EURELECTRIC PAPER ON REGULATORY INCENTIVES FOR SMART GRIDS

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ABSTRACT

The purpose of this paper is to assess the current regulatory challenges faced by European DSOs when investing in Smart Grids and to establish principles towards smarter regulation. The below findings have been extracted from a recently published and more detailed EURELECTRIC report [1].

INTRODUCTION

Expanding and improving Europe's energy networks will be vital to Europe's transition to a low carbon economy. Smarter distribution grids will be needed to integrate increasing amounts of decentralised generation, electric vehicles and heat pumps and encourage consumers to actively participate in managing their energy demands. This will require additional investment in new infrastructure.

EURELECTRIC has examined the regulatory frameworks currently in operation in Europe and has found that in many cases they do not support the network companies' requirement for higher levels of investment to deliver these necessary improvements.

This paper highlights some of the major shortcomings of the current frameworks and urges national regulators to establish a 'smarter' approach to regulation that will incentivise Europe's network operators to conduct these much-needed investments. It also makes a number of detailed recommendations which EURELECTRIC proposes to feed into related discussions with the European Commission, ERGEG and other stakeholders.

The survey found that:

- Sub-optimal rates of return and regulatory instability are hampering investment in smarter distribution grids.

- The roll out of smart meters is being delayed by a lack of clarity in the roles and responsibilities of individual market players

- Regulators are taking a narrow view of evaluating cost efficiency penalising extra expenditure on R&D or smart grid pilots and encouraging business as usual expenditure.

1. SMART GRIDS NEED SMART REGULATION

Smart Grids should not be implemented for their own sake but should be considered as a possible solution to operational and societal challenges. They will address new needs (3.1) and will also result in positive benefits and return in the long run (3.2). Regulation will play a key role in incentivising a smart allocation of resources by DSOs over the next 40 years (3.3).

1.1 Smart Grids are driven by real needs

Smart Grids are key to reducing carbon emissions, improving energy efficiency and enhancing a better asset management by:

- Facilitating higher penetration of renewable (e.g. wind, solar) and distributed generation (e.g. small windmill or micro-CHP plant) in compliance with operational security, power system and electricity market efficiency;

- Helping consumers participate more effectively in the market not only by using their energy more efficiently (e.g. through smart metering and "smart homes") but also by allowing consumers to also act as producers selling back their excess electricity (e.g. CHP or plug-in electrical vehicles).

- Enhancing the DSO grid operation tools, thereby reducing notably network losses

1.2 Smart Grids imply more capital expenditure for DSOs

Although Smart Grids will enable more efficient grid operation, a better integration of RES and will accommodate stronger demand-side participation, they will - at least at the outset - also lead to higher capital expenditures. Implementing Smart Grids requires additional investment in the grids and their automation, and thus also in the communication infrastructure between the grid operators, the grid and their customers (generators, consumers and even storage owners) as well as in adequate metering systems. The future challenges presented by the "smartening" of the electricity networks will differ greatly from those faced in the past.
Adapting the networks to growing electricity demand and new requirements, as well as investing in necessary replacements will therefore require significant capital expenditure on the part of European DSOs. According to figures from the International Energy Agency, the investment needs in the European distribution network will amount to 480 bn euros up to 2035 [2].

The benefits from this investment will accrue throughout the value chain from generators, suppliers and customers to society as a whole. This is why economic regulation defining the conditions for the socialisation of a major part of the investments is key for the successful implementation of Smart Grids.

The current financing model applied by the national regulators to DSOs and which has been traditionally geared to simply driving down costs, is not appropriate to enable DSOs to fulfil their expanding role in the future. As a result of the current regulatory formulas applied to DSOs, it has been observed that DSOs are under-investing in modernizing the grids. Much of this is a result of regulatory schemes that do not incentivize such investments.

1.3 Smarter Regulation is fundamental

EURELECTRIC is therefore calling for a revision of the regulatory financing model applied to DSOs. This needs to be based on a clear-sighted, broad analysis of the benefits of DSO investment both in terms of customer service and environmental benefits and to guarantee a fair long-term return on invested capital. In brief, a smarter regulation is required. It would however be misleading to say that all European regulatory schemes are backward-looking as some best practices are emerging in Europe.

In Italy for example, the energy regulator recently launched a competition-based procedure to incentivize Smart Grids/Demand Response projects. The selected projects will be granted an extra WACC (+2 percentage points) for a period of 12 years. Looking at the UK, we can see that the Innovation Funding Incentive was introduced in 2005 allowing up to 0.5% of annual revenue to be spent on innovation and more recently in 2010 the Low Carbon Networks Fund was set up to allocate £500m over the period 2010-2015 for the trialling of new initiatives by DSOs in readiness for the need for smarter operation of electricity networks.

2. EURELECTRIC SURVEY ON THE STATUS QUO OF ECONOMIC REGULATION RELATED TO SMART GRIDS

In order to assess the current regulatory schemes which determine the conditions under which European DSOs will invest or refrain from investing in Smart Grids, EURELECTRIC prepared a questionnaire on the current regulation. The questionnaire was completed by representatives from 16 European countries: Austria, the Czech Republic, Denmark, Finland, France, Germany, Great Britain, Italy, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, and Sweden.

2.1. The CAPEX Time-Shift Problem

A major constraint on investments derives from the delayed recognition of capital expenditures when setting allowances for revenues and prices. The "capex time shift problem" is intrinsic to incentive-based regulation if total costs are decoupled from revenues. Figure 4 presents the general regulation framework and shows that 6 out of the 14 countries surveyed have implemented a Rate of Return-regulation of capital cost (hybrid mechanism) and have therefore solved this distortion.

The "capex time-shift problem" is persistent in Denmark, Germany, the Netherlands and in Slovakia. In Germany there is a delay between investments and the integration of the resulting capital expenditures within the revenue cap from three to seven years which makes it impossible for the DSOs to achieve the expected rate of equity. Even the provided investment incentives of the regulatory act, like the investment premium, are without effect due to the restrictive interpretation of the regulatory authority. In the Netherlands, revenues are on average delayed by 4 years.

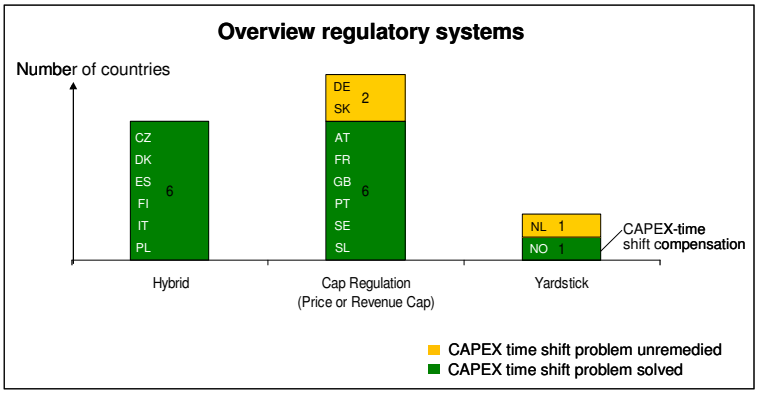

Figure 1: Overview of countries where the CAPEX time shift is/isn't solved

2.2 A narrow view of cost-efficiency measures does not take into account the added value of Smart Grids investments

One aspect refers to the evaluation of efficiency which is either based on benchmarking methods, reference networks and/ or standard cost. If these methods are not adjusted to the new challenges, smart grid investments would not be accepted as "efficient costs". This happens if the methods do not fully cover the requirements according to the desired development towards smart grids.

Benchmarking methods and reference networks should be carefully used, and expenses for research and development

and smart grid pilots should be excluded from the benchmarking process. Also, we consider that the spill over of high efficiency requirements on the achievable rate of return has to be taken into account. For example Portugal and France approve additional capital expenditures but set strong efficiency requirements for the operational expenditures reducing the companies' scope of action and the achievable rate of return.

Standard cost methods have to be reviewed and matched with smart grid requirements. For example in Finland the regulatory authority evaluates the reasonableness of capital expenditures by means of a standard cost catalogue treating smart grid investments like any other investments. If the smart grid components are more expensive than ordinary components, companies have to negotiate higher prices. It then remains in the hands of the regulatory authority, to decide whether to promote these kinds of investments.

2.3 Both suboptimal rates of return and regulatory instability are hampering smart investments in distribution grids

Besides the effects of regulation on the achievable rate of return – which is the major driver for investments – regulatory stability and therewith the evaluation of risk plays a substantial role. The analysis conducted in the 16 countries surveyed concludes that three main issues are defining the current state of regulatory stability:

- The legal basis (clear rules and mandates) refers to the fact that the development may have overtaken the legal means and responsibilities may therefore not be defined.
- The "ease of understanding" of regulatory methods (e.g. benchmarking) refers to the outcome of regulatory instruments. In such cases better "ease of understanding" and predictability of regulation is of greatest importance.
- The stability of the regulatory system: this refers to the amount and frequency of changes. Regulation will, of course, need to be developed to match the current framework. In addition, if changes are made too often and with not enough notice and information given, companies will lose confidence.

Figure 2 of our survey summarizes the status quo of regulation in Europe and indicates how strong the current barriers to investments are.

– The achievability of the regulatory rate of return is evaluated in the Y-axis and shows the return which is approved by the regulator (regulatory rate of return) in each country serves as a reference. Responses from DSOs located in the lower two-thirds ("below" and "significantly below") are showing that they can only achieve a rate of return which is below the regulatory rate of return. This is due to the CAPEX time shift and/or to the (ex post) denial of investments in the course of the efficiency analysis. The latter brings particular problems if it doesn't consider the investment needs adequately. The stronger the impact, the greater the effect on the cost of capital and the shorter the time allowed for eliminating "inefficiencies". Nine out of the 16 countries surveyed are facing strong barriers to investments due to a significantly reduction in the achievable rate of return compared to the regulatory rate of return.

– Still, barriers may also exist if regulatory stability is low. Hence the regulatory stability is evaluated in the X-axis. Companies in the left two-thirds (low & moderate) face a low planning reliability due to an unstable regulatory system, legal uncertainties and or a low ease of understanding of regulatory mechanisms. As it is uncertain whether capital expenditures will be accepted at all, this kind of uncertainty cannot be compensated by a higher risk premium. In only four out of the 16 countries is regulatory stability high. As both regulatory stability and a fair, achievable rate of return are crucial for promoting investments, only the three countries located in the upper right box do not face strong constraints on investments while the remaining 13 countries require improvements to their regulation system in order to foster smart grid investments.

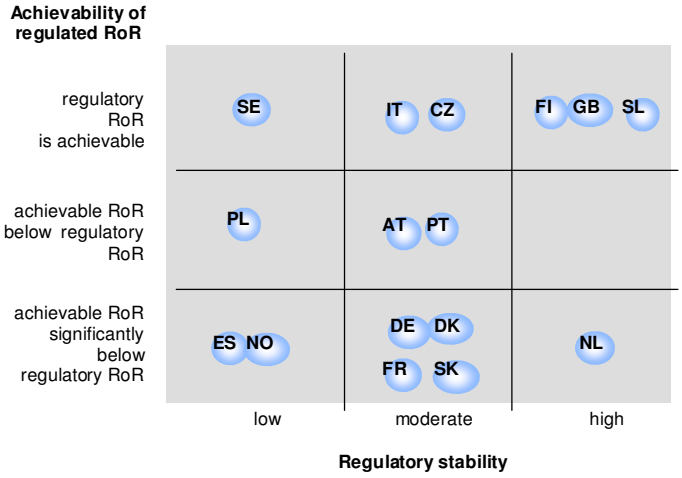

Figure 2: Regulatory framework – achievability of RoR vs. regulatory stability

3. EURELECTRIC RECOMMENDATIONS TOWARDS LIFTING THE BARRIERS TO AN OPTIMAL SMART GRIDS IMPLEMENTATION USING SMARTER REGULATION

Our survey revealed that the lack of consistency in the regulatory praxis and the overall European energy policy calls for a real paradigm shift towards smart regulation. European DSOs are keen to examine ways in which they can contribute to tackling climate change both by lessening their own impact on the environment and by responding positively to the changing needs of customers and other market players. But there is an urgent need for action to remove regulatory constraints to investments. The low achievable return on investment is an important issue, but so is the fact that missing incentives for smart grid investments as well as the attitude of national regulators towards smart grid costs are diametrically opposed to the European climate change targets.

EURELECTRIC therefore considers that economic regulation at Member State level should be revised to incentivize Smart Grids' implementation where it is economically viable. Indeed, the traditional regulatory framework has incentivized DSOs to reduce costs, including expenditures in areas such as R&D and skills renewal where the benefits often accrue beyond the lifetime of a price review period. In the future, a paradigm shift is necessary and allowances should be dealt with a long term perspective. What is needed is a balanced regulatory framework that provides on the one hand long term incentives for efficient delivery, including incentives for innovation and on the other, the necessary financial resources to allow DSOs to invest consecutively in Research & Development, Demonstration and Implementation of Smart Grids.

EURELECTRIC thinks that efficient regulation at national level is the key tool for driving the European development towards a highly modernized grid. We consider respect for the principle of subsidiarity to be essential in this discussion: Smart Grids cannot be rolled out in a top-down and one-size-fits-all way. Consequently, the development of Smart Grids will be made depending on the current modernization level of the distribution grid in the regional area concerned and Smart Grids will be implemented step-by-step. Regulators will be key facilitators in the process of modernizing Europe's electricity networks

EURELECTIC's five recommendations on Smart Regulation for Smart Grids:

1-Rewarding and Incentivising Capital Expenditures (CAPEX) in Smart Grids
A fair rate of return is an essential requirement for Smart Grid investments (for example investments in ICT technologies).

Revenue allowances set at the beginning of a regulation period should take into account future needs. There should also be clear rules for adjusting revenues during the regulation period. On the whole, regulation should become more flexible and put a stronger focus on the long term needs. This way it will promote long term regulatory stability rather than narrow, short term optimization.

2 > Improving the evaluation of Operational Expenditures
Due to the increasing risk of future stranded investments, efficiency standards should be carefully applied. Likewise expenses for research & development and for smart grid pilots should be excluded from the benchmarking since the efficiency of innovation can not easily be evaluated.

3 > Incentivising innovation and R&D funding
In the future, significant innovation will be needed if networks are to play their part in the efficient delivery of a low carbon economy through smarter grids.

4 > Clarifying roles and responsibilities
Clear mandates and responsibilities are important for driving Smart Grid investments (including smart metering) forward.

5 > Safeguarding regulatory stability
Besides a stable regulatory system, a regulatory roadmap may be a suitable instrument for the enhancement of regulatory stability.

REFERENCES

[1] EURELECTRIC, February 2011, *Regulation for Smart Grids*

[2] IEA, 2010, World Energy Outlook, IEA, Paris, France, 2010