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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Second Strategic Energy Review

AN EU ENERGY SECURITY AND SOLIDARITY ACTION PLAN

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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Second Strategic Energy Review

AN EU ENERGY SECURITY AND SOLIDARITY ACTION PLAN

1. INTRODUCTION

The EU's new energy and environment policy agreed by the European Council in March 2007[1] establishes a forward-looking political agenda to achieve the Community's core energy objectives of sustainability, competitiveness and security of supply. To make this a reality, the EU has committed to the "20-20-20" initiative: reducing greenhouse gas emissions by 20%, increasing the share of renewables in the energy consumption to 20% compared to 8.5% today and improving energy efficiency by 20%, all by 2020.

To put this into effect, in September 2007 the Commission tabled the third Internal Energy Market legislative package[2] aimed at ensuring more effective competition and creating the conditions fostering investment, diversity and security of supply; a competitive energy market is fundamental in achieving the "20-20-20" targets. In January 2008 it put forward a proposal to revise the Emissions Trading Scheme (ETS) Directive covering the period 2013-2020, a so-called "effort-sharing" decision for sectors not covered by the ETS and a new Renewable Energy Directive, which will provide a secure and predictable investment climate for EU industry[3]. The Parliament and Council have expressed their determination to ensure that these proposals are rapidly adopted.

Europe's new Energy Policy will fundamentally alter the EU's energy outlook. The package will reduce energy consumption in the EU in 2020 by as much as 15%, and lead to a reduction of expected imports of energy by up to 26% compared to the developments before the 20-20-20 initiative[4]. In other words, the EU will have taken the first steps to break the cycle of increasing energy consumption, increasing imports, and increasing outflow of wealth created in the EU to pay energy producers. Today, Europe imports 54%[5] of its energy. At this year's energy prices, these imports represent an estimated €350bn, or around €700 per year for every EU citizen. While trade in energy has a positive role to play, energy efficiency, greenhouse gas emissions reductions, diversity of energy sources and diversity of supplies are needed throughout our energy system. With the adoption of the 20-20-20 package, the EU will be poised to take the key next steps towards a more sustainable, more secure, more technology-based, energy policy, creating wealth and jobs in the EU.

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1 Presidency conclusions, European Council, March 2007

2 COM(2007)0528-32

3 COM(2008)30

4 Based on comparison of New Energy Policy + High Oil Price scenario with Baseline scenario with moderate oil price. For details on all statistics, projections and scenario analyses used in this Review, see accompanying Commission Services Working Paper "Europe's current and future energy position: demand – resources – investment".

5 Eurostat, year 2006

However, complementary measures are necessary to attain all three underlying objectives of the EU's new energy policy: sustainability, competitiveness and, above all, security of supply. For example, the EU is projected to remain dependent on imported energy - oil, coal and especially gas – for many years to come. Europe's indigenous production of fossil fuels is declining. As a result, net imports of fossil fuels are expected to stay at roughly today's levels in 2020 even when the EU's climate and energy policies are fully implemented.

The medium-term trends for global oil and gas consumption foresee a continued significant and sustained increase in demand, particularly from developing countries. At the same time, remaining reserves and spare production capacity are becoming increasingly concentrated in a few hands. Recent severe price rises and volatility on oil and gas markets reflect these trends.

With respect to the EU, this is of most concern with respect to gas, where a number of Member States are overwhelmingly dependent on one single supplier. Political incidents in supplier or transit countries, accidents or natural disasters, the impacts of climate change, remind the EU of the vulnerability of its immediate energy supply.

While each Member State is responsible for its own security, solidarity between Member States is a basic feature of EU membership. With the internal market for energy, specific national solutions are often insufficient. Strategies to share and spread risk, and to make the best use of the combined weight of the EU in world affairs can be more effective than dispersed national actions. For these reasons, energy security is an issue of common EU concern.

Given these global developments, the EU needs to take action to secure its energy future and to protect its essential energy interests. The EU needs to intensify its efforts in developing an effective external energy policy; speaking with one voice, identifying infrastructure of major importance to its energy security and then ensuring its construction, and acting coherently to deepen its partnerships with key energy suppliers, transit countries and consumers.

It also needs to tap the full potential of its oceans and seas for energy generation, rapidly evolve its transport system and make real progress in terms of the interconnection of the European energy market. The first priority in this respect is to ensure the adoption and rapid implementation of 20-20-20 package. To complete this, the Commission proposes as the core of this second Strategic Energy Review an **EU Energy Security and Solidarity Action Plan**, which complements the measures tabled to date in order to ensure the achievement of all three of the EU's core energy objectives.

In addition, this Strategic Energy Review takes the first steps towards the next stage of a European Energy Policy, considering the challenges likely to be faced between 2020 and 2050 and beginning the process of defining an EU response to these longer term challenges.

2. AN EU ENERGY SECURITY AND SOLIDARITY ACTION PLAN

The Commission proposes a five-point **EU Energy Security and Solidarity Action Plan**, focusing on:

- Infrastructure needs and the diversification of energy supplies
- External energy relations
- Oil and gas stocks and crisis response mechanisms
- Energy efficiency

- Making the best use of the EU's indigenous energy resources.

2.1. Promoting infrastructure essential to the EU's energy needs.

Whereas the oil market is a liquid international market, gas supply depends mainly on fixed pipeline infrastructure. At present, imports comprise 61% of EU gas gross inland consumption. 42% of these imports come from Russia, 24% from Norway, 18% from Algeria, and 16% from other countries, the latter mostly in the form of LNG[6]. By 2020, as EU indigenous production continues to decline, the percentage of gas imports is expected to increase to 73% from 61% today[7].

At the EU level, this represents a reasonably well-diversified supply picture. At national level, however, for historical reasons a number of Member States rely on a single supplier for 100% of their gas needs. Interconnection and solidarity within the internal market is not only a natural feature of an integrated market-based system but is equally essential to spread and reduce individual risk. The EU therefore needs to take concrete measures to ensure that these markets increase the diversity of their gas supply.

In addition, in order to meet the EU's 20-20-20 objectives in a manner guaranteeing electricity and gas supply to all the EU's citizens, major changes in the EU's internal energy infrastructure will be necessary over the coming years and decades. It requires transparent and reliable framework conditions within the EU and with respect to third countries so that business will be able to take up new investment opportunities**.** A determined approach at Community level to catalyse these developments is essential.

The Commission therefore proposes that the following six priority infrastructure actions be accepted as Community priorities:

- Connecting the remaining isolated energy markets in Europe is a priority. Together with the Member States concerned, and in close collaboration with national energy regulators, the Commission will develop a **Baltic Interconnection Plan** covering gas, electricity and storage in 2009. This will identify the key missing infrastructures necessary for the effective interconnection of the Baltic region with the rest of the EU, establishing a secure and diverse energy supply for the region, and listing necessary actions, including financing, to ensure its realisation. The efficient development of the market as well as the contribution of energy efficiency and renewables to increased security of supply will need to be duly taken into account in developing the Plan. Work will start immediately within a High Level Group set up with the Member States concerned. A regional Summit meeting will be called in the second half of 2009 to launch its implementation.
- A **southern gas corridor** must be developed for the supply of gas from Caspian and Middle Eastern sources, which could potentially supply a significant part of the EU's future needs. This is one of the EU's highest energy security priorities. The Commission and Member States need to work with the countries concerned, notably with partners such as Azerbaijan and Turkmenistan, Iraq and Mashreq countries, amongst others, with the joint objective of rapidly securing firm commitments for the supply of gas and the construction of the pipelines necessary for all stages of its development. In the longer term, when political conditions permit, supplies from other countries in the region, such as Uzbekistan and Iran, should represent a further significant supply source for the EU.

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6 Eurostat, year 2006

7 New Energy Policy + High Oil Price scenario; see footnote 4

The feasibility of a block purchasing mechanism for Caspian gas ("Caspian Development Corporation") will be explored, in full respect of competition and other EU rules. Transit for the gas pipelines will need to be agreed with transit countries and notably Turkey in a way that respects both the basic principles of the EU acquis and their legitimate concern for their own energy security. The Commission will invite representatives of the countries concerned to a Ministerial level meeting to secure concrete progress and a timetable to reach agreement. It will seek to identify by mid-2009 any remaining obstacles to the completion of the project which will be the subject of a **Communication on the Southern Gas Corridor** to the Council and Parliament.

- **Liquefied natural gas** and adequate gas storage are important in providing liquidity and diversity to EU gas markets. Sufficient LNG capacity consisting of liquefaction facilities in the producing countries and LNG terminals and ship-based regasification in the EU should be available to all Member States, either directly or through other Member States on the basis of a solidarity arrangement. This is particularly important for Member States currently overwhelmingly dependent on a single gas supplier. In 2009 the Commission will assess the global LNG situation and identify gaps with a view to proposing an **LNG Action Plan**.
- A **Mediterranean energy ring now needs to be completed**, linking Europe with the Southern Mediterranean through electricity and gas interconnections. In particular the Ring is essential to develop the region's vast solar and wind energy potential. The list of priority infrastructure projects adopted by the December 2007 Euromed Energy Ministerial meeting and the Mediterranean Solar Plan adopted in Paris in July 2008[8] form a blueprint for this development, and benefit from EU financial and political support. No later than 2010 the Commission will put forward a **Communication on the Mediterranean Ring** outlining a plan for completing the missing links, including key projects important for diversifying the EU's external energy supplies in further away regions, such as the future links from Iraq, the Middle East and Sub-Saharan Africa.
- **North-South gas and electricity interconnections within Central and South-East Europe** need to be developed as a priority, building notably on the New European Transmission System (NETS) initiative to create a common gas transmission system operator[9], the Energy Community Gas Ring, the priority interconnections identified by the Energy Community ministerial in December 2007[10], and the Pan-European Oil Pipeline[11]. The new Internal Energy Market package envisages the establishment of a regular 10-year Network Development Plan outlining missing links and the action necessary to complete them. This rolling plan will be elaborated by the new European network of transmission system operators (ENTSO). The Commission will work together with the national energy regulators and the TSOs in support of their preparation of a first such plan in 2010, if necessary even before the formal entry into application of the third internal market package.
- In line with the work of the European coordinator and the Communication on Offshore Wind tabled by the Commission together with this Strategic Energy Review, a **Blueprint for a North Sea offshore grid** should be developed to interconnect national electricity

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8 www.euromedinfo.eu

9 www.molgroup.hu/en/press_centre/press_releases/european_energy_infrastructure__ndash__nets_project/

10 www.energy-community.org/

11 www.ens-newswire.com/ens/apr2007/2007-04-03-03.asp

grids in North-West Europe together and plug-in the numerous planned offshore wind projects. It should become, together with the Mediterranean Ring and the Baltic Interconnection project, one of the building blocks of a future European supergrid. The Blueprint should identify the steps and timetable that need to be taken and any specific actions that need to be adopted. It should be developed by the Member States and regional actors involved and facilitated where necessary by action at Community level.

The Commission will therefore use its existing instruments to pursue rapid progress on all these priority actions, which have already been recognised as projects requiring Community support and action under the existing TEN-E programme. This will include an active approach collaborating with Member States concerned to make maximum use of the EU's ability to speak with one voice on international energy issues.

Considerable efforts of all involved parties will be required in order to finance the projects outlined above. A closer and more effective collaboration with the private sector and financial institutions, notably the European Investment Bank and the European Bank for Reconstruction and Development, is necessary to promote the necessary financing, in particular for cross-border projects. This work appears as a key element of the EU response to the current financial crisis and thus should be accelerated, as suggested in the recent Commission Communication[12], inter alia to support employment and contribute to offsetting the fall in demand. This is particularly important for certain key external energy infrastructures which face heightened non-commercial risks. The development of public-private partnerships, providing the necessary political underpinning, a supply framework and potentially a certain level of public financing or guarantees, as well as other innovative forms of funding, may also become increasingly important. This may potentially involve EU Member States, companies and Community financial institutions, as well as public and private entities from third countries.

However, in order to make further and rapid progress, the Commission considers that existing instruments are insufficient. As a first step, the EU should agree that the above projects represent **energy security priorities**.

As a second step, during 2009-2010 the precise detailed actions – in particular, identifying the financing needs and potential sources of finance – necessary to ensure their realisation will be determined, in close collaboration between the Commission, Member States, industry, transmission system operators, national energy regulators and the European Parliament, resulting in the Communications mentioned above. In this respect, it needs to be noted that energy infrastructures will be in place for a long time. The Commission will ensure that their development, design and location take into account the impacts of changing climatic conditions for the rest of the century, which will be a key element of their economic viability. All new EU energy infrastructures must be climate-proof.

As a third step, from 2010 onwards, the identified actions will need to be undertaken at both Community and national level. It should be noted that the current TEN-E budget of €22m per year means that its scope for catalysing the development of major projects of Community interest is limited. The original TEN-E instrument was conceived and developed when the EU was considerably smaller, and faced energy challenges of a completely different dimension compared to today. Thus, together with this Strategic Energy Review, the Commission tables a Green Paper that launches a reflection on how the existing TEN-E instrument could be

[12] Commission Communication "From financial crisis to recovery: A European framework for action" Com (2008)706, 29.10.2008

replaced by a new instrument, the **EU Energy Security and Infrastructure Instrument** with the possible objectives of (i) completing the Internal Energy Market, (ii) ensuring the development of the grid to permit the achievement of the EU's renewable energy objectives and (iii) guaranteeing EU security of energy supply, through assistance for key infrastructure projects within and outside the EU. In addition, the Green Paper launches a reflection on how best to ensure the effective use and evolution of the EU's external policy and financial instruments to contribute to achieving these objectives, without prejudice to the planned mid-term review of external assistance instruments in Spring 2009.

In the light of the results of the consultation following the publication of the Green Paper, the Commission will consider tabling a proposal for the above-mentioned new EU Energy Security and Infrastructure Instrument. Inter alia, the need for future Community funding would be evaluated, including for the next financial framework starting in 2014.

2.2. A greater focus on energy in the EU's international relations

Worldwide, countries are becoming increasingly interdependent in energy matters. Energy interdependence is influencing development, trade and competitiveness, international relations and global cooperation on climate. Energy must be given the political priority it merits in the EU's international relations, including its trade policy and agreements, its bilateral partnerships, cooperation and association agreements and political dialogues. The widely-varying interests of countries in the energy field, in a context of increasing energy interdependence, point to the need for more robust international legal frameworks based on a balance of commitments and benefits, within energy and across economic sectors.

As much as the European Union seeks security of supply through greater predictability and diversity, including from different companies within upstream markets, foreign governments and external suppliers seek security of demand, particularly where large investments in new upstream gas supplies for delivery by pipeline are concerned. They require clear and stable rules for the functioning of the internal market and arrangements on access to or investment in the European market. In many cases, there is a need to develop trust and deeper and legally binding ties between the EU and producer and transit countries, which could deliver significant mutual benefits in the long-term perspective that is needed to finance the more capital-intensive projects of the future. The EU should therefore use all the tools at its disposal, internal as well as external, to strengthen its collective weight with energy supply countries and to offer new kinds of broad-based partnerships. At the multilateral level, the EU should continue to press for further liberalisation of trade and investment in the energy sector.

In some cases, there is already regulatory and market integration. **Norway** is already integrated in the internal energy market as a member of the European Economic Area. Its role in enhancing the EU security of supply in gas (24% of EU imports) and oil (16%)[13] is essential and should be further developed within the EU-Norway energy dialogue, with common projects such as offshore wind in the North Sea and the development of Norway's substantial proved reserves. Effective collaboration with Norway is essential for EU energy security; maximising the long-term output of the Norwegian continental shelf on a sustainable basis is of equal interest to Norway and the EU.

The **Energy Community**[14] is building an integrated market in Southeast Europe anchored to the EU. It encompasses the internal market and security of supply legislation for electricity

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13 Eurostat, year 2006

14 www.energy-community.org

and gas and discussions on its extension to oil are underway. If negotiations formally starting in November are successful, the accession of Ukraine, the Republic of Moldova and Turkey to the Energy Community would catalyse their energy sector reforms and result in a mutually beneficial enlarged energy market based on common rules. This could help Ukraine, an important transit country, to upgrade its infrastructure. When appropriate, extension of observer status to other countries should also be considered. Finally, it should be noted that the enlargement process can play an important role in developing the wide application of the community acquis in the energy sector, thus following the EU's energy security objectives and contributing to the security of enlargement countries.

A strategy on **Belarus** should be developed, taking account of its importance as a neighbour and transit country.

Today the EU has Memoranda of Understanding on energy with a large number of third countries. Europe should develop a new generation of "**energy interdependence**" provisions in broad-based agreements with **producer countries** outside Europe. Energy interdependence provisions should aim at a balance between security of demand and security of supply. The focus should be on encouraging upstream investments, facilitating the development of the necessary infrastructures, clear conditions of access to markets (within energy and across economic sectors), dialogue on market and policy developments, and dispute settlement provisions. Transit arrangements must be agreed to guarantee normal flows even in periods of political tension, possibly through innovative approaches such as joint management and even ownership of pipelines by companies of supplier, transit and consumer countries. The provisions should be based on the EU's energy acquis where appropriate, and the principles of the Energy Charter Treaty[15]. The provisions should contribute to a long term political framework, reducing political risks and encouraging commitments by private companies on supply and transit. European banks such as the European Investment Bank and the European Bank for Reconstruction and Development could provide appropriately-structured finance linked to the development of major infrastructure projects in third countries. Special attention will be given to key external infrastructures which face heightened non-commercial risks.

In the case of **Russia**, the current wider context is the intention to negotiate a wide-ranging New Agreement replacing the 1997 Partnership and Cooperation Agreement. It is important for the long term health of the energy relationship between **EU and Russia** that the 1997 Agreement be deepened and given a stronger and broader foundation. Russia will remain the EU's main energy partner far into the future and more needs to be done to ensure that this relationship is based on trust; each would benefit from consolidating the main principles on which this partnership is based into law. Negotiations could in this way facilitate the reform and liberalisation of the energy market in Russia in line with its domestic objectives, provide stability and predictability of demand for Russian gas, and clarify the conditions under which Russian companies may invest downstream in the EU. Finally, an agreement with Russia could help establish binding and effective transit rules across the pan-European continent, which are lacking today. Each of these improvements would contribute to make Europe's sourcing, and Russia's supply, more diversified and dependable.

It is therefore important that legally binding energy interdependence provisions be developed, within the framework of the New Agreement to succeed the Partnership and Cooperation Agreement. This would require complementing the New Agreement mandate with a mandate to launch FTA talks. In the past Russia and the EU have linked FTA negotiations with Russia's accession to the World Trade Organisation, but decisive progress in this negotiation

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[15] www.encharter.org

has recently become less certain. Furthermore, the EU-Russia Energy Dialogue should be continued and further practical cooperation activities and joint projects should be developed. The more the EU-Russia energy relation is put on a solid mutually-agreed and balanced legal basis, the more trust and confidence will grow, creating a climate conducive to investments in exploration and infrastructure projects.

A similar approach should be developed with the countries of the **Caspian region**. The European Council has given high priority to the further development of relations with these countries. Given their energy resources and their importance to progress on the priority energy security infrastructures noted in the previous section, the Commission will focus all instruments on building robust cooperation, including a strengthening of the Baku process[16], to promote a genuine energy partnership. Enhanced engagement with all the relevant countries, notably through bilateral relationships, is an important priority.

The **EU-OPEC Energy Dialogue** provides a forum for joint assessment of the factors affecting prices, upstream and downstream investments needed in both producer and consumer countries and the impact of technological developments. The Dialogue is a recognition of the fact that producer and consumer countries have common interests in encouraging regular supply at affordable prices. Energy relations with **Iraq** and the **Gulf Cooperation Council** should be further developed in the field of hydrocarbons, including new areas such as clean energy technologies. In parallel, bilateral energy relations with individual Gulf Cooperation countries will be pursued.

Cooperation with partners such as **Australia, Canada, Japan** and the **US** as well as emerging **consumer countries** should be deepened to promote a common view on global energy security, to improve the transparency of global energy markets and to address the issue of sustainability. Cooperation frameworks are being developed with countries like **China** and **India**, bilaterally and multilaterally, and regions such as **Latin America** and the **Caribbean**. Cooperation is being developed with alternative supplier countries such as **Brazil** as a major biofuels exporter.

Energy relationships with **Africa**, notably North Africa, should be stepped up in view of its important potential ranging from hydrocarbons to an immense untapped potential in renewable energies. Countries such as **Algeria, Egypt, Libya and Nigeria** have long been important oil and gas suppliers and it is important that energy relations with them are enhanced. **The Trans-Sahara Gas Pipeline** represents an important additional opportunity for the EU to diversify routes and energy sources. The EU stands ready to help in its realisation through its various instruments, notably bilateral cooperation, the European Neighbourhood and Partnership Instrument, the European Development Fund and the European Investment Bank. Furthermore, the Africa-EU Energy Partnership with the African Union together with the African Regional Economic Communities will be instrumental in developing a deeper energy dialogue and concrete initiatives. The EU will assess the increasingly important role of Africa in the EU energy security and ensure that the adequate means and policies are made available. Regional integration of electricity markets and the promotion of renewable energy represent particularly important development opportunities for Africa, and the Commission will step up its assistance efforts in these areas.

A number of the EU's partners are considering launching a nuclear programme, a technology where EU industry enjoys a global leadership, or expanding their current activities. Many developing countries do not currently have the legislative and regulatory infrastructure needed

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[16] ec.europa.eu/dgs/energy_transport/international

to ensure that safety is the priority in design, construction and operational decisions. EU action to promote the highest standards of **nuclear safety and security** has recently been outlined[17]. With the Instrument for Nuclear Safety Cooperation, the EU will cooperate with and assist third countries in improving their nuclear safety culture and the safety of their operating nuclear power plants. For emerging countries intending to build nuclear power plants, the EU will help in the development of competent and independent nuclear regulatory authorities, capable of ensuring that the new plants are built according to international nuclear safety standards and operate in accordance with the highest standards.

In meeting the EU's objectives, it is vital, as the European Council has identified[18], that Europe speaks with one voice and acts accordingly. The recent review of EU's energy policy by the International Energy Agency[19] identifies external relations and energy security as priority actions for the EU. Speaking with one voice does not mean a single Community representative for external issues, but effective planning and coordination to ensure a commonality of both action and message at Community and Member State level. In order to put this into practice, in 2009 the Commission will identify the concrete **mechanisms necessary for ensuring transparency** between Member States and the EU. This should enable better coordination on developments and intentions on international energy issues. To complement such mechanisms, the Commission will consider proposing a revision of Regulation 736/96 which obliges Member States to notify to the Commission investment projects of interest to the Community in the petroleum, natural gas and electricity sectors, in order to increase its relevance to today's energy challenges. The Commission will consider how best to further develop early warning systems with key neighbouring energy partners

2.3. Improved oil and gas stocks and crisis response mechanisms

To meet its energy security objectives, the EU also needs to ensure that its internal crisis mechanisms and security standards are as effective as possible. The third element of the Energy Security and Solidarity Action Plan therefore updates and improves the existing Community rules in this area.

A mandatory regime of emergency **oil stocks** has existed since 1968[20]. Member States have developed different mechanisms implementing the Oil Stocks Directive: some rely on government held stocks similar to the US and Japanese systems, others rely on stocks held by industry. The system has proven effective to deal with limited disruptions, mostly in response to joint actions coordinated by the International Energy Agency. Nevertheless, in the light of experience the current system can be improved.

Together with this Strategic Energy Review the Commission therefore proposes a **revision of the EU emergency strategic oil stocks legislation** to improve coherence with the International Energy Agency regime, increase the reliability and transparency of available stocks, simplify compliance and verification, and clarify emergency procedures.

At present, the EU publishes data on the level of strategic oil stocks for each Member State. Unlike the US, it does not publish information on the level of additional commercial oil stocks held in the EU. In order to improve oil market transparency and limit the effects of uninformed speculation, the Commission proposes that the EU now takes the step of

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17 "Addressing the international challenge of nuclear safety and security", COM(2008)312

18 Eg March 2007 European Council Presidency conclusions

19 IEA Energy Policies Review – The European Union", OECD/IEA, September 2008

20 http://ec.europa.eu/energy/oil/stocks/index_en.htm

publishing, on an aggregated basis, the level of commercial oil stocks held by EU oil companies on a weekly basis.

The Commission has also reviewed the implementation and effectiveness of the **Security of Gas Supply Directive**.[21] It finds that today's legal framework could be improved. In particular, greater harmonisation of security of supply standards and predefined emergency measures on regional and EU levels are needed. However, there is insufficient evidence at this stage for the EU to decide upon obligatory strategic gas stocks. Strategic gas stocks cost at least five times more than oil stocks. A more effective approach is to promote the development and effective transparent operation of commercial storages, diverse supply connections enabling flexible sourcing from LNG or neighbouring providers within the EU internal market, and rapid demand reduction through interruptible contracts and fuel switching especially in electricity generation.

As in the oil sector, EU level crisis response coordination must be improved, both among Member States and in relations with supplier and transit countries. A more suitable threshold for triggering EU action should be considered and compensation arrangements should be clarified. The Gas Coordination Group should continue developing scenarios for reacting to future possible gas supply crises. Taking into account this work and the work of the International Energy Agency and the European Regulators Group for Electricity and Gas, the Commission will consult interested parties with a view to proposing a revised **Security of Gas Supply Directive** in 2010.

2.4. A new impetus on energy efficiency

The EU has taken a commitment to achieve a 20% improvement in energy efficiency by 2020. Both the greenhouse gas emission reduction and the renewables targets to which the EU has committed itself will contribute to achieving this objective and, conversely, ambitious action on energy efficiency will greatly help achieve the EU's climate objective by 2020, notably under the effort sharing decision. Energy efficiency measures have therefore a critical role to play in ensuring that the climate and energy objectives are being achieved at least cost, with a particular focus on buildings and transport.

It is equally evident that the 20% energy efficiency objective will contribute greatly to the EU's sustainability and competitiveness objectives. In addition, consuming less through energy efficiency is the most durable way to reduce dependence on fossil fuels and imports. Measures to improve energy efficiency and green technologies can also provide new opportunities for the economy, including SMEs, in the current difficult economic situation. Energy efficiency has to be at the heart of the EU's Energy Security and Solidarity Action Plan.

Important progress has been made towards the 20% energy efficiency objective. These measures should achieve an improvement in energy efficiency of some 13-15%. Together with this Strategic Energy Review the Commission therefore tables a new **2008 Energy Efficiency Package** of energy efficiency initiatives to make further important progress in meeting the 20% objective:

- A revision of the **Energy Performance of Buildings** Directive to extend its scope, simplify its implementation and develop energy performance certificates of buildings into

[21] Communication on evaluation report on security of gas supply Directive 2004/67, COM(2008)735

a real market instrument. Such a revised Directive will have the potential to save an average family hundreds of euros per year, even after deducting the cost of energy-efficient heating, cooling and building products.

- A revision of the **Energy Labelling** Directive, which has so far covered only household appliances, to apply labelling to a broader range of energy-using products, commercial and industrial, and to establish a harmonised base for public procurement and incentives provided by Member States. The Commission is also preparing upgraded or new classifications for a number of product groups. Under a separate legal instrument, a new energy label will be introduced for car tyres.
- An intensification of the implementation of the **Ecodesign** Directive. The Commission will adopt in the coming months minimum requirements for light bulbs (leading to the phasing out of wasteful incandescent light bulbs), electrical equipment in standby and off-mode functions of devices, street and office lighting equipment, external power supplies and simple set-top boxes for televisions. This first set of measures will be followed shortly by measures targeting washing machines, dishwashers and refrigerators, boilers and water heaters, motors, and televisions. When completed, considering the combined impact of ecodesign and labelling, they will have the capacity to save 96 Mtoe by 2020[22].
- Promotion of **cogeneration** is an important priority. To this end, the Commission is adopting, together with this Strategic Energy Review, a Communication and detailed guidelines for technical implementation of the Cogeneration Directive.
- The Commission will develop benchmarking and networking mechanisms to disseminate best practice. The **Covenant of Mayors**[23] will be an important instrument to facilitate this. Community funds (including the Intelligent Energy Europe programme) will be allocated to reinforce replication across the EU, together, where appropriate, with other EU financial instruments. A new Sustainable Energy Financing Initiative to be launched jointly with the European Investment Bank and where appropriate the European Bank for Reconstruction and Development will pursue this objective. The design and implementation of appropriate financing instruments for the small scale investments that are often required in energy efficiency investments is important (for example, upfront costs for owners or users of buildings).
- **Cohesion Policy** programmes have allocated over EUR 9bn to the promotion of energy efficiency and renewable energies in the period 2007-13. Cohesion Policy Funds support a vast range of activities, including energy efficiency improvements in industry, commerce, transport and public buildings, cogeneration and local energy production, innovation for sustainable energy, and training for monitoring and evaluation of energy performance. In addition, in the new Member States Cohesion Policy supports investment in energy efficiency in residential housing under certain conditions. As some of these actions may be funded by other Cohesion Policy budget headings such as R&D, urban and rural regeneration, and technical assistance, the actual allocation in support of Europe's Energy Policy is expected to be much higher. Financial instruments, including debt finance and equity funds provided by the EIB Group (e.g. through structural programme loans) and the EBRD, could allow additional funding in support of Operational Programmes.

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22 Derived from preparatory studies under Directive 2005/32/EC http://ec.europa.eu/energy/demand/legislation/eco_design_en.htm

23 http://ec.europa.eu/energy/climate_actions/mayors/index_en.htm

- A **Green Tax Package** will be presented as a complement to the energy and climate change package. It will include a proposal to review the Energy Tax Directive to make it fully compatible with the energy and climate change goals and an examination of how VAT and other fiscal instruments can be used to promote energy efficiency. The Commission will continue its efforts to promote the liberalisation of energy-efficient goods and services also in the context of **trade negotiations**.

It is at least as important to achieve improved energy efficiency in other industrialised countries and emerging economies as in Europe. Progress on a global agreement on climate change would create major new incentives for cooperation on energy efficiency. Energy efficiency should be one of the main objectives of the Energy Community in the coming years. The Commission will build on the **International Partnership on Energy Efficiency Cooperation** agreed in the G8 context with China, India and Korea in July 2008 to promote common product standards and ambitious efforts throughout the world, and will participate in its launch in 2009 as an IEA Implementing Agreement. In this context, the outreach activities of the IEA with emerging countries, is particularly important.

Energy efficiency has to be a constant priority for Community energy policy. The Commission will evaluate the **Energy Efficiency Action Plan** in 2009 and prepare a more focused Action Plan, as requested by the June 2008 European Council

2.5. Making better use of the EU's indigenous energy reserves

Energy produced within the EU represents 46% of the total consumed[24]. Before the 20-20-20 initiative, this was set to fall to 36% by 2020[25]. Implementation of the new Energy Policy would keep it at around 44% of EU consumption[26].

All cost-effective measures that can be taken to promote the development and use of indigenous resources should form an important element of an EU Energy Security and Solidarity Action Plan.

The development of **renewable energy** such as wind, solar, hydro, biomass energy and marine resources has to be seen as the EU's greatest potential source of indigenous energy. Today it accounts for around 9% of final EU energy consumption, the objective of a 20% contribution by 2020 has been agreed. Following the entry into force of the new Renewable Energy Directive, the Commission will focus on monitoring and facilitating its correct and timely implementation, and on remaining practical issues likely to hamper the effective and rapid increased penetration of renewable energy into the market, such as constraints on the grid. In the light of experience gained with the new Renewables Directive, the Commission will table a **Communication "Overcoming Barriers to Renewable Energy in the EU"**, identifying barriers and proposing actions to redress them.

In order to establish appropriate financing mechanisms for the massive development of renewable energy at EU level, the Commission is working with the European Investment Bank, the European Bank for Reconstruction and Development and other financial institutions to set up the above-mentioned **EU Sustainable Energy Financing Initiative** to mobilise large-scale funding from capital markets for investments in energy efficiency, renewable

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24 Eurostat, year 2006; consumption includes bunkers

25 Baseline projection with moderate oil price; see footnote 4

26 New Energy Policy + High Oil Price scenario; see footnote 4

energies, the clean use of fossil fuels and combined heat and power from renewables in Europe's cities.

In maximising the EU's natural resources, the role of technology is crucial. The need for renewable energy will only grow as our greenhouse gas objectives increase, so it is vital to catalyse rapid advances in the competitiveness, efficiency and sustainability of renewable energy production. Indeed, this represents a huge economic opportunity for the EU as much as an energy security and sustainability priority. This objective is currently being pursued in the context of the Strategic Energy Technology Plan, endorsed by the European Council in 2008[27]. Progress has already been made in its implementation, including on six European Industrial Initiatives: wind, solar, bio-energy (second generation biofuels), CCS (carbon capture, transport and storage), electricity grids and sustainable nuclear fission. The initiatives are being developed in close cooperation with existing Technology Platforms and European industry. The next step will be a Communication on Financing Low Carbon Technologies, which will be tabled by the Commission in 2009, in close association with the European Investment Bank. It will evaluate needed resources and potential sources of funding and propose ways to support large scale demonstrations at EU level, including up to twelve CCS demonstration plants. It will take into account the outcome of ongoing discussions on the revision of the Emissions Trading Directive, particularly the option of using auctioning revenues and earmarked emission allowances as a way to accelerate the implementation of the much needed demonstration activities.

Coal remains an essential component of Europe's domestic energy supply and an important alternative to oil and gas. It is available in large quantities from numerous suppliers around the world, and it can be relatively easily stored. Coal-based electricity generation is growing in importance across much of the world and continued substantial use of coal and lignite in generation in Europe is projected. Higher emissions of CO2 are its main drawback. Its use in the longer run is only compatible with the climate challenge if highly-efficient plants predominate and carbon capture and storage (CCS) is widely available. CCS development, both in Europe and outside, will depend on regulation and carbon pricing and the availability of new technology and processes. Obligatory CO2 emissions standards should be considered only after results of industrial demonstrations have been evaluated, notably if incentives provided by the Emission Trading Scheme as mentioned above have proven to be inadequate. Europe's aim to have up to twelve commercial scale demonstration plants in operation by 2015 and the G8 commitment to launch twenty demonstration plants globally by 2020 will require greater incentives than currently available.

Although Europe's gas and oil resources are declining, high oil prices and the security premium to be placed on indigenous resources increase the interest of extracting indigenous **oil and gas** reserves, including unconventional reserves insofar as this can be achieved in a sustainable manner. Furthermore, other domestic fuels in some areas of the EU such as oil shale and peat may also contribute to the energy security of some Member States.

In fact, unconventional resources quadruple the EEA's combined gas reserves to more than 60 000 Mtoe although their exploitation poses, in some cases, significant technological and environmental challenges. The Commission will commence discussions in the Berlin Fossil Fuel Forum[28] on which additional measures could be taken at Community and national level,

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[27] Com(2007) 0723; ec.europa.eu/energy/res/setplan/communication_2007_en.htm

[28] http://ec.europa.eu/energy/oil/berlin/index_en.htm

and in particular in partnership with Norway, to further promote the increased cost-effective and environmentally-compatible access to indigenous EU fossil fuels.

Oil refining capacity represents an important additional factor in ensuring EU energy security. It is important to improve the level of transparency of the demand-supply balance for refining capacity necessary to serve the EU's needs, bearing in mind drivers of demand (notably initiatives to green transport) and in particular, concerns regarding the potential availability of diesel fuel in the future. In 2010 the Commission's Energy Market Observatory will prepare a **Communication on Refining Capacity and EU Oil Demand.**

Finally**, nuclear energy** contributes to the EU's security of energy supply as a major source of baseload electricity, not increasing greenhouse gas emissions and thus combating climate change. EU uranium supplies are diversified within stable regions (Australia and Canada representing nearly half of the EU needs) and the cost of uranium has a limited impact on the electricity price. A third of electricity generation in the EU comes from nuclear energy.

As indicated in the Communication "Update of the Nuclear Illustrative Programme", accompanying this Review, over the next 10-20 years the majority of nuclear power plants in the EU will reach the end of their originally designed lifetimes. By 2020 the share of nuclear energy in power generation would decrease significantly if there are no decisions made about new investments. Decisions about lifetime extension, new investments or replacement become more acute, notably in the light of the EU CO2 reduction objective.

It is for each Member State to choose whether or not to invest in nuclear energy but the nuclear safety and security framework applied everywhere in the EU is of common interest. It must be clear that the EU maintains the highest safety, security, non-proliferation and environmental protection standards for nuclear generation. The EU therefore needs to develop a common legislative framework with respect to the safety of nuclear installations and the management of nuclear waste.

Following the establishment of the High Level Group on Nuclear Safety and Waste Management, composed of national regulators, and the discussions within the European Nuclear Energy Forum, the Commission will therefore present in 2008 a **revised proposal for a Directive setting up a Community framework for nuclear safety**.

3. TOWARDS A VISION FOR 2050

As global demand for oil continues to grow and many existing oil fields decline in production capacity, the demand-supply balance will become increasingly tight, possibly critically so. The need to address climate change will require a massive switch to high-efficiency, low-carbon energy technologies.

The EU’s agenda for 2020 has set out the essential first steps in this process. Deep structural change such as carbon-free electricity generation, or a radical technological shift such as breaking transport's dependence on oil will take considerably more time but require choices to be made by policymakers, investors, educational institutions and scientists today. The Commission will therefore propose to renew the Energy Policy for Europe in 2010 with a view to charting a policy agenda for 2030 and a vision for 2050. It will result from a wide consultation to examine possible longer-term objectives such as:

- *Decarbonising the EU electricity supply by 2050*. This is a huge challenge, but one that will be necessary if the EU is to fully play its role in reducing global greenhouse gas

emissions by 2050 to prevent climate change. It will require a further shift to renewable energy, carbon capture and storage and, for those countries that so choose, nuclear. The implementation of the emissions trading scheme will facilitate the shift to low carbon electricity through the replacement of existing electricity generation capacity, half of which reaches its end of life by 2030. 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%.

- *Ending oil dependence in transport*. The shift to electric, hydrogen and alternative fuel cars will not happen overnight, and will require huge changes in the EU's transport infrastructure. On the basis of the 2008 Commission Communication "Greening Europe's transport", the Commission will study the actions necessary to put the EU at the forefront of these changes. In particular, it will consider (i) the need for tax breaks and other incentives, respecting state aid law, for the purchase of greener, electric, biomethane and hydrogen vehicles and the early retirement of older, polluting ones, (ii) the possibility of requiring a minimum percentage of all new government and local authority vehicles to be electric, biomethane or hydrogen and (iii) the possible requirement for filling stations to introduce the necessary infrastructure to permit the rapid development of alternative transport across Europe. It will also consider how to catalyse further improvements in the efficiency of vehicles after 2012.
- *Low energy and positive power buildings*. 40% of final energy is consumed in buildings. Buildings can be designed and used in such a way that they do not consume more energy than they are able to produce, and indeed, to become net energy producers. The Commission will establish common principles for defining low or zero carbon and energy buildings and, where necessary, propose measures in order to further increase their number. It is also urgent to make progress on converting the existing stock of buildings. Every investment in existing buildings today may reduce our energy needs and contribute to the EU's emission reduction targets for decades to come. The Commission and Member States will further look into internal market conditions and incentives to leverage these investments for saving energy in the housing sector.
- *A smart interconnected electricity network*. Today's grid was constructed to transmit electricity from large power plants to national retail distribution networks. Tomorrow's grid will need to take account of climate change impacts and to serve an integrated European market with multiple small suppliers of renewable energy, be it from wind farms or domestic electricity generation which, alongside the larger power plants, will contribute to an increasing extent to guaranteeing essential electricity for the EU economy. Huge changes to the EU's electricity grid will be required to accommodate decentralised generation. Concepts such as an offshore supergrid ring around Europe to connect southern solar, western wave and northern wind or hydro energy with the main consumption centres needs to be explored further. Smart meters and controls at the retail level can greatly increase energy efficiency, and encourage the development of electric vehicles.
- *Promoting a high-efficiency, low-carbon energy system throughout the world.* The beneficial effects of an ambitious European energy agenda for 2030/2050 can be multiplied by convincing and helping the rest of the world to follow. Progress towards a global agreement on climate will be a powerful driver of change worldwide. An early and ambitious energy transformation agenda in Europe will help to make Europe's automotive, construction and energy engineering world technology leaders.

This is not an exhaustive list of the issues to be considered but these examples are based on technologies which have already been shown to work on an experimental scale. They

represent fundamental technological shifts which will not happen without a coordinated agenda for research and technological development, regulation, investment and infrastructure development, often on a continental scale.

In order to move forward on this, the Commission will prepare in the framework of the Strategic Energy Technology Plan, a **Roadmap towards a 2050 Energy Policy** of actions to be taken, in dialogue with Member State officials, academics and industry experts, in order to facilitate, where justified, their large-scale implementation. In particular, this Road Map will set out the actions necessary to achieve a zero-carbon electricity supply for the EU by 2050 and the choices available to do so.

4. CONCLUSIONS

The Commission's proposals on greenhouse gas emissions, renewable energies and the internal energy market set the framework for Europe to meet the 2020 targets adopted by the European Council. They will make a first major step towards transforming the EU into a sustainable and secure, technology-based, low CO2 energy market, creating wealth and jobs throughout the EU. A rapid agreement and implementation of these proposals represents the first essential element of any energy security policy for Europe.

- The 20-20-20 measures alone will however not meet the EU's energy security needs. Responding to the call from the European Council of 15-16 October 2008 to intensify work on energy security, the Commission proposes a five-point **Action Plan for Energy Security and Solidarity** and calls on the Council and Parliament to endorse the need for the EU to intensify its efforts in developing an effective external energy policy; speaking with one voice, identifying infrastructure of major importance to its energy security and then acting to ensure its construction, and acting coherently to deepen its partnerships with key energy suppliers, transit countries and consumers. In this regard the Council and Parliament is invited to endorse
- As a first step, the six priorities identified by the Commission as essential for the EU's energy security: the Southern gas corridor, a diverse and adequate LNG supply for Europe, effective interconnection of the Baltic region, the Mediterranean Energy Ring, the need for adequate North-South gas and electricity interconnections within Central and South-East Europe, and the North Sea Offshore Grid.

In addition, the Commission calls on the Council and Parliament to welcome:

- As a second step, the Commission's intention to identify and to communicate to the Council and Parliament by 2009/2010, the specific actions necessary to ensure the realisation of these projects in practice.
- As a third step, the intention of the Commission to consider tabling on the basis of the response to Green Paper, in 2010, a new EU Energy Security and Infrastructure Instrument, building on the existing TEN-E instrument.
- The Commission's determination to ensure the development of a Southern gas corridor and encourage the Commission and the Community financial institutions to collaborate closely in exploring the feasibility of block purchasing mechanism ("Caspian Development Corporation").
- The Commission's intention to outline the measures necessary to ensure that the EU "speaks with one voice" on external energy issues and the actions outlined in section 2.1.

- The Commission's intention to increase collaboration with Africa on energy issues through the Africa-EU Energy Partnership and to place greater focus on renewable energy promotion in Africa through EU development policy.
- The 2008 Energy Efficiency Package, encouraging the Council and European Parliament to expedite work on reaching rapid agreement on its elements.
- The proposed revision of the Oil Stocks Directive, and the Commission's intention to propose a refinement of the Gas Security of Supply Directive in 2010.
- The Commission's intention to promote the environmentally-compatible development of the EU's indigenous fossil fuel resources and to encourage the Berlin Fossil Fuel Forum to develop a concrete set of recommendations regarding the action necessary to further this objective.
- The Commission's intention to table, in the light of experience gained with the new Renewables Directive, a Communication "Overcoming Barriers to Renewable Energy in the EU".
- The revised proposal for a Directive setting up a Community framework for nuclear safety.
- The initiative of establishing a Sustainable Energy Financing Initiative as a joint Commission/European Investment Bank project to mobilise large-scale funding from capital markets for investments in energy efficiency, renewable energies and the clean use of fossil fuels.

Finally, the EU needs to begin preparing its energy future in the longer term. The Commission will therefore propose to renew the Energy Policy for Europe in 2010 with a view to charting a policy agenda for 2030 and a vision for 2050, to be supported by a new Action Plan.

ANNEX

Annex 1 – Main scenarios for 2020

The table below shows the EU's energy profile in 2005 and the projected profile in 2020 under four scenarios: (i) a baseline scenario, without the Energy Policy for Europe and with oil prices at 61$/bbl; (ii) a scenario without the Energy Policy for Europe but with an oil price at $100/bbl; (iii) a scenario with the Energy Policy for Europe and the moderate oil price; (iv) a scenario with the Energy Policy for Europe and the higher oil price.

EU-27 Mtoe	2005	Baseline projection[29], oil price 61$/bbl	Baseline projection, oil price $100/bbl	New Energy Policy projection, oil price $61/bbl	New Energy Policy projection, oil price $100/bbl
Primary energy demand	**1811**	**1968**	**1903**	**1712**	**1672**
Oil	666	702	648	608	567
Gas	445	505	443	399	345
Solids	320	342	340	216	253
Renewables	123	197	221	270	274
Nuclear[30]	257	221	249	218	233

EU energy production	**896**	**725**	**774**	**733**	**763**
Oil	133	53	53	53	52
Gas	188	115	113	107	100
Solids	196	142	146	108	129
Renewables	122	193	213	247	250
Nuclear	257	221	249	218	233

Net imports	**975**	**1301**	**1184**	**1033**	**962**
Oil	590	707	651	610	569
Gas Mtoe (*bcm*)	257 *(298)*	390 *(452)*	330 *(383)*	291 (337)	245 *(284)*
Solids	127	200	194	108	124

29 The baseline scenario is a projection of current trends. Only policies implemented by end-2006 are included.

30 Assumes nuclear phase-outs decided by Member States as at end-2006

Final electricity demand	**238**	**303**	**302**	**257**	**260**

More detailed analyses are presented in the annexed Commission Services Working Paper, "Europe's current and future energy position: demand – resources – investment". Note that the last two columns show predictions for the EU's energy supply picture once the 20-20-20 targets have been met in full, based on the Primes model.