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EDITORIAL

Energy security within the European Union is a discussion that has grown in scope and ambition as a result of the recent events on the international stage. Instability in and around Ukraine, a major transit corridor for Russian gas, has emphasized the need for Europe to develop an energy security strategy. As diplomacy continues to interfere with energy security, the European Commission has adopted a comprehensive "European Energy Security Strategy", endorsed by the European Council, in line with the 2030 Energy and Climate Framework.

Based on the in-depth analysis of the Member States' energy dependence, the Strategy identifies short-term measures and elaborates on the challenges that will need to be solved in the medium to long-term. In the longer term, a greater focus on internal energy production ensures that nuclear power will remain central to the EU's energy mix. Of course, renewable sources of energy such as solar, wind and hydroelectric will remain a centerpiece of the European project. Unique to this strategic review is the recommended strengthening and development of emergency systems throughout Europe. This requires increased cooperation and a renewed effort towards an integrated grid that would facilitateenergy flows and trade between Member States.

It is imperative in the minds of EU leaders and policymakers to expand the functionality of the energy grids throughout Europe. With increased Liquefied Natural Gas (LNG) production in Norway and calls for solidarity in the East, the natural gas pipeline network is expected to expand and allow for reverse flows.

As competition for resources increases with the emergence of major players such as India and China on the international market, European policymakers continue to look inward in search of the solutions that will further protect Europe from the next energy crisis. Ultimately, energy security will be a costly affair. The investment needed in energy infrastructure to reduce EU's external supplier dependency may amount to 200 billion Euros[1] per year over the next five years. In addition, greenhouse gas and renewable energytargets will benefit from the fact that the EU Emissions Trading System (EU ETS) is reformed and its operations, expanded. The ETS is considered as a component of efficient and cleaner energy production by policymakers and the private sector across Europe. However, some argue that there are shortcomings in its financial structure which create "gaps" between the large-scale projects and private investment. So as to solve these issues, sources of increased support and trust from the private sector must be found to increase investment in the energy sector and reach greater energy efficiency in markets.

There are also calls for greater energy governance. The issue spans from external concerns over supplies to transparent and competitive production practices. The solution explored by Jorge Vasconcelos is a regulatory framework comprised of Member States, the European Parliament, as well as "competition authorities", in which the coordination effort is ambitious enough and has teeth to ensure consistency of the European energy mix. The setting up of a new energy governance system will be key for the implementation of the 2030 Energy and Climate Framework.

Many are already looking towards the 2015 United Nations conference hosted in Paris as a platform for Europe to take the lead in the fight against climate change globally.Although opinions are split over the EU's importance and power, all agree that the EU should lead by example through the actions taken within the ambitious 2030 Framework and by speaking with one voice as well as bringing together the largest contributors to GHG emissions, in an effort to find "shared solutions".

Consolidation and integration is once again Europe's principle tool to tackle the challenges it faces today. The United States have demonstrated their resilience and engagement towards energy independence through aggressive production policies. However Europe is committed to create an operational framework that includes a new governance system, further Europeanisation of EU energy policies aiming at securing the transition to a low-carbon economy, and increased investment.

Laurent ULMANN
Editor-in-chief

1 European Energy Security Strategy http://ec.europa.eu/energy/doc/20140528_energy_security_communication.pdf

TABLE OF CONTENTS

II/ Moderating energy demand and ensuring consistency with the 2030 Energy and Climate Framework

III/ Building a well-functioning and fully integrated internal market

IV/ The European Energy Security Strategy

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Energy

The main priorities of Energy Union in Europe

Maroš ŠEFČOVIČ
Vice-President for Energy Union, European Commission

The importance of energy in our day to day life is increasing constantly. The European Union imports 53% of the energy it consumes, including almost 90% of its crude oil, 66% of its natural gas and 42% of its solid fuels such as coal. In 2013 the bill for external energy amounted to about €400 billion.

Energy was also at the origin of European integration with the creation of the European Community for Coal and Steel and the European Atomic Energy Community. Since then, European energy policy has developed further. Geopolitical events, worldwide energy competition and the impact of climate change have raised the importance of energy even more.

In his political guidelines, Jean-Claude Juncker, the President of the Commission, called for "a Resilient Energy Union with a Forward-Looking Climate Change Policy". He emphasised that securing energy and acting for the climate is an EU priority and will be for the next five years.

The definition of an "Energy Union" is still in the making. The Commission services are now working on a document in order to define what it is and its main principles. This document will be published in 2015 and the occasion will be marked with a big debate on the issue involving other EU institutions, Member States and stakeholders.

However, even if we do not currently have a unique and precise definition of "Energy Union", some important aspects of it have already been developed:

- The 2030 framework for climate change recently adopted by the European Council represents a big step towards a coherent EU position on CO_2 reduction, increasing renewables and boosting energy savings. These agreed objectives will contribute to achieving Energy Union (namely: a binding EU target for a reduction of at least 40% in greenhouse gas emissions by 2030 compared to 1990; a binding target of at least 27% of renewable energy at EU level; an energy efficiency increase of at least 27%, to be reviewed by 2020 having in mind a 30% energy efficiency increase by 2030; the completion of the internal energy market by reaching an electricity interconnection target of 15% between Member States and by developing important infrastructure projects).
- The European Energy Security Strategy is the latest policy strategy adopted by the European Commission which defines ways to reduce the EU's energy dependence and increase its energy security. Indeed Europe is heavily dependent on one single supplier, namely Russia, responsible for a third of oil imports, 39% of gas and 26% of solid fuels. Six EU countries depend on Russia as the sole supplier for their gas imports.

For me, the main priorities of the Energy Union are the following:

a. Security, solidarity and trust. The idea is to improve cooperation and solidarity between EU Member States. Diversification of supplies and routes are an important part of this concept. Developing and strengthening the EU's negotiation power vis-à-vis non-EU countries and considering the voluntary common purchasing of gas are solutions to be explored. Better coordination is necessary to increase EU bargaining power and to resist pressure from external countries. Of course, such an initiative has to comply with competition and WTO rules.

b. Ensuring a competitive and fully integrated internal market. This includes, in particular, improving infrastructure and interconnections and better regional cooperation. Our efforts must continue in order complete the internal energy market, 248 energy infrastructure projects of common interest have already been listed and will benefit from EU funds.

c. Moderating energy demand. This means that we need to improve energy efficiency in buildings and industry and improve energy networks.

d. Reducing greenhouse gas emissions thanks to the development of low-carbon energy sources and growth in renewable energy. President Juncker's objective is for Europe to become number one in renewable energies.

e. Investing in research and promoting innovation in order to bring forward high-performance, low-cost and low-carbon energy technologies to the market. This is crucial for our economies in order to improve our competitiveness.

There is no doubt that we need to focus strongly on the interests of EU citizens, increasing their quality of life through cheaper, cleaner and more secure energy, increased competitiveness and more and better jobs. In the immediate future, the major priority will be to ensure security of supply for the coming months and in particular the coming winter, in the event of gas shortages due to the current tension between Russia and Ukraine. We must ensure that there is a short-term action plan in case of supply interruption, especially to those Member States most at risk. This is crucial with regard to solidarity and mutual responsibility of the EU and its Member States. Medium-term measures will need to include a review of the Gas Security of Supply Regulation.

Even if there is no precise and generally accepted definition of Energy Union, it is clear that we need to act now!

The energy challenges facing us are present and have an impact on each one of us. We need to better coordinate our energy policy. For this, a solid framework to ensure that sustainability and security of supply go together with continued market integration and competition between Member States and companies is necessary. Collaboration and coordination at EU and Member State level to achieve a real Energy Union is the key.

There is no energy security without solidarity

Jerzy BUZEK
MEP - Chair, ITRE Committee, European Parliament

The European project is full of amazing accomplishments. We have built four freedoms of movement, we have created the Schengen zone, we have introduced a common currency, we are working on the Digital Single Market and European Research Area. There is, however, one fundamental precondition for the success of all of the above and for long-term prosperity of Europeans: stable and affordable access to energy. It can only be secured under synergy of resources and under concerted action of all players. Allow me to paraphrase the famous motto of our Solidarność movement: there is no energy security without solidarity!

Growing energy demand and growing dependence on highly priced energy imports is a pan-European problem. How can we best diversify energy supplies? How can we enhance and modernize the energy infrastructure to increase efficiency and cross-border flows? How can we explore the potential of unconventional sources? No energy distributor, no town council and no government are capable of answering these questions alone.

It was with such challenges in mind that Jacques Delors and I proposed, in May 2010, the establishment of the European Energy Community. We conceived it as a policy framework based on the "energy policy triangle": guaranteeing stable access to energy at reasonable prices, maintaining our industrial competitiveness and promoting sustainable development. Only a balance of these areas can bring the EU back on the path of secure long-term growth.

The European Energy Community has been recently upgraded into the Energy Union based on the very same principles: common internal energy market built on Europe-wide networks, common research on new energy and energy-efficiency technologies, and common EU voice in relations with its external energy suppliers.

Common responsibility on all levels

Energy policy has been embedded in the Treaty of Lisbon as a shared competence of the EU and its Member States. The responsibility for energy security nonetheless begins far below the country level: in our houses and towns. Cities, accounting for over 70% of energy use, have a great potential to become savers and even net producers of energy. Energy efficiency is easiest to promote on the basic, local level where citizens can best identify with the goals. To boost this role of cities we should continue developing an innovative approach to sustainable buildings and transport, district heating networks, urban lightning, waste management etc.

On the national level, we must take into account Member States' right, enshrined in the Treaty, to base their energy portfolios on all their indigenous energy sources. Of course, this base for energy security differs from country to country. Moreover, all energy sources, be it fossil fuels, renewables or nuclear, bring along opportunities as well challenges. Our duty is to ensure that they are used in an efficient and least harmful way. What we want to eliminate are the challenges related to energy production, not any of the sources of energy themselves.

On the EU level we are already much more resilient than we were during the gas supply disruptions of 2006 and 2009, not least because we have advanced in the creation of the Internal Energy Market. Only a competitive market with properly interconnected and smart grids, free of energy islands, supported by crisis management and solidarity mechanisms and strategic reserves, can give us an EU-wide guarantee of security of supply. As I write these words in late 2014 it is clear we will not meet the deadline set by Member States in 2011. This must not, however, deter us from intensive work on completing the market's "body" - the infrastructure -while remembering about its "soul" - the legislation that is waiting for urgent implementation.

The Ukrainian crisis has reminded us strongly about the need to diversify sources and supply routes of imported energy. It is important to explore the capabilities of northern and southern gas and oil corridors and the amount of strategic reserves. A promising solution for both external supplies and internal distribution comes with the "energy highways" that can help us solve the problems of surplus wind generation in the North and solar in the South of Europe and North Africa, and efficiently connect the generation hubs with even the most distant consumption and storage centres in a true "supergrid".

Our energy security does not end on the EU's external borders. For nearly ten years our closest neighbourhood in Western Balkans and in the East has been covered by the rules of the EU energy market. A group of experts which I had the pleasure chairing just recently concluded its conceptual work on the strengthening of this framework - created by the Energy Community Treaty. The EU must actively participate in creating an investment-friendly area in the "8th energy region" and stimulate timely implementation of the laws. We must also enhance, through a cooperation of energy and foreign policies, our relations with strategic partners from further afar, beginning with the USA in the context of the TTIP but also with Canada, Japan, Australia and others.

Last but certainly not least, we must further develop common research and innovation as a key factor of European energy security. It equips us with tools for tackling such topics as energy efficiency, reduction of emissions and other environmental burdens or the introduction of renewable sources. Besides yielding new energy technologies, research also has the potential to change Europeans' habits and way of life. Research-based energy policy can contribute to the renaissance of our industry and thus, to our emergence from the crisis not only with more energy security but also with a stronger standing in the global economy.

A reliable and robust climate and energy framework for 2030 – An important contribution to strengthening the EU's energy security

Sigmar GABRIEL
German Federal Minister for Economic Affairs and Energy

At their meeting of 23 and 24 October 2014, EU heads of state and government decided on the cornerstones of the EU's climate and energy framework up to 2030. This marks the end of a long discussion that began in March 2013 with a public consultation organised by the EU Commission. Emerging from an economic and fiscal crisis, the early debate on the 2030 framework was dominated by arguments about balancing environmental and competitiveness objectives.

In early 2014, the evolving crisis between Russia and Ukraine forcefully reminded us all that energy policy must contribute to ensuring *energy security* as well as to achieving economic and environmental objectives. The crisis confirmed the soundness of Germany's and Europe's long-standing policy of diversifying energy sources and supply routes. It also paved the way for a more pragmatic and facts-based discussion on the political and economic merits of self-standing targets on energy efficiency and renewable energies.

The June European Council adopted a series of short-term measures preparing Europe for a potential gas crisis in the winter 2014/2015. It also stressed the important role of energy efficiency policies as a cost-effective way for reducing energy demand and dependency, and thus for enhancing the EU's energy security. The EU Commission picked up the ball, proposing in July an EU efficiency target of 30% for 2030 and arguing that such level of ambition would significantly reduce the EU's dependence on fossil fuel imports. The European Council – when deciding on an efficiency target of at least 27 percent for 2030 – also agreed to review this target with a view to raising it to 30 percent, something strongly supported by the German government.

Overall, the EU climate and energy framework for 2030 will make an important contribution to strengthening the EU's energy security.

- The EU target on energy efficiency will lower the EU's dependency on energy imports. It will also save in the range of 130 bn euros per year that would otherwise be spent on such imports – money which can be spent on productive investments in the European economy.
- The EU target on renewable energy shows that Europe is committed to further developing its most important indigenous energy resources: renewables. This is a strong statement, also in regard to reducing dependency on energy imports.
- The European Council underscored its strong commitment to completing the internal energy market and to enhancing interconnectivity in line with the 10% interconnection target. One priority in this regard is connecting the Baltic states to the European grid. This will significantly reduce their vulnerability vis-à-vis potential disruptions to Russian gas supplies and will strengthen their future negotiating position with Gazprom.
- A well-connected and integrated EU internal energy market enhances the resilience of the EU energy system and significantly lowers decarbonisation costs. Intermittent renewable energy sources are more easily integrated, and less back-up capacities are needed for balancing the market. Completion of the EU internal energy market, development of infrastructure, market-coupling, and swift implementation of network rules therefore remain of key importance.

Green growth: an Asset for Energy Security in Europe

Ségolène ROYAL,
French Minister, Minister of Ecology, Sustainable Development and Energy

The Russia-Ukraine crisis has recently highlighted how vitally important energy security issues are for the European Union. Any responsible energy policy must guarantee the citizens and economic operators reliable access to energy, at an affordable price and under conditions that curb our greenhouse gases emissions.

Of course, this implies diversifying our supply sources, enhancing intra-European trade through interconnections and efficient energy markets as well as making sure we can react swiftly in the event of a crisis.

However, securing Europe's energy independence and sovereignty calls for a more profound overhaul based on three priority objectives, regardless of the differences in the energy mix, the fruit of each country's unique history: saving energy, weaning ourselves off the dependence on hydrocarbons and developing renewable energy.

These objectives underpin the transformation of France's energy model in which the country is committed to reducing consumption, preparing for the post-oil period and speeding up the development of green energy sources that protect the environment within a context of mobilisation against climate change.

The draft law on Energy Transition for Green Growth, recently voted by the French National Assembly, sets ambitious targets for our country: cutting our greenhouse gases emissions by 40% by 2030, reducing our energy consumption by 20% compared with 2012 levels (to be further cut by half by 2050), curbing the consumption of hydrocarbons by 30% and increasing the share of renewables to 32% of our energy consumption by 2030.

This Law and the action plans initiated in support thereof set up concrete means, accessible to everyone (citizens, companies, territories) in order to facilitate the active involvement of all actors and achieve these proactive objectives.

In order to save energy - the cheapest energy being that which is not consumed - we are initiating a wide-scale energy infrastructure renovation as well as a housing and building insulation plan, which will create jobs and bring down energy bills; we are also installing smart meters nation-wide which will allow a better-informed management of individual energy consumption, and setting up energy efficiency programmes within companies - as there lies potential for extra competitiveness - and transport energy efficiency programmes with, for example, cars that use less than 2 litres per 100 km.

In a sector that is the largest emitter of greenhouse gases we are developing individual and collective clean transport, with electric vehicles or buses running on biogas. We actively support the development of renewable energy (photovoltaic solar power, onshore and offshore wind energy, marine energies and hydro-electric power, biomass and methanation, geothermal energy, etc.) as well as the circular economy, where waste becomes a resource, and which safeguards the environment. In order to rebalance our energy model we are capping our nuclear potential to its current capacity and will bring down its share in our electricity production from 70% to 50% by 2050.

This green growth is a source of technological innovation that mobilises public and private research as well as provides the opportunity to develop future-oriented industrial sectors and create new activities and jobs that are not vulnerable to relocation.

Together we can make Europe the first eco-continent. The European Council of October 2014 has reached an ambitious Energy-Climate agreement in which France, alongside other countries, has been deeply involved: cutting greenhouse gas emissions in Europe by at least 40% by 2030 compared to 1990 levels and increasing the share of renewables to at least 27% of our energy mix. To these binding goals is added an indicative target for enhancing the energy efficiency of the European Union by at least 27%, which I hope will be revised upwards in 2020.

The process has been set in motion. In this regard many European cities and communities are ahead of their governments. Europe has the means to strengthen its energy security, boldly embarking on the path towards green growth, which is our new frontier and the key to a new economic dynamism for all countries.

The energy issue was our beginning: the Coal and Steel Community launched the process of the European construction. The time has come for a new energy strategy for Europe with a coherent research, innovation and investment policy, reflecting our common ambition and as an example to the world of what can be achieved. It is not a matter of artificially standardising our national energy models, but rather of joining forces and giving life to a project-oriented Europe around five challenges which are, in my view, of major significance:

- Energy efficiency. Good for business competitiveness, good for our energy security and good for the climate;
- Developing carbon-free energy, with a diversity that enables us to promote the potential of all our territories, both on the continent and in the European overseas territories;
- Research and innovation to keep Europe at the leading edge of clean energy technologies and sectors of excellence, innovative within its borders and highly competitive beyond them ;
- Securing our supply through diversifying both sources and channels, reinforcing our bonds of solidarity in times of crisis, assessing proactive mechanisms for collective purchasing that could strengthen our bargaining power while fully respecting the competition rules;
- An integrated internal market, which involves strengthening our electricity and gas grids as well as upgrading the electricity market, allowing for an increasing share of renewable energy, a collective reflection on the support measures for these energy technologies and an increased regional cooperation, in particular the coupling of regional markets.

As we see for gas and oil: energy is a geostrategic weapon. That is why Europe must remain in charge of its own energy destiny. We have all the assets for it: excellent researchers and engineers, the skills and inventiveness of our small and big businesses, the capacity of initiative of our territories and the increasing awareness of our citizens. We can take full advantage for ourselves of all the economic and social opportunities brought about by green growth and, drawing on our achievements at the European scale, throw all our weight behind getting the other continents on board and achieving success at the World Climate Summit that will be hosted by France in December 2015.

Promoting the economy and the environment, generating wealth and dealing with climate change, creating activities and protecting the planet: Europe must demonstrate that today all of this must work together in order to strengthen our energy security and guarantee the well-being of our peoples.

Indigenous resources are critical to building an energy union

Rt HON EDWARD DAVEY
UK Secretary of State for Energy & Climate Change

On October 24th, EU leaders agreed the EU's 2030 Energy and Climate Policy Framework including a domestic emissions reduction target of at least 40%, an EU-level renewables target of 27% and an indicative 27% energy efficiency target. This is a historic achievement, delivering on all of the EU's energy and climate goals: sustainability, security and competitiveness. The EU must now build on these foundations as we develop a robust, competitive and low carbon Energy Union.

The 2030 package is hugely significant. It is good for the climate, enabling Europe to lead in building momentum and ambition in the international climate talks. Just a few weeks after the EU agreed its GHG target, the USA and China put their climate targets on the table, demonstrating that EU leadership works. It's good for competitiveness, providing greater investors certainty and the flexibility for countries to design their own low carbon energy mix at least cost. And it's good for energy security, paving the way for significant cuts in fossil fuel imports over the next 15 years.

But now is not the time to sit back. We need to accelerate progress on our climate, energy security and competitiveness goals. That's why Germany, France, the UK and many others want early EU ETS structural reform via a Market Stability Reserve, containing at least the back-loaded allowances, and starting in 2017. And why we want the Commission to bring forward initial proposals to implement the 2030 GHG target by spring 2015 at the latest.

A well-structured Energy Union will compliment and reinforce these efforts, speeding up progress on all our energy and climate policy goals. The UK supports the five key pillars as set out by Vice-President Šefčovič that will underpin an effective Energy Union: strengthening the EU's voice in international energy affairs; integrating the internal energy market; moderating energy demand; decarbonising the energy mix; and boosting research and innovation.

But a successful Energy Union must enable and support the development of the full range of low and lower carbon indigenous energy resources. This should of course involve boosting renewable energy and significantly improving energy efficiency. Indeed, the UK is currently the world's leading investment destination for offshore wind and we want the Commission bring forward a package of ambitious and cost-effective energy efficiency standards for products, vehicles and buildings. But we will only achieve a genuinely secure, competitive and low carbon Energy Union if Europe also enables and supports the use of new nuclear, Carbon Capture & Storage (CCS) and shale gas in those countries that wish to use these technologies.

It is clear that many Member States, including the UK, see nuclear power as part of their future low carbon, secure, energy mix. In the UK, we want to replace our ageing nuclear fleet with new nuclear power stations, operating alongside renewables, energy efficiency and gas. Removing nuclear from the list of available indigenous low carbon energy technologies would irreversibly damage the EU's climate and energy security goals. So an Energy Union must enable and support new nuclear for all those countries that want to pursue it, ensuring that the necessary skills and technologies are available, ensuring confidence and full adherence in the EU's nuclear safety regime and by providing an enabling market framework for nuclear.

Carbon Capture & Storage (CCS) is another critical low carbon technology for a successful Energy Union and I am delighted that both Vice-President Šefčovič and Commissioner Cañete recognise the importance of CCS. As the IPCC and IEA have demonstrated, meeting the 2 degree climate limit will be much more difficult and expensive without it. CCS is vital for strengthening EU energy security, enabling the continued use of indigenous fossil fuels while meeting our climate targets in full. And CCS is likely to be important to fully address the emissions from heavy industry. But it will take time for CCS to be deployable at commercial scale. So we want the Commission to bring forward a comprehensive European CCS Strategy and Roadmap as part of the CCS Directive Review next year, mainstreaming CCS into the Energy Union for the long-term.

Finally, a successful Energy Union should recognise the potential role that unconventional hydrocarbons can play in cutting emissions, boosting energy security and creating jobs. As an indigenous energy resource, the attractiveness of shale gas is clear, particularly to those countries highly reliant on Russian gas. But from a climate perspective, it makes sense for countries to replace high-emitting coal with lower carbon shale gas as part of their transition to a fully low carbon energy mix. Early elimination of coal will be impossible for some Member States unless gas, shale or otherwise, is part of the mix, at least in the next few decades. And shale could create significant commercial and employment opportunities whilst following the evidence to prioritise environmental sustainability as required by existing EU law.

The UK continues to place great importance on renewables. We are the world leader in offshore wind, and are rapidly expanding our solar and onshore wind sectors too. EU support for innovation to reduce costs of renewables, including in less mature sectors such as tidal and wave and geothermal will be important.

An Energy Union is an excellent opportunity to build on the ambitious, flexible and cost-effective approach seen in the 2030 framework, accelerating progress on all three of the EU's energy and climate objectives. The Commission's five pillar approach is a good start. But by incorporating a smart approach to enable and support the inclusion of the full range of low and lower carbon indigenous energy resources, the Energy Union can be another huge European success story.

Towards the energy security in Baltics

Rokas MASIULIS
Minister of Energy of the Republic of Lithuania

The current geopolitical reality in Europe once again reminded us about the overly high Europe's energy dependence on Russia as well as the pressing need to address this situation of vulnerability and insecurity. On 28 May 2014, the European Commission swiftly responded by issuing a comprehensive European Energy Security Strategy that set out concrete measures and identified 33 critical infrastructure projects to strengthen the EU's energy security.

Lithuania has successfully begun implementing the Strategy by finishing the construction of the first liquefied natural gas (LNG) terminal in the Baltic States. The opening ceremony of the LNG terminal in Klaipeda was held on October 27, 2014 and this will remain a historical day when Lithuania, together with its regional partners, celebrated the arrival of a newly-built FSRU vessel "Independence" to Klaipeda seaport.

The LNG terminal, located at the port of Klaipeda, is based on FSRU (Floating Storage and Regasification Unit) technology. It has a regasification capacity of 4 billion cubic meters (bcm) per year and will be a key game changer in the completely monopolistic gas market of the three Baltic States, which in total consume 4,8 bcm of natural gas per year.

Although the primary goal of the Klaipeda LNG terminal is to satisfy the Lithuanian national needs, the terminal will operate under the so-called third party access regime, which means that our neighbours and partners will also have the possibility to use the terminal's capacity for their own needs on regulated and non-discriminatory basis. Open access to the capacities of the Klaipeda LNG terminal will allow gas trading companies to import their own LNG cargo or to buy it from the LNG supplier LITGAS, which has Master Sale and Purchase agreements (MTA/MSPA) with major LNG suppliers, whose aggregate supply accounts for more than half of total global LNG supply. Consequently, it is the first time in history that Lithuania and the other Baltic States have an alternative gas supply and are no longer 100 % dependent on Russian supplies. It will be one of the key measures to increase the security of energy supply and to create the environment for effective competition in gas market.

The Klaipeda LNG terminal will also provide possibilities for cooperation in LNG reloading which is a new type of activity in the Baltic Sea region. Gas in liquid form would be pumped to smaller tonnage vessels at the all year round ice-free Klaipeda port and shipped to small terminals. Since the Baltic Sea and the North Sea are being classified by the International Maritime Organization as the Sulphur Emission Control Area, starting from January 1, 2015 ships sailing in these seas will have to use low-sulphur fuel, which means that LNG will become one of the preferred alternatives.

On August 21, 2014 state-owned natural gas supplier and trader LITGAS signed an LNG supply contract with Statoil ASA, which has offered the most favourable conditions to supply 0,54 bcm of natural gas per annum through the LNG terminal for 5 year period. This contract is a guarantee for Lithuania that we will no longer pay a politically-based price for natural gas – it will establish a new natural gas pricing policy linked to the natural gas price movements on international markets.

The other major gas and electricity infrastructure projects ending Lithuania's energy isolation have also been included in the list of key projects foreseen in the European Energy Security Strategy. Lithuania is successfully moving towards their completion as well. Power interconnections with Poland (LitPol Link) and Sweden (NordBalt) will be commissioned next year and the necessary EU financial support for the construction of a bi-directional gas

interconnection between Poland and Lithuania (GIPL) has been secured from the Connecting Europe Facility fund.

Once these projects are commissioned, the Eastern-Baltic region will no longer have the status of an "energy island". Yet, for its fully-fledged membership of the EU energy market, the Baltic States will also need to ensure synchronous electricity operation with the European Continental Networks as currently their system remains interconnected with the IPS/UPS system controlled by Russia. This fact once again was highlighted by the European Energy Security Strategy and we have to mobilise our regional and European efforts to have one synchronously functioning energy system without "energy island" in the EU internal energy market.

Infrastructure is crucial for creating a true internal energy market, however, it is not a goal *per se* but a vehicle enabling further market integration. Here, regional cooperation should be given a central role, as it is the most efficient approach for finding solutions to regional challenges and making decisive steps towards the consolidation of a European market.

Considering the relatively small size of the Eastern-Baltic energy market and the urgent need to implement large-scale energy projects, Lithuania is strongly supporting the idea of sharing the existing energy infrastructure with our neighbours and partners.

Therefore, our focus in the gas sector should be placed not only on the construction of the necessary infrastructure but also on the harmonization of the regulatory environment at least at the regional market level. This would allow market players to interact with each other and the regional market would be able to react with a sufficient speed in an emergency situation. If this is not the case, the market may react too slowly or even may not react at all due to legal formalities. In this regard, cooperation at the regional level on the implementation of the necessary legal, economic and technical measures for effective functioning of a common regional market is essential in order to prevent such scenario from happening. The recommendations given by the recently accomplished stress-test of the gas system resilience clearly indicates future and urgent directions for our actions.

Lithuania is taking decisive steps to strengthen its energy security and bring the isolation to an end. Energy security is, however, a dynamic issue subjected to changing global energy markets and geopolitical developments. It is therefore of crucial importance that Europe stands ready to address the evolving challenges and does not only revert to the issue of security when a crisis situation occur. In this regard, it is essential to closely monitor the implementation of the European Energy Security Strategy and to review and adapt it to the changing situation both inside and outside the EU.

Europe is going in the right direction as the October European Council agreed to revert to the issue of energy security already in 2015 to assess progress. It is now up to us, the Member States, to demonstrate such progress and to strengthen Europe's resilience.

An efficient gas market for Europe

Tord A. LIEN
Minister of Petroleum and Energy, Norway

A well-functioning, integrated and commercially based energy market is the most important factor for energy security in Europe.

Natural gas is a vital source of energy for Europe; more than 250 million Europeans rely on gas today. Norwegian gas accounts for one third of EU's gas imports. Almost all the gas we produce is exported through gas pipelines to EU-countries. While Norway is important to EU for gas supply, EU is important to Norway for gas demand.

The Norwegian continental shelf is estimated to hold considerable gas resources to be discovered and produced, pointing to that Norway has the potential to remain a large gas producer for many years. We expect that our production could grow somewhat in the years ahead. Into the next decade the production level will depend on new areas being opened for exploration and new discoveries.

In the wake of the crisis in Ukraine, the Commission has proposed, as part of an energy security strategy, that the EU should seek to enhance cooperation with Norway. The Commission wants to explore possibilities to increase gas imports from Norway, and also supports further expansion of the Norwegian gas supply infrastructure. Norway welcomes this initiative and is ready to engage in a discussion with the EU and EU member states on these issues.

Over the history, gas has been a reliable source of energy for Europe. Gas supplies have remained stable through decades – even during the cold war – and there have been no lasting disruption to supplies. New regulations and expansion of the gas infrastructure in recent years have improved gas security further. The increase in LNG import capacity and gas storage has contributed to supply diversity. Completion of the North Stream pipeline has reduced dependency on older gas transit routes.

However, additional measures could be taken in order to strengthen the resilience of the gas supply system further. EU has set a target on interconnectivity, and pointed to specific gas transmission and LNG projects that will further improve the European gas market.

In line with this, Norway considers infrastructure development, diversification of routes and supply sources and continued efforts to make the European energy market more efficient to be key priorities in a strategy to enhance gas security. A well-integrated and efficient energy market is the key to energy security in Europe.

Some have proposed a joint purchasing body for gas as part of an Energy Union, as a response to the geopolitical developments in Europe. However, in a wide scope, this would run contrary to well-functioning gas markets with diversity among suppliers and buyers. In effect, it could reverse the liberalization of the gas markets that has taken place in Europe during the last decade.

The EU's aim to enhance its energy security further is understandable. We support a wise and efficient use of energy, combined with a role for natural gas. One should, however, be aware of that a policy to reduce the role of gas might also impact upstream gas investments, both in production and infrastructure.

Companies on the Norwegian Continental Shelf are now considering development of additional gas infrastructure in the Barents Sea. Both LNG and a new pipeline connection to the existing infrastructure in the North Sea are possible alternatives. When deciding to invest, the companies will take into consideration the future prospects for gas in Europe.

Clear signals from policy makers on the role of natural gas in the future energy mix, as well as a clear and coherent regulatory framework, is crucial to ensure the necessary future investments in the gas sector. Gas importers seek supply security; gas producers need security of demand.

The role of gas must be seen in context with the overall energy and climate policy in Europe. Norway supports the ambitious emissions reduction target in the EU climate and energy framework towards 2030, and the decision to build on the Emissions Trading System as the main climate policy tool. Generally, we believe that better infrastructure, well functioning markets and the EU-ETS are key elements – both to achieve climate targets and increase security of supply.

Norway and the EU are close partners in this area. We believe gas has an important role to play – both as a replacement for coal, and as backup for intermittent renewable energy.

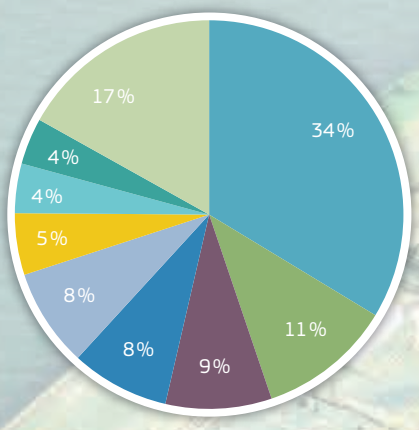
In the electricity sector, Norway also has a role to play. Interconnectors link Norway to both the Netherlands and Denmark . Cross-border trade with Norway is important for balancing Danish wind power. Recently, licences were granted for new interconnectors to Germany and the United Kingdom. This will increase Norway's interconnection capacity with nearly 50 percent.

Norway and the EU also cooperate closely in the development of Carbon Capture and Storage. Recently, the Norwegian government presented its new strategy for CCS. The importance of international cooperation is underlined, and we have accepted an invitation from the European Commission to participate in a joint effort to help realize a full-scale CCS project in Europe.

The challenges facing Europe's climate and energy policy affect us all. We look forward to continue our close cooperation with the EU and EU member states on all these issues.

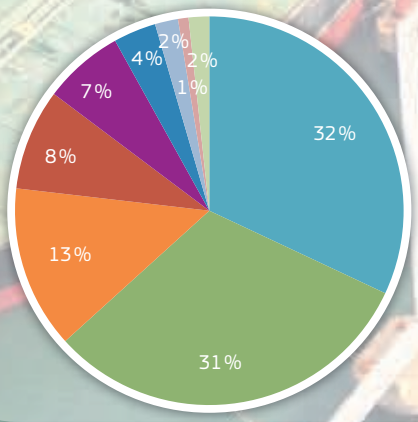
EU-28 Imports* by Country of Origin

Imports* of Crude Oil – 2012
Total = 523 094 kton



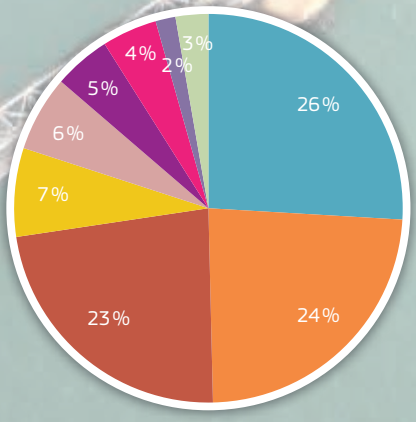
- Russia
- Norway
- Saudi Arabia
- Nigeria
- Libya
- Kazakhstan
- Iraq
- Azerbaijan
- Other

Imports* of Natural Gas – 2012
Total = 12 824 707 TJ-GCV



- Russia
- Norway
- Algeria
- Qatar
- Not specified
- Nigeria
- Libya
- Trinidad and Tobago
- Other

Imports* of Solid Fuels – 2012
Total = 217 749 kton



- Russia
- Colombia
- United States
- Australia
- South Africa
- Not Specified
- Indonesia
- Canada
- Other

* From Extra-EU – Source: Eurostat, May 2014
Methodology and Notes: See Appendix 13 – No 1

The new European Energy Security Strategy

DOMINIQUE RISTORI
Director-General, DG Energy, European Commission

The European Union's prosperity and security hinges on a stable and abundant supply of energy. The fact that citizens in most Member States have not had to experience any lasting disruption of their energy supply since the oil crises of the 1970s' is a testimony of the success of the Member States and the EU in guaranteeing this. For most citizens, energy is available "on tap". Nevertheless, in the winters of 2006 and 2009, temporary disruptions of gas supplies strongly hit EU citizens in some of the Eastern Member States. This was a stark "wake up call" pointing to the need for a common European energy policy. The current crisis in Ukraine has strongly re-emphasised the importance of the energy security challenge.

Since then, a lot has already been done in order to strengthen the EU's energy security and to reduce the number of Member States that are exclusively dependent on one single supplier. In May this year, we have adopted a European Energy Security Strategy bringing together a wide range of actions aiming at reducing our external energy dependency. This Strategy has been endorsed by the European Council. This is essential as the key to improved energy security lies first in a more collective approach through a functioning internal market and greater cooperation at regional and European levels, in particular for coordinating network developments and opening up markets and in a more coherent external action.

This Strategy contains short and long term measures. In the short-term, it triggered the energy security stress tests (Communication of October 2014) to simulate a disruption in the gas supply for the coming winter. This analysis, which provides a complete picture of the risks and possible solutions, came up with general and country specific recommendations including developing emergency infrastructure such as reverse flows, increasing storage capacity, reducing short-term energy demand or switching to alternative fuels.

Even though the EU is much better prepared to possible gas disruptions than during the previous gas crisis in 2009, the stress tests however, have shown that Europe is still vulnerable in terms of security of supply, in particular those countries with a high degree of dependence on gas from a single supply source. More generally, we know that the EU will remain dependant on energy imports, notably of gas, at least in the near future.

We therefore need to do more. Let me focus here on some security of supply priorities:

Our energy security policy must include a stronger support of our most exposed neighbours, notably Ukraine, Moldova and the Western Balkans. The Commission has mediated and brought its strong support to the agreement found in October between Ukraine and Russia on the gas price and gas debt issues. Moreover, the contracting parties of the Energy Community have been included in the stress test exercise, but we need to strengthen further our links and interconnections with these countries.

Furthermore, the EU must engage more with its international partners to explore options for strengthening our collective energy security. We therefore intend to further increase cooperation in the G7 context. The G7 Energy Ministerial Meeting which took place in Rome last May has been an important step in this respect, and we look forward to continuing this good cooperation on the occasion of the next G7 Energy Ministerial Meeting which will take place in Hamburg next May, under the G7 German Presidency. Energy is also high on the agenda of the G20, with a G20 Energy Ministerial Meeting scheduled for October next year in Turkey who will be holding the G20 Presidency.

We also need to further diversify Europe´s supply of gas and nuclear fuels. I am convinced that LNG will remain and grow as a major potential source of diversification in the years to come. New LNG supplies from Northern America, Australia, Qatar and new discoveries in East-Africa are likely to increase the size and liquidity of the global LNG markets. We need to intensify our dialogue with LNG supplying countries and to develop the required EU infrastructure in terms of terminals and interconnections.

Beyond strengthening our relationship with existing suppliers such as Norway, the EU should also open the way for new sources. The establishment of the Southern Corridor and the identified projects of common interest preparing the ground for supplies from the Caspian region and beyond is an important element in this respect. The EU should also engage in intensified political and trade dialogue with Northern African and Eastern Mediterranean partners, in particular with a view to creating a Mediterranean gas hub in the South of Europe. The recent Rome Conference on the Euro-Mediterranean Energy Partnership co-organised by the European Commission and the Italian Presidency has marked a clear willingness of all players on both sides of the Mediterranean to give a new boost to Euromed energy cooperation.

But diversification is not everything. Moderating energy demand is also a powerful tool to reduce the EU's external energy dependency and exposure to price hikes. The best fuel is indeed the one that we don't use. The EU has the best legislative framework for energy efficiency in the world (Energy Efficiency Directive, Performance of buildings Directive, Eco-Design, Eco-Labelling) but we need to do more and better. The recently agreed target of increasing of at least 27% our energy efficiency at EU level by 2030 – with a review by 2020 having in mind 30% - is an important milestone in this respect. Energy Efficiency, together with energy infrastructure and renewables - will be at the heart of the Investment Plan for Europe, with a focus on the building sector which is responsible for about 40% of energy consumption in the EU.

The EU can also reduce its dependency on particular suppliers by maximising its use of indigenous sources of energy. We can increase the use of renewable energy, as well as nuclear energy and sustainable production of competitive fossil fuels where these options are chosen.

There is a strong political momentum for pushing this agenda. In his political guidelines, President Juncker called for "a Resilient Energy Union with a Forward-Looking Climate Change Policy". He emphasised that securing energy and acting for the climate will be an EU priority for the next five years. The definition of this "Energy Union" is still in the making, but it is clear that energy security will be at the core of the EU energy policy, together with competitiveness and sustainability. Ultimately, the transition to a competitive and low-carbon economy is the main possibility we have to reduce our energy dependency over the longer term.

A real energy policy: European Union can do it!

Françoise GROSSETÊTE
MEP, Vice-President EPP

We are currently living a very uncertain energetic environment: geopolitical imbalances threaten our supply, climate policies force us to limit our consumption, the energy market is still fragmented, national policies are not harmonised enough and energy prices are too high which deteriorates competitiveness. The cost of non-Europe is high.

In this very difficult context, the EU is committed to a fully functioning, interconnected and integrated energy market.

It is important to ensure energy security and to insist on the need for interconnections which need to be improved in order to establish an energy union.

Companies also need to be offered a clear framework and need to be accompanied to compete on a global market; that is why, for example, we have to prevent carbon leakage.

We should really care of energy policy for some clear reasons. The European Union accounts for one fifth of the world's energy use, the number of employees in the energy sector is about 1.5 million, energy costs can represent until 10 per cent of industrial production costs, EU pays 2.5 per cent of its annual GDP to import energy, world energy consumption will keep growing, the investment challenge is huge, and i could continue with other facts and figures.

One of the EU's tasks regarding the energy sector is to coordinate national energy policies. Each Member-State remains free to choose how he wants to provide for the energetic needs of his citizens, for instance regarding the use or non-use of nuclear energy. But we do need the European internal energy market to be open and flowing. In order to reach that, we must encourage public-private partnerships and funding options for research and development of new energy sources. We must be a source of proposals and new ideas for a stronger European energy market.

Our infrastructures must be invested in if we wish to guarantee energy supplies to all our citizens. Currently, many areas of our continent are linked to the energy grid by weak infrastructures, which could at any time create blackouts or shortages in the network. It takes time and complex administrative procedures to allow for investments and the creation of new energy infrastructure. Indeed, some Member States are still in an "energy island" as a result of a lack of well-functioning infrastructure connections within the rest of the EU. Infrastructure is the backbone of the entire energy system, and without sufficient cross-border inter-connection capacity it will be simply impossible to establish a truly integrated market.

What's more, our energy partners (Russia, the Gulf countries) are not easy to negotiate with: their politics are sometimes unstable and other countries, such as China, may compete with us for access to their resources. The EU must become more vocal, more powerful and more united in its negotiations with energy partners. We must find a way to become more independent for our energy supplies. This can be attained through several courses of action.

Firstly, our continent must work on its energy efficiency. This is a real issue but we can only go so far with this method: our economy needs energy and our citizens have the right to live in comfort and modernity! There is an urgency of stronger energy efficiency measures in building and transport through financial and fiscal incentives.

Secondly, renewable energies must be encouraged, but in a realistic and reasonable perspective. It would be naïve to think that they can replace other sources over a very short timeframe: the infrastructures are not ready for this, the new energy sources are not yet cost-efficient and prices are highly unstable (weather-related, for instance, for wind-based or solar-based power). Enormous investments will be needed before anything serious can be implemented.

We must not be scared of research and development. Research and development efforts need to be more supported, for example in carbon capture and storage field, as well as electricity storage. Energy storage will play a key role in enabling the EU to develop a low-carbon electricity system. It can ease the market introduction of renewables, accelerate the decarbonisation of the electricity grid, improve the security and efficiency of electricity transmission and distribution, stabilise market prices for electricity, while also ensuring a higher security of energy supply. Technological advances can be found in many sectors. All options must be explored. Innovation is key to winning the battle.

If we want to guarantee safe access to energy for all our citizens in the upcoming decades, we must act now: we must find the appropriate balance in our policies for our energetic mix to be functional and technologically advanced, at the lowest possible cost.

Finally, concerning international climate negotiations, European Union should come to The Lima Climate Change Conference that will take place in Lima, Peru, from the 1st till the 12th of December 2014 to discuss and not to impose its views in order to prepare the big conference of the United Nations Climate Change Conference in 2015. Focusing on unilateral actions bring no solution; therefore the EU cannot be overly naive in negotiations. In order to reach real change, a global agreement is needed next year in Paris.

Energy Security – a true or false concern?

Gérard MESTRALLET
Chairman & Chief Executive Officer of GDF SUEZ

Over the past few months, security of supply has emerged as a high priority issue for politicians, consumers and companies. Is it a true or false concern?

Gas supply to Europe is obviously at the core of the attention due to ongoing political developments. Nevertheless, avoiding over-reaction in this area is key. The agreement reached on October 30 between Russia and Ukraine, with support of the European Commission, constitutes an important step in restoring more constructive gas relations.

Indeed gas is indispensable in the European energy mix, notably in the power sector for back-up to renewables development. But, gas is not only an attractive fuel in power generation, it also performs well in heating and in transport. So any attempt to suppress or reduce gas in the European energy mix would be totally counterproductive.

At the same time, Russian gas production companies have always been important and reliable commercial partners for European supply companies. They have no interest to suspend gas supplies to Europe, Europe being one of the major clients of Russia for hydrocarbons. So, question of supply by Russia to western Europe is, so far, not really in question.

In addition, compared to 2009, the situation is far from different. Europe is now in a stronger position to deal with any disruptions thanks to new infrastructures such as the Nord Stream pipe (which runs under the Baltic sea to Germany), the high level of gas in storage, the reverse flows, the development of LNG terminals, and, more generally, more diversified supplies.

The situation is more worrying for electricity. Indeed, operators of thermal power plants, and natural gas ones in particular, are facing a short-term crisis that may yet have disastrous long-term consequences.

These plants' economic viability is being undermined significantly as a result of a substantial drop in demand due to an economic downturn, aggravated by subsidised renewables coming onto the market in an un-coordinated manner. If this trend persists there will be more and more closures, and no prospect of replacements being built. However, these plants are essential, notably as back-up providers for renewable intermittency. So this situation is putting at risk the electricity security of supply.

That is why, a coordinated European approach to capacity mechanisms across Europe is absolutely needed for electricity security of supply purposes. By no way capacity mechanism should be seen as a subsidy. On the contrary it should be seen as a part of a new market design and a payment for a service to provide the qualified availability to guarantee security of supply. In particular, pan-European capacity mechanisms would provide much-needed harmonisation of today's patchwork of national schemes, and would also speed up the integration of national energy markets.

All in all, the challenges facing Europe's energy sector must not be under-estimated. Security of supply is one important pillar of the European energy policy. But at the end of the day, we need a reliable European framework to engage into energy transition whilst keeping power supply safe, affordable and sustainable – and the 2030 energy and climate strategy provides a good base for that. It is with this idea that the *Magritte Initiative* gathering CEOs of major energy companies[1] has been set up to contribute to the EU debate in order to make again Europe a place attracting investors, creating jobs and playing a key role on the international scene.

1 CEZ, ENEL, ENI, E.ON, FORTUM, Gas Natural Fenosa, Gas Terra, GDF SUEZ, IBERDROLA and RWE.

Moderating energy demand through energy savings

Patrizia TOIA
MEP and Vice-Chair of ITRE Commission, European Parliament (S&D)

If we want to win the energy challenge of our generation we need to be more ambitious on energy efficiency. Today energy security, sustainability and affordability is the main challenge of European Union. Energy is a powerful instrument for job creation with a great potential for stimulating growth in the real economy, in particular in the area of renewables and energy efficiency in the buildings sector, but energy is also key for EU competitiveness, for our security, as we face today in Europe the urgent need to strengthen our resilience to supply disruptions, and energy is key for sustainability. In the past we have put a lot of emphasis on renewable sources of energy and on diversification of energy providers, but to win the energy challenge we have to shift paradigm and focus more one the demand of energy, rather than investing only on the offer. The most cost effective and untapped renewable source is the energy we don't use. The priorities of our efforts have to shift to energy efficiency in order to moderate the demand.

Energy efficiency is the most important field of energy saving, because it allows a more rational use, which means using less energy with the same or better results for people and the environment. The widespread belief that the production of energy in the future should be qualitatively different from that developed to date leads to various consequences.

One is certainly the need to invest and gear up to improve energy efficiency and thus cut down the enormous waste that there are today. The problem is not just the insufficient supply or non-virtuous behaviour of citizens, institutions and companies. The problem is also the lack of technological innovation. Often it is the lack of technology that prevent the savings or the intelligent use of energy. The new energy paradigm is not only the evolution from fossil fuels to alternative energy, but also the switch from a model of society that waste energy to another that could be called "the model of rational and intelligent use of energy". To keep our energy bills in check and improve our energy security, we need to moderate our energy demand. Improving energy efficiency will not only increase energy security, but also enhance the competitiveness of European industries.

On the energy issue Europe is doing its part. For 2020 have already been set targets to achieve a 20% reduction in emissions of greenhouse gases, 20% share in the use of renewable sources and 20% improvement in energy efficiency. Then for 2030 we have recently agreed a new policy framework for a binding EU target of at least 40% domestic reduction in greenhouse gas emissions, a binding EU target of at least 27% for the share of renewable energy and an indicative target at the EU level of at least 27% is set for improving energy efficiency. These EU targets represent one of the most ambitious commitment to combat climate change, but the weakest part of this plan is the one where more effort is more needed: energy efficiency.

The non-binding target of 27% of for improving energy efficiency in 2030 is not enough to reach our goals of security, sustainability and competitiveness and it dosen't go far enough from the estimated business as usual scenario of 25%. The European Commission had proposed a 30% target, but a study of the same European Commission showed that a 40% energy efficiency target would grow Europe's economy at a rate of 4% a year, spark an annual 3.15% boost in employment and cut fossil fuel imports by €505 billion a year.

In the chemicals sector for instance, a 40% efficiency target would increase employment by 4.1%, a 35% goal would hoist it 2.2%, a 30% target would give a 1.1% lift, while a 25% business-as-usual scenario would deliver a smaller 0.4% increase. "Setting a binding objective for energy efficiency – is written in the European Commission's study - can help to achieve three major policy objectives at once: decreasing European dependency on fuel imports, lowering the EU's CO_2-emissions and boosting growth and jobs". Without binding targets the EU energy goals are at risk. Today the latest data show that even the 20% target for 2020 is at risk and EU will likely reach 18-19% of energy efficiency. Socialists and Democrats in the European Parliament will push for a revision of the Energy Efficiency Directive to strengthen its provisions, in particular on the renovation of public buildings, and the need for the right incentives to be provided for renovation of private buildings. Furthermore we will push to put in place a roadmap to achieve an 80% reduction in the EU's building stock energy demand by 2050. Buildings emit 36% of the total CO_2 emissions of the EU; thus as the demand for energy in buildings falls, less combustion of fossil fuels will lead to reduced CO_2 emissions and better air quality for EU citizens. Such policy would boost the economy and the employment and would help to eradicate fuel poverty trough lower energy bills. The construction sector is principally composed of SMEs and their role will be pivotal in delivering a better built environment that stops energy waste in buildings and in the creation of millions of new, direct jobs. Today the new EU investment plan offer an opportunity to reach our energy efficiency target, but we need much more political determination and willingness.

Diversifying external natural gas supplies and related infrastructure

Eldar SÆTRE
CEO and President, Statoil

"To be sure of adequate security reserves commensurate with future requirements, it will be necessary to push ahead very actively with prospecting and development operations".

The above is a quote from the European Commission's second "*Study on the Long-Term Energy Outlook for the European Community*" dated 1964 and it is today, 50 years later, a forceful reminder of continued efforts in exploration and production being the key to secure natural gas supplies in Europe. Natural gas first needs to be found before it can be brought to market.

Globally, the oil and gas industry spends yearly around EUR 500-600 billion on exploration and development. The scale of this effort becomes visible when we compare it to the yearly EUR 400 billion the EU, the world´s largest energy market, spend on energy imports or the estimated EUR 350 billion in power investments in Asia.

The EU is geographically well placed to benefit from the proceeds of these efforts. And it has. In 1984 the EU imported 92 bcm of natural gas from three suppliers. Thirty years on the EU looks set to import around 290 bcm from 12 source countries.

In the span of three decades the EU has seen a fourfold increase in the number of sources for a threefold increase in supplied volumes. Moreover, over the last three decades global gas reserves to production ratio has remained stable at more than half a century of production ahead. Fact is that the EU has never before had a more diverse gas supply base than today.

There are three fundamental reasons for why this happened. The first is economic growth. For the most part of these three decades the EU presented solid perspectives of growth allowing investment decisions in long-life energy supply chains to be taken.

The second is reliable revenues generated in an open economy and with access to multiple economically strong counterparties. Many of the new suppliers saw great benefits in transacting with solid European companies in a world currency.

The third element is that the EU for most of this period pursued a policy framework conducive of natural gas use, be it in the competition policy arena doing away with coal subsidies and liberalising European energy markets or in the environmental arena with a focus on air quality.

On all three accounts traditional and prospective gas suppliers face today a fundamentally altered EU gas market. The market is now mature and the last couple of years´ demand has been decreasing with an unfavourable economic environment that risk subsiding. The future requirement for imports looks set to be markedly less than what the industry projected only some years back and some see growth returning only sometime in the 2020s or even beyond 2030.

The EU has also since 2009 pursued a little joined up and complex energy and climate change policy framework favouring subsidising energy efficiency measures and renewable power generation in the fight to reduce GHG emission. Completion of the internal energy market has progressed only slowly.

More recently the ongoing conflict between Russia and Ukraine have moved the EU to look for ways to respond to a situation perceived to present real threats to European security – including initiatives questioning current free market practices for purchase of gas.

All combined there has hence been a significant rise in policy and regulatory risks on the European market with gas suppliers not facing a level playing field on which to compete.

Hence, while the role natural gas could play in achieving the EU's climate change policy objectives have become clearer, the conditions for it doing so have deteriorated.

In a 2030 and 2040 perspective no credible long term GHG emission reduction can be achieved without relying on natural gas in power generation, in industrial operations and in the residential heating segment. The EU will not deliver on its emission targets where it to see a lock-in of coal and renewables in power generation.

With the EU 2030 targets set, the European Commission now has the opportunity to rebalance the policy framework. In addressing security of supply it is welcome that the European Energy Security Strategy has a well-functioning internal energy market at its core.

A strong and vibrant gas market in Europe will be key to ensure that natural gas value chains remains an attractive investment proposition for future investors. This is also why a policy path aimed at significantly reducing the EU's gas demand will not enhance energy security in Europe. To gas project investors it would be a negative signal and over time reduce the prospects of attracting new players.

To address sustainability and competitiveness the EU 2030 agreement now needs to be followed up with a simplified, robust and predictable legislative framework that acknowledges the importance of natural gas.

The focus on a 40% binding GHG emission reduction target, avoiding multiple overlapping binding targets, and structural reform of the ETS is welcome. However, failing the latter the EU must start thinking about what role second best options such as emission performance standards can play to tackle coal burn in power generation.

Both energy efficiency and renewable energy will be key contributors towards a more sustainable European energy sector in the future. That said, we must ensure an increasing exposure to market forces and innovation and thereby a drive towards the most cost effective solutions to both save and produce low-carbon emitting energy.

Diversified external gas supplies and related infrastructure will rely on a well-developed European energy market and a coherent and predictable framework. This is a recipe to cost-efficiently deliver fewer emissions, sustaining growth and jobs as well as energy security. In such a future, natural gas will have its natural place.

Boosting renewables in Europe: citizens' initiatives and regional markets

Claude TURMES
MEP (Group of the Greens / European Free Alliance)

In 2012, more than half of the energy consumed in the European Union was imported, and this figure reached nearly 67% for gas only. At the same time, the intergovernmental panel on climate change (IPCC) made it clear that the objective to limit global warming to 2°C by the end of the century is not compatible with our current intensive usage of fossil fuels, which are called to progressively disappear. In this context, there are only two possible answers to energy security and climate issues: energy efficiency and renewable energy sources.

Moderating demand and increasing the share of renewables are key steps in order to reduce our energy dependency and constitute the best attitude to face the gas crisis. This correlation can be observed in several Member States. In Portugal for example, energy dependency dropped by nearly 11% between 2005 and 2012 while the share of renewables in electricity production increased from about 30% to 52%, and the CO_2 intensity fell by 20% simultaneously. Over the same period, the annual national energy bill saving reached 728 million euros in 2012 thanks to renewables, all of that in a context where electricity prices remain lower than the EU average. Such an example illustrates that the large-scale deployment of renewables triggers a virtuous circle in terms of decreasing CO_2 emissions and increasing domestic energy production. To cut it short, renewables are the only indigenous energy sources which are at the same time climate-friendly, risk-friendly, and competitive on the market. Obviously, nuclear energy does not matches these criteria as 99% of the nuclear fuel consumed in the European nuclear power plants is imported; and the price of electricity produced from nuclear does not include all costs related to dismantling and waste management, not even to speak about the disastrous consequences of a possible accident.

Today, technology is mature enough to ensure large-scale deployment of renewables in Europe. The missing element is the transfer and the massive roll-out of those technologies to industry and the public. In order to do so, the first priority is the full implementation of the existing framework to achieve the ambitious 2020 targets. Several measures should be adopted at European level to make sure these objectives will be reached. Firstly, priority access to the grid should be granted for all electricity generated from renewable sources. Secondly, diminishing red tape and unnecessary administrative burden to establish and maintain a stable regulatory framework is a must. Thirdly, all cooperation mechanisms foreseen under the RES directive should be further developed and not the sole statistical transfers: joint support schemes and joint projects, mobilising all resources available such as the structural funds and the upcoming 400 billion euro investment package, also known as the "Juncker Plan".

Our 2020 ambitions have been recalled by the Heads of State during the latest European Council and endorsed even by the most anti-renewables governments such as Poland and the United Kingdom. If we achieve these goals, it means two-thirds of all energy investments made during this decade would go to renewables, chiefly to wind and photovoltaic where the greatest potential lie - at least until other technologies such as marine energy reach their maturity. Although the European Union is on the right way, efforts are still to be done as nine Member States are not on track to meet their national target. This is the case of Belgium, France, Latvia, Luxembourg, Malta, the Netherlands, Slovenia, Spain and the United Kingdom.

Where large joint projects are called for, both on-shore and off-shore wind should be considered, such as the North Sea "supergrid" integrating the electricity produced in off-shore wind farms to the inland electricity markets in Belgium, Denmark, Germany, the Netherlands, Sweden and the United Kingdom. When considering renewables and their integration, it is necessary to have flexibility in the power system, and it is much cheaper to build a flexible back-up system at macro-regional level. In addition, small projects should also receive all our attention, especially when they aim to set-up decentralised electricity generation units where the citizens/consumers are directly involved to become citizens/producers. Photovoltaic and wind installations are particularly adapted to sustain such cooperative models. Encouraging their development implies working more closely with entities and organisations like city governments, regions and NGOs, and taking their input into account more systematically when discussing about energy security in Brussels.

Finally, after 2020 comes 2030, and we will need a strong leadership from the European Commission to set out ambitious objectives, including binding targets declined at national level to ensure a real energy transition. The European Commission's right of initiative shall in no way be threatened by attempts from the most conservative Member States to re-nationalise energy policy and to undermine the deployment of renewables in Europe.

To conclude, the European Union will become the world leader of renewables if it develops both of its legs: building upon local citizens' initiatives for small-scale photovoltaic and wind projects, and establishing regional markets for large-scale on-shore and off-shore wind programmes. This is the recipe for success, and to only way to attain our energy security and our climate goals on time.

Improving Europe energy resilience through a well-functioning single energy market

Simone MORI
Executive Vice President, Enel

Resilience is typically defined as the ability to swiftly recover from something unpleasant, such as shock, injury, etc. and this concept is perfectly suited for the energy system of the 21st Century, in particular in the electricity and natural gas industries. These two sectors need to withstand stress coming from different sources while continuing to deliver a reliable and affordable energy supply to customers.

When thinking about the resilience of the European energy sector we need to take into account some particular features of the Old Continent: its lack of raw materials to meet its energy needs and as a result its soaring dependence on energy imports. Today the EU imports 53 percent of the energy it consumes, almost 90 percent of the crude oil and 66 percent of the natural gas used within the Union[1]. This means that geopolitical events could put reliable sources of oil and gas for European countries at risk. For instance, relations between Ukraine and Russia are currently under stress, raising questions on how to make the EU gas system resilient to short-term disruption and reduce its dependence on external supply in the long term.

Furthermore, Europe needs to cope with global environmental challenges that are becoming more daunting with each passing day, and the energy industry needs to find ways to decarbonise the economy before climate change becomes irreversible. As a consequence, European gas and electricity systems must find new, cost-efficient ways to maintain their resilience.

Strengthening coordination between natural gas and electricity markets will also be important, as disruptions in the gas sector can easily bleed over to the electricity sector. Any improvements should take this into account.

Europe's energy sector can become more resilient only if it has access to a number of import routes, which can be achieved via investment in infrastructure. LNG terminals are key to ensuring not only the diversification of gas supply routes, but also the diversification of supply partners, and thus access to more competitive sources of gas. As such the construction of new LNG terminals is a priority in the European Commission's Energy Security Strategy. As general rule, the diversification of gas supply and import routes should be supported taking into account an accurate cost benefit analysis.

The use of competitive local energy sources should be increased as they can play a significant role in stabilizing prices in Europe. It is also for this reason that the European Council recently decided to move forward with the introduction of targets for renewable energy and energy efficiency. However, in order to reach these goals CO_2 prices need to be the main driver to promote investment in renewable energy, other low carbon technologies and energy efficiency, while CO_2 markets should provide stable and reliable price signals. The EU emissions trading system (ETS) should be reinforced through the introduction of a mechanism that mitigates against the impact of exogenous variables (such as economic cycles and overlapping policies) on long-term CO_2 price distortions.

The further exploitation of renewable energy will be key to decarbonising the electricity sector and their development should be driven by price signals emerging from the CO_2 market. Should the CO_2 market fail to provide the right signals, auctions may be needed as a complementary policy tool that can put prices at a level capable of attracting new investments. Auctions for long term contracts should take place at a European level and be based on clear and transparent schedules that ensure predictability and transparency, as well as sustainability within the industry. This will help avoid the risks associated with the "boom-bust" development cycles currently taking place in many countries.

It is of utmost importance that not only CO_2 markets but also power and gas markets provide reliable price signals. Gas and electricity markets must be able to signal situation of stress. Only by doing so will energy markets be able to be resilient, as companies would trust them and invest where and when it is needed.

As it was shown in the European Commission's Stress Test Communication, European gas sector is able to secure supplies to protected consumers even in the event of a six months Russian gas disruption by relying on markets. A well-functioning internal energy market, with unimpeded trade across borders, is the most efficient and cost-effective way of ensuring security of supply as prices would signal the possibility of diverting supplies towards markets under stress.

This concept also applies to the electricity sector, and as such integration of national energy markets into a broader European market will be key to ensuring the security of both gas and electricity supplies.

Current national electricity generation mixes are the result of different energy policies, interests and constraints; for example France's generation mix is characterized by the largest share of nuclear power, while in Italy the majority of electricity comes from gas and while in the Nordic countries from hydropower.

However, bringing national figures together we can see a European energy mix that is well balanced and generates important benefits. A balanced energy mix allows a bigger share of renewable energy in electricity production, the decarbonisation of the economy, reduced dependency and increased resilience.

To do this, the creation of an internal energy market and the integration of renewable energy into the market must be accelerated. The latter can be easily achieved through regulation that enables the participation of renewables across all market timeframes and moves markets closer to

1 European Energy Security Strategy, COM(2014) 330, Brussels, 28.05.2014

real time. Currently, the trading of electricity and balancing services is done on fragmented national trading floors, meaning that the internal energy market can be achieved with the introduction of common European rules on market functioning. Although common European rules, like the one drafted in the European Network Codes and voluntary initiatives (known as Electricity Regional Initiatives), are invaluable instruments for the integration of European energy markets, their progress has been too slow.

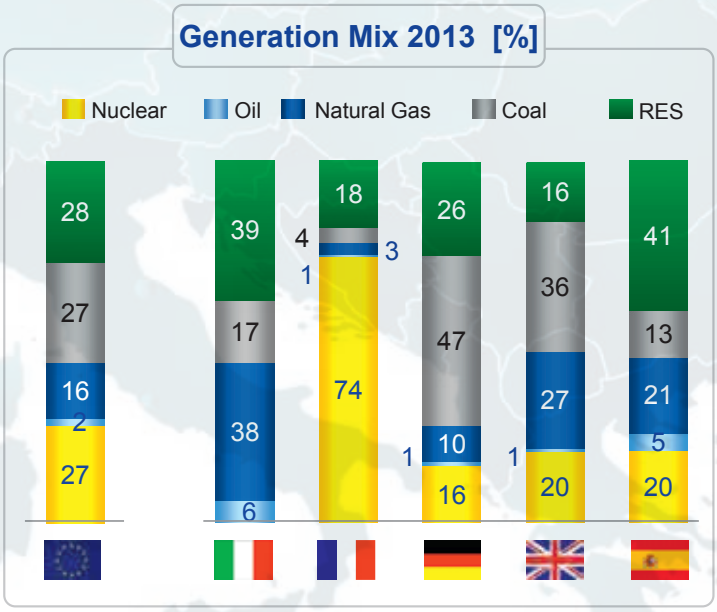
Integrating national markets would enable a better use of connecting infrastructure, which would lead to a reduction of the reserve capacity that would need to be purchased by the power system operators and an increase in dispatchable renewable energy.

Another key step in the increasing power system resilience is improving long term contracts between supplier and producers, as energy markets need long term signals in order to encourage efficient investment and disinvestment decisions and thus avoid boom and bust cycles. Moreover these contracts may be crucial for renewable energy development, ensuring stability of revenues and lowering the cost of the risk associated with these investments. Of course this does not mean thinking about reregulation. These signals should be provided through the market, but Europe has to promote the development of a market design based on these types of contracts.

We should also consider that, as the current trend of renewable power plants that are mostly connected to distribution grids is expected to continue, European and national policy makers and regulators should aim to encourage investment in the digitalisation and innovation of distribution networks. To this end, when designing smart grids remuneration schemes, positive externalities connected to their deployment should be taken in due account.

A smart distribution system could be also useful for a decarbonisation of the transport sector driven by electric vehicles. Energy efficiency means using less energy to provide the same service, and a greener transport sector, together with other energy efficiency measures, will reduce pollution and improve quality of life in urban environments. This will mean a gradual but massive switch to electricity, which is the most efficient energy vector.

In conclusion, if we are able to deploy new import routes and new ways of procuring energy (such as LNG), improve the use of existing infrastructure and build new infrastructure where needed, make the most of domestic energy sources including renewable energy and energy efficiency, integrate gas and electricity markets, provide reliable long term price signals and digitalise distribution grids, we will have resilient energy systems that will be able to keep the promises made almost 15 years ago in Lisbon – that energy markets will be reliable, affordable and sustainable.



Source: Enel elaboration on generation 2013 data from Enerdata.
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The innovation dynamic in energy security in Europe

Pedro DE SAMPAIO NUNES
Head of the EUREKA Secretariat

Europe is at a crossroads in the definition of a coherent energy policy. As a journalist recently wrote in a well-known newspaper: 'Cheap energy is the new cheap labour', and the struggle to attract and mobilize industrial investment, essential to overcome the present economic crisis, has more and more to do with energy costs and reliability of supply, as major factors to consider in the decision for investment.

The risk with renewables, as the option to become the main energy source provider and their ability to ensure in the short term energy supply, at a low cost and high reliability, is discouraging domestic or foreign companies to locate their investments on the European continent. America, with its shale revolution, is currently the big winner in the fierce struggle for attracting industrial investment.

The question here is whether Europe can afford to pursue this path, without throwing away all possibilities of keeping energy-intensive industries in our economic space, in view of the noted migration of some important sectors of European industry elsewhere, along with the associated jobs and wealth creation. Innovation will be one important part of the solution. Innovation in products, services and business models.

In a cold analysis of the situation, the innovation factor appears as essential to come up with quick and effective solutions. But with careful avoidance of one of the more common errors of policy makers - the temptation for winner's picking - and the extreme risk aversion that characterizes our modern society. The bold *Energiwende*[1] policy in Germany, is coming with a high price in the short and medium term, and its success is not ensured. It is more the result of the fear of an improbable nuclear accident in Europe, than from the certitude that renewables will be able to ensure the bulk of low-carbon energy supply in Europe, at a reasonable and competitive cost, and with the reliability of supply required by its customers.

To be clear, renewable energy development and deployment is a very positive feature of any energy policy, and Europe should be proud of leading this drive. But with the present state of the art of these technologies, they are simply not able to replace conventional sources of energy, due to their intermittency and lack of energy density, at least for the time being.

So a first conclusion is that innovation must target energy storage, without which, renewables will not be able to integrate the energy power systems without a disproportionate cost. A second conclusion is that energy efficiency must be implemented starting by a rapid roll-out of smart metering, to improve transparency, efficiency and competition in the energy market, giving a better and more informed choice to consumers. From these two vectors of innovation, a new business model based on a decentralized energy system could emerge and prevail in the future. The energy system of the future will be based on the interaction of the new decentralized model and the conventional centralized model, and no one can today foresee the weight of each parcel. This will depend how cost efficiently each one will provide the energy needed.

So, as a third conclusion, nuclear energy must be revisited, without prejudice, and the next entry on the nuclear power market of new actors in the developing world, must be closely studied and followed. New technological avenues, as thorium reactors, small scale and inherently safe reactors, must be continued. Finally, the shale revolution ongoing in the USA, as the major factor changing the balance of power in the global energy scene, must be also replicated in other zones of the globe, with particular attention to minimizing environmental impact in all aspects, from GHG emissions to contamination of water reserves.

But it is now impossible to ignore this game changer, and the ones who do will be the ones who will lose the world energy and economic battle. Taking part in this battle is absolutely critical - to supply our citizens with affordable energy and to sustain an advanced welfare system, such as the one Europe has enjoyed up until now.

1 the transition by Germany to an energy portfolio dominated by renewable energy, energy efficiency and sustainable development

Financing energy efficiency – from local to global

Patrick LAMBERT
Director, Executive Agency for Small and Medium-sized Enterprises (EASME)

The European summit on 23rd October reaffirmed energy efficiency as a key priority for the European Union, due to its positive impact on energy security, competitiveness, affordability, job creation and fight against climate change. A strong set of policies supporting energy efficiency is now in place with the directives on Energy Efficiency, Energy Performance of Buildings, products labelling and Eco-design. European stakeholders at all levels are incentivised to make their behaviour and investment decisions more energy-efficient.

At the European level, reaching the 2020 objectives would require an estimated €100 billion of additional investment in energy efficiency every year, which cannot be achieved with the public resources alone. Private finance will need to be mobilised.

Although energy efficiency is commonly agreed to be the best option at the macro-economic level, in practice many cost-effective investments still do not take place because they do not find financing solutions adapted to their needs. In practice, many stakeholders have the feeling that they have suitable projects, but not the money to finance them.

On the financial side, the first conclusions of the Energy Efficiency Financial Institutions Group (EEFIG), convened by the European Commission and the United Nations Environment Programme's Finance Initiative (UNEP FI), provide a different view. The finance sector is more and more eager to invest in energy efficiency, and has the potential to do so, with over €12 trillion under asset management based on the Principles for Responsible Investment (PRI) in the EU.

Many factors explain why finance is not flowing into energy efficiency. Investments are often rather small (mostly between €50,000 and 1 million), and tailor-made to a specific object or production process; this results in high transaction costs. Energy efficiency is also seen as a risky investment, due to the lack of a clear track record on the actual savings, and because it is harder to accept insulation or pumps as collateral for a loan than for example photovoltaic panels. But ultimately, the key issue is the lack of sufficient demand to justify setting up new products in a new market. In short, the finance sector has the money but does not find projects to invest in, because most projects do not fit expectations.

It is essential to overcome the gap between energy efficiency and finance if we want the EU to reach its 2030 objectives. European funding is used in 3 different ways: to support supply of finance for energy efficiency, to develop a pipeline of projects, and to organise dialogue between both sectors.

Firstly, public funding can be used to address the supply of finance under 3 main types of instrument. Dedicated credit lines are made available at preferential interest rates either by providing money at a lower cost, or by buying down the interest rate; in Estonia and Lithuania, money from the European Structural and Investment Funds (ESIF) is used to lend money at low interest rates for the energy retrofit of multi-family buildings. Public money can be used to 'de-risk' investments by sharing the risk of payment default, for instance through guarantee funds, which allow banks to lend at a lower interest rate. It can also be used to provide equity in investments which are still seen as risky by private investors; the European Energy Efficiency Fund has for example invested equity in several biomass district heating projects.

For the period 2014-2020, around €38 billion from the ESIF will be allocated to the shift to a low carbon economy, a large share of which is expected to go to energy efficiency.

Secondly, the European Union supports the development of a credible pipeline of projects at the local and regional level, building on the momentum of the Covenant of Mayors which gathers over 6,100 local and regional authorities committed to exceeding the EU's 2020 objectives on energy efficiency, greenhouse gases and renewable energy. Local authorities can play a major role in aggregating and standardising small-sized projects on their territory, starting with public buildings and street lighting but also targeting residential and commercial buildings as well as industry and SMEs. This is crucial to reduce transaction costs and create confidence for private investors.

Project development assistance funded by the Intelligent Energy Europe and Horizon 2020 programmes, notably through the ELENA facilities, requires that each euro of European funding trigger at least €15 to 20 of investments in energy efficiency or renewables. The €96 million already committed in project development assistance is expected to deliver €3.6 billion of investments. Many of these projects use energy performance contracting (EPC), in which a single entity designs the works, implements them and guarantees the savings which are used to repay the investments. The EPC provider can bring finance at no up-front cost for the client.

Finally, the European Union supports dialogue between the finance and energy efficiency sectors, in order to bridge the cultural gap and facilitate the flow of private finance. The Horizon 2020 programme provides funding for activities such as the organisation of roundtables on finance for energy efficiency and renewable energy, the engagement of institutional investors, the development of labels and benchmarks for investment portfolios, and the roll-out of innovative business models to invest in energy efficiency.

Financing massive investments in energy efficiency is one of the major challenges for the European Union and its finance sector. It will require efforts at all levels of the value chain, from local projects to the global capital markets, and can only be achieved by a co-ordinated action of European institutions, Member States, local and regional authorities, in close co-operation with the private sector.

Secure Gas Supply – Key for European's Energy Transition

Gerhard ROISS
Chairman of the Executive Board, CEO of OMV Aktiengesellschaft

The European Union is strongly committed to reduce the Union's carbon footprint and to transform its energy system to a sustainable one, based on renewable energy sources. Ambitious targets were set to accomplish the so called "energy transition". The 20-20-20 targets are even reinforced by a more stringent proposal for 2030. Reducing the CO_2 emissions by 40% of 1990's emission-level, having at least 27% Renewables in the energy mix and increasing energy efficiency by 27%. This has to be accomplished by 2030.

However, currently we observe a rather paradox situation in Europe's energy mix. On the one hand a clear commitment to the ambitious energy targets is given – supporting "green energy". On the other hand Europe's coal demand steadily increased in the past years. Newspapers already heralded the "Renaissance of Coal". Future will show whether this was too early, since in 2013 this upward trend did not continue.

However, fact is that Natural Gas, the cleanest fossil fuel, was put in a role of a supporting actor. And instead of being given the role of "best supporting actor", Natural Gas only plays as a minor supporting actor. By the end of 2014 the European Union will have consumed about 411 bcm of gas. This is about 20% less than 4 years before (2010: 523 bcm). All segments lose volumes, but it's the power sector that is especially burdened. A 40% decrease in volume is expected due to reduced utilization of gas fired power plants.

To come back to the Oscar terminology: This is a clear miscast. A successful "Energy Transition" has two star roles to staff, obviously the "Renewables" and "Natural Gas".

To be a reliable partner in this duet, a secure supply of Natural Gas is absolute crucial.

The different perspectives of gas supply

On the one hand there is the question of origin. Recent events brought dependency on gas imports back on the political agenda. In 2013 EU28 had an indigenous production of 155 bcm, leaving 292 bcm for import. This means a dependency on imports of 65%. Unfortunately, gas supply from export-regions like Russia via the Ukraine and the MENA region shows volatile reliability.

To reduce the risk of supply disruptions two tools may be applied. First, increase of indigenous production and therefore the reduction of import dependency and second, diversification of import sources.

There is Natural Gas in the Europe Union. It's a question of economics, technology and political will whether it can be produced or not. Failure to maintain or increase indigenous production will further increase Europe's energy import dependency. OMV has promising projects in the Black Sea that will produce European gas for Europe.

There is also gas in Europe that cannot be produced in a conventional way. At the moment, no firm numbers are available on gas in place and recoverable volumes. However, at the moment the political environment seems to put unconventional gas into the off before we even looked at what we have.

On the other hand there is the question of connectivity: Diversification of import sources

means more pipeline connections to different producing countries – focusing on stable regions for gas supply and transport. Currently a big part of net imports come from or through regions with political risk.

Diversification of import sources can also mean getting more independent from specific exporting countries at all by importing globally traded Liquefied Natural Gas (LNG). In 2013, about 15% of the net imports of Natural Gas were LNG. Regasification infrastructure is not the bottleneck. The existing regasification terminals of about 200 bcm were utilized below 25% in 2013. However, if LNG volumes were to be re-directed to Europe, this would have the potential to increase prices substantially, as Europe is in competition with Asian markets which offer a much higher price level.

Security of supply not only means to have gas in Europe, but also means accessibility for the consumer. The gas pipeline grid is not particularly well suited for that in all parts of the European Union. Cross border interconnectors and reverse flow options were not first priority of national grid companies in the past. This is changing; however, still there is a long way to go. To achieve this, closing gaps in gas infrastructure must be a key priority of European energy policy including the necessary co-funding.

The divide of Europe

Generally speaking we see two different realities in Europe. On the one hand we have got North Western Europe – the "privileged region". Privileged in terms of supply sources and connections. About three quarters of demand are covered – either from indigenous production or imported from Norway. And the Nord Stream Pipeline offers a direct import route from Russia to Germany. Currently it is used by half of its capacity only.

In addition, North Western Europe is a privileged also in terms of a vast and connected pipeline grid in and in between the countries and in terms of liquid trading hubs.

And we have a "non-privileged" region - Central and South Eastern Europe. This region depends to a high degree from imports from one supplier (some countries to a 100%), and the transit through the Ukraine. If these imports are impacted for political, commercial of technical reasons, CEE and SEE will face a significant supply crisis, leading to cold homes and industry outages.

In terms of security of supply there is clear homework to do for this region. Starting with "gas highways" – import pipelines. Such a Central & South Eastern European Gas Corridor is overdue and essential for this region. Further existing pipeline systems have to be interconnected in order to secure stable energy supply for the customers.

The prevailing market situation and political climate give little hope that the issues of a secure gas supply will be solved in the near future. What we need is a vision of a smooth and successful energy transition on the two pillars of Renewables and Gas. A key factor is the political commitment for the cleanest of fossil fuels. To say it with the Oscar: The best movie director will make sure that the stars, Renewable and Gas, play well together and win the awards.

Setting the course for the energy and environmental transition!

Philippe DE FONTAINE VIVE
Vice-President of the EIB, the European Union's financing institution

"It should be borne in mind that energy investment decisions are essentially taken by the private sector"

Between 2005 and 2011, investment in the energy sector in Europe experienced an unprecedented cyclical increase, rising from €30 billion in 2005 to €95 billion in 2011. This growth was largely the result of policies promoting renewable energies (RE) driven by the European Union and diligently implemented by its Member States. The EIB strongly supported this trend, investing on average €11 billion a year in the energy sector in Europe (*see bar chart*). While fostering the creation of Europe's RE stock (for which it was the leading provider of bank finance), the EIB's policy was to strengthen the consumer's security of supply by also making loans for conventional generation, transmission and distribution networks and external supply infrastructure. In addition, the Bank regularly invested in the creation of industrial sectors developing European energy production and management technologies: these attracted an average of €3.5 billion a year from the EIB[1].

At a time when the European Union is finally emerging from the global crisis that started in 2007, Europe is entering into a new phase of its energy transition, for several reasons.

Firstly, because the rapid growth of investment, in the face of the impact of the crisis (a fall in demand), engendered global overcapacity in electricity production. This trend contributed to the decline in wholesale energy markets and thus in the return on investment in heavy power generation industries such as nuclear and gas. This expansion-contraction effect is illustrated by the drastic fall in energy investment in 2013, to less than €50 billion. Secondly, because, in a number of EU Member States, renewable electricity generation has reached the point that it necessitates the urgent Europe-wide adaptation of our energy transmission systems and the introduction of far more refined management of consumption habits. The third reason is the raised awareness that our most important source of energy is, of course, our ability to save energy[2].

Investing in the energy transition

It is therefore a question of investing (and mobilising public opinion) in the *energy transition* in Europe, and no longer in carbon-free energy production alone. This requires us to focus our action on three priority areas:

- **Power grids:** whether it is a question of transmission or distribution/pricing, these grids are also becoming instruments of storage and balancing between production facilities and points of consumption at different peak times. There is a need to adapt them to these new uses on a European scale. For example, in 2013 the EIB financed a major programme to modernise RTE's network, including in particular the doubling of the very high voltage (400 Kv) line in the Montélimar-Lyon corridor to stabilise the European network between the Iberian peninsula and the Rhineland. With this in mind, large-scale interconnection projects remain the priority, such as for example the France-Spain link south of Perpignan and the security upgrade of the Mediterranean electricity arc between Spain and Italy, both financed by the EIB.
- **Electricity production facilities**, from renewables or otherwise, fine-tuning the energy mix objectives at European level and the distribution of the different modes of production on the territory of the 28 Member States. While exceeding its target of devoting at least 20% of its total electricity generation financing to renewable energy projects, the Bank is also funding the systematic upgrading of Europe's production plant (particularly in Central Europe) and the implementation of state-of-the-art conventional technologies coupled with district heating, as for example in Riga (Latvia).
- **Energy efficiency (EE):** the most urgent and most complex area, not only because it represents the biggest potential source of productivity, but also because it is still underexploited, diffuse and above all poorly inventoried. Indeed, most of the time energy efficiency is not regarded as an objective in itself, but as a component of a project promoted for other reasons – investment in urban public transport being a good example.

The financing solution depends on peripheral factors

Of estimated total energy investment in the EU of around €120-125 billion a year over 20 years, network investment is expected to attract around €25 billion and electricity generation around €10 billion, whereas it will be necessary to devote €80 to 85 billion a year to energy efficiency alone, mainly in the buildings sector[3].

Such a substantial increase in EE investment requires the creation of an operating framework, which will be all the more effective if it is set in the context of EU policy. There is a need, for example, to ensure the convergence of construction and energy efficiency standards,

1 The EIB is participating in implementation of the European Strategic Energy Technology (SET) Plan and has developed risk-sharing instruments designed to foster the emergence of innovative low carbon technologies and consolidation of European non-fossil electricity generation technologies: biomass, concentrated solar, offshore wind, geothermal, etc. It is also working together with the Commission on the NER 300 programme, which supports carbon capture demonstrators through the sale of emissions quotas.

2 The energy upgrading of buildings enables a 75% reduction of the sector's consumption, which accounts for 40% of the EU's primary energy consumption (33% of which is natural gas consumption). See COM(2014) 330.

3 See IEA: World Energy Investment Outlook 2014.

rethink the criteria for construction/refurbishment permits, organise the more symmetrical diffusion of information, build an energy services sector and enable such firms to operate EU-wide, and facilitate the decentralisation of decision-making on investment in public sector buildings.

It should be borne in mind, moreover, that energy investment decisions are essentially taken by private sector players using private sector finance. But in a European economy emerging from the crisis, in which financing capacity is hampered by risk aversion on the part of private investors and strong regulatory and prudential constraints on the banking sector, a number of obstacles are blocking the natural allocation of resources to the energy sector.

In these circumstances, two specific features of the energy sector must be taken into account:

- firstly, that changes in electricity tariffs, regulated by governments, determine operators' borrowing capacity. Forward guidance on changes in energy prices would therefore unlock private capital for investment in both electricity generation (renewable or conventional) and networks;

- secondly, that RE generation by small facilities would benefit from the stabilisation of regulatory frameworks and public subsidies in order to put an end to the windfall effect for certain investors and strengthen the medium-term viability of investments.

Dedicated financial initiatives and instruments

Alongside its senior and subordinated loans, the EIB deploys, with the support of the EU budget and in cooperation with the Commission, a number of dedicated financing instruments aimed at enhancing projects' credibility and controlling risk for co-investors.

- The Bank can play a credit enhancement role under its Project Bond Initiative: a £305 million issue helped to finance the link from the Greater Gabbard offshore wind farm off the coast of Suffolk to the UK mainland;

- The EIB is a partner is some forty infrastructure investment funds that take equity participations in network operators or power generation companies both within the EU and in developing countries. These funds are set up in cooperation with national promotional banks (e.g. the Marguerite and Inframed funds) or target the carbon credit markets in partnership with the EBRD or World Bank;

- The Bank manages a number of technical assistance instruments helping to strengthen the technical design and financing plan of projects, especially the RE and EE projects of cities. In this way, cities including Barcelona, Paris, Modena and Bristol have been supported by the ELENA facility. For developing countries, dedicated instruments combining loans, grants and technical assistance are also available (e.g. EEEF and GEEREF)[4];

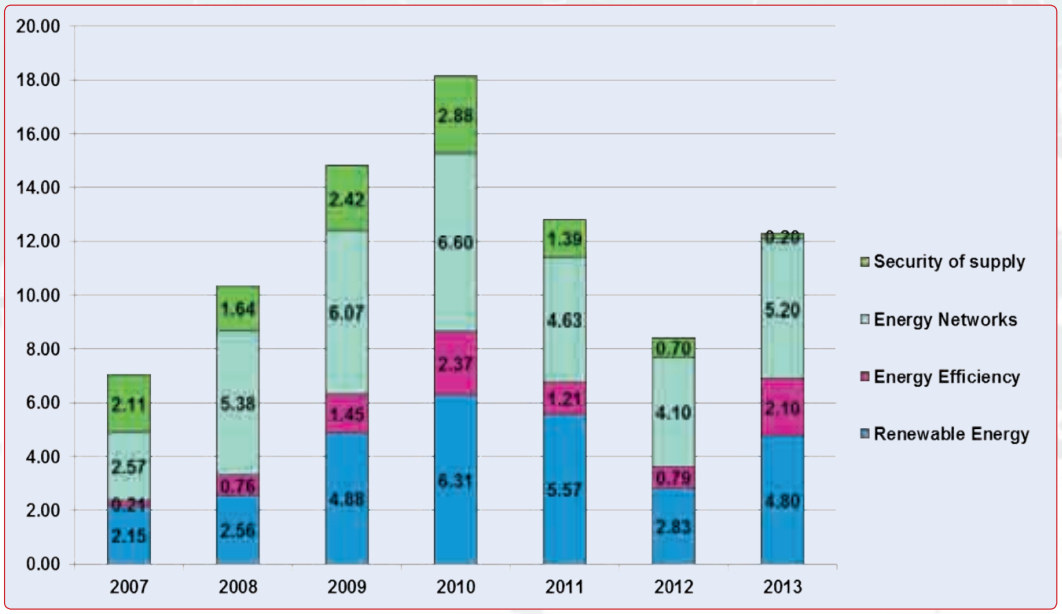
- The EIB and the European Commission can also help to set up JESSICA urban social development funds optimising the financial return on EE investments in fields such as waste processing (London), the refurbishment of social housing (Bucharest, Budapest, Vilnius and London) or the renovation of brownfield sites and school buildings (Hamburg);

- Lastly, under the JASPERS initiative the Bank and the Commission assist the CEE Member States with the technical design of their power generation, network and energy saving projects.

Alongside EU subsidies, mainly provided via the structural and investment funds, the EIB's palette of financial instruments can make a valuable improvement to the quality of projects and facilitate access to long-term finance.

4 For further details, go to the EIB's website : www.eib.org

EIB financing of Energy Investments (2007-2013)



Promotion of investment in the energy sector - a challenge for Europe

Markus FERBER
MEP (EPP), Vice-Chair ECON Committee on Economic and Monetary Affairs

The Ukraine crisis has shown how dependant we are on foreign energy imports, due to a relative lack of fossil fuel sources in Europe – hardly a secure position. Energy is a strategic sector upon which the EU depends, yet is also one of the biggest challenges we face.

For decades Europe had no common approach to energy policy. Then, with the adopting of Lisbon Treaty, the legal foundation for a common energy policy was created.

So, how should European energy policy look, and what aims should it have? Our energy policy must ensure that energy markets work to guarantee and safeguard an affordable energy supply, promote the interconnection of energy networks, and do so in a sustainable way. Of course, these goals are not always seen as going hand in hand – quite the opposite, in fact.

To solve this dilemma, we must agree on the minimum levels of reliability, sustainability and affordability we are willing and able to accept, while at the same time being willing and able to compromise.

The only way to achieve a secure energy supply in the EU is to foster a greater integration of the European energy market. The obvious way forward here is to complete our common internal energy market, the European Energy Union. This will allow us to overcome a number of the obstacles we face, which are currently hampering the development of cross-border energy trade and supply.

What will this Energy Union look like? In order to create this common internal energy market, we have created common rules for the internal electricity and gas markets. Furthermore, we have opened up domestic gas and electricity markets of the member states to new providers. Hence, we have already made some progress.

Today, consumers have a choice of suppliers and can switch between them easily. Besides, the providers of energy must provide clear terms and conditions. This has led to a marked improvement in consumer protection in Europe, something I warmly welcome.

But progress in the transition and implementation of common rules is slow. Some Member States are dragging their heels when it comes to implementation.

What barriers do exist? Achieving a European internal energy market is difficult due to various factors. This includes different conditions in national energy markets, the strength and dominance of some large energy providers and the consequent lack of competition.

Existing energy companies, often ones which were previously state-owned, frequently make it difficult for competitors when it comes to enter the market. This is usually done by means of inflated charges for use of the energy grid, or a lack of network capacity, particularly when it comes to cross-border networks.

In Germany, to give an example, a large percentage of the energy supply and trade (some 80%) is controlled by four main companies – E.ON, RWE, EnBW and Vattenfall. In other countries including France, energy supply is completely controlled by the state, where the state-dominated energy supplier Electricite de France has a market share of around 90%.

When it comes to energy prices for the end user, as prices are often established by only a few suppliers or the member state, competition is blocked. At the same time, as competition is blocked, it keeps new investors away. A lack of investment is the consequence.

So how can we overcome these barriers and what has to be done from the European side to promote investment?
Firstly, we have to promote public investment.

When it comes to infrastructure projects, it can be noticed that they are mainly financed by the private sector. As the private sector still has not fully recovered its strength from the economic crisis, the European Union must address measures to support and stimulate investment in infrastructure projects.

To mention only a few examples, the EU will provide 5.8 billion euros from 2014-2020 through the new Connecting Europe Facility (CEF) to stimulate investment in trans-European energy infrastructure. As the CEF provides financial aid to energy, transport and digital infrastructure, the full potential of funding from private and public investors could be used.

To overcome regional barriers within Europe, the EU supports investment through structural Fonds, mostly in less developed regions. In that connection, the European Regional development Fund (ERDF) aims to improve the investment for smart energy distribution, storage and transmission systems, which is essential to help fostering the completion of the Energy Union.

Furthermore, the 300 billion euro public-private investment programme proposed by the European Commission President Jean-Claude Juncker aims at reviving the European economy and to foster investments in energy, transport and broadband networks and industry clusters. I warmly support that the programme has a clear focus on energy as the major part of the programme will be devoted to energy.

Secondly, private investment has to be stimulated.

In order to encourage crucial investments in energy infrastructure, Europe is in need of more transparent, more efficient and more resilient capital markets. The European Commission's proposal for a Capital Markets Union aiming at ending fragmentation of European capital markets has the potential to deliver to that objective. As part of this, we need to get the incentives for long-term investments in Europe right. During the past years we have increased capital requirements for banks as well as insurers making long-term investments in the real economy comparatively unattractive. In the

framework of a Capital Markets Union, we need to reassess those requirements asking one central question: Do those provisions help to encourage investment? In many cases, the answer will be no and it is prudent to consider recalibrating some of those requirements. By carefully adjusting capital rules for certain investments under Solvency II and CRDIV, the Commission has already made some cautious steps into that direction. But more needs to be done. Given that there is a natural maturity match between the investments insurers make and the duration of many infrastructure investments, there is no reason why overcautious capital requirements shall hamper such long-needed investments.

Thirdly, to complete the Energy Union, investment in R&D programmes are needed. Under the Horizon 2020 programme the EU will invest also billion euros for research. Aiming to boost innovation in Europe between 2014 and 2020 and to strengthen Europe's technology base, one of the main goals of the programme is to provide Europe a secure, clean and efficient energy. Europe needs new technologies' to meet the goal of our energy needs from both today and tomorrow. Within the Horizon 2020 programme, we will address them.

The opening of a new legislature gives Europe now the opportunity to focus on the biggest, most important issues facing us – issues such as financial or energy policies. Europe should seize this opportunity, time is playing against us and action is needed fast.

A Power Chord for the transition to a low-carbon and environmentally-friendly economy: European recovery plan, cross-border electric interconnections and Green Bonds

Pierre DUCRET
Chairman & CEO of CDC Climat

All the debt product classes are expected to be activated to finance electricity transmission infrastructure. These new green assets are essential for the energy transition, and for the European energy policy.

Green Financial engineering, commitment and creativity will be incremental to help sponsors and debt issuers to match long investor appetite and requirements.

There is a need to invest in cross-border electrical grid interconnections to ensure the transition to a low-carbon economy.

The EU interconnected grid was historically developed in order to increase the security of supply and mutual assistance. This function is crucial in an environment where production is increasingly dependent on the vagaries of the climate and on the increase in geo-strategic risks.

The new geographical breakdown of production locations (renewable or conventional energies) therefore requires to change the structure of the electricity transmission grid at the same time.

✓ Solar power, which is primarily found in southern Europe, offshore wind power in northern Europe, and hydropower in Scandinavia and in the Alps will need to supply all European countries.

✓ European consumption is very sensitive to cold snaps, and the system sometimes has to deal with huge fluctuations in power.

Europe and the European recovery plan

Interconnections enable the efficient pooling of European energy complementarities against a backdrop where energy mixes are changing and where renewable energies are increasingly being included.

Power transmission networks offset the disparities between local, regional and national areas, in order to enable a balance between power generation and consumption at all times.

Accordingly, the development of renewable energies in Europe will be the main driver for the development of electricity transmission networks.

✓ 75% of the investments that need to be made between now and 2030 are aimed at transmitting 60% of green energy on balanced and secure networks

✓ These investments are expected to avoid significant losses of renewable electricity while improving the liquidity of the wholesale electricity markets

✓ The priority investment areas are the electric peninsulas, i. Around one third of the investments involve building subsea connections.

The average level of interconnection is currently around 8%. Last October, the European Council calls for the rapid implementation of all the measures required to achieve an interconnection target of at least 15% of all the Member States' installed power generation capacity by 2030.

Innovative support measures and new resources were revealed by the EU and the EIB via the CEF in 2013.

The November 2014 Juncker Plan pays particular attention to, and releases substantial resources for these projects.

The financing of energy transmission infrastructure presents financial challenges, due to the size of the investments required, which amount to around €100 billion.

Green Bonds in order to attract the available financing

Investors funds are available to finance the energy transition. Banks' short and medium-term liquidity is very high, and supported by the ECB; however banks are still reluctant to grant long-term financing. Equally, long term institutional investors' lo liquidity remains very substantial, while regulatory obstacles appear to be less significant.

The absolute level of interest rates remains very low, while credit spreads are very tight, and investors are seeking returns and diversification.

Against this backdrop, fundamental trends have begun to emerge among these long-term investors at the international level and in Europe, in terms of financing the energy transition, including.

✓ removing carbon assets from their portfolios and incorporating an approach to stranded carbon assets, at the same time as seeking to allocate an increasing portion of assets to green financing;

✓ the demand for operational research, certification and the supply of indices focused on the challenges relating to the transition to a low-carbon economy.

Accordingly, the real issue is to enable products to emerge that have the characteristic features required to meet the investment criteria of the available funds.

The development of Green Bonds, where the amounts outstanding and the number of issues have increased sharply since 2013, including a high level of corporate, is in keeping with this trend. The amount of Green Bonds outstanding is around €40 billion, while the issuance volume has increased by a factor of 10 between 2012 and 2014.

The Green Bonds Segment is expected to priority critical way of funding for the TSO's in the EU:

✓ Cross-border electricity interconnections primarily contribute to integrate an increasing percentage of renewable, to improving the energy-efficiency of the networks, and to reducing GHG emission levels. National and EU procedures govern the roll-out of these investments at the local level.

✓ The credit risk of the TSO's is within the Investment Grade rating range, as they are businesses that manage essential infrastructure ,are regulated on (i) a cost plus basis/ inflation-adjusted, and by (ii) a reasonable RoE (cap on the revenues and and the weighted average cost of capital).

Investments in these green assets will not only be achieved by on balance/sheet financing but also by project finance or securitization .

All the debt product classes are expected to be concerned by the financing of electricity transmission infrastructure, as these new green assets are essential for the energy, and for the European energy policy.

Green Financial engineering, and creativity will be incremental to help sponsors and debt issuers to match long investor appetite.

Security of Supply in EU electricity markets

Ignacio GALÁN
Chairman and CEO of IBERDROLA

The electricity sector has a **unique potential to contribute efficiently to a sustainable EU energy system** and, at the same time, is **key for competitiveness, growth, and job creation**.

These objectives lay **at the heart of EU legislation on energy and climate change**: providing better prices for EU consumers was one of the main targets of the internal electricity market when it was introduced in 1996, and several other energy security and environmental regulations have been developed since then.

Many of those can be considered major steps forward towards a Single Energy Market. However, the **application** of EU policy at **Member State level** has not been always homogeneous and, in some cases, has produced unintended results. As a consequence, **the sector faces significant challenges** that could affect the three main pillars of energy policy.

Although wholesale prices have fallen, **consumers are not benefiting from these reductions**, as **taxes and other policy charges** not related with energy supply are **increasing final tariffs**. This is reducing European industry's **competitiveness** and affecting the welfare of domestic consumers.

In addition, despite falling demand, **security of supply is increasingly at risk** in many EU Member States. Current **energy-only markets do not remunerate properly the service provided by "firm" or flexible generation**, especially in the current environment of low wholesale prices; this is making many **advanced and efficient thermal plants unprofitable**, bringing them to **premature closure**. Temporal overcapacity in neighboring markets can compensate this situation, but if this trend continues, the problem will be extended across all the EU internal electricity market.

Moreover, the EU commitment to decarbonisation is not reflected in the **functioning of the Emission Trading Scheme**, strongly affected by an excess of allowances due to the current economic scenario. Hence, CO_2 prices are reaching levels that are insufficient to incentive technological change.

All in all, this situation is **diminishing** the **capacity of private agents to finance** the **massive investments and innovations** required over the next 25 years.

This situation calls for **urgent reforms in European Electricity Policy**. In this context, some reasons for increased optimism have recently appeared. Indeed, the concept of **Energy Union** launched by President Juncker constitutes a very interesting starting point for a debate among EU institutions and Member States about the magnitude of the current problems and their potential solutions.

We certainly hope this will lead to a **far-reaching consensus regarding the need for coordinated action** to **complete the EU Single Energy Market**.

In this sense, we firstly need to **consolidate the European Union's institutional framework for energy and climate change**. This would require the establishment of a **strong single European Energy regulator** empowered to guarantee a uniform application of the Internal Energy Market regulations at Member State level.

Secondly, a **reinforced CO_2 market price signal** is essential as the key driver for investment in low carbon technologies and energy efficiency. The 2030 framework for energy and climate is extremely beneficial as it provides long term visibility. However, **structural and short term measures** -such as an early implementation, in 2017, of the **Market Stability Reserve**- are required to strengthen the Emission Trading System.

Regarding **generation activities**, a **market-based approach** must be recognized as the best instrument to achieve energy policy objectives. To this end, the **elimination of distortions such as levies on production** constitutes a prerequisite to **create a level playing field**.

Following this principle, **generation adequacy must be monitored at national and regional level**, introducing **incentives to guarantee security of supply**. These incentives should **reward flexible and firm capacity on a technologically neutral basis**, allowing for **demand participation**.

In addition, **support schemes for renewable energies should be coherent with penetration targets** -avoiding uncontrolled development processes and retroactive measures-, and **implemented without creating market interferences**.

More generally, an **Environmental Tax Reform** could **improve the efficiency of CO_2 price signal across all sectors** and internalize other environmental costs. The **EU energy model has been so far based on fossil fuels**, which has had **negative consequences for security of supply** in terms of price risk, energy dependence, emissions and pollution.

The key **role of electricity networks** to safeguard security of supply should also be recognized. In this respect, those geographies that **did not promote investment sufficiently** over the last decades, such as **some areas in the US**, are now **making significant efforts** to reach **service levels** that are **available** to most **European consumers**. In addition, **transmission regulatory frameworks must strengthen the independence of system operators** and promote the **development of interconnections**, subject to **robust cost-benefit analysis**. The **roll-out of smart grid technologies** must be **incentivized as well**.

Moreover, a **rational framework for new customer-centric models must be adopted**, in particular **distributed generation**, avoiding **discrimination** among consumers through cross subsidies created by the fact that, under some current tariff structures, the owners of these facilities avoid contributing fairly to overall costs.

Last but not least, **charges not directly related to energy supply**, but to **fiscal, environmental or social policies**, must be **removed from tariffs and financed through more efficient schemes**. This is **essential for European companies to compete on a level playing field** with peers from other areas where electricity customers do not bear such costs (mainly US).

All these measures will result in a **more efficient, uniform, sustainable and secure internal electricity market**. This will allow the sector to **contribute to the ambitious EU decarbonization targets** preserving at the same time **security of supply and competitive prices for European consumers**.

How can Europe best increase its energy security, reduce its dependency to imported fossil fuels and at the same time address the energy transition and climate challenges?

Antoine FRÉROT
Chairman and CEO - Veolia

"When there is a will, there is a way"… When there are both a will and means, there are ways and choices! Europe has to make serious choices as it is currently facing major energy challenges: satisfying a growing demand for energy, coping with the progressive scarcity of conventional sources of energy, securing energy imports while international constraints and geopolitical risks are increasing, protecting European consumers and industries against volatile and unpredictable prices of primary energy sources, reducing Greenhouse Gas (GHG) emissions... This context characterized by an increase of international tensions, should trigger the acceleration of Europe energy efficiency and independence efforts.

Energy Security depends on a proper Heat Policy

The EC recently released the results of the "Gas Stress Test" study[1] it has conducted on the resilience of the European gas system – and thus of our continental energy system – in case of a short term (6 month) disruption of gas delivery in Ukraine. The events on the Eastern flank of Europe have triggered the fear of a "Heating crisis" that would leave part of the population in the cold and potentially the entire European economy in a stalemate.

As a reminder **75% of the gas imported in the EU is used for heating purposes**. 50% for buildings heating and hot water preparation – and the remaining 25% in the industrial sector.

The report shows that a number of short term measures, such as maximising capacity of interconnectors (gas and electricity), increasing gas and other fuels storage levels and preparing an extensive fuel switching plan would be the key mitigation factors.

Very interestingly, it highlights the fact that in the medium and long term, **increasing the role of district heating will be fundamental for ensuring long-term energy security**. Thanks to the flexibility of their fuel feed, heat networks can be switched to renewable and local resources such as biomass, waste heat, cogeneration, solar and geothermal, heat pumps, municipal waste, etc. The report also recommends the replacement of individual gas boilers by mass connexion of dwellings to district heating networks that run on local biomass and other decarbonised sources.

Beyond guaranteeing its current security, Europe must address its dependency on fossil fuels as it entails massive economic and sustainability impacts. The current decrease of oil prices can be explained by the massive surge of shale oil and shale gas production in the US, as well as the slow-down of the Chinese economy. The EU is benefiting partially from this impact, mostly for oil, but not for gas, and its industrial companies are at a clear disadvantage vis-a-vis their North American competitors. However, spending remains very high and the current price drop could be reversed very quickly. It is a certainty that, sooner than later, Europe will again be spending more than half a trillion Euros per year on climate damaging fossil fuels. This leads to ask the crucial question:

How can Europe best reduce its dependency on imported fossil fuels and at the same time address the energy transition challenge?

It is unlikely that the Ukraine crisis will be settled soon. Therefore we should take advantage of these dramatic changes in this world which the prosperity, power and technology maps are being redrawn, to improve European energy strategy, infrastructure and consumption patterns.

Transitioning to a highly energy-efficient and low carbon economy can be managed whilst enhancing the EU's competitiveness and reducing its dependency on imported hydrocarbons. It is a key priority to achieve our climate and energy targets for 2030 and beyond through a transformational effort that will influence the European economy and society for the next generations.

Heating represents almost 50% of the total energy consumption of Europe (and 70% of all energy consumed by buildings is for heating purposes). Here lies the biggest potential for reducing both our energy consumption and carbon footprint. **This massive source of potential savings must be central to the European energy policy**.

A significant reduction in EU fossil energy consumption is only feasible through a genuine Heat policy at EU level, focusing on Heat Production and Distribution Efficiency. It should be defined as one of the main axes of the EU Energy Roadmap and an essential element of EU climate policy beyond 2020.

Reaching the EU energy efficiency and climate targets requires a reduction in heat consumption and in related GHG emissions. This can be achieved by combining a number of result-oriented and cost effective solutions. Some of them are contractual and financially based, some technological, while others rely on renewable or low carbon energy sources.

a) **The contractual angle:** A way to secure long lasting efficiency results is to promote long term Energy Performance Contracts (EPC) for heating and cooling services. The development of an ESCO Industry (Energy Services Companies) – still at an early stage in Europe - would accelerate the financing of investment in energy performance-based projects, as returns can be secured by the long term commitments of qualified and specialised operators.

b) **The technology and infrastructure side:** until recently Energy Efficiency policies, , were principally focused on the insulation of public and individual housing ; this is

1 http://ec.europa.eu/energy/stress_tests_en.htm

only part of the equation since heat and cold generation, as well as distribution matter at least as much. **District heating networks** (DHN) have an essential virtue: the flexibility of their energy feed. They can serve the purpose of increasing the share of renewable energy or waste energy to substitute for imported hydrocarbons. DHN can also be fed with other - intermittent - renewable energies (in particular solar and wind energy electricity when in excess capacity), and they can be used as storage facilities for heat produced from those variable sources. Moreover, waste heat produced by industrial and power plants, data centres, sewage systems can be recovered and fed into DHN. **Combined heat and power** (CHP) plants, which provide electricity and heat, are often more than twice as efficient as conventional power stations. Cogeneration allows for cost savings, slashes CO_2 emissions, ensures independent electricity supply and reduces exposure to electricity price fluctuations. Capturing the identified economic potential for cogeneration in Europe – estimated at 110-120 GWe additional – will be instrumental in reaching the EU's strategic climate and energy goals. Finally, large scale heat pumps are also promising technology that could generate massive quantities of low carbon heat.

c) **Renewable or waste heat sources:** Biomass is already the leading source of renewable energy in Europe, but it is far from having reached its full potential. As a substitute for fossil fuels, it significantly reduces CO_2 emissions. Its usage can be increased without harming biodiversity, in a circular economy approach. Wood waste recycling (from furniture waste, construction activities, etc.) is also potentially a major source of fuel. The use of Solid Recovered Fuels (SRF) would equally be a major plus, as tens of millions of tons of these biomass-derived products are potentially available in Europe. Heat can also be recovered from waste incinerators, a very important carbon-free energy source. Finally, more than a quarter of the EU population lives in areas where geothermal energy can be tapped in a cost effective manner and connected to DHN.

The way these technologies/renewable sources are harnessed matters a lot, both for constructing the infrastructure and for ensuring the proper heat delivery services and the expected savings. It is through a combination of technological choices, low carbon energy sources and contractual frameworks that the best projects will be defined, implemented and will yield effective results.

The Energy challenge must be met at the regional and local levels. The role of local and/or regional authorities is key to optimizing the transition effort towards low-carbon decentralised energy systems. Local and regional stakeholders are in charge of defining the most adequate offer (energy mix) and making sure the demand side (energy efficiency, thermal renovation) is also taken into consideration, so as to achieve the best impact on a number of key goals: security, sustainability, competitiveness, job creation, etc.

Business case: *In 2012 Veolia invested €70 million in Łódź and Poznań (Poland) to convert the boilers feeding the district heating systems of the two cities, serving more than 700,000 inhabitants. These upgrades are now operational and the systems have now reached 18% renewable energy, four fifth of which is coming from forest waste. Veolia has also developed locally a 2,000 hectares plantation of Miscanthus (Elephant weed), an annual crop that contributes to the biomass feed. Overall the project has generated dozens of long term local jobs. The high efficiency boilers are part of cogeneration plants that have a capacity of 67 MWe of green electricity sold to nearby businesses.*

How can the EU support this effort?

A stable and long term oriented financial and regulatory framework is required as energy efficiency solutions often have a relatively long return on investment.

Energy transition must be supported by long term public funding. With more than 150 million Europeans affected by fuel poverty, funding of essential public services is vital for strengthening social cohesion. Citizens are not always able to bear all the costs of public heating services: in some cities in Central Europe, households disconnect from heating networks and switch to more polluting and less efficient individual heating solutions.

Regional and local authorities should be able to assess all positive externalities of such projects and integrate them in a cost benefit analysis. **The private sector should be encouraged to play a more important role in financing energy efficiency**. In order to leverage private capital and multiply the effect of public spending, European and national authorities should develop appropriate public-private financing mechanisms (PPPs). Obstacles to the development of PPPs should therefore be eliminated. Moreover, in public procurement procedures, **authorities must be able to easily choose the "environmental best bid"** instead of following a logic based solely on "low cost" criteria (to the detriment of the quality of services provided to the users as well as the sustainability of infrastructures in the long term). This would also be in line with the Energy Efficiency Directive currently in its transposition phase.

To take effect and produce the expected results, the targets must be accompanied by appropriate public policies in the Member States. **Installations supplied with renewable or recycled energy sources still need financial support from public authorities** to compensate for usually high investment costs. In times of "energy poverty", national public policies should encourage users to connect to already existing district heating networks and discourage disconnections**. Finally, regulatory mechanisms must be put in place to avoid cross-subsidies** that artificially keep the price of electricity low at the expense of heat.

These measures, if properly implemented, can help Europe spur economic growth, contribute to an industrial Renaissance of Europe by improving its competitiveness, and protect and use its resources more efficiently.

Developing a new governance for the European energy market

Jorge VASCONCELOS
NEWES, New Energy Solutions - Alternate Member of the Administrative Board of ACER

In October 2014 *"The European Council agreed that a reliable and transparent governance system without any unnecessary administrative burden will be developed to help ensure that the EU meets its energy policy goals, with the necessary flexibility for Member States and fully respecting their freedom to determine their energy mix."* This statement is in line with the Commission President's wish *"to reorganise Europe's energy policy into a new European Energy Union"* announced in July before the European Parliament.

Creating a new "*governance system"* and building a new "*Energy Union"* requires deep structural changes. In order to start "walking the talk" the nexus between "governance" and "energy" must be clarified. The purpose of this short paper is to contribute to this process by discussing possible meanings of the expression *"governance system"* in the context of EU energy policy and by proposing to improve governance of energy markets.

"Governance" is a relatively new concept in the EU public space. Back in July 2001 the Commission issued a White Paper[1] recognizing that *"there is not only a need for urgent action to adapt governance under the existing treaties, but also for a broader debate on the future of Europe in view of the next intergovernmental conference.*

Already within the existing Treaties the Union must start adapting its institutions and establishing more coherence in its policies so that it is easier to see what it does and what it stands for. (...)".

In a footnote, the White Paper provided then the following definition:

"*'Governance' means rules, processes and behaviour that affect the way in which powers are exercised at European level, particularly as regards openness, participation, accountability, effectiveness and coherence*."

The White Paper made no explicit reference to energy; however, it indicated that the Commission *"will consider the creation of regulatory agencies on a case-by-case basis"* which might apply to energy.

Speaking on *"Energy regulation at the European level"* as chairman of the Council of European Energy Regulators at the 1st Annual Conference of the Florence School of Regulation, in May 2005, referring to the White Paper, I introduced the concept of "regulatory gap" (independent energy regulatory authorities are mandatory at Member State level but nonexistent at EU level, thus making regulation of cross-border transmission and trade an underdetermined equation) as a governance problem, pointing out that:

"regulation has played and continues to play an essential role in shaping EU governance.

The place of regulation in the overall architecture of EU institutions and in the balance of powers between Member States and EU institutions is still an open question."

And I also pointed out that

"Unfortunately, the Inter-Governmental Conference did not pay enough attention to these matters and the governance question was not properly addressed. The lack of clear and efficient EU governance, including suitable regulatory mechanisms, became more evident after the last EU enlargement in May 2004."

As a matter of fact, the Treaty of Lisbon, inherited from the Inter-Governmental Conference, does not address governance issues properly, either in terms of political substance or in terms of institutional architecture. Consequently, the Treaty

1 *«European governance - A white paper» COM(2001) 428 final - Official Journal C 287 of 12.10.2001*

does not provide guidance concerning the development of a new energy policy "governance system".

Before trying to figure out what such a system could be, it may be useful to consider the following World Bank definition[2]:

« Conceptually, governance (as opposed to "good" governance) can be defined as the rule of the rulers, typically within a given set of rules. (…)

One might conclude that governance is the process – by which authority is conferred on rulers, by which they make the rules, and by which those rules are enforced and modified. Thus, understanding governance requires an identification of both the rulers and the rules, as well as the various processes by which they are selected, defined, and linked together and with the society generally. »

According to the above definition, governance involves 3 steps: identifying rulers, establishing rules and assigning roles. We will briefly discuss how each step may be seen in the context of EU energy policy.

1) The rulers

Individually, Member States are free "to *determine their energy mix".* Collectively, Member States have agreed on several goals and targets, also approved by the European Parliament, that explicitly or implicitly limit their individual freedom. Therefore, as recognized by the Council in October 2014, it is necessary to improve *"coordination of national energy policies"*. This requires substantial political will and innovative institutional arrangements.

2) The rules

Over the last 20 years, EU energy policy has been translated into an extensive set of rules concerning, i.a., energy markets, environmental restrictions, consumer rights, trans-european infrastructures, international cooperation, research and development, etc. Because almost all EU rules are the outcome of complex political negotiations, the potential for overlapping and conflicting interpretations cannot be neglected and increases with time. Therefore, it would be useful to simplify and to enhance coherence of the EU energy legal framework. This requires a few smart EU law experts. Moreover, the "regulatory gap" should be overcome - this requires audacious legislators.

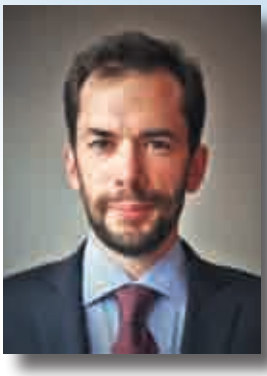
3) The roles

Besides Member States and European Parliament ("the rulers") there are many other actors actively involved in the development and implementation of EU energy policy: first of all the European Commission, followed by an increasing number of institutions (namely regulatory agencies and competition authorities), as well as formal (e.g. networks of transmission system operators) and informal organizations. Their increasing responsibilities include monitoring, reporting, tariff setting, proposal and approval of technical and market rules, etc. The different roles and responsibilities are not always clearly defined and although jurisdictional conflicts are seldom in Europe, several gaps and grey areas persist. For the benefit of transparency and efficiency some roles could be revised and new role assignments could be established, namely as regards planning, reporting and monitoring, as indicated in the conclusions of the October 2014 European Council. Therefore, more coherent rules should also define more coherent roles. This requires extensive knowledge about how laws and market rules are designed, as well as about how they work in practice – typically, a task for a wise men committee.

While waiting for the implementation of the new energy policy "governance system", useful steps should be undertaken to improve governance of electricity and natural gas markets – for instance, there is no reason to further delay the establishment of EU operational coordination centres. Without proper coordination existing and new transmission assets will remain underutilized, the risk of further black-outs and gas supply disruptions increases and efficient market integration is not feasible.

2 http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/MENAEXT/EXTMNAREGTOPGOVERNANCE/0,,contentMDK:20513159~pagePK:34004173~piPK:34003707~theSitePK:497024,00.html

The contribution of nuclear energy to supporting European security of supply



Baptiste BUET

Director AREVA Brussels, Representative to the European institutions

Nuclear energy's contribution to ensuring the security of energy supply in the European Union has been repeatedly recognized by EU institutions in recent years. Examples include the European Commission's communication on "a policy framework for climate and energy in the period from 2020 to 2030" (January 2014) and, in the context of the Russia-Ukraine crisis, in the Commission's proposal for a European Energy Security Strategy (April 2014). On October 2014, the European Council confirmed this approach.

From AREVA's perspective, it is clear that nuclear energy supports security of supply in the EU for the following reasons:

1. Nuclear power contributes to maintaining a reliable low-carbon electricity system

- **The EU electricity system requires baseload generation to maintain a high degree of quality and reliability, while integrating additional intermittent renewables capacities.** Nuclear, bioenergy and hydropower are the only existing low-carbon, baseload technologies, as CCS is not currently available. Nuclear power generates 28% of electricity in the EU, and it provides half of the low-carbon electricity produced.

- **In line with Article 194 of the Lisbon Treaty, the 14 Member States operating nuclear power plants contribute, "in a spirit of solidarity between Member States," to ensuring the security of the EU energy supply**. As the European electricity market is interconnected and integrated, nuclear energy benefits the EU as a whole, well beyond those states which decide to rely on nuclear power.

- **To continue nuclear's sustainable contribution to the EU electricity system, the responsible production of nuclear power is ensured by the European legal framework.** In particular, the European law requires the highest level nuclear safety be maintained, the implementation of long-term solutions for the management of radioactive waste and for transparency and public participation rules to be applied.

2. As a fuel source, uranium meets all the criteria for security of supply and energy independence

- **Uranium resources are well diversified geographically, providing assurance against geopolitical risks and disruption of supply.** These resources are dispatched throughout the world, mainly in economically and politically stable countries: 46 % of uranium reserves are located in OECD countries. As global leaders in this field, EU industrials hold key mining assets in Canada, Australia, Kazakhstan, Niger and Namibia among others. Uranium is also easily stored in large quantities and European nuclear utilities hold stocks representing more than two years of reactor operations. This capacity means that any short-term disruption in uranium supply will not impact electricity generation.

- **Recycling used nuclear fuel provides a secondary uranium resource and avoids the use of natural uranium resources by approximately 25%.** This fuel, known as MOX fuel, is currently used in several European countries: France, Germany, the Netherlands, Belgium and Switzerland.

- **Nuclear costs are structurally stable and predictable**, particularly because the cost of uranium only amounts to 5% of the final cost of electricity. This is notably compared to the economics of gas and coal which are strongly tied to fossil-fuel prices (representing 30 to 50% of the final electricity price) and which may be impacted by carbon pricing.

3. The technological leadership and industrial assets of the European nuclear industry provide the EU with strategic independence

- **Concerning the production of fuel, the EU hosts all of the facilities for every step of the front-end of the nuclear fuel cycle: conversion, enrichment and nuclear fuel fabrication.** These are owned and operated by European industrials, guaranteeing strategic technological and industrial energy independence.

- **The EU has decades of experience and expertise in nuclear reactor construction and operation.** There are currently 132 nuclear reactors in operation in the EU, four new reactors under construction (including two of AREVA's EPR reactor, designed in Europe), and two additional EPR reactors are planned for construction at Hinkley Point C in the UK. The EU also benefits from a fully qualified supply chain to support these activities, including research reactors.

- **For the back-end of the nuclear fuel cycle**, Europe has well-established experience and fully-developed industrial capacity for used fuel management and recycling. The EU is also the most advanced region regarding the ultimate, safe disposal of radioactive waste.

AREVA recognizes the importance of the European energy security strategy and the 2030 climate and energy package. During their implementation, the contribution of nuclear power in supporting European security of supply should be taken into account, while fully respecting the right of Member States to determine their own energy mix

- **The EU institutions, including the Euratom Supply Agency, have the competences to implement a European nuclear uranium and fuel supply policy vis-à-vis external suppliers**. As in other energy sectors, some European utilities are completely dependent on Russian suppliers. In order to support supply diversification, AREVA is committed to providing solutions in this area.

- **Europe's strategic independence and industrial and technological leadership can only be maintained if investments in new European nuclear power plants are possible**. Such important and long-term projects will support investments and development throughout the entire nuclear supply chain in Europe, including for the numerous European-based SMEs. The 2030 climate and energy framework outlined by the European Council in October 2014 is a step in the right direction. Beyond a structural reform of the Emissions Trading System, a pragmatic approach to market and financing models that support long-term investments in low-carbon power generation is necessary.

How to increase the security of gas supply through the market design?

Thierry TROUVÉ
CEO of GRTgaz

The Agency for the Cooperation of Energy Regulators (ACER) is currently working on the gas market organisation for 2025, and wants to reinforce the security of supply for the European Union, in particular by developing competition among suppliers and major producing countries. This is a major challenge in light of the tensions generated by severe climate episodes (February 2012) and sometimes unstable international relations. Currently, it should be noted that the market organisation is insufficient to guarantee the supply of gas to European consumers in unusual situations.

Therefore, reinforcing the security of gas supply on the European Market, as well as diversifying sources assumes additional infrastructure investments, as indicated by the European Commission in the "Infrastructures" Package and the "Connecting Europe Facilities" Regulation. As shown by the ENTSOG (European Network of Transmission System Operators for Gas) simulations in their Ten-Year Network Development Plan - (TYNDP) for Europe, new transmission capacities would first make it possible to supply the European market at a lower cost through arbitration among the various supply sources. They would also make it possible to reduce our dependence on the dominant producers, and to guarantee delivery of gas to all European consumers in the event of a technical breakdown, exceptional cold spell, or geopolitical crisis.

Green gas commitment

6 European gas transmission system operators (Eneginet.dk, Fluxys, Gasunie, Gaznat, GRTgaz, Swedegas) have committed to pooling their expertise and developing innovative projects to make a 100% carbon neutral gas supply possible by 2050. The solutions implemented will be diverse and suited to the context of each country involved in the initiative. The main areas of cooperation are the injection of "renewable gas" (biogas produced from waste and gasification of biomass) and the development of "green certificates", the "Power to Gas" technology of producing hydrogen from surplus electricity and recovery of it through gas networks; gas in transport, and liquid natural gas (LNG) as a fuel for road and maritime transport.

Uncertainties that are slowing investment decisions

Nonetheless, in a difficult economic context, the decision to make these investments remains difficult to take especially as an increasing uncertainty seems to have overcome the players on the long-term requirement for these infrastructures, built to last for 60 years or more. Certainly, the reduction in gas consumption is a reality, and forecasts by the International energy Agency are regularly revised downward. The economic crisis that has affected Europe since 2008 and the success of new energy efficiency policies are linked to this decrease. But this decrease is also the result of a current lack of competitiveness between gas and coal, in particular due to the complete collapse of the CO_2 quota market. Thus, if the actual economic cost reflected the environmental impact, the competitiveness of gas—which emits half the CO_2 of coal in producing electricity—would be dramatically improved. As European Energy Policy struggles to gain a firm footing, the resulting lack of consistency is hindering investment decisions and may lead if we are not wary, to increased CO_2 emissions and higher prices for consumers.

Where European transport regulations are concerned, a paradox can be seen between the need to encourage market liquidity and the necessity of long-term commitments to promote the development of new infrastructure. Regulation 715/2009—concerning conditions of access to the transport system—did, on the one hand, lead to the 2013 adoption of a network code that allows up to 80% of the allocated capacity for terms of 5 years or more. On the other hand, it also led to a project concerning a "tariff" network code that favours booking transmission capacity in the very short term.

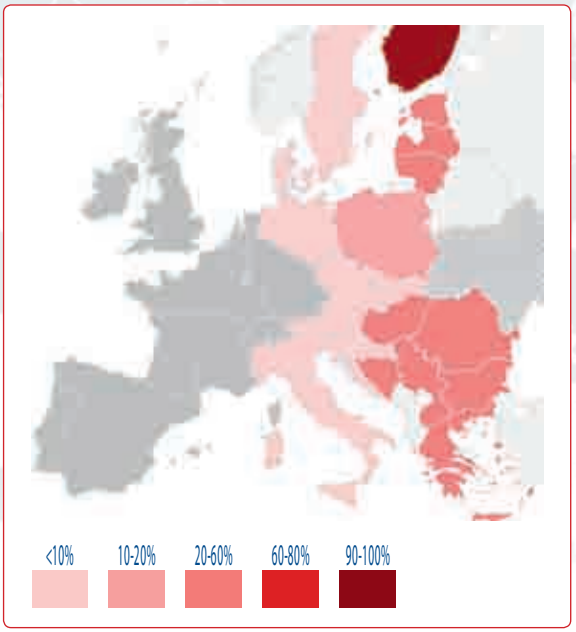
Because of a lack of long-term commitment by users of the gas system and in particular by major energy groups, infrastructure operators are hesitating to develop additional capacity, out of fear of creating structures that will be unused in time, but whose stranded costs must be borne by end-consumers.

Promoting the development of "green" gasses and new uses

Against this background, to inspire investor confidence and drive forward progress in climate protection, European Energy Policy must increase reliance on gas as a supplement to electricity production from renewable sources. In particular, it must promote the development of "green" gas (biomethane), a local production process that creates jobs and is useful for our energy independence. In terms of uses, it must promote the gas and biogas fuel sector, which now constitutes a proven and competitive solution for reducing pollution emissions in transport. In the longer term, our infrastructures can provide a response to one of the major challenges of the energy transition: energy storage. In effect, the gas network could accommodate the surplus solar and wind electricity in the form of very large quantities of synthesised hydrogen and methane (Power to gas).

Beyond infrastructures, developing the security of supplies in Europe must also include a appropriate market design that suitably enhances the value of peak supply and flexibility mechanisms, and underground storage in particular. This requires better control over the obligations stemming from current regulations on the security of supply, at both the national and European levels.

As highlighted by the European Commission in its energy roadmap for 2050, gas will be essential in transforming the energy system and developing new, flexible infrastructures is a "no regrets" option that can accommodate several directions; the regulatory framework remains to be defined to improve security, facilitate, and accelerate this transition!



Source: ENTSOG: impact of a 6-month Russian gas supply disruption coupled with a cold spell.

GHG Emissions Targets*

Emissions Compared to 1990

Index 100=1990	1990	1995	2000	2005	2010	2011	2012
EU-28	100	93	92	93	86	83	82
BE	100	105	103	100	93	85	83
BG	100	70	54	58	55	60	56
CZ	100	77	75	74	70	68	67
DK	100	111	100	94	90	83	77
DE	100	90	84	81	77	74	77
EE	100	49	42	46	49	52	47
IE	100	107	124	128	113	106	107
EL	100	105	120	128	112	110	106
ES	100	111	135	154	125	126	122
FR	100	99	101	102	94	89	89
HR	100	73	83	96	90	89	83
IT	100	102	107	112	97	95	90
CY	100	121	138	150	151	147	148
LV	100	48	38	42	47	45	43
LT	100	45	40	48	43	44	44
LU	100	81	81	108	102	100	97
HU	100	81	80	81	69	67	64
MT	100	123	130	147	150	151	157
NL	100	107	103	102	101	95	93
AT	100	103	104	120	110	108	104
PL	100	95	84	85	88	88	86
PT	100	117	138	145	119	116	115
RO	100	71	55	58	48	50	48
SI	100	101	103	110	106	106	103
SK	100	74	69	71	64	63	58
FI	100	100	99	98	107	97	88
SE	100	102	96	93	91	86	81
UK	100	93	90	89	80	75	78

* Emissions of the Kyoto basket of GHG
Source: Eurostat, July 2014
Methodology and Notes: See Appendix 13 – No 1

EU 2020 Targets

Renewable Energy Targets*

%	2012 Overall RES Share	2012 RES Interim Target	2020 RES Target
EU-28	14.1%	10.7%	20.0%
BE	6.8%	4.4%	13.0%
BG	16.3%	10.7%	16.0%
CZ	11.2%	7.5%	13.0%
DK	26.0%	19.6%	30.0%
DE	12.4%	8.2%	18.0%
EE	25.8%	19.4%	25.0%
IE	7.2%	5.7%	16.0%
EL	13.8%	9.1%	18.0%
ES	14.3%	11.0%	20.0%
FR	13.4%	12.8%	23.0%
HR	16.8%	14.1%	20.0%
IT	13.5%	7.6%	17.0%
CY	6.8%	4.9%	13.0%
LV	35.8%	34.1%	40.0%
LT	21.7%	16.6%	23.0%
LU	3.1%	2.9%	11.0%
HU	9.6%	6.0%	13.0%
MT	1.4%	2.0%	10.0%
NL	4.5%	4.7%	14.0%
AT	32.1%	25.4%	34.0%
PL	11.0%	8.8%	15.0%
PT	24.6%	22.6%	31.0%
RO	22.9%	19.0%	24.0%
SI	20.2%	17.8%	25.0%
SK	10.4%	8.2%	14.0%
FI	34.3%	30.4%	38.0%
SE	51.0%	41.6%	49.0%
UK	4.2%	4.0%	15.0%

* As % of the Gross Final Energy Consumption
Source: Eurostat, May 2014
Methodology and Notes: See Appendix 13 – No 1

Making sure that our climate policies does not further increase our energy prices

Antonio TAJANI
First Vice-President of the European Parliament (EPP)

Energy costs are a key factor influencing the level of competitiveness of many industry sectors, in particular the energy intensive industries, including SMEs. In this sense, the European Commission has to consider the increasing in energy price differentials between the EU and its main competitors worldwide.

According to the International Energy Agency (IEA), electricity prices paid by European industry are today 2.3 times higher than in the US and 1.2 compared to China. When we look at natural gas prices it is even higher with prices that are today 3 times above the US level and are expected still to be double in 2035[1]. Under current trends, such high differentials are expected to persist in the future and already affect investment decisions today. By 2035, about 10% of European energy-intensive industries' global export market share is expected to be lost[2].

In January 2014, as Vice President of the European Commission, responsible for industry, I welcomed the Commission report on energy prices and costs[3], requested by the May 2013 European Council, which confirmed the existence of a significant and increasing energy cost gap between the EU and its main international trading partners, with substantial differences also between Member States.

The report presented a thorough analysis from which clear conclusions must be derived, notably that energy prices are clearly on the rise (industry paid +4% and +3% per year for electricity and gas, respectively, between 2008 and 2012). Non-energy components of prices, i.e. network fees, taxes and levies, including support schemes for renewables, have been steadily increasing and today may cumulatively represent, depending on the sector and region observed, between 30% and 45% of the final price paid by an industrial operator.

These conclusions need to be fully taken into account by the European Commission when devising basic and important elements of the new energy and climate framework as well as for all other relevant policy discussions, such as the ETS structural reforms, shale gas and state aid guidelines.

Today, as Vice-President of the European Parliament I am rapporteur for the ETS MSR (Market Stability Reserve) in the Industry, Research and Energy Committee (ITRE). The MSR, as presented by the European Commission, raises uncertainty for the industry on the number of allowances, puts into question the existing ETS as a purely market based mechanism and unnecessarily increases carbon prices resulting in CO2 pass-through on electricity prices in Member States, thereby increasing the cost burden for industry.

I do not oppose to such an instrument but I think it that the proposal of the MSR does not take into account the latest political wills express by the European Council Conclusions of October 2014. They underline that both direct and indirect cost for the respective industry sectors will be taken into account as well as the need for affordable energy prices. The MSR should be updated along these lines.

Over more than a decade the EU has set ambitious climate objectives. Between 1990 and 2011 the EU27 has reduced its emissions by about 18%. More than anyone else in the world. Yet, this has come to a cost. Against a share of 14% in 2010, today the EU emits about 10% of global CO2 emissions and is expected to reach only between 3 and 9% in 2050. Let's not forget that the EU has also a reindustrialisation target to raise by 2020 industry's share of GDP to about 20%.

That is why our policies on climate and energy for 2030 should be well balanced, taking into account the affordability aspect in order not to prevent our reindustrialisation effort and to avoid a further increase of energy costs. This is why we urgently need the completion of the internal market for energy.

1 IEA 2013
2 Ibid
3 COM(2014) 21 final and SWD(2014) 19 final

Investments in advantaged assets for cleaner transportation fuels

Nikolaas BAECKELMANS
ExxonMobil Vice President EU Affairs

Over many decades, petroleum refining has steadily changed to meeting an evolving need for different products. The refining process today is a fundamental element in the supply chain that helps to enable our modern way of life, safely and cost-effectively transforming a barrel of crude oil into a wide variety of products that have value to millions of consumers and businesses. These range from fuels for our cars, trucks, airplanes, and ships over heating oil for our homes, to other oil products used in manufacturing processes. Refining products also represent 68% of the base stocks used by the EU chemical industry to produce petrochemicals.

Being a refiner in Europe today is however not easy. Industry overcapacity, low cost product imports and government regulations are combining to produce extremely low profit margins and industry-wide losses. Despite this challenging environment, ExxonMobil recently announced plans for major upgrades at two of its European refineries: Antwerp, Belgium, and Slagen, Norway.

These projects are investments in advantaged assets and will improve the competitiveness of these European refineries so they can successfully deal with the challenging industry environment and serve consumers for decades to come.

Europe´s diesel demand for trucking and other commercial transportation is expected to see continued growth. The refining industry in Europe, however, faces a shortfall in capacity to convert fuel oil into cleaner fuels, particularly diesel.

At the Slagen Refinery in Norway, ExxonMobil will install a new processing unit to produce vacuum gas oil, which is a higher-yield feedstock used to create finished products such as lower-sulfur diesel. The new unit is a residual flash tower that will improve the refinery's overall crude distillation process by replacing production of heavy fuel oil with lighter, higher-value gas oil.

The investment in Antwerp, Belgium, valued at more than US $1 billion, will go into the construction of a new coker unit that will convert heavy, higher sulfur residual oils into much-needed transportation fuels, such as marine gas oil and diesel fuel - helping to expand trade and support the European economy.

This expansion follows the substantial investments of 2008 and 2010, which included a 130-megawatt cogeneration facility and a diesel hydrotreater. With these cutting-edge technologies, ExxonMobil has been able to increase production of ultra-low-sulfur diesel and improve energy efficiency. For example the cogen unit has reduced carbon dioxide emissions to levels that are the equivalent of taking 90,000 cars off Belgium's roads.

Coupled with the planned delayed coker unit, expenditures for these Antwerp facilities total more than $2 billion – to improve the refinery's operations, efficiency, and environmental performance.

Moving forward with such upgrades, in the face of a very challenging business environment, requires a disciplined approach to strategic investments in advantaged assets.

These investments will enhance ExxonMobil´s integrated downstream and chemical portfolio in the region to better compete in this challenging environment and to meet the region's growing demand for cleaner transportation fuels.

With that, businesses can do their part to sustain a competitive refining industry.

However, governments will need do their part to ensure Europe can compete effectively in the global marketplace. The best way to do this is for government to maintain a stable tax, legal, and regulatory framework that does not impose burdens or regulations that discourage investments that lead to innovation and improved performance, or that would disadvantage Europe's refining operations compared to the rest of the world. We need transparent, predictable EU energy policies. Policies which are based on a cost/benefit analysis, and allow the market prices and open competition to determine the solutions and investments necessary to achieve societal goals at lowest cost.

On such basis, advantaged refineries like Antwerp can be equipped to compete in the global marketplace, provide secure supplies and be part of the energy industry's effort to improve the lives of millions in Europe and around the world.

The key role of the EU Emission Trading System (ETS) in driving investment in energy efficiency and renewables

Jos DELBEKE
Director-General, DG Climate, European Commission

To limit global warming, the world needs to significantly reduce emissions from carbon dioxide and other greenhouse gases. The EU has committed to lowering its emissions of these gases by 20% in 2020, 40% in 2030 and by 80-95% by 2050. To achieve this we will need to change the way we use energy throughout our economy. Our key instrument to realise this transformation effectively and affordably is the EU Emissions Trading System (ETS).

A stronger EU ETS beyond 2020

At their October summit, EU leaders agreed the headline targets of the EU framework on climate and energy for 2030. The agreed targets include a binding domestic reduction in greenhouse gas emissions by at least 40% by 2030 compared to 1990 levels, an EU-wide binding target for renewable energy of at least 27% and an indicative energy efficiency target of at least 27%. The decision underlines the EU's position as a world leader in the fight against climate change.

The successful programme for funding innovation will be renewed and expanded to 400 million allowances and expanded to also fund investments in low-carbon innovation in industrial sectors. Next to this, a new modernisation fund of 2% of the EU ETS allowances will be set aside to address particularly high investment needs in lower income Member States for investments in energy efficiency and the modernisation of the energy systems. Lower income countries may also opt to continue to give up a limited share of their auctioning allowances for free to the energy sector until 2030 to promote its modernisation under enhanced transparency rules.

These measures will ensure the EU ETS continues to function as a strong driver for investments in renewables and energy efficiency in the years to come.

Emissions Trading System is delivering climate results

The ETS has been the cornerstone of European climate policy since its start in 2005. By setting a cap, or limit, on the total number of greenhouse gas emissions in any given year for more than 12,000 installations such as power plants and factories in EU 28 Member States (as well as Norway, Iceland and Liechtenstein), the ETS ensures that the environmental objective is reached.

The EU ETS is delivering. The numbers are clear: since 1990 total EU emissions have fallen by around 19%. At the same time, Europe's economic output has grown by 45%. We have managed to decouple economic growth from greenhouse gas emissions and we are firmly on track to reach the 20% target for 2020. But with 2030 and beyond in mind, it is also worth considering how the ETS contributes to driving investments in energy efficiency and renewables.

Green growth as an economic opportunity

Strengthening the share of renewable energies on our continent is not, as Commission President Jean Claude Juncker has underlined, just a responsible climate change policy response. It is also an industrial policy imperative if we still want to have affordable energy at our disposal in the medium term.

Renewable energy and energy efficiency can contribute to reducing our fuel import bill as well as to climate action, green growth and job creation. Economic analysis by the Commission

estimates that avoided imported fuel costs as a result of renewable energy were at least 30 billion euro in 2010, compared to a total trade deficit of energy products of 304 billion. That's why the second objective of the ETS, to drive innovation in clean energy and low carbon technologies, is so important.

A better business case for renewables and energy efficiency

Because the ETS puts a price on carbon, each tonne of greenhouse gas emissions saved is worth money. It allows a company to save costs or earn money by selling surplus allowances to other market participants. This simple fact has placed climate change on the agenda of company boards and their financial departments across Europe. When they consider the business case for investment in renewable energy or energy efficiency measures, the ETS ensures the price of CO_2 is taken into account.

Similarly, an increasing carbon price will help make low-carbon alternatives like wind or solar power more attractive compared to fossil fuels like coal and gas. It will also contribute to a better business case for efficiency measures, particularly those that directly reduce use of the most CO_2 intensive fossil fuels like coal or lignite.

Further steps can strengthen the contribution of the ETS to renewables and energy efficiency

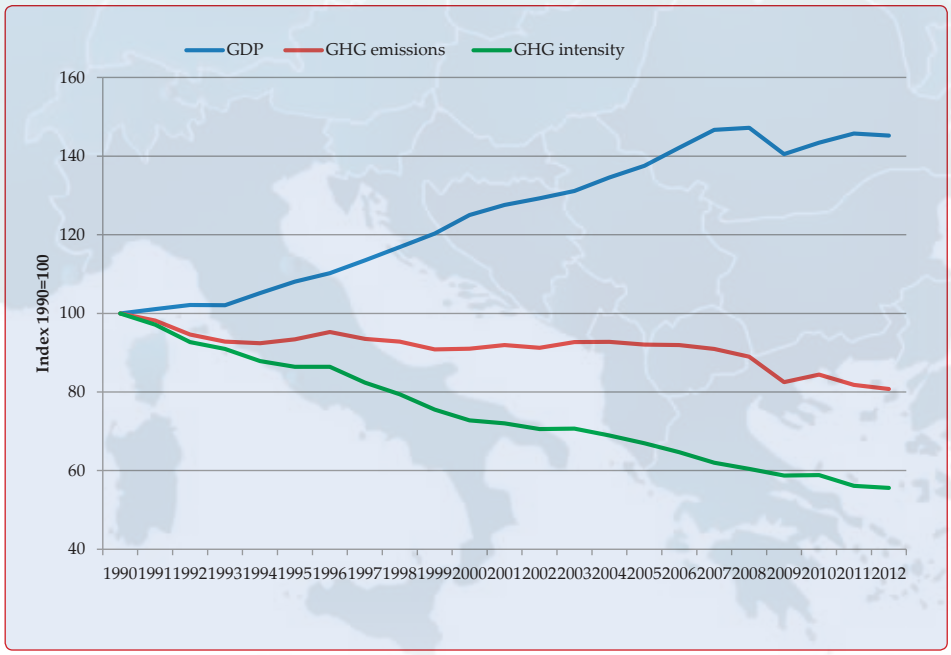
So the ETS is already supporting both renewables and energy efficiency both indirectly and directly. We should seek to strengthen it further. Because of the economic crisis, the current carbon price is lower than anticipated when the current rules were agreed. While the cap on emissions safeguards the overall environmental objective, the low carbon price reduces the incentive for investors and the Member States' revenues from auctioning allowances. Therefore, the Commission has proposed the implementation of a Market Stability Reserve that would improve the system's resilience to major shocks by automatically adjusting the supply of allowances to be auctioned, ensuring that the current surplus of allowances is addressed.

More funding for clean energy and investments

Besides its central contribution to the business case for renewables and energy efficiency, the ETS also contributes to direct investment in clean energy and energy efficiency. Since 2013, auctioning is the default way of allocating allowances simply, efficiently and transparently. The rules agreed by EU leaders encourage countries to use at least half of the revenues from these auctions for climate action by funding measures like renewable energy and energy efficiency. In fact, the recently published progress report shows that more than €3 billion will be used for domestic or international climate action – significantly more than half of the €3,6 billion in auctioning revenues for 2013. For example, Germany has earmarked the revenues for a fund to help finance environmental and energy efficiency policies and France will use the proceeds to fund insulation in the housing sector.

Separately, the proceeds from the sale of 300 million allowances from the ETS are being used to fund demonstration projects for Carbon Capture and Storage (CCS) and innovative renewable energies at commercial scale. The cumulative funding for the period 2013-2020 will be €2.1bn, which will leverage approximately €2.8bn of private investments for 38 selected projects that together will increase annual EU renewable energy production by some 18 TWh. Together with the emissions captured by the CCS project, this will be equivalent of taking over 3 million cars off EU roads. Through the smart use of these sources of revenue, the ETS is also helping to bridge the gap between research and commercial viability for the clean alternatives which will play an increasing role in the market in years to come.

"Evolution of GDP (in real terms), GHG emissions and emission intensity (i.e. ratio of greenhouse gas emissions to GDP): Index (1990 = 100)". The source is "EEA, DG ECFIN (Ameco database), Eurostat".



An Energy Union to Europe's rescue?

Zbigniew MICHNIOWSKI

Vice-Mayor of Bielsko-Biała, President of PNEC (Polish Network "Energie Cités") and Vice-President of Energy Cities.

Over the past few months, the grand project of an "Energy Union" has increasingly been presented as a potential solution to address numerous EU challenges, and injecting some renewed sense of solidarity into the European project. This concept, initially coined and put forward by our then Prime Minister Donald Tusk, will not succeed if it focuses on joint purchasing of gas or building new pipelines and interconnecting infrastructures.

Local ownership and participation should be a cornerstone of this new Energy Union, key ingredients to restoring trust in EU institutions. Indeed, only a locally-led energy transition would bring positive spill-over benefits to European citizens, from an economic, environmental and social point of view.

Undeniably, local authorities are the most relevant and legitimate players to take on such a role. They are best placed to know their territory's resources and energy potentials, and identify where and how these should be harnessed. They are more directly accountable to their citizens and can establish closer links with them, with local partners and SMEs. In some cases, municipalities are also in the unique position to simultaneously act as energy consumers, providers and regulators.

While traditional, centralised energy systems are being challenged in many parts of Europe, cities and local communities are coming forward as the main protagonists of the new distributed, decentralised paradigm.

New governance model

In recognition of this, the European Commission supported in 2008 the launch of the Covenant of Mayors movement, creating a new governance model through which local authorities were voluntarily committed to implementing EU climate and energy objectives on their territories.

Six years on, the Covenant has grown beyond expectations with over 6,000 participating cities – representing a third of the EU population - 4,000 of them having adopted a Sustainable Energy Action Plan. According to preliminary analysis from the European Commission's Joint Research Centre, implementation of these plans in the most energy-dependent Member States[1] could reduce the need for Russian gas imports by 58%.

Energy security

Until recently, the Covenant of Mayors had not been given a correspondingly prominent position in ensuing EU climate and energy legislation. But the Ukrainian crisis pushed it up the EU agenda, as the European Commission realised the potential of local action plans in reducing reliance on foreign sources of energy. In May 2014, it called on Member States to support an "accelerated implementation" of these plans, labelled as a "key action" of its European Energy Security Strategy.

In the summer, the cities of Bielsko-Biała and Warsaw sent a letter to the then Polish Deputy Prime Minister Elżbieta Bieńkowska (now European Commissioner for Internal Market, Industry, Entrepreneurship and SMEs) calling for a greater involvement of local authorities in achieving an ambitious European climate policy. Two months later, I was invited along several other Deputy Mayors from Central and Eastern Europe to share some of my city's best practices in improving energy self-sufficiency. These notably include the development of local heat sources, such as the deployment of small-scale biogas plants, and the installation of high efficiency boilers, solar and photovoltaic collectors in private homes. All these actions have lead to

increased local energy security and greater independence from external energy suppliers.

Ultimately, such investments help make better sense of European policy. Channelling funds to these initiatives creates jobs and business for local companies. In light of this, Polish MEP Jan Olbrycht recently called for fast-track access to regional policy funds for Covenant of Mayors signatory cities having adopted an action plan. President Juncker's €300 billion investment package should support such objectives

Wind, wood, solar, geothermal, surplus heat: all the energy we need is right here in our cities.

But as George Orwell once put it: "To see what is in front of one's nose needs a constant struggle", so we'll continue to strive towards that direction, for a more inclusive energy transition. A hopeful project for the European Union.

1 Estonia, Lithuania, Latvia, Finland, Bulgaria and Slovakia import 100% of their gas from Russia

LIFE CYCLE ASSESSMENT IN CONSTRUCTION : energy demand managed from materials production to recycling of buildings

Emmanuel FOREST

CEO, BOUYGUES Europe
President of the Energy Efficient Buildings Association (E2BA),
an initiative of the European Construction Technology Platform (ECTP, www.ectp.org)

When energy security of supply is considered, it is primordial to look thoroughly into ***demand reduction***. It is even a prerequisite.

The ***construction sector***, together with the transport sector, have been pinpointed as strategic focus targets in this year's Commission ***Communication on Energy Efficiency (EE)***. It is a sensible diagnosis and it is important that all stakeholders join the front line together to reach first the 2020 and then the 2030 objectives agreed upon by the Member States recently.

The issue of Energy Efficiency of Buildings (EEB), after already many years of interest, has now become a ***familiar issue*** in Europe, not only for public authorities at all levels and stakeholders, but even for a large share of the citizens.

The European legal framework is quite adequately developed, with in particular the ***Energy Performance of Buildings Directive (EPBD)*** which calls for near zero energy new buildings at public level by 2019 and at private level by 2021, also encouraging EE in major renovation works. The strong political support for EEB is also reflected by the continuation in the framework of Horizon 2020 of the ***EEB Public Private Partnership*** with an EC budget of 600 M€ for Research, Development and Innovation actions. Finally, many ***European regions*** have made of EE a strategic priority in their ***Operational Programmes for 2014-2020*** that will be supported by the European Structural Investment Funds (ESIF).

It is very encouraging to witness that the long term vision offered by the EU framework allowed many actors to take ***risks*** and show ambitions that go « ***beyond regulation*** ». As examples, let us mention cities where ***local authorities*** deploy their own EE initiatives, ***SMEs*** that developed ***innovative advanced materials***, or construction companies that succeeded in turning already today ***positive energy buildings*** into a ***business model*** .

Some might then be tempted to ask : « if we can already do this, why do we need to finance and work more ? ». Of course we do. Because not only do we need to find always ***better adapted and cheaper solutions*** to optimize deployment throughout the EU, but because we are also creating a ***competitive industry*** that can export its know-how around the world. And if considered again through the lens of energy security of supply, the EU's heavy dependance on ***energy imports*** remains a long term challenge calling for ***continuous improvements*** in all possible sectors.

Many other aspects than the building itself are contributing to its EE objective : the buildings location and orientation, ***ICT applications*** like smart meters, local renewable energy production and ***storage*** (both electric and thermal), innovative ***financial engineering*** solutions (ex. Energy Performance Contracting (EPC)), the training and close involvement of the buildings ***users***, … it is a real kaleïdoscope of innovations that lead to this success story in the making.

So, if the built environment is clearly set to play its energy efficient role by lowering needs for heating, cooling and lighting , it can be the focus of even more attention by increasing its energy efficiency potential ***beyond the operational phase***: the process can indeed start from energy consumption for ***materials production***, the construction phase and extend finally beyond usage up to the end of life with the ***recycling of buildings***. This approach of the **Life Cycle Assessment (LCA)** of a building is becoming more and more the reference in the building sector. It is also to be earmarked for its timeliness with another fresh Commission initiative : its ***Communication on Circular Economy*** and the ***revised Waste Directive***. This is appearing as an extraordinary opportunity to embrace simultaneously the Energy and Waste challenges.

The LCA concept is wide and some of its salient features complementing the issue discussed here would be the following.

Materials who were once in priority looked at for a specific quality like ***insulation capacity*** (after safety standards of course), now are appraised for the embedded energy needed to fabricate them, then also for their potential for easy and cheap recycling. On this issue, the European policy on ***Key Enabling Technologies (KET)*** managed by the Commission with the support of the Council and Parliament, is strategic for the development not only of ***Advanced Materials*** but also of other KETs that can contribute to Energy Efficiency objectives.

Let us mention also the various works phases around a building : to **think of demolition even before construction**, still a surprise to many, is also becoming a privileged approach. Because advantages are many, and if both phases are optimized, not only are regulations respected (recycling…), but if these energy intensive works can be planned more efficiently, they will ensure not only energy savings but substantial cost reductions.

Once again, these elements show that it is often a « pendulum effect » where sometimes regulation stimulates action but also sometimes experience from action can help carving the best regulation, proving the indispensable dialogue needed.

To conclude on this issue of Energy Efficiency and Construction,it is remarkable that the collaboration between stakeholders and the European Institutions has constantly improved since the setting up of the ***European Construction Technology Platform (ECTP)*** in 2004 and then with the ***Energy Efficient Buildings Association (E2BA)*** in 2009. The relationship beween enterprises and local and regional authorities is also paramount for the ***large scale deployment of innovative solutions***. The answers we will find together to the energy security of supply challenge will be without doubt also answering to a number of other challenges that the EU is facing on its path to recover a healthy, competitive and sustainable economy.

Energy security, a paramount priority for European energy policies: the role of natural gas

Pierre VERGERIO

Executive Vice President Gas Midstream Energy Management & Optimization, Edison SpA - Board Member, Eurogas

Energy security is a paramount priority for Europe's energy policies, above all with regard to managing Europe's growing reliance on energy imports. It has been so for decades, starting from the Messina declaration in 1955, and it will continue to be so in an effort to combine competitiveness of our energy supplies with the imperative goal to make European and world energy systems more sustainable.

Gas is a crucial component of this equation. Scholars called it a "fuel of consequence", placed at the crossroads between its environmental advantages, its proven reliability as a component of a flexible power mix, the growing opportunities stemming from new technologies and new potential supply sources. Thus, the European Union has progressively captured atop its agenda the goal of making our gas supply more secure and competitive.

The gas market in Europe is facing major challenges in adapting to the crisis-led demand downturn and adjusting its present structure, whilst safeguarding at the same time its capability to invest in future developments. On the contrary, the development of non-conventional gas is contributing considerably to an almost energy self-sufficiency and stunning economic growth of the United States and is providing an evident competitive advantage that could increase even more given the post-2020 European scenario.

With this in mind, shale gas developments in Europe may prove much less significant than in the US, due to a number of factual and regulatory elements. The EU should thus pay the utmost attention in order to develop in a timely manner the necessary external and internal infrastructures for the European gas market to take full advantage of conventional and unconventional developments, as well as for matching the relationships with existing suppliers and new ones, offering a solid, reliable and accessible infrastructure backbone for EU energy security, sustainability and competitiveness goals. Failing to do so, may ultimately result in a prejudice to the competitive recovery of European industries and the whole European economy.

First and foremost, in order to develop this strategy, when Europe's reliance on external energy imports grows, so shall grow our attention to those reserves that fall within our territory, or in its closest vicinities. That is why we shall work on boosting sustainable exploration and production activities, aimed at maximizing our potential. Italy for example has significant gas and oil reserves (126 Mtep), the largest in Continental Europe after the Nordic countries. Exploiting these resources could mobilize investments of about €15 billion and create 25,000 new jobs, with an annual saving in energy expenditure of about €5 billion in view of the reduction in fossil fuel imports. The EU has made an important step forward with its recent offshore safety Directive. It shall now ensure that it is appropriately implemented, and that it becomes a solid ground to establish a more conducive vision on domestic resources at the national level, and to favor a truly needed level playing field throughout our communities. Edison is contributing to this goal, by continuing to invest in those countries where the hydrocarbon sector is already an important reality. Edison is an historical player in the Italian E&P sector, and it is present in Croatia and UK; in the broader European economic space, Edison is developing its presence in Norway.

Second important aspect: developing new supply options for Europe and its growingly energy-thirsty neighborhood shall be a priority. This is particularly important now that the Eastern Mediterranean Region is emerging as a major potential supplier to Europe. Indeed, abundant reserves are being found and developed in the wide Levant basin, extending beyond Israel to also Cyprus and potentially Greece. Edison is indeed engaged in playing a conducive role to promote such developments, key to European energy security, leveraging on its consolidated presence in Mediterranean countries such as Algeria and Egypt and on the ongoing activities in Israel (where Edison is currently the first EU company to have entered the fast developing Israeli hydrocarbon industry) and wider region, aimed also at developing a sound gas export option capable of securing the future productions to the EU consumptions. In this light, the emphasis attached by the Italian Presidency of the European Union and the European Commission on giving new momentum in the Euro-Mediterranean cooperation is therefore crucial. It can build on extensive corporate experience and exchanges (such as those of OME – Obsérvatoire mediterranéen de l'énergie), but it shall engage all key stakeholders, Governments and institutions in an effective and innovative format, that of the thematic platforms that have been recently announced. This development can be very fruitful and effective in the gas sector.

Third, as mentioned before, a sensible policy has to be designed for reviving and enlarging a prosperous and long-term cooperation with existing suppliers. Indeed, Edison believes that long term contracts will continue to be important to secure necessary development of gas fields and transportation infrastructures financing, thus contributing to manage investment risk and ensuring security of supply. In this regard, the role of mid-streamers for ensuring security of supply trough diversification of sources, routes and counterparts should be acknowledged, within a broader effort for reinforcing a constructive and mutually beneficial dialogue between producers, mid-streamers and consumers.

This leads us to the fourth point. Once relationships with suppliers have been established, or in order to enable new ones to be activated, a robust infrastructural policy has to be designed. The EU has articulated a set of tools aimed at creating a conducive framework for investors, but a lot more will be happening with the upcoming implementation of robust prioritization and co-financing tools. Edison is now playing its role in full with a broad set of projects aimed at diversifying routes from existing suppliers, opening new routes both via pipeline and GNL, improving European storage capacity.

Finally, once gas arrives to European borders, it shall be made available to European citizens; we cannot avoid to complete the debottlenecking of existing interconnections and to promote the development of the physical assets that break down barriers to regional and international trade and increase opportunities for both producers and consumers.

In conclusion, energy, and in particular gas, has to be a key component of the political debate, and policy goals have to be set by focusing on the crucial objective of reaching the competitive, sustainable and secure energy needed to foster a competitive and sustainable economy in Europe.

Paris Climate Conference: acting together, offensively and positively

Pervenche BERÈS
MEP (S&D)

The United Nations Paris Climate Conference (COP21), which will be held in December 2015, is a milestone for France, for Europe and the Planet. The challenge is of major significance: fighting climate change, which poses a threat to our societies, our economies and the very future of Mankind. Negotiating a new international climate agreement - to be implemented in 2020 and applicable to all countries -, is paramount in order to keep global warming below 2°C relative to pre-industrial temperature levels. The French government, in charge of organising this Conference, has drawn up a clear road map: "Paris Climate 2015 should not be a summit that attempts but one that makes decisions".

In the wake of the 2005 Kyoto Protocol countries are now divided into two blocks under the principle of common, albeit differentiated, responsibilities with, on the one hand, the signatory States legally bound to cut greenhouse gas emissions, i.e. the "developed countries", and on the other hand, the States that are exempt of this requirement - the "emerging" or "developing countries". One of the challenges of the Conference will be to recast this principle as no one had been able to anticipate the growth of the emerging countries, while their emissions are currently recording the strongest increase.

Each of the 195 countries will have to join a legally binding global climate change agreement and make efforts based on commonly defined, quantified , albeit still differentiated, targets; these efforts will not only be made on new bases but they will have to be ambitious enough to be efficient. All Parties will have to make financial commitments: as long as the countries remain free to decide whether or not and how much they will want to invest in climate protection, one thing is certain, voluntary contributions will not suffice and the 2°C target will not be reached. All Parties will have to comply with the agreement or penalties will follow if those targets are not met.

In order for this Conference to be successful and not lead to the same failure as the 2009 Copenhagen Conference for want of an agreement from China and the United States and due to the lack of leadership of the EU, we must leave no stone unturned to try and convince both countries to take action. These giants, who account together for half of the global emissions, have carefully remained on the side-line of the fight against climate change, which started at the 1992 Rio Summit.

EU Socialists fervently hope that the Union will stand by France, which demonstrates the same rigour now as it did in the past in order for this Summit to be successful. A failure in 2015 would mean the degradation of natural resources, new conflicts over water, food and energy and millions of climate refugees.

We have fought for ambitious and binding targets to be set out. The European Parliament has recommended, at our behest, the principle of a 40% reduction - by 2030 - of CO_2 levels compared to 1990, a 40% increase in energy efficiency by 2030 and the development of renewables that should account for 30% in 2030. While sending a strong signal to the European Union's main partners in this negotiation with quantified targets, the Council did not meet our demands on 24 October.

We are the first generation to have become aware of the environmental challenge and the last one able to take timely action. This is why we insist that the EU should not reconsider its ambitions. The EU must remain at the forefront of the fight against climate change. Not only because the EU should protect its own people against the negative impact of climate change but because it gives the EU the opportunity to transform its faltering and struggling economy into a modern economy based on a new sustainable development model with tremendous potential and benefits: reduced energy costs, energy independence, enhanced innovation and new ecology-friendly companies - accounting for the creation of many new jobs, the limited use of resources and a positive impact on the health of all European citizens. Europe's reorientation and enhanced job creation require investment-driven, and ecological and energy transition policies.

For the sake of Europe as well as the Planet, world leaders should not consider climate challenge as a greenhouse gas emission "shared burden" but rather as the opportunity to "share solutions". Prior to the Conference, the French diplomacy, spearheaded by the Minister of Foreign Affairs, Laurent Fabius, in charge of this crucial summit, has been working with determination towards a "solution agenda" in order to convey a positive statement across all continents, whereby emphasising the prospects of creating jobs, generating wealth and inventing new production methods and consumption patterns.

The climate negotiations will surely be complex: they are a laboratory of new kind for multilateralism and new south-north relations. The European Union must support France in its attempts to create the conditions for an offensive, collective and positive action around its "climate diplomacy" in order for the Paris Climate Conference to deliver this indispensable universal agreement to safeguard the future of Planet Earth and its inhabitants.

Demand-side management in Europe: tomorrow's challenges

Laurent GRIGNON-MASSÉ

EDF, Customer Branch, Strategy
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Chantal DEGAND

EDF, Customer Branch, Strategy
Director Departement New Business Models

Demand-side management[1] (DSM) is at the core of political ambitions: building renovation, national targets for consumption reduction… DSM may have seemed to be less at the forefront than other challenges over these pas decades (in particular on the generation side : decreasing of fossil fuel use and increase or renewable energy), however it is not a new concern in Europe.

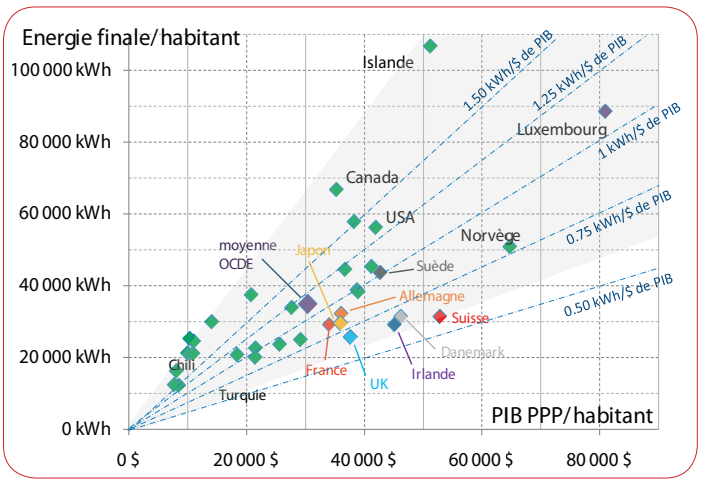
The European countries are among the most efficient in the OECD

The large European countries are among the OECD's most efficient countries both in terms of per capita consumption and consumption per $ of GDP (see figure below).

Those indicators include activity, economic structure, climate, country size and density effects and, though they are not synonymous with "energy efficiency", they do give a fairly good estimate.

Within the European zone, the situations are contrasted: for instance there is a sizable discrepancy between the United-Kingdom and Sweden, the latter consuming about 50% more energy per capita and per $ of GDP.

Initiated over four decades ago, DSM policies have since then become more ambitious



Per capita consumption and energy intensity of different countries (IEA)

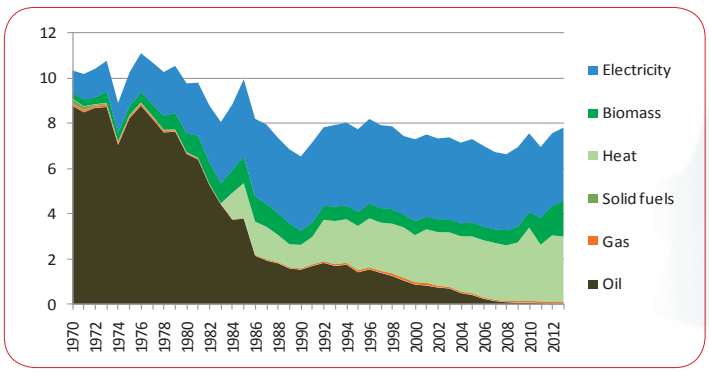
The first energy saving measures were initiated in the wake of the oil shocks. France implemented its first Thermal Regulation, set up the Energy Conservation Agency - l'Agence pour les économies d'énergie - in 1974 and initiated day light saving in 1976… At the European scale, the Rational Energy Use Programme (utilisation rationnelle de l'énergie - URE) was set in motion in the early 70's in order to encourage exchanges of views as well as a regulatory framework between Member-States.

For the past two decades the ambitious approach of DSM policies has been intensified to address new issues, particularly environmental (climate change) and economic challenges, and challenges in terms of energy dependence. This approach has led to setting up ambitious Community targets including by 2030: - 40% greenhouse gases (GHG) compared with 1990 levels, 27% renewable energy in final energy consumption and - 27% primary energy compared to a reference scenario. To these Community objectives are added national targets. In France, the draft law on Energy Transition for green growth aims at a 20% decrease in final energy by 2030 compared with 2012 levels, then 50% by 2050, as well as a 30% reduction in fossil fuel consumption by 2030.

These targets are complemented by a Community legislative framework (in particular The Ecodesign&labelling Directives, The Energy Performance of Buildings Directive and the Energy Efficiency Directive) as well as national measures. The latter are very heterogeneous, as exemplified by the building sector: France resorts mainly to the Energy Saving Certificates mechanism, Germany uses loans and subsidies granted by its State-owned KfW bank, and last but not least Sweden works on a carbon and energy taxes base.

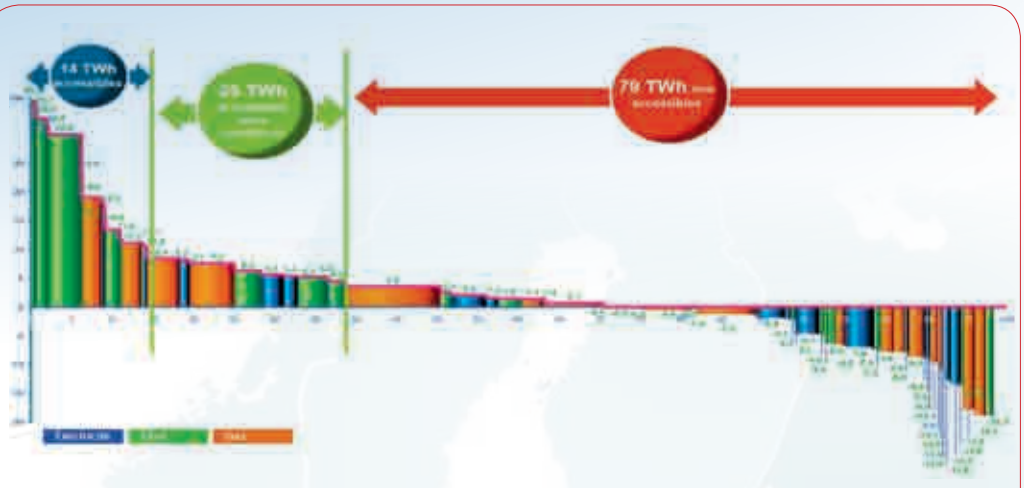
Significant results thanks to DSM policies

DSM policies have achieved tangible results on a national scale with the decoupling between GDP and energy consumption since 1970. In France, the GDP grew by a factor of 2.5 between 1970 and 2012, whereas final consumption only increased by 30% and CO_2 emissions were cut by 20%. In Sweden, policies have removed fossil energies from the residential sector (see figure below).



1 Managing the energy demand (DSM) includes actions on system efficiency, their use (restraint) and the market shares between energies (substitution).

The tangible results of the DSM policies can also be observed in the significant drop in per-unit energy consumption of numerous appliances and products: ~ 100% of the refrigerators, dishwashers and washing machines were at least Class A in 2012, the per-kilometre consumption of the new European cars was cut by 30% between 2010 and 1990. And the per-square meter heating consumption in France dropped by 25% between the end of the 70's and the mid-1980's, and then again by 25% from the end of the 80's to present time.

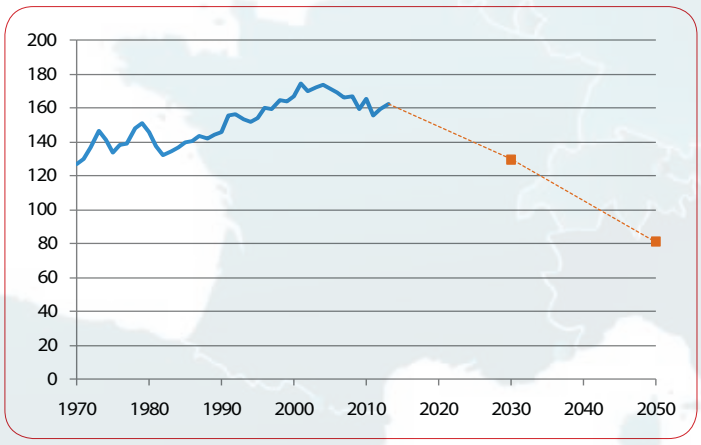


Example of Merit Order : Internal Return Rate (%) of energy efficiency operations in the French residential sector (source : UFE)

Despite significant results thanks to DSM policies, changes are required

Despite this progress, national consumptions have not dropped significantly. A first explanation lies in the weight of the bullish factors (demography, comfort, economic growth…). Moreover, Member-States share the incapacity to increase DSM actions in quantitative terms. In the building sector, measures are struggling to increase the pace of renovation despite mature solutions and significant investments. In France, the volume of the renovation market declined between 2006 and 2010 in spite of loans and tax credits (€ 2.6 billion CIDD - Sustainable Development Tax Credit - and PTZ - Zero-interest Loan - in 2011) and the system of Energy Saving Certificates. In Germany, despite subsidies and loans issued by the KfW (€ 2.8 billion in 2011), the pace of heavy renovation does not exceed 1% of the building stock, which is far from the 2% target.

Changes are required to reach the ambitious targets for a reduction in demand. As far as France is concerned, consumption will have to be reduced twice as fast as in the past decade (see figure below) in order to achieve the targets set forth in the Law on Energy Transition. Attaining the objectives for a reduction in GHG emissions also relies on a significant acceleration of the rate at which emissions decrease.



Final energy consumption in France and targets set forth in the Law on Energy Transition (Mtep)

The cheapest kWh is not that which is not consumed

As highlighted by the UFE - the French Union of Electricity - in the French residential sector, DSM profitability currently varies very widely, and for many of DSM operations profitability is still afar off. In a heavily constrained economic background and a tight budgetary situation, the priority is thus to target the DSM operations that need to be promoted.

Targeting economically efficient operations to reduce fossil fuel consumption is a priority

In the European Union, the largest energy consumer is the building sector, followed by the transport sector and the industrial sector. Fossil fuels account today for the majority of the mix of final energy consumption in Europe.

The first step consists in targeting the most efficient operations in order to initiate a virtuous circle (energy savings and providing additional investment capacities). The aim is to maximise the number of kWh saved or tons of CO_2 prevented per euro spent. In the short run profitable operations will be scarce but they should gradually increase in numbers through the combined effect of rising energy prices and reduced DSM operating costs due to their growing numbers.

DSM operations should be targeted taking into account the specificities inherent to each sector. For instance, in the building sector, the actions to be encouraged should be attentive to the typology and initial characteristics of the building considered and its occupants. This means conducting operations in housing that is still heated by fuel oil and is the most energy-consuming. The most efficient operations are loft insulation and replacing fuel oil boilers with condensing boilers in areas serviced by gas, or, if not, with heat pumps.

Generally and across all sectors, targeting carbon energy enables to address numerous challenges, in particular by reducing GHG emissions, Europe's energy dependence and its trade balance. Furthermore, given the current climate issues, energy savings alone, without the evolution of market shares between energy sources, are lacking. The UFE has shown that, even if fuel oil were to disappear, energy saving in the residential sector would allow for an about 35% maximum reduction in emissions. In the long term, only electric solutions associated with carbon-free electricity will enable to work toward Factor 4.

Conclusions

As regards DSM, a Community legislative framework associated with heterogeneous national policies yielded significant results over the past 40 years. However, a change is required if we are to meet the ambitious targets set for the different time horizons (2020, 2030, 2050). The first step consists in targeting the most efficient operations in order to initiate a virtuous circle (energy savings and providing additional investment capacities). In the long term, electric solutions are decisive in order to reach Factor 4.

AIE, http://www.iea.org ■ ENERDATA, database, www.enerdata.net
EUROSTAT, http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/
■ UFE, http://www.ufe-electricite.fr/IMG/pdf/ufe_etude_1_.pdf

Tackling Europe's vulnerability to energy shocks

Monika ŠTAJNAROVÁ
Economic Officer, BEUC

The energy transition together with the security of energy supply have been high on the agenda for the last couple of years and while the overall goal of a secure, low carbon economy is crystal clear, the strategies to achieve this goal are yet to be proved successful.

Energy is an essential commodity consumers need every day so energy policies need to be built on the principle of affordability. That is also why distributional impact assessments distinguishing between various consumer groups play such an important role – while analysing the EU or national policies, it can reveal potential gaps or if promised benefits can be delivered to all consumers.

Power to the consumer

Energy prices consistently rank as one of the main financial concerns for consumers. On top of that, the current direction of the energy systems' transition which requires large infrastructure and systems' investments will further add onto consumer bills. At the same time, we see that current energy markets remain still largely imbalanced, unjustifiably complex and affordability becomes the number one challenge.

As energy efficiency is one of the most cost-effective ways of mitigating climate change, enhancing security of supply and reducing energy bills of already financially challenged European households, consumers across Europe are seeking more and more energy efficient solutions. However, the information concerning energy efficiency must be transparent so that consumers can trust and get motivated to invest in more efficient technologies. Also, energy efficiency measures must be cost-effective, supported by appropriate incentives and properly audited.

Two years ago, the EU legislators approved the Energy Efficiency Directive which is being implemented across the EU. This Directive outlines measures supporting more efficient energy use in the energy chain and the involvement of consumers is taken for granted. However, consumers must be engaged through a series of co-ordinated national policies that would support and encourage energy efficient behaviour. For instance, the diversity in consumer's attitude to the environment or their income, type of home, age and family situation requires different policy.

Distributed generation has become an opportunity for consumers to play an active role in the energy sector. This new role will require policies to tackle existing barriers and help bring about market transformation. In addition, demand-side participation has been discussed due to its significant potential to increase the overall efficiency of the EU energy system. However, the market is not ready yet for consumers to get benefits while participating in this system.

Moreover, due to fast paced technological innovation, new technologies facilitating new services are entering our everyday lives. So the market urgently needs a clear direction to co-ordinate energy efficiency policies and policies related to new technologies and demand response.

Energy savings potential through product design must be fully grasped

The Ecodesign and Energy Labelling Directives also form a well-established EU product policy framework that can contribute in tackling dependence on foreign energy supplies. Existing ecodesign and energy labelling measures can contribute to about 40% of the EU 2020 energy savings targets.[1] These measures cover among other things a large range of product groups commonly found in European households. However, this does not mean the job is done. Certain measures like those on washing machines, fridges and dishwashers are about to complete their first cycle of implementation. The upcoming revision of these measures is an opportunity to take advantage of the unexploited energy savings potential and integrate the experiences learned from the first years of the implementation such as for example user patterns and their adaptation to the new measures.

As one of the most recognizable and successful communication tools of the EU, the Energy Label enables consumers to be part of the transition to a more energy efficient Europe. Since its introduction it has instigated changes in the purchasing behaviour of Europeans and has spurred innovation, resulting in more efficient appliances being available to consumers. The upcoming revision of the Energy Label is an opportunity to restore the A-G layout together with the motivational effect of the EU Energy Label, by making the information it provides more understandable and transparent to consumers.

Transport needs a holistic approach

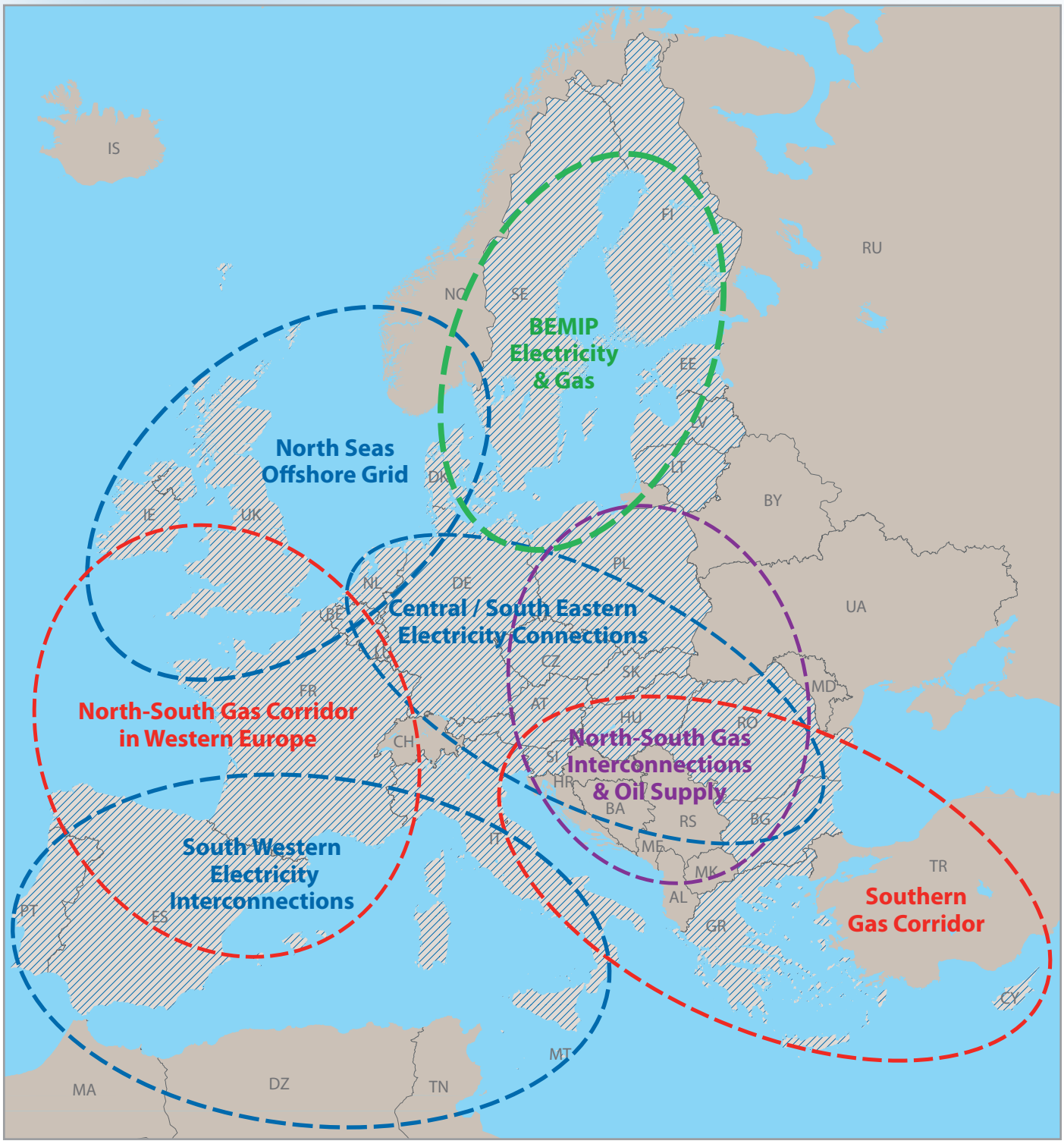
As far as transport is concerned, it is clear that further action is needed to protect consumers from our dependence on foreign energy supplies. The sector as a whole is responsible for around €200bn of the EU's €300bn annual oil import bill. For motorists, this overwhelming reliance on the rest of the world has meant for some tough times and having to stomach short term price hikes in the wake of geo-political unrest whilst dealing with long term price rises due to an increased global demand for fuel over the past 40 years.

The EU has however taken some positive moves as far as road transport is concerned, such as the setting of fuel economy/CO_2 targets for cars up until 2020. This approach has been crucial in spurring car makers to invest in more energy efficient vehicles and further targets are needed for 2025. Of course, setting fuel economy targets cannot be considered as a silver bullet here. It will also require a suit of measures such as improving conditions for alternative energy infrastructure, public transport and cycling in cities.

While the list of areas for action is infinite, it is clear that the secure, low-carbon energy system needs a low carbon society. That requires a serious change of thinking with policy makers designing policies with consumers in the centre.

1 According to coolproducts campaign calculations. For more information: http://www.coolproducts.eu/infographics

European energy infrastructure priorities for electricity, gas and oil



- Gas
- Electricity
- Electricity and gas
- Oil and gas
- Smart Grids for Electricity in the EU

Improving coordination of national energy policies and speaking with one voice in external energy policy

Theresa GRIFFIN
MEP (S&D)

Energy policy has been at the centre of the European project since the creation of the European Coal and Steel Community in 1951 and the European Atomic Energy Community in 1957. Nowadays, energy policy remains at the forefront of the European debate but the political environment is vastly different. These days, energy policy exists in a changed, complex and challenging environment marked by the economic crisis, the fight against climate change, the shale gas energy revolution in the United States, the nuclear accident in Fukushima and, most recently, the gas crisis between Russia and Ukraine.

European energy policy reflects the inherent tension of the EU by its desire to integrate 28 national systems into a single model. This antagonism is particularly present in energy policy where Member States rightly consider energy as a strategic issue but wrongly place their national requirements over efforts to integrate at European level.

Crucially, the EU needs an efficient, influential and coordinated energy policy in order to improve the life of EU citizens while also benefiting the EU as a whole.

There are three main issues to be examined.

Firstly, we need to achieve an internal integrated energy market, which would help reduce the price that consumers pay for their energy needs.

Socially, the issue of fuel poverty is of major concern to both national and European politicians as is the need to provide a certain level of affordability among all Member States. In the UK, according to the Fuel Poverty Statistics Report, around 2.28 million people, representing 10.4% of all UK households, suffer from fuel poverty. At the European level, around 25 million people are estimated to be in from fuel poverty. Unfortunately, this number is expected to increase due to rising energy prices and increased fuel bills. This will have a drastic impact on the quality of life of European citizens and has to be mitigated against in social and economic policy.

In order to promote market integration and solidarity between Member States, we need to reinforce connecting infrastructure and use available EU funding to intensify technical support for critical projects. The complete transposition of the internal energy market must be ensured. In particular, this involves delivering the Third package for Electricity and Gas markets and the Energy Efficiency Directive.

Secondly, on the need for an external energy policy, the recent crisis between Russia and Ukraine has made clear how crucial energy security is for the EU. We must diversify our energy sources and improve energy transmission infrastructures to safeguard our energy independence.

According to the European Commission, since the mid-90s, import dependency has increased by 10%. Natural gas is in the spotlight for disruption risks due to depletion of EU gas reserves. The EU finds itself faced with a problematic combination of a high import dependency on gas and a limited number of suppliers. At present, six Member States depend on Russia as a single external supplier for their entire gas imports and in 2013, energy supplies from Russia accounted for 39% of EU natural gas imports. This is all the more worrying as the EU's increasing dependency on imported fossil fuels may have significant effects on the independence of its decision-making in other policy areas.

The integration of national energy networks can insure energy security by enabling the diversification of suppliers' routes and sources of energy supply to the EU. Diversification of the energy mix and greater support to renewable energies are also strong prerequisites. In June 2014, the European Commission underlined this connection, linking EU energy security with the 2030 Framework and climate and energy targets. The recent crisis may therefore represent a window of opportunity for policy makers to put in place greener and more sustainable policies.

Thirdly, on sustainability, the EU needs to be unified and credible if we want to promote a transition towards less-carbon dependent economies.

Engaging other regions in the fight against climate change should remain one of the EU's top priorities. The November 2014 deal between China and the United States to cap carbon emissions and increase the use of renewables is encouraging; however, the process should not be allowed to come to a standstill. Paris will host the UN Climate Conference at the end of 2015 and the EU should speak with a single determined voice as we still expect global carbon emissions to rise by 29% by 2035.

At the EU level, this means we must remain credible on our commitments to energy efficiency and renewable energies. Ambitious national binding targets must be promoted and the currently flawed EU ETS (Emissions Trading System) should be given the necessary support to succeed with the Market Stability Reserve. In this context, greater energy network interconnections also appear even more necessary due to the intermittent nature of renewable energies.

The common denominator to these three main challenges is the need for a strong political commitment and impetus from EU policy makers.

In his promising hearing before the European Parliament, Commission Vice-President Maros Šefčovič presented his vision of the future Energy Union which will involve five main pillars: energy supply security and solidarity among the Member States; integrated national energy markets; reduction of European energy demand; decarbonisation of the energy mix; and an increase in investments in research and innovation.

We are facing a critical time in energy policy and we must make sure that this political vision is translated into action for the benefit of all EU citizens.

Stepwise to a real European electricity market - Regional approaches as blueprint for capacity markets?

Peter TERIUM
CEO of RWE

"Energy is a powerful instrument for the real economy, key for our security and also key for sustainability." This is a perfect definition for the different roles energy has to play in Europe today and also in the future. It was given by EU Commissioner Miguel Arias Cañete last month in Brussels when concluding a conference on EU Energy Policy and Competitiveness. We as a European utility are working to help realise these three functions. But given the many changes for almost all aspects of our sector, we find ourselves confronted with many challenges.

One of these challenges is to develop a market design for electricity fitting with a growing number of intermittent energy sources like wind and solar. The effects of their volatile supply are well known: Subsidised renewable energies with priority access to the grid put pressure on the wholesale prices, while conventional power plants not only earn less money per produced unit, but also have to be switched off more often for hours, days, sometimes even for months. Plants have to be mothballed or even completely shut down if they permanently are "out of money".

But as the sun is not always shining and the wind is not always blowing, Europe needs enough conventional capacities to cover its demand, 24 hours a day, seven days a week. Markets where this is not possible have to face load shedding. The example of Belgium shows that this is real threat even in Europe: The Belgian government already prepares the general public and the industry for regional "brown outs", should the country face a hard winter like we had two years ago. Even if the situation in Belgium - with unplanned shut-downs of several power plants in combination with small capacity of interconnections to its European neighbours - is not the general case for Europe: This example shows the risk a country and its economy run if incentives are not sufficient to invest in due time in new non-intermittent capacities. While the growing feed-in of the renewables is left out of market forces, the so called "energy only market" left on its own is less and less capable to induce what is needed.

To counter such severe risks for their security of supply, several Member States have already introduced capacity remuneration mechanisms (CRM), others are at least preparing such schemes. They should function as a second pillar of the market with payments for the service to provide the qualified ability to guarantee the security of electricity supply that we are used to in Europe. National CRM should incorporate already a cross-border participation where physically possible. The old ideal of the "European copper plate" still seems far away, but the quantity and the quality of the trans-European, cross-border "interconnectors" will grow anyway. Market schemes have to be prepared for this evolution. CRM also should be non-discriminatory. Schemes which would single out technologies like coal would be inevitably more expensive for the whole system as the operating costs of gas are higher than for coal. This burden would have to be carried by the customer. Additionally a strategy even enlarging the dependence on a small number of importers is running against the objective of Europe to strengthen its security of supply. This argument is valid even without looking at the Ukraine crisis.

But – and this is Europe – most governments still act on their own regardless whether their national schemes fit with a more and more European internal market for electricity. While households and industry still wait to fully reap the long-time promised fruits of the internal market with lower energy prices and secured supply, a growing divergence in national market designs poses a threat to the success of a real "European" electricity market. The European Commission therefore is totally right to demand at least a minimum set of common rules applicable in all Member States if capacity mechanisms are to be implemented. Asking for more already today– a real harmonisation as realised for the internal market for goods and capital – is for now not a realistic option looking to the huge differences we have to recognise in the national systems.

But regional cooperation could serve as a start demonstrating that capacity based market mechanism can also function across borders. The German energy industry is already in discussion with the French industry to develop a common market system which could function as a sort of "pilot" for Europe. The single objective for national as for transnational systems has to be security of supply. Therefore, the future market regime has to guarantee a technology open competition of suppliers in full transparency for all market participants. This is a precondition in order for market forces being able to deliver reliable supply with the best price for the benefit of the national economies in Europe.

Transmission system operators are committed to actively support the achievement of the European energy policy

Pierre BORNARD
Deputy Chief Executive Officer of RTE - Chairman of the Board of ENTSO-E

On the eve of the investiture of the Juncker Commission, the European Council reaffirmed its will to build an Energy Union aiming at secure, affordable and sustainable energy and agreed on an ambitious 2030 climate and energy policy framework. It relies on four main building blocks: an at least 40% reduction in greenhouse gas emissions compared to 1990, two targets of at least 27% for renewable energy and energy savings and a 15% electricity interconnection target.

The implementation of this energy policy framework is one of the priorities of the Juncker Commission… and of European transmission system operators. Indeed, it requires their intense commitment to plan and securely operate the power system while anticipating the important changes it will face in the forthcoming years.

One of the principal challenges that ENTSO-E must respond to is the necessary development of the electricity backbone infrastructure. As typical individual network reinforcements can take in excess of 10 years from design to completion due to very long permitting procedures (and lack of public acceptance), transmission system operators must think in terms of decades into the future. This is the role of the Ten Year Network Development Plan (TYNDP), which provides a reference point for Europe's needs in terms of infrastructure. This community-wide report is published once every two years by ENTSO-E, the European Network of Transmission System Operators for Electricity, as required by the Third Energy Package.

The TYNDP represents the most up-to-date and technically complete study of tomorrow's power system and storage. Its role is to ensure a greater transparency regarding the entire electricity transmission network in Europe. In this sense, the plan provides a picture of the energy mix possible in the long-term perspective, underlines the bottlenecks within the European transmission system and presents the associated pan-European projects meant to solve them.

If the latest version of the TYNDP was submitted to ACER before the European Council, it was however built upon the objectives set out by the European Commission in the Energy Roadmap 2050. Its results hence underline the importance of Europe's infrastructure challenge: interconnection capacity must double by 2030, about 100 investment needs (incl. 15% of upgrade of existing assets), 50 000 km of new and refurbished lines, 21 000 km of new HVDC lines, € 150 billion by 2030. This is a key condition for reaching a competitive, secure and sustainable electricity supply to the European industry and citizens.

Moreover, the general move towards a more diverse, numerous, smaller sized and a less controllable generation fleet presents major challenges to accommodate the necessary second-by-second balance between generation and consumption. The variability of some of this generation with weather conditions requires new tools and approaches in order to maintain adequate security of supply, including the development of more pro-active customer consumption flexibility, the so-called Demand Side Response ENTSO-E is contributing to promote.

This evolution, along with increasing interdependencies between the different transmission systems and shorter market time intervals create new challenges for the TSO community and require much deeper coordination between operators close to real time.

Regional security coordination initiatives - such as CORESO, TSC, SSC… - are key actors in enabling TSO coordination in parts of continental Europe to tackle the new challenges. They already count several years of experience, cooperate with each other and are recognised as important contributors to the security of the overall network. The regional security coordination initiatives have been pioneered and developed pro-actively by transmission system operators. For example, regional security coordination initiatives play an increasingly important support role for operators in the control centres, however, full decision making responsibility remains with the transmission system operators.

This is why ENTSO-E has decided to proceed to a wider application and further development of the regional security coordination initiative model and ensure full European coverage in order to implement the required further steps in operation coordination that the European electricity system needs.

A coordination strategy based on the existing regional security coordination initiative model strikes a balance between regional flexibility (to allow for solutions tuned to the needs of this region) and a more centralised approach (to ensure cross-regional coordination). It is thus the way forward to manage system complexity, ensure full geographical coverage and minimise operational risks.

The role of transmission system operators and ENTSO-E goes beyond these two examples of system planning and operational coordination, as they also play a key role for the conception and implementation of market schemes (to keep them in line with the physical power system) and of harmonised network codes at the European level. This is this expertise and system-wide perspective that transmission system operators are committed to engage to the benefits of European citizens and the society at large.

The Necessary Development of Energy Grids in Europe
For enhanced energy security and diversification

Michel DERDEVET

Secretary General, Member of the Executive Board of ERDF, University Lecturer at IEP Paris, Professor at the College of Europe in Bruges.

Since 1973 and in the wake of the first oil crisis, securing supply and diversifying energy sources have been central to Community and national energy policies. Such diversification has been carried out with some success: alongside oil, coal and hydro-electric power have come nuclear power and natural gas, followed by renewable energies, in particular wind and solar power. Our dependency on oil has been reduced through a transfer of energy use to natural gas and electricity. However, 40 years later, it must be acknowledged that security and diversification challenges remain paramount, whether these are the tensions surrounding our gas supplies from Russia or the growing concerns about the ability of the electricity systems in many countries (France, Belgium) to cope with winter peak demand.

As far as natural gas is concerned, it seems that securing European supplies will require moving forward in three main areas: first, developing pipelines to diversify the energy supply sources. Second, improving the speed of mobilising stocks and setting up the compressors required to reverse the flows, particularly to the countries of Eastern Europe. Finally, reducing congestion such as that between the north and the south areas in France, leading to price differentials and, potentially, to threats to supplies.

As regards electricity, the situation is more complex and is largely the result of the delicate interaction between the liberalisation of the energy sector and energy transition which has led to renewable energies being subsidised. Benefitting from priority dispatch and purchase obligations, renewable energies have helped ease wholesale prices on the markets. As a result, the latter find it difficult to send the proper price signals needed for investment in peak capacities. At the same time, the subsidised RE capacities, due to their intermittent nature, are not able to guarantee peak capacity. Beyond the narrow question of integrating renewable energies, the current situation seems to reveal the weaknesses of the *energy only* market; which is leading to the setting up of capacity mechanisms in Europe.

In this context, the grids are playing a growing role in regulating increasingly volatile power flows and mobilising extra-national capacities through interconnections. Moreover, energy transition is calling into question the tree structure that consisted in transporting energy from major production centres via the transmission network to the distribution network, which would then deliver to consumers. 95% of renewable energies are now connected to the distribution network, which is being transformed into a collection network. As a result, if RTE is planning 15 billion of investment over the next 10 years, ERDF will have to raise more than 40 billion euros. The yearly investment of the network operators in France is virtually identical to the cost of an EPR!

The development of a transport and interconnection grid is indeed essential to address the challenge posed by peak demand and the new distribution of the production sources. For instance, the German power grid is not designed to cope with replacing the nuclear power produced in the south of the country by the wind power generated in the north. Thousands of kilometres of high voltage power lines would be required. For its part, Belgium would no longer have to deal with the problem of supply continuity if it were interconnected with Germany. In addition to enhanced security of supply, new infrastructure will lead to better market coupling, price convergence between countries and a better allocation of production capacities.

Meanwhile, though developing and reinforcing the distribution grids will entail much greater investment, the latter will open the way to tomorrow's innovations. Whether by addressing the intermittence of renewable energy generation or the future pressure related to peaks in demand, developing *smart grids* and steering demand seem essential. This is also a fast-growing market. According to Navigant Consulting, the worldwide turnover of communicating networks is expected to double by 2020 to 55.8 billion euros per year.

Other R&D issues have emerged as being just as crucial, both to address the challenge posed by the European electricity system and in terms of large industrial markets. The chief issue is undoubtedly storage and especially the need to drastically reduce the costs of the existing solutions. Batteries in particular, but other solutions, such as *Power-to-Gas*, seem to have a bright future ahead of them. If, in the coming years, this type of storage technology were to become competitive, the European electricity system would indeed be a lot more secure but it would be disrupted in many of its fundamentals. Furthermore, greater efforts are required in terms of undergrounding and direct current transmission not only to deal with the lack of public acceptance of high voltage power lines, but also to lower costs. Indeed, public hostility towards overhead power lines would be a lot less problematic if undergrounding costs were reduced or if switching from alternating current to direct current became competitive for transport thereby drastically increasing voltage and minimising transmission losses.

While securing our energy supply and diversifying our sources of production, the new power grids will at the same time contribute to developing innovative industrial sectors, ensuring well-functioning energy markets, optimising costs and, ultimately, building a stronger Europe.

Geopolitics of energy: state of the foreign policy of the EU

Philippe JUVIN
MEP, EPP, France

Energy security has become a major geopolitical and economic concern for Europe as a whole. Tensions between Russia and the European Union engendered by the current crisis in Ukraine, coupled with the recent threat of new disruptions in Russian gas supply (through Ukraine) have acted as a strong wake-up call for the European Union to decrease its growing dependence on energy imports, especially on Russian energy, which threatens the security of its supplies. More than ever before, the diversification of sources, suppliers and transport routes must be of priority in the EU policy agenda. Meanwhile, in an increasingly challenging international energy and economic scene, the European Union has also committed to lead the fight against global warming by decreasing its greenhouse gas emissions, improving energy efficiency, reducing energy consumption and promoting renewables, which also stand to enhance EU energy security. In evidence, such substantial projects cannot be handled by the member states without the creation of a true European Energy Union that will enable them to pool their national resources, coordinate their national policies and speak with one voice with their current and future international energy partners.

The European Union currently imports 53% of the energy it consumes and fossil fuels still dominate the EU's energy mix. Although the origins of energy imports have changed in the last decade, Russia remains the EU's first provider of crude oil, natural gas and solid fuels. The results of the energy security stress tests released last October by the Commission have shown the vulnerability of some eastern member states and neighboring countries engendered by their dependence on Russian gas. Considering that no alternatives can be found in the short term, current emergency and solidarity mechanisms have to be urgently reinforced, among which energy storage capacities, development of reverse flow technologies and protection of critical infrastructures. However, such measures require investments in new interconnection capacities and trans-European energy infrastructure projects, as well as the completion of a fluid, unified and transparent energy market within and beyond the EU's borders. In other words, member states need to commit to implement a trans-European energy community that will be led with a unified regulatory framework.

The European Union must also urgently invest in research and innovation to increase its use of indigenous energy sources. In order to achieve the EU's 2030 objectives, priority should be given to improve the cost-effectiveness and grid infrastructures for renewable energies. The exploration of conventional and unconventional oil and gas resources in full compliance with EU environmental and safety standards should also be strongly encouraged. With regard to nuclear energy, which represents an important part of the EU energy mix, urgent efforts should be made in enhancing nuclear safety and diversifying nuclear fuel suppliers.

The diversification of suppliers and routes will be a long-term process that will demand important common investments. Among our current energy partners, Norwegian production has great potential to grow. Regarding the south-eastern gas corridor, the current political tensions with Russia have made the South Stream project lose most of its relevance to the benefit of the Trans-Adriatic pipeline project, which will bring Azeri gas to Europe while enabling natural gas imports from other countries of the Caspian region and beyond. Moreover, the discovery of offshore reserves off the coast of Cyprus could also offer new supplying opportunities. Looking South, despite the fact that the instability of the region currently prevents any long-term commitments, the EU should consider engaging in trade dialogue with Algeria, North African and Mediterranean partners, with a view to developing electricity grid interconnections and creating a Mediterranean gas hub. Finally, the rise of Liquified Natural Gas also offers a major opportunity for diversification of both suppliers and routes in the years to come (Qatar, US shale gas etc.).

As a matter of fact, Europe is not the only entity seeking diversification of its energy supplies. And the growing international energy demand, mainly from Asian clients, might constitute a serious threat to the EU's capacity to meet its future internal demand. Although decisions on energy mix must remain a national prerogative, the EU should now be able to question national deals that threaten Europe's security supply as a whole, which still points to the same urgent priority: Member States must better coordinate important energy policy decisions and speak with one voice in external energy policy. In this perspective, an EU central purchasing body for gas would offer powerful negotiating leverage, especially towards Russia. But more generally, energy security issues must now urgently be co-related with all foreign policy instruments that could contribute to the development of the EU's external energy relations, such as the European Neighborhood policy, the Common Foreign Security Policy, Trade agreements and adhesion negotiations.

In the past, we have succeeded in making Europe self-reliant for food. As far as energy is concerned, the United-States have become independent thanks to shale gas within a few years. The EU should set itself the same goal.

An electrical « hub » in the Mediterranean to secure the electricity supply of the European Union and the countries of the southern rim of the Mediterranean

André MERLIN
President of MEDGRID

The idea of interconnecting large electrical grids has always been ahead of the political world. As a result, we have seen the emergence of a large European cross-border network long before Europe had become what it is today. This need for interconnection has arisen from the difficulty to store electricity: what is consumed has to be generated at the same time, which forces suppliers to provide for additional means of production. Interconnecting with a neighbouring grid and sharing supplies seems like an insurance at a lower cost.

It was only natural to envisage the interconnection across the northern and southern shores of the Mediterranean. The concept of a Euro-Mediterranean electricity grid is not a novelty: the first interconnection between Spain and Morocco, with a capacity of 700 MW, was set up at the end of the 20th century.

In the context of rising $C0_2$ emissions concerns, there has been a particular interest in promoting renewable energy sources, especially solar energy, in the south of the Mediterranean and trying to transfer parts of this energy to Europe. This was one of the components of the Mediterranean Solar Plan.

Medgrid was created in early 2011 to promote and facilitate the setting-up of a Mediterranean grid by 2020 in accordance with this Plan. Since then, the ambition of the Mediterranean Solar Plan has been reduced for 2020 but still remains since it appears that investments in solar and wind power have higher yields in the south of the Mediterranean than in the north. In that regard, the interconnection between south and north, which could operate both ways, remains as relevant as before.

The work of Medgrid

Feasibility studies

One of the first tasks Medgrid had to tackle consisted in defining the possible routes and reinforcing the existing grids necessary to channel 1, 2 or 3 GW from south to north but also from north to south by 2020. Due to geographical reasons (depth of the sea, distances), the submarine links and the grids involved are located in 3 “corridors”: a western corridor comprising the Iberian Peninsula, Algeria and Morocco, a central corridor with Tunisia, Italy and Algeria, and an eastern corridor involving many countries in the Eastern Mediterranean region, from Turkey to Libya.

The construction costs of these infrastructures and the operating costs (maintenance, losses) have been assessed for each case study.

Technological studies

The world’s deepest existing submarine power link is located at a depth of 1600m. In order to expand the choice of link routes it seemed of interest to study the technical feasibility and the economic conditions of the construction of a submarine link reaching a depth of 2000m. Medgrid took as an example the link between Algeria and Italy, which runs along Sardinia, and scrutinized every step of the making, laying and maintenance of the cable. The main issue at such depths lies with maintaining the mechanical integrity of the cable under its own weight, during laying or raising for repairs, and it is critical to develop a resistant enough structure. Moreover, it is essential to use a ship capable of bearing the weight of such a structure. There are solutions but it seemed reasonable to assume that the entire cable and logistical system will only be operational around the years 2030.

Project profitability

Interconnecting two electrical grids achieves several benefits: it allows for cheaper or less polluting electricity import from the other system; in case of unavailability of means of production (or excessive - peak - consumption) it is possible to call upon the production of the neighbouring system without investing in back-up means of production…

We use a digital simulator which models the interconnections of separate or partially interconnected electrical grids in order to assess the economic gain of the interconnections. This model simulates the operation of the existing electricity generation plants to meet the demand at the lowest cost for all countries. To do so, it draws from electrical plants in increasing merit order of variable production costs, wherever these plants may be located within the zone, with the interconnections allowing energy transfer from the country of production. As a result, the overall “annual operation cost” of electricity generation plants is reduced: the fuel and CO_2 emission costs are reduced compared to a situation without the new interconnections. Setting up these interconnections is economically justified if the profit generated balances the annual investment and the maintenance costs of the interconnections.

The model explores the 8760 hours of a year sequentially to adequately take into account the discrepancy in daily load curves of each country as well as a series of contingences influencing both electric consumption (heating and cooling of buildings) and production (wind patterns, solar radiation, water inflow, default rates etc.), many times around in order to draw a statistically significant gain assessment.

Conclusion

Today, all arguments are in favour of developing a Euro-Mediterranean electrical grid: it will provide the opportunity to make the best use of the energy resources, to exploit the potential of renewable energy, more particularly solar energy, in the southern Mediterranean countries, and to enhance security of electricity supply both for northern and southern countries…

The European Union and the countries of the southern rim of the Mediterranean are now faced with the challenge of transforming these studies into projects of common interest (PCI).

The benefits of the external dimension of the European internal energy market

Sami ANDOURA[1]
Holder of the Chair of European Energy Policy, College of Europe

EU member states and operators cannot anymore deal with third countries without **taking the internal market dimensions and common value into consideration**. An EU approach in certain key areas is now necessary to allow that bilateral deals by individual member states and companies with suppliers and transit countries benefit the entire EU market, but also that no third country/companies can threaten key EU energy assets and infrastructures or engage in targeted reductions of energy supplies.

Beyond the current case-by-case *ad hoc* approaches, **the European energy policy should aim at developing the concrete and useful external dimensions** which bring real added value to issues related to EU internal energy market and its security of supply, with a specific focus on a clear strategy of diversification of supply sources and transit routes and on putting the EU and its neighbours right on track towards a pan-European energy market over time based on EU model.

Enhancing diversification of gas sources and transit routes for the common European interest and its security of supply, in order to limit EU's increasing exposure to import dependency, and particularly for EU member states that depend on a single supplier is a key external dimension of EU internal energy market. In this regard, the EU should reinforce energy partnerships and dialogues with the current and future main transit and supplier countries, so as to develop common approaches to security of supply but also to promote trade relations and economic opportunities among industry players involved on both sides.

In order to enhance **transparency and coherence of EU member states actions on the international energy scene**, the European Commission should be able to fully play its role of facilitator in negotiating intergovernmental agreements with third countries on behalf of the EU when it potentially affects the functioning of the internal market such as infrastructures, access to resources and generation facilities, while leaving companies care to negotiate and conclude the commercial contracts in compliance with EU law. The revision of the present IGA mechanism for this purpose is necessary.

The **authorization/certification of access to the EU internal market** to third countries companies should be addressed at EU level. Their access should be subject to an equivalent access to their market through EU negotiated agreements for transparent, stable, and reliable legal frameworks with partner countries. It would also imply to develop an EU strategy over trade and foreign investments in critical energy assets/infrastructures, as all its external partners do for the access to their domestic markets.

The EU should also explore in concrete terms the possibility of **pooling the supply of external energy resources** by establishing, in exceptional and solidly justified circumstances (for instance when suppliers make it an essential precondition, or fora group of small companies and public or private operators which are not involved in the production of the gas to be transported, or in times of supply disruption/crisis), exceptional *ad'hoc* "*Gas Purchasing Group(s)*" aiming to give participating companies a genuine power of negotiation with regard to external suppliers, with EU involvement both *ex ante* (providing authorisation) and *ex post* (ensuring compliance with EU law).

Pooling forces would be equally important to secure the **financing of major transnational infrastructures** for gas transportation (Pipelines and LNG terminals). Solutions also have to be found to the present absence of EU commitment in the form of formal financial guarantee that other major consumer countries can offer to suppliers.

As part of a far-reaching project **to create a pan-European area of security and prosperity**, the neighborhood should be at the heart of the external dimension of European energy policy and internal market, whether it is in the framework of the European Neighbourhood Policy and the Energy Community Treaty. This strategy cannot be limited to transferring the EU energy *acquis* to neighbouring countries but should be based on the following priorities:

- The EU and its neighbours must gradually **open up their respective energy markets** on a reciprocal basis, to develop with partners concrete co-development projects in the energy sector, and to enhance cooperation between regulators, network operators and other stakeholders on both sides.
- The **Energy Community Treaty**, which is the right model for the relations in the EU neighborhood, should be expanded and strengthened in terms of governance, with the sufficient capacity building and institutional setting, and the necessary powers and resources to impose the rule of law and implement the necessary regulation in the countries concerned.

Russia will remain a key energy supplier to the EU in the foreseeable future, making important to foster dialogue as part of EU-Russia energy relations with the long term goal to achieve a comprehensive and strategic agreement. This will only be possible if the EU remains firm and assertive in making its principles and rules respected by Russian operators and better take into account the huge existing interdependence between the EU and Russia in the energy field, which goes much beyond the gas sector.

The same applies to **Turkey** in terms of transit for oil and gas. Turkey's future role as a key transit country for the supply of natural resources to the EU must be entangled in a common binding regulatory framework. This imply to avoid that Turkey becomes another "Ukraine", and to better articulate energy interests with greater political developments related to the enlargement process.

As the **largest economic and trading bloc**, the EU has a lot to offer to external partners and bargain with energy suppliers. Strategies to share and spread risk, and to make the best use of the combined weight of the EU, its member states, energy markets and operators in world affairs can be more effective than dispersed unilateral actions.

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Delivering Energy Security in the EU

David HONE
Chief Climate Change Adviser at Royal Dutch Shell

Long before greenhouse gas (GHG) reductions became a priority and competitiveness concerns rose up the political agenda, Europe had a focus on energy security. In the 1970s and 1980s when externally sourced natural gas came from Russia and oil from the Middle East, but both locations were a cause for concern, security was a relatively simple notion. Today this is no longer the case.

In a globally connected world with highly liquid energy commodity exchanges trading throughout the working week, over-the-counter markets offering a wide variety of cargoes for sale and a multiplicity of national trading partners keen to secure market share in the EU, the concept of energy security is anything but simple.

For much of Europe, the range of supply options available and the well-established flexibility of the global energy market should be sufficient to allay concerns that an immediate issue of security exists. But there remain real and legitimate concerns about short term energy supply in certain EU Member States. The EU is making progress in delivering a functioning internal market and in diversifying both resources and supply options for all. It is important that the EU delivers on its commitments in this regard.

The initial response in Europe to the linked objectives of security, economic development and GHG reductions has been to turn to a strategy built on renewable energy deployment and efficiency. These current cornerstones of EU energy policy appear to meet all the long term needs, in that they apparently reduce the need for imported fossil fuels, lower the cost of energy supply and result in reduced GHG emissions. Unfortunately reality doesn't align with this supposition. The proposals for 2030 have shifted this emphasis back to a single binding target for carbon emission reductions, which is a step in the right direction for both climate policy and energy security.

Perhaps the most challenging aspect of this triple objective is the real reduction of carbon dioxide emissions. The recent IPCC 5th Assessment Synthesis Report states clearly that it is the cumulative release over time of carbon dioxide that matters, not the rate at which emissions are released at some point in time. As such, although reducing the annual flow of emissions from Europe by 2030 is certainly a positive step, it does not necessarily guarantee success in terms of limiting the eventual global temperature rise, even if all other countries followed the EU lead in 2015 in Paris.

From a climate perspective, the temperature rise over time is arguably a function of the size of the global fossil-fuel resource base and the efficiency of extraction at a given energy price. As supply-chain efficiency increases, so does the eventual extraction and use of resources and, ultimately, the accumulation of CO_2 in the atmosphere. This means that efficiency may drive, not limit, the increase in emissions.

In fact, since the Industrial Revolution, efficiency through innovation has revolutionized just a handful of core energy-conversion inventions: the internal combustion engine, the electric motor, the light bulb, the gas turbine, the steam engine, and, more recently, the electronic circuit. In all of these cases, the result of greater efficiency has been an increase in energy use and emissions – not least because it improved access to the fossil-resource base.

EU efforts to rely on renewable energy supplies as an emissions mitigation strategy may be similarly ineffective, given that the displaced fossil-fuel-based energy remains economically attractive, which means that it is used elsewhere or later.

Instead, policymakers should focus on limiting cumulative emissions. Most importantly, it highlights the need for climate policy that focuses on the deployment of carbon capture and storage (CCS), which use various industrial processes to capture carbon dioxide from fossil fuel use and then store it in underground geological formations, where it cannot accumulate in the biosphere. After all, consuming a ton of fossil fuel, but capturing and storing the emissions, is very different from shifting or delaying the consumption of that same ton of fuel.

But it is the inclusion of a robust carbon price within the energy system that really shifts the balance. Not only is it critical within the EU, but it must become progressively global owing to the nature of the problem and the vast scale of international energy trading. A broadly implemented carbon price would impact the terms of trade for fossil fuels, shifting investment patterns towards lower carbon fuels such as natural gas, bolstering the deployment rate for renewable energy and requiring the large scale implementation of CCS. A robust carbon price also addresses energy costs. A recent report released by the MIT Joint Program on the Science and Policy of Global Change argued that with cost as the primary motivation, market-based approaches would be the economically preferred societal solution to emissions control. In their own analysis MIT argued that if Australia, New Zealand, Canada, EU and Mexico formed a carbon trading group within a global agreement, substantial savings would be realised. These savings can be safeguarded by maintaining current approaches to protect energy intensive industries from possible carbon leakage.

A policy framework built on this thinking remains elusive, but is nevertheless achievable within the 2030 timeframe. An early implementation of the Market Stability Reserve offers the opportunity to correct the current allowance surplus within the EU ETS, thereby restoring the carbon price to its necessary prominent role. Renewable energy deployment and improved efficiency are essential for EU economic growth, but they should be the result of a robust and efficiently operating carbon price and not dependent on potentially costly mandates. Such a policy framework, in combination with a technology capital support mechanism (we currently have the NER300) and infrastructure development will also see CCS deployment commence, thereby further securing the EU energy future.

Energy security, a real issue for establishing European leadership?

Ashley FOX
MEP (European Conservatives and Reformists Group)

With each new gas dispute between Ukraine and Russia, the fragmentation of the European Energy market has been shown up as a glaring strategic weakness. Some EU Member States have been reluctant to wean themselves off their reliance on Russian gas, strengthening Russia's influence and delaying the diversification and infrastructure development that is essential to cut exposure to gas supply from a single source. The key objective of our medium to long term energy security strategy must be to ensure that no Member State is unduly vulnerable to disruption from a single energy supplier.

In the new European Commission we have a Vice-President whose role is specific dedicated to the 'Energy Union'. The incoming European Council President, Donald Tusk, has put the creation of an energy union as one of his core objectives. The parameters of what the energy union is, what it should look like, who should do what, have not really been set but recent history shows us that the desire to protect national energy champions from competition means agreement may prove problematic.

Strengthening the Member State's bargaining power in negotiations with external suppliers needs to be considered as a potential route forward, provided that any measures comply with EU internal market and competition rules. The Commission played a coordinating role for the EU when dealing with Russia before, most notably during the gas crisis in 2009, and there is scope for further coordination with Member States when negotiating with Russia. However we must avoid a top-down approach, as the Commission has attempted in the past. For instance mandating collective purchasing at EU level has been proposed by many, but this could have serious consequences on competition within the internal market which we must view as key to security in the long-term.

We have to remember that establishing 'European leadership' in energy security does not just mean *vis-à-vis* our relations with Russia. Member States may choose to collectively agree, via the European Council, to develop and coordinate approaches to new potential gas suppliers. The prospect of US exports as part of TTIP has generated much excitement in Brussels, and we could see increasing volumes of oil from Canada after the Commission dropped its proposals to label oil from tar sands. But we must also look at removing the barriers that restrict access to existing European supply. The on-going row between Spain and France over exporting both renewable energy and gas demonstrates how protectionist some Member States still are - Spanish arguments in favour of exporting its oversupply of wind energy and gas from its seven LNG terminals are sound and seemingly being blocked by a French reluctance to allow this cheap energy to pass across their border.

Continuing the development of electricity and gas infrastructure within the internal market will further enhance our ability to withstand potential supply disruptions and boost competition. Next year Poland will open its first LNG terminal, which along with new pipelines will help further ease Russia's grip on former Soviet-bloc Member States. European partners should support Poland with its longer-term ambition of creating a Polish regional gas hub, which with its shared borders offers the potential to connect Baltic and Nordic states to Southern and Western Europe.

The EU's climate change ambitions have been too isolated both in terms of their impact on energy policy and also in that they have not been matched globally. Indigenous energy production within the EU needs to be more broadly supported and not just in favour of renewables. Planning and permitting in the EU is consistently cited as taking far too long and is placed against the backdrop of an often uncertain investment environment created by a near constant threat of new regulation fuelled apocalyptic scaremongering by climate NGOs. The state aid approval for the UK's new nuclear reactor at Hinckley Point, located in my South West England constituency, is hugely significant and could trigger a renaissance of nuclear power in Europe and much needed secure and low emission electricity generation.

That the world's first fully operational CCS power plant commissioned in Canada in September shows how far skewed the EU's much hyped 'Climate and Energy Package' for 2020 has been towards renewables investment, when we should have been pursuing a variety of low-carbon options. The continued failure of policy makers in Europe to provide the right framework for the development and deployment of CCS would be a serious dereliction of duty. It was therefore pleasing to see the European Council avoiding the same mistake in the 2030 strategy by focussing purely on a single overall 40% emission reduction target.

More generally, energy efficiency can be one of the most effective tools for reducing energy consumption and with it import dependency. The Commission needs to work more effectively with Central and Eastern European Member States to remove the barriers to energy efficiency take up such as access to finance, and also the tendency to undervalue its potential contribution to energy security aims.

Ultimately, energy security is crucial to Europe's economic future and national leaders need to attach as much urgency and dynamism to respond to its challenges as they did with the banking crisis. Stepping up diversification, liberalisation and infrastructure development will do more to boost our energy security than simply moving to deal with Russia collectively ever could.

A Euro-Mediterranean Cooperation on natural gas is a key to energy security in the region

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The South and East Mediterranean region is characterised by a high energy demand growth. Energy demand is expected to double by 2030 according to OME scenarios; electricity demand is expected to triple by then. Simultaneously, the energy system/mix in the North is evolving by a growing integration of renewable sources and energy efficiency in a stagnant period of demand of the economy, and taking into account the phasing out of nuclear energy in some countries and the price evolution of different fossil fuel sources. Moreover, Mediterranean region is facing a transformation of market conditions and relation between suppliers and consumers. Altogether, this rises energy security concerns.

In this context, natural gas is a key to face the flexibility of modern energy system and mitigate environmental challenges. It contributes to global energy security and the development of a safe, secure and affordable energy for the sustainable development of the region. However, uncertainties exist on gas volumes needed in the mid to long term, an important issue for investment in infrastructures and development of additional resources.

Within this picture, I would like to focus my comments on two issues: (i.) the role and the potential of natural gas in the Mediterranean region and (ii.) its role as a driver for cooperation.

(i) Europe is facing the hard challenge of securing its current and future natural gas supply. Its domestic gas production is declining. Furthermore, demand prospect scenarios diverge, depending on the role gas plays to mitigate GHG emissions and to support renewable energy deployment. According to OME scenarios, less than 20% of EU gas demand will be covered domestically by 2030 versus more than 1/3 today.

In the South and East Mediterranean region, one of the most important challenges is to address the increasing energy demand, natural gas being the fuel of choice in the energy mix. Another important challenge is for gas exporting countries to maintain or increase their level of exports.

In such context, actions are needed in two directions.

First, to value the regional resource capital is crucial not only for energy supply, but also to build a virtuous circle between investments, growth and job creation. Creating the right policy framework is a priority to develop the long-term needed investments.

Second, to diversify the market for both consumers and producers. The European Commission has already highlighted the role of the Southern Corridor to bring new supplies from the Caspian and Middle-Eastern countries. Strengthening exchanges with traditional partners in the Mediterranean is also essential. The role of LNG should be reinforced. Then, this means also to optimize the contractual relationship between suppliers and consumers taking into account the need of long term investments.

Within the Euro-Med-region, two opportunities should be taken:

1. To strengthen exchanges with historical producers- Algeria, Libya, Egypt- that represent more than 90% of the present southern reserves (of which Algeria represents 50% approximately). Restoring confidence, promoting a more investment friendly framework and encouraging further dialogue among all stakeholders is compulsory for developing production capacities in order to meet domestic demand as well as export commitments.
2. To develop new resources: natural gas reserves in the region presently stand at 9 Tcm (less than 5% of the World gas reserves), but the region is yet relatively under-explored.

Indeed in the **East Mediterranean region**, recent large-scale offshore gas discoveries have opened up a new deep-water province. The Tamar and Leviathan fields were amongst the world's largest deep-water gas discoveries of the last decade. Israel has the potential to become a gas exporter. Similar could be said for Cyprus once the Aphrodite field is developed. Lebanon may also join the exporters club if the first offshore exploration bid round turns out to be fruitful.

Concerning the **Northern part of the Mediterranean**: These countries have been relatively well explored for hydrocarbons, but recently intensified exploration activities (Greece, Croatia, Montenegro and Malta) raise hopes for additional resources. Italy also is at the core of numerous developments.

Finally, **unconventional resources** may also contribute further but should not be seen as a game changer for the region.

(ii) The regional cooperation is definitely one of the most important answers to overcome the challenges ahead. **Mutually beneficial cooperation** is the solution for investments and innovation, thus security of our energy systems.

Important steps forward have already been achieved, as confirmed by the successful Ministerial Conference organized in Rome on 18 November by the Italian Presidency of the EU and the EC.

In particular, the **"Euro-Mediterranean Platform"** launched is an important tool to facilitate exchange and cooperation. This platform aims at enhancing the cooperation in the Euro-Med region between all the stakeholders of the natural gas chain through a bottom-up approach in order to improve gas supply security by identifying barriers or opportunities in terms of demand, supply, market structure, etc... This flexible structure is instead open to governments, regional organizations, administrative authorities, and private and public companies involved in the natural gas value chain.

OME is committed to pursue its efforts for this platform to be an effective tool to enhance and invigorate the regional energy partnership in the natural gas field.

Energy landscape: the world in 2035

Emmanuel HATON
Director, European Government Affairs, BP

Secure and affordable energy has been taken for granted for decades in Europe and "who cares about a train that comes on time".

Our European energy systems have been delivering energy efficiently for a long time. Due to this, the matter has failed to attract the attention of our decision makers, with the notable exception of treating energy as a fantastic tax vector to finance all sorts of policies.

Aiming at reducing the cost of energy imports and the EU's Greenhouse Gas emissions, policy makers decided to modify our energy paradigm. More renewable energy, less nuclear in certain Member States, energy efficiency measures and newly imported coal from the US have all had a serious impact on the functioning and cost of our energy systems.

It may now be time to reflect and see how the energy world will look in the next 20 years. This projection exercise can help us understand whether Europe has decided to engage in a path that is not supported by the rest of world or if the EU is following a path that we can observe elsewhere.

Three fundamental questions may be asked and answered by looking at our projection: Will the world have sufficient energy to fuel continued economic growth? Will that energy be secure? And will it be sustainable?

On the first question our answer is "yes". We project that global energy consumption will rise by 41% by 2035, with 95% of that growth coming from rapidly emerging economies. That growth is slower than what we have seen in previous decades, largely as a result of increasing energy efficiency. Trends in global technology, investment and policies leave us confident that production will be able to keep pace. New energy forms such as shale gas, tight oil, and renewable will account for a significant share of the growth in global supply.

On the issue of security the predictions offer a mixed, though broadly positive, view. Among today's energy importers, the US is on track to achieve energy-self-sufficiency, while import dependence in Europe, China and India will increase. Asia will become the dominant energy importing region. Russia will remain the leading energy exporter, and Africa will become an increasingly important supplier. Although it will remain a key energy player, the Middle East is likely to see relatively static exports.

On the question of sustainability, we project that global carbon dioxide emissions will rise by 29% with all the growth coming from emerging economies. There are some positive developments: emission growth will slow as natural gas and renewables gain market share from coal and oil. Emissions are expected to decline in the US and Europe, however, this will not be sufficient to avoid the world temperature rise.

Energy demand growth -1.5% p.a. - will be characterised by a very high industrialisation and electrification of non-OECD economies, most notably China.

By sector, industry remains the dominant source of growth for primary energy consumption, accounting for more than half of the growth between 2012-2035. This reflects the unprecedented pace and scale of industrialisation in Asia.

The next major component of growth is energy used in residential, services and agriculture, predominantly in the form of electricity.

The transport sector continues to play a relatively small role in primary energy growth, growing steadily but accounting for just 13% of total growth during 2013-2035.

Over this forecasting period of twenty years, all fuels show growth with the fastest seen in renewable (6.4% p.a). Nuclear (1.9% p.a) and hydro-electric power (1.8% p.a) both grow more rapidly than total energy.

Among fossil fuels, gas is the fastest growing (1.9% p.a) and the only one to grow more rapidly than total energy. Oil (0.8% p.a) shows the slowest growth, with coal (1.1% p.a) only slightly ahead. In the decade 2025-2035 gas is the largest single contributor to growth; but non–fossil fuels in aggregate contribute even more than gas, accounting for 30% of the growth in energy in that period.

By 2035 all the fossil fuels shares are clustering around 27%, and for the first time since the industrial revolution there is no single dominant fuel. Fossil fuels lose shares but they are still the dominant form of energy in 2035 with a share of 81% compared to 86% in 2012.

In summary, our projection clearly shows that there will be enough energy to supply the incremental demand. The fastest growing energies are renewable, nuclear and hydro power but they start from such a low base that fossil fuel will still remain largely dominant in 2035.

As far as Europe is concerned, by looking at its own and its neighbourhood gas reserves, as well as the effectiveness of the oil market to deliver the liquids where they are needed, our conclusion is that EU policy priorities should not be guided by the scarcity of the resource but by the need to fully benefit from the size of its internal market, together with the necessity to reduce Greenhouse Gas emissions.

The completion of a true EU internal market for gas and electricity is indeed the first key contributor to those two objectives.

Energy is not air: a transition is needed to secure our future

Dario TAMBURRANO
MEP

Energy is the blood that flows through the veins of the economy and society. It is essential to all human activities, just as the air. In general sense, energy enjoys the same prominence given to air, that is equal to zero, since its availability is implicitly taken for granted. On the contrary, it is not granted at all: most of the energy used for consumption comes from fossil fuels (gas, oil, coal) and there are countless analyses of the increasing downward trends of global fossil energy reserves.

What we need is a path towards the end of our dependence on fossil fuels: the impact of the reduced availability of fossil fuels would be devastating if it plucked off guard individuals and society. To understand its extent it is necessary to stop, at least for a moment, treating energy as the air we breathe and instead consider that the current social context and production system are based on a model of economic growth which is sustained by the growing use of energy.

Each artefact and each provision of services incorporates the amount of energy required to extract, process, transform and carry the raw materials. Over the past two centuries, thanks to the increasing use of fossil fuels, humanity has enjoyed a rising flow of energy that has made a constant increase in the production and consumption of goods and services possible.

Following the so-called "green revolution" of the agricultural sector, food now also incorporates energy from fossil fuels. It ensures irrigation, synthetic fertilizers and pesticides, transport, processing, preservation and packaging; but also the comfort of a building no longer relies on traditional architectural features related to bioclimatic architecture and local materials: it is based instead on energy-intensive materials (steel, plastic, concrete) and on energy consuming plants to provide heat, cool temperatures and light.

Until when will fossil fuels support this socio-economic structure? Even ignoring the dramatic impact on the climate and the environment, production capacity -- of oil in particular -- and security of supply have, for years, been in a very critical situation, one which the new extraction technologies compensate for with great difficulty.

The oil is a paradigmatic case study, as we are assisting with a progressive reduction of global reserves that is not offset by the start of production of new fields; the decrease of energy return of unconventional oil sources such as tar sands and shale oil (EROEI is the ratio between power generated and that used for the extraction processes: the more the EROEI falls, the lower the net energy, which is what is made available to human society). Beyond that, producing countries are characterized by an increase in domestic consumption and, consequently, by a decrease in exports, by armed conflicts or by political instability. The only new fields lie mostly in still inaccessible areas such as the Arctic and the deep ocean.

Freedom from fossil fuels should be pursued in order to build a transition to a zero-carbon society. Only through this process can we breach our dependence from energy blackmail from abroad (now the EU energy imports for about € 500 billion per year!) while combating climate change direct and reverse effects. Only in reaching this objective will it be possible to achieve an economic stability unaffected by volatile (and rising) energy prices.

This transition, however, cannot be addressed by the mere substitution of fossil fuels for renewable ones, which differ according to the quantity and quality of energy supplied, rates of production, distribution and storage models. It is necessary to foster the political impetus to tackle this problem by taking two directions: on the one hand we must increase the production of energy from renewable sources, on the other hand we must moderate our consumption while maintaining or even improving quality of life and delivery of services. Impossible? Quite the opposite: relatively easy and must cheaper, as consumer bills are reduced. The main driving tool must be energy efficiency: the most common intervention consists of the thermal insulation of buildings, but it could be broadened to and combined with the production of hot water, public lighting, a shorter food chain, relocation of production activities, and bringing the main sites of manufacture and consumption closer together.

Several crucial areas are vulnerable because of energy dependence and are exposed to collapsing in the event of shortages in the energy system for manufacturing, agriculture, transport of people and goods, distribution, sharing of services and so on. The need to protect and sustain these activities is key to understanding how advantageous it is for communities to gain independence from fossil fuels through the production of local and decentralized renewable energy. This would represent a production entrusted to a multitude of plants, themselves dedicated to self-consumption, and for larger plants to be considered and treated as common goods.

Only when citizens are truly aware of the worthiness of energy transition, can they be motivated to deal with the complex process of moving towards a society which is no longer dependent on fossil fuels; one which is instead characterized by energy independence for its local communities, rather than reliance on fossil fuels. It is certainly an ambitious and challenging task which will require much creative thinking, but the interest in undertaking this journey becomes evident when one ceases to take for granted -- as is the case with air-- the flow of energy that permeates the current economic and social structure: an enormous flow with many uncertain prospects.

Energy security: dreams and nightmares

Claude MANDIL
Former IEA Executive Director

Energy security is a concerning issue, which deserves serious thinking and well-designed policies. Unfortunately, this is far from being the case in Europe. In this paper, we would like to single out some energy security-related political statements, which may look obvious, but actually are not.

1) *Energy security is better achieved with less energy import dependency*.

Obvious, isn't it? Sorry, it is wrong. The implied meaning of this statement is that domestic energy supply is always more secure than imported one. Quite the opposite, almost all major supply disruptions of the past decades have been triggered by *domestic* events: hurricanes, droughts, strikes, nuclear safety mishandlings. The only significant exception – the Ukrainian-Russian gas issue – is not enough to base a general policy. Reducing energy imports may be needed for other reasons such as reducing foreign deficit, but not for security.

Should we conclude that European energy supply does not need careful management? Definitively not, but the key word is not independence, it is *diversity*: do not put all your eggs in the same basket; use a variety of fuels, from many suppliers, through different routes. By that token, Energy security of supply in Europe is actually rather good, and should not be worth anxiety.

2) *OK, that may be true in average, but not for a number of individual member states: look at gas supply to some eastern European countries, 100% supplied by Gazprom; you can forget your concept of diversity*.

I beg your pardon: we are supposed to be a European *Community*, with an attempt to define a common energy policy. What epitomizes a community is *solidarity*: no member country should experience an energy shortage, for whatever reason, without receiving an emergency supply from its fellow member states. True, that can be achieved only with some additional inter-connexion investments, allowing reverse flow of gas eastbound, but a lot of progress has been made in recent years, and taken globally, Gazprom accounts only for a mere 27% of total EU gas supply, with plenty of Liquefied Natural Gas (LNG) available elsewhere, now that the US does not need any LNG import, thanks to its non-conventional gas resources.

3) *You naïve guy. That will never happen, because the German know too well what solidarity means: it means that others can make mistake, and that eventually they foot the bill.*

This concern has to be addressed. Indeed, *solidarity* goes along with *responsibility:* each member country should, as requested by a European directive, decide and publish the policies and measures it will put in force under its own responsibility to mitigate the consequences of an energy supply shortage. In that context, solidarity would be a safety net, in case domestic measures are not efficient enough. And to make sure that member states are truly responsible, why not imagine a *peer review* system, with periodic reports made public on each country's emergency preparedness, on the model of the peer reviews made and published by the International Energy Agency (IEA)?

4) *Now, it is crystal clear that European gas purchasers are divided in front of Gazprom, therefore with a lower market power than their giant supplier. The proposal to have one single European gas buyer, made by Donald Tusk, former Polish Prime minister and president-designated of the European Council, is definitely an excellent one, is not it?*

Not so sure, for at least three reasons. The first: among the European purchasers are companies such as E.on, ENI, GDFSuez, not precisely small businesses. Their market power is quite good, indeed. The second: having a single buyer is just killing the market; how can gas utilities compete if they all buy their gas from the same entity at the same price? The third: what we do not like with Gazprom is that this company is too close to the Kremlin; one never knows whether the negotiation is conducted will a business or with the Russian Government. Creating a single buyer will have exactly the same result on the European side, and the purchasing process will be transformed into a diplomatic face-to-face. Is it really what we want?

5) *Anyway, energy security in Europe will soon be improved thanks to decentralised supply, close to consumers, provided by wind power and photovoltaic.*

Sorry, wrong again. Because of a binding target (20% in 2020) for energies which are intermittent and not –or not yet – cost-effective, specific measures had to be enforced in Europe: priority access to the grid and generous feed-in tariffs. The result? Market mechanisms were simply killed. Today, wholesale prices are too low to give the appropriate signal for much-needed base load and back-up capacities, and load variations caused by intermittency put the grid balances at risk. The probability of a severe blackout in winter is higher than it was twenty years ago! This concerning situation will last as long as market mechanisms (including a capacity market) will not be applied to all kinds of energy.

6) *But at the end of the day, why is it so difficult to provide the ordinary citizen the energy he or she wants?*

It is very difficult, because the ordinary citizen wants an energy which is safe, plentiful, available, clean, not radioactive, free of equipment in my backyard … and cheap. And no politician is brave enough to explain that this energy does not exist.

André MERLIN, President of MEDGRID,
Mariya GABRIEL, MEP, Vice-Chair of PPE, Member of PA-UfM
Françoise GROSSETETE, MEP, Vice-Chair of PPE,
Gilles PARGNEAUX, MEP, Member of PA-UfM
Kindly invite you to attend the

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