

# g<sup>3</sup> Technology



g<sup>3</sup>  
green  
gas for  
grid



## The Alternative to SF<sub>6</sub> for High Voltage Applications

### Removing Greenhouse Gases from the Grid

Nine of the ten warmest years on record have occurred since 2000, where greenhouse gases (GHGs) are at the root cause of climate change. Sulfur hexafluoride (SF<sub>6</sub>), an insulating gas used in high-voltage switchgear, is estimated to contribute 23,500 times more than carbon dioxide (CO<sub>2</sub>) to the greenhouse effect and can remain in the atmosphere for 3,200 years. Previously, Power Generation and Transmission utilities had no alternative to SF<sub>6</sub> for these products.

Green Gas for Grid (g<sup>3</sup>, pronounced “g” cubed) is GE’s environmentally-friendly alternative gas to SF<sub>6</sub> developed for high voltage (HV) electrical transmission equipment. g<sup>3</sup> products feature the same ratings and same dimensional footprint as the state-of-the-art SF<sub>6</sub> ones, with a drastically reduced environmental impact: more than 99% less gas global warming potential (GWP), comparatively. Also, g<sup>3</sup> products operate with no restriction under the same temperature range as SF<sub>6</sub> products (down to -30°C).

GE has a number of g<sup>3</sup> initiatives currently underway on **12 sites** that together will reduce the impact of the installed gas masses by more than 172,000 tons of CO<sub>2</sub> equivalent and cut GHG emissions by more than 99%. These projects include **51 GIS bays , 483 meters of GIL, 6 AIS Current transformers.**

### Same Performance, Global Warming Impact Reduced by More than 99%

#### Technical Benefit

- g<sup>3</sup> is applicable to all voltage levels
- g<sup>3</sup> is applicable at the same ambient temperature ranges as SF<sub>6</sub>
- g<sup>3</sup> high voltage equipment feature the same dimensional footprint as state-of-the-art SF<sub>6</sub> equipment
- g<sup>3</sup> is non toxic and falls in the same safety class as SF<sub>6</sub>

#### Environmental Benefit

- Remaining gas GWP represents only +/-1 % of that of SF<sub>6</sub>
- g<sup>3</sup> products dimensions are not increased, so the other environmental factors remain unchanged, contributing to the lowest environmental impact over the life cycle

#### Financial Benefit

- Utilities can qualify for tax reductions or incentives related to the reduction of their greenhouse gas emissions

### Green

- g<sup>3</sup> products feature a **reduced Global Warming Potential by more than 99%** compared with SF<sub>6</sub> products
- **Lowest environmental impact** over the life cycle of all SF<sub>6</sub>-free solutions
- No impact on ozone depletion

### Safe

- In the same toxicity class as SF<sub>6</sub> in its fresh state or after interruption in a circuit breaker
- 3M™ Novec™ 4710 molecule is registered according to European REACH process for chemicals

### Easy to operate

- Gas mixtures prepared in factories by certified suppliers
- g<sup>3</sup> filling and recovery at customer sites with gas cart
- Accessories for HV equipment including density switches, valves (mistake proof), moisture absorber
- Measurement devices to monitor gas ratio, moisture, tightness and detect leakage



## g<sup>3</sup> Portfolio

### 145 kV Gas-Insulated Substations

40 kA, for -25°C applications  
8 sites, more than 50 bays



GIS in Switzerland (Axpo)

### 420 kV Gas-Insulated Lines

63 kA, for -25°C applications  
3 sites, more than 480 meters



GIL in England (National Grid)

**Current Transformer up to 245 kV**  
**Voltage Transformers up to 123 kV**  
**Combined metering units up to 123 kV**  
63 kA, for -30°C applications  
2 sites, six 245 kV Current Transformers



CTs in Germany (TenneT)

## Designed for g<sup>3</sup>

### 72.5 kV Gas-Insulated Substations

31.5 kA, for -25°C applications



### 72.5 kV Gas-Insulated Substations

40 kA, for -30°C applications



For more information please contact  
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### Worldwide Contact Center

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