

15 December 2009

T&D Europe brief Position Statement on Smart Grids

The time is ripe for investment in the electricity grid - reinforcement of the existing installed base and development of capacity to incorporate new technologies and new sources of energy.

The purpose of this position paper is to offer a vision of how moving rapidly towards a smarter grid could assist the development of the SET Plan objectives on higher energy efficiency.

About T&D Europe

T&D Europe is the European association of the electricity transmission and distribution equipment and services industry. Companies represented by T&D Europe account for a production worth over €25 billion per year, and employ over 200,000 people in Europe. The member Companies of T&D Europe are strongly committed in support of the EU climate change sustainability targets, particularly through ongoing, aggressive technology development.

Importance of the electrical grid

The electricity grid is basic to the functioning of modern society. The electrical grid also plays an important role in enabling the use of renewable energies to their full potential.

Europe faces the enormous challenge of expanding and modernizing its power grids in order to satisfy the foreseeable, growing demand for electrical energy over the coming decades. Energy security, economic efficiency and minimal environmental impact are the three pillars of a sustainable energy system.

In order to achieve this and to make best use of the many enabling values of electricity in the next few decades, comprehensive modernisation and improvements in the European electrical grids are necessary. Therefore investments must be made - and as quickly as possible - despite the current financial and economic crisis. In fact, these investments should be beneficial to the overall economic situation in Europe.

Smart Grids

Exhaustive definitions of Smart Grids vary in detail but it is clear that:

- A Smart Grid manages real power flow and is more than smart metering and more than widespread communication systems, important though these are;
- We must optimise the use of the existing grid and build upon its installed base thereby contributing to a more sustainable generation, distribution and use of energy;
- We must develop the capacity for both transmission of bulk power and the integration of distributed resources from a variety of origins, e.g. photovoltaics, Combined Heat & Power (CHP), wind, biomass, electric vehicles, etc;
- We must reinforce the capacity to support the newer needs of the demand side and allow for the connectivity needs of technologies such as e-vehicles, intelligent industrial loads, micro-storage systems, etc.

A genuinely Smart Grid will become a key enabler to achieve the EU policy targets in energy usage in the following ways:

- by making possible the integration of renewables and distributed generation sources, the connection of which will become widespread. The problems addressed here are both the absolute capacity of the system and the management of complex and less predictable power flows. This issue is particularly acute in distribution grids;
- the new level of complexity of power flow threatens security of supply and therefore depends on a robust physical grid, aided by sophisticated automation solutions and new market models;
- by raising the energy efficiency of the network (i.e. reducing losses), and therefore reducing GHG emissions, by intelligent installation of smart solutions, e.g. load balancing, FACTS devices, Wide Area Management Systems, power factor correction, HVDC (high voltage direct current), etc;
- Investment in renewables - Installation of renewables can only be encouraged if investment in smarter grid systems, well in advance, is made a priority. By this means, power generated by renewable sources will be connectable and transportable, and therefore usable, in real time (avoiding their shut-down or inefficient energy storage) and hence contributing to its full potential. This will also lead to savings for the consumer and for each unit of energy because of the higher rate of return on investment capital. The need for capital investment in traditional power generation plant will also be reduced.

Regulation and Power Quality

Even the regulatory framework can make use of Smart Grids by taking advantage of the capabilities introduced by the new technologies. By improving the transparency of the physical flows and states of the grid equipment, as well as improving the reliability and technical flow in the grid, these smart technologies help the Regulator to monitor the capacity and the quality of supply and to manage their improvement. However, the Regulators will also need to take an active role in the development of new policies and guidance to utilities.

Future Investment

Much effort has gone into the very necessary programmes for stimulating and funding Research & Development and more recently into planning substantial programmes of demonstrator projects. Whilst these are welcome and essential, they must not be the whole story.

In the above comments, much has been said about the central importance of the physical grid. The same is true when it comes to new development of capacity or of the sophistication of the network. The actual investment in the capabilities of the physical grid will determine the true, final value of all the smart developments.

Many of the technologies of the Smart Grid are available in Europe and European manufacturers, whether global, pan-European or SMEs, are recognized leaders in them. Similarly, many of these technologies are already installed and proven worldwide. Support for Smart Grids would build upon this foundation to stimulate employment and the R&D base in Europe.

Conclusions

Smart Grids imply a suite of technologies and related regulatory issues that have high potential to contribute enormously to energy efficiency, as well as several related issues, and therefore should be a major weapon in the armoury in our campaign for a sustainable future for Europe (and beyond).