

CEDRO LAUNCHES THE NATIONAL BIOENERGY ASSESSMENT FOR LEBANON



In the presence of the Minister of Energy and Water, HE Mr. Gebran Bassil, the UNDP-CEDRO project launched the National Bioenergy Assessment for Lebanon in March 2012. The event was attended by the then Spanish Ambassador to Lebanon, Mr. Juan Carlos Gafo and the UNDP Resident Representative, Mr. Robert Watkins, along with representatives of a number of diplomatic missions, members of the press, and various stakeholders.



From the launching ceremony

Following upon the National Wind Atlas (completed in January 2011) and the hydropower and geothermal assessments (both currently under way), CEDRO's National Bioenergy Assessment will help Lebanon move yet another step closer to better understanding the mix of renewable resources available to satisfy its development needs in a sustainable manner, according to Mr. Watkins.

In turn, Minister Bassil said that developing bioenergy projects could ease both energy and waste management problems. According to Bassil, each of the country's largest garbage dumps is capable of producing 4 to 5 megawatts of power. The study conducted by CEDRO reveals that bioenergy streams could secure a considerable chunk of Lebanon's power needs for heating and transportation.

According to Mr. Gafo, the opportunities for the use of bioenergy, extremely vital in sectors such as agriculture, industry, and commerce, represent an alternative energy that does not compromise the country's economic future and that is truly sustainable. Various legal reforms, however, are needed to encourage private investments in the renewable energy sector. In the words of Mr. Watkins, however, "charting a path how to get there is already a substantial step forward."



Assessment Cover



Minister Bassil

BIOENERGY COULD SECURE 38% OF LEBANON'S TOTAL HEATING NEEDS



According to the most optimistic projection of a study on bioenergy published by CEDRO, Lebanon could secure approximately 38% of its entire current heating demand, 17% of its current transportation fuel needs, and 3% of its electricity needs (assuming a 4,000 MW capacity as planned for 2014) from bio-energy resources, by 2030. For a country that imports more than 97% of its primary energy requirements, these figures give substantial backing to Lebanon's becoming more energy-independent.

The use of bioenergy also has a number of secondary benefits: the management and reduction of forest fires, the generation of rural employment and income, the substitution of illicit crops, and the reduction of carbon emissions.

The National Bioenergy Strategy was implemented by a group of international and local companies and had five main tasks:

- Assessing available resources
- Identifying bioenergy technology conversion options
- Developing scenarios for the future
- Appraising Sustainability
- Resolving the barriers to bioenergy development

The first task was the most demanding as it involved a thorough assessment of all the available bioenergy streams in the country. A total of 23 biomass streams were identified, grouped according to their source:

a) Forestry	c) Energy crops
b) Wood and paper industries	d) Food processing industry
c) Agriculture	e) Municipal solid waste and non-hazardous industrial waste

Conversion options include technologies for:

- Liquid fuels production, such as the production of vegetable oil biodiesel, first generation bioethanol, lignocellulosic ethanol (second generation), animal fat and recycled oil biodiesel, etc.
- Biogas production, such as anaerobic co-digestion (manure and agro-wastes), anaerobic digestion of sewage sludge, slaughterhouse waste biogas, and landfill gas potential.
- Direct combustion, such as waste-to-energy, combustion boiler, combined heat and power, and co-combustion of biomass and coal.
- Pretreatment options, such as pelletization, gasification, and pyrolysis.

To these resource assessments and conversion options, strict sustainability criteria were set that took into consideration the social, economic, and environmental implications of bioenergy supply. Only those bioenergy streams that will not have any negative sustainability impacts but that, on the contrary, may reflect positively on sustainability criteria, were considered.

The study can be downloaded from the CEDRO website. The full study, complete with Annexes, can only be obtained in hard copy format from the CEDRO offices or can be mailed upon request.



“NATURE’S FESTIVAL”: A PLAY TO RAISE ENVIRONMENTAL AWARENESS



Eight hundred public elementary school children aged between 6 and 10 gathered at the UNESCO Palace on February 20 to watch “Nature’s Festival,” a theatrical production organized by the UNDP Energy and Environment Program.

The play, produced by Bee Event, was developed to raise children’s awareness of critical environmental issues and challenges that Lebanon is facing. “From now on, I will change my behavior at home, in school and everywhere I go in order to protect nature,” said Carmen Bassem, a six-year-old student from Chiyah Public School.



Participating students



In attendance: Gafo, Watkins and Khoury

The event was held under the High Patronage of the President of the Council of Ministers, HE Mr. Najib Mikati, represented by Minister of Environment, Mr. Nazim Khoury, and in the presence of the UNDP Resident Representative, Mr. Robert Watkins, the then Spanish Ambassador, Mr. Juan Carlos Gafo, diplomatic representatives, and environmental NGOs.

During the opening ceremony, Mr. Watkins explained that this theatrical production has been developed to present the most critical environmental issues facing Lebanon today in an engaging and accessible format, designed especially for children. The play presents challenges, such as climate change, but also talks about the benefits of energy and water conservation and of renewable energy, and presents solutions and practical examples to protect the environment.

Minister Khoury stressed the importance of environmental education, an important element in establishing good governance and in encouraging children to learn about environmental problems and find ways to solve them.

Ambassador Gafo talked about how environmental protection should and is slowly becoming a priority in Lebanon, as it constitutes the first step towards achieving adequate environmental sustainability. “It is vital to raise awareness not only among public institutions but also among the society at large,” he said. The government of Spain indeed supports and funds many environmental and energy projects, among them the financing of this theatrical production. “Nature’s Festival” has been performed in various public and private schools across Lebanon during 2012.

CEDRO AND THE LEBANESE YOUTH SHADOW GOVERNMENT LAUNCH MADINATI KHADRA



Three “green” proposals won funding in a new initiative called “Madinati Khadra.” The initiative, organized by the UNDP-CEDRO project, the Youth Shadow Government, and the Minister of Municipal Affairs called on municipalities across Lebanon to submit proposals for an eco-friendly competition and get the chance to win one of three prizes up to LBP 60 million (USD 40,000) each.

Carried out with the cooperation of the Ministry of Interior and Municipalities, the Ministry of Energy and Water, the Spanish Government, and CEDRO’s partners in the Lebanon Recovery Fund (LRF), the CEDRO project has thus launched the first national green competition among municipalities with the following objectives:

- Increase activity and build capacity for the innovation and development of renewable energy and energy efficiency projects, which contribute to the clean development of municipalities.
- Reduce energy consumption and greenhouse gas emissions.
- Raise awareness of alternative energy and energy efficiency.
- Increase the exposure of municipal green projects, and thus, increase funding potential.
- Reduce the reliance on the National Electricity Utility grid.
- Build resilience against climate change.

Winning proposals were selected based on several criteria, including yet not limited to innovation, creativity, replicability, savings in energy consumption, reduction of greenhouse gas emissions, project risks, and payback period. The winning proposals are:

Aley Municipality: Installation of Solar Water Heater and Photovoltaic at Aley Prison; Qbayet Municipality: Installation of solar-powered street lighting along with an awareness campaign and several workshops; Roumin Municipality: Implementation of a hydropower system to light the main street.



The three winning municipalities accepting their awards



CEDRO WEBSITE GETS A MAKEOVER



CEDRO has re-launched its website with a brand new, highly informative, and user-friendly design. The website aims to become a reference in energy efficiency and renewable energy matters. It will post various studies and reports, among them the wind atlas and the national bioenergy assessment. It will also show all of the sites of companies or institutions that have implemented energy conservation and renewable energy measures undertaken by the CEDRO project.

To know more, we invite you to visit CEDRO's website on www.cedro-undp.org. Please send us your feedback on the website to info@cedro-undp.org.

CEDRO INAUGURATES PV PROJECTS IN MARJEYOUN



The UNDP-CEDRO project and the Jabal Aamel Municipality Union inaugurated three different photovoltaic sites on 31 March 2012: Taybeh Public Library, Al Kantara Municipality, and Kabrikha Public School.

The event was held under the auspices and in the presence of the then Ambassador of Spain, Mr. Juan Carlos Gafo, Lebanese member of parliament, HE Dr. Ali Fayyad, UNDP Assistant Country Director Mr. Shombi Sharp, and in the presence of HE Qassem Hashem, Lebanese member of parliament, Commander of the Spanish force in UNIFIL Alberto Asarta Cuevas, as well as the head of Jabal Aamel Municipality, Mr. Ali Al Zein.

"These pilot projects in the Marjeyoun area aim at promoting a new culture of environmental awareness," said Sharp, while Mr. Gafo stressed on the fact that such projects contribute to reduce energy cost and preserve the environment and the community at large.

The Jabal Aamel Municipality Union offered shields of appreciation to the UNDP as well as the ambassador of Spain.



Location of PV Project Inauguration in Marjeyoun

FIRST BATCH OF MICROWIND SYSTEMS LAUNCHED



CEDRO's first batch of microwind projects are under way on three selected sites: Moukaytea Intermediate Public School (2 x 1.2 kWp), Karha Public School (1 kWp), and Ras Baalback Community Center (1.2 kWp).

Following a careful assessment, these sites were selected because of their favorable wind conditions and an electricity demand profile that enables the use of microwind as an optimal solution.



Microwind System

NINE NEW PV SITES FOR CEDRO



Nine new PV sites have been launched by the CEDRO project across the Lebanese territory (see table). These projects, along with the 62 PV projects implemented before, have enabled CEDRO to exceed the 100 kWp PV capacity mark! These institutions will reduce their energy dependence on both privately owned diesel generators and electricity from the national grid, a phenomena observed in many of the sites already powered by PV systems from CEDRO.

Nr.	Name of Institution	Region
1	Lebanese University - Roumieh Campus	Metn
2	Sultaniyeh Municipality	Bint Jbeil
3	Yanta Public School	Bekaa
4	Zahleh Public School	Bekaa
5	Dekweneh Technical School	Metn
6	Hamet Municipality	Batroun
7	Kfarhay Municipality	Batroun
8	Lebanese University - Tripoli Campus	Tripoli
9	Yahchouch Municipality	Keserwan



BDL'S GREEN ROOF INITIATIVE

 The CEDRO project, in collaboration with co-financer Lebanese Central Bank (BDL), is launching a first of its kind initiative in Lebanon: A "green roof" on one of BDL's buildings in Hamra, Beirut. A green roof is a system comprising fiber soil as a growing medium for plants, a drainage composite layer, a root barrier, an irrigation system, and water-proofed areas. The main objective of this green roof project is to improve the thermal impact on the selected building. The green roof is expected to reduce energy consumption for cooling and heating requirements in the floors directly beneath it. There will, however, be additional benefits to this project. Beirut, unfortunately, is known to have one of the lowest green space to built-up space ratios in the world. To counteract this fact, green spaces need to be promoted in the capital, even on roofs of buildings. This will create improved aesthetics, an enhanced local ecosystem, and slightly lower air pollution levels.



How a green roof appears.

CONCENTRATED SOLAR POWER IN LEBANON

 A concise study on Concentrated Solar Power (CSP) systems published by CEDRO can now be downloaded from CEDRO's website. The study presents a brief evaluation of CSP in light of technology and cost advancement. An interesting report finding is that the levelised costs of CSP, which is the total costs of the technology (including capital, operation, and maintenance costs) divided by the total amount of expected power output (discounted to present terms), achieve 16 Euro Cents/KWh for parabolic trough technology with 7.5 hour storage and 22 Euro Cents/KWh without storage, particularly if applied in the Baalbeck-Hermel area.

These figures are below the current average generation costs of the Lebanese electricity system, and certainly below the costs of the most expensive Lebanese power plants, located in Tyre and Baalbeck. The report also notes that CSP can work in hybrid mode, i.e. with additional input from natural gas to ensure optimal power generation.

UP TO 12 MW OF ENERGY FROM WASTEWATER TREATMENT

 A CEDRO-implemented study reveals that energy from wastewater treatment plants (WWTP) can yield up to 12 MW of electrical power in seven main projects in Tripoli, Sour, Aabde, Sarafand, Saida, Majdal Anjar, and the Bekaa. The study focused on anaerobic digestion of sewage sludge and the potential of co-digestion from various other feed-stocks across the existing and planned waste water treatment plants. The report on energy generation from wastewater is to be published by CEDRO in coordination with the Ministry of Energy and Water and the Council for Development and Reconstruction in early 2013.

STUDENTS FROM DAR EL AYTAM VISIT CEDRO RENEWABLE ENERGY SITE

 Several students from Dar al Aytam visited the solar hot water system installed at Saida Hospital. The students were guided through the system's operation, learning about the energy in terms of hot water delivered throughout the year, the savings on diesel use, and the consequent reduction in carbon emissions.

This initiative comes in line with the school's commitment to enhance students' awareness of new technologies that help preserve the environment.



Dar El Aytam students at the solar hot water system site

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