GRID

ALSTOM Grid SAS
France
Immeuble Le Galilée
51, esplanade du Général de Gaulle
92907 La Défense Cedex

ALSTOM

Mr. Mikkel Aaman Sørensen
Miljøministeriet
Miljøstyrelsen
Strandgade 29
1401 København K.
Danemark

Paris la Défense , May 12th, 2015

Dear Sir,

I and my team were glad to discover the ambitious decision taken by your authority for the future of Danish network. As such,

Alstom Grid is one of the main suppliers of power transmission equipment worldwide; delivering SF6 insulated equipment for voltage between 72kV and 1200kV.
The Alstom Grid's portfolio covers all types of SF6 equipment including gas insulated substations (GIS), gas insulated lines (GIL), all types of circuit breakers (live tank, dead tank) and all types of instrument transformers.

For long time Alstom Grid has been committed to the development of sustainable solutions for power transmission through its "clean grid" program.
As part of this program Alstom Grid aims to reduce the emission of SF6 in the atmosphere from its own manufacturing site as well as from customers' assets.

Alstom Grid has also embarked on an ambitious research program in order to develop power transmission equipment with reduced or very limited environmental impact.
Break-through has been made recently with a revolutionary SF6 free solution, g^3 - "green gas for grid". g^3 is in fact CO2 combined with a new fluonitrile compound. This new gas mixture will be used in newly SF6-free transmission equipment designed for all voltages with footprints, performance and economic conditions that meet closely with SF6 equipment parameters. This is valid for the most common operating conditions (minimum operating temperature above -30°C) as well as most common permanent and short circuit currents.

This technology has been presented for the first time in the CIGRE exhibition & conference in Paris in August 2014. The first product and pilot application was presented in the last Hanover fair in April 2015. From an environmental point of view, g^3 reduces the global warming potential (GWP) of power transmission equipment by 98% compared to SF6. However, the GWP of the mixture is still above the threshold of 25GWP which is being considered as the limit in this regulation.

At this present time, no prospective solution exists to replace SF6 with a GWP<25, acceptable footprint, technical performances, minimum operating temperature and economic conditions.

Alstom Grid believes that defining a threshold at 25GWP for electrical equipment above 72kV (transmission level) would be a very counterproductive measure. It would exclude the best candidates to replacement of SF6 and a realistic solution with a significant GWP reduction of 98% vs SF6.

The development of all products necessary for the Danish network by 2030 is already a very ambitious and challenging target.

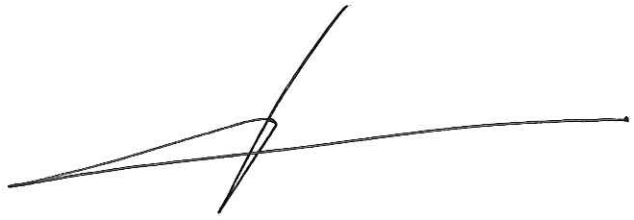
For electrical equipment for power transmission voltages above 72kV, we recommend to consider:

- a reduction of the GWP of the application (vs SF6 solution) by 95% or more, or
- to fix a more realistic threshold e.g. GWP of 1000.

The application should be limited to the import and sale of installations using F-gas with GWP above 1000. Moreover, completely replacing of all existing Danish assets using SF6 by 2030 appears to be unrealistic, considering manufacturers' development time, budget as well as the utilities' investments planning and budget.

We remain at your disposal to clarify any aspect of our solutions, and we will be glad to support Denmark, your Authority in making this initiative a reality.

Faithfully,



Stéphan LELAIDIER

GRID Research & Development Vice President