

**United Nations Development Programme
Lebanon
Project Document**



*Empowered lives.
Resilient nations.*

Project Title: Country energy efficiency and renewable energy demonstration project for the recovery of Lebanon – Phase 4 (CEDRO IV)

UNDAF Outcome(s): By 2014, improved accessibility and management of natural resources and enhanced response to national and global environmental challenges.

UNDP Strategic Plan 2014-2017 Integrated Results and Resources Framework – Outcome 1: Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded.

UNDP Strategic Plan output 1.5.: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy).

Expected CP Outcome(s): Climate change considerations mainstreamed in national priorities

Expected CPAP Output (s): National sustainable energy strategy developed and its implementation promoted

Executing Entity/Implementing Agencies: United Nations Development Programme

Brief Description

The main objective of CEDRO 4 is the application of renewable energy and energy efficiency systems and measures across Lebanon’s several economic sectors (commercial, industrial, and utility-scale, and a demonstration project on a village scale and bioenergy sourced heating) and beneficiaries.

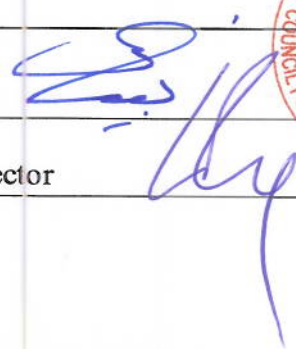

Ultimately, CEDRO 4 will continue the on-going assistance provided by the UNDP to the Government of Lebanon to develop and implement a national sustainable energy strategy to mitigate climate change, in line with the United Nations Development Assistance Framework (UNDAF) for Lebanon (2010 – 2014), and in line with the Millennium Development Goal 7 (MDG 7) of achieving environmental sustainability.

Programme Period:	<u>2013-2017</u>
Atlas Award ID:	00077650
Project ID:	00088302
Start date:	<u>01 January 2014</u>
End Date:	<u>31 December 2016</u>
Management Arrangements:	DIM
PAC Meeting Date:	

Total resources required:	Euros 3,000,000
Total allocated resources:	Euros 3,000,000
• Other:	
o EU	Euros 3,000,000 (USD 3,900,000)

Agreed by CDR: Mr. Nabil El-Jisr, President

Agreed by (UNDP): Mr. Luca Renda, Country Director



 FEB 2014

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LIST OF ACRONYMS

CEDRO	Country energy efficiency and renewable energy demonstration project for the recovery of Lebanon
CDR	Council for Development and Reconstruction
CO	Country Office
CSP	Concentrated solar power
EDL	Electricity du Liban
EE	Energy Efficiency
EEM	Energy Efficiency Measures
EIA	Environmental Impact Assessment
EOI	Expression to Interest
ESCO	Energy Services Company
GHG	Greenhouse Gases
LCEC	Lebanese Center for Energy Conservation
LRF	Lebanon Recovery Fund
MDG	Millennium Development Goals
MEW	Ministry of Energy and Water
MoE	Ministry of Environment
MoET	Ministry of Economy and Trade
MOI	Ministry of Industry
MoM	Ministry of Municipalities
MoF	Ministry of Finance
MOU	Memorandum of Understanding
NIM	National Implementation Modality
PMU	Project Management Unit
PV	Photovoltaics
RE	Renewable Energy
RECREEE	Regional Center for Renewable Energy and Energy Efficiency
SWH	Solar Water Heater
UNDP	United Nations Development Programme
UNDAF	United Nations Development Assistance Framework

1. SITUATION ANALYSIS

1.1 Background

The Lebanese electricity system suffers from substantial inefficiencies, poor management (under public management), and under-investment (lack of required generation capacity, inadequate maintenance, and so forth). It absorbs approximately 2-4% of national Gross Domestic Product through annual subsidy transfers of \$1-2 billion, depending on fuel prices, as most of generation is met through expensive fuel oil and diesel. Even with these subsidies in place, a generation deficit of at least 1000-1500 MW (depending on season) exists, requiring the Lebanese to seek self-generation based on diesel consumption. In total, energy-related costs burden the Lebanese to the extent, according to the Ministry of Energy and Water (2012), that almost one-third of gross domestic product is paid for energy-related requirements, including transportation. More than 97% of Lebanon's primary energy requirements are met through imports, a key barrier towards better security of energy supply.

Electricity supply in Lebanon is managed by Electricité du Liban (EDL), a public institution that has a nominal installed power supply capacity of approximately 2300 MW. 1900 MW of this capacity consists of thermal power capacity and approximately 280 MW of hydro (end of 2006). Available net thermal capacity however has varied from as low as 1600 MW (and sometimes lower) to a maximum of 2000 MW. This is due to several shortcomings such as restoration requirements, plant failures, fuel supply problems, and external hostilities (i.e. damage to fuel storage capacity or electricity generators due to war time hostilities) among other occurrences. Hydro power availability depends on rainfall and maintenance issues, and has been as low as 80 MW in some years.

In the year 2000, Lebanon emitted 18.3 Million tonnes (Mt) of CO₂ equivalent (CO₂ eq.), with the energy producing sector contributing more than 53% of these, as shown in Figure 1.

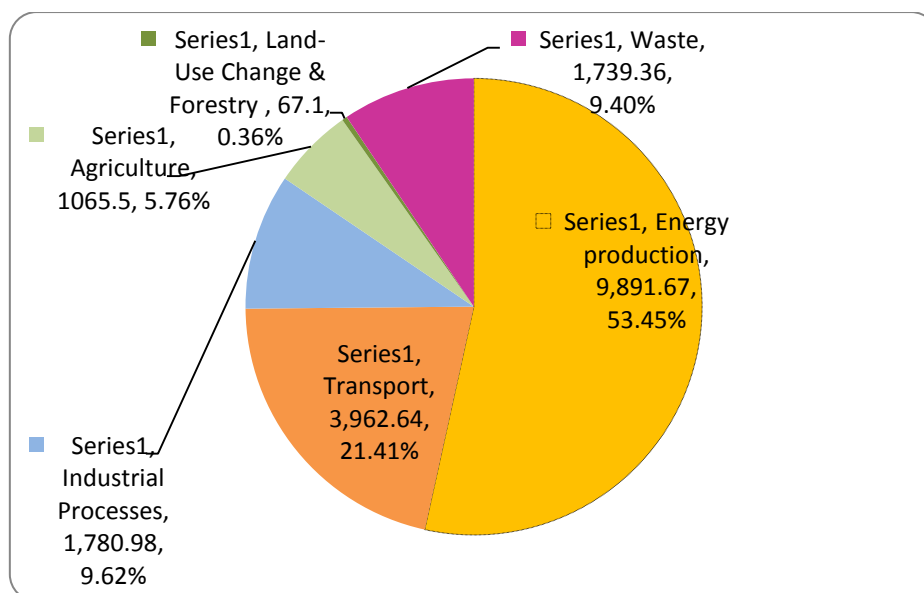


Figure 1. GHG emissions by source in 2000 (UNDP/MOE 2012)

In terms of kWh generated and delivered to the end user, the Lebanese electricity system, including the 33% diesel self-generation, performs twice as worse in terms of most other environmental end-points, as expressed in Figure 2, where the life-cycle kWh generated and

delivered in Lebanon is compared to the European kWh average in 2009 through a life-cycle assessment.

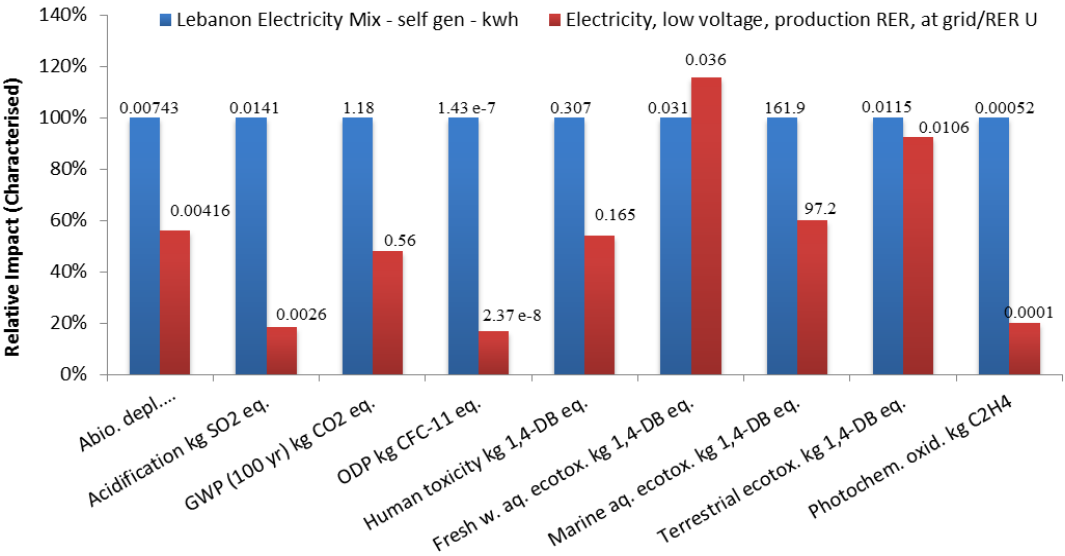


Figure 2. Characterized LCA results of Lebanese versus European electricity per 1 kWh of delivered electricity (El-Fadel et al., 2010)

The latest CO_{2e} grid factor, not based on a life-cycle assessment basis, yet based on a Clean Development Mechanism (CDM) project submitted by Lebanon in 2011 to the UNFCCC used 0.65 kg CO_{2e} /kWh. This rate will be used from this point forward.

To counteract this grave situation, the Ministry of Energy and Water (MEW) released its’ Policy Paper in 2010, with the following action plans are to be implemented;

	<i>Main categories</i>	<i>Brief description</i>
1	Generation	<ul style="list-style-type: none"> - 2100-2200 MW of new power plants - 245 MW obtained from rehabilitating existing plants - 40 MW additional hydropower - 60-100 MW wind power (short-term) - 15-15 MW waste-to-energy
2	Network	Upgrading, removing bottlenecks, and smartening the grid
3	Fuel sourcing	Shift to; <ul style="list-style-type: none"> - 66% natural gas - 12% renewable energy - 22% fuel oil
4	Renewable energy (RE)	12% of energy mix, excluding transportation, from renewable energy sources
5	Energy efficiency	Reduction of 5% of demand (yet against which baseline not set)
6	Tariff adjustment	Tariffs set to rise from current average of \$c9.4/kWh to \$13.75/kWh
7	Corporatization of EDL	To enable qualified team and flexibility
8	Legal	Amendment of Law 462, which calls for the formation of the National Regulatory Authority, and other legal issues

Table 1. Main action plans according to the MEW Policy Paper

Focusing on renewable energy, the Policy Paper added action plans set out in Table 2.

<i>Action plans</i>	<i>CEDRO response</i>	<i>National level response</i>
Complete a wind atlas for Lebanon and launch IPP wind farms with the private sector (2010).	Implemented by CEDRO based on existing data collection and satellite modeling	MEW has begun the tender process for the first wind farm, 60 MW. The success of this depends on political circumstances.
Start a pre-feasibility study on Photovoltaic (PV) farms.	Pre-feasibility study undertaken by CEDRO 3 and to be published in 2013	RECREE/Solar-Med project is working on solar atlas for PV and CSP and will be published early 2013.
Encourage public and the private sectors to adopt incineration technologies to produce electricity from waste.	Outside CEDRO scope, although the National Bioenergy Study, published by CEDRO in 2012, indicated a substantial potential from waste-to-energy	Government is in the process of evaluating its' entire solid waste management policy, and WtE is one likely winner to be followed in due course.
Encourage all individual and private initiatives to produce hydro power; even micro-hydro.	CEDRO has assessed pico-hydro power, both from river and non-river sources and begun piloting the technology	Hydropower has been assessed nationally by the MEW through a French company, focused on river-sources.
Further referral to Renewable energy sources; net metering and feed-in tariffs	CEDRO initiated 'net metering' in Lebanon and lobbied it through the Lebanese Center for Energy Conservation, the Ministry of Energy and Water, and Electricity of Lebanon (EDL) CEDRO also implemented many technologies on the ground and connected them via net metering (see section below)	MEW and EDL are well underway to spread the use of net metering in Lebanon for RE applications.

Table 2. MEW policy paper RE initiatives and CEDRO 3 related actions

The CEDRO project has implemented approximately 80 sites of PV, microwind, and hybrid PV and microwind across the country. Given the regular daily blackouts across the nation, a tailor-made design was created by CEDRO that works in both autonomous mode, with battery storage, and grid-connected mode when electricity from EDL is present and net metering is enabled. This design was, according to most of the contractors, the missing link in establishing electricity delivering RE systems.

Many lessons were learned with this design or architecture, such as lightning protection, not only from direct lightning, yet from lightning coming through the distribution networks. Data logging was established in all the sites and the techno-economic feasibility of these sites will be disseminated in 2013.

On the policy level, CEDRO worked closely with the MEW and the LCEC in order to remove the barriers that inhibit the penetration of RE systems. One of the most successful initiatives from CEDRO is net metering, the dual (quantitative) exchange of power between an RE source and the grid, a process that was prohibited before. Net metering paves the way for

feed-in tariffs, the policy that was/is most successful in promoting RE sources, according to European experiences.

1.2 Role of CEDRO 4

Taking the above into account, CEDRO 4 aims to work on supporting the following development objectives:

- 1- Support the Ministry of Finance to lessen public and private financial burdens related to energy expenditure, reducing therefore income burden and increasing security of supply.
- 2- Support the Ministry of Energy and Water to promote renewable energy up to 12% of energy mix by 2020 and increase energy efficiency by 5%.
- 3- Promote small-scale renewable energy sources through demonstration projects, capacity building and awareness raising on the one hand, and analysis on renewable energy resources in terms of potential and policy recommendation.
- 4- Enhance the drive towards a green economy, creating new 'green' jobs, particularly through engaging the private sector.

Ultimately, CEDRO 4 will continue the on-going assistance provided by the UNDP to the Government of Lebanon to develop and implement a national sustainable energy strategy to mitigate climate change, in line with the United Nations Development Assistance Framework (UNDAF) for Lebanon (2010 – 2014), and in line with the Millennium Development Goal 7 (MDG 7) of achieving environmental sustainability.

CEDRO 4 will work on the following activities:

- Renewable energy and energy efficiency applications, up-scaled on the one hand, and targeting new sectors on the other (particularly the commercial, industrial, and utility-scale)
- Implementing a low-carbon village
- Bioenergy application (for heating)
- Renewable energy policy support, planning and analysis
- Capacity building, awareness raising, and marketing

These initiatives are discussed in turn in the following sections.

1.3 CEDRO 4 applications

The main objective of CEDRO 4 are the application of renewable energy and energy efficiency systems and measures across Lebanon's several economic sectors (commercial, industrial, and utility-scale, and a demonstration project on a village scale and bioenergy sourced heating) and beneficiaries. Co-financing would be requested for the projects whenever necessary and feasible, particularly for private sector beneficiaries.

All the RE (and EE) systems for the commercial, industrial, utility scale, and the model town/village will have data logging systems for performance evaluation and later-date dissemination of techno-economic information. The bioenergy demonstration project will be monitored through surveys and direct expert monitoring.

The logged data shall not only be recorded for the CEDRO project, in order to ensure optimized operation and maintenance through day to day monitoring, yet shall be shared with research institutes and universities through a competitive cooperation (e.g., call for proposal) to disseminate the scientific lessons learned in peer-reviewed journals and other research publications.

Activity 1. RE applications for the commercial and industrial sectors

The first activity of the renewable energy applications will target beneficiaries not yet targeted sufficiently in Lebanon, particularly in the commercial and industrial sectors. The pilot projects proposed have an innovative component in that they will address local problems that require unique technical solutions, in order to allow for the development of the renewable energy market. That is, the use of renewables connected to the grid and supplying the load in case of grid interruptions, synchronizing with the diesel self-generator. When the grid is available, the PV and wind power (after local due diligence) will be injected to the grid via the net metering arrangement in place when a surplus in power exists. Technology transfer will be assured through these pilot projects through the organization of training and workshop events on the one hand, and through marketing the systems on the other. Co-financing of 50% shall be targeted from the selected beneficiary, and the selection process is discussed in Section 2.1.

BOX 1	Why 50% co-financing from beneficiaries
<p>The UNDP strongly believes not to increase the co-financing above the 50% level at this particular point (i.e., to have beneficiaries pay 50% of project cost and not more). This is because, unlike countries that have 24 hour electricity, Lebanon’s blackouts forced (and force) the installation of diesel back-up generators and any installed renewable energy source will NOT displace the diesel back-up generator, yet will simply (and yet importantly) reduce the use of costly diesel fuel. Given this new technology set-up to cater for the Lebanese case, CEDRO 4’s role will be to break through the technical and economic barriers and raise awareness on this unique approach so that it can be replicated in the private sector by themselves. At the beginning, potential beneficiaries may not be willing to pay three bills (utility electricity, diesel generation, and renewable energy source), until this technology is well established, demonstrated and costs are brought down through knowledge building.</p>	

Furthermore, an energy audit will be undertaken by a third-party specialized company (ESCO or other) and the recommended energy efficiency measures will be a pre-requisite for the RE system installation. The audit itself will be disseminated and generalized into best-practice guidelines. The targeted sites should have the power capacity of between 50-150 kW each.

Other expected results of this activity are;

- Characterization of the weaknesses of electrical grids,
- Analysis of the regulatory and legal framework and recommendations,
- Conceptual definition of the new system architecture,
- Technological development of an energy management pilot system in small and medium size industries
- Recommended financial support structure and level
- Dissemination and creation of broad network of stakeholders.

Activity 2. Model green-powered village (app. 60-80 houses)

The second initiative adopts a holistic approach to renewable energy and energy efficiency applications. A model village will be selected through a competitive shortlisting process, involving various necessary criteria that are suitable or favourable to the objective of establishing a first of its kind 'green energized' village, as well as the available allocated funding for this activity. The heating and electric demand of the village will be assessed through after the selection of one specific village, after which the necessary EE & RE applications that assist in satisfying the heating, hot water and electric demand of this village will be designed and procured.

Co-financing for the selected solutions for the village may be requested from the residents of the village themselves (that will be selected as direct beneficiaries), backed up by the municipality, if deemed feasible.

Addressing the necessary financial, legal, and technical issues required to ease replication of the model village to other villages is key to the success of this initiative.

Activity 3. Bioenergy application

The third initiative builds on the national bioenergy strategy of Lebanon, published by CEDRO 3 in 2012. The strategy has identified 10 bioenergy streams for Lebanon that are highly promising (under strict sustainability criteria). One of the more important resources identified is related to energy from forestry residues and agricultural residues. For heating purposes, pellets and briquettes can be formed from these residues through particular mechanical processes, and these can be used in biomass boilers in commercial and industrial facilities that require heat and/or steam, and for heating in rural homes. The benefits of this project are substantial, particularly in relation to forestry residues, where the benefits are related to;

- Reduction of forest fires; collection of dried matter from forests reduces the risk of forest fires, and forest fires is a major concern in Lebanon.
- Collection of forestry residues requires substantial labour, particularly in rural areas
- Processed residues into briquettes and pellets delivers a heating source for rural residents in winter, where difficulty in paying for heating (as diesel is the main median used) has been the norm.
- Reduction of energy costs for the commercial/industrial facility.

The setting up of the chain for this particular bioenergy stream is a challenge, given the complex logistical, legal and environmental components involved. However, the role of CEDRO 4 is to establish best-practices in this sector based on efficiency, environmental sustainability, and legal authorization procedures and to advocate such practices. Environmental impact assessment (EIA) will be undertaken for the identified site, especially for the biomass resource collection impacts.

In this activity, in-kind co-financing will be sought from the municipalities in the form of land, legal works and labour for pruning and wood cutting.

Summary of applications

Table 3 summarizes the sectors and renewable energy systems targeted, the number of sites, and the co-financing requested with brief comments.

	Application	Sector	No of sites	Minimal beneficiaries' Co-financing 1*	Co-financing 2**	Comments
1.	Renewable Energy Systems (PV, wind, hybrid PV-wind, hydro...)	Commercial & Industrial sectors	Up to 6 sites	50%	Site dependent	Energy efficiency measures required
		Biomass (municipality)	1	30% (in-kind)	Site dependent***	Heating briquettes & pellets from forestry & agri. residues
2.	Green Village	Village	1	Will be assessed in due course	Minimum efficiency requirements	-
* Co-financing can also rely on soft loans expected from 2014 ** Energy efficiency measures as prescribed by energy audit *** Municipality will need to obtain the land whereon the biomass system will be installed.						

Table 3. Renewable Energy Applications

Activity 4. Renewable energy policy support, planning and analysis

Policy support and analysis on renewable energy applications in Lebanon is necessary in order to build on previous experience and establish new opportunities. Lebanon, through the CEDRO project and other initiatives, has moved well into resource assessments of various renewable energy resources, particularly related to wind power (onshore and offshore¹), bioenergy resources, geothermal power, and hydropower from non-river sources. Other initiatives have been developed for Lebanon (and the region) with respect to hydropower potential (from river sources) by the Lebanese Ministry of Energy and Water, and solar resources for PV and CSP via the Solar-MED project².

The next batch of analysis needs to focus on large-scale power with storage technologies (such as hydro-pumped storage) to shave off peak demand, policy support, regulatory frameworks and grid integration protocols. In particular, focus will be given to the below priorities (priorities are coded so that their timeframes can be followed in Section 3);

#	Study	Code
2	Enhancing the penetration & management of distributed generation through support to distribution grid operators (known as service providers)	S1
6	Other policy/legal and/or regulatory studies to push forward renewable energy	S2
7	Assessment on large-scale power delivery and storage for peak demand	S3

Table 4. RE policy support and analysis studies (coded)

Activity 5. Capacity building, awareness raising and marketing

Capacity building and awareness raising form the corner stone of the project, where technical support to the RE market and RE stakeholders will be given high focus, focused on works to be undertaken by initiative 1, as will the marketing of RE to various groups.

In particular the focus of capacity building will be targeted on the following players;

¹ Offshore wind potential requires a more robust measurement campaign, as the wind atlas relied on modeling as there are no measurements for offshore wind potential. However, given that onshore wind is not yet developed, offshore resources can be analyzed at a later stage.

² Please see; <http://www.solar-med-atlas.org/>

- Local manufacturers, suppliers, and installers of RE systems
- University students, graduates and professionals in the industry
- Public stakeholders involved in the sector; Ministry of Energy and Water, Council for Development and Reconstruction (CDR), Electricite Du Liban (EDL), and the private sector service providers.

Capacity building for EDL shall focus on their capacity and understanding of RE integration into the network, net metering support, and including renewable power forecasting and management (network integration).

With respect to awareness raising, willingness to pay for and acceptance renewable energy and energy efficiency measures depends on the level of awareness on the relevance of these systems, as it is a matter of financial viability. To this end, awareness raising shall target the following groups;

- Industrial and commercial sectors, based on projects implemented and lessons learned
- Municipalities across Lebanon, esp. w.r.t bioenergy applications
- Residential sector through nation-wide campaigns using various forms of media (with MEW support)
- Young generation through various activities and events

With respect to marketing, CEDRO 4 will ensure all its' work is well marketed, both for awareness raising on RE and EE, and for maximum EU visibility, through the established and maintenance of the following;

- Website portal
- Bi-annual newsletters
- Corporate brochure
- Renewable energy best practices brochures
- Facebook/twitter accounts and updates
- Youtube documentaries
- Local media marketing
- Other...

2. STRATEGY

2.1 Methodology for RE applications in the commercial/industrial sectors (Activity 1)

CEDRO 4 will continue the methodology used by CEDRO 3 when implementing projects, slightly modified to take into account the co-financing requirements, and the implementation of energy audits and subsequent energy efficiency measures. This process is two-tracked and is categorized as shown in Figure 3 below.

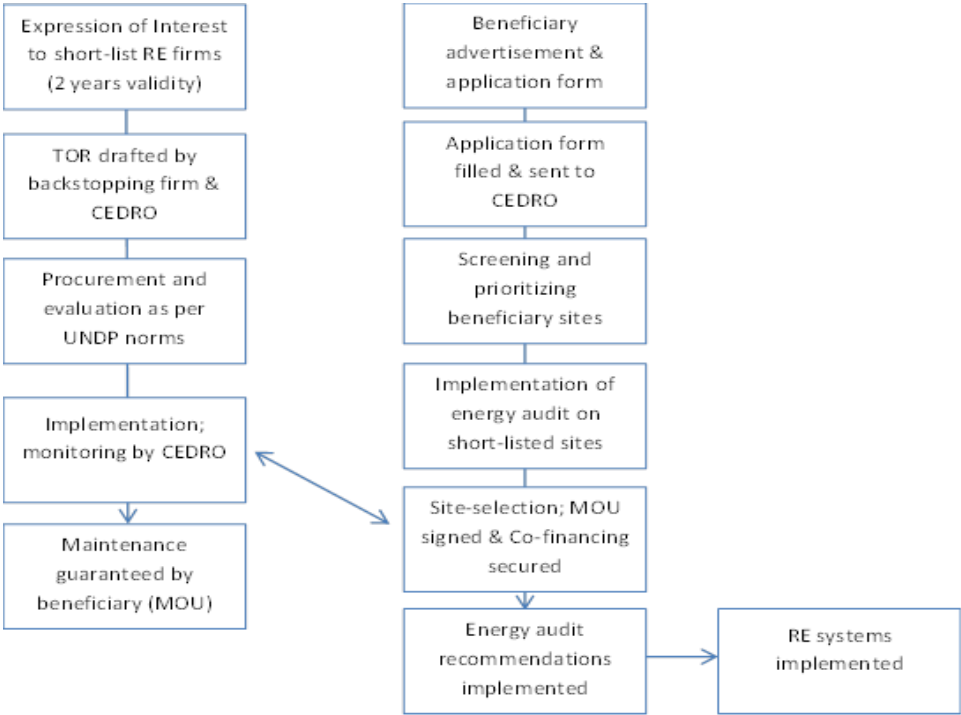


Figure 3. CEDRO 4 RE applications' modality (general)

As Figure 3 shows, two main tracks are followed simultaneously towards the implementation of the RE systems across the commercial and industrial beneficiaries.

The first track involves the short-listing of qualified firms who have the quality of products standards and certification and qualified team required to implement the forthcoming projects. Within this same framework of the CEDRO 4 project, an international consultancy specialized in energy efficiency and renewable energy applications and technologies will provide the CEDRO team with the technical support for the subsequent effective design, implementation and validation of the RE and EE applications. There will be two main lots wherein the contractor can be short-listed to (contractor can apply to one, or all of the lots). These are;

- Lot 1.** Commercial/Industrial systems (PV and Wind)
- Lot 2.** Bioenergy applications

The second track involves, first, the advertisement of the opportunity to have a 50-150 kWp RE system installed for **Activity 1** (industrial/commercial sectors), and a biomass boiler

supply chain for **Activity 3**, including a dissemination call from the Ministry of Interior and Municipal Affairs (MoIM).

For activity 1, the advertisement will call for interested beneficiaries to fill out an application form, within which there will be a set of criteria indicated. Annex 1 indicates a draft list of the criteria to be requested, separated by ‘obligatory criteria’ that must all be fulfilled, and ‘additional criteria’ that may provide for grading and prioritizing between the sites. After the application is submitted, the best (top 6) sites will be visited by CEDRO engineers to verify the information filled on the application form. The pre-selected sites/potential beneficiaries will sign a memorandum of Understanding (MOU) with the UNDP, respectively, binding the beneficiary to the following;

- Full finance is required for the implementation of energy audit recommendations by the selected beneficiaries and 50% co-finance of the RE system is required (estimated budget will be delivered to beneficiary by CEDRO)
- Access to full information on the beneficiary’s energy consumptions and costs
- Undergo an energy audit, and fulfil the audit’s recommendations (at least the most cost-effective measures as stipulated by independent consultant)
- Allow measuring equipment for several months before project implementation for data collection.
- Access to the site and all needed data by the CEDRO project team and/or any specified expert/academic.
- Maintain the system throughout their lifetimes (at least 10-15 years)

2.2 Methodology for model green-powered village (app. 60-80 households) (Activity 2)

For **Activity 2**, the selection of the village has to take into account the budget available. Annex 2 shows the map of Lebanon with the number of buildings per village district. There are many potential candidates for this model village, in that the numbers of buildings are below 100. Selecting one village out of the many options would be done in a transparent and viable manner to ensure the success of the application. The criteria required would be established in due course, yet will cover issues as the below:

- Commitment of municipality
- Setting up the co-financing scheme and guarantee
- Willingness of all residents to have monitoring of their energy use, either through the review of their energy bills and/or through the direct installation of monitoring equipment over the course of several months.
- Willingness of all residents to have an energy audit performed and recommendations implemented.
- Willingness of having wind, solar, and biomass resource assessments within municipal boundaries
- Willingness to assist in documentation and marketing
- Ability and willingness to operate and maintain installed systems.
- Other (to be determined)

2.3 Methodology for bioenergy applications (Activity 3)

For **Activity 3**, a potential municipal site with a nearby forest will be identified through the same application form as Activity 1, with the additional criteria of securing the necessary biomass resources. The Municipality must have the legal right to the forest and must secure

the land upon which the biomass process of briquetting will be established. A private company will be procured competitively to carry out the entire process, monitored by the CEDRO team and a qualified bioenergy consultant – specialized in this type of bioenergy stream. The involvement of the Ministry of Environment, national forest associations and NGOs and other partners working in this sector will be integral to the communication, dissemination and replicability of this Activity.

2.4 Methodology for policy support and analysis (Activity 4)

The process for policy support and analysis follows a modality of competitive bidding process in line with UNDP procurement and recruitment guidelines to identify the most suitable expert(s) in the field. Expertise can be hired either as individuals or specialised companies and awards are based on international competition that includes a price-quality assessment to ensure best-value for money.

2.5 Methodology capacity building and awareness raising (Activity 5)

Capacity building on RE systems will be undertaken directly by the CEDRO team and its' hired backstopping firm. These events will focus on the local market and the various stakeholders involved. Where and when certification is required, capacity building may involve a certification body to be present, hired competitively through the UNDP procurement unit.

With respect to awareness raising, CEDRO 4 will focus on many levels. Both in-house material and procured medians will be used for awareness raising. All social media will be targeted, and when and where necessary, procured through the UNDP procurement unit.

All CEDRO's work will be marketed and made visible, through official inauguration events, and various other media means. The EU visibility will be ensured by including all EU logos *en par* with those of the UNDP and the CEDRO project and by explicitly mentioning the EU as the funding source in all public presentations, press releases, and promotional items and events (among others), as per the Communication and Visibility Manual for EU External Actions.

3. DURATION AND INDICATIVE ACTION PLAN

The duration of CEDRO 4 project shall be 36 months. The general activities to be followed are listed in Section 1 (and Section 2) above. They are re-listed below:

- Activity 1. RE applications for the industrial/commercial sector
- Activity 2. Model Village
- Activity 3. Bioenergy
- Activity 4. RE policy support and analysis
- Activity 5. Capacity building, awareness raising, and marketing

For each of the three years, the expected timeframes for the implementation of the above activities are shown in Tables 5-7.

Year 1															
Activity		Semester 1						Semester 2						Implementing body	
		1	2	3	4	5	6	7	8	9	10	11	12		
1-5	Preparation of offices	■	■	■											UNDP
1-5	Hiring of staff	■	■	■											UNDP
1	Shortlisting of qualified firms for 2 year period for identified lots			■	■	■									CEDRO/UNDP
1-4	Backstopping firm hired for a period of 24 months			■	■	■									CEDRO/UNDP
1	Advertisement in local media and application forms submitted				■	■	■								MEW/CEDRO/UNDP
1	Application forms evaluated and sites prioritized					■	■	■							CEDRO
1,2,3	Sites visited and verified by CEDRO team; top sites selected							■	■	■	■				CEDRO
1,2	Energy audit performed and data logging equipment installed on selected sites								■	■	■	■	■		CEDRO/beneficiary
1,2,3	MOU signed with selected beneficiaries											■	■		CEDRO/UNDP
1,2	Procurement of monitoring equip. for energy readings if necessary										■	■	■		CEDRO
5	S1 preparation										■	■	■		CEDRO
5	S2, S3 preparation										■	■	■		CEDRO/EDL
5	Website establishment			■	■	■	■	■							CEDRO
5	Newsletter publication						■	■				■	■		CEDRO
5	RE best practices brochures										■	■	■		CEDRO/MEW

Table 5. Year 1 tentative plan

Year 2															
Activity		Semester 1						Semester 2						Implementing body	
		1	2	3	4	5	6	7	8	9	10	11	12		
1-3	TORs for first batch of sites prepared and posted online	■	■	■											CEDRO/UNDP
1-3	TORs for second batch of sites prepared and posted online		■	■	■										CEDRO/UNDP
1 - 3	TORs for third batch of sites prepared and posted online			■	■	■									CEDRO/UNDP
1-3	Contract signed for 1 st batch project implementation & works begin				■	■	■	■	■	■	■	■	■		CEDRO/UNDP
1-3	Contract signed for 2 nd batch project implementation & works begin						■	■	■	■	■	■	■		CEDRO/UNDP
1 - 3	Contract signed for 3 rd batch project implementation & works begin								■	■	■	■	■		CEDRO/UNDP
4	TORs for studies prepared and posted online				■	■	■	■	■	■					CEDRO/UNDP
4	Contract signed and works begin										■	■	■		CEDRO/UNDP

2	Data collection through energy bills, installation of monitoring equipment in households, and renewable energy resource assessment.	■	■											
4	S1, S2 studies released and implementation commences	■	■	■	■	■	■	■	■	■				CEDRO/UNDP
4	S3							■	■	■	■	■	■	CEDRO/UNDP
5	Capacity building (esp. to EDL) events on various RE sources											■	■	CEDRO/UNDP
5	Awareness raising events				■	■					■	■	■	CEDRO/UNDP
5	Newsletter publication						■	■					■	CEDRO/UNDP

Table 6. Year 2 tentative plan

		Year 3													
Activity		Semester 1						Semester 2						Implementing body	
		1	2	3	4	5	6	7	8	9	10	11	12		
1-4	Works on batch 1 ongoing and completed	■													CEDRO
1-4	Works on batch 2 ongoing and completed	■	■	■											CEDRO
1-4	Works on batch 3,4 ongoing and completed	■	■	■	■	■									CEDRO
1-4	Works ongoing and completed	■	■	■	■	■	■	■	■	■					CEDRO
1-3	Data logging after completion of work		■	■	■	■	■	■	■	■	■	■	■	■	CEDRO
1-4	Data logging after completion of work										■	■	■	■	CEDRO
2	Installation of RE and EE recommendations on village	■	■	■											CEDRO
2	Monitoring of RE and EE installations on village				■	■	■	■	■	■	■	■	■	■	CEDRO
5	Newsletters						■	■					■	■	CEDRO
5	Capacity building and awareness raising			■	■	■				■	■	■	■		CEDRO
5	Official opening of sites		■	■		■	■		■	■	■	■	■		CEDRO/MEW
1,2,3	Monitoring of all sites, maintenance, data logging & writing up	■	■	■	■	■	■	■	■	■	■	■	■	■	CEDRO
5	Final batch of policy support to EDL/MEW	■	■	■			■								CEDRO
5	Official opening of sites		■	■											CEDRO
5	Awareness raising events		■	■											CEDRO
5	Capacity building event		■	■											CEDRO
5	Writing up final project document on experiences and technologies							■	■	■	■	■	■	■	CEDRO
5	Project evaluation report										■	■	■	■	CEDRO

Table 7. Year 3 tentative plan

4. RESULTS AND RESOURCES FRAMEWORK

Intended Outcome as stated in the Country Programme Results and Resource Framework:				
Outcome 3: Climate Change considerations mainstreamed in national priorities				
Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets:				
Indicator 3.1: Market transformation towards more sustainable energy use observed. Baseline 3.1: Few sustainable energy applications and projects exist				
Target 3.1: Increased number of sustainable energy projects implemented at national level				
Applicable Key Result Area (from 2014-2017 Strategic Plan):				
Output 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy).				
Project title and ID (ATLAS Award ID): CEDRO IV – Project ID 00088302– Award ID 00077650				
INTENDED OUTPUTS	OUTPUT TARGETS FOR (YEARS)	INDICATIVE ACTIVITIES	RESPONSIBLE PARTIES	INDICATIVE INPUTS
<p>Output 1: Capacity building and implementation of innovative renewable energy technologies</p> <p>Baseline: Limited application of renewable energy technologies in Lebanon</p> <p>Indicators:</p> <ul style="list-style-type: none"> - Availability of end-use renewable energy demonstration projects; - Availability of relevant technical tools for the spread of renewable energy applications. 	<p>Targets (2014)</p> <ul style="list-style-type: none"> - Selection of backstopping agency - Preliminary identification of beneficiary sites - Set-up of project team - Selection of pilot sites and technologies - Securing co-financing <p>Targets (2015)</p> <ul style="list-style-type: none"> - Procuring the suppliers - Initiating installation at sites <p>Targets (2016)</p> <ul style="list-style-type: none"> - Installation and commissioning of systems - Capacity building - Awareness raising 	<p>Activity Result 1: Implementation of Pilot Projects</p> <ul style="list-style-type: none"> - Selection of sites - Design and implementation - Monitoring and follow-up <p>Activity Result 2: Setting up an enabling environment</p> <ul style="list-style-type: none"> - Project management - Legal and policy changes - Awareness raising - Capacity building 	<p>UNDP</p>	<p>€ 1,600,000 (USD 2,080,000)</p> <p>€ 1,400,000 (USD 1,820,000)</p>

Annual Work Plan

EXPECTED OUTPUTS	PLANNED ACTIVITIES <i>List activity results and associated actions</i>	Responsible party	PLANNED BUDGET				
			Funding Source	Budget Description	Amount (USD)		
					2014	2015	2016
Output 1 <i>Baseline:</i> Limited application of renewable energy technologies in Lebanon - <i>Indicators:</i> Availability of end-use renewable energy demonstration projects; - Availability of relevant technical tools for the spread of renewable energy applications. <i>Target:</i> - Application of RE and EE systems and measures for industrial/commercial sector - Implementation of model Village Implementation of Bioenergy - RE policy support and analysis - Capacity building, awareness raising, and marketing <i>Related CP outcome:</i> Climate	1. Implementation of Pilot Projects - Selection of sites - Design and implementation - Monitoring and follow-up	UNDP	EU	71200-International Consultant	20,000	30,000	20,000
				71300-Local Consultant	5,000	10,000	8,400
				72100-Contractual Services Companies	300,000	1,100,000	551,122
	2. Setting up an enabling environment - Project management - Legal and policy changes - Awareness raising - Capacity building	UNDP	EU	71200-International Consultant	2,000	40,000	29,469
				71300-Local Consultant	5,000	24,882	19,517
				71400-Contractual Services Individuals	180,770	274,525	274,525
				71600-Travel	5,127	6,983	7,000
				72100-Contractual Services Companies	17,600	130,000	50,000
				72200-Equipment and Furniture	26,000	0	0
				72300-Materials and Goods	1,000	4,000	4,000
		72400-Communication and Audio-Visual equipment	5,000	63,000	75,000		

Change considerations mainstreamed in national priorities				72500-Supplies	5,000	16,940	15,500
				72800-Information Technology equipment	5,000	5,600	5,000
				73100-Rental Premises	12,880	31,000	31,000
				73400-Rental and Maintenance equipment	5,100	15,000	15,000
				74200-audio Visual and Printing Production Costs	8,000	54,000	94,000
				74500-Miscellaneous	2,000	3,500	4,220
				75700-Training Workshops and Conferences	2,000	13,000	11,000
				75100-Facilities and Administration	42,523	127,570	85,047
TOTAL					650,000	1,950,000	1,300,000

5. SUSTAINABILITY OF THE ACTION

CEDRO 4 will maximize the positive impacts on the renewable energy and energy efficiency market in the country, allowing for more penetration of the former and an increased rate and knowledge transfer of the latter.

The project will impact the Lebanese economy on all levels; technical, economic, social, and environmental level – as described below.

5.1 Technical impact

CEDRO 4 will carry out several demonstration projects on RE sources, preceded by energy audits and energy efficiency measures. The commercial, industrial and residential sectors (via the village model) are targeted. Many of the projects will have a novel architecture, especially designed to synchronize with the grid, when grid power is present, and with the diesel self-generator when grid power is absent. This synchronization is complex yet best practices and standards will be set to be followed by the private sector. Previously, CEDRO 3 set the same kind of architecture that was not present or known in the market and which enabled the small-scale renewable energy sector in Lebanon to start.

For the model village, the approach adopted to assess the options through monitoring, the implementation mechanism, and the post-monitoring of the project will be well documented to take into account or assist in replication. The synchronization of various RE options, coupled with the targeting of energy use behavior and energy efficiency, will be a reference for other villages and towns to follow suite. Barriers that prohibit the technical performance of systems will be identified and, where possible, removed.

For bioenergy, setting up the value chain for the various bioenergy streams for heating is very important. CEDRO will take this risk on board, creating thereby best practices and lessons learned through experience, while coordinating with all the stakeholders present on how best to make use of the identified bioenergy streams while considering legal issues, logistics, sustainability, and forest management.

Best practices for private sector participation will be assessed and recommendations will be given.

5.2 Social and economic impacts

The social and economic impacts of CEDRO 4 are direct and indirect. The direct benefits are related to the beneficiaries themselves, in that a direct reduction of costs on energy bills will be achieved, targeting especially the reduction of diesel use in self-generators and EDL bills, the latter of which is enabled through the export of excess power to the grid in times of power surplus. All these ensure more competitive commercial and/or industrial facilities, especially given the high costs of securing power in Lebanon. The implementing arm (contractor) will also benefit in terms of income generation and employment opportunities. The energy audits and their recommendations will ensure a lowered energy cost of activity. Ultimately, the Government of Lebanon will also benefit through lower expenditure on fuel subsidies.

For Activity 2, the selected village will benefit tremendously from achieving a ‘green energy’ status, in terms of reduced energy bills, both from the national utility and from the reduced to

eliminated use of the diesel back-up generator. Yet indirect effects also will be achieved, in terms of marketing the village as a 'green village' and the attention this will gain from researchers, students, officials from other villages, and other interested parties.

For the bioenergy projects, the direct benefits are similar to the above, with the addition of creating rural employment for biomass collection, as well as providing a cheaper source of heating for the identified sectors than the commonly used diesel fuel in winter.

Indirect benefits are the multiplier effects and the experiences disseminated in the private sector. It is hoped that all the projects followed will have, or will soon have, an economic return on their own. This factor, coupled with awareness-raising and the existence of soft loans in the market should create multiplier effects where more systems will be independently installed. Feed-in tariffs and how to subsidize these tariffs will be strongly analyzed through CEDRO 4.

5.3 Environmental benefits

The first environmental benefits of the CEDRO 4 project are the benefits achieved by reducing the use of energy, as prescribed by the energy audits and the implemented energy efficiency measures.

Secondly, environmental benefits of the RE systems to be installed target mostly the reduction of pollution from self-generation diesel use, mainly carbon dioxide (a green-house gas – GHG), carbon monoxide, particulate matter, nitrogen oxides, and sulfur dioxide among other (see Figure 2). They also will target delivering cleaner energy in terms of kWh than that of the Lebanese grid, which is mostly composed of fuel oil generated power.

For the model village, large environmental benefits will accrue to the targeted village in terms of reduced pollution and related green-house gases from energy use. The indirect environmental benefits would be achieved through the replication of the project bought about from marketing and advertising the lessons learned.

With respect to the bioenergy application, additional benefits are concerned and are to be linked to better forest management practices. Forest fires in Lebanon are an increasing problem, and therefore reducing the dried matter in forests (without undermining the nutrient cycle) will reduce the risk of forest fires. The dried matter displaces diesel heating, and therefore accrues all the benefits stated above.

It is difficult to estimate the direct and indirect reduction of green-house gas emissions that the three above activities will achieve. Table 8 adopts a very conservative and very rough approach towards the estimated GHG emissions, in terms of CO₂e, saved.

Activity	Described	App. total capacity	Annual output (kWh) per annum (assuming PV with 14% (capacity factor)	Total Annual CO _{2e} savings (in kg)
1	Commercial /Industrial	600 kW	1,226,400	478,296
2	Village	-	-	-
4	Bioenergy	-	-	-
Total saving over 15 years assumed (conservative) lifetime				7,174,440

Table 8. Rough estimate of potential direct CO_{2e} savings (assuming 1 kWh emits 0.65 kg of CO_{2e})

Table 8 indicates a saving of app. 7.17 million kilos of CO_{2e} over the 15 years assumed lifetime (conservative assumption). This is equivalent to 55.4 acres of forests preserved, or 1495 passenger cars removed for a period of one year (<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>). However, these estimates of carbon savings are very conservative as they do not include the energy audit recommendations, the heating and hot water solutions implemented by the bioenergy sector application and the model village options that are insofar unknown. On the other hand, the savings assume a constant grid CO_{2e} factor, whereas in reality the grid factor will change through time as the electricity mix is altered.

Last yet not least, all the awareness raising and capacity building campaigns will target energy savings and RE applications. These will have a strong environmental impact and/or outcome.

5.4 Post-project sustainability

The strong co-financing required (50% in the commercial and industrial sectors) will ensure ownership (and therefore property rights) is actuated and maintenance is followed post-project. To further ensure this, a legally binding Memorandum of Understanding (MOU) will be signed by the beneficiary and the UNDP/MEW, which obliges the beneficiary to undergo the necessary maintenance of the project for a pre-determined number of years.

The sustainability of the model village will be at two levels: for the residents, the installation of renewable energy and energy efficient systems would ensure the reduction of the cost paid for household energy consumption. This will motivate residents to continue to maintain and use the systems. On the other hand, the municipality will benefit from a reduction in funding spent on electricity, for public lighting specifically, which would ensure the maintenance of these systems. The municipality will also benefit from increased marketing and hopefully tourism given that it would be a “model” in the country.

For the bioenergy application, post-project sustainability is expected to reduce forest fires in the future, the availability of cost-effective biomass heating logs for winter for the residents and employment opportunities required for pruning, working the shredding and compressing machine, storage, and delivery of heating logs.

The UNDP-CEDRO project will have access to the sites as per the MOU for maintenance checks and data logging, all through the CEDRO 4 project's lifetime. The possibility of transferring the monitoring role to the MEW will be assessed post-CEDRO 4.

5.5 Institutional and policy sustainability

CEDRO 4 will carry out its responsibilities within the MEW, and will coordinate closely with the Lebanese Center for Energy Conservation (LCEC) and the Ministry. Therefore, although CEDRO 4 is a project, its work will be coordinated with existing institutions, working on all levels to strengthen these institutions, both in terms of knowledge and capacity building, and in terms of assessing what the sector requires for the sustainability and progress of RE and EE applications.

5.6 Risks

The main risks that can be faced in CEDRO 4 and the possible mitigation measures for these risks are identified in Table 9 below.

RISK LOG TEMPLATE

Project Title: Country energy efficiency and renewable energy demonstration project for the recovery of Lebanon – Phase 4 (CEDRO IV)	Award ID: 000776501	Date:
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#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
1	Political situation in Lebanon deteriorates		Political	P = 4 I = 4	Beyond the power of the project, however, the projects implemented will reduce the financial burdens of beneficiaries, something highly required during times of economic downturn due to political instability.				
2	Co-financing not achieved		Financial	P = 3 I = 4	If problems of co-financing are faced, then co-financing rates could possibly be lowered (requesting a decision from the Project Steering Committee) and the number of sites targeted could be, consequently, lowered. Studies on willingness to pay for RE will hopefully be conducted in 2013 by the ongoing CEDRO 3 to ensure elicit willingness to pay in the residential, commercial and industrial sectors.				

					Furthermore, the application forms themselves will expose maximum willingness to pay.				
3	Particularly focused on the options recommended for the model village and bioenergy applications, where social acceptance is required		Social and Environmental	P = 2 I = 3	The EIA will focus on social & environmental attributes for the bioenergy application. For the model village, interviews to the residents themselves will ensure that their concerns are well met.				

Table 9. Risks identified and mitigation

6. LOGICAL FRAMEWORK

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
Overall Objectives	<p>Support the national objectives by 2020 of a 12% share of energy mix from renewable energy sources and the increase in energy efficiency by 5%.</p> <p>Enhance the drive towards a "green economy", creating new "green" jobs, particularly through engaging the private sector</p> <p>Contribute to improve the Lebanese macroeconomy</p> <p>Fight against Climate Change</p>	<p>% increase in renewable energy generation since 2013</p> <p>% increase in energy efficiency since 2013</p> <p>Increasing contribution from renewable energy and energy efficiency business development to the Lebanese economy</p> <p>Decrease of national GDP's share for energy production and distribution costs thanks to renewable energy sources and energy efficiency measures</p> <p>Decrease of the quantity of Greenhouse Gas Emissions at national level</p>	<p>Annual reports from the Ministry of Energy and Water (MoEW)</p> <p>Surveys and analysis of the green sector's development</p> <p>National budget (Ministry of Finance)</p> <p>Annual reports on Climate Change (Ministry of Environment)</p>	
Specific Objective	<p>Enhance the energy efficiency (EE) and renewable energy (RE) markets in Lebanon by promoting EE and RE applications, through pilot and demonstration projects giving proof of their technical and financial feasibility/opportunity</p>	<p>Increase of the number of energy efficient and renewable energy applications being installed and operational</p> <p>Increase of the number of economic actors involved in the EE and RE market and the overall turnover of this subsector</p>	<p>CEDRO 4 reports</p> <p>National reports from MoEW</p> <p>Survey of willingness to install and pay for renewable energy and energy efficient applications</p> <p>Ministry of Industry's annual reports detailing the development rate of EE and RE technologies' supply chains</p>	<p>Continued political support from the Ministry of Energy and Water and other actors on renewable energy and energy applications</p> <p>Investment costs of renewable energy and energy efficient applications continue to decrease at the international level</p>

		Relevant policy recommendations and/or legislations adopted	Official journal	Financial support mechanisms and policy recommendations are available to promote RE & EE installations
Expected Results	<p>Result 1: Decentralised energy efficiency and renewable energy applications are promoted in the commercial and industrial sectors</p> <p>Result 2: The sustainable energetic autonomy of a small village (60-80 households) is proven by the set up of a "Green Village"</p> <p>Result 3: Renewable energy sources from biomass are generated, thereby contributing to mitigating risks of forest fires</p> <p>Result 4: Policies and regulatory framework in the field of green energy in Lebanon are improved</p> <p>Result 5: The technical capacity and public awareness on energy efficiency and renewable energy are enhanced</p>	<p>Six to eight energy efficiency and/or renewable energy systems are installed and operational</p> <p>Decrease of energy costs of (and potentially up to the absence of imported energy into) the green village (60-80 households)</p> <p>Quantity of bioenergy produced and economic yield</p> <p>At least 2 policy recommendations are developed and promoted At least 2 technical studies on renewable energy policies are published</p> <p>At least 5 technical trainings are undertaken and at least 1 national public awareness campaign is implemented, their outcomes contributing to the development of EE and RE applications</p>	<p>CEDRO 4 reports and surveys Annual project board meetings</p> <p>Energy audit & monitoring reports</p> <p>Energy monitoring reports Civil protection reports</p> <p>Official journal Publications from the MoEW</p> <p>Evaluation reports of trainings Surveys on awareness raising campaign(s)</p>	<p>Investment costs of renewable energy and energy efficient applications continue to decrease at the international level</p> <p>Continued political support from the Ministry of Energy and Water and others on renewable energy and energy applications</p>
Activities	<p><i>Activities for Results 1, 2, 3</i></p> <p>Identify willing beneficiaries through an open application process and secure all required legal documentation Support the beneficiaries in securing cash co-financing for the projects</p>	<p>Number of beneficiaries involved in the project</p>	<p>CEDRO 4 progress reports</p>	<p>A strong system of data collection based on CEDRO 4's objective being well marketed is required.</p>

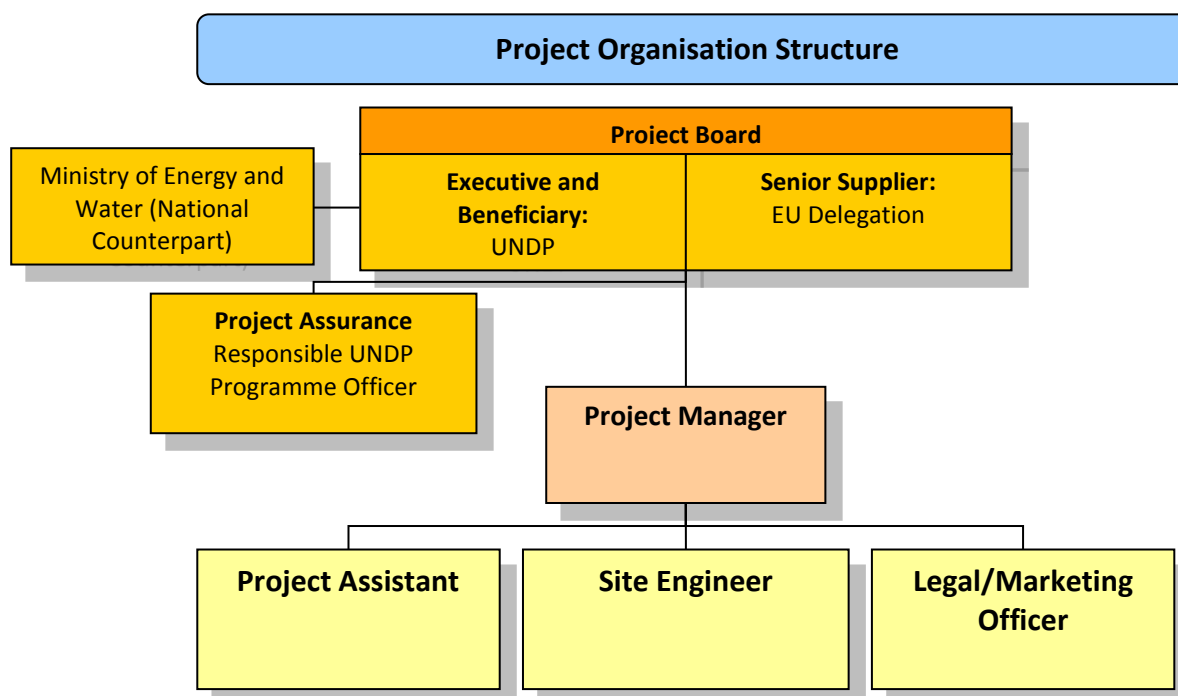
<p>Design the energy systems in the most efficient way and using state-of-the art methodology Competitively procure the needed energy systems in line with international best-practice Train the beneficiaries and suppliers on these new energy systems</p> <p><u>Activities for Result 4</u></p> <p>Undertake a gap analysis of the policy and regulatory needs Draft terms of reference to recruit the required expertise for policy recommendations as needed Hold national stakeholder consultations to verify recommendations Publish technical policy recommendation reports and disseminate to the public (when relevant)</p> <p><u>Activity for Result 5</u></p> <p>Developing and implementing a marketing strategy for the project Development and implementation of an awareness raising strategy for the project Participation in technical trainings and seminars on renewable energy and energy efficient applications Issuance of quarterly newsletters Regular update of the project website</p>	<p>Type and number of designs completed</p> <p>Cost and quality of the energy systems procured</p> <p>Number of beneficiaries and suppliers knowledgeable on RE and EE applications</p> <p>Issuance of reports on gap analysis and regulatory needs Issuance of terms of reference and recruitment contract of the expertise</p> <p>Relevance of proposed recommendations given after consultations % increase in public knowledge on RE and EE systems</p> <p>Project's marketing strategy Awareness raising strategy for the project</p> <p>Number of participants for the technical trainings and seminars</p> <p>Level of distribution/spreading of quarterly newsletters Increase of the number of monthly website's visitors</p>	<p>Technical designs prepared</p> <p>Bidding documents and contracts signed</p> <p>Reports on awareness raising</p> <p>CEDRO 4 progress reports</p> <p>CEDRO 4 progress reports</p> <p>Feedbacks from the organised trainings and seminars</p> <p>Quarterly newsletters Website</p>	<p>Appropriate outreach to the public and to suppliers is ensured</p>
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7. MANAGEMENT ARRANGEMENTS

7.1 Implementation Arrangements

The UNDP will monitor the progress towards intended results, and will ensure high-quality managerial, technical and financial implementation of the project, and will be responsible for monitoring and ensuring proper use of administrated funds to the assigned activities, timely reporting of implementation progress as well as undertaking of mandatory and non-mandatory evaluations for each of their respective components. Furthermore, the procurement of goods and services and the recruitment of personnel shall be provided in accordance with UNDP guidelines, procedures and regulations.

A 'Project Board' or 'Project Steering Committee' will be set up and will be responsible for making, by consensus, management decisions for the project when guidance is required by the Project Manager, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. The Project Board decisions should be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. The Project Board will meet every six months or more as needed by the project. The steering committee will also provide expertise and ensure the various studies carried out and recommendations are in line with national priorities and are well coordinated with other on-going activities within the sector. The Project Board/Steering Committee will consist of concerned national counterparts, including but not limited to the Ministry of Energy and Water, the donor agency, and the UNDP.



In accordance with the decisions and directives of UNDP's Executive Board reflected in its Policy on Cost Recovery from Other Resources, the Contribution shall be subject to cost recovery by UNDP for UNDP general oversight and management services (General

Management Support - GMS) recovered with a flat rate of 7% and includes the following services:

- General oversight and monitoring, including participation in project reviews
- Briefing and de-briefing of project staff and consultants
- Resource management and reporting
- Thematic and technical backstopping through Bureaus

7.2 Audit

The audit of Direction Implementation Modality (DIM) projects is made through the regular external (UN Board of Auditors) or internal audits (audits managed by UNDP's Office of Audit and Investigations).

The audit of DIM projects is made through the regular external (UN Board of Auditors) or internal audits (audits managed by UNDP's Office of Audit and Investigation OAI).

7.3 Visibility

UNDP will ensure that the EU project will receive the maximum visibility possible and will follow the guidelines of the Communication and Visibility Manual for EU External Actions.

UNDP will be responsible for determining when its name and logo are to be displayed and prior written authorisation must be granted by the UNDP Resident Representative on a case by case basis.

8. MONITORING FRAMEWORK AND EVALUATION

8.1 Overall Monitoring Framework

UNDP will undertake periodic monitoring of the implementation progress through regular meetings with the project team. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion and to ensure smooth implementation of project activities. Furthermore, UNDP will be responsible for financial monitoring and reporting on all disbursements of the project.

Monitoring will be a continuous and systematic process review of the various activities and will be intended to

- measure input, output, and performance indicators;
- provide regular and up-to-date information on the progress towards meeting the overall Project Objectives;
- alert the implementing partners with problems in implementation, and provide basis on which performance may be improved, and
- determine whether the relevant stakeholders are responding as expected.

8.2 Within the annual cycle

- On a quarterly basis, a quality assessment shall record progress towards the completion of key results, based on quality criteria and methods captured in the Quality Management table below.
- An Issue Log shall be activated in Atlas and updated by UNDP to facilitate tracking and resolution of potential problems or requests for change.
- Based on the initial risk analysis submitted (see annex 1), a risk log shall be activated in Atlas and regularly updated by reviewing the external environment that may affect the project implementation.
- Based on the above information recorded in Atlas, a Quarterly Progress Reports (QPR) shall be submitted by the Project Manager to the Project Board through Project Assurance, using the standard report format available in the Executive Snapshot.
- a project Lesson-learned log shall be activated and regularly updated to ensure on-going learning and adaptation within the organization, and to facilitate the preparation of the Lessons-learned Report at the end of the project
- a Monitoring Schedule Plan shall be activated in Atlas and updated to track key management actions/events

8.3 Annually

Annual Review Report: An Annual Review Report shall be prepared by the Project Manager and shared with the Project Board and the Outcome Board. As minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the QPR covering the whole year with updated information for each above element of the QPR as well as a summary of results achieved against pre-defined annual targets at the output level.

Annual Project Review: Based on the above report, an annual project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP) for the following year. In the last year, this review will be a final assessment. This review is driven by the Project Board and may involve other stakeholders as required. It shall focus on the extent to which progress is being made towards outputs, and that these remain aligned to appropriate outcomes.

9. LEGAL CONTEXT

This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of Lebanon and UNDP, signed on 10 February 1986.

UNDP as the Implementing Partner shall comply with the policies, procedures and practices of the United Nations safety and security management system.

UNDP agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml . This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

ANNEX 1. Criteria for RE system installation in commercial/industrial sector (indicative)

In order to be short-listed for the RE systems, there are several criteria that are necessary to be present for the project to take place, and other criteria that are beneficial for the success of the project and that would be graded accordingly with a minimum passing grade. These are divided into Obligatory Requirements and Additional Requirement.³

Obligatory requirements

In order to be eligible for the PV farm, the below are criteria that must ALL be met;

	Obligation	Description
A.	Commercial and/or Industrial facility (hitherto the Company)	The applicant Company must be fully and legally registered within the appropriate department in the government of Lebanon (GoL), and must be either a commercial entity or an industrial one (official definition required).
B.	Financial balance of commercial and/or industrial facility is positive	To assist in ensuring the sustainability of the project, the financial balance of the Company must be positive, i.e., the Company is in no financial debt.
C.	Legally sound	The Company must not be in any legal dispute...
D.	Space and shading	The Company applicant must have adequate non-shaded roof or adjacent land space to cater for the PV system or a wind regime that is not hindered by any near-by obstacles
E.	Maximum demand	The Company must have a minimum and maximum daily demand of X kWh. ⁴
F.	Co-Financing	The Company must co-finance the project. At least 50% of the total cost of the project must be incurred upfront by the Company. Credit facilities exist through the Central Bank of Lebanon and the UNDP will assist the Company in obtaining approval for financial assistance (i.e., through NEEREA) in the form of soft loans (the beneficiaries will not be eligible to apply to the grant funding from the EU through the NEEREA). . The Company must also incur all the costs related to the maintenance of the system.
G.	Memorandum of Understanding (MoU)	The Company must sign a MoU with the UNDP and the MEW. In this MoU, the Company will commit to maintaining the RE system effectively, and will include a clause to allow the UNDP to obtain any operational

³ The criteria listed are subject to refinement and change during the evolution of this project.

⁴ To be determined in due course, yet important as the impact of the RE system must be substantial.

		data on the performance of the system through specifically installed data loggers. ⁵
H.	RE system must be insured	The RE system must be insured against accidental damage, and the cost of this insurance must be accrued by Company.
I.	Existence of diesel self-generation	The Company must have a diesel self-generator. This is important given the blackouts in Lebanon. The PV system must therefore synchronize with the national grid and with the diesel self-generator.
J.	1 project per owner	Only one project is allowed per owner or group of owners
K.	Energy audit and EEM	Energy audit and the recommendation measures of the audit must be implemented by the Company, in collaboration with CEDRO.
I.	Others	Other criteria will be determined in due course.

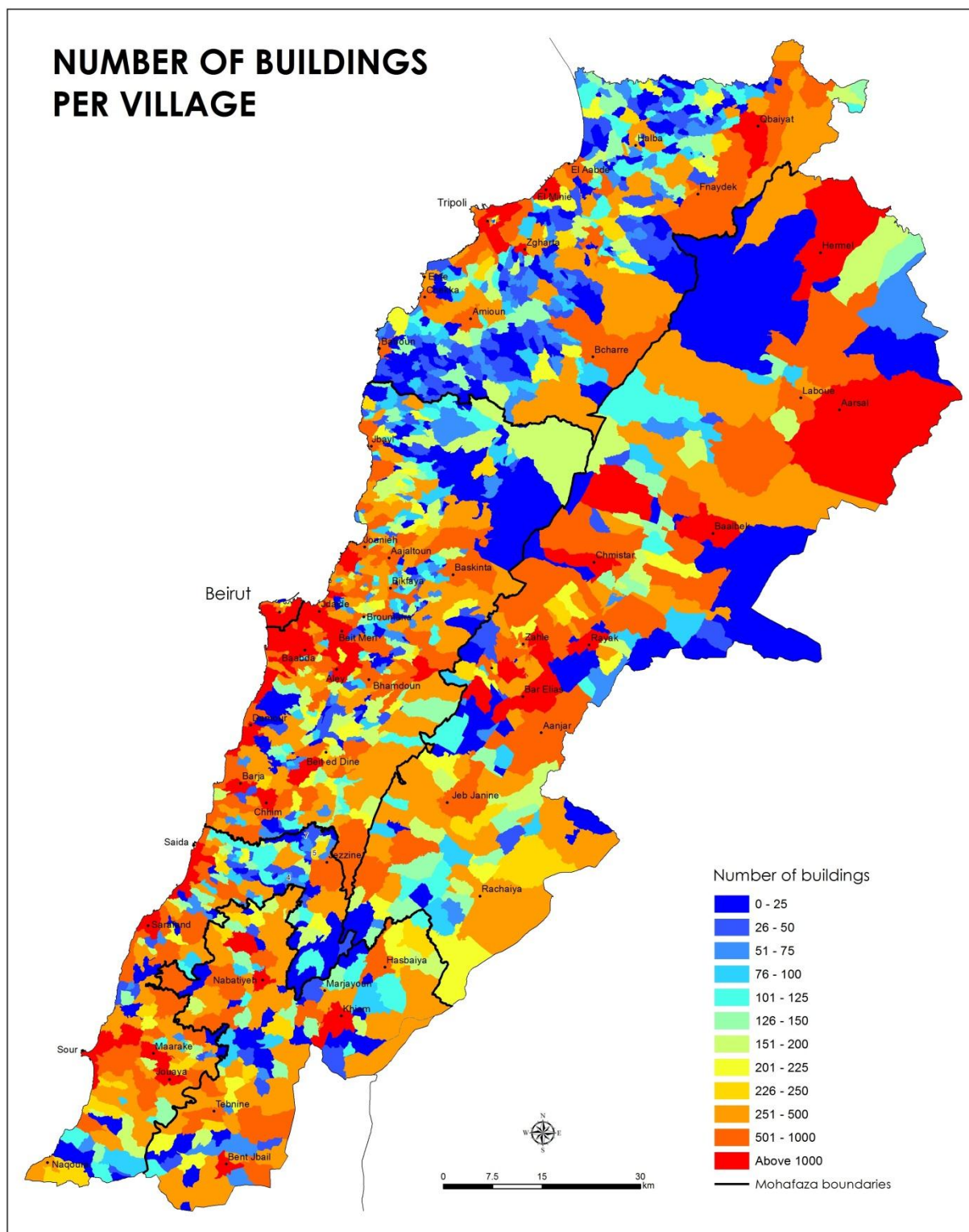
Additional requirements and/or obtainable points (indicative)

The points below are highly desirable and are graded accordingly. The Company must receive at least a certain level of points (to be determined), and Applicants will then be ordered in accordance with their respective grades.

Code	Requisite	Definition	Points obtainable
A	Changing back-up generation	Willingness to replace existing diesel self-generator with 2 smaller generators.	To be determined (t.b.d)
B	Co-financing	Willingness to co-finance more than 50%	0 points for 50% co-financing as this is obligatory. However, additional co-financing will be given additional points (to be determined)
C	Maintenance	Presence of a strong maintenance team	(t.b.d)
D	Net metering benefits	Ability of the RE system required to export at least 10-15% of output and benefit from net metering. Billing information from EDL is required.	(t.b.d)
E	Awareness raising	Willingness to assist the UNDP in awareness raising on the benefits of energy efficiency and renewable energy.	(t.b.d)
F	Other	To be determined	-
		Maximum Total points obtainable	1000 (example)

⁵ A sample of the MOU will be provided for the short-listed beneficiary sites

ANNEX 2. Number of buildings per town/village district



SOURCE: CEDRO GIS