



European Network of
Transmission System Operators
for Electricity

A NEW REGULATORY FRAMEWORK FOR TSO R&D IN ENTSO-E COUNTRIES

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1 EXECUTIVE SUMMARY

This document has the general objective to **define the main criteria to be developed at a European level in order to guarantee appropriate, homogeneous and coherent regulatory framework for R&D activities**, capable to promote and incentivize the absolutely necessary R&D activities by TSO's.

The 20-20-20 targets, decided by the EC in 2008, and the EC ambitious objectives for the decades beyond 2020, have introduced new important challenges on grid operators. A strong effort is, therefore, required to develop additional RD&D activities to meet those challenges.

As a clear evidence of this new approach, the third energy package tasks explicitly TSO with RD&D necessary for the innovation of their activities.

Grid operators have proposed an ambitious RD&D roadmap in the framework of the SET plan initiative. This RD&D roadmap involves grid operators, manufacturers, ICT providers, grid users and researchers, each within a dedicated and complementary role. The plan has been validated by the stakeholders of the electricity grids.

A target level for Research & Development funding based on percent of Allowed Revenue (the amount of money that a network company can earn on its regulated business) should be identified. The recommended target level is 1%¹. It is important to recognise that specific Demonstration and Deployment projects at Transmission level may require significant funding over and above this target level, and there may be specific instances where lower target levels may be appropriate.

Adopting a common measure is intended to assist discussion with Regulators and allow a comparison of intensity of spend to be made within ENTSO-E.

¹ In the Lisbon Strategy, the EC contemplates to spend 3% of EU GDP to Research and Development. Taken into account that TSOs are not the only R&D players in their domain, one third of this target (i.e. 1% of the annual TSO turnover) should be spent by TSOs on R&D activities.

A survey conducted among European TSOs has shown that today, with a few exceptions, the **network operators remuneration** in most of the ENTSO-E countries **neither includes a component dedicated to recover the costs incurred for developing R&D activities nor fixes specific incentives to promote R&D for TSOs.**

A long-term perspective on funding is mandatory now in order to mobilize sufficient external players and internal TSO staff.

As the benefits of the RD&D activities will be mainly in favour of the consumers, the relevant costs should be borne by tariffs, complemented by public funding. Therefore, it is necessary to implement a suitable financial compensation for the RD&D by regulatory frameworks (tariffs, national and European research funding), leaving to the competent authorities (regulators, member states, EC) the role to monitor the efforts and results of TSO R&D work.

2 LEGAL BACKGROUND

The Third Energy Package, adopted by the European Parliament in April 2009, pushes Member States, Regulators, TSO's and DSO's to launch innovation programs, as it states that:

*"ENTSO-E shall adopt common network operation tools to ensure co-ordination of network operation in normal and emergency conditions, including a common incidents classification scale, and **research plans**" (Regulation (EC) 714/2009, art 8.3.a)".*

The Package states also that these activities should be incentivized through appropriate remuneration schemes:

*... In fixing or approving the tariffs or methodologies and the balancing services, the **regulatory authorities shall ensure that transmission and distribution system operators are granted appropriate incentive**, over both the short and long term, to increase efficiencies, foster market integration and security of supply and support the related research activities ... (Directive 2009/72/EC, art 37.8).*

According to the EU legislation (Regulation (EC) 714/2009, art 8.3.a) ENTSO-E has published in 2010 the first release of its R&D Plan.

3 REGULATORY FRAMEWORK AND FINANCING OF R&D

The EU Power Sector reforms in the last decade have moved to a business model where TSOs (no matter if they are public or private companies) are strongly conditioned in their plans by the existence of suitable remuneration schemes. Network operators are fully aware of the relevance of essential increase of innovation for the achievement of the 20/20/20 targets and beyond, but until now, in many countries, R&D carried out by the TSOs is not considered a necessity, and the methodology applied to calculate the company remuneration does not take it into account. Moreover, as regulated actors, TSOs have limited access to commercial benefits coming for the implementation of innovative technologies. Due to the lack of an explicit regulation, R&D expenses are mostly considered as justified costs of the transmission activities and therefore treated as operational expenses. This means that **there is no incentive to increase those costs**, but, on the contrary, very often they are subject to efficiency mechanisms which tend to reduce them year by year (i.e. RPI-X mechanisms).

The result is that in many European countries there are no or not sufficient funding schemes in context of R&D. Those schemes do not allow to meet the necessary R&D efforts for tomorrow's Pan-European Power System. What actually is needed, is a fair compensation for the services provided to the system, including innovation. It is necessary to implement a suitable financial compensation for the R&D by regulatory frameworks (tariffs, national and European research funding).

The full-scale demonstrations of R&D projects should be coordinated at European level. This would allow for a drastic reduction in demonstration costs and would furthermore stimulate the design and supply of innovative and (energy/cost) efficient technology. This is why the implementation of the proposed R&D plan requires a new enhanced structural collaboration among European TSOs that goes beyond what is already performed within EU-supported research projects. This collaboration requires:

- a dedicated TSOs framework to coordinate the R&D plan that is open to the participation of DSOs, generation companies and other stakeholders when relevant;
- covering 100 per cent of the TSOs' expenses.

The R&D Plan requires a protracted effort for TSOs, who must have the necessary resources (financial, HR and tools) for achieving the Plan objectives. A prerequisite for the effective implementation of the R&D Plan is to ensure time to implement new regulatory frameworks, capable to guarantee the availability for the society, through appropriate incentives and monitoring the development schemes, of tools and technologies. This should apply to all the power sector stakeholders, but particularly for the regulated ones.

Therefore, the European Commission, the Member States, ACER and the national Regulators, should jointly develop mechanisms to encourage R&D activities carried out by TSO's; Regulators, for instance could implement adequate remuneration mechanisms for those demonstration projects, developed by TSOs, recognized as necessary for testing on site new technologies and functional knowledge for the future transmission system.

Those mechanisms would represent a significant improvement compared to the current situation.

In order to have a clear overview of the current situation on regulatory framework related to R&D activities ENTSO-E mandated the former Working Group "Research and Development" (WG R&D) within the ENTSO-E "System Development Committee" to launch an assessment on how the European TSOs organise their research and development work individually. The publication of the ENTSO-E R&D Plan and the launch of the EEGI initiative, which has determined the expectations that many of the EU member states could fund part of the projects proposed in the frame of the R&D Plan, have made crucial to have a clear picture of the currently available R&D financing sources in the various ENTSO-E countries, in order to promote harmonized initiatives among the Member States for supporting our R&D activities. The results from the questionnaire show that the network operators remuneration in most of the ENTSO-E countries does not include today a component dedicated to recover the costs incurred for developing R&D activities.

When there is no explicit regulation, R&D expenses are mostly considered as justified costs of the transmission activities and therefore treated as operational expenses. TSO costs would then be recovered through normal tariff mechanisms updated accordingly, in many cases subject to efficiency mechanisms (i.e. RPI-X mechanisms). This means that with the current

regulatory framework most of the TSOs have no means to get new R&D expenses included in the allowed costs. Therefore, it is very difficult to expect that the steep increase in R&D requested by the R&D Plan is achieved.

While we have generally noticed a lacking R&D-sustaining framework in ENTSO-E countries, the situation is, if possible, more critical at a European level. In fact, while National regulators could fix incentives in national tariffs to support "grid-internal benefits", there is a need of other sources to support "grid-external benefits". It is key that management of R&D funding should be harmonized at European level in order to foster better collaboration between TSO's. To this aim, ACER, the Agency for the Cooperation of European Regulators, recently incorporated according to Reg. EC/713/09, could play a decisive role in promoting appropriate pan-European remuneration mechanisms, to favour the also the alignment of the national legal and regulatory frameworks.

4 SHORT TERM ACTIONS

According to the Third Internal Energy Market package, tariffs should ensure that network operators are granted appropriate incentives, including support to related research activities.

While in the medium term it is reasonable to believe that the implementation of the Third Energy Package, which has come into force in March 2011, will have adequate funding in the Member States, how to ensure now, in the short term, the launch of the Research and Development under the Plan remains an open question.

New appropriate tariff schemes are not expected to be active in a majority of Member States in the period 2010-2012. A significant share of public funding should come from European sources to encourage the European-level planning and cooperation to avoid unnecessary duplication of efforts and to promote solutions that support European standardization and interoperability.

To this end, a significant role could be played by EEGI - European Electricity Grid Initiative - dedicated to the electrical infrastructure and to facilitate interaction with the "developers" Research, technology vendors and other stakeholders to participate in the R&D Plan.

5 MEDIUM TERM ACTIONS

TSOs must state their requirements based on secure and efficient grid operation incorporating new technologies. They have already made a first move, with the ENTSO-E R&D Plan and the engagement in EEGI.. Now, to support a timely deployment of new, advanced technology we believe that new regulatory frameworks, supporting incentives and controlling deployment schemes should be developed by the European Regulators allowing for the initial up-front investments be done by the transmission and distribution system operators as well as producers and consumers. Regulators should support the new developments needed by ensuring the TSOs the funds for RD&D and for realizing pilot projects to test the new technologies that might be part of the transmission backbone in the future.

A fair and transparent regulatory framework is a precondition for allowing generators, consumer or prosumer, and any other relevant stakeholder to participate in and actually efficient electricity market. Examples of possible incentivising regulatory framework are, to a certain extent, those proposed in UK, Italy, Finland and Denmark.

1. **In UK**, National Grid has a 0.5% of regulated transmission turnover (£6.2m for electricity in 2009/10) of revenue Innovation Funding Incentive (IFI), which is 80% allowance from Ofgem and 20% from National Grid. The incentive was started in April 2007 and will be reviewed in 2012/3. From 2010 it has been put in place a new regulatory mechanism for electricity distribution, the so called Low carbon network Fund (LCNF), 500 million pounds / 5 years.
2. **In Italy**, it has been recently put in place an incentive regulation mechanism for smart grid demonstration grids (mainly Distribution). The Call for projects is usually selected according to KPIs and ex ante cost-benefit (C/B) analysis. Distribution companies can present project (also involving other stakeholders like ESCos, retailers, manufacturers), dealing with Demonstration projects in field (no labs) on MV networks (<35kV).The selected projects will be allowed extra-WACC (increased from 7% to 9% for 12 years).
3. **In Denmark** the TSO has several obligations in the area of R&D activities. The TSO is regulated by a specific act, giving the framework for R&D projects and funding. R&D projects can either be internal

Danish, in cooperation with dedicated partners from universities or manufactures or as pan European projects with relevant benefit for the Danish transmission grid. There are several R&D options in the regulation.

- a) The TSO is obligated to ensure an ongoing development of the transmission grid - this includes necessary R&D projects. There is no limitation to the total budget of such R&D activities. However these expenses are funded from the transmission tariff which has to be approved by the National Regulator.
 - b) Secondly, the TSO is hosting several PSO (Public Service Obligation) funded R&D schemes in the area of environmental friendly electricity production and Smart Grid. The annual budget is some € 25m and relevant applicants are to attend annual calls. The TSO is participating in several EU ERA NET. Both in ERA NET cooperation and external FP 7 ENERGY projects it is possible to get top up funding from the PSO programmes. The national Regulator has no influence on the PSO R&D activities.
 - c) The Minister of Climate and Energy has the power to ask the TSO to perform specific R&D to ensure security of supply, better market function, development of the grid, European activities, energy analyses and other relevant TSO actions. There is no limitation to the extend of such tasks. Transmission tariff will secure the funding and the National Regulator is deemed to accept the costs once the Parliament is behind the political requests to the TSO.
4. A further example, still to be implemented, is the draft proposal for a new R&D treatment **in Finland**. The Finnish Energy Market Authority (EMA) intends to add a new innovation incentive in the next regulatory period, to encourage the TSO to promote innovative technical and functional solutions. Based on this draft, EMA should consider that the reasonable expenses in accordance with the innovation incentive are deducted from the TSO operating profit (operating loss) in the calculation of the actual adjusted profit. EMA should approve the actual R&D expenses as part of the innovation incentive so that a maximum of 1% of the TSO reasonable return is handled as reasonable R&D development expenses in the calculation of the actual adjusted profit. Capitalized R&D costs are not accepted in the calculation of the innovation incentive.