



PROGRESS REPORT

Reporting UN Organization	: United Nations Development Programme (UNDP)
Country	: Lebanon
Award ID	: 00047251
Award Title	: CEDRO III – “Country energy efficiency and renewable energy demonstration project for the recovery of Lebanon”
Award Timeframe	: Oct 2009 – June 2014
Award Components	: CEDRO 3 – 00071261
Reporting Period	: 01 st October 2013 – 31 st December 2013

List of Acronyms

BDL	Banque du Liban
CDR	Council for Development and Reconstruction
CO	Country Office
GDP	Gross Domestic Product
EDL	Electricity of Lebanon
EE	Energy Efficiency
GSHP	Ground Source Heat Pump
ITB	Invitation to Bid
LCEC	Lebanese Centre for Energy Conservation
LED	Light Emitting Diodes
LRF	Lebanon Recovery Fund
MoET	Ministry of Economy and Trade
MoEW	Ministry of Energy and Water
MoF	Ministry of Finance
MoU	Memorandum of Understanding
PV	Photovoltaic
RE	Renewable Energy
SHW	Solar Hot Water
SPNL	Society for the Protection of Nature in Lebanon
UNDP	United Nations Development Programme
WWTP	Waste Water Treatment Plants



I. PURPOSE

Project Summary:

The aim of the CEDRO project is to support Lebanon's recovery, reconstruction and reform activities and to complement the national power sector reform strategy through the implementation of end-use energy efficiency and renewable energy projects and through the removal of barriers for the promotion of sustainable energy applications in Lebanon. To achieve this, the project will work on three levels: the first involves the establishment of a demonstrative model addressing public sector building and facilities, the second involves the activation of the replication process, and the third involves the triggering of a national sustainable energy strategy and action plan. The CEDRO project is financed through the Lebanon Recovery Fund, and is in-line with Lebanon's ongoing efforts to improve national patterns of energy consumption and cost.

Project Phases and Outputs:

CEDRO 3
3,772,827 USD

- ➔ Implementation of end-use energy efficiency and renewable energy applications for public sector buildings and facilities (app. 60 sites across Lebanon)
 - ➔ Technology transfer to enable the conversion of other public sector buildings and facilities into energy efficient modalities
 - ➔ Research and development to enable the formulation of a national sustainable energy strategy and action plan
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Project Linkages to National Priorities and Reconstruction Goals:

Lebanon imports around 97% of its energy needs in the form of fossil fuel. In 2004, the national energy bill amounted to around 1.6 billion USD (around 20% of the annual public expenditure and around 7.8% of the national GDP), and in 2005 it reached 2.1 billion USD (around 26% of the annual public expenditure and around 10% of the national GDP).

The government of Lebanon has placed the reform of the power sector among its highest national priorities, as outlined in the recovery, reconstruction and reform paper submitted to the Paris 3 conference after the 2006 conflict. However, given the enormity of the challenges faced by the power sector, the power sector reform strategy has concentrated on addressing the energy supply side, without extending the scope to the demand side of energy management.

Knowing that reform on the supply side needs to be accompanied by reform on the demand side, the proposed CEDRO program has sought to complement the national power sector reform strategy by targeting end-use energy conservation and renewable energy demonstrations which will assist in the above categories of demand-supply imbalance, security of supply, diversification of energy sources, economic cost and the environment.

Moreover, the current Lebanese government has set itself a goal of achieving 12% of its total energy needs from renewable energy sources. CEDRO is seeking to assist in achieving this goal through its demonstration projects of various zero carbon to low carbon technologies and its analysis of renewable energy resources.

This project is an initiative by the Government of Spain to assist the Government of Lebanon in its recovery and reconstruction efforts with a clear focus on promoting sustainable energy services and concentrating on public sector buildings and facilities.

This project is in line with Lebanon’s recovery, reconstruction and reform objectives, and falls within the Ministry of Energy and Water’s main priority to meet national demand for electricity.

Project Implementation Partners:

The CEDRO partners and their respective roles are indicated to in the Table below:

Institution	Role
Spanish Agency for International Cooperation	Funded the CEDRO project through the LRF. The agency simply observes the work of the CEDRO project and sends representations to any event or occasion that CEDRO launches.
Ministry of Energy and Water (MoEW) and Lebanese Center for Energy Conservation Project (LCEC)	CEDRO’s works closely with the Ministry and the LCEC as they are the main players in the energy sector. CEDRO’s work augments that of the Ministry and the LCEC, particularly in terms of knowledge-sharing through research activities for the energy sector.
Ministry of Finance	Part of the established Steering Committee for CEDRO.
Ministry of Economy and Trade	Part of the established Steering Committee for CEDRO.
Council for Development and Reconstruction	Part of the established Steering Committee for CEDRO, and monitors the works and finances of CEDRO.



- International Partners: - Spanish Agency for International Cooperation
 National Partners: - Ministry of Energy and Water (MoEW)
 and Lebanese Center for Energy Conservation Project (LCEC)
 - Ministry of Finance
 - Ministry of Economy and Trade
 - Council for Development and Reconstruction

1. Project Management

- Preparation of regular progress reports and financial management of expenditures;
- Organization of stakeholder meetings (regular meetings with the Ministry of Energy and Water (MoEW) and with EDL) – leading to and following up on several projects that have been implemented on pico-hydro, energy from wastewater treatment plants, Batroun centralized PV lighting port, among others;
- Daily follow-up with site engineers and project staff;
- Providing technical and policy advice to decision-makers (MoEW) and UNDP CO on renewable energy issues;
- The CEDRO project is providing the MoEW and the LCEC in writing up and publishing the National Renewable Energy Strategy from 2014-2020 and beyond. This study will include the techno-economic assessment of renewable energy sources in Lebanon and will also look at the supporting environment needed to support Lebanon in meeting the renewable energy target of 12% by 2020;
- Assess future requirements for renewable market enhancement in Lebanon.

2. Implementation of end-use energy efficiency and renewable energy demonstration projects for public sector buildings and facilities

Several completed project in Q4 of 2013 projects are listed below:

- The Batroun Port Renewable Energy Street Lighting contract is now completed. Some modification to the original design followed taking into account fishermen’s feedback. The official inauguration/opening of Batroun Port was launched on Sunday October 13, 2013. The Port includes approximately 110 LED fixtures, including new poles, lighted through a centralized 10 kWp PV system.
- The pico-hydro project in Ramliyah in Mount Lebanon has been completed. The pico-hydro is now completed. The project will provide 10 kWp of hydropower from the irrigation channel in Ramliyah, powering the public school in Ramliyah and feeding the excess power into the grid through the net metering arrangement.
- The implementation of street lighting in Roumin, South Lebanon, has been completed. Twenty solar PV street lighting fixtures, with LED lighting, PV panels, and battery storage are installed, providing lighting to Roumin at night – enhancing the feeling of security and lowering the risks of accidents.
- The implementation of the hybrid PV-microwind contract for four sites has been completed, including the site at Aarsal. These systems provide 1 kWp of PV power and 1 kWp of microwind, enabling the displacement of the previously existing backup diesel generators and the lowering the electricity bills. The sites implemented are listed again below;

Rihannieh Public School
Chebaa Secondary Public School
Deir El Ahmar Public School
Aarsal Telecom Outpost



The only ongoing project left for CEDRO 3 is the green roof application on the Central Bank of Hamra. It was decided, as indicated in Q3 of 2013, to extend the area of the green roof to connect it to the entrance/door. This extension enables the access to the roof for all BDL employees.



Green Roof, Central Bank

The expected timeframes of the above project is shown in the Table below:

ID	Type	ITB/RFQ delivered to bidders	Project commences	Project completion
1	Hybrid PV/U-wind	July 2012	Aug 2012	Completed
2	Green Roof – Phase 2	July 2012	Jan 2013	February 2014
3	Batroun Port	July 2012	Feb 2013	Completed
4	Ramliyah Pico Hydro	July 2012	Feb 2013	Completed
5	Roumin Street Lighting	July 2013	Sep 2013	Completed

3. Setting an enabling environment for the conversion of public sector buildings and facilities into energy efficient modalities

- The CEDRO website (www.cedro-undp.org) is being updated. Future updates and changes are expected.
- CEDRO Exchange Issue 8 and 9 have been prepared and will be sent many stakeholders/contact members in Q1 2014. They address solar hot water solutions for high-rise buildings, concentrated solar power technology and potential for Lebanon, pico-hydro installation, and the Batroun port opening among other stories.
- CEDRO inaugurated the Batroun Port on October 13 2013 with the presence of the Minister of the Energy and Water, the Spanish Ambassador to Lebanon, The head of



Batroun Municipality, the Head of the Fisherman Association, and the Assistant Resident Representative of the UNDP.



Batroun Port Inauguration – October 13, 2013



Batroun Port Inauguration – October 13, 2013

4. Assisting the establishment of a Sustainable Energy Strategy for Lebanon

- The National Geothermal Power Assessment study is completed and is currently being designed into a publication to be disseminated in Q1 of 2014 in a conference under the auspices of the Minister of Energy and Water.
- A nation-wide survey to assess the willingness to pay (WTP) for small-scale and utility renewable energy systems in Lebanon for both the residential sector and the commercial sector have been launched by CEDRO. Results are in and CEDRO is in the process of analyzing the data to publish a report. Report cannot be expected before end of Q2 2014.
- A new study for the assessment of the industrial potential, job creation, and local capacity for renewable energy systems in Lebanon has been awarded to a local consultancy and work is ongoing.



All in all, CEDRO aims to assist the government in Lebanon in deciding which energy source to utilize to reach its objective of 12% of its energy mix to come from renewable energy sources by 2020 – an objective approved by the Council of Ministers and asserted in the Copenhagen Summit.

II. RESOURCES

CEDRO 3		
Total budget approved	:	USD 3,772,827.00
Total disbursements as for December 2013	:	USD 3,266,284.52
Available Balance	:	USD 506,542.48
Commitments for next quarter	:	USD 150,000.00

Budget and Expenditure Breakdown per LRF Category:

CATEGORY	CEDRO3	
	Total Budget (USD)	Total Exp. to date (USD)
1. Personnel* (Incl. staff and consultants)	252,000	704,511.95
2. Contracts (Incl. companies, professional services)	599,050	1,274,442.82
3. Training (incl. AV printing / production)	41,000	33,644.37
4. Transport (local)	11,000	45,820.28
5. Supplies and commodities** (Incl. IT equip and rental & maintenance)	55,000	79,669.03
6. Equipment (including installation)	2,505,000	737,549.42
7. Travel	15,000	63,731.18
8. Miscellaneous	31,539	100,804.14
9. Agency Management Support (7%)	263,238	226,111.33
TOTAL	3,772,827	3,266,284.52

*Total expenditure for staff and consultants exceeds the total allocated budget because most of the technical design and supervision of works is being implemented by project personnel and not sub-contracted to third-party companies as originally planned. A budget revision is therefore being requested should this be necessary.

** Given the difference in budget line description between UNDP and the LRF accounts, the expenditures being reported under this budget account "supplies and commodities" because Batroun Port Renewable Energy Street Lighting contract should be considered under the budget account "contracts" not "supplies and commodities"



CEDRO Project	CEDRO 3 USD 3,772,827
Activity Results	
1 - Implementation of end-use energy efficiency and renewable energy demonstration projects for public sector buildings and facilities	➔ Identification and Implementation of 60-80 EE/RE demonstration projects across Lebanon
2 – Outreach and technology transfer to enable the conversion of other public sector buildings and facilities into energy efficient modalities	➔ Development and implementation of technical workshops and awareness tools ➔ Development of GIS energy data base and EE/RE procurement specs ➔ Validation of project results and development of replication schemes
3 – Research and development to enable the formulation of a national sustainable energy strategy and action plan	➔ Assessment of national renewable energy resources ➔ Assessment of national energy efficiency potential ➔ Development of national EE/RE strategy & action plan



Progress in Project Implementation:

Activity Results	Activity Actions	Targets for 2013	Status for 2013
1 – Project Management	1.1 Technical Management; 1.2 Financial Management; 1.3 Operational Management.	<ul style="list-style-type: none"> ✓ Organization of 2 conferences and/or events, including end of year project closing meeting ✓ Opening of Pico-hydro site 	<ul style="list-style-type: none"> ✓ 1 conference already undertaken, related to energy from wastewater treatment plants. ✓ Pico-hydro completed, opening awaiting good weather in Q1 or Q2 of 2014 ✓ CEDRO participated heavily in the 2013 Beirut Energy Forum
		<ul style="list-style-type: none"> ✓ Apply the issues raised in the report on the status and results of the CEDRO I pilot projects published in Q4 of 2012 	<ul style="list-style-type: none"> ✓ Recommendations of CEDRO 1 Evaluation Report have been completed
		<ul style="list-style-type: none"> ✓ Provide advisory support services on EE/RE policies and legislations 	<ul style="list-style-type: none"> ✓ Advisory role and participatory role in the upcoming Lebanese Renewable Energy Strategy is to be undertaken this year and to be undertaken in 2014 with the LCEC and the MEW.
		<ul style="list-style-type: none"> ✓ Attendance of capacity building workshops for CEDRO team 	<ul style="list-style-type: none"> ✓ 3 CEDRO engineers participated in the RENAC (http://www.renac.de/), which is 75% funded by RENAC (only). ✓ CEDRO project manager attended a statistics course to enable the interpretation of results from the WTP study
		<ul style="list-style-type: none"> ✓ Preparation of regular progress reports 	<ul style="list-style-type: none"> ✓ Q1 progress report prepared ✓ Q2 progress report prepared ✓ Q3 progress report prepared ✓ Q4 progress report prepared



Activity Results	Activity Actions	Targets for 2013	Status for 2013
2 - Implementation of end-use energy efficiency and renewable energy demonstration projects for public sector buildings and facilities	2.1 Undertake targeted assessment and identification of project beneficiary sites;	<ul style="list-style-type: none"> ✓ Following-up on projects under implementation ✓ Batroun Port ✓ Qabayeet street lighting initiative ✓ Roumin Pico-hydro system 	<ul style="list-style-type: none"> ✓ Batroun port is now completed ✓ Ramliyah pico-hydro is now completed ✓ Hybrid sites are now completed ✓ Chahhar hospital completed.
	2.2 Develop tender documents and undertake bidding & procurement of goods/services;	<ul style="list-style-type: none"> ✓ Launch three sites of Madinati Khadra competition ✓ 8 larger PV sites ✓ 4 hybrid PV/microwind sites ✓ Green Roof initiative at the Central Bank ✓ Chahhar public hospital 	<ul style="list-style-type: none"> ✓ All PV sites completed ✓ Green roof works well underway esp for phase 2. ✓ Chahhar hospital has been completed ✓ Qubeyeet street lighting is now completed. ✓ Roumieh prison continuation is now transferred to the ISF
	2.3 Undertake commissioning of works and supervision and monitoring of sites;	<ul style="list-style-type: none"> ✓ Complete work on Bejji Municipality (GSHP) ✓ Complete work on Roumieh Prison 	<ul style="list-style-type: none"> ✓ Bejji municipality will be commissioned once building is ready and inhabited.
	2.4 Undertake testing of performance & data collection.	<ul style="list-style-type: none"> ✓ Regular maintenance of all sites ✓ Data collection 	<ul style="list-style-type: none"> ✓ Maintenance checks regularly followed by 3 CEDRO engineers ✓ Data being collected from many sites across the country



Activity Results	Activity Actions	Targets for 2013	Status for 2013
3 – Outreach and technology transfer to enable the conversion of other public sector buildings and facilities into energy efficient modalities	3.1 Develop and implement technical workshops and awareness activities; 3.2 Develop GIS energy data base and EE/RE procurement specs; 3.3 Validate project results and enable replication schemes.	<ul style="list-style-type: none"> ✓ Development and implementation of 1 technical workshops ✓ Continuation and expansion of CEDRO outreach and visibility ✓ 1 newsletter to be produced in 2013 ✓ Complete revamping of CEDRO website to be implemented ✓ Final CEDRO Project documentary (if budget allows) 	<ul style="list-style-type: none"> ✓ One technical workshop was undertaken by CEDRO, related to the MEDSOLAR project that CEDRO contributes human resources too. This workshop was on the design element of larger PV systems and occurred on the 24th of September 2013. ✓ Updating project website: www.cedro-undp.org (En/Ar); ✓ Newsletter 8 and 9 prepared and will be disseminated in Q1 2014. ✓ PV brochure prepared and distributed ✓ Video clip on CEDRO's achievements produced and posted online on CEDRO website ✓ Full press coverage for the Energy from Wastewater Event at the MEW ; All the TVs aired a report during their news, and most daily newspapers mentioned the event ✓ Full press coverage for the Batroun Port inauguration.
		<ul style="list-style-type: none"> ✓ Interactive Map for CEDRO sites to be installed on new website 	<ul style="list-style-type: none"> ✓ Interactive Map being set up, part of which is on the website.
4 – Research and development to enable the formulation of a national sustainable energy strategy and action plan	4.1 Assess national renewable energy resources; 4.2 Assess national energy efficiency potential; 4.3 Develop national EE/RE strategy & action plan.	<ul style="list-style-type: none"> ✓ Publish energy from waste water treatment plants (WWTP) study ✓ Publish study on hydropower resources from non-river sources ✓ Launch and implement the national geothermal power assessment for the country. ✓ Undergo Renewable Energy Strategy Study with the Ministry of Energy and Water and the LCEC ✓ Undergo study on the willingness to pay (WTP) for renewable energy for the commercial and residential sectors in Lebanon ✓ Undergo a study for the assessment of the industrial potential, job creation, and local capacity for renewable energy systems in Lebanon 	<ul style="list-style-type: none"> ✓ Energy from WWTP has been published and disseminated ✓ Hydropower resources from non-river sources has been published and disseminated ✓ PV farm study has been published and is being distributed ✓ Study on WTP ongoing. ✓ Study on Industry and Renewable Energy Ongoing.

* EE/RE = Energy Efficiency and Renewable Energy



Implementation Constraints and Lessons Learned during this quarter:

None



IV. FUTURE WORK PLAN

Outputs and Activities	2014	
	Q1	Q2
<p>1. Implementation of end-use EE/RE demonstration projects</p> <ul style="list-style-type: none"> – Identification of beneficiary sites – Development of tender documents – Procurement of goods / services – Site Supervision and hand-over – Monitoring of system performance 	<p>Monitor implementation of works</p> <p>Record all data collected from sites</p> <p>Monitor all installations</p> <p>Prepare Operation and maintenance plan post-CEDRO</p> <p>Project extended to June 2014</p> <p>Inaugurate BDL green roof</p> <p>Inaugurate Pico-hydro</p> <p>Follow industry and RE study</p> <p>Complete WTP study</p>	<p>Terminate project</p> <p>Publish Operation and maintenance plan post-CEDRO</p>
<p>2. Outreach and Technology transfer for the activation of EE/RE applications</p> <ul style="list-style-type: none"> – Establishment of energy saving data base for public sector facilities – Development & Implementation of capacity building & awareness programs – Development of relevant EE/RE policies and procedures – Validation of project results 	<p>Awareness activity to be determined</p> <p>Geothermal power assessment result dissemination</p> <p>Put together all CEDRO's work on RE and EE in one document; a national document for RE and EE</p>	<p>Dissemination of results of the RE and Industry study</p> <p>Completion of CEDRO publications from works done and inputs in the Renewable Energy Strategy.</p>
<p>3. Research and development for the formulation of a national EE/RE strategy and action plan</p> <ul style="list-style-type: none"> – Assessment of national RE potential – Assessment of national EE potential – Identification of viable EE/RE actions – Identification of Implementation tools and funding mechanisms 	<p>Put together all CEDRO's work on RE and EE in one document; a national document for RE and EE</p>	<p>Put together all CEDRO's work on RE and EE in one document; a national document for RE and EE</p>



CEDRO 3

- ➔ Implementation of end-use energy efficiency and renewable energy applications for public sector buildings and facilities (60-80 sites across Lebanon)
- ➔ Technology transfer to enable the conversion of other public sector buildings and facilities into energy efficient modalities
- ➔ Research and development to enable the formulation of a national sustainable energy strategy and action plan