



## Application of HVDC GIS with Clean Air along the entire energy transmission

### B3 PS 1 – Question 1.4

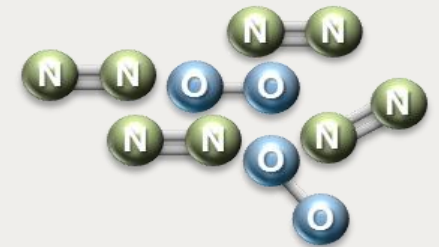
To what degree are the new environmental directives impacting on the industry's ability to respond and deliver the substation infrastructure necessary to facilitate NetZero?

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**SIEMENS**  
ENERGY

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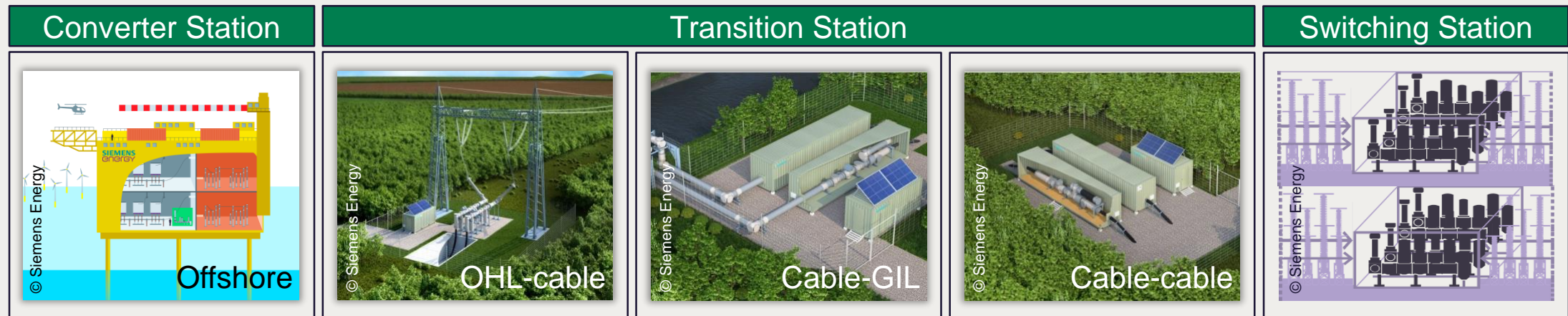
- New environmental directives and the aim of NetZero give guidance for manufacturers and grid operators to focus on...
  - ...further SF<sub>6</sub> emission reduction
  - ...no more SF<sub>6</sub> in new installations in the future
  - ...**development and application of new SF<sub>6</sub>-free equipment**
- The most sustainable solution is the application of **Clean Air**
  - No global warming potential GWP=0, enabling climate-neutral GIS in the future
  - Safe in terms of compliance with all future greenhouse gas restrictions
  - Safe multi-vendor long-term availability



80 % N<sub>2</sub> + 20 % O<sub>2</sub>

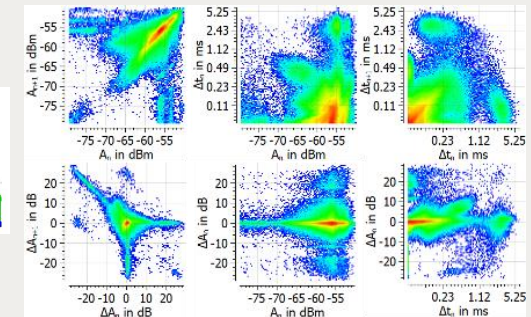
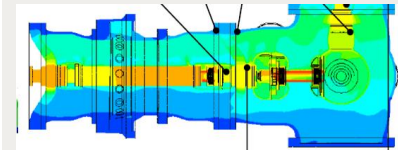
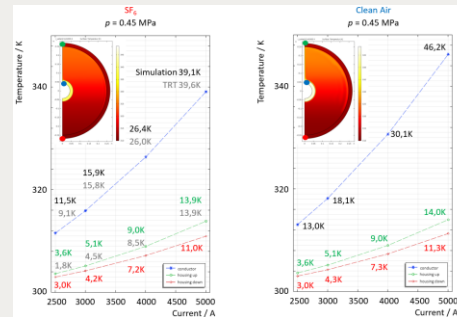
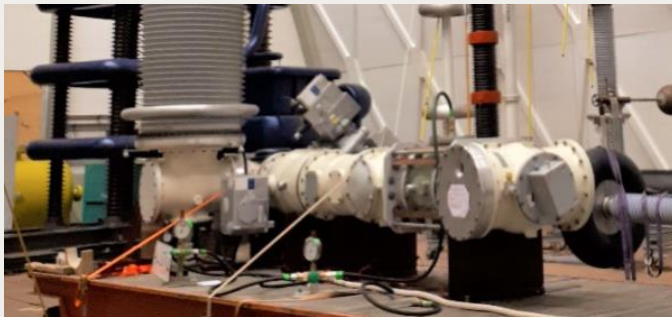
# Application of HVDC GIS with Clean Air along the entire energy transmission

- Clean Air is a potential insulating gas for HVDC GIS also, to maximize the sustainability along the entire energy transmission
- With the growing demand for HVDC systems, but also small-footprint solutions, offshore and onshore application of compact HVDC GIS up to  $U_r = \pm 550$  kV will be intensified during the next years



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- A feasibility study revealed the suitability of the SF<sub>6</sub> based  $\pm 550$  kV HVDC GIS, filled with Clean Air, for  $\pm 352$  kV



K. Juhre, M. Kosse, C. Klein, R. Plath, "Feasibility Tests of a 320 kV Gas-insulated DC Switchgear with Clean Air", Cigre Session 2022, Paper B3-11079, 2022

- Further work on feasibility and product development of F-gas free HVDC GIS up to  $\pm 550$  kV DC is ongoing to serve projects on- and offshore with small-footprint solutions