

Clean Energy for Everyone:

The growing role of renewable resources

Brief summary of presentation by

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1. RATIONALE

Why should mankind use renewable energy resources?

1. They constitute the biggest energy resource we have

(Note: all our oil, gas and coal were made by renewable solar energy millions of years ago)

2. They are widely distributed over the earth
3. They strongly help reducing unwanted global warming effects of energy use
4. They help diversifying our energy supply
5. They create new business opportunities
6. They will play major role in transition process to sustainable energy system
7. Fossil fuels will eventually run out, oil first (50 years), then gas (100 years) and finally coal (200 years); and also uranium supplies are limited (50-100 years)

But at present the world energy supply is still dominated by fossil fuels and the contribution of renewables is only about 13%.

What are the barriers to their widespread use?

- Fossil fuels are still relatively cheap, partly because their external effects are not incorporated in the price
- Renewable energy costs are often not (yet) competitive, but are coming down rapidly through the learning curve
- Energy policies are often not favorable for their promotion
- There are sometimes environmental concerns (hydro, wind, biomass)
- Some sources have an intermittent character (wind, solar), bio-energy delivers firm power

2. MARKET GROWTH AND BUSINESS OPPORTUNITIES¹

In the year 2005 record investments were made in new renewable energy capacity: \$38 billion in total (compared to \$30 billion in 2004). Germany and China were the leaders in investments, with \$ 7 billion each, but also in the USA, Spain, Japan and India large investments were made.

The total renewable power capacity grew from 160,000 to 182,000 MW (excluding large hydro, equalling around 750,000 MW). The global wind capacity grew 24% to 59,000 MW, grid connected solar photovoltaic (PV) capacity grew 55% from 2000 to 3100 MW. The solar hot water capacity increased from 77,000 to 88,000 MW(thermal). Also the ethanol production increased, from 30 to 33 billion litres, and the biodiesel production from 2.1 to 3.9 billion litres.

The renewable energy industry has also attracted the investor's attention, as the 85 publicly traded

¹ These data are derived from the Global Status Report "Renewables", 2006 Update, by REN21, the Renewable Energy Policy Network for the 21st Century

renewable energy companies in 2005 had a market capitalization of more than \$50 billion, twice the estimated amount of 2004. The largest number of companies is in the solar PhotoVoltaic (PV) business which, according to the Global Status report, is becoming one of the world's fastest growing and most profitable industries.

3. POLICIES AND LEVEL PLAYING FIELD

It has often been said, but cannot be repeated enough: in order for renewable energy sources to compete properly with conventional energy technologies the "playing field" should be levelled. An important element of this uneven playing field is the fact that the traditional energy sector is still being subsidised heavily. As an (older) example: in the period 1995-1998 fossil fuels, electricity and nuclear power in total received USD 215 billion in subsidies annually, whereas renewables and end-use efficiency received only USD 9 billion.

Much work still has to be done to realise a proper integration of renewables in the energy economy, storage will become gradually more important for example (both thermal and electrical), but technology and costs are just only two of the aspects deserving attention.

Promoting renewable energy sources should NOT be done in isolation, but should always be part of an integrated energy policy based on three pillars. This so-called **Trias Energica** involves:

- (1) a permanent effort to increase energy efficiency (and energy conservation);
- (2) strong support for implementing renewable energy sources, with clear targets;
- (3) efforts to use fossil fuels as clean as possible (through Carbon Capture and Storage).

Renewable energy policies must be established and implemented by national and local authorities, financing should be made available at reasonable terms, fiscal incentives and "green" funding should be promoted, institutional hurdles must be taken, proper training must be ensured, stricter building codes can have a strong impact on the accelerated use of renewables, and environmental effects should be taking care of right from the beginning.

4. THE RENEWABLE SOURCES THEMSELVES

Note: details of the various renewable sources, such as wind and solar power, solar heating and cooling and bio-energy, will be presented in Rome. They are not summarized here.

5. CONCLUSIONS

One concludes that the prospects for renewables are steadily improving but that there is still a long way to go before they can really become the dominant energy source towards the end of this century. It must be clear that the real problems are not of a technical nature (although technical development remains needed), but largely political, financial, institutional and social. Renewable energy sources need a level playing field to succeed: sufficient resources, proper taxation, proper institutional backing, part of national energy policies, part of university curricula, removal of unsustainable subsidies to the conventional energy sector. The R&D funds devoted to the further development of renewables are still small compared to those spent on nuclear power and fluctuate seriously with political interest. Funds available for financing renewables are rarely available on attractive terms, energy policies of countries seldom offer more than lip service for renewables, utilities in many countries are at best indifferent to renewables. Also, proper information is lacking at various decision levels and ongoing technical development is required to further increase the performance/price ratios.

6. EPILOGUE

The sun has proven to be a very reliable source for mankind: hundreds of million years ago she gave life to the plants and animals that were gradually transformed into our fossil fuels, which we consume so fast that they will last only a few hundred years. From a historical perspective this is a very brief intermezzo: mankind exists for about half a million years and hopes to continue at least that long. Mankind had a renewables-powered society for ages, and only since the use of coal to power the Industrial Revolution it was transformed into a fossil-fuelled one. No one contradicts the fact that sooner or later the fossil fuels will run out, so that the society of the late 21st and subsequent centuries will have to be powered by renewable energy sources. Because major changes in energy infrastructure take 50 to 100 years, the coming decades should be used to facilitate the gradual transition towards a modern renewables-powered energy infrastructure.