Feature Policy Overview – part One

The drivers, the changes, the chances

EER correspondents Sonja van Renssen and Hughes Belin spent many days talking intensively with stakeholders in Brussels. They put together an overview of where smart energy is (and is not) headed in Europe. They discuss: the drivers – especially the policymakers themselves. The changes – in the product energy. And the chances – which come from unexpected places.

| *by Sonja van Renssen and Hughes Belin*

What came first in Europe: smart meters and grids or the policy framework to regulate them? It's a bit of a chicken-and-egg story. There are many "smart" drivers, such as:

- the general trend of decentrali sation (meaning more wind and solar in the power sector)
- the global trend towards a gree ner society (and rising energy prices)
- new applications such as electric vehicles and heating
- the growing sophistication of information and communica tion tools
- plus, let's not forget the so-called 'empowerment of customers' who are supposed to make more decisions than ever before in their lives.

These trends have certainly had an influence, but EU law, notably through its energy and climate goals as well as its energy market li-beralisation, was probably the cata-lyst for industry to mobilise "smart technologies" a few years ago.

EU member states have set three goals for 2020: a 20% cut in CO_2 emis-sions compared to 1990 levels, 20% renewables in the EU energy mix and 20% energy savings compared to energy demand projections. The three goals are interlinked and "the

EU targets on renewables and energy efficiency require a thorough modernisation of energy networks", according to Jean-Arnold Vinois, acting Director for Internal Market at the European Commission. There is unanimous consensus on this across the energy value chain, from regulators to network operators.

Challenge of renewables

As renewable energy sources are connected to the grid, this poses a challenge to transmission system operators (TSOs). In addition, many distributed generation units, mainly fed by renewable energy sources such as photovoltaic power and cogeneration are being integrated into distribution networks. Distribution system operators (DSOs) therefore also face the challenge of integrating renewables into their grids.

But traditional systems are not designed to operate with such variable resources. With renewables to increase on average from some 12% to 20% of the energy mix by 2020, they will increasingly destabilise the power system. Grid operators need real-time information about consumption and weather in order to better anticipate demand and plan the integration of the renewables. "Right now, from the substation to the point of consumption, the network is blind", says John Harris, Vice President and Head of Governmental Affairs for Europe at smart meter maker Landis+Gyr. "Most DSOs know there's a power outage because people call up and say there's no electricity."

SAP has launched a new technology that enables it to read ten million meters in less than half a second

This is where smart meters and grids come in: to get an insight into this last mile. Smart meters will enable two things: 1) operational optimisation and 2) better investment decisions. If you know the consumption patterns in two villages, in one of which capacity is tight, you might decide that an interconnector between them makes more sense than grid reinforcements in the first.

Efficiency as a driver

Energy efficiency is a second powerful driver for smart grids because it enables optimal grid management and lower network losses. "Smart means managing the network at lower cost than traditional network expansion methods i.e. business as usual," explains Gunnar Lorenz, Head of Networks at Eurelectric, the European power industry association. "Energy is not a commodity anymore. We need to optimise it," says Maher Chebbo, Vice President of Utilities and Communication Industries for Europe, Middle East and Africa at software giant SAP.

It wasn't always like this. In Italy, one of the first EU countries to see widespread deployment of smart meters, energy giant Enel took the initiative, not to save energy, but to ensure consumers actually paid for it. In Sweden, another smart meter forerunner, the parliament imposed monthly billing based on actual energy use rather than estimates. Instead of sending round a meter reader to every household every month, the energy industry turned to a technical solution that was more cost-effective: smart meters. "[Today] Sweden is trying to find out how to upgrade its metering so it can help people save energy," says Jessica Stromback, Executive Director of the Smart Energy Demand Coalition (SEDC), a lobby group that promotes demand side programmes in Brussels.

Consumers are facing a huge change. For the first time, they will be able to follow their actual electricity consumption. "This provides them with strong incentives for energy saving," says the European Commission. It estimates that consumers with smart meters installed can reduce their annual energy consumption by around 10%. And the Commission quotes some pilot projects suggesting savings can be even higher: up to 40% in the UK-based AlertMe project which allows customers to turn off appliances by web interface or mobile.

Yet technology enthusiast Ray Pinto, Senior Government Affairs Manager at Microsoft Europe, warns that it's not all as easy as it looks. Microsoft, he says, invented an algorithm enabling people to calculate their energy usage. But pick up rates were low. "It all sounded great," he says. "But what we began to realise is it's only so interesting to see your energy. People care about their energy usage and its cost, but what they care about more is their comfort." It's when a technology makes life easier that it really takes off, he believes – think of downloading music – that wasn't done to save the planet and yet it contributes. The smart meter is necessary but insufficient to deliver energy savings.

Consumer engagement |

The EU recently finalised its most ambitious ever energy efficiency directive. This includes a chapter on smart metering. In the Commission's original proposal, this set out fresh provisions on consumer information provision. But most of these were thrown out by member states during the negotiations. "It's a missed opportunity," says Harris from Landis+Gyr. According to Gérard Magnin, Executive Director of Energy Cities, a European association of local energy agencies, all information today resides with the DSO, and there is little appetite to change that.

But the new EU energy efficiency directive does introduce for the first time a regulatory framework for 'demand response'. 'Demand response' and 'dynamic' or 'time-of-use' pricing for electricity allow customers to buy electricity at constantly changing prices. It therefore helps cut demand at peak times and results in less need for peak capacity. Companies like EDF are interested because they have a close relationship with their customers and specialise in nuclear – a baseload, not peakload, source.

> *Public money isn't the driver in first instance*

Smart meters can lower the cost of demand response. And demand response, in return, helps pay for the smart meters, says Stromback from SEDC. She estimates that industrial and commercial demand response could net companies some €2bn a year in direct earnings. "If you charge consumers for technology and you don't enable them to benefit from it you just rip them off. Programme development, be it demand response, feedback, smart bills or however it ends up being, is what makes it worthwhile to European citizens to have this done."

Patricia de Suzzoni, Advisor to the Chair of French energy regulator CRE and Chairperson of CEER's Customer and Retail Markets Working Group, is concerned that new massive demand response programmes have not been rolled out in great numbers. "There are many market actors ready to implement demand response programmes," she says, but the EU has to set a framework for retail market data management, including the formats and interfaces for energy service companies (suppliers, distributors, aggregators etc) to interact in a safe and secure manner.

Potential participants are fine with this idea as long as they are involved in shaping the framework, says Dusan Jakovljevic, Policy Director at Energy Efficiency in Industrial Processes (EEIP), a lobby group representing European industries. Demand response is on their radar and he envisages a two-way process that will optimise how and when energy is used. "It is unfortunate that the current draft network code [into which demand response is being integrated] seems to plan for our cooperation with TSOs only 'when necessary' and only reflects their immediate priorities," Jakovljevic warns.

Applications of the future |

Telecoms and data management companies are a strong driver of the "smart" movement because they see huge business opportunities thanks to the number and quality of data gathered

through smart meters. Software giant SAP has launched a new technology that enables it to read ten million meters in less than half a second – the possibilities for new customer services are endless.

According to the European Commission, electric vehicles are also a driver for smart grids. Today the network would not be capable of loading a large number of cars over short periods during the day. Smart grids would make this possible by optimising charging and lowering prices. "Charging systems will be able to cope with the demand only if there is an intelligent and balanced management of the system," the Commission notes. But few industrial stakeholders talk about electric vehicles as a key driver.

None of the above – with the exception of demand response for industrial and commercial consumers, which has its own business case – would be possible if Europe's 3rd energy market liberalisation package had not set up the first hard legal provision for rolling out smart meters. Australia is the only other country in the world to have done this. Under EU law, at least 80% of consumers in the EU have to be equipped with smart meters by 2020. Member states may carry out a cost benefit analysis if they wish, but are not required to do so.

This is the basic piece of legislation for all discussion in Brussels on rolling out smart meters and grids. Lawmakers added this provision on the grounds that consumers should participate in the

Common functional requirements of smart meters

Based on 11 cost-benefit analyses of smart meter roll-outs received from member states by October 2011, the European Commission's DGs Energy and Connect have drawn up a list of minimum functionalities for smart meters. There are ten and they are backed by regulators. The Commission hopes the remaining member states have used them in any other cost-benefit analyses submitted by 3 September.

For the Customer:

- Provides readings from the meter to the customer and to equipment that he may have installed;
- Updates these readings frequently enough to allow the information to be used to achieve energy savings;

For the Meter Operator:

- Allows remote reading of meter registers by the Meter Operator;
- Provides two-way communication between the meter and external networks for maintenance and control of the meter;
- Allows readings to be taken frequently enough to allow the information to be used for network planning.

For commercial aspects of energy supply:

- Supports advanced tariff systems;
- Allows remote ON/OFF control of the supply and/or flow or power limitation.

For security and privacy:

- Provides Secure Data Communications;
- Fraud prevention and detection.

To allow distributed generation:

- Provides Import / Export & Reactive Metering.

energy market and there should be more competition at the retail end. And of course consumers can only get involved if they have the means to know their consumption. It is thanks to this legal basis that the European Commission has been able to take action to boost the rolling out of smart grids and smart meters.

The Commission has created a central forum for discussion on smart grids and meters called the Smart Grids Task Force. It gathers all stakeholders (regulators, industry and consumers) except member states. When it was first launched in November 2009, it aimed to answer the question: "is the current regulatory framework sufficient to roll out smart meters and grids as envisaged by the third package?" The conclusion in mid-2011 was "No". The task force was re-launched in February 2012 to decide how to accelerate the process. It will run for two more years and is focused on four issues: standards, data protection and privacy, market models, and EU funding assistance. It's not a law-making body but issues recommendations that member states are encouraged to take up.

So far, the task force has issued a definition of the basic functionalities a smart meter should have (see box). Based on its work, the Commission has also issued a mandate for smart meter and smart grid standard development to European standardisation organisations and created an inventory of smart grid projects and lessons learned in the EU.
EU money

There is a consensus among stakeholders that no new legislation on smart meters and grids is needed at European level. "It's more about implementation now," says de Suzzoni. So what else can the EU do? Inject some more seed money into the sector, perhaps. The fourth working group of the Task Force is dealing with smart grids in the context of the so-called 'infrastructure package', or how the EU will boost the modernisation of its cross-border energy infrastructure.

Smart grids are one of the twelve priorities listed in the package. Some smart grid projects may therefore be labelled 'projects of common interest' (PCIs) and benefit from faster permitting rules and eligibility to apply for EU funds through a special mechanism proposed as part of the next EU multiannual budget (2014-2020). This is the Connecting Europe Facility (CEF), where €9.1bn is earmarked for energy.

To get the EU label and become eligible for EU financing, projects have to fulfil certain criteria. But for smart grids "these criteria are nonsense", Lorenz says. Like most EU-financed projects, smart grids must be cross-border and as a general principle replicable elsewhere. But other criteria insist they involve 10kV lines and bring together at least two TSOs and two DSOs – from different countries – something which on the ground is "very difficult for DSOs to do", Lorenz adds. The deadline for applications is set for September 30, 2012 but very few projects are expected to apply.

In fact, most smart grid projects will probably apply for EU money from the CEF's telecoms pot. This is similar in size to the energy pot but the only requirement is partnership with ICT, Lorenz says. "The aim is to foster synergies between energy and telecoms," explains Mercè Griera-i-Fisa, from the European Commission's Smart Cities and Sustainability Unit, DG Connect. After all, "the smart grid is a power network with a telecommunication network associated with it", she says.

But "public money isn't the driver in first instance", Harris from Landis+Gyr notes. Nor are demonstration projects – there are plenty of pilots supported by the European Electricity Grid Initiative (EEGI), an initiative of the Strategic Energy Technology Plan, that have served their purpose in showing that the technology works. What's needed now is getting it out there to consumers. If policymakers ultimately kicked off this revolution, it's up to policymakers to see it through. ■

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