

Green Switching

Is about making responsible choices
for energy distribution

Problem definition

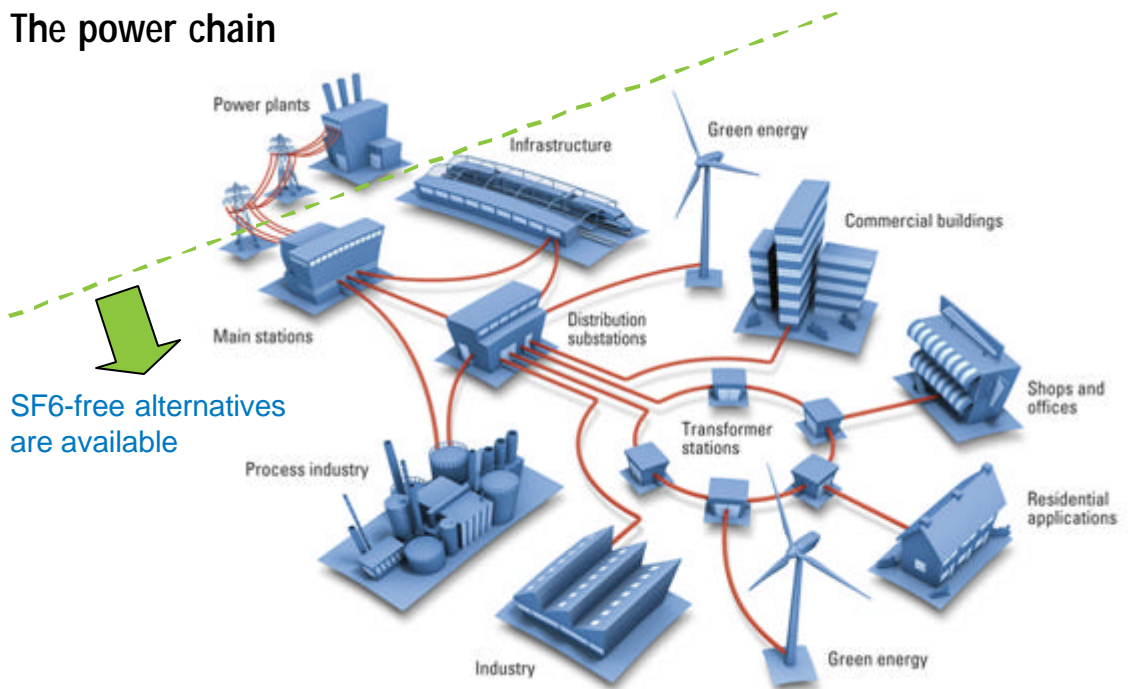
- Increased use of the greenhouse gas SF₆ in MV switchgear for energy transmission and distribution networks
- Emissions of SF₆ from switchgear are unavoidable
- The Global Warming Potential (GWP) of the greenhouse gas SF₆ is 23,000 times stronger than CO₂
- Relatively low emissions of SF₆ have a relatively large impact
- In the atmosphere a newly discovered substance (CH₃SF) is developed from SF₆ with an even greater greenhouse effect
- Danger of climate change demands reflection

Application of SF6 in the network

- Transmission & distribution of electrical power:
 - High voltage (50kV and above)
 - Medium Voltage (1kV to 50kV)
- SF6 is indispensable at High Voltage (few alternatives)
- Various good alternatives for medium voltage are available:
 - Technically at least equivalent
 - Already more than 25 years commercial available
 - Very good experience in the market
 - High level of safety and reliability
 - Cost effective (Total Cost of Ownership)

Power distribution

The power chain



SF6-free alternatives are available

Features of SF₆ gas

- Why is SF₆ used in switchgear?
 - Good technical properties
 - Relatively attractive in terms of purchase cost
 - Compact size of switchgear
- Loss due to leakage from switchgear is unavoidable
- Emissions are increasing in line with the use of it
- Toxic by-products of SF₆ require special treatment
 - Safety regulations and protocols
 - Environmental hazards and health risks in case of technical failures
 - Danger for the general public when applied in commercial and underground applications

Environmental facts on SF₆ gas

- SF₆ is not a natural substance but a synthetic compound
- Gaseous and inert at room temperature; high density
- SF₆ is the strongest greenhouse gas on the Kyoto list (GWP 23.000)
- Very long presence in the atmosphere (>1000 years)
- Emission of SF₆ in the Netherlands are > 300.000 ton CO₂-equivalent in 2005
- In the upper layers of the atmosphere, by-products of SF₆ decomposition contribute to a breakdown of the ozone layer
- During an open arc, SF₆ breaks down into very toxic substances (HF, SF₄, SOF₂ and S₂F₁₀)

Regulations and guidelines

- EU regulation shows concerns about risks
- IEC regulations and protocols for maintenance and repair
- The same for processing SF₆ systems at the end of their service life
- Studies of possibilities for cutting back in applications where SF₆ is essential (high voltage)
- Further discouragement of use for applications where alternatives exist, such as sports footwear and double glazing
- Social organisations want a general ban

Clean switching technology exists

- Switchgear based on vacuum and solid material insulation:
 - Greatly reduced environmental pollution
 - Equivalent technical performance and service life
 - Just as compact and adaptable
 - Low maintenance
- Sufficient suppliers for a competitive market

Basic principles of the Platform

- SF6 is listed in the Kyoto Treaty as one of the substances to be discouraged.
- Avoidable risks to the environment, health and safety are to be avoided.
- Where there are (risk-free) alternatives, these are to be given preference
- Green switching is consistent with corporate responsibility
- The Green Switching Platform aims to partner energy companies to support their environmental policy
- www.greenswitching.com

Relationship with corporate responsibility

- Corporate social responsibility includes:
 - Not allowing cost to be the decisive factor
 - Taking social cost into consideration
 - Assessing risks and hazards of substances (SF6)
 - Eliminating avoidable risks as far as possible
 - Giving preference to environmentally friendly alternatives

Summing up

- SF₆ is a recognised greenhouse gas
- Emissions from switchgear are unavoidable
- The growth trend will result in increased emissions, adding to the greenhouse effect
- Satisfactory alternatives are available
- The environmental policy of organisations is consistent with restraint in the use of SF₆ and discouraging it.

Conclusion:

The use of SF₆ gas in the distribution network is unnecessary and undesirable.