

Transatlantic perspectives on energy infrastructure

Bruegel, March 23rd, 2012

The aim of this event was to provide an opportunity to discuss what the United States and Europe might learn from each other to allow for an inexpensive transition of the energy system. It also served to announce a new paper by Bruegel, supported by GMF, on developing the necessary energy infrastructure for a common electricity market featuring a large share of renewables, which will be published shortly.

Jon Wellinghoff, Chairman of the Federal Energy Regulatory Commission (FERC) of the United States, provided an overview of the situation, and where energy regulation/transmission investment is headed, in the US. **Konstantin Staschus**, Secretary-General of European Network of Transmission System Operators for Electricity (ENTSO-E), presented the situation in Europe. **Kitti Nyitrai**, Networks and Regional Initiatives Unit, DG Energy, European Commission, acted as a discussant. **Georg Zachmann**, Research Fellow at Bruegel, followed this discussion with the presentation of a draft GMF paper on energy infrastructure investments and some policy recommendations. Some of these recommendations have been inspired by American models that were successful in incentivizing infrastructure investments. **Susanne Nies**, Head of the Energy Policy and Generation Unit at Eurelectric, chaired the event.

The first presenter was Chairman Jon Wellinghoff, who provided a high-level overview of the work at FERC. FERC is an independent regulatory agency in the federal government of the US, responsible for the wholesale natural gas and electric markets in the US, as well as infrastructure at the wholesale level for interstate transmission and pipelines. Over the last five years, approximately 9900 miles of high voltage interstate transmission lines have been installed. FERC oversees those lines from the perspective of the planning framework/rules, although planning is done by individual regional authorities (for example, the regional independent system operator (ISO)). There are public policy reasons for planning beyond reliability and simple economics to lower cost. These rationales include state actions to establish renewable portfolio standards (RPS) – over 30 states have RPS in place. Additionally, federal EPA regulations impact generation (plant closings) and thus indirectly impacts transmission.

FERC also has cost allocation oversight for the method and sets up the framework for regional determination of cost allocation. Cost allocation methodologies and costs for individual transmission lines must be approved by FERC. The one area of disconnect is in the siting. FERC has virtually no authority in siting the transmission lines – siting is in the purview of states, but can be delegated down even to the county level. In contrast, FERC has full authority over siting natural gas pipelines. The Secretary of Energy has recently created a rapid response team to move forward with coordinating Federal Agencies with respect to transmission lines (on federal lands such as forest areas). So now FERC is trying to at least coordinate to minimize the cost of siting on federal lands. In the last 5 years, the US has installed over 35GW of wind and almost 3GW of solar. There has been a tremendous amount of additional renewable resources in a short period of time. FERC has

set up legal frameworks for regulating markets in areas where there are organized wholesale markets. To the extent that organized wholesale markets are voluntary, these markets are created by transmission owners (TOs) coming together and giving up the market operation to a third party independent agency. This independent agency is under the jurisdiction of FERC. These markets don't exist everywhere. They don't exist in the southeast or west of the Mississippi with the exception of California. The markets that do exist vary from area to area in how they operate, though they must meet the overall FERC framework. There are some very robust markets, such as NY, New England, and PJM which have both real-time and day-ahead markets. FERC can't dictate what products will be part of the markets but can try to structure the markets in a way so that all products can participate. One area that FERC is trying to encourage is the demand side – which includes energy efficiency, demand response, and distributed generation. FERC is interested in ensuring that these products can participate in the market. The more products both on the supply and demand side, the more efficient those markets will be. FERC has established rules where if bidding into an energy market for supply-side resources with Locational Marginal Prices (LMP), then you must pay for demand-response the same price that you would have to pay a generator. This is the first time where there is equality between demand-side and supply-side resources in an electricity market. PJM has over 10,000 MW of demand-response bidding into their market. Some also have energy-efficiency bidding in. PJM has over 800 MW of energy-efficiency bid-in. FERC is very interested in ensuring that these markets are robust.

Next, Konstantin Staschus presented on ENTSO-E and the challenges of the European Transmission Policies. ENTSO-E was founded in December 2008 via the third internal energy package, and fully operational in July 2009. It represents 41 TSOs from 34 countries. The third package regulation on cross-border electricity transmission requires that all TSOs involved must participate in this association. ENTSO-E must jointly, with ACER and the Commission, create a ten year network plan (TYNDP) every two years, and must draft network codes which later become regulations through checks and balances. Although Europe has managed to integrate much more renewables than the rest of the world, the TSO's concern is over the sheer quantities and intermittency in Europe. France has an installed capacity fairly comparable to that in the PJM area. From a system-operational perspective, the large amount of renewables integration is hard to manage. A graph presented on renewables investment versus transmission investment projects in Europe shows that renewables projects appear to dominate. The joint market studies in the TYNDP have identified the transmission which will be necessary to adapt to increased renewables. A 17% increase is needed according to the TYNDP 2012 plan. 104 billion Euros is needed in the next 10 years. This is a challenge for Europe, where less than 1% of overhead lines have been built during the last decade. There are problems with social acceptance (permitting) and finance. Social acceptance issues may result in the delay of 1/3 of TYNDP items. The infrastructure legislation requiring a 3-year time limit for permitting is absolutely necessary. Disaster looms if lines come as slowly as they have in the past – we can't keep integrating more renewables without more infrastructure. The proposed infrastructure regulation and three-year time limit is key to streamlining permitting procedures. Incentivizing TSOs to deliver on time must be a key priority.

Regarding the market integration, there is a pretty coherent picture with a target model for 2014. The price-coupling day-ahead allocation has been tested in a large part of Europe, and ENTSO-E is hoping that this will prove itself so well that the extension to the rest of the Europe will be a copy-

paste. ENTSO-E network codes will define the rules while regional implementation projects will pave the way for a EU-wide implementation of the target model. The TSOs have gone through three rounds of unbundling and are the most neutral things in the industry.

Next, Kitti Nyitrai, acted as a discussant. She stressed that the third package highlights what needs to be done on the legislative side. The Commission will attempt to establish a three-year deadline on permitting – even though in the EU permitting is usually a national or sub-national process. It should best be accomplished by a one-stop-shop. Meanwhile environmental standards should be preserved and streamlined by memberstates. ACER can take decisions on behalf of some regulatory authorities. Financing is absolutely necessary.

Georg Zachmann then presented on a blueprint for energy infrastructure investments. Although the US and Europe possess very different regulatory and political frameworks, the issues posed by unbundled electricity generation and transmission on infrastructure investment are the same across both sides of the Atlantic. On both continents, increased renewables imply a large investment backlog over the past 40 years. In terms of renewables, Europe has 90GW of wind compared to 47 GW in the US. The single market means interregional integration in the US and the EU single market in Europe. Three problems which both continents face are:

1. Synchronization and coordination of investment
2. Diverging interests of stakeholders and asymmetric information
3. Diverging interests of states.

The solutions in the US differ from those adopted by the EU and may provide some takeaways for European policy. In the more developed US markets, locational prices in centrally optimized zones, and ISOs (who do not own the grid they operate) seem to have addressed the coordination issue. In 2009, 87% of new transmission in the 2005 plan had been completed in the CAISO grid. The ISO model may also better address the diverging interests of stakeholders. In Europe, TSOs are partially unbundled but may still have conflicting interests due to their ownership and operation of the grid elements. The CAISO phased-in harmonization of tariffs may provide a model for addressing the diverging interests of member states. In the EU, bilateral negotiations are currently the norm. In the draft proposal, we suggest that the EU adopt independent planning, locational prices, and redistribution from the US model. Additionally, there should be democratic legitimization (as opposed to unanimity), and the plans should be binding for all involved parties. Currently, the TYNDP is nonbinding and this fails to resolve the issue of asymmetric information.

A discussion followed in which Jon Wellinoff mentioned that the US is very interested in non-transmission alternatives and asked if the EU was considering it. The other panelists did not mention any integration of non transmission alternatives into the network development planning, but stressed that the network development plan is a market model based on simulations. Additionally, Konstantin Staschus mentioned that trust is the word because the law is that planning must be done independent of generators and must be approved through a joint committee. Kitti Nyitrai added that the third package came into effect one year ago, let's not open discussions again. Locational signals are not the problem but the problem is getting the grid built. Geographical balance undermines solidarity. Additionally, a question was asked on the ratio of overhead versus underground lines in

the US – this ratio is approximately 98% above and 2% or less underground. AC-DC is approximately 90% to 10% though there is a growing focus on DC for moving wind.