

## ***WORKING PROGRESS OF ITALIAN POSITION IN TO FRAMEWORK OF SET PLAN***

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### **Overview (The Background)**

In 2013 the Italian Government has issued a National Energy Strategy (NES) that sets out clearly the main goals to be pursued in the coming years, that describes the basic decisions to be taken and establishes the priorities of action – albeit being aware that we are acting in a free market context and with driving forces that cannot be controlled centrally. The NES is the outcome of a broad public consultation and the engagement with public institutions, R&D centres, associations and social partners and with direct and indirect stakeholders in the energy sector. The end result is a broadly shared set of analyses and energy policies and a guideline for future action, with the aim to structurally influence a sector that is key in terms of economic growth and improvement of the quality of life in our country.

The path of **progressive decarbonisation of the economy requires research and development in advanced technologies**, with regard to renewable energy, efficient use of energy and sustainable use of fossil fuels. As we have seen, the distance that separates us from the different envisaged decarbonisation scenarios at current knowledge is still very big. To achieve such a transition, without jeopardizing the economic and social performance standards, a **'discontinuity' in terms of cost and effectiveness of the solutions will be needed**. Unless these conditions are brought about, reaching the Roadmap 2050 scenarios for Europe will be complex and expensive; furthermore the envisaged substantial shift towards 'green energy' by emerging economies will be difficult as they have a strong and growing need for energy; the same is true for those countries where awareness and social choices do not put environmental issues at the top of the political agenda. Market forces, however, can contribute decisively to shift this tendency and - as it happened in the past - **major technological changes are critical in changing the balance of market forces**.

It is therefore essential to **increase the global effort in research and development**, firmly focusing resources and political commitment on the research of 'breakthrough' technologies, instead of using existing technologies. In this sense, Italy can contribute by investing more strongly on research and development, and even more by offering its help to guide the debate and policy-making towards greater international efforts.

Italy recognizes that at **the European level, the “Strategic Energy Technology Plan” (SET Plan)** is the strategic response to the major climate and energy challenges. The European Commission has also taken other significant initiatives, most notably the Horizon 2020 programme which, from 2014 to 2020, will gather research and innovation measures into a single framework programme. In these, energy (especially renewables) will have a prominent position. Italy has important areas of international excellence in specific fields. On the other hand, an analysis of the aggregate input (investment) and output (scientific and patent production) indicators reveals that **research and innovation in the energy field is being held back**. This can mainly be explained by the limited resources for research and innovation, the high level of fragmentation of actors and areas of research involved, and by the lack of a single coordination “control room” and clear-cut policy establishing research priorities.

## Methods

### (Italian Position of industries and research)

The country has internationally recognised **areas of excellence**, for example, in the field of **second-generation biofuels, geothermal power, concentrated solar power, power electronic** or in the development of **smart grids**, an emerging sector in which Italy has recently consolidated its leadership by coordinating the creation of the International Smart Grids Action Network (ISGAN). In addition, the country is engaged in important R&D programmes on **clean coal, storage systems** and in **nuclear research**.

However the **level of resources** devoted to research and innovation, both private and public, is significantly **lower** in Italy. In 2010, our country allocated to R&D in the energy sector about \$1.3 billion, of which about \$400 million in public funds. This compares with \$4 billion invested in Germany, \$3.8 billion in France and in \$1.5 billion for the United Kingdom. We are followed by Spain, with \$0.8 billion. In terms of **patents**, too, Italy does not hold a leading position and in the last decade has **lost ground internationally** – at least in quantitative terms – with a decline from 1.4% to 0.6% of the world's patents in the energy sector. Along with **limited public resources**, the following critical areas in the system are obvious obstacles:

- **Low private sector participation** in R&D investment in the energy sector
- **The high degree of fragmentation** among the parties and the areas of research involved, which sometimes translates into overlaps or an inability to “act as a system” around major initiatives and/or hubs of excellence.
- **The lack of clear guidelines** on energy research priorities for the country, on which to concentrate resources, and of a **single coordination “control room”** for the sector to facilitate collaboration and the more effective allocation of the resources available.
- The need to **revise and adapt the set of knowledge** in human capital and in particular those concerning the energy sector to new demands is a major challenge for the coming years.

## Results

### (The key choices)

In relationship to the areas of excellence in the production and management of energy systems the following areas to be of priority interest:

Priority Themes
Research in <b>innovative renewable</b> technologies, particularly those in which, as a country, we already start off in a strong position: <b>geothermal</b> and <b>second generation biofuels</b>
Research in <b>renewable technologies that can be integrated in buildings</b> with solutions with low impact on the landscape and the architectural heritage of the historical centres of our cities
Integrated systems of power generation from renewable sources with systems of accumulation and least production from sources fossils (natural gas) to continue the market parity of the renewable ones.
Research in <b>smart grids</b> , partly to facilitate distributed generation, and in <b>storage systems</b> , also in relation to sustainable transport and mobility
Research in <b>energy efficiency materials and solutions</b> , and their <b>technological transfer</b>
The development of projects on <b>CO2 capture and storage</b> , mainly from the perspective of Italy's participation in the European implementation programme around this technology and <b>possible technological transfer initiatives in non-EU areas</b>
From a longer-term perspective, the development of international collaboration <b>in the field of safety and studies on fusion and on generation IV nuclear fission reactors</b> , in which Italy can boast excellent scientific and technological expertise, will also be important

## Conclusions

A **census of national competences** in the energy research sector is also planned, a vital preliminary step in establishing more precise priorities and properly calibrating the incentives applied to specific branches of technology.