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NEWS



g³ green gas becomes mobile in Spain

RED ELÉCTRICA DE ESPAÑA S.A implements the first mobile GIS substation using g³, a promising SF₆ alternative

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CLEAN GRID G³ SF₆-FREE SOLUTIONS
 SF₆

In order to help Spain achieve its new climate strategy for a at least 20% reduction in carbon emissions by 2030, Spanish transmission system operator RED ELÉCTRICA DE ESPAÑA S.A. will energize its first g³-gas insulated substation this year in the beautiful Canary Islands. This project also marks the first time this SF₆ alternative gas has been integrated into a mobile substation.

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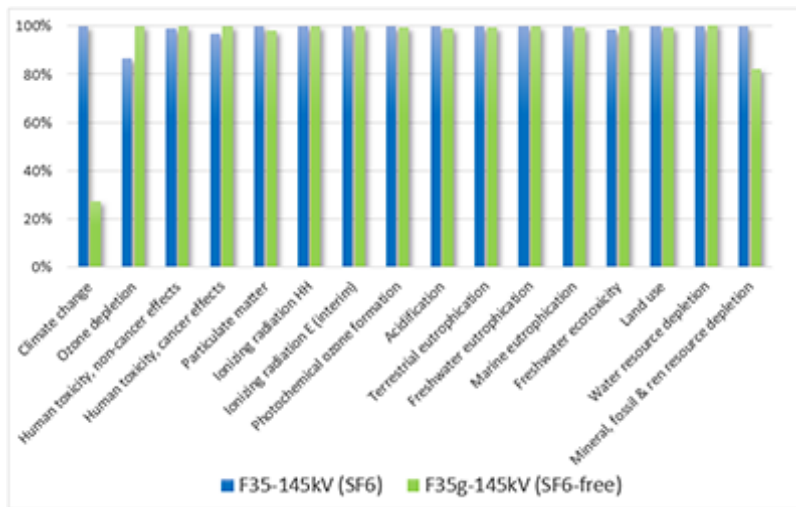
g^3 is GE's game changing Green Gas for Grid, a breakthrough alternative to sulfur hexafluoride (SF_6), which has been the standard insulating gas used in most high voltage (HV) electrical transmission equipment over the last decades. Offering the same technical performances, dimensions and safety as SF_6 , g^3 products are superior in that they reduce drastically Global Warming Potential (GWP). They operate without restriction under the same temperature range as SF_6 products, (down to $-30^{\circ}C$).

g^3 high voltage products also feature the best Life Cycle Assessments (LCA) of all available SF_6 -free solutions. A LCA is a quantitative methodology ruled by international ISO 14040/14044 standards. It takes into account:

- Manufacturing phase: materials, energy consumption, emissions, waste...
- Distribution phase: packaging & transportation
- Use phase: power consumptions, emissions, maintenance, fluid leakage...
- End of life: dismantling, material treatments

The LCA considers all the environmental indicators: pollution of water, air,

soil and the depletion of resources. The study presents the environmental impact of the product not only on climate change (carbon footprint), but also water acidification, toxicity, ozone depletion, and impact on resource depletion.



LCA comparison of GE's F35-145 kV (SF6) in blue, and GE's F35g-145 kV (SF6-free) in green

"The g³-gas insulated substation is not only showing excellent GWP results but it simply doesn't transfer the pollution on other environmental indicators compared to other SF₆-free solutions," notes Bertrand Portal, g³ product Manager at Grid Solutions.

In order to address the geographic challenges the Canary Islands face with its distance from mainland transmission networks and limited space for adding on-island power generation, RED ELÉCTRICA DE ESPAÑA S.A. decided to invest in 10 mobile substations, one of them equipped with GE's g³-filled gas insulated switchgear (GIS). These containerized gas-insulated mobile substations, manufactured in Madrid, give utilities the flexibility they need to accommodate maintenance and emergencies while ensuring grid availability during peak demand. In the case of an emergency or scheduled substation refurbishment, the compact units can be transported from one substation to another, or between islands, by standard maritime shipping.

The initial allocation of this g³ 72.5 kV containerized substation is on Tenerife Island. Energization managed by RED ELÉCTRICA DE ESPAÑA S.A, with GE's support, will then follow rapidly. The application will use g³ gas not only as insulating, but also as an arc quenching medium for switching.

“Our g³ technology is a game-changing alternative to SF₆ for high-voltage equipment and is part of GE’s broader efforts to help the electric transmission and distribution industry reduce its greenhouse gas emissions,” said Vera Silva, Chief Technology Officer at GE’s Grid Solutions. By implementing g³ in their gas insulated mobile HV equipment, RED ELÉCTRICA DE ESPAÑA S.A. makes a step in preparation for an upcoming evolution of EU’s “F-gas” regulation.

Spain now becomes the eighth country in Europe to adopt GE’s SF₆-free solution, contributing to the reduction of green-house gases on electrical grids, and thus their impact on climate change.

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