Local and regional impact of the Trans-European Energy Networks TEN-E with a focus on the forthcoming Energy Infrastructure package

The report was written by
Progress Consulting S.r.l. and Living Prospects Ltd.
It does not represent the official views of the Committee of the Regions.

More information on the European Union and the Committee of the Regions is available on the internet at http://www.europa.eu and http://www.cor.europa.eu respectively.

Catalogue number: QG-30-13-380-EN-N
ISBN: 978-92-895-0692-2
DOI: 10.2863/76389

Table of Contents

1.Survey of policy developments and trends

1.1 Introduction

The energy sector is often referred to as an artery of modern industrial society, as it strongly affects long-term competitiveness, through, among other things, fuel prices, energy import dependency and environmental impacts. Acknowledging the importance of the sector, the European Union (EU) supports the development of Trans-European Energy Networks (TEN-E) as an integral part of its overall energy policy objectives: increasing competitiveness in the electricity and gas markets, reinforcing security of supply, and protecting the environment. Further, the EU aims to stimulate the interconnection, interoperability and development of Trans-European Networks (TENs) for transporting energy, as this is essential for the effective operation of the internal energy market in particular and the internal market in general. The TEN programmes are defined by EU decisions that establish relevant guidelines and by EU regulations containing the framework for their financing. The EU also supports TENs expressly to stimulate regional cooperation, solidarity and growth.

With such policies, the EU sets out to introduce a system with a unified European approach, prioritising capital-intensive trans-European electricity and gas networks, such as the Denmark-Germany-Baltic Ring project (addressing electricity interconnection capacities and the possibility to integrate offshore wind energy), the Mediterranean Electricity and Gas Rings (two projects) and the European liquefied natural gas terminals (diversifying sources of supply and entry points). This was intended to benefit local and regional areas by making it possible to: (i) enhance competition and stimulate the internal energy market; (ii) supply all regions of the Community from internal or external sources; and (iii) promote and integrate renewable energy sources into the system.

Through a series of revisions and related policies, the EU has sought to accelerate the implementation of these networks. Recognising that more work is still required, the European Commission (EC) is in the process of developing an Energy Infrastructure Package (EIP). The EIP aims to define a holistic, strategic and coherent framework for infrastructure development for the EU. As such, it will cover infrastructure development both inside and outside the EU and will touch upon EU energy, climate and environment policies, as well as cohesion and regional policy, and external relations policy.

On 17 November 2010, the EC published the Blueprint for Energy Infrastructure Priorities for 2020 and beyond (COM (2010) 677 final), as part of a series of

documents that will form the EIP. The documents that will follow are not likely to change the direction established in this Blueprint; they are expected to include the identification of main bottlenecks of European energy infrastructure development, the application of specific procedures for their accelerated planning and permitting, and the latest state of play on smart grids in Europe. All of these together will give a clear perspective on how EU institutions intend to push forward the development of TEN-E in the future.

The EU also dedicated several funding mechanisms to promote technical cooperation for interregional interconnection projects. These come in the form of co-financing, loans and loan guarantees, direct grants, as well as interest rate subsidies.

1.2 TEN-E policy and funding developments and trends

1.2.1 Policy evolution overview

TEN-E networks were developed in 1996 as part of the move to complete the single market. At that time, the EU did not have an energy policy remit and there was no internal energy market. Policies simply called for the effective operation of the internal energy market towards economic and social cohesion, by reducing the isolation of less favoured European regions and reinforcing the security of energy supplies.

Roughly 10 years later, the EU agreed a raft of policies propelling European energy policy forward. The Lisbon Treaty (signed in December 2007 and entered into force in December 2009) ushered in a new era in European policy, with energy, among other policies, being added to EU shared competences, thereby strengthening the EU role in the sector. In the same period (early 2007), the EU adopted an overarching 'Energy Policy for Europe'[1] forming a first resolute step towards becoming a low energy economy with safer, more competitive and more secure energy supplies. Moreover, at the end of 2006, the TEN-E Guidelines (1364/2006/EC) were developed, strengthening a set of priorities including: sustainability and the environmental impact assessment; security of supply; interoperability with new Member States; and greater coordination via a European coordinator, to ensure better harmonisation on projects between the EU and the Member States (MS).

Following these initial steps for a truly European energy policy, the EU has gradually formulated an entirely new policy framework, most notably with the 2008 second strategic energy review, the 2009 third internal energy market

[1] COM (2007) 1 final.

package, and the 2010 Communication on 'Energy 2020 – A strategy for competitive, sustainable and secure energy'[2]. These documents recognise that progress made to meet the three principle goals for energy policy, i.e. security of supply, competitiveness and sustainability, is being made too slowly, whilst the scale of the problem grows. Each document brings in further changes to the energy infrastructure. For example, the second strategic energy review prioritises six infrastructure projects and states the need for further measures; while the third package on internal energy market measures is aimed at independent and coordinated actions of transmission providers, including cross-border electricity exchanges and conditions for access to gas transmission networks, as well as the obligation on regulators to consider the impact of their financing decisions beyond their own borders. The Energy 2020 Communication calls for a step change in the way Europe plans, constructs and operates energy infrastructures.

The European Commission's review of progress in the implementation of TEN-E projects for 2007-2008[3] highlighted a lack of advancement and defined the main obstacles responsible for progress delays, i.e. competition failures, authorisation procedure weaknesses and financial mechanism limitations. The Energy 2020 Communication attempts to address these concerns by suggesting: regulatory framework consolidation; streamlining of permit procedures and authorisation rules for prioritised projects of 'European interest'; and provision of an optimum finance framework.

The framework encompassing these measures will come in the form of the Energy Infrastructure Package which will be developed in two phases. As part of the first phase, the Commission issued the Blueprint for Energy Infrastructure Priorities for 2020. In a nutshell, the Blueprint outlines a strategy for speeding up the implementation of priority energy corridors, integration of renewable energy, and smart grids. Based on the energy corridors, concrete projects of 'European interest' will be identified in 2012, which should benefit from EU financing and building permits, including a time limit for final decision-making whilst meeting environmental and public participation requirements. More documents are expected to follow as part of the full EIP to provide a holistic strategy for energy infrastructure development both inside and outside the EU.

The common aim underlining each of the above-mentioned post-2007 policies is to coordinate, advance and eventually create an internal market for energy. With each successive revision, there has been a trend to include new concepts to propel the EU closer to this overarching objective. Overall, since the 2006 TEN-E revision, these efforts have included: planning of prioritised projects or

[2] COM(2010) 639 final.
[3] SEC 2010 (505) final.

corridors of 'European interest'; establishment of a European coordinator to coordinate actions between the EU and the MS, though not expressly involving the local and regional authorities (LRAs)[4]; consolidation of the regulatory framework; streamlining of permit procedures and authorisation rules; and optimisation of the available financial mechanisms to leverage public and private funding sources.

1.2.2 Local and regional impact of policies

In relation to LRAs, the latest (2006) TEN-E regulations call for: (1) completing the internal energy market and reducing the isolation of less-favoured and island regions; (2) securing and diversifying energy sources; (3) contributing to sustainable development and reducing environmental impacts. More precisely:

(1) Completion of the internal energy market. The networks were to connect remote regions to the trans-European energy networks, in order to improve the stability of their energy supplies. This, together with the interoperability of trans-European energy networks for electricity and gas, were considered essential for the effective operation of the internal energy market and for reducing the isolation of peripheral and island regions.

(2) Securing and diversifying energy sources. Networks designed to secure and diversify energy sources were expected to enhance internal cohesion; policies, in fact, aimed at providing local and regional territories with access to a wider choice and a higher-quality of services at more competitive prices, as a result of the diversification of energy sources. These benefits likely triggered a recent grouping of energy stakeholders from Germany, France, Belgium, the Netherlands, Sweden, Denmark, Ireland, the UK and Norway to form the 'North Sea Countries Offshore Grid Initiative', to spur construction of an off-shore wind grid in the North Sea, with connecting installations on the mainland. A Memorandum of Understanding, laying the foundation for action and the financing for such an ambitious project are still under discussion.

(3) Contributing to sustainable development and reducing environmental impacts; with regard to sustainability, policies aimed at supporting local/regional renewable energy production expected, in turn, to lead to income generation for many regions due to its local and inexhaustible nature. The focus was also on connecting local or regional renewable

[4] When projects encountered difficulties, a European coordinator can be appointed by the EC to facilitate cooperation and ensure that adequate monitoring is carried out to keep the Community informed of progress. The 2006 guidelines specified that the coordinator would encourage 'cooperation between all parties concerned', yet the guidelines did not specify which 'parties' explicitly.

energy production to the interconnected energy networks, as the interconnection of TEN-E would promote the use of more efficient technologies, thus reducing losses and the environmental risks associated with the transportation and transmission of energy.

A 2006 European Investment Bank (EIB) report evaluating cross-border TEN projects considered the regional impact of TEN-E projects and served as a wake-up call. The regional impact was evaluated looking at: employment, accessibility, efficiency and social inclusion. The study found that the most significant regional impacts of cross-border energy projects reviewed, relate to accessibility (i.e. the possibility to attract new and often project-related industries) and efficiency (i.e. reduced energy prices and better energy supply). Employment and social inclusion effects were not deemed great, and the report noted that most of the projects were completed with delays, sometimes lasting up to 4 years. Three of the main reasons for the delays were: (i) complex and lengthy procurement procedures; (ii) environmental opposition; and (iii) local authorisation procedures. '*Cross-border connections*', the report maintained '*are facing major difficulties since they receive less priority at national level and require greater coordination efforts. The guidelines for the development of TENs are drawn at the EU level, while infrastructure planning and measures to implement individual projects are the responsibility of the Member States concerned or delegated to a more local level.*'[5]

These findings were also mirrored in a 2007 evaluation report[6] that noted that the most serious problems relate to authorisation delays and environmental concerns. Indeed, even the Commission's own Report on the Implementation of TEN-E projects for 2007-2008[7], noted that '*progress has been more mitigated as regard the objectives to reduce the isolation of peripheral regions and islands*', to increase European cohesion by connecting outlying areas, by levelling the playing field and increasing diverse and secure energy supplies. Four of the nine projects were still under development when the report was finalised. The report asserts that debates over the electricity generation mix and authorisation procedures slowed infrastructure development; the greatest obstacle to progress was authorisation procedures – lamenting that TEN-E has no remit to address these. The report names procedures exacerbated by environmental requirements and public opposition (i.e. NIMBY: "Not In My Back Yard") as partly responsible for patchy implementation.

These three implementation and evaluation documents clearly outlined bottlenecks facing TEN-E infrastructure development, the greatest of which

[5] EIB (2006).
[6] MVV consulting (2007).
[7] SEC 2010 (505) final.

relates to authorisation procedures and the lack of coordination. Notably, the Commission's 2010 report identifies a '*clear need to streamline planning and authorisation procedures in the case of projects which cross several jurisdictions'* and calls for mechanisms that would ensure consistency between European and national energy infrastructure priorities. Moreover, measures suggested by later policies (second strategic energy review, third internal energy market package and Energy 2020) also attempted to address these weaknesses where possible: involving the appropriate regional stakeholders in developing blueprints, to ensure consistency and consolidation of regulatory approach, and to engage '*constructively in facilitating projects*', perhaps referring to public acceptance and environmental impact evaluations. These recommendations aimed to ensure that TEN-E projects benefit local and regional areas, are also mirrored in public consultation on the 2008 Green Paper entitled 'Towards a secure, sustainable and competitive European energy network'[8].

Lienz (AT) - Cordignano (IT) line

The project, significantly delayed due to local opposition, concerns the building of an electricity power line connecting Lienz (Austria) to Cordignano (Italy). The line crosses both agricultural and tourist nature reserves and local communities are against it, mainly fearing electromagnetic fields. In Austria, permission of the local authorities is required, though these lack experience in dealing with projects of this size and have met with difficulties in securing a decision, due to political implications and public fear. In Italy, the project has been addressed in national legislation concerning strategic infrastructures (Law no. 443/2001, known as 'Legge Obiettivo') by introducing a simplified procedure. The total delay is predicted to reach 10 years.

Clearly, the trend in EU policy-making is to focus on using projects of 'European interest' to cut through the current multi-dimensional complexity of local and regional procedures needed to make progress in TEN-E implementation.

[8] COM(2008)782.

2.TEN-E inventory of funding instruments

2.1 Introduction

The new EU energy policy framework outlines significant new infrastructure needs to meet coming demand. Drivers for increased energy demand come primarily in the form of climate change objectives, security of supply, market integration, and the evolution of energy generation mix, type and location.

To accompany the Energy Infrastructure Priorities for 2020[9] this new policy framework '*triggers substantial needs for new energy infrastructure investment in the EU, which is estimated at about 215.5 billion Euros up to 2020*[10].' This represents '*large-scale investment needs at a level not seen over the past decades both within Member States and across borders*.' [11] The EC, in its impact assessment, suggests that half of the sum will have to come from government coffers and that '*the other €100bn will require public action on permitting and leveraging the necessary private capital*'[12]. At a time of austerity across many European countries, this investment will feel enormous and will likely have a significant impact on customers' energy bills. Yet, the EC remains guarded on this front, suggesting that it is not necessary for the costs to be directly incurred by consumers in increased prices, and expecting that competition between energy companies, that will be promoted by EU legislation, will discourage them from passing on the cost to the final consumers.

2.2 Infrastructure investment needs

Electricity demand is expected to increase and new renewable capacities will be developed, both requiring more out of electricity transmission and distribution grids. In fact, the EC foresees to double the annual extension of the currently operational European transmission grids, with a growth rate of approximately 1.5% between 2010 and 2020 (compared to an annual average growth rate of 0.8% from 1989-2003), noting that this corresponds to an annual investment of about 3.3-4.7 billion EUR for projects of European significance. According to ENTSO-E, '*these projects correspond to investment needs of 50-70 billion EUR for 2010 – 2025*'[13], for everything from new transmission lines and existing line upgrades to managing greater variation of generated power. In total, the EC

[9] SEC (2010) 1396.
[10] Idem, page 11.
[11] Idem, page 17.
[12] Euractiv (2010).
[13] SEC (2010) 1396.

expects electricity investment needs to reach 142 billion EUR including interconnections, offshore connections and smart grids.

As for gas, the European Commission notes that estimating its future demand across Europe is highly uncertain due to future energy policy choices. The EC calculates gas infrastructure needs in the coming decade will require an investment of 71 billion EUR.[14] This would include EU internal interconnectors (including reverse flows), new import infrastructure (pipelines and LNG), and storage requirements. This figure also includes 14 billion EUR of investments outside the EU.

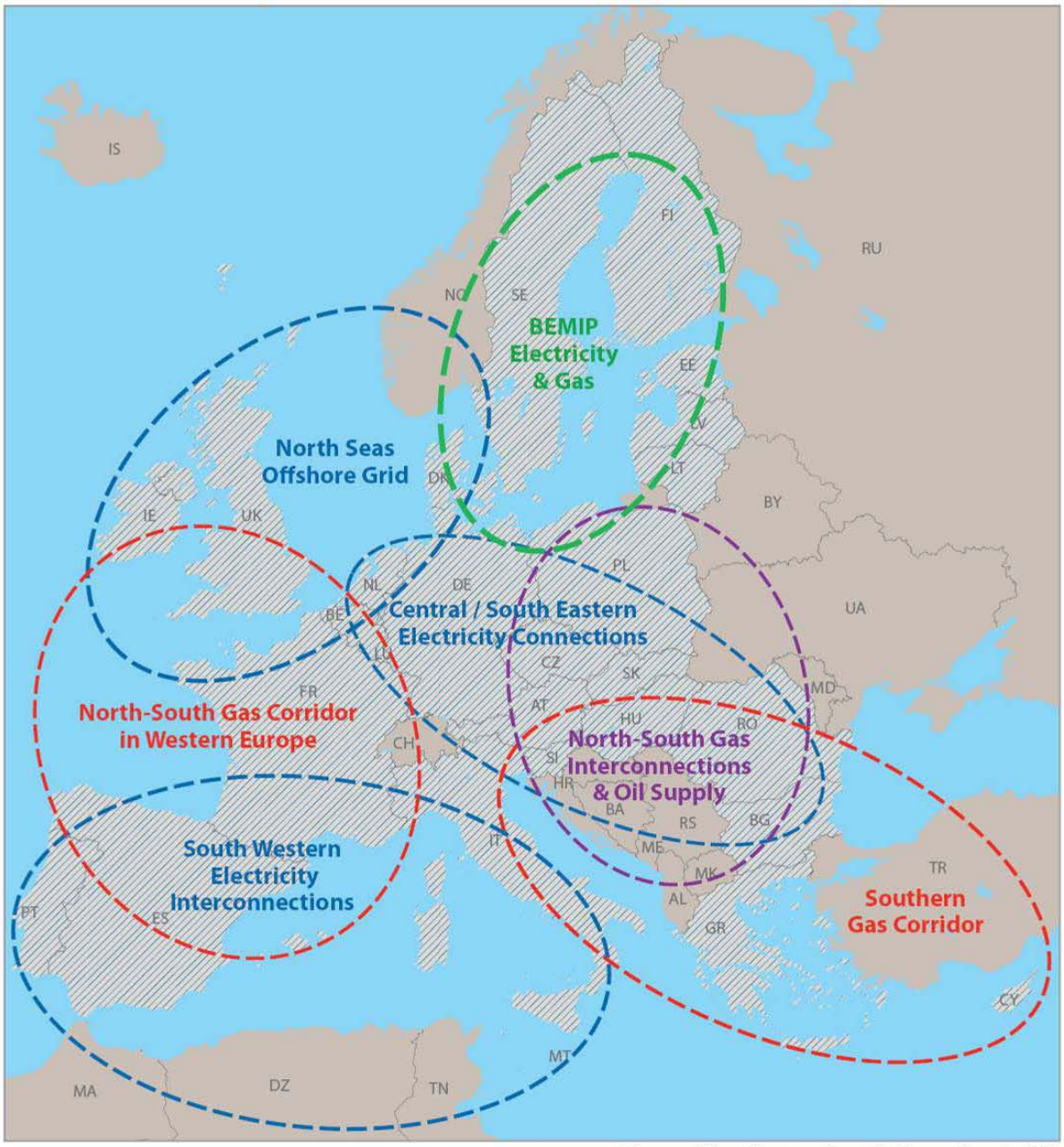
On top of this, there is the CCS-related infrastructure investment which the Joint Research Centre estimates will require 2.5 billion EUR by 2020. This brings the total overall investment needs to a startling 215.5 billion EUR just until 2020. As a result, the EC notes that '*given the problems encountered, these investments will not happen without strong action at national and community level*.'[15]

Moreover, in its Energy Infrastructure Priorities document, the Commission defined four priority corridors for electricity and three for gas, where concrete projects eligible for European funding will be identified in 2012. These projects of 'European interest' will also benefit from an accelerated permitting process with a time limit for the final decision.[16] The electricity priorities include an offshore grid in the North Sea and a connection to transport power from wind parks to Northern and Central European cities and to hydro-storage in the Alpine region. Other projects are aimed at connecting the Iberian Peninsula with France, strengthening the regional network in Central Eastern and South Eastern Europe and integrating the Baltic energy market into the European market. For gas, two priority corridors run North-South in Western Europe to remove internal bottlenecks and in Eastern Europe to boost Baltic market integration. The Southern Gas Corridor is also given priority status to deliver gas directly from the Caspian Sea to Europe with the aim of bypassing Russia.

It would obviously be in the CoR's interest that the Commission directs investments toward priority corridors that strengthen the peripheral regions by connecting them with the backbone of the existing European grid in Western Europe, as well as toward the interconnection of the European grid with neighbouring countries, i.e. northern Africa. The latter is essential to improve the future security of supply of Europe, taking into account the energy reserves

[14] Stet, page 20.
[15] SEC (2010) 1396.
[16] EC 2010.

and potential of those regions, such as LNG and solar in northern Africa, and gas in the Caspian region.



Source: EC 2010

2.3 Existing funding instruments

The TEN-E funding programme is based on the TEN Financial Regulations, the latest of which was updated in 2007. They set conditions for financing eligibility of TEN-E projects, specifying the funding rate for studies and for works. Infrastructure investment needs have grown, as have their political importance. Therefore, the type of funding instruments and the amounts of funding made available have correspondingly grown.

Energy infrastructure projects are implemented by Transmission System Operators (TSOs). Depending on the total cost of a project, the current main financing sources for the implementation of such projects (Table 1) are: (i) TSOs' own resources (amounting to approximately 20-100% of the total investment required, depending on the scale of the overall investment); (ii) Bank loans (e.g. EIB and European Bank for Reconstruction and Development (EBRD), mainly through regular banks): these loans may amount to an average of approximately 40-80% of the total investment required; (iii) EU co-financing: TEN-E annual Programme, European Economic Programme for Recovery (2009-2010), Structural Funds, ENPI (or previous instruments such as PHARE, etc) and RTD Framework Programme; and (iv) Partnerships with companies active in the gas and power sector (possibly other than TSOs).

Table 1 - Inventory of funding instruments for Trans-European Energy Networks

Funding instrument	European Investment Bank
Status	*Owned by the EU27 MS, the bank makes available long term finance to large capital investment projects.*
Size & Type of funds	At least 75 billion EUR will be available for trans-European transport projects in the period 2004-2013. EIB offers large long maturity loans with an option for either fixed or variable interest rate.
Eligibility criteria	Compliance with EU environmental principles and standards.
Funding instrument	The Marguerite infrastructure fund
Status	*An international fund established by long-term institutional investors from both the public and the private sector aimed at financing greenfield projects.*
Size & Type of funds	Currently approximately 700m EUR are available for investments. The total fund size is expected to reach 1.5 billion EUR by the end of 2011; 25-35% will be invested in energy projects and another 35-45% in RES projects.
Eligibility criteria	Minimum investment of 10m EUR and a maximum of 10% of the total fund size. Priority will be given to medium and large-sized greenfield infrastructure projects, including energy (TEN-E) initiatives. Assets need to be located on EU territory. Pilot projects developing experimental or non-tested technologies are excluded.
Funding instrument	European Regional Development Fund (ERDF) and EU Cohesion Fund
Status	*ERDF is aimed at financing initiatives that strengthen economic and social cohesion in the EU. The Cohesion Fund is aimed at financing initiatives of MS whose Gross National Income is below 90% of EU average. Both funds jointly co-finance infrastructure- and environment-related programmes.*
Size & Type of funds	Allocation of funds is subject to the Operational Programmes proposed by each MS and approved by the EC. For the period 2007-2013, the available budget is 207 billion EUR for the ERDF and 70 billion EUR for the Cohesion Fund. The funds provide direct co-financing, with a maximum rate of 85%.
Eligibility	ERDF - As per the provisions of *Regulation (EC) No*

criteria	*1080/2006 of the European Parliament and of the Council of 5 July 2006 on the European Regional Development Fund and repealing Regulation (EC) No 1783/1999 (as amended in 2009).* Cohesion Fund - As per the provisions of *Council Regulation (EC) No 1084/2006 of 11 July 2006 establishing a Cohesion Fund and repealing Regulation (EC) No 1164/94*. The Cohesion Fund supports projects related to energy provided that the latter have clear benefits for the environment.
Funding instrument	TEN-E annual Programme
Status	*An EC Programme providing grants to TEN-E projects based on an annual call for tender.*
Size & Type of funds	In 2010, the total budget was 20.76m EUR. Allocation of funds is by the Commission on the basis of grant proposals made by MS and can total 50% for studies and 10% for works.
Eligibility criteria	Only '*projects of common interest*' as listed under Annex III of the guidelines for TEN-E (Decision No 1364/2006/EC) are eligible. Applicants can be either (a) Member States or (b) undertakings or international organisations with the agreement of Member States.
Funding instrument	European Economic Programme for Recovery (2009-2010)
Status	*The EEPR is a temporary fiscal stimulus announced in November 2008 to last until end 2010. EU Regulation 663/2009 sets out a financial instrument for energy projects.*
Size & Type of funds	Allocation of funds is by the Commission on the basis of grant proposals made by MS and can total 50% of project-related expenditure for the implementation of the project. The available budget for the total EEPR fund amounts to 200 billion EUR, consisting of national budgets (170 billion EUR) and EU and EIB budgets (30 billion EUR), of which the financial instrument for energy projects totals 3.98 billion EUR. Of that amount, 2.365 billion EUR can go toward gas and electricity infrastructure. For 2009 and 2010, the Commission used an additional 3.5 billion EUR for trans-European energy inter-connections.
Eligibility criteria	Criteria are outlined in *EU Regulation 663/2009 of the European Parliament and Council establishing a programme to aid economic recovery by granting Community financial assistance to projects in the field of energy.*

Funding instrument	European Bank for Reconstruction and Development
Status	The bank provides financing to banks, industries and businesses, as well as new ventures and investments in existing companies, including also in publicly-owned companies.
Size & Type of funds	Funds available for direct investments go from 5m EUR to beyond 200m EUR. EBRD provides loans, equity finance, guarantees, leasing facilities and trade finance.
Eligibility criteria	Financing is typically limited to a maximum of 35% of the total project cost. Environmental and social standards requirements apply to projects financed.
Funding instrument	7th EU Framework Programme for Research and Technological Development (FP7 RTD)
Status	*The research programme is aimed at reinforcing the scientific and technological base of European industry, as well as at supporting EU policies through the enhancement of research.*
Size & Type of funds	Funds are available for research projects in a broad range of thematic areas, including the smart energy networks sector. For the period 2007-2013 the programme has a total budget of over 50 billion EUR.
Eligibility criteria	Grants are determined on the basis of calls for proposals and a peer review process. Activities funded must have a European added value.
Funding instrument	European Neighbourhood and Partnership Instrument (ENPI)
Status	*A dedicated EU funding instrument aimed at promoting sustainable development and approximation to EU policies and legislation in European Neighbourhood Policy (ENP) countries. Part of the available funds is to be provided for the integration of energy networks.*
Size & Type of funds	For the period 2007-2013, the available budget is approximately 12 billion EUR.
Eligibility criteria	Projects should address the priorities identified in the ENP Action Plans agreed with the authorities of the implementation country. Standard EC procurement rules apply.

Funding instrument	JASPERS
Status	*A Cohesion Policy joint initiative, this partnership, established in 2006, among the EC (DG Regional Policy), the EIB, the EBRD and KfW, offers technical assistance to the new MS to prepare major projects for EU support. TENs are included among the key priorities of JASPERS.*
Size & Type of funds	Indirect, fully covering the technical assistance required at any stage of project cycle.
Eligibility criteria	Project applications are reviewed by JASPERS together with DG REGIO and the Managing Authority of the MS involved, on the basis of project maturity and relevance to EC and country priorities. Only large scale projects of over 25-50m EUR are reviewed, with some exceptions in the case of small-sized countries.
Funding instrument	JESSICA
Status	*A Cohesion Policy joint initiative by the EC, the EIB and the Council of Europe Development Bank, aimed at promoting sustainable investment, and growth and jobs in EU urban areas.*
Size & Type of funds	Indirect, uses 2007-2013 Structural Funds through the MS Operational Programmes to produce revolving funds that can be used for investments in sustainable cities and towns, potentially including municipal smart grid networks.
Eligibility criteria	As per the provisions of *Council Regulation (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999 (as amended in 2009)* and of related regulations implementing the provisions of EC 1083/2006. Selection of projects is based on their business plan.

Funding instrument	KfW and *KfW IPEX-Bank*
Status	*A German, state-owned promotional Bank supporting investments globally. KfW IPEX-Bank is a subsidiary providing tailor-made financing solutions for large-scale projects in Germany and for expansions, exports and new projects abroad.*
Size & Type of funds	Tailor-made financing solutions are offered for, among others, infrastructure, climate and environmental protection projects. In 2009, commitments reached 8.9 billion EUR.
Eligibility criteria	KfW and its subsidiary apply the provisions of the UN Principles for Responsible Investments (PRI). Loans are provided through regular banks.

It is important to note that MS, in most cases, do not participate directly in the financing of projects of trans-European energy networks since these projects are mostly implemented by TSOs and the costs are recovered through the regulated tariffs according to the users-pay principle.

Considering the relatively limited EU budget devoted to energy projects (and networks)[17], the Commission announced on 17 November 2010 that it will propose an additional funding mechanism in 2011 for the EU's next long-term budgetary period (2014-2020). The new financial instrument will '*support projects of European interest, for the new financial perspective after 2013. Beyond grants, innovative market-based solutions may be proposed, such as equity participations, guarantees and public private partnership loans*'[18].

[17] Andoura, S. *et al.* (2010).
[18] Memo/10/582/2010.

3. The development of Smart Grids

3.1 Overview of Smart Grids

The Blueprint for Energy Infrastructure Priorities for 2020 and beyond targets smart grids as a priority area for the EU. '*Grids must become smarter*' the document explains, noting that reaching the 2020 energy efficiency and renewable targets will not be possible without more innovation and intelligence in the networks at both transmission and distribution level. '*Smart electricity grids will facilitate transparency and enable consumers to control appliances at their homes to save energy, facilitate domestic generation and reduce cost. Such technologies will also help boost the competitiveness and worldwide technological leadership of EU industry, including SMEs.*'[19] Ultimately, the EC hopes to develop a framework together with incentives for the rapid growth of Smart Grids.

The Commission recognises that '*market forces are not enough to deploy Smart Grids'* and as a result is considering options for an initiative[20] that is likely to include legislation to boost their development. The Commission has established a Smart Grid Task Force[21] to assess these options; according to the Blueprint, the results of this assessment and possible further measures will be published in the course of 2011.[22] In addition, the Commission will set up a 'smart grid transparency and information platform' to publicise best practice experiences and consider the development of an appropriate regulatory framework that features technical standards and data protection.

The EC acknowledges that the deployment of Smart Grids is a cross-cutting issue requiring considerable effort. Currently, support is mostly to R&D projects and feasibility studies; not many pilot projects exist across Europe where Smart Grids have been rolled out and are being used, apart from Italy and Germany, for which two cases are outlined below. [23]

[19] COM (2010) 677 final.
[20] EC (2010b).
[21] http://ec.europa.eu/energy/gas_electricity/smartgrids/taskforce_en.htm
[22] COM (2010) 677 final.
[23] As the European Commission report on the state of play of smart grids had not been issued when this document was written, these cases have been developed largely using Internet sources.

3.2 Case studies

3.2.1 Case study: ENEL (Italy)

Background

Since early 2000, the Italian energy company ENEL has been building a Smart Grid in Italy. Within a few years, ENEL has installed 32 million smart meters for its customers while continuously working on improving the grid. Believing that smart networks are the key to reaching a low carbon strategy and increased security of the system, ENEL has taken the lead in Europe in the development of a smart energy grid. The third important driver for ENEL is the upgrade of ageing infrastructures to reduce total system costs and increase the network flexibility to face long term uncertainties.

Automatic Meter Management

In 2008, ENEL's Automatic Meter Management (AMM) system made 250 million remote readings (collected on a bi-monthly basis from residential customers in the regulated market and on a monthly basis from small businesses and residential customers in the free market) and more than 12 million remote operations. As part of this, ENEL customers – both residential and industrial – enjoy dynamic pricing options, where power pricing options change every 15 minutes based on the status of energy demand and generation. The system provides maximum transparency, by real-time reading of energy consumption and rates as well as minimisation of human error in meter readings and therefore reduced complaints and disputes. Together with AMM, ENEL has also installed remotely operated systems for its High Voltage (HV) and Medium Voltage (MV) networks, with more than 100,000 remotely controlled MV substations (case study 1b). This enables automatic fault clearing procedures and improvements in the network by reducing power disruption events and optimising consumption.

Work Force Management

ENEL transformed 5300 vehicles into 'mobile offices' to deliver efficiencies by shortening the time of intervention and speeding-up operations. All field engineer vehicles are equipped with technologies and devices to enable direct connection from the field to the centre, and management of processes through mobile applications. The 'fault management' time spent per year per customer dropped drastically, together with response time, paperwork and travel costs.

Results

All the above resulted in significant system improvements. According to company documents, ENEL's quality of service has improved by over 60%, with the minutes of interruption per year declining from 128 in 2001 to 49 in 2009. This, according to a US study, represents a value to ENEL's customers equal to 126m EUR per year. In addition, the related costs decreased by 40% from 80 EUR per customer to current 49 EUR per customer per year, equal to a total saving of 992m EUR per year. Because of these results, ENEL's smart grid solution represents a worldwide cost efficiency benchmark. The Smart Grid initiative enabled their consumers to save energy, develop domestic energy generation and therefore provide choices for energy savings and efficiency, and reduce costs. Following the successful deployment of the Smart energy Grid in Italy, ENEL is extending its application to other distribution grids within the ENEL Group, namely in Spain where 13 million Smart meters will be installed in the period 2010-2015 in the distribution grid of Endesa covering Catalonia, Aragon, the Canary Islands, the Balearics, Andalusia and Badajoz.

3.2.2 Case study: Intelligent Networks MT (Italy)

Background

ENEL Distribuzione has installed remotely operated systems for its HV and MV networks, including more than 100,000 remotely controlled MV substations, throughout Italy. In 2009, the company initiated the Programme 'Intelligent Networks MT', aimed at experimenting with innovative ways of operating the MV electricity network in four southern Italian regions falling under the EU Convergence objective, i.e. Puglia, Sicily, Campania and Calabria.

Funding

The programme, which is divided into four regional projects, received 77m EUR in co-financing from the Structural Funds; this was made effective through the Inter-regional Operational Programme (IOP), following relevant agreements (one per each region) with ENEL and the Ministry of Economic Development.

Objectives

The specific objective of the Programme is to facilitate the deployment of distributed generation grids in the selected pilot sites and the upgrading of the network to a mixed active/ passive type, in order to maximise energy fed into the grid. Measures are also aimed at making the structure of the MT network

more compatible with solar power generation plants of a capacity ranging from 100 kW to 1MW.

Implementation

The programme is implemented in selected sites covering segments of the MT network of Puglia, Campania (in the province of Caserta), Calabria (in the province of Reggio Calabria) and Sicily (in the provinces of Palermo and Trapani). The MT network is already compatible with the distributed generation connection systems; hence the Programme is expected to increase this availability in terms of number and power of systems. Specifically, projects under development will: (i) improve voltage regulation, to allow control in all the MT grid nodes and manage in a safe manner a potential loss of primary power supply; (ii) release the produced energy in a distributed form, to allow the dissection (automatic or remote) of MT producers, according to the conditions of the grid and the rules established by the Regulatory Authority; allow functioning of the grid in an interconnected configuration, to increase short-circuit power and connectivity of generating plants.

Results

At the end of 2010, more than 40% of the programme had been implemented. Work completed includes: (i) 'site preparation' in all four pilot areas; (ii) integration of distributed generation systems into the network; and (iii) a number of measures to limit the effects of network failures.

Benefits for the regions concerned

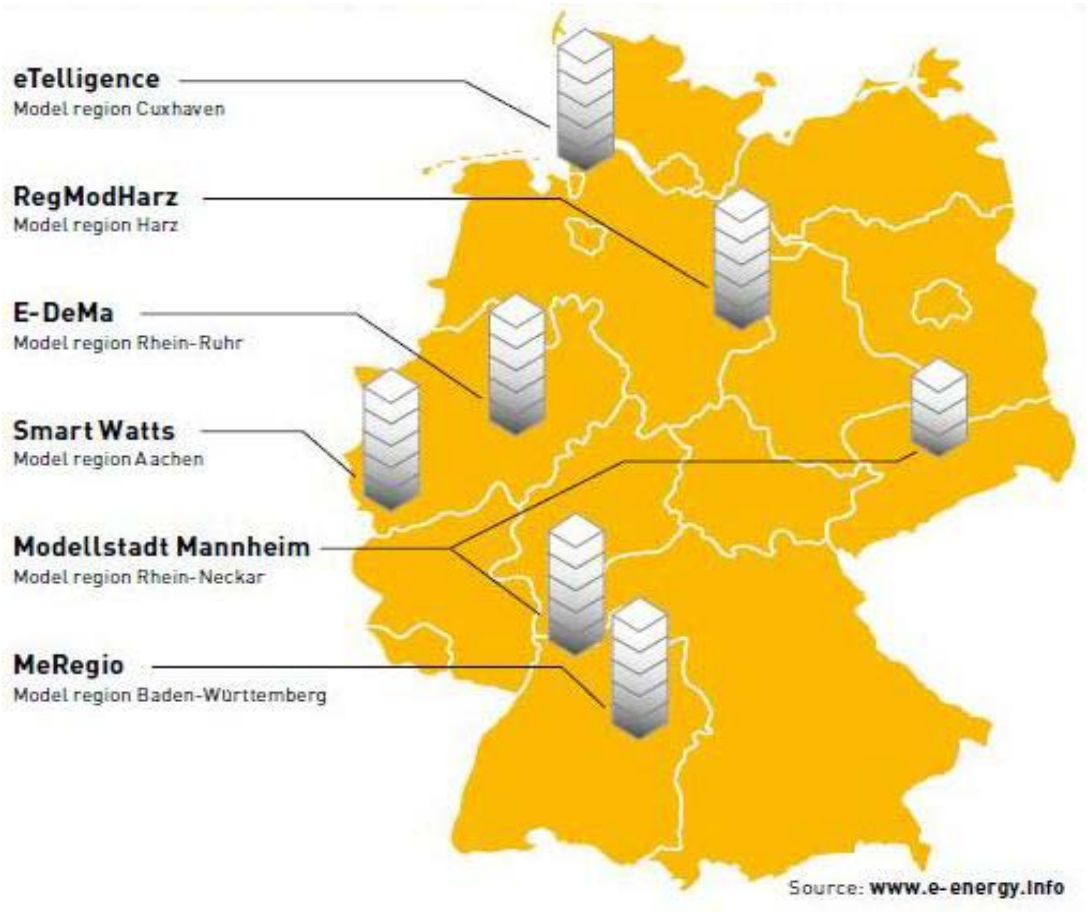
The target territories will benefit from the advantages of smart grids, in terms of increased network availability. It will also allow for more renewable energy producers to be connected to the network.

3.2.3 Case study: Model Regions (Germany)

Background

The German government is promoting the development of smart power grids to enhance energy efficiency and encourage the use of green power in a way that will secure a stable supply of energy whilst combating climate change. As such, the government has launched a series of pilot projects to create an 'Internet of Energy' aimed at boosting energy efficiency with the help of information technology. Funding is provided by the Federal Ministry of Economics and Technology, together with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The projects[24], set up following a regional approach, will finish in 2012. They incorporate technologies in the areas of energy storage and smart mobility, and are developing the concept of a smart home that uses as little energy as possible and feeds surpluses back into the grid.

Figure 3.1 -Implementation of selected pilot projects



[24] A technology competition launched in 2007 identified 6 regions for the projects. The 4-year programme has a total budget of 140m EUR, with 60m EUR contributed by the government and the rest by the companies involved.

With the Project E-DeMa, **the Ruhr region** aims to turn consumers into 'prosumers', i.e. clients who both produce and consume power. In this project, RWE Energy and Siemens are developing an intelligent power consumption control system to ensure the real-time collection and provision of consumption data and to optimise network operation management via decentralised distribution networks. The aim is to allow consumers to regulate their energy consumption from their living rooms based on real-time information on when peak periods are over and the price of power is at its lowest. Three main phases can be distinguished: *Phase 1* is about setting the project basis and the conceptual designs and specifications. This includes the definition of the E-Energy marketplace (AP 1, with reference to Figure 3.2), the outline of the communication infrastructure (AP 2), the specification for the information and communication technology (IKT) gateway (AP 3), the system concept for the E-Energy marketplace software (AP 7), including the meter data management, and indicators that allow the quantification of the benefits of an E-Energy market on completion of the project. *Phase 2* involves the development of the technology parts (IKT gateway, software etc.) as well as the business processes for trading and the marketplace. *Phase 3* includes a demonstration of the new technologies in the E-DeMa model region to evaluate and validate the economical, the energy and the environmental savings.

Figure 3.2 – E-DeMa project implementation plan

Development area	AP	Phase 1 2009	Phase 2 2010	Phase 2 2011	Phase 3 2012
IKT infrastructure	2	Specification, requirement specification	Modelling, simulation		Model validation
			Technology selection, realisation		Trial run, structural adjustment
IKT gateway	3, 4	Specification, requirement specification	Realisation	Provision	Area test
Technical processes, distribution grid operation	6	Specification, requirement specification	Development, realisation, control technology		Trial run, functional adjustment
			Modelling, simulation		Model validation, extrapolation
Economic processes trade & marketplace	5	Specification, requirement specification	Development business processes, products		Trial run, product adjustment
			Modelling, simulation Value creation, energy efficiency		Model validation, extrapolation
System software meter data management / marketplace	7	Specification, requirement specification	Development and test of the software system and interfaces		Software adjustments

Source: E-DeMa website

The Baden-Württemberg project aims to create a minimum emission region and a model house where the dishwasher switches itself on when power is

cheap, and electricity is generated through solar panels on the roof or a combined heat and power (CHP) plant in the basement. Household appliances are interlinked via communication technology and connected to a smart system platform. Electric vehicles are parked in the garage and are charged when the mini-CHP produces more electricity than the grid can take. If necessary, electricity from the battery can also be fed into the grid.

The Mannheim project is testing a Smart Grid suitable for a conurbation that makes heavy use of decentralised renewable power sources. The trial is taking place in Mannheim and Dresden and will use new methods to improve energy efficiency, grid quality, and the integration of renewable and decentralised sources of energy into the urban distribution network. Electricity is offered to customers close to the point of generation and when the power is generated, thus avoiding the need to transport power (a process in which power is lost) and to use decentralised energy storage units. "Prosumers" can adjust their power consumption and their power generation in line with variable pricing structures.
The Harz project is developing a 'virtual power station' grouping renewable power generators and energy storage facilities in line with consumer needs, with the aim of achieving stable, reliable and consumer-oriented electrical power from a high proportion of renewable sources.

The Aachen project is developing an intelligent grid based on the concept of a smart kilowatt hour in which participating households can see where electricity was produced, how it was transported, and how much the power currently costs. The aim is to develop a system in which household appliances primarily consume renewable electricity when it is available at low cost (for example, in strong wind or sunshine).

3.3 Obstacles facing smart grids

Moving from the classic, centralised grid system of today to the mesh-like Smart Grids of the future requires a common vision, collaboration and societal buy-in. The elements of change must be facilitated on all levels, from technology, standards and open systems via legal and regulatory frameworks to commercial arrangements, manufacturing and supply chains, all with a view to demonstrating and proving the benefits of new and emerging technologies.

According to the EC, the major challenges to widespread adoption of smart grid technologies in Europe are twofold, namely the current lack of: (1) 'Smart' incentives to invest in the grid's innovation; and (2) a EU regulatory framework for Smart Grids guaranteeing that existing barriers to the Smart Grid deployment (such as data protection rules, lack of standardisation, scattering of lessons learned from pilot projects, uncertainties in business cases, and uncertainties in

who does what and interfaces) are addressed, also with regard to the possibility that obstacles to Smart Grid deployment are created by unilateral actions of the Member States[25].

The lack of strong financial incentives for investors and end-users make any investment in Smart Grid technologies potentially unattractive due to an uncertain profitable return and/or direct benefit (e.g. environmental and social) in the minds of consumers. In this case, LRAs have a role to play by offering financial incentives to attract investments and exploit local resources, e.g. renewable, as well as build local Smart Grids.

With regard to an EU regulatory framework, it would need to address:

- System security and quality of supply: the design of the smart grids must ensure system security of a complex, interconnected and ageing infrastructure of the European energy system.

- Data privacy: consumers' private data must be protected. Consumers should remain able to decide who will have access to which kind of information in their 'energy profile'.

- Standardisation: for smart grids to represent a competitive and affordable alternative technology, especially for communications, they should comply with international standards.

- Transparency: policy-makers should develop relevant regulations to reinforce the need for both monitoring the distribution grid and recording power flow real time by the operators. This will optimise grid loading and efficiency and will enable the operators to report information in a transparent way.

- Competitiveness: Smart Grid technologies must be affordable and competitive. Stakeholders, and consumers in particular, are keen to see more robust results from R&D projects as well as pilot installations, to boost innovation and accelerate the deployment of these technologies.

- Awareness: low stakeholder awareness about Smart Grids in the EU keeps confidence in the technology and its benefits at low levels. Furthermore, the transformation of a consumer into a 'prosumer', which is a fundamental part of a successful Smart Grid, is also seen with hesitation. The greatest challenge is how to communicate with the wider public and

[25] EC (2010b).

convince them to accept and actively participate in Smart Grids.[26] Smart Grids cannot revitalise Europe's infrastructure unless LRAs and consumers participate and embrace the new technologies needed. Local political opposition might not only cause delays in relevant infrastructure, but might even scare off investments in the first instance. For this reason, political and industry leaders are urged to work with LRAs and consumer organisations to gain knowledge of what they need and how to communicate with them, by actively listening to their concerns and involving them in decisions.

3.4 Relevance of smart grids for local and regional sustainable energy policies and local and regional green economic development[27]

The power grid of the future will be a more Internet-like grid, with multi-directional flows of central and dispersed generation sources (Distributed Energy Sources – DER) and consumers transformed to 'prosumers'. Jacques Delors advocates a combination of a centralised approach to cross-border interconnection issues and local initiatives on smart grids.[28] This would mean LRAs could take the lead by establishing a set of rules and mechanisms for generation and load matching via demand side management (e.g. to decrease peak load energy use), that can further facilitate energy management or support local 'islanding' microgrids. LRAs could also put the necessary systems in place to facilitate information flow from a local microgrid to and from a larger scale regional or national grid. This would enable end-users to access real-time information about the grid and take action on their consumption and/or production patterns.

To get the most out of Smart Grids, regional and local policies could further leverage Smart Grids in improving the security and quality of supply. Smart Grids can empower regional energy sources and networks to be self sufficient as well as vital contributors to the integrated European energy system via renewable sources. For European policies to integrate local and regional concerns, LRAs need to get involved early in the decision-making process to ensure their input in identifying optimal locations and availability of wind and solar generation sources, working with micro-generation options for millions of homes, establishing interconnections to renewable and distributed generation sources, and facilitating consumer-friendly technology that involves consumers

[26] The SmartGrid Consumer Collaborative website.
[27] Note: at the time of elaboration of the relevant section (19 January 2011), the European Commission report on the state of play of smart grids had not been issued.
[28] Andoura, S. *et al.* (2010).

in intelligent applications. Integrating LRAs' input on these would go a long way toward the development of the green economy. This input is vital to ensure that Smart Grid development does not jeopardise the quality of life. In other words, it should be assessed if there is a need for LRAs, on top of EU policies, to ensure supply security, the connection and operation of clean and sustainable energy and that local and regional communities benefit from Smart Grid investment.

For Smart Grids to become a competitive and attractive technology to invest in, there is a need for coordinated policies at the central and local/regional level, that provide the necessary financial incentives for this purpose. This will help regional and local communities benefit from relevant funding schemes and investments in Smart Grids and attract infrastructure projects of major strategic importance. It is not necessary for LRAs to invest directly in renewable energy sources and interconnection infrastructure, yet LRAs could offer financial incentives to companies to enhance the attraction of investments in their area.

There will also be a need for qualified professionals to develop new processes and technologies, including green technologies, accelerate the roll out of smart grids using ICTs, exploit EU-scale networks, and reinforce the competitive advantages of businesses, particularly in manufacturing and within SMEs, as well as to assist consumers to value resource efficiency. These increased employment prospects have the potential to encourage economic, social and territorial cohesion by bringing highly-skilled jobs to the regions as well as investments.

4. Local and regional impact assessment of TEN-E policies

4.1 Priority infrastructure actions - impact assessment

In 2008, the EU adopted an action plan to strengthen EU energy security called the Second Strategic Energy Review. It emphasised the importance of infrastructure links needed to strengthen energy security and solidarity between MS, and introduced the prospect of achieving a low carbon economy by 2050, which will necessitate a major shift towards low carbon energy technologies. Six infrastructure initiatives as energy security priorities for the EU were identified:

1) the Baltic Interconnections Plan (interconnection of the three Baltic States and their connection with their EU neighbouring countries);

2) a Southern Gas corridor for the gas supply from the Caspian and the Middle – Eastern sources (Azerbaijan, Turkmenistan and perhaps Iraq, to deliver gas across Turkey, to Europe, bypassing Russia and Ukraine);

3) LNG capacity expansion (utilising LNG imported primarily from Northern Africa);

4) a Mediterranean energy ring (linking Europe with the Southern Mediterranean, through electricity and gas interconnections);

5) North–South gas and electricity interconnections within Central and South-East Europe (to create a common gas transmission EU system operator)

6) a North Sea offshore grid (interconnecting national electricity grids in North-West Europe, i.e. Germany, the UK, France, Denmark, Sweden, the Netherlands, Belgium, Ireland and Luxembourg)

In relation to the Baltic Interconnections Plan, in June 2009, the Baltic Sea Region States reached an agreement on the Baltic Energy Market Interconnections Plan (BEMIP) identifying a number of steps to improve energy security in the region to cover gas, electricity and storage. That was an important step toward connecting Estonia, Latvia and Lithuania to the integrated EU gas market and transmission system. As such states are afflicted by both low levels of diversification and security in their gas supplies[29], strengthening

[29] Ramboll Oil & Gas (2009).

interconnections with the EU neighbouring countries of Sweden and Poland was of paramount importance. BEMIP will, in fact, also entail an alternative supply source for Poland, which is currently exclusively supplied from Russia, directly or via Belarus. According to the BEMIP, the Baltic electricity market will be integrated into the EU market by 2015, at which time a local and regional impact assessment will be conducted.

In relation to the Southern Gas corridor, the Second Strategic Energy Review called for EU gas supplies in the Caspian region to be extended when '*political conditions permit*'. The document mentioned the Nabucco, Turkey-Greece-Italy and South Stream pipelines as possible alternatives to Russian gas in the aftermath of the supply crisis between Moscow and Kiev. Yet, the Review failed to precisely define the Southern Gas Corridor concept. A January 2009 Intergovernmental Conference in Hungary, ended with a clear commitment by government representatives from the EU and Caspian countries to develop a southern energy corridor linking Europe and Turkey with the Caspian region and the Middle East.

Southern gas corridor

This priority corridor is expected to have environmental implications for LRAs; however, the corridor will represent a trade-off with the potential benefits due to improved security of supply and likely lower tariffs due to the diversification of gas supply sources.

According to the German Energy company RWE, concrete discussions on financing with development banks such as the EIB, EBRD and IFC and export development banks, have begun and complete detailed technical planning as well as social and environmental impact studies are under way.[30] As another report put it, '*The complexity around the decisions necessary to establish new legacy transportation infrastructure and production facilities is immense and certainly invites all parts of the value chain to a systematic and coherent line of actions. Governments and regulators need to establish regulatory frame conditions that could ensure decisions by commercial companies to invest tens of billion of dollars to produce and deliver the gas from the reservoir to end consumers*'[31]. Considerations include political risks, construction risks, operational risks, finance risks, legal risks and market risks.

[30] RWE Press & News webpage.
[31] Skalmeraas, O. (2009) .

LNG capacity expansion

The local and regional impact of LNG capacity expansion is twofold: firstly, the energy prices for those regions that will 'host' LNG will likely decrease; secondly, there will be a need – and, in fact, an opportunity - for investing in the necessary infrastructure (e.g. harbours) which will support local/regional economies and create jobs. How the Commission plans to raise capacity remains to be determined, as the LNG Action Plan promised for 2009 is long overdue.

With regard to expanding Europe's LNG capacity, it should be borne in mind that in 2007, LNG accounted for only 13% of the EU imports of natural gas, with the main suppliers being Algeria (34% of total LNG), Nigeria (18%) and Egypt (15%). Spain, the number-one consumer, relies on it to meet 70% of its gas needs. France is in a distant second place, while 20 EU countries do not generally use LNG at all. For some local and regional authorities, LNG can fill an important energy gap and according to some industry estimates, the share of LNG in EU gas imports will rise to 20% by 2020[32].

The fourth initiative, the Mediterranean energy ring, aims to link Europe with the Southern Mediterranean through electricity and gas interconnections that will improve energy security, facilitate energy exchanges among Southern Mediterranean countries and help develop their vast solar and wind energy potential. This initiative will likely provide increased levels of supply security, higher efficiency and environmental benefits to LRAs. In the case of the latter, this is because the electricity that will be traded across the border will help balance the load of the different regions and manage possible peaks in demand without the need to build extra capacity. An additional benefit for the LRAs is expected to be their likely more important role in accelerating the development of a European gas system, due to the improved intra- and inter-connected regional and national gas network.[33]

The last initiative, North Sea offshore grid, is a blueprint for interconnecting national electricity grids in North-West Europe and linking them to planned offshore wind projects. In the conclusions of the Energy Council on 19 February 2009, the plans for the blueprint were endorsed and the scope enlarged from the North Sea to '*the North Sea and North West Offshore Grid*', thus clearly covering also the Irish Sea. Together with the Baltic Interconnection Plan and the Mediterranean Ring, this constitutes one of the building blocks of a future European supergrid. According to one report, if offshore wind installations have

[32] Brunsden J. (2009).
[33] Eraldo Banovac *et al.* (2009).

to carry the burden of the grid extension to new offshore fields, it will be up to 60% more expensive to install than onshore as the costs of foundations and connections to the grid are much greater. However, balancing this are the much higher resource yields, shown to be 40% more energy than for 6 equivalent coastal installations, and the much longer hardware lifetimes due to reduced turbulence.[34]

North Sea offshore grid

This project is expected to bring several benefits to LRAs. In particular, LRAs that produce renewable energy not yet connected to a larger or national grid (e.g. Scotland' renewable) will then be able to sell to the neighbouring countries and improve energy security and supply. In addition, this regional grid will also help cut down CO2 emissions.

4.2 Energy Infrastructure Package - Impact Assessment

As stated previously in this report, several evaluations of TEN-E projects found that the greatest challenges to be faced relate to streamlining authorisation processes, addressing environmental concerns of local and regional communities and authorities, and inadequate funding. Through a series of revisions and related policies, the EU has sought to speed up the implementation of these networks. Recognising that significantly more work is required, the EC committed itself to developing the EIP. As of 15 January 2011, only one of the five components of the announced EIP had been published, the Communication on Energy Infrastructure Development for the 2020/2030 Horizon, published on 17 November 2010, together with accompanying documents including: (i) an Impact Assessment (SEC(2010)1395); and (ii) State of Play in EU Energy Policy (SEC(2010)1346).

The Impact Assessment of the Communication lists the main objectives of the Trans-European Energy Network, namely to:

1) support the completion of the EU internal energy market while encouraging the rational production, transportation, distribution and use of energy resources;

2) reduce the isolation of less-favoured and island regions;

[34] Greenpeace (2000).

3) secure and diversify EU energy supplies also through co-operation with third countries;

4) contribute to sustainable development and protection of the environment (including inter alia a greater use of renewable energy sources and the reduction of environmental risks associated with the transportation of energy).[35]

The Communication provides a blueprint or a vision of what the EC believes is needed to make TEN-E networks efficient. It suggests a new method of strategic planning to map out necessary infrastructures, determine which ones are of European interest, on the basis of a clear and transparent methodology, and provide a toolbox to help with their timely implementation, including ways to speed up authorisations, improve cost allocation and target finance to leverage private investment.

Overall, the Communication anticipates making a positive local and regional impact via the coordination and optimisation of the European network on a continental scale. Specifically, in terms of the internal energy market, the Communication notes that a new energy infrastructure policy will '*enable the EU to reap the full benefits of an integrated European grid, which goes well beyond the value of its single components'* [36], by bringing economies of scale that will be established for individual MS.

On the second objective, the Communication hails the example of the Baltic Interconnection Plan as an opportunity to end the Baltic states' 'energy isolation' and integrate them into the wider EU energy market.[37] Additionally, the Communication identifies connections in Central Eastern and South Eastern Europe as priority energy corridors to strengthen the integration of energy islands. As for securing energy sources, it is expected that '*a fully interconnected European market will also improve security of supply and help stabilise consumer prices by ensuring that electricity and gas goes to where it is needed'*.[38]

Europe needs to further develop its energy networks, the intra-EU connections as well as connections with its neighbours in Northern and Eastern Africa and Eastern Europe. Strong and connected EU energy networks can support a competitive environment among and within the LRAs as part of the larger EU energy market, which will likely bring prices down for the benefit of consumers

[35] SEC(2010)1395.
[36] COM(2010) 677 final.
[37] Idem, p. 32.
[38] Idem, p. 10.

and enterprises. LRAs can also benefit from the potential environmental benefits due to improved system efficiency.

Finally, with regard to reducing environmental impacts, the Communication cites upcoming improvements in procedures and guidelines. These include optimising environment permit authorisations, and new guidelines to increase the transparency and predictability of the process for all parties involved (ministries, local and regional authorities, project developers and affected populations). These changes aim to improve '*communication with citizens to ensure that the environmental, security of supply, social and economic costs and benefits of a project are correctly understood, and to engage all stakeholders in a transparent and open debate at an early stage of the process at local, regional and national level to enhance trust and acceptance of the installations'*.[39] Minimum requirements regarding the compensation of affected populations in the given LRAs could also be included, to ensure that those populations do not feel exploited, unprotected, unimportant and that no consideration has been given to tangible local benefits.

The changes would also see the establishment of a 'one-stop shop' for each project of European interest, acting as a single point of reference and an interface between project developers on the one hand and the competent authorities involved, at national, regional, and/or local level on the other. This authority would '*coordinate the entire permitting process for a given project and disseminate information regarding administrative procedures and decision-making processes to stakeholders*'. Within this framework, MS would have full responsibility to '*allocate decision-making power to various levels of government*', including the local or regional level. For cross-border projects, coordinated or joint procedures would be explored to '*improve project design and expedite their final authorisation. To assist regions and stakeholders in identifying and implementing projects of European interest, the Commission will develop a dedicated policy and project support tool to accompany infrastructure planning and project development activities at EU or regional level.*' Such a tool would provide for joint electricity-gas modelling and forecasting, as well as a common approach facilitating project assessment that reflects short- and long-term challenges and allows for prioritisation of projects. In addition, tools will be created to enhance understanding of the benefits of each project by the wider public, thus involving the latter in the process. These tools '*should be complemented by communication on the benefits of infrastructure development and smart grids for consumers and citizens, in terms of security of supply, decarbonisation of the energy sector and energy efficiency.*'[40]

[39] Idem, p.15.
[40] Idem, pp. 15-16.

Therefore, the Communication gives us an indication of what future policy on TEN-E might look like. It remains to be seen if successive changes and requirements for energy network policy to (a) connect remote regions to the trans-European energy networks, (b) improve the stability of energy supplies to these regions, and (c) encourage the uptake of renewable energy sources from regions, will bring about the promised benefits to local and regional areas. Certainly, in the current analysis, the positive benefits to LRAs, so celebrated at the inception of these policies, are yet to be realised, pending the implementation of TEN-E infrastructure and components.

Appendix I – References

- Andoura, S. *et al.* (2010), Towards a European Energy Community: A Policy Proposal by Jacques Delors

- Blau, J. (2010), 'Stakeholders team up to expand Europe's super grid' 13 May 2010, Renewable Energy world.com

- Brunsden J. (2009), EU weighs LNG's pros and cons, European Voice, 29 January 2009.

- Centre for European Policy Studies website

- COM(2010), Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Implementation of the Trans-European Energy Networks in the period 2007-2009, 4 May 2010, (COM(2010)203 final)

- Council (2009a), Council conclusions on 'Second Strategic Energy Review – An EU security and solidarity energy action plan', 19 February 2009

- Council (2009b), Council of the European Union, Council Adopts Internal Energy Market Package, press release 11271/09, 25 June 2009

- DG Enterprise and Industry, E-business watch website

- EC (1995), Council Regulation (EC) No 2236/95 of 18 September 1995 laying down general rules for the granting of Community financial aid in the field of trans-European networks

- EC (1999), Regulation (EC) No 1655/1999 of the European Parliament and of the Council of 19 July 1999 amending Regulation (EC) No 2236/95 laying down general rules for the granting of Community financial aid in the field of trans-European networks

- EC (2001), Directive 2001/42/EC of the European Parliament and European Council on the Assessment of the Effects of Certain Plans and Programmes on the Environment

- EC (2003), European Commission Staff Working Paper, on Article 22 of Directive 2003/55/EC concerning common rules for the internal market for natural gas and Article 7 of Regulation EC No 1228/2003 on conditions for

access to the network for cross-border exchanges in electricity – new infrastructure exemptions

- EC (2004), Regulation (EC) No 788/2004 of the European Parliament and of the Council of 21 April 2004 amending Council Regulation (EC) No 2236/95 and Regulations (EC) No 1655/2000, (EC) No 1382/2003 and (EC) No 2152/2003 with a view to adapting the reference amounts to take account of the enlargement of the European Union

- EC (2006), TEN-E Guidelines: Decision No 1364/2006/EC of the European Parliament and of the Council of 6 September 2006 laying down guidelines for trans-European Energy networks and repealing Decision 96/391/EC and Decision No 1229/2003/EC

- EC (2007a), Communication from the Commission to the European Council and the European Parliament. An Energy policy for Europe, 10 January 2007, COM (2007) 1 Final

- EC (2007b), TEN-E Financial Regulation: Regulation (EC) No 680/2007 of the European Parliament and of the Council of 20 June 2007 laying down general rules for the granting of Community financial aids in the field of trans-European transport and energy networks

- EC (2008a), Commission Decision establishing the 2008 annual work programme for grants in the field of trans-European networks – area of energy infrastructure, 16 April 2008, C(2008)1360

- EC (2008b), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Second Strategic Energy Review: An EU Energy Security and Solidarity Action Plan, 13 November 2008 (COM(2008) 781 final)

- EC (2008c), Green Paper 'Towards a secure, sustainable and competitive European Energy Network', 13 November 2008, COM (2008) 782 Final

- EC (2009), 'Results of the public consultation November 2008-March 2009: Green Paper towards a secure, sustainable and competitive European energy network. Executive summary.'

- EC (2010a), Commission Staff Working Document of 4 May 2010, Annex to the Report from the Commission on the Implementation of the Trans-European Energy Networks in the Period 2007-2009, Pursuant to Article 17

of Regulation (EC) 680/2007 and Articles 9(2) and 15 of Decision 1364/2006/EC; SEC(2010)505

- EC (2010b), Commission Roadmap on the Initiative to support the implementation of Smart Grids, version 3, October 2010

- EC (2010c), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'Energy 2020 – A strategy for competitive, sustainable and secure energy', 10 November 2010 (COM(2010) 639 final)

- EC (2010d), Commission staff working document of 10 November 2010, 'State of play in the EU energy market: an accompanying document to Energy 2020 – a strategy for competitive, sustainable and secure energy', SEC (2010) 1346 final

- EC (2010e), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'Energy Infrastructure Priorities for 2020 and beyond: a Blueprint for an Integrated European Energy Network', 17 November 2010 (COM (2010) 677 final)

- EC (2010f), Commission Staff Working Document of 17 November 2010, Impact Assessment to Accompany Energy Infrastructure Priorities for 2020, SEC (2010) 1396 final.

- EC (2010g), Commission's Questions and Answer document accompanying the launch of the Blueprint on 17 November 2010; Memo/10/582.

- eMeter essential software for smart grid success website

- Ecological Considerations, pp. 5-6.

- Ecorys & Ecofys (2009), 'Ex-Post Evaluation of the Trans European Energy Networks Funding Programme 2000-2006', final report, February 2009.

- ENEL website

- Eraldo Banovac *et.al* (2009), South East Europe Case-Study: Impact of Regulation on gas infrastructure investments in the regional gas market integration, Eraldo Banovac, Darko Pavlović, and Tomo Galić, Croatian Energy Regulatory Agency

- Euractiv (2010), 'EU says €200bn needed for energy grids by 2020' article published on 18 November 2010 and updated 23 November 2010

- European Investment Bank (2006), 'Evaluation of cross-border TEN projects: synthesis report', December 2006

- FT (2010), 'Ireland aims to capitalise on wave power', 14 November 2010

- Greenpeace (2000), Offshore Wind Energy in the North Sea, Technical Possibilities and Ecological Considerations

- Germany trade and invest website

- Kema consulting company website

- Landis & Gir company website

- Metering Europe website

- MVV Consulting (2007), 'Implementation of TEN Projects, 2004-2006 Evaluation and Analysis', Volume 1 Final Report, November 2007

- Oettinger G.H. (2010), Speech by EU Commissioner for Energy on the challenges of the next ten years – the need for a European common policy, Stakeholder Conference on preparation of Energy Strategy 2011-2020 Brussels, 30 September 2010

- Ramboll Oil & Gas (2009) Future Development of the Energy Gas Market in the Baltic Sea Region, June 2009, for the European Commission, DG TREN

- Research and markets website

- Skalmeraas, O. (2009), Caspian Gas to Europe: Tomorrow's legacy is made today, StatoilHydro, p. 1.

- T&D Europe (2010), input to European Commission Public Consultation on 'Towards a new Strategy for Europe 2011-2020'

- The SmartGrid Consumer Collaborative website

Opinions of the Committee of the Regions

- CoR (1999), Opinion, 8 October 1999 on the Proposal for a European Parliament and Council decision amending Decision No. 1254/96/EC laying down a series of guidelines for trans-European energy networks (COM(1998) 542 final - 98/0284 (COD))

- CoR (2002), Opinion, 16 May 2002 on the Proposal for a Decision of the European Parliament and of the Council amending Decision No. 1254/96/EC laying down a series of guidelines for trans-European energy networks (COM(2001) 775 final - COD 2001/0311)

- CoR (2008a), Opinion 9 & 10 April 2008 on the Third Legislative Package on European Electricity and Gas Markets, EUROPEAN UNION

- CoR (2008b), Outlook Opinion "How regions contribute to achieving European climate change and energy goals, with a special focus on the Covenant of Mayors," 77th plenary session, 26-27 November 2008

- CoR (2009), Draft Opinion 17-18 February 2009 of the Commission for Sustainable Development on the Energy Performance of Buildings and the Second Strategic Energy Review.