

Summary Report

Tuesday 17 October 2011 - Berlin

FUTURE – How much grid do we need and why?

Looking behind the scene: On what assumptions are future grid scenarios based? – Henk Eleveld, KEMA

Kema is a leading consultancy in network planning. Henk Eleveld gave an introduction about the key challenges that Europe's grid will face in view of the rising share of renewable energies. The different properties of many renewable energies (availability, variability and allocation) will lead to technical challenges with regards to necessary transmission capacity, but also to frequency and voltage control. Planning the future grid for Europe must follow a threefold objective, being (i) reliable, (ii) affordable and (iii) sustainable. Future major production centres, such as wind parks in the Northern Seas and solar power in the south must and are already considered in the planning today. Using distributed sources of energy, such as solar PV, will not reduce the grid needed significantly, as local storage is difficult to achieve. HVDC grids are today considered as part of the solution, which represents a significant change from the perception only two years ago.

Planning the integration of renewables in the 2020 grid – Mihai Paun, ENTSO-E

ENTSO-E is the European network of transmission system operators. It plays a critical role in delivering European climate and renewable energy targets, by driving for the development of the future grid. Based on the experience with the first "pilot" ten-year-development-plan, ENTSO-E is now developing the new ten-year plan 2012 with an improved approach with regards to (i) methodology, (ii) transparency, (iii) coordination and (iv) stakeholder involvement. The experience with European grid planning has shown that it is important to also consider the long-term horizon until 2050 in the planning, besides the shorter-term horizons of 2020 and 2030. ENTSO-E is therefore starting a project to identify future long-term grid scenarios in a modular way. In order to successfully plan a future grid, clear long-term targets are needed. Unlike often perceived, business here do not object clear guidance. In order to increase transparency of how much grids we will need in the future, Mr Paun said that he would appreciate RGI to drive forward the idea of an openly accessible grid model.

National grid development planning in Germany – Roland Bauer, 50Hertz

Mr Bauer gave an overview of the new procedure of grid planning that is currently applied in Germany. It is a new model that is applied for the first time this year and aims to improve quality, transparency and acceptability of the future grid planning outcome on both national and local level. The first step, that is currently underway, is the development of a scenario framework, which includes a public consultation. The result of this first step will be a limited number of energy-system scenarios to be considered while developing grid planning. A market simulation is then performed upon these scenarios, followed by the grid planning exercise itself that also considers technologies to be evaluated and chosen.

NGO's perspectives on grid requirements – Thomas Duveau, WWF

Mr Duveau presented the perspective of the NGO community on the future grid development. As WWF pursues the target of a fully decarbonised power sector by 2050, it supports the build-up of the infrastructure required to reach this in general. Key issues that are important for its successful implementation are (i) transparency, (ii) participation and (iii) acceptance. Mr Duveau presented two theses: (1) "Transparency is in the interest of TSOs". While in the history, this has not always been perceived as such, in the long term transparency is crucial for the successful achievement of TSOs' objectives. The necessary shift in the fundamental approach towards grid expansion can be characterised as being from "decide-announce-defend" to "announce-discuss-decide".

The second thesis was (2) "Participation is a prerequisite to acceptance". Referring to the new approach of grid planning currently tested in Germany (described before by Dr Bauer), his conclusion was that this is a good step in the right direction, but that there is still a "bumpy road" ahead. The exercise should not end up in being simply a new version of the former "DENA studies", which were not well perceived by many NGOs.

TODAY – System Integration of Renewables – Today's challenges

Day-to-day challenges of integrating renewables in the transmission grid – Alan Croes, TenneT

Mr Croes presented four dimensions of the challenge of renewables grid integration; market (i.e. one European price), environment (i.e. dependent on policies and regulation), scale (i.e. local, national and international aspects of NIMBYs, permits, visions), time (i.e. long-term planning vs. operation). From a TSO's perspective, the challenge related to long-term planning is that scenarios and planning corridors will always deviate from the actual implementation. The same applies for day ahead planning, as demand can be easier predicted but a generation mix with large shares of variable renewables is not. To tackle these challenges continuous mid-term planning, daily forecasts and real-time online data collection beyond national borders are required. A robust process for grid planning and scenario making is required in order to provide regulatory certainty for all involved parties. Mr Croes added that in order to manage the grid integration of renewables, market flexibility is required to allow all interested actors to participate. He concluded that TSOs need to innovate and increase transparency amongst TSOs and cooperation in order to integrate renewables and not hinder their further development.

Current grid integration of wind turbines and remaining challenges – Ruth Brand-Schock, Enercon

Ms Brand-Schock presented Enercon's wind converter and control concepts. Wind converters can provide grid stability through the fault-ride through feature. Enercon developed a project where locally 100% renewable electricity proved to be feasible and can provide a constant power supply through a combination of solar, wind, biogas and hydro reservoirs. One key issue for such a system is that there is not sufficient inertia in the grid to accommodate for periods when suddenly the load is higher and higher feed-in is needed. At current levels of renewables penetration, TSOs do not face such an issue but it will come rapidly in the future. Manufacturers can provide inertia emulation through wind turbines. She concluded that complementary to ENERCON's intelligent and flexible grid management, grid extension and incentives for renewables system integration are also key.

System requirements and technical challenges in the modification of grids – Heike Kerber, VDE / FNN

Ms Kerber stressed the need to change the grid's system development and transition from a centralised to a synthesis of centralised and decentralised approaches. VDE will publish a roadmap for all the technical challenges for such a system change in order to develop a common understanding. The issue of TSO data transparency was also raised. By law (depending on the country), NGOs can nominate an expert to have access to TSO data. However, what is equally important is to have robust systems without the need to know all types of data. Ms Kerber concluded that the potential of demand-side management, storage and wind ancillary services needs to be addressed. Antonella Battaglini (RGI) suggested the development of an openly accessible grid model that could be used by all stakeholders. Mihai Paun (ENTSO-E) commented that ENTSO-E would be interested in identifying opportunities for developing such a model.

TRANSPARENCY – What data should | can | cannot be disclosed and why? *Panel Discussion with Stephanie von Ahlefeldt, BMWi; Christoph Bals, Germanwatch; Olivier Feix, 50Hertz; Alexander Wirth, Swissgrid*

The panellists started with a brief statement each. Ms von Ahlefeldt (BMW) stated that in Germany, issues around transparency have changed and are currently tremendously changing. While in the past most data relevant for grid planning had to be kept secret, the Bundesnetzagentur (German regulator) will establish a process to allow nominated experts the access to all relevant data. Mr Bals (Germanwatch) pointed out that in Germany, now everybody has a common understanding, and that this is an excellent starting point to start moving ahead. With regards to transparency, he perceived the continued reluctance of some actors, who may prefer an “old-fashioned”, less transparent approach followed e.g. at the prior DENA studies for grid planning in Germany. Mr Feix (50Hertz) emphasised the importance of information, dialogue and benefit sharing in order to reach public acceptance. He stated that TSOs are ready to continue to move towards new approaches. This includes not only following requirements towards transparency, but be an active part in shaping a new transparency. Key to success will be that everybody is able to play its role in the best possible way. Mr Wirth (Swissgrid) pointed out that before, TSOs were not allowed to share information, mostly driven by legal concerns around market competition as well as fear of protecting this critical infrastructure against terrorism. Today, these former approaches have evolved, e.g. since terrorists can easily find much information that is publicly available and there must be other ways to protect critical infrastructure. The subsequent intensive debate included discussions around data transparency, but also stressed the importance of trust and cooperation between the stakeholders involved.

Tuesday 18 October 2011 - Cottbus

VISIT – GridLab in Cottbus

Visit and simulation of high renewable energy infeed in the 50Hertz control zone - Hans-Jörg Dorny, CEO, GridLab, Marco Schneider & Dirk Lehmann, GridLab

Mr Dorny and Mr Feix gave an overview of 50Hertz’s system trainer and showed a simulation of overloaded lines when high renewables infeeds occur. A cascade of measures is applied to bring back the system to sustainable grid situation, the measure of last resort being the curtailment of renewables. Until now, 50Hertz would stir renewables curtailment based only on forecasts but new legislation allows in the future access to online data and the power to directly influence the behaviour of renewables in order to relieve overloaded lines more efficiently. 50Hertz stressed that market evolution and technical evolutions are diverging a lot. This gap must be reduced again in the future since this situation leads to missing market rules that incentivise behaviour that supports the system.

Increasing challenges for German power grid operators caused by high renewable infeeds - Prof. Harald Schwarz, Centre for Energy Technology Brandenburg, Brandenburg University of Technology (BTU), Cottbus

Prof. Schwarz provided an overview of the high voltage (up to 550kV) testing facilities and the research carried out at BTU. TSOs in Germany are forced to take grid stability measures at an alarming high frequency due to the increasing shares of renewables. To accommodate this, an extended transmission and distribution grid is required coupled with storage capacities. Prof. Schwarz presented BTU’s work on grid stability that included storage solutions (wind/hydro and electric cars), HV circuit breakers and a future ‘overlay grid’.