

France-Israel Dialogue on:
Sustainable Energy options
4-5 July, 2010
The Jerusalem Institute for Israel Studies

Abstracts

Session 3: "What are the alternatives for sustainable energy?"

- *Mr Sylvain Hercberg, Director of Prospective, EDF Prospective and International Affairs Division*

Renewable energies contribution to sustainability

Electricity generation represents 40% of CO₂ emissions related to energy, 25% of global greenhouse gas emissions. These emissions are directly linked with from the mix currently used (2/3 of fossil fuels and one third of zero carbon). They must be halved by 2050, to address climate risk. Addressing the climate challenge leads to two requirements for the electricity sector: a broad effort to improve efficiency; and as much de-carbonization of generation as possible. Renewables are part of the solution. But a key topic should be dealt with: how have affordable prices and then ensure security of electricity supply, knowing that these technologies have their specificities and must be economically acceptable?

Hydropower: a considerable potential in the world and production cost is usually less than 50 €/MWh; hydro generation is very competitive, but capital intensive: moreover, hydro facilities must meet the challenges raised by social and environmental impacts of large structures.

Wind power: in France, the present current cost is about 70-80 €/MWh for onshore wind farms and much more for offshore sites. Wind power is the most mature REN after hydropower, but its intermittency leads to relying on monitoring and forecasting devices, and increases the need for flexibility of the rest of the generation facilities. Eventually, the storage of electricity may provide part of the solution.

Photovoltaic solar: several competing technologies exist, but the generation cost remain very high compared to centralized generation, and depends on location; more, the gap is too large to hope for sharp reduction without technological breakthroughs.

Other REN: the same approach must be done for all REN, such as marine energy, offshore wind, geothermal energy, solar thermal, biomass, ...

Conclusion: REN must be prioritized according stage of maturity. Then, a strategy for development must be designed and properly implemented, with first RD & D and then

massive deployment when the production cost is sufficiently low. This maturity depends on the local economic and geographical context.

- *Mr Philippe Lambert, Contributor to Passages on Communication & partnerships*

Energy – The road to a low carbon future

The energy challenges we are facing today are escalating.

As the economy pulls out of recession, global energy demand is growing again: in a sense it's good news, because the world is clearly pulling billions of people out of poverty at a time. But also challenging news because we need over a long period of time to feed the world's economies with more energy, affordable energy and cleaner energy and find our way to a low carbon economy .

The key energy drivers are at the heart of the energy scene are:

1. Demand growth.
 2. Energy supply
 3. Environmental impacts
 4. Security of Supply
 5. Technology & Policy
- The global economy continues to undergo rapid structural change, with large swaths of the world aspiring to catch up to the income level of the OECD.
 - Access to energy lies at the heart of this transformation
 - At the same time, the challenge of creating a lower-carbon economy is still very much before us. The policy decisions that are taken today can either progress or impede the move toward cleaner energy.
 - Scaling them up to the point where they can begin making a significant contribution to world energy demand is a project that will span decades.
 - A ranking of technological options shows that the gap is now closing between fossil fuels and low-carbon alternatives as these become cost effective thanks to scale and technological breakthroughs.
 - To accelerate the introduction of low-carbon solutions and enhance energy security, the pricing of carbon is a positive option

- *Professor David Faiman, Director of the Solar Energy Institute, Sde Boker*

"Cost-effective solar power from the Sahara"

Review the efficiency and land requirements of very large-scale: photovoltaic; solar-thermal; and wind-power systems. then emphasize the particular advantages of concentrator photovoltaic (CPV) plants including their expected superior economics.

Finally, Prof. Faiman shall take the southern Mediterranean countries as case studies, pointing out that in order for Europe to be able to employ the Sahara for carbon-free power production, the chief obstacles are not expected to be technological.

- *Dr Shahar Dolev, Research director of the Israel Energy Forum*

The energy sector in Israel, as in the rest of the world, is heading towards a crisis – the global struggle against GHG emission, the rise in energy demand in spite of depleting sources, and specifically in Israel, land scarcity that affects the ability to install energy infrastructure – all will most probably bring about an increase in energy costs, and maybe even strict limits on its generation and use. With respect to this global trend, Israel must take leadership in the world's transition to low energy economy in the coming decades –as it will serve a tremendous strategic and economic opportunities for the Israeli ingenuity.

- *Michel Derdevet, Executive Director in charge of Communications and Public Affairs of RTE (Réseau de Transport d'Electricité)*

Power transmission grids in the energy transition

Transmission grids are a key element in the energy transition our societies have to face.

RTE, as a transmission network operator, plays an important role to respect the energy and climate change policy targets set by the European Union: improving energy efficiency, reducing greenhouse gases emissions and developing renewable energies. These challenges force the network to adapt to sustainable energies.

Firstly, transmission grids are fundamental in deployment and integration of renewable energies.

Contrary to popular believes, wind or solar energies are not local and decentralized productions; they have to be connected to transmission grids to be then distributed. But wind power plants or solar panels cannot be processed like nuclear or thermal power stations. Renewable energy resources are intermittent and depend on many conditions (wind speed, alternation day/night...). Transmission grids face new challenges to integrate them. Indeed, electricity cannot be stored; a smart system is needed to ensure electricity demand meets supply. It is up to RTE to balance supply and demand, and therefore to handle renewable energy sources. The French transportation system operator is innovating

in order to be able to receive large amounts of renewable energy (wind energy mainly). Without sophisticated transmission grids, the development of renewable energies will be blocked, or at least will not happen on a large scale.

Secondly, leading-edge transmission grids are needed to improve energy efficiency. Therefore, the network has to optimize assets and power flows. Energy efficiency consists in using less energy for the same level of energy generation: as the saying goes, “doing more with less”. The three main ways to obtain leverage are: more efficient power plants, less losses on the transmission grid and demand-side management efforts. To meet all these expectations, transmission system operators have to fully develop what we call Smart Grids technology. Essential to receive large-scaled renewable energies production and to improve energy efficiency, smart grids enable consumers to participate to the energy transition thanks to a two-way communication system.

- *Professor Uri Marinov, Environmental consultant*

The energy policy for the state of Israel should be based on the following measures:

Energy conservation: Strong programs of energy conservation should be established. All studies that were conducted in the last decade have indicated that the country could save up to 20% of its energy demand, by perusing conservation.

Natural gas: Gas should be the major source of energy for the production of electricity. Necessary measures should ensure uninterrupted supply of gas. Electricity production should be carried out in small scale units. Large scale power plants, whether based on coal or nuclear, should not be built in the future. The existing units will continue to function until decommission will take place. To ensure supply of gas for the years to come, export of Israeli gas, should not be permitted.

Economic measures: In calculating the production cost of electricity, all externalities should be included. The selling price of electricity will reflect it. Carbon will be taxed, especially for transportation, but also for the production of electricity.

Solar and Wind: With correct pricing of electricity, the use of solar (both PV and thermal) will become economically viable. No regulatory restrictions should be applied to the production of it, provided it is done within the terms of a plan approved by the National Planning and Building Board.

Energy Fund: A certain percentage from the selling of electricity (and gasoline) will be directed to an energy fund that should be established by the Government. The fund will support R&D by academic and industrial institutions. One major goal of the fund will be, to establish 2-3 R&D centers that will conduct interdisciplinary research in areas like fuel -cells and hydrogen production.

Smart grid: A smart grid will replace the existing one, and will allow a two way connection to every customer and producer of electricity.

Policy: Medium and long term energy policies will be established with a major aim to minimize green- house gases from energy production and use.