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**A European Strategic Energy Technology Plan (SET-Plan)**

**SUMMARY OF THE IMPACT ASSESSMENT**

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## Summary of the Impact Assessment

### for the European Strategic Energy Technology Plan

#### 1. INTRODUCTION

The European Council has prioritised the need for transforming Europe into a highly energy-efficient and low greenhouse-gas-emitting economy and on 9 March 2007 has adopted an Energy Action Plan, paving the way towards an Energy Policy for Europe. Recognising the need for an integrated approach to climate and energy policies, this Action Plan pursues a threefold objective of combating climate change, limiting the EU's external vulnerability to imported fossil fuels, and promoting economic growth.

Research and innovation on energy technology has a vital role to play in achieving the above-mentioned goals. Europe must develop a world-class portfolio of affordable, clean, efficient and low-emission energy technologies and create stable and predictable conditions for industry, particularly SMEs, to ensure the widespread deployment of these technologies in all sectors of the economy.

In the context of the Energy Action Plan, the European Council has invited the Commission to propose no later than March 2008, a European Strategic Energy Technology Plan (SET-Plan) to revitalise energy technology innovation. The main elements of the forthcoming Commission proposal are a governing structure to lead the European efforts on energy technology innovation and a set of European large scale initiatives to accelerate the development and deployment of key energy technologies.

The purpose of this document is to summarise the assessment of different policy options for the governance of a SET Plan.

#### 2. THE BASIS FOR AN EU ACTION

To meet the 2020 targets adopted by the Council on greenhouse gas emissions, renewable energy and energy efficiency, there is a need to drive down the cost of existing low-carbon and high efficiency technologies and bring about a step change in their market take-up. In the longer term, new generations of technologies have to be developed through breakthroughs in research to meet the ambition of reducing our greenhouse gas emissions by 60-80% by 2050.

Current trends of the evolution of the European energy system and its projection into the future are however not encouraging; Europe is not on a pathway to meet its objectives. For decades, the abundant availability of resources, the lack of carbon constraints and the cost imperative of market forces have not only left Europe dependent on fossil fuels, but have dulled the drive for innovation and investment in energy technology required for making the energy system sustainable.

Energy research budgets (public and private) in the EU have declined substantially since peaking in the 1980s. This has led to an accumulated under-investment in energy research capacities and infrastructures. The levels of investment and innovation effort are now completely out of sync with the scale of the challenge ahead.

The energy technology innovation process also has structural weaknesses, such as long lead times for new technologies to mass market, locked-in infrastructure investments, diverse market incentives and network connection challenges, etc. Furthermore, the market take-up of new energy technologies is additionally hampered by the nature of the technologies themselves. They are generally more expensive than the technologies they replace. In short, there is no natural market appetite for such technologies.

Also outside Europe, other global agents have identified this opportunity of bringing new technologies into the market and are focusing their efforts on developing low carbon technologies. The undesired outcome of this could be a carbon constrained European market depending on imported technologies, despite the fact that the demand is created domestically.

Member States working alone will have difficulty in creating the conditions necessary to allow industry to develop the necessary technologies and to compete in global markets. Currently the EU research base is characterised by fragmentation, non-aligned research strategies and sub-critical capacities. In essence there is a need for a better coordination of the individual innovation efforts to reach the necessary critical mass.

In addition, the European Union is not currently using the full potential for innovation of the internal market for exploring synergies between Member States in the development and deployment of new energy technologies. The variety of national regulations and technical specifications fragment the market and inhibit industry investments in risky technologies.

Time is of the essence. It will take decades to progressively transform the energy system, hence this necessitates immediate strategic action at European level, pro-active planning and a comprehensive policy framework.

### **3. THE OBJECTIVES OF THE SET-PLAN**

The strategic objective of the SET-Plan is to ensure that the EU Industry and Research base will acquire a well established status as a global leader in the development and market take up of low carbon energy technologies both in view of providing the EU with the necessary technologies to achieve its own policy objectives but also grasping the opportunities of these new markets worldwide.

There is a need to create a long term EU framework for energy technology development, i.e. an EU energy technology policy. Such a framework would be characterised by strengthened coordination of national and Community actions, including joint strategic efforts to develop promising technologies, increased public and private investment, reinforced development of human resources, the exploitation of the benefits from the development of the internal market and the European Research Area. Member States, the Community, industry and the research community all have different roles to play.

Consequently, the SET-Plan pursues: (i) the transformation of the governance of the energy research and innovation system through the engagement and the commitment of all

stakeholders in a coherent programme; (ii) a strategic planning that orients the research and innovation efforts towards technologies and measures with the greatest potential to deliver the European energy policy targets; (iii) a more effective implementation, execution and management of all activities across the whole innovation process; and, (iv) a cost-effective and results-oriented allocation and increase of means.

#### 4. THE POLICY OPTIONS

Four policy options for the overall governance have been considered.

One possibility is to continue with the current energy technology innovation process. This approach has been effective in supporting the European energy system so far. Several Member States are already pursuing ambitious strategies on next generation energy technologies indicating the importance to invest now in this field. This process is mainly based on individual programmes, with their own priority setting mechanisms, governance and funding, implemented at different levels: EU, national, regional, corporate, etc. These programmes differ in scope and scale of allocated resources, as reflected on the intensity of efforts dedicated to specific technologies. To improve the level of coordination between programmes to create the optimal critical mass and raise the necessary additional funding to address the challenges facing the energy sector, some efforts are currently undertaken through trans-national agreements (ERA, bilateral agreements), the establishment of memoranda of understanding (e.g. COST, EUREKA, EU framework programmes), etc.

Another possibility is to establish a new innovation structure and process at the EU level, embedded in a single, coherent and flexible strategic coordination framework, coupled with a shared vision and a dynamic strategy on energy technologies, while making the most of and expanding the current European energy technology innovation base. Ultimately, the new process pursues a more effective use of resources – from ideas to markets, while revitalising, increasing and more effectively utilising, public and private investment. More specifically, a Coordination Committee for Energy Research and Innovation is established, populated by Member State representatives with authority on budget and chaired by the European Commission. This Committee defines and supervises a multi-annual strategy for enhancing innovation on energy technologies and steers a results-oriented Action Plan. Open-access information and knowledge management systems, including technology watch and capacities mapping are created to support this Committee on strategy and implementation. The Action Plan is implemented through a number of European Actions, which include several European Initiatives. It is executed by ‘sharing-in-doing’, i.e. the engagement and commitment of resources at the Action level and is monitored periodically through a common assessment framework. The means for undertaking each Action (financial, human resources, infrastructure) are provided by each party that contributes to it, under specific instruments for joint execution, such as Art. 169, Art. 171, bi- or multi-lateral agreements, etc. Finally, an annual EU Energy Technology Conference brings together all stakeholders in the entire innovation system.

An alternative policy option is to set up a centralised structure with the remit of devising and implementing a strategy on energy innovation at the EU level in line with the EU policy objectives. This structure is established through a regulation and has its own Governing Board. The Governing Board sets, endorses and reviews a multi-annual strategy and a detailed work plan that is managed and monitored by its own management structure. Funding is provided to the organisation by the Member States, the European Commission and the

industry either on a case by case basis or through fixed grants, and is allocated by the Governing Board through its work plan. The actions to be funded are selected through calls for proposals, open to all European stakeholders. In essence, the main differences with the previous policy option are: (i) the creation of a European dedicated structure having as a mandate to define a multi-annual innovation strategy and to manage at the European level Community and Member States efforts; doing so however requires funding from national and Community levels; (ii) the decision-making framework is based on a top-down approach, and, (iii) R&D&D funding is channelled through the organisation on a competitive basis.

The last policy option considered is based on a market-driven approach. This option relies on distinctive roles for public forces and private entities. The public authorities set binding targets on carbon emissions and put in place the required enabling market instruments creating a fertile ground for the uptake of technologies. In turn, the leadership of technology development is borne solely by the market forces. In practice, a set of binding targets for CO<sub>2</sub> emissions are enacted at the EU level, accompanied with a strong carbon pricing mechanism (possibly via ETS). The main differences with the two previous options are (i) the lack of coordination and planning on technology innovation at the EU level, and, (ii) there are not a priori established joint operational efforts between public and private sectors to enhance innovation, but may be formed on demand.

## **5. KEY FINDINGS OF THE ASSESSMENT OF THE POLICY OPTIONS**

The policy options have been assessed against three criteria, namely, leadership, implementation and resources. The key findings of the impact assessment can be summarised as follows:

- **Leadership:** A strategic coordination ensures the highest level of leadership by the establishment of a single framework for innovation and a of coordination committee with the possibility to make decisions. The alternative governance model embedded in a centralised structure is also suitable to address the needs to accelerate the pace of innovation. However some transfer of competencies from the Member States is required to ensure the effectiveness of this model, raising some subsidiarity concerns. Finally, the market driven approach does not have an institutionalised leadership structure, necessary to balance the short term vision of the market with the longer term sustainable goals of Europe.
- **Implementation:** A key strength of a strategic coordination is the provision of a single framework for the implementation of Actions, reinforced by governance, on a broad portfolio of energy technologies that facilitates the systematic use of instruments for joint programming and execution. Although the effectiveness of implementation of a centralised structure is secured by an institutionalised framework supported by an organisation with its own budget and governance, it carries a risk of bureaucratisation and more importantly, of self transforming an additional organisational layer with no significant impact on innovation. Finally, the market-driven approach bears the risk that the achievement of the policy targets could also be realised using non-European technology or technology developed by Europeans abroad.
- **Resources:** The facilitation of a systematic use of specific instruments such as Joint Technology Initiatives in a strategic coordination catalyses the revitalisation of public and private investment, while ensuring that financial resources are allocated and used in a more

focused and results-oriented manner. The institutionalised budget in a centralised structure guarantees a minimum level of stability and financial security to support a balanced portfolio of short term and long term technologies. Nonetheless, the funds necessary for the structure to execute its work plan may be limited due to competition for resources with existing programmes. Finally the market-driven approach ensures an effective utilisation of resources and the necessary fund-raising from private investment, putting less pressure on public resources. It is however noted that the investment in human capital and basic research may not be optimal.

## **6. RECOMMENDATION**

From the assessment of the impact of the four policy options, the preferred option is the establishment of a strategic coordination as it combines the best features for leadership, implementation and resources. This strategic coordination seems to be the best option to evolve towards a reinforced energy research and innovation system that would accelerate developments. In the longer run, its successful implementation may lead to further appetite for integration, making progressively a centralised innovation process at the European level more attractive than today.