



Europe's MV GIS Transformation: Charting a Sustainable Course with F-Gas Phase-Out

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- Realizing the GWP potential of SF₆, the industry is shifting towards environmentally friendly alternatives.
- GIS is projected to exhibit robust growth with a CAGR of 7% in terms of revenue during the same period, with significant demand originating from renewable sources.
- SF₆-free MV switchgear of the 1-24kV category, facing an earlier deadline in 2026, is anticipated to undergo the most rapid growth, with initial estimates suggesting CAGR surpassing 30% in terms of revenue during the same period.

Across [Europe](#), gas-insulated switchgear (GIS) forms the backbone of a reliable and efficient electrical grid. However, GIS uses sulfur hexafluoride (SF₆), a dangerous greenhouse gas that poses a significant threat to the environment. SF₆ is one of the fluorinated gases (F-gases), and the EU is working actively to phase out the use of F-gases in Europe. The article sheds light on the deadlines for the SF₆ phase-out and emerging MV switchgear market trends and outlook in Europe.

GWP Comparison of Some Gases

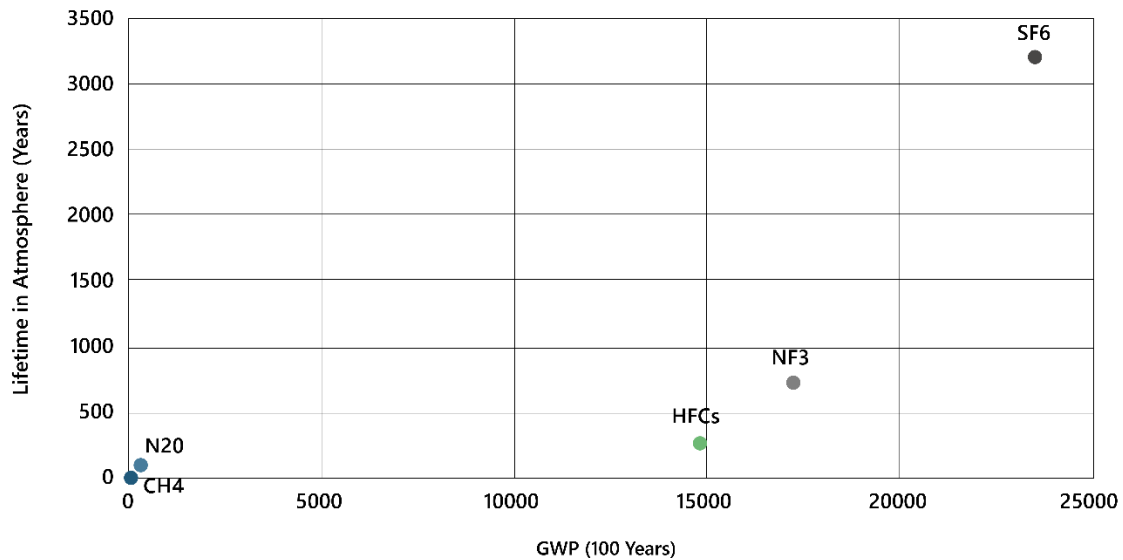


Figure 1: GWP Comparison of Some Gases.

Source: Greenhouse Gas Protocol.

Push for Alternatives

Realizing the GWP potential of SF₆, the industry is shifting towards environmentally friendly alternatives. Under the European Green Deal, alternatives for SF₆-based switchgear are urgently needed to meet the ambitious goal of a 55% greenhouse gas reduction by 2030. Balancing energy demands with environmental responsibility requires immediate action, making the search for sustainable solutions in the electrical switchgear sector paramount.

The EU has been at the forefront of acting against F-gases, enacting bans on their use in windows and tires since 2007. From March 2024, the revised F-gas Regulation (EU) 2024/573 has come into effect, reaffirming a steeper phase-out of F-gases from the remaining applications, building upon years of discussion and feedback from the stakeholders. For the electrical power grid industry, the deadlines for restriction on SF₆-based switchgear are given below.

- Medium Voltage (MV) Primary and Secondary Switchgear <24kV: January 01, 2026
- MV Primary and Secondary Switchgear 24-52kV: January 01, 2030
- High Voltage (HV) Switchgear 52-145kV: January 01, 2028
- HV Switchgear >145kV: January 01, 2032

Effective after the deadline, the use of any f-gas in greenfield MV equipment is prohibited, as technically suitable alternatives with a GWP <1 will be available. For HV switchgear, the use of SF₆ or other f-gas mixtures with a GWP > 1 will only be permitted if no OEM is offering a switchgear with an insulating medium of GWP < 1. Furthermore, starting from 2035, the use of new SF₆ gas will be strictly prohibited, even for maintenance, and only reclaimed or recycled gas will be permissible. However, the regulations are lenient on brownfield projects where there are no technically suitable alternatives available. These stricter deadlines aim to accelerate the transition towards safer and more sustainable alternatives in the electrical industry.

MV Switchgear Market & Trends

According to projections by PTR, the MV switchgear market in Europe is anticipated to experience substantial growth in terms of revenue from 2023 to 2028. The air-insulated switchgear (AIS) is expected to achieve a CAGR of 4.75% in terms of revenue from 2023 to 2028, reflecting steady growth. Meanwhile, GIS is projected to exhibit robust growth with a CAGR of 7% in terms of revenue during the same period, with significant demand originating from renewable sources. The significance of GIS is evident from its major share, accounting for an estimated 60% of the total revenue in the switchgear market in 2028. As Europe experiences significant growth in MV Switchgear, particularly with the projected rise of GIS, the focus is on the emerging trends in SF₆-free switchgear solutions, highlighting the industry's commitment to sustainability and advancing eco-friendly alternatives.

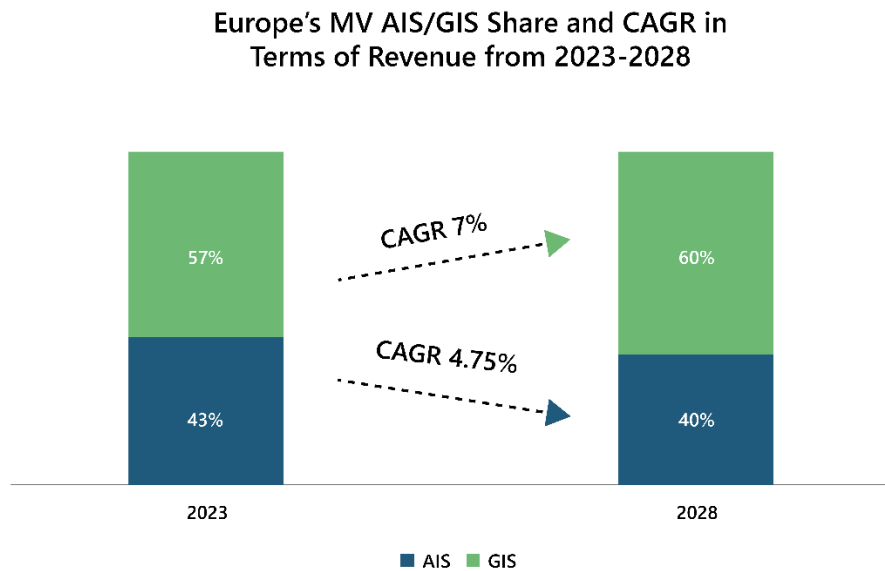


Figure 2: Europe's MV AIS/GIS Share and CAGR in Terms of Revenue from 2023-2028.

Source: PTR Inc.

Focus on SF₆-Free MV Switchgear

PTR's initial figures indicate a promising outlook for SF₆-free MV switchgear, particularly those based on natural-origin gas, with a notable CAGR projected between 2023 and 2028. SF₆-free MV switchgear of 1-24kV category, facing an earlier deadline in 2026, is anticipated to undergo the most rapid growth, with initial estimates suggesting CAGR surpassing 30% in terms of revenue from 2023 to 2028. In contrast, SF₆-free MV switchgear of 24-42kV category, with a more distant deadline in 2030, is expected to experience growth at a comparatively lower rate.

CAGR for SF₆-free 1-24kV MV Transformer in Terms of Revenue from 2023-2028



Figure 3: CAGR for SF₆-free 1-24kV MV Transformer in Terms of Revenue from 2023-2028.

Source: PTR Inc.

Way Forward

For OEMs in the MV switchgear industry, Europe's commitment to sustainability signifies an exciting opportunity to spearhead the development and adoption of sustainable switchgear alternatives. The phaseout of SF₆-based switchgear is gradual, however it is important to transition completely to SF₆-free technologies to prioritize the environment. By harnessing innovation, fostering collaboration, and embracing cutting-edge [SF₆-free technologies](#), OEMs can not only comply with revised regulations but also secure a leading position in a greener future for the electrical industry.

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