Stock taking document
Towards a new Energy Strategy for Europe 2011-2020

Introduction

European energy policy has developed in the last decade with the European Commission adopting successive Green Papers and Strategic Energy Reviews to advance the agenda on sustainability, competitiveness and security of supply. The first EU Energy Action Plan[1], endorsed by the European Council in March 2007, has been largely executed through new legislation and ongoing proposals that will soon be agreed. In 2007 the European Council called on the Commission to prepare a new Action Plan for the post 2010 period.

The overall goal of European energy policy remains **to ensure safe, secure, sustainable and affordable energy for all**, businesses and consumers alike. The challenges of global energy security and energy geopolitics, slow progress in combating climate change at the global level, the urge to recover on growth and jobs in the EU and the need to invest in tomorrow's energy networks call for a new Energy Strategy to further deliver on those objectives.

The Commission's proposals for a **Europe 2020 Strategy** include the flagship initiative to promote a "Resource-efficient Europe". This incorporates the commitment to **deliver the 20-20-20 targets** on greenhouse gas emissions, renewable energy and energy savings (with the target of a 30% cut in greenhouse gas emissions if the conditions at international level are right). It also requires completing the internal energy market and implementing the European Strategic Energy Technology Plan (SET-Plan).

Completing the internal energy market, achieving energy savings and promoting low-carbon innovation are the main vectors to reach the objectives of competitiveness, sustainability and security of supply. A well functioning internal market, based on regional and pan-European interconnections, will serve all consumers, ensure energy security and allow the transition towards a low-carbon electricity system. There remains large scope for cost-efficient energy saving measures in order to reduce greenhouse gas emissions; energy savings also lower the energy bill and reduce dependence on energy imports. Finally innovation will be essential to make our energy system sustainable and to renew Europe's manufacturing base and create green jobs. An open global business climate and a more coherent and effective approach to the EU external energy relations will also help us to reach our objectives.

The inclusion of a specific chapter on energy in the **Lisbon Treaty** now offers a firm legal basis for developing energy initiatives based in particular on sustainability, security of supply, the functioning of the internal energy markets, the interconnection of networks and solidarity, while restating the right of Member States to decide which fuels to include in their energy mix.

The purpose of this document is to take stock of the far-reaching debate on energy policy initiated by the **Spanish Presidency**, including at the fruitful Informal Energy Council on 14-15 January 2010, in view of formulating a new comprehensive Energy Strategy for Europe for 2011-2020 early next year. The Commission is committed to have an in depth discussion with all stakeholders on the basis of this stocktaking document.

[1] COM(2007)1

1. Progress since the Energy Action Plan of 2007

1.1 Achievements of the 2007 Energy Action Plan

Four years ago, the EU had no comprehensive energy policy. The Energy Action Plan of 2007 has not only resulted in a large number of new initiatives, legislation and heightened public awareness. It has also started to change the political context for energy policy making and demonstrated that certain measures such as the promotion of renewable energy and energy efficiency, the trans-national modernisation and expansion of grids, the promotion of gas security of supply and energy technology developments and the creation of a functioning energy market are most appropriately dealt with at EU level.

The Energy Action Plan of 2007 has led to concrete results such as the adoption of the third internal energy market package, the energy and climate change package (in particular the Renewable Energy Directive and the revision of the EU Emission Trading System), the Nuclear Safety Directive and the Strategic Energy Technology Plan. A raft of energy efficiency legislation was adopted and progress was made in major regional infrastructure projects.

The **third internal energy market package** has laid out the framework conditions for a fully functioning and competitive internal market, which ensures more choice and the lowest possible energy prices for consumers and business, greater transparency and competition as well as strengthened security of supply by improving the conditions for investments in power plants and transmission networks. Work is well underway for the establishment of a European Agency for the Cooperation of Energy Regulators (ACER) which provides for regulatory oversight at EU level. With the new European Networks of Transmission System Operators (ENTSOs) progress is made on harmonized network rules and coordinated investment plans. The emergence of a number of regional electricity markets[2] is a positive sign of further market integration. Greater attention is also given to individual energy consumers and the functioning of retail electricity and gas markets.

A well functioning, competitive internal energy market is key for the long-term energy and climate objectives pursued by the EU: it ensures energy to be supplied most efficiently and eliminates undue monopoly profits. Only this way, the carbon price emerging from EU policies like the EU ETS can convey the necessary investment signals, which are indispensable for a cost-effective transition to a low-carbon energy system. If these investment signals were distorted or undermined, as it might be the case if competition does not work properly, the EU economy would incur higher costs.

With regard to the **infrastructure** required to complete the internal energy market, an important debate on the future framework for European energy networks was launched in 2008[3]. The Commission is taking a strategic interest in a number of network initiatives endorsed by the European Council in 2009[4] which will lead to better regional connections in the Baltic, Mediterranean and Central and Eastern Europe regions. The new Regulation on

[2] such as the Pentalateral Forum in Northern Europe, the Heptalateral Forum in Central and Eastern Europe, or MIBEL in the Iberian peninsula.

[3] Green Paper *Towards a secure, Sustainable and Competitive European Energy Network* COM(2008)782

[4] Baltic Energy Market and Interconnection Plan, Mediterranean Ring, Southern gas corridor, electricity and gas connections in Central and South Eastern Europe, North Sea offshore wind network and grid connections, strategy for Liquefied Natural Gas

notification of infrastructure investments will also contribute to better monitoring of energy infrastructure investments which will help to identify bottlenecks in all areas of energy: generation, transmission, storage and processing/refining.

The **European Economic Recovery Plan** earmarked an unprecedented amount of €3.98bn EU public funding for energy projects with the aim to promote energy policy objectives as well as economic recovery and jobs.

To reduce greenhouse gas emissions, an **amended Emissions Trading Scheme** and legally binding national emissions reduction targets for non-ETS sectors in 2020 (Effort Sharing Decision) have entered into law.

To boost **energy efficiency**, a revised Energy Performance of Buildings Directive and Energy Labelling Directive have been agreed and Eco-design implementing measures were adopted (including gradual phasing out of incandescent light bulbs).

The **Renewable Energy Directive** established for the first time binding targets at Member State level, both for the overall share of renewable energy and the share of renewable energy in transport. It also established framework conditions that will ensure that these objectives are achieved in an efficient and sustainable way. The first round of reporting from Member States under the Directive (the "forecast documents" of December 2009) showed that collectively Member States should over-achieve the share of 20 % renewable energy in 2020 required by the Directive.

To accelerate the development of low carbon technology, the Commission tabled a **European Strategic Energy Technology Plan (SET-Plan)**. Both Parliament and Council have endorsed the Commission's proposal to focus existing resources at EU level[5] to implement the SET-Plan, particularly the European Industrial Initiatives on wind, solar, bioenergy, electricity grids, Carbon Capture and Storage, and nuclear fission (generation IV reactors). The planning phase has already demonstrated the positive effect that initiatives of this kind have in enhancing coherence between actions at national and EU level and in providing a more attractive and powerful framework for international cooperation.

Cohesion policy rules were also revised to allow further support investments on energy efficiency and renewable energy in residential buildings throughout the EU, with a potential of up to EUR 8 billion for the period up to 2013.

Energy solidarity and security concerns have become more prominent in recent years. The oil emergency stocks mechanism has been updated, and a proposed Regulation to strengthen gas security of supply, including emergency preparedness, is due for adoption in 2010. The proposed Regulation, together with the ten years network development plans of the European Network of Transmission System Operators, will help resolve some of the issues that were highlighted during the Ukraine-Russia gas crisis such as weaknesses in infrastructure and uneven emergency planning.

To support the contribution of nuclear energy to security of supply and the low carbon energy mix, the EU has further developed an advanced legal framework on nuclear safety, security

[5] Energy part of the Seventh Framework Programme, Euratom Framework Programme, innovation part of the European Energy programme for Recovery, and the 300 million allowances of the new entrant reserves of emission allowances of the Emission Trading System.

and non proliferation. A fundamental step was the adoption in 2009 of a new legally binding **European framework for nuclear safety.** The framework for nuclear safeguards has also been strengthened through the introduction of integrated safeguards in all EU non nuclear weapons states with significant nuclear installations.

On the **external dimension**, the EU agreed a number of new energy dialogues and intensified its existing cooperation with countries in its eastern and southern neighbourhood, neighbouring partners in the Western Balkans under the Energy Community Treaty, Central Asia, Iraq and the Middle East, as well as China, Russia, Brazil, the US and the African Union. Energy cooperation addresses issues of mutual interest ranging from regulatory cooperation to infrastructure development and from promotion of sustainable policies to joint projects (Mediterranean Solar Plan, biofuel sustainability scheme, EU-US Energy Star agreements). International nuclear energy cooperation, in particular in the fields of safety, security and non-proliferation, has also been strengthened, through Euratom agreements with key partners and reinforced cooperation with the International Atomic Energy Agency.

Progress was made to open membership of the Energy Community to Turkey, Moldova and Ukraine, with Moldova expected to become a full member as of 1 May 2010.

EU collaboration in international organisations such as the International Energy Forum and the International Energy Agency as well as with OPEC has also been strengthened. The EU worked closely with the G8 partners on setting up the International Partnership on Energy Efficiency Cooperation. Finally, energy has been increasingly integrated into the EU's trade negotiations in various settings, including bilateral (for example Ukraine) and multilateral ones (for example, WTO accession of Kazakhstan) by addressing trade and investment issues.

1.2 Remaining gaps and shortcomings

For European energy policy to be effective, it is not sufficient that a legislative framework is in place; it must also be implemented. **The current state of implementation of European energy legislation is overall poor**. For example, the Commission has had to pursue many Member States for inadequate implementation of the second internal market package, adopted 7 years ago (except for the Gas Regulation that was adopted in 2005), and the Energy Performance of Buildings Directive dating from 2002. A large number of National Energy Efficiency Action Plans submitted in 2007-8, as required under the Energy Services Directive, were disappointing. In the area of renewable energy, where legally binding targets were agreed upon in 2009, there has been more progress but the economic crisis of 2009 may have jeopardized or delayed planned industrial investments.

The result of the poor implementation is an internal energy market which does not function properly yet. This means that a crucial lever to promote affordable and secure energy and to accompany the transition towards low carbon energy is currently not fully exploited. Well functioning retail and wholesale markets, accompanied by smart regulation, are crucial to ensure that citizens and businesses in Europe can exercise choice with the appropriate tools at their disposal[6] and that competition between suppliers presses prices down and quality of

[6] Recent consumer surveys identified energy among the markets where stronger focus on consumers is needed. Further analysis is carried out to understand the problems consumers are facing in retail electricity and to look at best practices.

service up. Well functioning markets, accompanied by a stable regulatory framework, are crucial to provide producers, suppliers and distributors with the necessary transparency and predictability to base their investment decisions on. Well functioning and well interconnected markets in Europe are necessary to allow resources to be shared across Member States, getting the most out of supply diversity (including from renewable sources), flexibility of demand and spare capacity. Interconnected markets are also crucial to allow for solidarity at times of a supply crisis. Integrated energy markets will finally strengthen the EU's position towards its international partners.

An important weakness is the **lack of a European infrastructure framework**. A common perspective has become critically needed to address four challenges: to interconnect the various markets in Europe and accomplish market integration; to ensure security of supply through proper connections with third country supply sources; to link sources of renewable energy production with the existing grids; and to develop smart grids which pave the way for increased decentralisation of energy production and the full absorption of renewable energy. The Trans-European Network framework allowed for very little EU coordination over infrastructure developments. Although the third internal market package and the proposed Gas Security Regulation both include provisions to enhance coordinated energy infrastructure investments, there is a need for a more strategic, coherent and better-targeted approach to energy infrastructure in the EU.

The energy savings potential continues to be greatly underutilised. The EEAP has led to significant advancements in Community energy efficiency and savings policy. However, there is a large room for improvement. The EU has to realize all the 20% potential for cuts in primary energy consumption by 2020. Apart from its obvious importance to energy security and sustainability, energy efficiency is also central to making the economy more competitive, promoting local businesses opportunities (especially for SMEs), and lowering people's energy bills. More financing, awareness-raising, qualified workforce, quicker uptake of energy efficient technologies and innovation as well as better functioning markets for energy services are all needed to facilitate a higher uptake of energy efficiency. Without significant energy savings and reduction in energy intensity including energy-efficient behaviour, a sustainable and low-carbon economy will be impossible to achieve.

The **coordination of the external dimension of the EU energy policy also remains weak**. The EU still does not leverage an influence commensurate with its size as a regional energy market of half a billion consumers. Speaking with one voice on key questions of energy policy would significantly strengthen the ability of the EU to impact global developments. The status of relations with the Russian Federation as the EU most important energy partner needs to be upgraded and strengthened. With regard to neighbouring countries, the extension of the main principles of the internal energy market should be accelerated to increase transparency and security of supply and to improve the investment climate.

Europe's first-mover advantage in renewable technologies and in energy efficiency standards for products, buildings and services should also give more scope for promoting international work in this field. Bilateral cooperation e.g. with the US and China offers opportunities in this respect as do multilateral efforts in fora such as IRENA and IPEEC[7]. Ambitious global efficiency standards and globally applied renewable technologies will broaden the basis for EU businesses to market their products and know-how in this area. There is also scope for

[7] International Renewable Energy Agency and International Partnership for Energy Efficiency Cooperation

applying more coherently trade and investment discussions in multilateral and bilateral context, both through negotiations and strategic dialogues, to secure a more stable framework and legal certainty for energy and green technologies, and to create a balance of interests.

Innovation remains critical and must be given even higher priority. R&D spending in Europe is below 2%, compared to 2.6% in the US and 3.4% in Japan, mainly as a result of lower levels of private investment. Europe needs to focus on the impact and composition of research spending and to improve the conditions for private investments. The Commission has estimated EU technology development investment needs of €80 billion up to 2020. This amount can increase up to 1 trillion Euros in the next 20 years perspective to keep energy flowing while making the switch to low carbon energy and delivering the 20-20-20 targets as well as on long term climate change and energy goals. The challenge for policy delivery is to ensure that available funds are invested in the sort of projects and initiatives which will contribute most to achieving the energy policy objectives. In addition, public funds should be used as seed money attracting private investments to a maximum extent, for example through public-private partnerships.

In **transport**, regulation has been adopted to accelerate the introduction of cleaner fuels and power-trains. CO_2 limits have been imposed on the performance of new car fleets and the Commission has adopted a similar proposal for vans. The fuel quality directive targets well to wheel emissions and there is also a binding target of 10% share for renewable energy in the transport sector by 2020. These recent initiatives will need to be complemented by advances in overall system efficiency through better integration of transport modes and traffic management and by further improvements in fuels and vehicle technology such as second generation biofuels and clean low-carbon electricity generation linked to electric car developments.

Public awareness-raising and acceptance have perhaps been underestimated for their impact on delivering energy policy. The success of energy labelling suggests that information that is fit for purpose (simple, concise and comparable) and awareness raising campaigns can change habits. An informed public can become a crucial driver of policy implementation. On the other hand, public opposition to new energy infrastructure projects is frequently a key obstacle to new investments in grids that are necessary to enhance security of supplies and the integration of renewable energy sources in the supply system. Public perceptions are also crucial for the future use of conventional energy sources and for timely implementation of new technologies designed to reduce their carbon footprint, such as Carbon Capture and Storage.

It is imperative to exploit full potential offered by advanced ICT technologies. Smart meters should enable well informed consumers to contribute substantially to energy savings and production from renewable sources at local level. Advanced meter technologies will need to be consumer-friendly so that consumers can have relevant and comparable information. It is important that all consumers are able to benefit from these opportunities. Moreover, questions about data protection, privacy and systemic safety against cyber-crime or terrorist attacks need to be addressed.

2. Next steps: towards an Energy Strategy for Europe 2011-2020

2.1 An evolving environment

Internationally, the growing world population and rising incomes of citizens in developing economies create a rising demand for limited fossil fuel resources. Countries that were previously energy exporters are now becoming energy importers. China is fast becoming the world's largest energy importer, and even major oil and gas producers such as Iran and Indonesia import fuel to cope with growing demand at home. At the same time new suppliers emerge (for instance in relation to biofuels) or major economies have managed to reduce their dependence on imports (like the US due to the recovery of shale gas).

The EU has no choice but to ensure that its energy policy has a strong and coherent international dimension and to integrate energy into its external policies and actions. In ensuring a stable and secure supply of energy resources at affordable prices which the internal market needs, 27 Member States acting together on an EU solution will have more impact than a single Member State. While recent events have underlined that the main challenge concerns the future security of gas imports, there have also been some instances of supply disruptions for oil even though oil is more diverse in terms of supply sources, routes and infrastructure. The EU needs to develop a coherent and unified response to promote certainty and stability in bilateral relations and to ensure modernisation of existing and the development of new energy infrastructures, among other challenges.

One striking event reflecting the extent of the **challenge for European energy security** was the gas disruption between Russia and Ukraine in January 2009, which affected 12 Member States and which was only resolved by joint European action. This raises the important issue of transit which the EU needs to address.

These developments also underline the need of a fresh look at our indigenous energy sources and the role they can play in the security of our energy supplies. Technological progress makes it possible to use in a sustainable and economic manner EU's indigenous resources, including unconventional ones, which could not be tapped in the past.

At the same time, the EU economy is likely to remain highly dependent on imports of a number of conventional fuels (coal, gas, oil) for the foreseeable future. As part of the transport almost exclusive dependence on oil, Europe increasingly relies on imports of diesel in order to balance the demand patterns on the European fuel market. This dependency translates into exposure to global markets for such commodities. Such exposure is particularly visible in case of oil whose global market is characterized by significant volatility. The EU's measures to promote a diversification of the economy away from oil, notably in the transport sector, are not moving fast enough to increase the resistance of the EU economy to such volatility. 2008 saw oil prices reach almost $150 per barrel, compared to barely $10 a decade before. Subsequently, oil prices collapsed, before edging up to above $80 per barrel in 2010.

This level of volatility not only damages economic stability as a whole. It is also detrimental for energy project planning and investments, particularly since gas prices remain linked to oil prices in most continental long-term gas contracts, further undermining the stability of future supplies. The economic crisis and market volatility led to a 20% lower capital expenditure in oil production investments in 2009 compared to 2008; the IEA estimates that some 6 millions barrels a day of capacity have been either delayed or suspended indefinitely.

The results of the Copenhagen climate conference in December 2009 confirm that the contribution of energy policy **to tackling climate change** remains crucial. The "Copenhagen Accord" anchors the EU's objective to limit global warming to below 2°C above pre-industrial levels[8]. It requested developed countries to put forward their emission reduction targets, and invited developing countries to put forward their actions, by 31 January 2010. The more than 100 submissions to date by both developed and developing countries[9], many of them including targets or actions, demonstrate a broad and still growing support for the Accord. They demonstrate the determination of a majority of countries to step up their actions on climate change now. The Copenhagen Accord also provides for fast-start support to developing countries approaching US$ 30 billion for the period 2010-2012, with balanced allocation between mitigation and adaptation[10].

The EU will be an even stronger and credible participant in the coming rounds of global climate change discussions if it has an effective, unified energy policy in place.

The **ongoing economic crisis** exacerbates the need for an effective European energy strategy. While it has – temporarily – decreased energy demand and related GHG emissions, the uncertainty created by the crisis puts the brakes on many critical energy projects and risks slowing down energy technology development. The economic crisis has exacerbated a glut in international gas supplies. Low demand combined with unconventional gas and large LNG projects coming on stream, has temporarily exerted a downward pressure on prices, which could create the illusion that gas prices will remain low in the future. That illusion, in turn, could remove the sense of urgency for investments in energy efficiency, in tapping new supply sources and in transport infrastructure. When demand for gas will pick up as the economy comes out of recession, such underinvestment may lead to a shortage in supplies which could push prices up again and hence slow down economic recovery and growth while foregoing the advantages of savings on the EU's total energy import bill.

As a result of the crisis, energy demand and greenhouse gas emissions have fallen. In a short term that might seem as positive news from the energy sustainability point of view. But the result is principally a mere effect of a drop in economic activity, while energy sustainability means less energy and less greenhouse gas emissions *per unit of output* not in absolute terms. The challenge for the EU is, thus, to ensure that the economic growth policies which emerge from the crisis continue to curb demand and emissions, and do not result in a return to the upward curve of the past. The EU therefore should not renounce on the level of ambition of its policies. Moreover, the recession has also increased the pressure on investors and made finance scarce. The EU energy system needs billions of Euros of investments in energy networks, production and transport capacities and clean technologies. This must be a key theme of the future energy strategy.

Investments should be geared to contribute maximally to the European energy policy objectives (i.e. safe, secure, sustainable and affordable energy for all) whilst at the same time

[8] The Accord even calls for consideration of strengthening the long-term goal, including in relation to temperature rises of 1.5°C.

[9] An overview of submissions thus far can be found in the staff working paper SEC(2010) 261 accompanying the post-Copenhagen Communication COM(2010) 86/3 and on http://www.unfccc.int.

[10] As part of the EU and its Member States fast-start activities the Commission is currently programming and designing its own fast start interventions in developing countries for an amount of € 150M for the period 2010-2012. Several of these actions will focus on renewable energies, support to mitigation of greenhouse gas emissions, capacity building and against deforestation.

enhancing the competitiveness of European industry and creating sustainable jobs. It is vital for Europe to maintain its capacity to innovate and to remain competitive on leading technologies with multiple benefits: decreasing unit costs of energy production in Europe and exports of know-how and equipment to developing countries thereby also promoting energy-mix diversification and greener development paths in those countries.

The EU has just renewed its strategy on growth and jobs and proposed an **EU 2020 agenda** on smart, sustainable and inclusive growth. The objective is to come out of the crisis with a stronger and more sustainable economy, which delivers high levels of employment, productivity and social cohesion. Energy policy has a prominent role to play to contribute to the success of this agenda.

2.2 Key issues for the new energy strategy

2.2.1 A strong focus on implementing agreed policies

As a starting point for making further progress, Member States and the Commission must ensure that the rules adopted since the 2007 Energy Action plan are properly implemented. Implementation of adopted legislation will create a stable framework for businesses to plan their investments and activities, will offer benefits to consumers in terms of choice, security of supplies and information available. It will also enhance the credibility and strength of Europe towards its international partners.

Proper implementation of already adopted legislation, including the **2nd and 3rd internal energy market package,** is essential to ensure that the market provides the right price signals for investments. Well functioning retail and wholesale markets with smart regulation are needed, including a more active role of the regulators in promoting efficient markets and implementing them at the European level (with the help of ACER). The Commission will continue to assist the Member States, where appropriate, in implementing the measures needed to complete the internal energy market. However, if necessary, it will not hesitate to launch infringement procedures in order to ensure compliance so as to establish a level playing field in all Member States. The Commission will also continue to enforce stringently the competition rules in the energy sector, including State aid rules.

Implementing the **agreed policy on renewable energy, energy efficiency** and the **Strategic Energy Technology Plan** will in any event be necessary as a first step to achieve the ambitious 20-20-20 targets for 2020. Further steps are needed but such measures will not be credible or effective, if the existing legislation and programmes are not fully implemented. The Commission is committed to work with the Member States where appropriate to ensure maximum compliance, including infringement procedures if needed.

2.2.2 Full integration in the longer term perspective

In line with the internationally agreed target to limit global temperature increases to two degree Celsius compared to pre-industrial levels, the European Council set as objective a 80-95% reduction in greenhouse gas emissions by 2050 compared to 1990 levels. As some 80% of these emissions come from energy (production of electricity and heat, transportation, fossil

fuel combustion in buildings and services sector, and in industry), avoided energy use, improved energy efficiency and decarbonisation of energy supply are the core components of any pathway towards achieving decarbonisation.

The **Decarbonisation of Energy Roadmap to 2050** will bring together a range of possible development paths for energy production and use in Europe in line with long term EU climate targets and will explore cost-effective transition pathways. This should serve as a basis for a better assessment of implications of today's energy policy decisions and better understanding of the decisions of strategic importance needed today.

The new strategy for energy policy for the period 2011-2020 should be fully compatible with the longer term decarbonisation objective, taking into account in particular the long-term investment periods in the energy sector. As certain elements of the longer term future are inevitably uncertain, such as possible technological breakthroughs or failures, it is important to avoid lock-in.

2.2.3 Priority areas for the future strategy

Modern integrated grids

A key focus in EU energy policy in the coming years will be energy infrastructures. By 2020, it is essential that the EU disposes of energy networks that:
(i) form the backbone of a fully integrated European internal energy market enabling gas and electricity to flow between Member States without bottlenecks;
(ii) link Europe to diversified supply sources in third countries;
(iii) allow to feed renewable energy production, off-shore and on-shore, into the European supply system;
(iv) are smart, i.e. allow to integrate intelligently actions of generators and consumers in order to efficiently deliver sustainable, economic and secure energy supplies.

As a further step towards the creation of such grids, the Commission intends to present a new proposal for an **Energy Infrastructure Package** by the end of 2010 that will form the basis for future strategies to develop infrastructure and interconnections at the European level. It will prepare the replacement of the current framework for Trans-European Networks for Energy.

The TEN-E Implementation Report[11], adopted on 4 May 2010, highlights the priorities, which will be further elaborated and analysed in the Package. The package will address the shortcomings of the current TEN-E framework and the challenges and difficulties that energy infrastructure is facing or will face in the future. In particular, to meet the ambitious energy and climate policy goals, the networks must become more Europe-wide, to enable the development and proper functioning of the internal energy market, to strengthen security of supply but also to provide the right size for innovation. They must also become more flexible, to allow integration of renewables and new low carbon technologies, such as CCS, into the network; incorporating new energy demand technologies, such as "smart" metering, and new demand patterns, such as plug-in electric vehicles.

[11] COM(2010)203

A priority area will be smart grids to enable more active transmission and distribution systems in order to improve efficiency, reliability, flexibility and accessibility. The development of technology to deliver more efficient management of networks where it is needed at the distribution level and to develop fully interoperable grids, will to a large extent consist in the integration of information processing and communication functionalities. Possible synergies between energy and telecommunication infrastructures should be explored, in particular at the distribution level where both energy and information and communication technologies converge[12].

The external dimension of infrastructure and the diversification of supply routes and sources will also need to be looked at, especially in the gas sector but possibly also for oil.

Furthermore, the Commission will examine how to accelerate authorisation procedures, taking into account that local communities are often resistant to energy infrastructure in their neighbourhood, and how to increase coordination between Member Sates to achieve key infrastructure projects of European interest.

Improving the resilience of existing energy networks will also be needed and will require a common and coordinated approach for assessing the vulnerability of critical infrastructure to extreme weather events[13]. This provides a basis for strategic choices regarding networks, back-ups and energy security. Energy infrastructure projects which receive EU funding should take climate-proofing into account based on methodologies to be developed.

On financing, network investments should in future continue to be financed mainly from tariffs paid by the users. The third internal energy market package created solid bases for investments in infrastructures, notably through the 10-year Network Development Plans that are being developed by the ENTSOs. ACER & ENTSOs will have a key role to play through improving the electricity and gas market design and preparing the market for future challenges such as integration of renewable energies.

However, not all infrastructure investment will be delivered by the market alone, and cost cannot always be directly allocated to beneficiaries for projects with widespread European benefits (e.g. when one member state invests to the benefit of neighbouring states). The package will address the issue of the optimal balance to be found between "the user pays" and "the taxpayer pays" principle.

The new proposal should lead to a far more strategic, coherent and better-resourced financial instrument.

Issues for consideration for the short-term:

- Strengthening cooperation and coordination at EU-level of energy networks to build a pan-European integrated, interoperable, secure and modern grid.

[12] See the strategic initiative " A digital agenda for Europe"
[13] *Adapting to climate change: Towards a European framework for action* COM(2009)147

- Improving the framework conditions for investments in renewing power generation and infrastructure.
- Promoting the development of fully interoperable smart grids, inter alia to allow for decentralisation of energy production, integration of renewable energies and the completion of the internal energy market. This includes the roll-out of smart meters whereby individual consumers can better monitor their demand to reduce peaks and transfer demand to cheap-rate periods, enter into demand-response agreements and improve energy efficiency within their homes.

Issues for consideration for the longer-term:

- Strengthening the role of ACER & ENTSOs to develop a more integrated regional and European energy market.

Making progress towards a low-carbon energy system

Preparing the shift towards a low-carbon energy system will require the use of various instruments. A reduction of emissions from energy production and use can be achieved in any of the three following ways: reducing emissions, reducing energy needs and increasing the production and use of carbon-free energy.

- **Reducing emissions** is the overall goal foreseen through the decarbonisation of the economy which implies policies in various sectors such as energy, transport, agriculture as well as the use of market-based instruments such as price signals, taxation and the ETS.

- **Reducing energy needs** is a key priority and requires reinforced policies at all levels. The objective of achieving 20% energy savings by 2020 is an indicative overall target; there are no individual targets on Member States. In the framework of the new Europe 2020 strategy, the Commission has entered into a dialogue with Member States on how to determine national targets, which would facilitate tighter monitoring of progress towards the EU common objective as well as more regular adjustment of national strategies.

In parallel the Commission has embarked on the preparation of a new **framework for energy efficiency policies** which will both address bottlenecks to implement already adopted measures and propose additional policies to fully exploit the energy savings potential and achieve the 20% energy savings by 2020. Preliminary results of the ongoing evaluation of the Energy Efficiency Action Plan show that there is yet progress to be made in areas such as energy supply and transformation and the role of utilities, transportation, establishment of a well functioning market for energy services. Also in other areas additional instruments could be needed to support the legislation (e.g. buildings).

Member States' role in implementing energy efficiency measures is crucial. The new framework will identify the different European, national, regional and local levels of intervention to increase ownership of measures as well as their overall coordination and coherence. The review of the energy efficiency framework will also analyse possible sources of financing, including both existing and new instruments, where such funding can have a value-added effect. This will include continuing to mobilise the Structural and Cohesion funds

and possibly setting up innovative financial instruments. The alignment of future Cohesion Policy with the Europe 2020 Strategy will provide a key delivery mechanism to achieve the priorities of smart, sustainable and inclusive growth in Member States and regions, and contributing to achieving the EU headline targets.

- For increasing the production and use of carbon-free energy, a key area will be electricity supply, where there is an urgent need to replace the ageing power generation capacity. The Commission's Second Strategic Energy Review stresses that if strategic investment decisions are taken rapidly, nearly two thirds of European electricity generation could be low carbon in the early 2020s from the current level of 44%. This shift to low carbon energy sources will also bring additional benefits in terms of security of energy supply.

For decarbonising the EU's electricity generation capacities, massive expansion of renewable energy will be needed (in particular to reach the 20% renewable energy target), alongside other low carbon energy sources including nuclear energy for Member States that choose to have this source in their energy mix.

The amended emission trading system and its decreasing emission cap over time combined with improved emission allocation rules will continue to be a key instrument to ensure the decarbonisation of the energy system. In particular, it provides economic incentives for decreasing the carbon intensity of the electricity system, as well as via transmission into electricity prices for demand-side electricity savings. Potential developments resulting in carbon leakage from electricity production should be closely monitored and, if case may be, addressed by appropriate measures. Moreover, options for further enhancing the ETS' ability to spur innovation should be explored in line with the Europe 2020 strategy.

Issues for consideration for the short-term:

- Developing appropriate regulatory conditions for the take-off of a demand response electricity market, including at household level with smart meters and smart devices and appliances.
- Encouraging cities and regions to continue to develop local, integrated solutions for meeting their energy, waste management and sustainable transport and housing needs[14].
- Using consumer-centred tools (e.g. labels, information campaigns and long-term education initiatives) to promote energy savings, smart use of energy and fuel switching by energy users.

Issues for consideration for the longer-term:

- Using market-based instruments to give the right price signals and incentives for energy savings, smart use of energy and fuel switching by energy users, through the emissions trading scheme (ETS), energy taxation and phasing-out of fossil fuel subsidies.
- Promoting green public procurement to facilitate market uptake of low-carbon technologies.
- Developing a more coordinated European approach towards the licensing and design certification framework for nuclear investments.

[14] The Covenant of Mayors is already demonstrating innovative schemes. See: http://www.eumayors.eu/

Leadership in technological innovation

Technological innovation will be pivotal for Europe to achieve its 20-20-20 climate action targets and for Europe to complete its 2020 Agenda for smart, sustainable and inclusive growth[15]. Innovation will be needed to develop efficient technologies and low carbon technologies (renewable energy, energy storage, energy efficiency including digital technologies, CCS, and research on new generation nuclear production and safe disposal of nuclear waste). The level of public and private spending on research and development in energy technology innovation must be drastically increased.

Issues for consideration for the short-term:

- Implementing the European Strategic Energy Technology Plan (SET-Plan)
- Promoting local energy solutions and further developing the "smart cities" initiative to promote clean and energy-efficient investments.

Issues for consideration for the longer-term:

- Identify market failures and bottlenecks for private investment in innovation and explore the potential to enforce existing or to setting up new innovative financial instruments (a European low-carbon energy fund or low-carbon energy guaranteed loans for instance) to address these barriers and to leverage EU funds to stimulate private investment.
- Launching a dedicated set of large industrial innovation programmes of strategic importance for European energy future.

A strong and coordinated external energy policy

The EU should continue to develop stronger common actions and accompanying measures on external energy matters to increase its influence on regional and global energy markets and to protect the integrity of the internal market and the security of energy supplies for all its members. Consideration could be given, in the context of the Lisbon Treaty, on whether new legally-binding initiatives are necessary with third country producer and transit countries to underpin the EU's growing energy import dependence. The EU should apply the principle of solidarity and mutual support with important implications, for example, for its ability to respond to an import disruption or a threat of disruption or to take new advantage of its buying power. Towards the EU's partners in the Western Balkans, signatories of the Energy Community Treaty, the EU should focus on the strict application of calendars to implement EU energy rules.

The EU should enhance its influence in the global debate on the use of the Earth's limited natural energy resources and their environmental impact. It should promote global standards for example on a secure and safe use of nuclear energy, energy efficiency, smart grids and the

[15] See the strategic initiative on a "European plan for research and innovation"

use of renewable energy. Global standards and an open investment climate will also broaden the potential market for European businesses capitalising on their lead in technological innovation and know-how which should hence foster the competitiveness of EU industry.

Developing innovative international carbon mitigation instruments, phasing-out harmful fossil-fuels subsidies and addressing the challenge of energy technology transfer will need to feature high on the agenda of energy cooperation.

Issues for consideration for the short-term:

- Further integrating energy markets with our neighbours (Energy Community, Eastern Partnership, Mediterranean region and Baku Initiative) through the approximation of rules and market access in order to promote diversity of supplies, a stable and predictable environment for investors and energy efficiency and renewable energies.
- Ensuring that the energy and trade agenda are properly linked in pursuit of the energy goals.
- Developing EU efforts and initiatives to encourage and convince third states to make international nuclear safety and security standards legally binding, in particular through reinforced cooperation with the International Atomic Energy Agency.
- Strengthening a coordinated EU approach to major infrastructure projects in third countries including through new tools such as the Caspian Development Cooperation, which promote diversification of supplies for the EU, thereby enhancing energy security such as the development of the Southern Corridor or the Mediterranean Ring.
- Intensifying efforts in the global energy organisations and initiatives (e.g. IEA, G20, WTO) to promote well-functioning, open, transparent and competitive energy markets, good governance and comprehensive energy policies.
- Deepening cooperation with consumer countries, including emerging economies, to promote adoption of sustainable energy policies and a shared view on energy security.

Issues for consideration for the longer-term:

- Promoting trade-opening initiatives for sectors such as sustainable products and technologies, and international cooperation on standardization on low carbon technologies.
- Promoting stable bilateral relations through innovative means with the EU's traditional suppliers such as Russia, Norway, Algeria etc, including possible mechanisms to leverage the EU's buying power.

Protecting the EU citizens

The aim of the internal energy market legislation is to provide consumers with high quality services at competitive prices that reflect the external costs of energy consumption. While days of cheap energy are definitely over, by removing bottlenecks and increasing competition, the internal market should ensure that consumers do not pay more than what is really necessary for their energy consumption. Work continues to be done on ensuring proper implementation of the internal market legislation and on ensuring proper information and better choice for consumers.

EU citizens should also be guaranteed a high level of safety and security for energy supply and use.

The transition towards a low-carbon energy system should lead to new employment opportunities which need to be fostered by modernising labour markets and developing skills and competences as advocated in the Europe 2020 flagship initiative setting an Agenda for new skills and jobs.

Issues for consideration for the short-term:

- Implementing the existing legal provisions for the protection of vulnerable customers and developing more guidance for all consumers through the exchange of good practices (for example through the London Citizens Energy Forum).
- Creating a level playing field among the energy producers through the implementation and deepening of the internal energy market, notably the full independence of Transmission System Operators to ensure equal conditions for all market players, and if necessary through further measures in particular in markets in which competition is not working efficiently.
- Increasing transparency. Improving market transparency on network operation and supply which guarantees equal access to information, making pricing more transparent, increasing trust in the market and helping to avoid market manipulation.
- Providing for more effective regulatory oversight both at national and EU level.
- Providing with guidance on the appropriate tools to facilitate consumer participation in the energy markets through transparency and clarity of information and comparability.
- Promoting access to energy savings measures for all consumers including the poorest who are often living in the least energy performing buildings and can least afford low-usage products and building insulation.
- Developing high standards for the entire nuclear cycle, in particular by proposing a Community framework for radioactive waste disposal.
- Proposing a longer-term perspective on nuclear medicine, covering in particular radiation protection of patients and medical staff, as well as the shortage of supply of radioisotopes.

3. Conclusions

Since endorsement of the first Energy Action Plan by the European Council in March 2007, the legislative framework for achieving our energy policy objectives has been substantially strengthened. We now need to focus on fully implementing this framework and translate our agreed policies into concrete results for the citizens and businesses of Europe. Several shortcomings remain and new developments have exacerbated the need for a reinforced energy strategy.

The key components of such a strategy are the exploitation of the full potential of energy savings, the promotion of low carbon innovation, a fully functioning internal energy market, secure and sustainable energy networks and greater cooperation and solidarity within the EU as well as achieving a more coherent and effective approach to the EU external energy

relations. Short term effects of the economic crisis cannot reduce Europe's determination to improve the sustainability of our energy consumption and reduce the amount of energy needed and emissions generated per unit of output.

Compared to the previous Action Plan, **greater emphasis is needed on investments**. Billions of Euros will need to be invested in new technologies, infrastructure, energy efficiency improvements, low-carbon power generation and public education and skills to make the low-carbon transformation happen. While the economic crisis made finance scarcer, market-based instruments need to be used more consistently to orient investments in the right direction. Future security of supply will depend on new interconnections both inside and outside the EU, energy saving practices and technologies and "intelligent" grid and metering technologies. Keeping energy affordable for industrial, commercial and private consumers will be a further challenge, but European rather than national approaches will be more efficient, and create economies of scale, for the benefit of consumers.

In today's globalised world, the **economic and social benefits** of achieving the 2020 goals are significant. This could result in €60 billion less in oil and gas imports by 2020. This represents not only financial savings; it is also essential for our energy security. Further progress with the integration of the European energy market can add an extra 0.6% to 0.8 % GDP. Meeting the EU's objective of 20% of renewable sources of energy alone has the potential to create more than 600 000 jobs in the EU. Adding the 20% target on energy savings, it is well over 1 million new jobs that are at stake[16]. However, complementary measures will need to be taken, for example to ensure the availability of skilled labour, to realise this potential.

The delivery of the 2020 goals will imply a **coordinated effort at all levels**. Europe will achieve its objectives of sustainability, competitiveness and security of supply in energy if it acts collectively. The new Energy Strategy should encompass actions at both EU and Member State level. Cities and regions play a key role in developing local integrated solutions. In accordance with the Europe 2020 strategy, new tools need to be developed to assess progress towards common goals and coordinate national strategies.

The Commission invites views on the above-mentioned issues from all stakeholders and will publish this document on the Internet to collect them at the following address: http://ec.europa.eu/energy/consultations/index_en.htm. It will then develop, in consultation with stakeholders, the Council and the European Parliament a new Energy Strategy for Europe for endorsement by the European Council in March 2011.

[16] *Europe 2020 A strategy for smart, sustainable and inclusive growth* COM(2010)2020