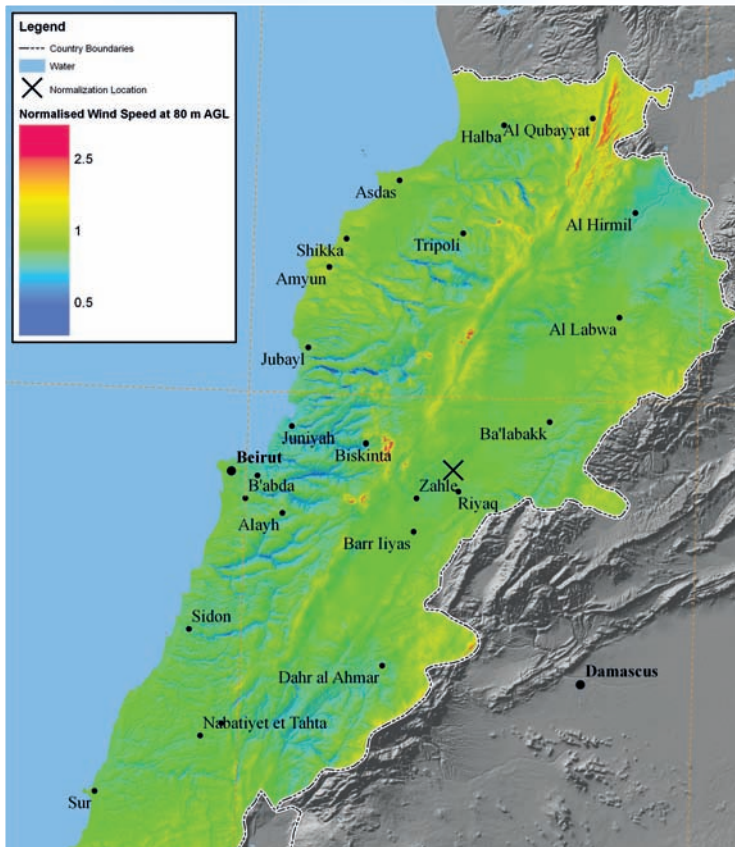


THE RECOMMENDATIONS OF A WIND ATLAS OF LEBANON



The national wind atlas for Lebanon is finally out, and outputs and results will be disseminated during a conference to be held in January 2011, under the auspices of the Minister of Energy and Water. The wind atlas will indicate the wind velocity and direction across the different regions of the country, using a 100-meter resolution, and will investigate such parameters for offshore implementation within the exclusive economic zone (EEZ) of Lebanon and in waters not deeper than 30 meters.

To find out about the potential of wind energy in Lebanon, both onshore and offshore, join us for the presentation of the wind atlas results by Garrad Hassan, a leading consultant in renewable energy, based in Bristol (UK). The results presented at the conference will be shared with the audience. The presentation, which will end with the national actions required to translate the wind atlas into the first wind farm, will be followed by a list of recommendations for the regulatory and legal roadmap.

A BUSY 2011 FOR CEDRO

The first quarter (Q1) of 2011 is expected to be the period during which most of the new CEDRO projects will be launched with an estimated budget of over USD 1 million.

These projects include a number of PV installations, LED street lighting projects, a large dimming street lighting project, and two new solar hot water (SHW) installations.

In Q2 of 2011, a ground source heat pump (GSHP) project will also be launched, along with a thermal insulation retrofitting project.

Q3 is expected to see the launch of the micro-wind installations across sites that will prove to have the most significant wind speeds, to be determined by the wind speed measurement study currently being implemented by CEDRO.

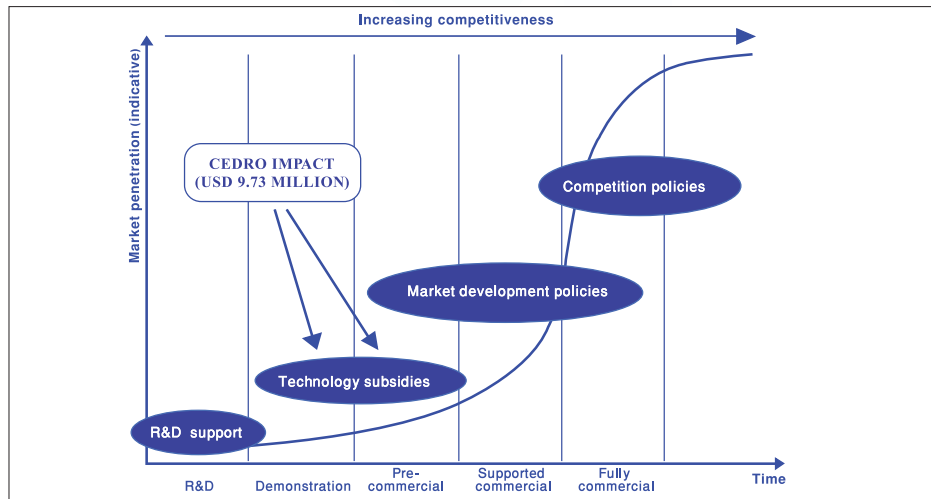
The year will also have its share of studies and analyses:

- 1- The launching of a national hydropower assessment awaits approval from the Ministry of Energy and Water.
- 2- A survey of energy use in the domestic sector is being prepared in coordination with the Lebanese Center for Energy Conservation (LCEC).
- 3- The study for the conceptual design of the new LCEC building, a state-of-the-art structure in green architecture, might also be launched in coordination with the LCEC.

If you think there are other important applications and/or studies on the renewable energy (RE) sector or technologies in Lebanon that we should look into, please feel free to share your views with us on info@cedro-undp.org.



GOVERNMENT POLICIES NEEDED TO PUSH CHANGE FORWARD



One of the main roles CEDRO plays is to help in establishing renewable energy (RE) and energy efficiency (EE) markets in Lebanon. Funds spent on RE and EE projects early on in the life cycle of the market development go a long way in benefiting the various players involved. Firstly, they speed up contractors' learning curve in the installation, operation, and maintenance of these systems, reducing installation time lags and thereby their cost. Secondly, they encourage new players to enter the market, promoting competition, reducing costs, and creating new "green" jobs. Finally, they help in building consumer awareness.

The market life cycle is illustrated by what is known as the "S-curve." CEDRO's primary impact lies in the demonstration and pre-commercial stage. Since its inception, CEDRO has managed to reduce by approximately 25-35% the bidding prices it received from the various firms short-listed for RE systems, such as solar hot water and photovoltaic (PV) systems, thanks to a transparent process based on competitiveness.

Without further legislative support, however, this is as far as CEDRO can go. Although CEDRO and the LCEC have paved the way for the RE and EE sectors in Lebanon, "market development policies," known as the "supported commercial" stage, where the slope of the S-curve is steepest, are needed to introduce radical change. These changes are characterized by significant rates of market penetration of RE and EE systems.

Policies are, therefore, overdue. The Lebanese government needs to introduce either soft policies such as "net metering," the quantitative exchange of electricity between the RE system and the national grid, or stronger and more successfully tested policies, such as feed-in tariffs (FITs), which are financial transfers for every kWh generated and/or exported by the RE system to the grid. Without these legislative initiatives, the enabling environment for the RE and EE markets created by such projects as CEDRO cannot be sustainably carried forward, and Lebanon will likely be significantly delayed in reaching its target of 12% renewable energy of its total mix by 2020.



Anemometer

MEASURING WIND

A study of the measurement and modeling of wind speeds has been launched and implemented by Solarnet at various public institutions across Lebanon. By the end of July 2011, CEDRO hopes to have gained sufficient information about wind speeds at the sites to decide which ones will be fitted with a micro-wind turbine of a capacity anywhere between 1.5 kW and 5 kW. The following sites are under study:

Akkar

- El Mkatyaa Intermediate Public School
- El Rihannieh Public School
- Karha Public School

Bekaa

- Deir el Ahmar Secondary Public School
- Kamed Ellouz Intermediate Public School
- Ras Baalbeck Community Center
- Aarsal Lebanese Army Communication Post

South

- Chebaa Secondary Public School
- Debaal Public School
- El Kleile Kindergarten Public School



CSP PLANTS AND PV FARMS: DREAM OR POSSIBILITY?

Two new studies in solar energy are being implemented by CEDRO, namely the concentrated solar power (CSP) plants, and the technical and economic viability of a PV farm. The results of both studies will be published in the first half of 2011.

A ten-year-old ESCWA report indicated that Lebanon has negligible potential for CSP, given the need for large areas of land and surfaces of water, strong solar irradiance, and low cloud cover. CEDRO has, therefore, decided to recruit the services of an international expert with more than 20 years of experience in CSP to provide an updated techno-economic perspective of the application of this technology in Lebanon.

CEDRO is also in the process of recruiting an international expert on PV farms, who will be in charge of paving the way for the possible implementation of a PV farm in Lebanon. After reviewing all existing documents and communicating with all relevant Lebanese stakeholders, the expert will assess the climatic data and the current electricity network in the various regions of Lebanon. The expert will then assess the legal and regulatory frameworks and any required amendment(s) to pave the way for a PV farm, as well as any possible negative environmental impacts PV farms may have on Lebanon. The expert is expected to prepare a financial feasibility study of the PV farm, clearly indicating the required power purchasing agreement or feed-in tariff level that would make the project financially viable (with and without taking into account possible carbon credits). The last item on the expert's mandate is to prepare the bidding documents for the first PV farm in Lebanon, which would include the full technical and standard specifications requirements, and which will be handed to the government of Lebanon.

SAIDA GOVERNMENTAL HOSPITAL JOINS THE SHW CLUB

With its newly installed solar water heating systems, the Saida Governmental Hospital is expected to slash its diesel bill by half. Saving on the energy bill is expected to help governmental hospitals channel their financial resources into medical assistance to the local population.

The inauguration of the systems took place in July 2010, in the presence of a number of official representatives, including Abdo Tayar, representing Energy and Water Minister Gebran Bassil, Bahij Arbid, representing Minister of Health Mohammad Khalifeh, and the country director of the UNDP office in Beirut, Seifeddine Abado, representing the UNDP resident representative, Martha Ruedas. Spanish Ambassador, Juan Carlos Gafo, whose country is behind the USD 9.73 million fund sponsoring the work of CEDRO, also attended the event.



Saida - Governmental Hospital

SOLAR WATER HEATING AT A LEBANESE ARMY TEACHING INSTITUTE IN BAALBECK

The two main buildings of the barracks of Baalbeck's main teaching institute for non-commissioned officers now have running solar water heating installations.

Each of the two buildings received 112 panels, amounting to 263 m² of panels, capable of providing 65% or more of the building's needs in domestic hot water (used for household purposes, such as showering, cleaning, etc.). The project will also be installing water-saving showerheads and taps to save on the water consumption of the barracks.

Used by around 800 personnel, the new installations are projected to save more than 30,000 liters of diesel per year, which will save money and will result in less pollution. Solar heating should offset the yearly release of 90 tons of CO₂, which is equal to about 84,000 m² of forests transforming carbon dioxide to oxygen. The project is also expected to impact the soldiers' awareness of energy saving in the barracks. The Lebanese Armed Forces will complement the project with personnel-targeted seminars and workshops on the basics and importance of saving energy and the use of renewable energy.

The involvement and commitment of the Lebanese Armed Forces in this project should ensure its success.



20,500 LITERS OF SOLAR HOT WATER AT 5 GOVERNMENTAL HOSPITALS

Following on the success of large-scale solar hot water (SHW) installations across hospitals in Lebanon, specifically in Saida, Halba, Jezzine, and Hermel, CEDRO proudly announces the completion of five new SHW installations, namely: the 500-liter installation in Ehden Governmental Hospital, the 2,000-liter installation in Sir El Donniah, 6,000 liters both in Keserwan and Sibline governmental hospitals, and 12,000 liters in the governmental hospital of Tripoli.

Together, these systems will provide 55-75% of the overall needs in hot water for the above mentioned institutions, thereby saving a similar percentage of the consumption of diesel fuel used for heating purposes. Theoretically, these systems will save the government approximately USD 25,000 to USD 35,000 per annum – a figure to be validated through the future collection of data.



Keserwan - Government Hospital



Sibline - Governmental Hospital



Tripoli - Government Hospital