

SECOND REPORT OF THE HIGH LEVEL GROUP ON COMPETITIVENESS, ENERGY AND THE ENVIRONMENT

CONTRIBUTING TO AN INTEGRATED APPROACH ON COMPETITIVENESS, ENERGY AND ENVIRONMENT POLICIES

Long term energy futures and investment in power generation and energy efficiency

I) Overview and principles

1. Europe has reached an important juncture in setting its **long term energy policy goals**. Scenario analysis suggests an energy future for the European Union that is unsustainable in terms of its competitiveness, its commitment to fight climate change in line with the Kyoto obligations and other unsustainable environmental trends, and the need to guarantee its security of supply. Given the expected steady rise in global energy demand¹, there is a pressing need to reduce energy and carbon intensities in both the European and global economies. At the same time it is important that the process of internalisation of carbon externalities for European companies exposed to international competition is well managed and the international competitiveness of the EU industry is strengthened. Oil and gas reserves are concentrated in a few politically sensitive countries on which the EU increasingly depends for its primary energy. Global and EU CO₂ emissions are expected to remain inconsistent with the target confirmed by European Council, that the global mean surface temperature increase should not exceed 2°C.
2. The EU cannot continue to project its energy future on the basis of current trends. A change in trend is necessary and has to be brought about immediately with urgent implications for policy development, since many investment decisions have to be made very soon to meet expected energy demand and to replace ageing infrastructure². Once investment decisions, in the energy sector and energy intensive industries, are made and projects have started, the effect of such decisions will have an impact that lasts for 30 to 50 years. For this reason, the High Level Group on competitiveness, energy and the environment has taken, in this report, a **long term perspective** e.g. 2030-2050 consistent with the long lifetime of energy investment and long development cycles for new technologies.
3. All energy **scenarios** are unsustainable unless big emitting countries worldwide act to reduce their greenhouse gas emissions; the EU will not be able to address this challenge alone. Playing a leadership role in addressing climate change is a clear responsibility that the EU has as a developed region, at the same time the EU needs to consider the effects on competitiveness. There will be advantages for the competitiveness of the EU economy through eco-innovation in all sectors when it plays a leadership role. The EU in line with the European Council Conclusions will need to continue to demonstrate leadership to increase international consensus and weigh up the best possible actions to reach the long term goal of a sustainable energy future, while seeking to minimise the worldwide competitive disadvantages to EU

¹ Without further measures European energy demand is projected to continue growing at a rate of 0.5 -1.0% per annum

² Various scenarios projections calculate that in a baseline scenario around 700 GW of new capacity will be needed to secure electricity supply to 2030, taking into account that more than half of the existing capacity has to be replaced.

businesses. Otherwise EU growth could be reduced while environmental protection worldwide would suffer through environmental leakage³.

4. Europe has the capability to make its energy policy sustainable in the long term by building on its own experience and achievement so far. It is already one of the most energy efficient economies. It has implemented a market based climate change instrument, i.e. the emission trading scheme, and benefits from an electricity generation portfolio that is about 45% carbon free, including nuclear⁴ energy.
5. As proposed in the Green Paper on a European strategy for sustainable, competitive and secure energy, the future energy policy has to focus on the three aspects of sustainability. For the HLG, in terms of concrete action, this translates into energy policy being driven by a **threefold objective**: competitiveness, environment (within which combating climate change is a priority), and security of supply. Any energy-related measure or proposal has to be benchmarked against this threefold objective to ensure coherence. Setting the right framework for energy policy is of key importance. This can be achieved by providing the right tools, enabling Member States to speed-up delivery of their commitments in the most effective way. The regulatory framework must ensure that the EU energy market works effectively and delivers the best solution. Long term predictable incentives are necessary for investments to occur in line with the threefold objective. These incentives have to be market-based and internalise externalities as much as possible. Emissions trading is an essential tool to internalise the climate change externalities through a carbon price. However in order to manage the impact on the competitiveness of EU industry, not only must the cost of internalisation be broadened to all those responsible for emissions including transport and household sectors, an international approach has to be built.
6. Massive **investments** in the energy system are needed until 2030. In the majority of cases these investments will have to be undertaken by the private sector, facilitated by an appropriate framework which addresses the different problems holding back investment. Well functioning energy markets, a transparent, coherent and predictable regulatory framework and access to suitable sources of finance are essential to ensure that the energy investment, in spite of their long-term nature and uncertain rate of return, will be undertaken. Effective market opening and cost reflective grid charges will ensure a level playing field between centralised and decentralised generation. The different existing and developing energy technologies, including combined heat/cooling and power, all have their specific advantages and disadvantages. They have to be promoted when they contribute to the threefold objective. In the long term (up to 2050) no single technology is able to meet the challenge of being the most cost-effective, zero/low carbon emitting and available internally or imported with few risks in terms of price and quantity therefore all options must be kept open. On the demand side, emphasis must be on enhanced energy efficiency as recognised by the Commission in its Action Plan. On the supply side, Member States will need to decide on the range of low carbon technologies taking into account the environmental and safety risks. Particular attention will have to be given to technologies available at material scale. These appear to include renewables, more efficient

³ One member of the group wanted to give more emphasis to the economic opportunities and benefits for EU businesses of taking action on climate change

⁴ One member of the HLG opposes the inclusion of nuclear as an element to be considered by Member States as part of their energy mix. Another member opposes for sustainability and security reasons.

energy production, fossil fuel combined with carbon capture and storage (CCS), and nuclear⁵ for those Member States that decide so. A continued process of technological innovation can be expected to produce further options over time.

7. **Energy efficiency technologies** are just as much part of the solution as generation technologies and analysis suggests that they could contribute significantly to CO₂ reductions. The improvement of energy efficiency needs to embrace the entire value chain including all energy conversion processes, energy transportation, distribution and efficient end-use of energy in the product, and process of production. Many energy efficiency improvements are very cost effective for the user offering quick pay backs, the challenge is to make both public and industry aware of these profitable opportunities to invest in these energy saving measures. This is as much about consumer behaviour as about technologies. Where market signals appear too fragmented for users to take cost effective and energy efficient decisions, intervention is needed. Energy efficiency gains are to be sought not only in industry but also in transport and housing sectors.
8. **Renewable energy** is to play a key role in a sustainable energy future, not only for the EU, but worldwide. The costs are being reduced through technology development and economies of scale. The large scale deployment of renewable energies – taking into account carbon constraints and security of energy supply – will depend on them becoming competitive with conventional energy sources.
9. Europe's vision of a **sustainable energy future** will need to be a low carbon, secure and competitive future. A set of identified technologies, energy efficiency, renewables, and fossil fuel, including coal, combined with CCS, and nuclear⁵ for those Member States that decide so, can contribute both to fighting against climate change and to meeting security of supply. They notably result in diversification of energy supply, both in terms of technology and geographically, and effective utilisation of indigenous supply. But some are not competitive with conventional energy sources even at the current high prices of oil and gas. Market-based incentives have to be implemented to support technology deployment and a long term sustainable energy future. All necessary effort must be made to ensure that energy markets work effectively, and any interventions to address market failure are made on the basis of sound evidence.

The approach should respect the following **principles**:

- a. A more coherent and systematic approach to security of energy supply should be developed. This could be done by ensuring that policies account for the risks and potential costs not fully discounted in market prices.
- b. A long term predictable carbon premium implemented mainly through the European emissions trading scheme (ETS), capturing, from an economic point of view, the additional cost of fulfilling the climate change commitments, and the setting up of long and medium term targets of reducing CO₂ energy emissions by all major emitters;
- c. Taking into account the international dimension, the need for competitive energy prices in Europe and possible distortions of competition in the international markets; a

⁵ One member of the HLG opposes the inclusion of nuclear as an element to be considered by Member States as part of their energy mix.

technology neutral approach is needed for deploying energy efficiency technologies and the different generation technologies;

- d. Support incentives for emerging technologies should be;
 - i. Able to change over time. They should be targeted at technologies with potentialities to mature rapidly and designed to progressively fade away as soon as technologies become mature and commercially viable. This requires a vision of the needs over time;
 - ii. Cost-effective; not overlapping; not resulting in unintended effects;
 - iii. Coordinated and converging within the EU so as to avoid undue distortions of competition and inconsistent national support schemes.
- e. Transparency of the functioning of the energy markets and independent regulatory oversight

II) General issues and recommendations

These recommendations complement the previous recommendations of the 1st Report.

a) A framework for promoting a sustainable, secure and competitive energy future

- 10. A **long term strategy** of how EU energy policy can ensure a sustainable energy future is needed. This will set Europe on a path towards less carbon emissions, greater energy efficiency and more diversity of energy sources, while ensuring the continued competitiveness of its industries and the prosperity of its citizens.
- 11. The EU needs a more conducive framework with a view to setting Europe on a path towards a sustainable energy future. An appropriate framework should act as an enabler for Member States to deliver on their climate change commitments, ensure security of energy supply, while protecting industrial competitiveness, and ensure fair and free competition in energy and industrial markets within the EU. To do this the EU will have to work out how best to use the tools at its disposal, regulation, targets and market based instruments. Targets in general aim at giving guidance for reaching EU policy goals and providing investor certainty. Long and medium term targets will need to be achievable and translate into cost effective operational targets, while ensuring that Member States have flexibility over low carbon technology alternatives, and investors have confidence.

- (1) The EU and Member States should build a **comprehensive energy strategy** for their future driven by the need to ensure competitiveness, to protect the environment, with a focus on fighting climate change and guarantee security of supply. Energy efficiency and renewables will need to play an important role in this future. Economic evaluation of existing or developing technologies needs to be carried out, at regular intervals, thus taking into account the lead time for the development and deployment of these technologies. The Commission should develop a mechanism to ensure that a coherent and systematic approach to security of energy supply is taken, consistent with liberalised energy markets.
- (2) The EU should also set itself a **long term Greenhouse Gases and a CO₂ emissions reduction target** with a series of medium term targets. Such targets must be considered in the context of a need for international actions to efficiently combat climate change.

- (3) In this context, to guide investment in the energy system, the comprehensive energy strategy should define and regularly update **EU-wide objectives** regarding the contributions that energy efficiency and a shift in the energy mix towards zero and low carbon sources could make to the strategic goals of EU energy policy. These objectives, which should be both technically and economically feasible, would over time and where appropriate replace existing sub-targets. They will have to be consistent with other environmental objectives and provide the necessary investor confidence while avoiding the picking of specific technologies; therefore, keeping all options open. Within this framework, the choices relating to the energy mix remain a national competence.
- (4) The **emissions trading scheme** should be improved as already recommended by the HLG, and extended to appropriate sectors to become over time the main **market based** mechanism by which necessary incentive for investment in mature low carbon technologies is provided. This scheme would enable phasing out, where appropriate, the different subsidy mechanisms that currently support different mature energy technologies and replace them, in so far as they cover the carbon externality, with a more integrated market based system to reduce CO₂ energy emissions. Other instruments should be used to complement this policy as necessary. In the long term, the evolved EU-ETS should develop towards a global emissions trading system⁶.
- (5) The EU should ensure that when implementing measures or targets **market distortions** are **minimised** between the different zero or near zero carbon emitting technologies, recognising that support schemes may be necessary for specific emerging technologies for a temporary basis. Ambitious R&D in this area must continue to be supported. The instruments will have to adjust over time in a predictable and consistent manner, providing investor confidence and accommodating different challenges as the EU moves towards its goal of a sustainable energy future. As the EU moves towards an integrated energy system, national and EU instruments should converge.
- (6) Member States shall ensure that the regulatory framework provides a level playing field for **decentralised generation reflecting e.g., the impact on** energy efficiency, emissions, grid losses, infrastructure investment and competition.
- (7) Member States should consistently **integrate their energy policy goals in their National Reform Plans**, under the framework of the Lisbon strategy for growth and jobs. This will contribute to awareness raising and will lead to improved coherence among measures, notably relating to energy market liberalisation, energy efficiency and conservation, renewables and security of supply.

b) Strengthening international cooperation

12. Climate change is a global issue and, as recommended in the previous HLG report, the European Commission should play an effective leadership role in driving global commitment to addressing climate change. The EU should aim at building a global emissions trading system through linking up with other countries (e.g. USA, Russia, Japan, China and India) and regions that have recognised the climate change challenge, and identify common ways

⁶ In its first report the HLG proposed a number of improvements for the functioning of the system which should be implemented shortly.

forward. The feasibility of all potential policy measures that could provide the necessary incentive to encourage the EU's trading partners to undertake effective measures to abate greenhouse gas emissions should be analysed. A thorough analysis should be carried out of the feasibility of positive trade measures (e.g. granting access to environmentally positive goods) as well as border tax adjustments. These actions would mitigate risks associated with leading on climate change and the impacts that a carbon premium could have on the long term competitiveness of European industry.

The actions to boost development and deployment of sustainable energy technologies and security of supply, will need to be undertaken in cooperation with all regions either facing these challenges or able to contribute to them. The EU cannot meet this technological challenge alone, there will be value for all in building an international dialogue on cooperation in research and technology development. This should not just have the effect of speeding up development and deployment of technologies in other parts of the world, but it will help technologies reach commercial viability sooner, thereby speeding deployment. Similarly meeting the security of supply challenge will require international dialogue and agreements with the aim of creating confidence for investors.

- (8) In addition to and within the UNFCCC the Commission and Member States should **engage major emitters world wide** in the climate change challenge, through a series of complementary actions including, cooperation on technology development and deployment, exchanging best practice in energy policy, and providing incentives for adoption of sustainable policies.
- (9) The Commission should **build further agreements and strengthen international cooperation** in view of creating further access to resources and developing innovative technologies. The EU should also undertake technology cooperation with developing countries to help them adopt more sustainable energy technologies (this would include working through Kyoto flexible mechanisms - JI/CDM)

c) Innovation and R&D

13. The EU has a clear role in setting the right framework for **investment in new technologies**, ensuring that long term risks can be managed through confidence in markets and clear policy signals. The EU also has a role in supporting the development and demonstration of new technologies and creating the favourable conditions for the development of EU market for these technologies. **Energy efficiency** is identified as an area where large gains are possible, notably for SMEs. Despite the apparent high rate of return on energy efficiency, the adoption of energy efficient technologies is slow due to poor understanding of benefits, asymmetry of information and other market failures. As energy efficiency has such an important role to play in managing future energy demand the EU needs to deploy the tools that work best at ensuring that energy efficiency technologies are adopted.

Carbon Capture and Storage (CCS) could play a potentially important role in combating climate change and promoting security of supply (through use of coal and other fossil fuels from secure sources): in Europe and the world without CCS present energy scenarios indicate that the trajectory to the 2°C objective would be very difficult to reach by 2050. Appropriate support and demonstration is required to test its commercial and technical viability. But

progressively, CCS will have to compete with other technologies in forming part of the solution for a sustainable energy future.

Renewables and the next generation of low carbon technologies have the potential to contribute to the threefold objective. Member States and EU - level R&D should be better focused on development of the immature among these low carbon technologies. For renewables, research should focus on reducing their cost, and thereby bringing forward the point at which they become commercially viable.

For existing technologies research should focus on delivering greater efficiencies (e.g. next generation of nuclear⁴ reactors and turbine efficiency). Member States and EU - level R&D should also support the development of novel technologies that could contribute the threefold objective. Greater international coordination of research activities and R&D partnerships with trading partners should also be strengthened.

- (10) The Commission should establish a **strategic European Energy Technology Programme** whose funding would come from Member States, EU and industry R&D programmes. This programme must address both supply and demand issues. The Programme should focus on technologies that need an ambitious funding programme to accelerate technology deployment, and where Europe could strengthen or develop technology leadership. In this context the EU and Member States should set up joint technology initiatives for example on renewables or carbon capture and storage, to raise private and public capital for co-financing of several first of a kind large scale demonstration projects.
- (11) The Commission will need to propose a regulatory framework for CCS. This will need to address barriers within the existing statute, as well as addressing relevant environmental, health and safety, and liability issues.
- (12) The Commission should consider the feasibility of establishing together with the European Investment Bank a European level funding scheme that supports **new risk and revenue sharing tools** that can be put on offer by the banking sector and are targeted at a speeding up deployment of new technologies that support the sustainability goals of EU energy policy. The aim of the fund should be to bridge the gap between existing financial market lending and the additional investment costs resulting from the ambitious timelines of the new energy policy.
- (13) Member States and the European Commission should promote **energy efficiency and innovation** through
- development of sector specific **energy auditing standards** aimed at identifying cost effective energy saving measures ;
 - raising public awareness with citizens and SMEs, through the setting up of advisory structures;
 - increasing involvement of financial institutions in **supporting energy saving investment projects**; encouraging banking sector to offer finance **packages specifically aimed at SMEs** to adopt energy efficiency savings identified in energy audits ;
 - modifying tax schemes to favour innovation, energy efficiency and energy conservation related investments ;
 - look at what incentives could be put in place to stimulate technological innovation for ever more **energy efficient products** ;
 - commercial scale demonstration projects with Energy Intensive Industries.

III) Outlook

14. The High Level Group has focused on a strategic energy future for Europe and investment in power generation and energy efficiency. The objective has been to draw up recommendations on how policy options can be developed to enable a sustainable energy future, that is low carbon, secure and contributes to strengthening the competitiveness of the European economy, reaching Europe's climate change objectives and which promotes energy security of supply into the future. Inevitably as the HLG has been looking at horizontal issues there are a number of recommendations which complement and elaborate upon recommendations of the first report. Attention will now turn to technology perspectives and innovation in energy intensive industries and the impacts of environmentally harmful subsidies.

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