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DENMARK ASKS

HOW STABLE IS YOUR ENERGY SUPPLY?

Energy consumption is rising around the world, much of it based on oil from politically unstable regions. Global society is also becoming ever more dependent on electricity, which cannot be stored in quantity and thus requires continuous uninterrupted supply. Maintaining security of energy supply, in all its aspects, is a major challenge for governments worldwide.

At present, Denmark is virtually self-sufficient in energy, due to its own modest reserves of oil and natural gas in the North Sea, the increased use of renewable energy resources, and decades of focus on energy efficiency which has kept overall energy consumption virtually unchanged for 30 years despite economic growth of over 50%.

Future preparedness

But Denmark has already started looking ahead to the time when its oil and gas production will decline, and the government has formulated a long-term energy policy to ensure a balance between security of supply, economic growth and respect for the environment.

"Energy Strategy 2025" puts forward a range of initiatives that look at energy security from both the consumption and production perspective: intensified energy-saving efforts to reduce overall energy consumption; increased use of renewable energy to reduce reliance on fossil fuels and combat anthropogenic climate change; and an intensified focus on more effective technologies and alternative fuels to provide competitive alternatives to diesel and gasoline in the transport sector - the one key area where energy consumption has continued to rise over time.

Contingency planning

Nordic governments have recognised modern society's increasing dependence on electricity and the crucial importance of the transmission grid to secure a continuous electricity supply. Furthermore, national transmission networks in the Nordic region have increasingly acquired transnational characteristics. Cooperation between the Nordic transmission system operators and the authorities is therefore necessary regarding contingency planning and crisis management, in order to manage major power outages and the resulting cascade effects.

State control

To safeguard future economic growth, the Danish government is committed to ensuring sufficient capacity through expansion of the electricity infrastructure in a way which reinforces security of supply while encouraging environmentally friendly electricity production and promoting competition.

At the start of 2005, the Danish State took over responsibility as transmission system operator for both electricity and gas from the commercial suppliers who hitherto handled this task.

Ownership is now exercised by a state enterprise, Energinet.dk, which is completely independent of commercial activities. The objective is to ensure open and equal access for all users of the network.

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CASE

NORDIC COOPERATION

The Nordic power system is the most integrated in Europe. The single electricity market consists of Denmark, Finland, Norway and Sweden. Iceland is also a part of the Nordic cooperation, but is not interconnected with the other countries. The interconnection of the power systems makes the countries mutually dependent, and so cooperation between the nations is of utmost importance to securing power supply.

With the exception of Denmark, the Nordic countries are situated far to the north in harsh climatic conditions. Populations often live in small communities widely spread over large areas. Living in modern society, their dependence on an uninterrupted electricity supply is of major importance. This fact, together with the climatic conditions, set strict requirements regarding reliable and smoothly functioning power systems. As consumption is higher than production, the Nordic nations as a whole are net importers of electrical energy from neighbouring countries.

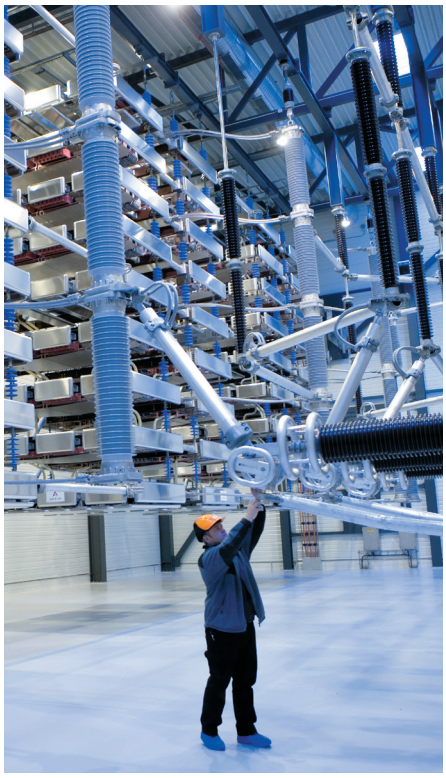
Formalizing cooperation

The energy authorities and the transmission system operators in the Nordic countries - Denmark, Finland, Norway, Sweden and Iceland - meet regularly in regard to contingency planning and crisis management in the Nordic power sectors and cooperate in a number of ways in order to make improvements. This cooperation has been formalized in a Letter of Intent signed by the Nordic authorities and transmission system operators. The Letter of Intent was significantly revised in 2007.

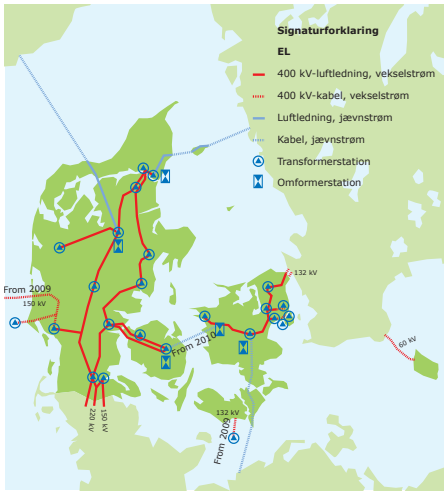
Cooperation is important for crisis management of the electricity supply. Such cooperation can take many forms such as information-sharing, understanding each other's systems, capabilities and vulnerabilities, identification of problems of mutual interest and joint projects. It can also include joint crisis management mechanisms, and standardisation of e.g. equipment and methodologies.

Improving preparedness

As part of this cooperation, a report has been prepared on "Nordic Contingency Planning and Crisis Management" with the aim of describing the organisation of the power system in the Nordic area, the disposable resources and how preparedness across national borders can be improved.



The thyristor valve is the heart of the Tjele HVDCsubstation, which connects Denmark with Norway. Here, alternating current is rectified to direct current or vice versa.



The map shows the main power lines in Denmark and the interconnectors between Denmark, Norway and Sweden.