

Paris Session 2022



Continuous Improvement for Optimized Substation Management

B3 PS 1 – Question 1.4

To what degree are the new environmental directives impacting on the industry's ability to respond and deliver the substation infrastructure necessary to facilitate NetZero?

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SIEMENS
energy

B3 – NetZero - New environmental directives

Sustainable Development Goals

Good Health, Affordable & Clean Energy, Climate Action, NetZero

Legislations & Regulations (main examples for fluorine F-gases)

National **penalties for CO₂ and/or SF₆**; moving towards SF₆ bans

CARB California: **Stepwise SF₆ phase-out** for new installations

EU Regulation Proposal: Placing on market **prohibition for F-gases**

Worldwide **restrictions activities for PFAS*** (forever chemicals) started

Grid operators & equipment manufacturers



SF₆ emission reductions, SF₆ phase-out and launch
of future-proof F-gas-free clean air products



80% N₂ + 20% O₂



Vacuum



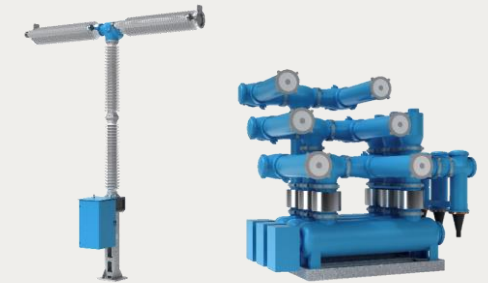
Prohibition F-gases GWP ≥ 10	
≤ 24 kV	1 January 2026
≤ 52 kV	1 January 2030
≤ 145 kV, 50 kA	1 January 2028
> 145 kV, 50 kA	1 January 2031



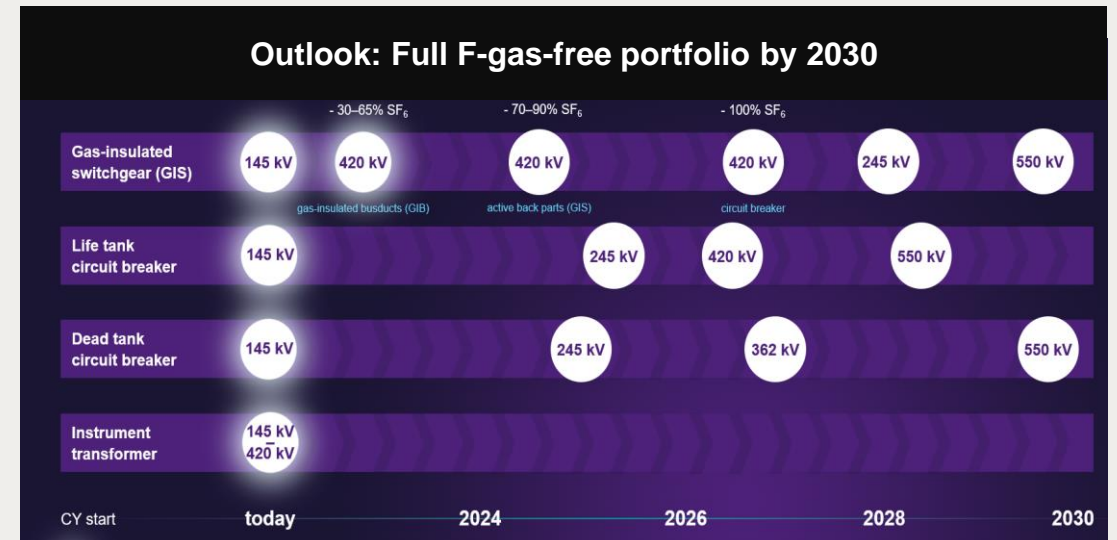
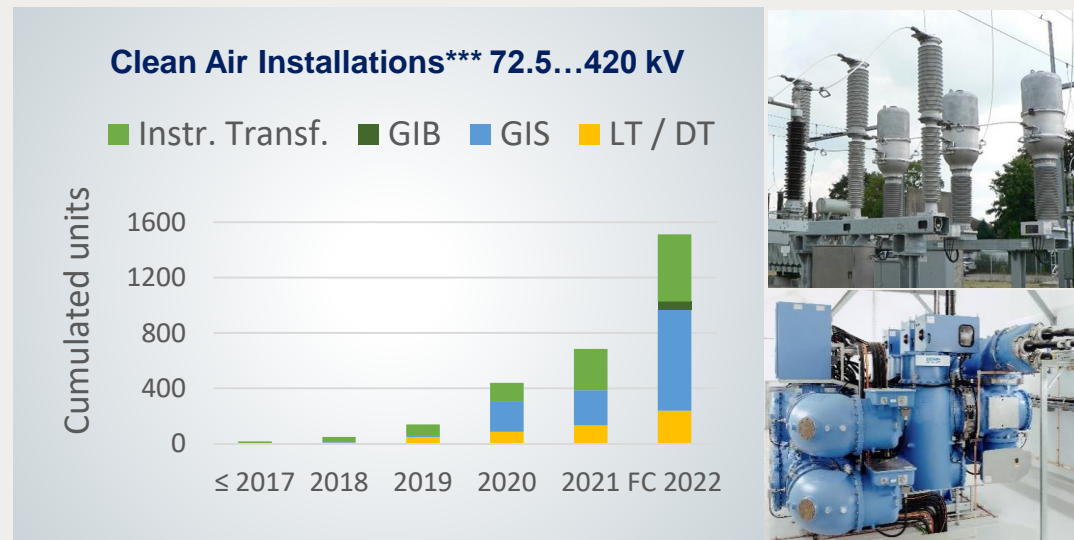
* Per- & polyfluoroalkyl substances as e.g. C4-FN and C5-FK

B3 – NetZero - Introduction of F-/PFAS-gas-free products

- > Installations with GWP* = 0 are growing rapidly worldwide
- > More than 900 units successful in operation up to 420 kV
- > More than 2500 units contracted, ~ 2.500.000 tons CO2-eq saved
- > Zero GHG** emissions in grids possible (Scope1 Grid Operator)



Double break VI CB 420 kV



* Global Warming Potential ** Greenhouse Gas *** GIB: Gas-insulated busducts, GIS: Gas-insulated switchgear, LT / DT: Life Tank & Dead Tank Circuit Breaker