

HYDROPOWER ASSESSMENT FOR PUBLIC UTILITIES AND NETWORKS IN LEBANON

“Every MW counts!” That is the driving force behind a study launched by CEDRO in collaboration with the Ministry of Energy and Water to conduct a national assessment of the hydropower potential of public utilities and networks in Lebanon. At least four non-conventional sources will be examined: (1) Irrigation channels and conveyers; (2) water treatment plant inlet and outfall pipes; (3) electrical power plant outfall pipes; and (4) water distribution networks. The primary function of the examined systems and/or networks will be left intact. However, whenever there are pressure points that require pressure reduction, or water discharges located at a sufficient height, the study will have identified a potential to generate electricity. The GoL could then step in to implement micro-hydro plants in the above-mentioned sources, since they all belong to public establishments. According to Karim Osseiran, Power Generation Advisor at the Ministry of Energy and Water, micro-hydro power generation will be promoted in the private sector in order to encourage the latter to take initiatives in this matter. The study will be published by the end of 2012.



REHABILITATING OLD HYDROPOWER PLANTS

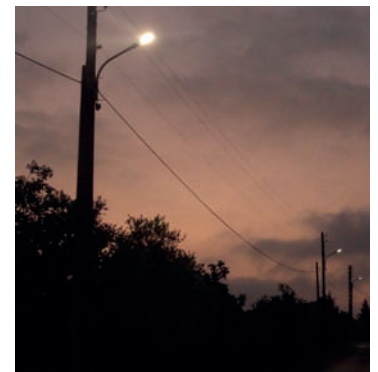
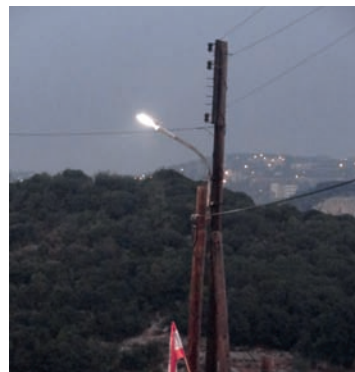
On behalf of the Ministry of Energy and Water (MoEW), the CEDRO Project hired an international consultant to assess the state of several hydropower plants in Lebanon, and undergo a techno-economic assessment of their rehabilitation/modernization, as well as write the tender documents. Lebanon currently enjoys a nominal supply of 274 MW but a much lower actual supply. Part of the reason for this discrepancy is the age of the turbines, which, if upgraded, may produce energy that's closer to their nominal capacity. Karim Osseiran, Generation Advisor at the Ministry of Energy and Water Power, indicates that the Government of Lebanon (GoL) will be operating some of these plants. The private sector, however, may also be involved in the future, depending on the decision either to return the concessions to the GoL or to privatize them again via IPP laws.



The Pelton wheel being welded at one of the turbines at the Rachmaya hydropower plant

PROTECTING LED STREET LIGHTING FIXTURES

CEDRO has installed 484 Light Emitting Diodes (LED) street lighting fixtures in nine regions across Lebanon, namely: Ghalboun, Kfour, Arbeh, Kfarnabrakh, Saida, Choueifat, Tal Zounoub, Rachaya, and Moukhtara. However, since LED fixtures are highly sensitive to excessive voltages and can be damaged by lightning, and since the street lighting poles in Lebanon do not usually have a ground wire, CEDRO took steps to protect the new LED installations. CEDRO installed earthing systems in the 484 street lighting poles, Surge Protection Devices (SPD) for transient over-voltages in each fixture, as well as Surge Protection Devices (SPD) for transient and permanent (TOV) over-voltages on each of the lighting control panels of the street lighting circuits in the nine regions. In the future, protective measures, including earthing, should be implemented along with the installation of LED lighting fixtures.



TWO LU THESES ON CEDRO PROJECTS



Mr. Ruslan Mustafa Shallak and Mr. Mouhannad Bassem Zouhbi have earned their Masters degree in Energetic Physics at the Lebanese University after successfully writing their theses on photovoltaic and solar hot water systems installed by CEDRO. The jury included university professors Dr. Hamed El Khatib, Dr. Khalil Ahmad Kain, Dr. Loay Al Soufi, and Dr. Amar Asoum. The CEDRO Project has supported tens of interns and university students throughout the five years since its establishment, giving them full access to available data on projects and studies being implemented.

NATIONAL BIOENERGY STRATEGY TO BE MADE PUBLIC IN EARLY 2012



The national bioenergy assessment for Lebanon has been completed and will be announced in a workshop in early 2012. Ten major bioenergy streams were identified (see figure) and will significantly increase Lebanon's energy independence with respect to heating, electricity, and transportation sectors. Don't miss this event!



Residues from felling

Residues from olive trees

Residues from fruit trees

Energy crops

Olive cake by-products

Waste wood

Municipal sewage sludge

Animal fat and slaughterhouse residues

Yellow grease

Landfill potential

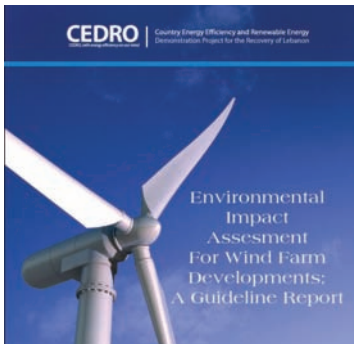
ENERGY FROM WASTEWATER TREATMENT PLANTS



Sewage contains potentially more embodied energy than the energy required to treat it. However, the wastewater treatment plant in Tripoli is the only Lebanese plant working with this energy. Sewage sludge is surplus bacterial biomass that is a byproduct of the wastewater treatment process. This sludge is high in moisture content (80-90%), difficult to dry, and needs to be disposed of. Anaerobic digestion of sewage sludge is a disposal method that produces biogas and fertilizer. A study to assess the technical and economic feasibility of energy production from 10 commissioned and/or to be commissioned wastewater treatment plants in Lebanon is underway. The study is carried out in coordination with the Ministry of Energy and Water and Mr. Youssef Karam, Irrigation, Water, Sewage and Infrastructure Department Manager at the Council of Development and Reconstruction (CDR). The technical specifications of the tender documents for the sites deemed appropriate for this technology will also be delivered to the CDR for actual implementation.



EIA WORKSHOP AND GUIDELINE REPORT



CEDRO published a guideline report entitled “Environmental Impact Assessment for Wind Farm Developments,” which was prepared for the UNDP-CEDRO Project by a renowned international consultant.

The guideline report was presented during a two-day technical workshop in Beirut, which hosted environmental consultants specialized in EIA assessments in Lebanon.

This report is part of CEDRO’s vision for a sustainable energy strategy, which started with the publication of the Wind Atlas. The latter atlas found that there is potential for wind energy. That’s why CEDRO is committed to paving the way for the development of wind farms. Pending the necessary legislative framework to enable the participation of the private sector in wind energy production, CEDRO is building awareness around all the necessary action plans required to obtain a license for a wind farm that complies with international norms. The most important licensing requirement is obtaining the approval of the EIA.

MICRO-WIND SPEED ASSESSMENT OF 10 PUBLIC SITES IN LEBANON



The CEDRO Project has completed its study of 10 public sites for potential micro-wind projects. Anemometers were installed at a height of 10 meters in four places, while modeling was used in other areas to indicate the sites’ wind speed potential. Of these 10 sites, at least seven showed good potential for the installation of micro-wind turbines. CEDRO will be implementing in 2012 micro-wind systems at elevations between 10 and 20 meters from the ground and a rotor diameter of 4-6 meters. Sites where micro-wind systems will be installed are:

- Mokaytea Public School
- Karha Public School
- Aarsal Communication Outpost
- Rihannieh Public School
- Deir El Ahmar Public School
- Ras Baalbeck Community Center
- Chebaa Public School



NATIONAL GEOTHERMAL ASSESSMENT



CEDRO is currently preparing to launch a Geothermal Resource Assessment for Lebanon, in collaboration with the Ministry of Energy and Water. The objective of the study is to establish a Geothermal Atlas for Lebanon and to estimate the country’s current overall potential for geothermal heat and power generation. The study will also assess the ability of geothermal power to help the Lebanese government meet its objective of supplying 12% of its total energy needs from renewable energy sources by 2020.

The National Geothermal Resource Assessment for Lebanon falls within CEDRO III’s initiative to develop a national sustainable energy strategy and action plan. This study will make Lebanon one of the pioneers in the field of renewable energy research, as only a few countries have so far carried out serious and complete geothermal assessments.



NET METERING: GET CONNECTED TO THE GRID



CEDRO warmly congratulates the Government of Lebanon, and in particular the Ministry of Energy and Water (MoEW) and Electricité Du Liban (EDL), on their initiative to enable net power metering in Lebanon. This step is sure to push forward the renewable energy sector in the country and will prepare Lebanon for feed-in tariffs, once the fiscal environment allows for the implementation of such a policy.

The initiative is a perfect example of the cooperation between the CEDRO Project, the Lebanese Center for Energy Conservation (LCEC), the MoEW and EDL to advance the renewable energy sector in Lebanon. CEDRO is a staunch supporter of the installation of renewable energy systems and highly encourages plugging these installations into the national grid. The CEDRO Project itself will be processing net metering for over 60 sites.



Casing of the temperature sensor



Pole holding the anemometer



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