

***Catching Up: Priorities for Augmented Renewable Energy R&D
Joint Seminar on Long-Term R&D Priorities***

*Organised by
the International Energy Agency Renewable Energy Working Party and
Renewable Energy and Hydrogen Implementing Agreements*

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Paris, France**

Summary

The International Energy Agency (IEA) hosted a one day seminar, on 3 March 2005 with the purpose of providing recommendations on mid to long term R&D priorities for renewable energy.

The Renewable Energy Working Party (REWP) and the related Implementing Agreements (Bioenergy, Geothermal, Hydrogen, Hydropower, Ocean Energy Systems, Photovoltaic Power Systems, Solar Heating and Cooling, Concentrating Solar Power and Chemical Energy Systems and Wind Energy Systems) agreed to work together to define R&D priorities to support the vision of the REWP that 50% of the world's total primary energy supply could be obtained from renewable sources by the middle of this century. The key element towards the realisation of the REWP vision is the accelerated technological advancement and cost reduction of all the renewable energy technologies, combined with novel applications and deployment in the context of distributed generation, global production and trading of fuels (including hydrogen), and bulk transmission of renewables-generated electricity.

About 100 persons attended the event, representing the cutting edge knowledge base of renewable energy technologies in member countries. This included the delegates to the IEA Committee on Energy Research and Technology (CERT) and the IEA Renewable Energy Working Party, representatives of governments, European Commission, European Renewable Energy Council, members from all Renewable Energy and Hydrogen Implementing Agreements, international and national energy research institutes, international and national industry associations, IEA Secretariat and others. The conclusions of the Seminar are intended to form the basis for a report on the R&D priorities for renewable energy technologies to be presented to the IEA Member countries.

The Executive Director of the IEA, Mr Claude Mandil, opened the seminar and the CERT and the REWP Chairs provided introductory comments. Leaders of Implementing Agreements, as well as expert organisations, industry R&D representatives and the IEA Secretariat made presentations. They were followed by discussion and comments.

1- Key conclusions .

Renewable energy has made very significant progress over the last three decades. Through R&D – much carried out through international collaboration – a number of sustainable technologies have advanced and are gaining a growing market share while contributing significantly to energy supply. Hydroelectricity provides almost 20% of global electrical generation while bioenergy and geothermal contribute significant amount of both electricity and heat. Newer technologies such as wind and photovoltaics are becoming important global industries with annual sales of several billion US\$.

The experts attending the Seminar stressed that the potential for renewable energy supply offers significant opportunities for further growth. Drawing on the experience of the last few decades and the lessons learned, it is clear that renewable energy can play a very important role in transitioning to a global sustainable energy supply by the middle of this century.

Although it was recognised that each country has its own R&D priorities based on their particular resource endowment, technology expertise and industrial strengths, a number of priorities were identified from the broader IEA perspective. Based on recent IEA analysis, there is consensus that R&D in renewable energy must be strengthened, but with a caveat that priorities must be well selected in order to address policy objectives,

especially as they relate to prospective cost effectiveness. Intelligent choice of such priorities will invariably facilitate market deployment of new and improved technologies. To this end, it will be necessary to refocus the renewable energy strategy towards three general directions, as summarized by the IEA Executive Director. They include:

1. Increased targeted renewables R&D funding;
2. Improved strategy for market deployment; and
3. Inclusion of externalities in policy considerations.

2- **Key findings** include:

1. R&D and market deployment complement each other and result in faster and more meaningful technology learning.
2. In view of the impact of technology deployment policies in advancing the state of the art and expediting commercialisation, governments should seek new deployment policies that will facilitate renewables' market growth.
3. R&D and policy strategies need to differentiate among technologies in order to address diverse problems of particular and unique technical challenges.
4. Renewable energy technologies have different development profiles but potential benefits may be similar in terms of more secure and diversified energy supply, economic development and reduced environmental impact (for example, hydro/wind/PV)
5. International technology collaboration has provided proof that it can substantially contribute to the process of technological innovation. Many of the identified technology issues can be addressed through collaborative effort within the framework of the IEA.
6. In view of the priorities dictated by the implementation of the Kyoto Protocol, renewable energy sources should be given a higher priority than they had in the recent past.

3- **Technology related priorities** include:

1. Recognising that the key impediment to wide commercialisation of renewable sources is still their higher cost compared to conventional energy, the top priority remains cost reduction efforts in order to improve market deployment potential. This can be achieved through technology advances and also through the development of manufacturing and production processes, themselves affected by targeted market deployment and active investments by the private sector – the learning cycle.
2. Integration to the grid of intermittent renewable sources must be addressed through improved storage technologies as well as specific management procedures such as market design, interconnection of networks, output forecasting and grid management.
3. There is a continuous need for demonstration projects for some technologies, in particular concentrating solar power and ocean energy, to test new findings and as a precursor to market deployment.
4. There is need to address environmental and social issues, including those associated with planning, permitting and public acceptance.
5. Improvements in the regulatory framework are needed in areas addressing heating and cooling such as bioenergy, solar heating and geothermal heat pumps.
6. R&D must lead to market related products and services. This link is particularly important in the context of justifying R&D in political messages and requests for additional resources. There has to be a clear distinction between wide ranging 'long term scientific research' and well focused 'near market R&D'.