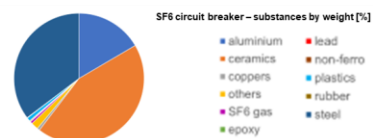


Preventing the use of SVHC

To prevent the use and dispersion of SVHC during the entire life cycle of electrical equipment stakeholders, like electrical equipment manufacturer, grid operators as well as the society, countries and regulators, have to meet basic requirements.

Manufacturer

- Complete transparency on substances used and thus on SVHC in own portfolio (*basis for SVHC phase out*)
- Target is not to use any SHVC in future



Grid operator

Sustainable project specifications with HSE and Lifecycle requirements including its cost consideration to avoid the use of toxic and hazardous substances (SVHC) in electrical equipment

Evaluation criteria including sustainability indices

SUSTAINABILITY	TECHNOLOGY	OPERATION	INVESTMENT
HSE Criteria	Technical Criteria	Operation & Maintenance	Commercial Criteria
<ul style="list-style-type: none"> Company sustainability goals GWV insulating gas HSE aspects insulating gas EPD (ISO 14021) -gas free, PFAS-free 	<ul style="list-style-type: none"> Operational temp. range Gas leakage rate GC-switching capability CB technology (gas or vacuum) Digitalization technology 	<ul style="list-style-type: none"> Gas handling special equipment Gas leakage rate Availability of insulating gas Inspection/revision intervals Special training of own staff Reporting others (SF₆ gas, CO₂) 	<ul style="list-style-type: none"> Equipment price Transport, installation & Commission 7 Years free End of life, recycling Warranty, liability, other commercial T&Cs
COMPLETE TENDER EVALUATION			

Society, Countries and Regulators

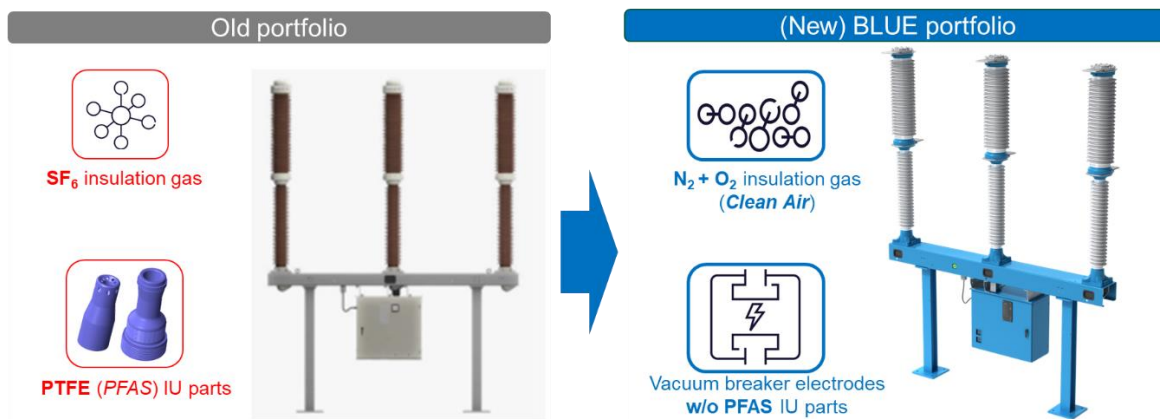
- Innovative regulations to sustainable phase out toxic and hazardous substances and forever chemicals (e.g. PFAS).
- Sustainable suggestion for alternative substances

Global activities on PFAS regulations

[1]	Stockholm Convention on persistent Organic Pollutants (POP) aiming on reducing or eliminating PFAS (2001)	
[2]	Five EU member states (Denmark, Germany, Norway, the Netherlands, Sweden) filed registry of intention to ban PFAS (2020)	
[3]	EPA (US) upgrade PFAS action plan for drinking water regulation (prohibition of import of PFAS containing products) (2020)	
[4]	PFAS National Environmental Management Plan for guidance to address PFAS contamination (2018)	

An example for phasing out toxic and forever chemicals by introducing a new technology concept, is represented in the Siemens Energy Blue switching portfolio. Toxic, hazardous substances, like the insulation gas SF₆ and forever chemicals, like PFAS (PTFE), both essential for a successful switching process, are completely dissolved by introducing the CO₂ friendly vacuum technology.

Example of replacing forever chemicals or substances generating toxic byproducts by introducing a **new technology**



PFAS:
 currently under evaluation within EU to be declared toxic (SVHC) and banned by 2025

Bibliography:

- [1] United Nations, "Stockholm Convention on POPs", Stockholm, 2019
- [2] ECHA news, "Five European states call for evidence on broad PFAS restriction", ECHA/NR/20/13, Brussels, May 2020
- [3] US EPA, "PFAS Strategic Roadmap: EPA's commitments to action 2021-2024", EPA-100-K-21-002, Oct. 2021
- [4] AU & NZ EPA, "PFAS National Environmental Management Plan (NEMP)", HEPA ISBN: 978-1-76003-283-8, 2020