

COMMITMENT OF ENI SpA IN RENEWABLE AND SOLAR ENERGIES

Eni SpA – Strategy Development ; Research Center for non-Conventional Energies – Istituto ENI Donegani ; Via Fauser 4 – 28100 Novara (Italy)

ENI SpA, established in 1953, is one of the world leader companies in oil and gas extraction and refining. Eni's growth process is sustained by the continuous technological innovation. This will ensure to core business the key technologies required to both win competitive advantages and make them sustainable in time to promptly face new industrial scenarios. Eni's overall financial expenditure for technological innovation in the four-year period 2007-2010 will be approx. € 1.5 billion. To support its research capabilities, ENI has also developed a complex collaboration network with both Italian and foreign universities, community and national institutions, international research laboratories and international professional associations.

Along its former core business oil & gas activities, Eni is committed to fight climate change by focusing its research in three main directions:

- use of solar energy, with particular reference to the development of organic and hybrid photovoltaic cells and hydrogen photo-production systems and to study the feasibility of concentrated solar hybrid plants for power generation;
- biofuel production;
- development of technological skills for the geological sequestration of CO₂ and the production of fuels by CO₂ biofixation.

A number of long-term research projects have been launched on these subjects, for a total research investment in renewable energies of € 90 million (2007-10). In this frame, the mission of the former research center of the petrochemical branch of ENI ("Istituto Guido Donegani") has been refocused on non conventional energies.

ENI started the following 4-year projects on solar energy in 2007:

- 1) Organic solar cells
- 2) Photoactive materials
- 3) Water photosplitting for hydrogen production

In addition, a 400 MW natural gas-concentrated solar power-dissalation plant (to be located in dismissed industrial areas in the Mediterranean belt) will be designed and evaluated.

Skills ranging from molecular modelling and organic and polymer synthesis to materials and devices characterization, already available in the research center or to be developed will be implemented to achieve the selected targets.

In detail, as for organic photovoltaics, quantum chemical calculation will be applied to design the materials starting from their chemical structure (HOMO and LUMO, band structure, excited states, electron transfer mechanisms). New polymers and photoactive materials will be prepared and evaluated to identify suitable donor-acceptor pairs and to assess their properties. Finally, photovoltaic devices will be fabricated from the most promising materials and tested. Issues like materials costs and stability will be taken into consideration for all the activity along.

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