RAP

Energy solutions
for a changing world

Policy Brief

Securing Grids for a Sustainable Future

October 2011

Lead Author:
Phil Baker, *University of Exeter*

RAP Advisor:
Meg Gottstein, *Principal*

Acknowledgements:
The RAP Research team, in particular Elisabeth Watson, who has compiled accompanying case studies on interconnector and transmission investment and planning, available at: http://www.raponline.org/document/download/id/4624

RAP would like to thank E3G (www.e3g.org), in particular Jonathan Gaventa, for valuable contributions to the development and review of this policy brief.

Electronic copies of this paper and other RAP publications can be found on our website at **www.raponline.org**.

To be added to our distribution list, please send relevant contact information to **info@raponline.org**.

RAP

Policy Brief: Securing Grids for a Sustainable Future

Delivering the Infrastructure Necessary to Support a Secure, Integrated, Low-Carbon European Power System

Highlights

- **A more European approach to transmission network planning.** The focus of Europe's network development planning process should be the cost-effective delivery of an integrated electricity grid designed to accommodate European energy policy goals, not only those of individual Member States.

- **Maximum use of available assets.** Given the magnitude of the investment challenge, all development proposals need to be fully justified and tested against alternatives, including the use of "smart grid" technologies, energy efficiency and operational measures. Regulatory incentives together with operational standards and procedures need to ensure that the utilisation of existing assets is maximised and unnecessary investment avoided.

- **New sources for transmission investment.** Arrangements should be adopted that allow private investors to compete with transmission system operators to deliver interconnection or other transmission infrastructure. A contestable approach to investment, where private investors have access to regulated returns, would encourage new sources of investment and promote more efficient outcomes for consumers.

- **A comprehensive assessment of the benefits of interconnector investments to enable the allocation of associated costs.** Analysis based solely on energy price differentials is unlikely to capture the full value of increased interconnection capacity. A wider appreciation of the benefits of interconnection would support additional capacity and allow a more equitable allocation of costs. Congestion revenues should also be allocated to reflect the benefits received from interconnection.

- **Meaningful stakeholder participation in the planning and regulatory processes.** A successful European approach to transmission network planning and cost allocation, including the consideration of non-wires alternatives, will require the collaborative participation of a wide range of stakeholders. Rules that improve the transparency of and access to computer modelling, input assumptions, scenario development and other key steps in the planning and regulatory processes will be needed to facilitating meaningful stakeholder engagement. Funding to acquire the necessary technical expertise for this engagement may also be required.

Background

Establishing an integrated electricity system capable of delivering Europe's long term energy policy goals will require substantial investment in transmission infrastructure. The Commission's Blueprint for an integrated European energy network[1] estimates that some €142 billion will need to be invested in the electricity grid by 2020, while other estimates[2] suggest that the efficient delivery of Europe's longer term decarbonisation goals may require investment in inter-regional transmission of some €200 billion by 2050. However, the Commission believes that current arrangements will only take up around half the capacity required by 2020, due in part to difficulties in accessing finance, an asymmetry of costs and benefits associated with cross border interconnection and the inability of existing arrangements to capture the benefits of interconnection from a "European" perspective.

Investment in interconnection will cause electricity prices to converge thereby creating winners and losers. Consumers in some Member States may be disadvantaged by increased interconnector capacity, but be expected to contribute to the costs of investment. Conversely, some Member States may see congestion reduce without being expected to contribute under existing rules. This asymmetry is likely to present a barrier to the investment in interconnector capacity necessary to deliver Europe's energy policy goals. It is therefore essential that arrangements to allocate the costs of investment in an equitable fashion are developed.

Currently, Europe's strategic transmission investment programme is defined by the Commission's Energy Infrastructure Blueprint, together with the European Network of Transmission System Operators for Electricity (ENTSO-E) 10-year non-binding network development plan (TYNDP) process. ENTSO-E's first TYNDP is essentially a collection of projects identified by national transmission system operators (TSOs). While the 2012 TYNDP will no doubt be an improvement, the extent to which the transmission development process achieves a pan-European rather than national focus remains to be seen.

To overcome these challenges and develop a European grid aligned with Europe's decarbonisation goals while protecting the interests of consumers, new arrangements for electricity transmission planning and financing will be needed. Based on international examples of innovative arrangements or best practice, this Policy Brief sets out the key considerations needed to ensure that the evolving European approach for to infrastructure is coordinated, efficient, competitive, equitable and transparent.

Proposed Regulation

The European Commission has recently proposed new regulations[3] to ensure the sufficient and timely development of energy infrastructure, including electricity transmission, necessary to deliver the European Union's energy policy objectives for security, market integration and sustainability. Specifically, the proposed Regulation aims to support the delivery of necessary infrastructure through a process that identifies projects of common interest (PCIs), streamlines permitting, allows returns on capital that reflect project risks and ensures that costs of investment are recovered according to the benefits bestowed.

The proposals set out in the Regulation represent a significant advance in addressing the barriers to the deployment of the cross border interconnection that currently exist. However significant uncertainties still remain and further measures may need to be pursued in parallel with those proposals to ensure that interconnection and other transmission development is delivered in the most cost-effective fashion.

1 See "Energy infrastructure priorities for 2020 and beyond – a Blueprint for an integrated European energy network" (DG Energy, 2010), at http://ec.europa.eu/energy/energy2020/infrastructure/index_en.htm.

2 See "European Climate Foundation (ECF) 2050 Roadmap – A Practical Guide to a Prosperous, Low-carbon Europe" (ECF, 2010), at http://www.roadmap2050.eu.

3 Proposal for a Regulation of the European Parliament and of the Council on guidelines for the implementation of European energy infrastructure priorities repealing Decision No 1364/2006/EC. See http://ec.europa.eu/energy/infrastructure/strategy/doc/com_2011_0658.pdf

Identifying Investment Needs

The 3rd internal energy market package[4] provides a sound foundation for strategic transmission planning on a European scale. TSOs are required to cooperate though ENTSO-E in developing strategic investment plans, while National Regulators (NRAs) are required to cooperate in the pursuit of cross border investment via the Agency for the Cooperation of Energy Regulators (ACER). However, the reality is that the investment plans set out in ENTSO-E's first TYNDP currently have a national rather than European focus, while the role of NRAs in protecting the interests of national consumers makes cooperation on interconnection projects of European interest difficult, particularly when the interests of one set of national consumers may be compromised

.

The issue of conflicting national consumers' interests should be eased by addressing the issue of cost allocation, which is discussed later. In terms of identifying interconnector and other transmission investment priorities from a European perspective however, the solution lies in developing a pan-European analytical approach. The proposed Regulation goes some way to addressing this issue by setting out rules to identify PCIs required to develop the 4 strategic trans-European corridors[5] identified by the Commission. However these rules still rely on cooperation between Member States on a regional basis, rather than promoting a truly pan-European approach that is, for example, detailed for informing the cost allocation process. As such, the arrangements proposed by the Regulation seem to fall short of those ultimately required to ensure that investment projects are chosen on the basis of what would be best from a European, rather than a Member State or regional, perspective.

Adopting a pan-European approach to interconnector and transmission investment will ensure that Europe's market integration and decarbonisation goals are achieved more cost-effectively. Currently, Europe's transmission investment programme as set out in ENTSO-E's first TYNDP is essentially a collection of projects identified by national TSOs. The second TYNDP to be issued in 2012 will advance the situation in that it will include those investments necessary to deliver Member States' National Renewable Energy Action Plans (NREAPs) but, as such, may fall short of a strategic plan to deliver Europe's energy policy goals in the most cost-effective fashion. Moving away from this situation will ultimately require a more unified approach to investment planning, involving the development of composite databases, common analysis tools and the creation of a central resource capable of carrying out the analysis necessary to identify European strategic investment priorities.

While the proposed Regulation is a major advance on current situation, if an integrated European electricity system is to be operated efficiently and Europe's energy policy goals delivered in the most cost effective fashion, a pan-European approach to identifying investment needs is required.

Transmission utilisation

Given the magnitude of the investment challenge over the next decade and beyond, it will be important to ensure that all transmission investment undertaken is fully justified and that cost-effective alternatives to that investment are considered. In this context it is argued that the estimates of investment in transmission required by 2020 and beyond set out in the Commission's Blueprint assume an approach to investment planning, system operation and network regulation that may no longer be appropriate given the new energy paradigm. There is a need therefore to consider how these areas may need to evolve in order to maximise the utilisation of available transmission assets and ensure that the goal of an integrated, secure and sustainable European electricity system is achieved in the most efficient and cost effective fashion.

4 Directive 2009/72/EC and Regulation (EC) No 714.

5 The Northern Seas offshore grid, Southwestern interconnection, Central & Southeastern interconnection and the Baltic energy market interconnection.

Smarter network operation

Typically, the utilisation of interconnection and transmission networks in general is low at around 30%. With a business as usual approach, utilisation can be expected to decline further as networks expand to accommodate the growth in intermittent generation capacity.[6] It is necessary therefore to consider how this trend of reducing utilisation could be addressed through the adoption of revised operational procedures, the deployment of network control devices and, not least, through releasing the potential of energy efficiency, responsive demand and "smart" distribution systems. The adoption of risk-based operational standards that, for example, take into account the relationship between weather conditions and the incidence of overhead line faults, could release additional transmission capacity during periods of fair weather. Similarly, the deployment of flexible AC transmission (FACTS) devices[7] that allow circuit flows to be controlled can significantly increase network utilisation. The alleviation of network constraints through these and other measures such as the deployment of generation inter-tripping[8] will reduce congestion costs which, through the application of cost benefit analysis undertaken in planning timescales, will result in a reduced requirement for transmission network expansion.

In a similar fashion, controllable discretionary demand and distribution-connected generation may be organised through emerging smart grid technologies to attenuate peak transmission system flows, thereby enhancing transmission system utilisation and, in turn, reducing the need for transmission investment.

Given the scale of the grid investment challenge, it is necessary to ensure that optimum use is made of existing assets, which often have low utilisation. The full deployment of cost-effective energy efficiency measures, use of smart technologies, risk-based operational standards and operational measures could increase network utilisation and thereby reduce investment needs at the margin.

Smarter regulation

Minimising transmission investment requirements through "smarter" system operation and the optimum use of existing transmission assets will require TSOs to be appropriately incentivised. Currently, TSOs are encouraged by network regulation to invest in primary network assets rather than to consider operational or secondary investment alternatives so as to maximise returns. TSOs are seen by investors as "low-risk" entities and have little incentive under existing regulation to consider operational or smart alternatives to investment if the outcome is increased operational risk and forgone investment opportunities.

Network regulation too often encourages the continuation of current practice rather than positive change and national regulators (NRAs) will need to develop incentives to ensure that TSOs compare investment in new capacity and alternatives to that investment in an objective fashion. TSOs will then be encouraged to optimise the utilisation of existing and newly developed transmission assets through innovation, thereby reducing the possibility of unnecessary investment. In addition, "efficient reliability" pre-conditions to regulatory approval of cost recovery for a proposed transmission investment can

6 The introduction of large amounts of intermittent generation such as wind and solar, often located at the periphery of the transmission network, together with the need to retain conventional plant as back-up will require increased transmission capacity to accommodate a range of power transfers that are both volatile and variable in nature. Transmission asset utilisation can therefore be expected to fall from already low levels of around 30%.

7 FACTS (flexible ac transmission) refer to devices such as thyristor controlled series compensation (TCSC), static var compensators (SVC) and quad boosters that can control power flows on individual circuits.

8 By automatically tripping generation on the occurrence of specific transmission faults, the pre-fault loading of critical transmission circuits can be increased, thereby increasing network capacity.

help to level the playing field between network assets and demand-side alternatives.[9]

The bias often found in national network regulation towards investment needs to be removed. The implementation of "smart" alternatives to traditional investment needs to be encouraged through regulatory incentives, including pre-conditions to the approval of primary network assets.

Securing Transmission Investment

The default position in Europe is currently that interconnection is developed on a fully regulated basis, with investment costs allocated between the coupled Member States and recovered via national transmission tariffs. The possibility of "merchant-exempt" investment also exists whereby projects are granted exemption from either the third party access (TPA) or use of revenues requirements set out in the 3rd Package Regulations and Directives. However, the merchant route has been somewhat undermined by the Commission's decision[10] to impose conditions on the exemption from the TPA requirements obtained by the BritNed interconnector between GB and Holland, reflecting concerns that the project may have been undersized in order to protect utilisation revenues.

In order to overcome the "investment gap" predicted by the Commission's energy Blueprint, the Regulation proposes a revised mechanism designed to accelerate the investment process. The mechanism sets out how PCIs will be identified by the Commission and supported by regional cooperation between Member States. This process would appear to provide a route whereby private investors, as well as incumbent TSOs, can develop infrastructure on a fully regulated basis, with investment costs recovered via national transmission tariffs. It is not, however, entirely clear how the mechanism will work or how contestable the process will be. Will, for example, merchant investors be able to compete with incumbent TSOs to develop individual infrastructure projects and, if so, on what basis will projects be awarded?

The proposed Regulation also suggests that the rate of return for infrastructure projects would be similar to currently available regulated returns with the possibility of "add-ons" for higher-risk projects or access to some level of public funding. However, in the current environment where capital is scarce and infrastructure investors have many investment alternatives, delivering the step-change in investment necessary to deliver Europe's market integration and decarbonisation goals will require that investors have access to competitive rates of return.

A fully contestable approach

The €140 billion investment in transmission estimated by the Commission as being required by 2020 implies an effective doubling of the investment rate seen in recent years. The ability of TSOs to raise investment capital either through debt or equity release is, however, limited by credit rating and investor concerns respectively, and new entrants and new sources of investment may therefore be required to meet the challenge ahead.

While the arrangements proposed by the Regulation are welcome in that they have the potential to attract new finance, consideration should also be given to other methods of bringing in new investment. For example, a truly contestable approach to infrastructure

9 For example, this might mean: (a) a transmission expansion plan that has incorporated all cost-effective demand-side resources (including clean distributed generation) into the assessment of need for the proposed transmission investment, (b) full recognition, in organized markets, of the contribution of demand-side resources to system reliability, and (c) the cost recovery of energy efficiency and other non-transmission alternatives is comparable to the cost recovery of the transmission option. See *Clean First: Aligning Power Sector Regulation with Environmental and Climate Goals*, (RAP, 2010) at http://www.raponline.org/document/download/id/927.

10 See Exemption decision on BritNed interconnector at http://ec.europa.eu/energy/infrastructure/exemptions/doc/doc/electricity/2007_britned_decision_en.pdf;

development could be established, whereby TSOs and other investors compete in a reverse auction to develop PCIs or indeed any other infrastructure project. Eligible parties would bid a regulated income stream to construct and own infrastructure and, all other things being equal, the lowest bid would be successful thereby delivering the least cost solution to customers. The availability of a guaranteed regulated income stream to recover investment costs would reduce the cost of project capital, reducing the burden on electricity customers.

Once constructed, the facilities would be operated by the relevant TSOs as part of the integrated electricity system in accordance with agreed procedures. Returns on investment would of course need to be sufficient to attract investors, however the competitive process would serve to ensure that costs to consumers were minimised. The process would provide an alternative route for investors to invest in interconnector capacity other than through existing TSOs, while at the same time overcoming the principle disadvantage of merchant-exempt investment in that projects would not be undersized.

Examples of a contestable approach to the provision of transmission infrastructure exist elsewhere, for example in the US[11] and Brazil. The "Allowed Annual Revenue" process operated by the Brazilian Electricity Regulatory Agency (ANEEL) allocates the right to construct and own approved "economic" infrastructure projects (i.e. excluding reliability or connection projects) via a reverse auction. Eligible parties bid an annual revenue stream and the successful bidder is awarded a concession for a period of 30 years. Data to 2008 suggests the average discount on the maximum Permitted Annual Revenue offered by private investors (31.3%) is higher than that offered by incumbents (26.2%) and that private investors have consequently captured the majority of revenue (76.5%) since auctions where introduced in 1999[12].

The arrangements adopted by Brazil are in some ways similar to those adopted for the development of GB's offshore electricity network, albeit that the GB regime focuses on the connection of generation and not interconnection between systems. Rather than extending the existing onshore regime that would have created exclusive ownership rights within defined geographic offshore areas, the UK Government opted for a regime that allowed parties to compete to develop and own the transmission facilities necessary to connect offshore generation. Although the GB offshore regime has been criticised in some quarters for delivering "radial", rather than interconnected solutions, this is unlikely to be an issue in the context of a contestable approach to delivering specific investments, identified as being necessary by a "European" planning process.

While still in a "settling down" period, the GB offshore regime has been successful in delivering new entrants and sources of funding, attracting £4 billion of investment appetite for the nine transmission projects included in the first tender round worth some £1.1 billion. Ofgem forecast that the potential savings to accrue from the first tender round could amount to £350 million[13] and, if similar savings could be made by adopting a contestable approach to the €140 billion of transmission investment estimated by the Commission to be required by 2020, then the benefits seen by Europe's electricity consumers would clearly be considerable. In addition, and assuming that potential investors bid income streams that deliver realistic rates of return, then the need for financial assistance via the Connecting Europe Facility or other funding vehicle would be reduced.

11 A contestable approach to transmission project development is reflected in the recent FERC Order No. 1000 proposed by the US federal regulator, in which the right of incumbent transmission providers to claim "first refusal" in the construction of transmission facilities has been removed. See next section.

12 See "Electricity Transmission Sector in Brazil – Analysis of the Auction Results and Public & Private Firms' Costs". Serrato, December 2008.

13 See Ofgem's response to Energy and Climate Change Committee's inquiry into a European Supergrid, http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenergy/writev/1040/esg09.htm

A "cap & floor" regime

An alternate means of encouraging private investment in interconnection infrastructure is the "cap and floor" regime developed by Ofgem and the Belgium regulator CREG for the proposed interconnector between Belgium and GB (project NEMO). The regime was developed to overcome the uncertainty surrounding merchant-exempt investment following the Commission's decision to impose additional conditions on the exemption decision for the BritNed interconnector.

The cap and floor regime relies on an interpretation that part (a) of Article 16 (6) allows investors a reasonable return on investment. A cap on revenues would be set, above which revenues would be returned to TSOs. A revenue floor would also be set, which would trigger payments from TSOs to investors in order to maintain a minimum return on capital. The intention would be to set the revenue cap and floor so that the reduction in risk to investors provided by the floor exactly compensates for the limit on revenues or returns created by the cap.

The regime represents a compromise between the merchant-exempt and the default European regulated approach to interconnector development. As such, it at least partially retains the advantages of commercial project development while at the same time potentially addressing the issue of undersizing that arises with merchant-exempt projects.

The contestable approach to transmission investment adopted by Brazil, and GB for offshore development, demonstrates that there is an appetite amongst investors for asset-backed investment supported by regulated returns. The approach has the potential to ease the funding gap by encouraging new entrants and sources of investment, while ensuring that development costs are minimised. While the proposed Regulation envisages private investors participating in the investment planning process and having access to regulated returns, it is not clear that this amounts to a truly contestable arrangement.

Equitable Cost Allocation

Leaving aside the wide-spread environmental, security and competitive benefits that will flow from an integrated, low-carbon European electricity system, increasing interconnection capacity will impact Member States differently and create winners and losers amongst market sectors. Increased interconnector capacity will cause energy prices to converge, with energy prices falling for some and rising for others. In the current regulatory environment, where the primary role of NRAs is to protect the interests of national electricity consumers, this uneven distribution of benefits arising from increased interconnection is a potential barrier to deployment. If, therefore, the interconnector capacity required to support an integrated low-carbon European electricity system is to be developed, it will be necessary to adopt arrangements that allocate the costs of interconnector investment according to the benefits bestowed.

Cost allocation in the proposed European regulation

This "beneficiary pays" approach to cost allocation is adopted by the proposed Regulation, which requires the establishment of a system-wide cost benefit analysis that will allow the beneficiaries of infrastructure developments to be identified and costs allocated in an equitable fashion. In developing this methodology, ENTSO-E, ACER and NRAs are required by the proposed Regulation to consider a range of potential benefits delivered by increased interconnection capacity. The most readily quantifiable impact will be reduced congestion and the associated convergence of energy prices, which will have specific consequences for individual Member States and point to a particular allocation of costs. Analysis based solely on energy price convergence is unlikely to capture the full value of interconnector capacity enhancements however, and other benefits such as increased reliability and competition will be felt more widely and therefore allow a more general allocation of costs.

While the cost benefit approach proposed by the Regulation is comprehensive and is capable of identifying the impacts of interconnector development at a Member State level, the actual allocation of costs will be a matter for agreement between NRAs, or for ACER where no agreement can be reached. This would appear to leave the potential barrier to equitable cost allocation associated with the customer protection focus of NRAs in play, while it is unclear whether ACER has the legal authority to impose changes to national transmission tariffs where NRAs cannot agree.

An option to reinforce the "beneficiary pays" approach would be to include congestion revenues in the cost allocation process. The proposed Regulation is silent on this issue, however allocating the congestion revenues arising from interconnector flows in a manner that reflected the benefits received - i.e. allocating the majority share of revenues to those Member States that received least benefit from that interconnection – would seem both appropriate and also conducive to the avoidance of disputes.

The equitable allocation of costs will be an important driver in promoting cross-border investment. The proposal to adopt a pan-European approach to the cost benefit analysis necessary to identify the impact of interconnector investment on individual Member States and inform the allocation of costs, is a major step forward in this regard. However, while the actual allocation of costs remains a matter for agreement between Member States, the potential for disputes and delays remain.

In order to reinforce the equitable allocation of interconnection benefits, consideration should be given to allocating congestion revenues in a fashion that reflects the benefits received.

Cost allocation initiatives in the US

There are parallels between the North American and European transmission and electricity market structures that make investment cost allocation initiatives being taken or considered in North America relevant to the situation in Europe. The North American transmission system consists of four extensive "interconnections", crossing national, state and utility boundaries. These interconnections cover vast areas and, although interconnected with each other, are essentially separate entities albeit subject to centralised governance by the regulatory authorities, NERC and FERC. While, unlike in Europe, there is no agenda to move to a single North American, US or interconnection-based electricity market, the existence of central regulatory authorities, multi-state interconnections and regional electricity markets that cross state boundaries, give rise to similar interconnector development and cost allocation challenges to those emerging in Europe.

Although practice varies widely across the US, a number of regional transmission operators (RTOs) recover at least some of the costs of reliability[14] or economic[15] infrastructure developments on a "beneficiary pays" basis. For example, the New York ISO allocates the cost of reliability infrastructure developments so as to reflect the contribution to the security violation resolved by development, with the costs of economic developments allocated according to the locational marginal pricing (LMP) savings. The Midwest ISO adopts a similar approach but, for major reliability and economic projects that have widespread benefits, recovers the majority of project cost via the grid-wide transmission tariff.

14 Reliability infrastructure developments are those required to meet local, regional or national reliability standards.

15 Economic projects are those designed to reduce production costs or increase overall economic efficiency as justified by cost benefit analysis.

Proposed rule issued by the US federal regulator (FERC) on regional transmission planning and cost allocation to take into account public policy mandates.

The "beneficiary pays" approach in the US has recently been reinforced by a FERC ruling relating to transmission planning and cost allocation. Without mandating a "one size fits all" approach (individual regions can develop their own arrangements) to cost allocation, FERC Order No. 1000 requires that transmission providers take part in regional planning processes that take account of state or federal public policy requirements. The Order requires that the regional transmission plans emerging from the planning process must define a cost allocation methodology for various categories of transmission project, including transmission required to deliver public policy goals that satisfy a number of principles supporting a "beneficiary pays" approach. These principles, which mirror at a high level those set out by the proposed Regulation, are:

- **Cost allocation must be "roughly commensurate" with estimated benefits**
- **Non-beneficiaries should not have to pay**
- **Cost benefit thresholds must not exclude projects with significant benefits**
- **Costs should not be allocated outside a region without agreement**
- **Cost allocation methodologies and identification of beneficiaries must be transparent.**

Adjacent transmission regions must also cooperate to satisfy these principles when establishing cost allocation methodologies for inter-regional projects to ensure that the most efficient or cost effective transmission solutions are identified. In addition, Order No. 1000 removes the right of incumbent transmission providers to claim "first refusal" in the construction of transmission facilities, due to concerns that such rights might discourage new transmission development. Non-incumbent developers will therefore have the same opportunity as incumbent transmission developers to recover investment costs through regulated transmission tariffs.

Southwest Power Pool's (SPP) "Balanced Portfolio Approach"

As part of its Integrated Transmission Planning process (ITP), SPP employs a "balanced portfolio" approach that combines priority, economic or other transmission projects that can be shown to benefit SPP customers as a whole, i.e. on a regional basis, and that also benefit each individual zone within the SPP region. The cost of an implemented balanced portfolio of transmission projects is recovered entirely through SPP's postage stamp transmission tariff. Where a particular portfolio of projects is shown not to benefit an individual zone within SPP's region, there are provisions to fold some that zone's other transmission cost responsibility into the portfolio to ensure that benefits exceed overall costs for all zones.

The approach overcomes the "winners and losers" issue amongst zones within SPP's region and so justifies cost recovery on a "socialised" basis. As such, the concept could provide an alternative approach to transmission investment in Europe. Transmission projects identified as PCIs through the Commission's energy infrastructure blueprint or ENTSO-E's 10 year investment planning process could be parcelled for implementation in portfolios that were beneficial to all Member States on a regional or pan-European basis, with costs recovered via "postage stamp" type transmission charges. Member States that did not benefit from the implementation of a particular portfolio, but which were required to contribute via a common European or regional tariff, could have an appropriate proportion of the costs recovered through their transmission charges moved into the portfolio so that they too received a net benefit from implementation.

A variety of cost allocation practices exist in the US, some of which are based on the "beneficiary pays" principle and may therefore have some relevance to the situation in Europe. FERC's recent rulemaking mandates this approach and, by removing the right of "first refusal" gives non-incumbent transmission developers equal access to cost recovery via transmission tariffs.

Meaningful Stakeholder Participation

A successful European approach to transmission network planning and cost allocation, including the consideration of non-wires alternatives, will require the collaborative participation of a wide range of stakeholders. Rules that improve the transparency of and access to computer modelling, input assumptions, scenario development and other key steps in the planning and regulatory processes will be needed to facilitating this productive engagement. Models are typically proprietary, but regulatory agencies can (and do) direct utilities to put agreements in place with vendors to allow stakeholders to use a proprietary model for specific purposes, as has been the case in Oregon and California.[16] Funding to acquire the necessary technical expertise for effective stakeholder involvement may also be required, and there are examples in the US where such funding is provided.

A European example of encouraging stakeholder participation in transmission planning is provided by Ofgem's RIIO (Revenue = Incentives + Innovation + Outputs) network regulation framework[17]. RIIO requires TSOs in Great Britain to engage with customers in developing network investment plans and, as part of this engagement, National Grid has consulted on future requirements and how these are met. In order to allow customers to make informed judgements in what is a complex debate, National Grid has published a model which allows the implications of varying scenario assumptions on the need for transmission investment to be investigated.

The European Regulation should consider these and other leading practices[18] to ensure that stakeholders can engage meaningfully in pan-European transmission network planning and cost allocation.

16 See, for example, Article 10.3 and 10.4 of the California regulator's rules of practice and procedure here: http://docs.cpuc.ca.gov/published/RULES_PRAC_PROC/105138.htm.

17 See Ofgem's Handbook for implementing the RIIO model at http://www.ofgem.gov.uk/networks/rpix20/consultdocs/Documents1/RIIO%20handbook.pdf

18 For an overview of international best practices on interconnector and transmission investment and planning, see: *Securing Grids for a Sustainable Future: Case Studies*, available at : http://www.raponline.org/document/download/id/4624

Conclusions & Next Steps

Delivering the transmission infrastructure necessary to achieve an integrated electricity system capable of supporting Europe's energy policy goals will be a major challenge. The Commission's Blueprint document provides a vision of what that electricity system might look like, while the proposed Regulation, if adopted, represents a step forward in providing the means of delivery.

However, as the European approach to infrastructure continues to develop, it is essential that arrangements for planning and financing electricity grids are coordinated, efficient, competitive, equitable and transparent. In the preceding sections, we highlight measures that could usefully be adopted in the areas of regulation, investment and cost allocation to contribute towards these goals. Attention is also drawn to practice in the US and elsewhere that might be relevant to the European situation.

This Policy Brief is a snapshot of work by the Regulatory Assistance Project to develop a position on these issues, particularly the allocation of costs. A final report will be published in February 2012.

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that promote economic efficiency, protect the environment, ensure system reliability, and allocate system benefits fairly among all consumers.

RAP's experts include former regulators, government officials, and senior energy executives. With support from foundation and governmental grants, they provide deep expertise on regulatory and market policies that advance economic efficiency, protect the environment, ensure system reliability, and fairly allocate costs and benefits among consumers.

RAP in the EU

RAP coordinates its EU activities from its offices in Brussels and Berlin, with a focus on both EU-level and Member State-level policies. RAP advises regulators and government officials on a peer-to-peer basis, providing technical assistance on issues ranging from design and implementation of energy efficiency programmes and smart metering schemes to rate design and electricity market reform.

RAP's recent publications include

- *Residential Efficiency Retrofits: A Roadmap for the Future*
- *Advancing Both European Market Integration and Power Sector Decarbonisation: Key Issues to Consider*
- *The Role of Forward Capacity Markets in Increasing Demand-Side and Other Low-Carbon Resources: Experience and Prospects.*
- *Prices and Policies: Carbon Caps and Efficiency Programmes for Europe's Low-Carbon Future*
- *Smart Policies Before Smart Grids: How State Regulators Can Steer Smart Grid Investments Toward Customer-Side Solutions*
- *Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements*

Contact RAP

EU Office
Rue Stassart 48, Brussels 1050, Belgium
Tel: +32(0)2 789 30 13
www.raponline.org

RAP

EU Office
Rue Stassart 48, Brussels 1050, Belgium
Tel: +32(0)2 789 30 13
www.raponline.org