<sub>6</sub> for medium voltage electrical switchgear?

The new EU F-gas Regulation introduces a ban on the use of SF<sub>6</sub> in new electrical switchgear, depending on the voltage level, the number of bidders (manufacturers offering alternative solutions) and the type of alternative gas used.

There is no ban on the use of SF<sub>6</sub> for maintenance or repair of electrical switchgear that was put into operation before the ban dates.

## 4 Who is responsible for compliance?

The operator of the switchgear is responsible for ensuring compliance. The operator is the entity exercising actual control over the technical functioning of the switchgear. Where switchgear is put into operation by an entity, this entity is considered the operator until a legal handover occurs to another entity, which then assumes the operator responsibility for compliance.

## 5 When do the bans take effect?

The ban dates for MV switchgear are as follows:

Voltage (kV)	Date of ban	Typical voltage level (kV)
Ur ≤ 24	1 <sup>st</sup> January 2026	3.6, 7.2, 12, 17.5, 24
24 < Ur ≤ 52	1 <sup>st</sup> January 2030	27, 36, 40.5, 52

It will not be possible to order MV electrical switchgear using SF<sub>6</sub> intended to be put into operation after the ban dates if an alternative solution exists.

## 6 What does “entry into force” mean?

“Entry into force” is the date when the regulation starts to apply, 20 days after its publication in the Official Journal of EU, so 11<sup>th</sup> March 2024.

## 7 What does “putting into operation” mean?

“Putting into operation” is different from “placing on the market<sup>(1)</sup>”, which refers to the delivery of switchgear. Although “putting into operation” is still not defined in the regulation, the European Commission has published an FAQ<sup>(2)</sup> clarifying and explaining why this expression is needed for switchgear:

“The prohibition starting date refers to “putting into operation”. At what point is switchgear “put into operation”?

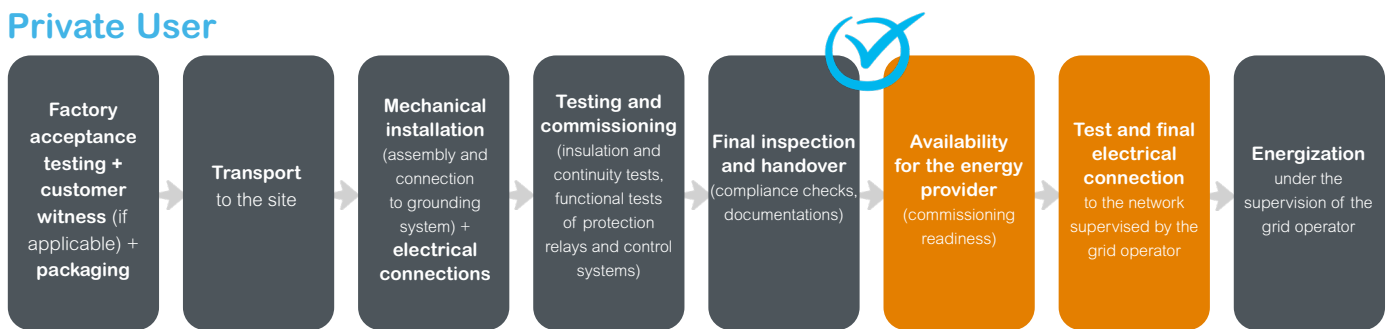
Putting into operation is the moment of handover of the equipment to the operator for use/exploitation, after completion of any necessary tests of functionality, performance or other, and any required inspections. On the other hand, energization or connection to the grid is not a requirement.

Could you give some practical examples?

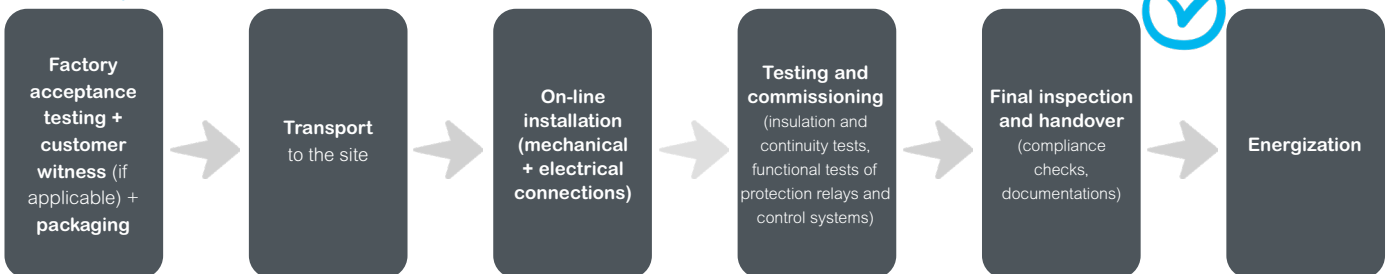
The following graph shows 2 processes depending on the user type (private or grid operator).

 = putting into operation

### Private User



### Grid Operator



(1) In EU 2024/573 “placing on the market” is defined in Art. 3 (6) as follows: “placing on the market” means the customs release for free circulation in the Union or the supplying or making available to another person within the Union, for the first time, for payment or free of charge, or the use of substances produced, or of products or equipment manufactured, for own use.

(2) Global FAQ page at [https://climate.ec.europa.eu/eu-action/fluorinated-greenhouse-gases/faq\\_en](https://climate.ec.europa.eu/eu-action/fluorinated-greenhouse-gases/faq_en) where a dedicated part is focused on switchgear [FAQs on switchgear as regulated by the F-gas Regulation \(EU\) 2024/573](#)



## 8 Does the switchgear operator have the choice of the alternative solution?

In medium voltage (rated voltage up to and including 52 kV) the alternative gas must not contain any fluorinated gases. It can be air, compressed air, nitrogen, carbon dioxide or a mixture of gases that does not contain any fluoride atoms. For MV electrical distribution Schneider Electric has developed AirSeT technology, which combines pure air for insulation and vacuum technology for breaking - Shunt Vacuum Interruption (SVI)<sup>TM</sup>.

## 9 Are there any exemptions to the application of the F-gas Regulation for MV switchgear?

In the first two years after the dates of ban, it is possible to choose a solution using a fluorinated alternative gas if there are no bids without F-gases or only bid from one manufacturer offering equipment without fluorinated gases. Moreover, the fluorinated alternative must have a GWP < 1000.

After the first two years it is possible to use a fluorinated alternative with a GWP < 1000 ONLY if no F-gas-free solutions are available.

If no SF<sub>6</sub>-free MV providers are available on the market, it will still be possible to use switchgear containing SF<sub>6</sub>.

These rules can be summarized as follows:

Years after ban date	1	2	3	4
SF <sub>6</sub> allowed	Zero bid with GWP <1000			
GWP <1000 allowed	Zero or 1 bid with no F-gas		Zero bid with no F-gas	
No F-gas	OK			

Could you give some concrete examples?

### Example 1:

I am a grid operator, and my network nominal voltage is 24 kV: The ban date for SF<sub>6</sub> switchgear is 1<sup>st</sup> January 2026. I can put SF<sub>6</sub> switchgear into operation before this date. I need to carefully plan the orders of the switchgear I intend to put into operation after 1<sup>st</sup> January of 2026 (i.e., after 2025) because only SF<sub>6</sub> switchgear ordered before the regulation entered into force (i.e., by the end of February 2024) can be put into operation after 2025:

- If there are 2 different manufacturers offering a solution without F-gases, I need to choose between them.
- If no manufacturers offer a solution without SF<sub>6</sub> that meets my specifications, I can choose SF<sub>6</sub> switchgear and put it into operation after 2025. Once there is a manufacturer offers a compliant solution without using SF<sub>6</sub> I must stop putting SF<sub>6</sub> switchgear into operation.
- If there is only one manufacturer offering a solution without F-gases, and other manufacturers proposing a solution without SF<sub>6</sub> but using another F-gas, I can choose between them only during the two years following the ban date, i.e., until 31<sup>st</sup> December 2027. Once a second manufacturer offers a solution without F-gas, I must choose between the manufacturers offering MV without F-gas.
- If there is only one manufacturer offering a solution without F-gas and no manufacturer offering a solution without SF<sub>6</sub> then I must choose the solution without F-gases. This is currently the case in Europe for voltage level ≤24 kV where no manufacturers offer switchgear using fluoroketone, fluoronitrile, or HFO.

For the current market scenario, the table above can be simplified as follows:

Years after ban date	1	2	3	4
SF <sub>6</sub> allowed	Zero bid with GWP <1000			
No F-gas	OK			

For case b. and c., as the owner of the equipment, I need to retain documentation and report to the relevant state authorities, indicating the location of the installed switchgear.

### Example 2:

I am an industrial user and I need to install a MV/MV power substation using 36 kV GIS for the feeder side and 12 kV equipment for the distribution side. Fortunately, there are many F-gas-free solutions available for the 12 kV level. Nevertheless, I can order and put into operation 12 kV SF<sub>6</sub> equipment until the end of 2025.

For the high-voltage side, I can order and put into operation any type of switchgear, including those using SF<sub>6</sub>, until 31<sup>st</sup> December 2029.



## 10 Is there any specificity related to the tendering process?

The *FAQs on switchgear as regulated by the F-gas Regulation (EU) 2024/573* explains that only one tendering process is needed to demonstrate the absence of alternatives. In addition, the FAQ warns that tenders must not set unnecessary technical criteria that could unfairly exclude restriction-compliant switchgear, unless such criteria are technically justified for the specific application.

## 11 How does the F-gas Regulation apply to new installations or the existing installed base?

The F-gas Regulation **ONLY** applies to new installations of switchgear.

For the existing installed base, maintenance, repair, and extensions are still permitted using SF<sub>6</sub> switchgear. There are specific conditions under which SF<sub>6</sub> may still be used after the ban dates for extending an installation.

- The extended device is not compatible with the existing installation;
- A replacement of the entire installation would be necessary to meet the restriction (Art 13(15)).

See 13 for the reporting obligations in those cases

## 12 Beyond the F-gas ban, does the regulation introduce any new requirements or constraints on MV switchgear?

Technicians performing installation, servicing, maintenance, repair or decommissioning of electrical switchgear must be certified (training + evaluation). In addition to the training defined in EU 517/2014 regulation (regulation and standards, emission prevention, recovery of SF<sub>6</sub>, safe handling), the training must also include the safe handling of equipment containing flammable or toxic gases or operating under high-pressure. The level of pressure will be defined by the European Commission within three years of the regulation's entry into force.

Technicians trained before the entry into force of the regulation retain their attestation or certification, but they must now refresh their training every seven years.

By 2035, the use of SF<sub>6</sub> for servicing and maintaining electrical switchgear will be prohibited unless the gas is reclaimed or recycled.

Producer responsibility is still described in Article 9 (renamed extended producer responsibility) and now includes financing obligations for electrical and electronic equipment waste (WEEE) Directive 2012/19/EU. This directive applies to electrical and electronic equipment used below 1000 VAC and 1500 VDC. Medium voltage switchgear is not affected, except for the LV cabinet.

Leakage mitigation ("prevention of emissions"), labeling, leak checks and detection systems, reporting, remain unchanged. These rules apply to switchgear using both SF<sub>6</sub> and fluorinated gas mixtures, but not to F-gas-free equipment.

## 13 What happens in case of non-compliance?

Legally, the issue may be escalated to national authorities and the EU Commission. Non-compliant countries will face fines, and each national authority is responsible for establishing penalties for end users and notifying the EU Commission by 1<sup>st</sup> January 2026. The regulation sets a maximum administrative financial penalty of five times the market value of the products and equipment concerned, and eight times in the case of repeated infringements.

All derogations must be reported by users to the competent national authority, including the location of the installed switchgear.

## 14 What are the reporting obligations for the switchgear owners/operators?

In case of medium voltage switchgear, there will no longer be any reporting obligations, because the switchgear will not use any fluorinated gases.

However, if the user wishes to apply the derogations allowed by the regulation, they must provide additional information.

The documentation establishing the evidence for the derogations must be retained by the operator for at least five years after the relevant ban dates and must be made available to the competent authority of the Member State and to the European Commission upon request.

The operator must notify the competent authority of the Member State where the electric switchgear is put into operation.

Existing obligations such as labeling, leak checks, and reporting still apply if the gas used is SF<sub>6</sub> or another low-GWP fluorinated gas.

The following table gives a summary of such obligations:

DEROGATIONS	Documentation	Location	Existing obligations (label, report)
Maintenance and repair using SF <sub>6</sub>			●
Moving of SF <sub>6</sub> switchgear (or second-hand). The first location (placed on the market) must be in EU	●		●
SF <sub>6</sub> switchgear put into operation after ban dates, but ordered before 11 <sup>th</sup> March 2024, the entry in force of the regulation	●	●	●
Switchgear using SF <sub>6</sub> or any fluorinated gas mixture, because there is only one or no bidder offering an F-gas-free solution.	●	●	●
Extension using SF <sub>6</sub> , because no compatible F-gas-free solution available.	●	●	●

## 15 Can a Member State decide not to apply the ban, should it deem the cost disproportionate?

It is extremely unlikely to happen, because formally:

1. The Commission must initiate the request.
2. Approval must be obtained from the Member States.

This provision has never been applied in the past.

## 16 What are the conditions for accepting SF<sub>6</sub> in extensions?

A derogation is possible when the proposed F-gas-free switchgear for extension is not compatible with the existing switchgear panel or does not exist. This is intended to avoid replacing the entire existing switchgear.

For example, it is possible to add an RM6 extension unit if RM AirSeT is not compatible.

Schneider Electric's SM AirSeT range allows for a seamless transition from its SF<sub>6</sub>-based predecessor range or for extending the SM6 installations. The footprint, connection point positions and operations are the same, avoiding the need for civil works and retraining of personnel. An extension of SM6 switchgear can be made using SM AirSeT, as it is compatible.

It is possible to create a transition unit to connect SF<sub>6</sub> switchgear to F-gas free unit is not directly addressed by the regulation, but if the transition unit uses SF<sub>6</sub> it is considered an authorized derogation under EU 2024/573.

## 17 Is it mandatory to recycle SF<sub>6</sub> at the end of the equipment's life, and who pays for it?

It is mandatory to RECOVER SF<sub>6</sub> at the end of life. Medium voltage electrical switchgear is not covered by the WEEE (Waste of Electric and Electronic Equipment) Directive. Therefore, the user is responsible for covering the financial cost of gas recovery.

## 18 When a switchgear operator decides to use SF<sub>6</sub> under an exemption, are they required to proactively communicate with the relevant local authorities?

Yes. The documentation establishing the evidence for the derogations must be retained by the operator for at least five years after the respective ban dates and must be made available to the competent authority of the Member State and to the European Commission upon request. Except in the case of switchgear relocation (or second-hand use), the operator must notify the competent authority of the Member State where the electric switchgear is put into operation when applying the derogation.

The list of national contact points is available [here](#).

## 19 Can a country request to postpone the ban dates by up to four years? Does this mean that in a given country, the general ban for 24 kV might not apply until 2030? What are the conditions?

This derogation already exists in the current regulation, but has never been used for any F-gas (including refrigerants). There are two conditions specified in the regulation:

- a. Alternatives are not available or cannot be used for technical or safety reasons.
- b. The use of technically feasible and safe alternatives would entail disproportionate costs.

The definition of “disproportionate cost” level is still pending clarification from the EC, and it is uncertain whether the Commission will provide a definitive answer.

Any request to delay the ban dates must be submitted to a formal vote in the Council, with the following conditions:

- At least 55% of the Council members must approve, comprising at least fifteen Member States, and
- These Member States must represent at least 65% of the EU population.

Such process is expected to be an exception and very difficult for a Member State to pass.

## 20 What is the EcoDesign directive exemption clause? Could you please clarify?

There is a derogation referencing the EcoDesign Directive 2009/125/EC, but this directive does not include switchgear and is focused on energy efficiency.

The EcoDesign Directive will be repealed by the EcoDesign for Sustainable Product Regulation (ESPR) which addresses also other products such as textiles, steel or aluminum. The scope of this regulation extends beyond energy-related products and carbon footprint.

The ESPR has been in force since July 2024 (EU 2024/1781), and on 16 April 2025, the EU Commission published the 2025–2030 working plan [\(see document COM/2025/187 final\)](#).

Electrical switchgear is still not listed under this regulation; therefore, this exemption clause does not currently apply.

## 21 Who is restricted from using F-gas — the seller or the buyer?

The buyer/user (operator) is restricted, as the ban is defined in Article 13 under “control of use.” The responsibility for applying the regulation lies with the user. The manufacturer of switchgear must provide an F-gas-free solution that meets the user’s technical requirements.

## 22 What is the understanding of “disproportionate costs” mentioned in Article 11 §5 b)?

[See 17](#)

## 23 Regarding the extension derogation mentioned in Article 13 §15: Does that mean that for primary switchgear, extensions can be easily done with SF<sub>6</sub> equipment if their GWP is lower than that of SF<sub>6</sub>?

First, the extension must be technically compatible without using F-gas. If that is not the case, an extension using existing SF<sub>6</sub> switchgear or a compatible unit may be used.

[See also 9](#)

## 24 About Article 13, §13, (text below) does the “EcoDesign requirement” mean that SF<sub>6</sub> equipment that complying with Directive 2009/125/EC can avoid this regulation if its LCA is better?

“Paragraph 9 shall not apply to electrical switchgear for which it has been established pursuant to EcoDesign requirements adopted under Directive 2009/125/EC that its life cycle CO<sub>2</sub> equivalent emissions would be lower than those of equivalent equipment which meets the relevant EcoDesign requirements and would comply with the global warming potential limits in paragraph 9.”

Medium and high-voltage switchgear are not within the scope of Directive 2009/125/EC. [See also 18](#)

## 25 Has Schneider Electric performed any analysis or projection on the potential impact on the T&D industry if SF<sub>6</sub> equipment must be phased out? Are grid operators and industrial users assessing the transition risks posed by the F-gas Regulation?

A mandatory phase-out of existing SF<sub>6</sub> equipment is not included in any current regulations. It may be encouraged through financial incentives or discouraged through penalties and taxing of high-leakage equipment. None of the recent regulations banning SF<sub>6</sub> require the removal of SF<sub>6</sub> from the installed base — this includes the EU, California, New York State, and China. In the future, users of SF<sub>6</sub> electrical equipment may face increasing constraints to encourage the transition to SF<sub>6</sub>-free alternatives:

- Penalties for major emissions due to poor maintenance (e.g., sudden leaks), as seen with OFGEN in the UK
- Taxes on SF<sub>6</sub> used for refilling (e.g., in Spain), or on SF<sub>6</sub> contained in new equipment
- Mandatory recovery, recycling, or destruction of SF<sub>6</sub> during maintenance or at end-of-life

The installation of new equipment is the primary target, as alternatives already exist or are expected to be developed in the coming years. SF<sub>6</sub> equipment is therefore seen as a low-hanging fruit for reducing environmental footprint of electrical distribution.

## 26 Is modernization with LF or SF<sub>6</sub> gas breakers still possible until 2035? What is the outlook?

Modernization will not be affected by the deadline of 2035. Only recycled or regenerated SF<sub>6</sub> gas will be permitted for use. Schneider Electric has already qualified recycled SF<sub>6</sub> gas sources for use in its SF<sub>6</sub> equipment without compromising the equipment's performance.

Modernization using SF<sub>6</sub> will remain possible without a deadline, provided that the modernized circuit breaker does not increase the total SF<sub>6</sub> volume in the panel.

### Rationale:

The 2035 deadline applies to services and maintenance using virgin SF<sub>6</sub>. This includes refilling or retrofitting with SF<sub>6</sub> breakers that use new (virgin) gas. Schneider Electric is actively working to replace virgin SF<sub>6</sub> with regenerated SF<sub>6</sub>, which has identical technical properties.

It is expected that by 2035, all SF<sub>6</sub> used in the EU will be regenerated.

# Learn More



How EEC Engie looks after the local ecosystem with sustainable strategy



How GreenAlp makes a city better with green innovation



How E.ON in Sweden is providing greener energy



Discover AirSeT technology



How SF<sub>6</sub>-free and digital technologies combine for sustainability and efficiency



Renault Group's circularity on track with AirSeT

## Schneider Electric

35 rue Joseph Monier  
92500 Rueil-Malmaison, France  
Phone: + 33 (0)1 41 29 70 00

[www.se.com](http://www.se.com)

Document updated 19<sup>th</sup> September 2025

©2025 Schneider Electric. All Rights Reserved. Life Is On Schneider Electric is a trademark and the property of Schneider Electric SE, its subsidiaries and affiliated companies. All other trademarks are the property of their respective owners.

998-23113800\_External\_250919

Life Is On

