



Promoting Energy Efficiency in Industrial Sector: Lebanese Experience

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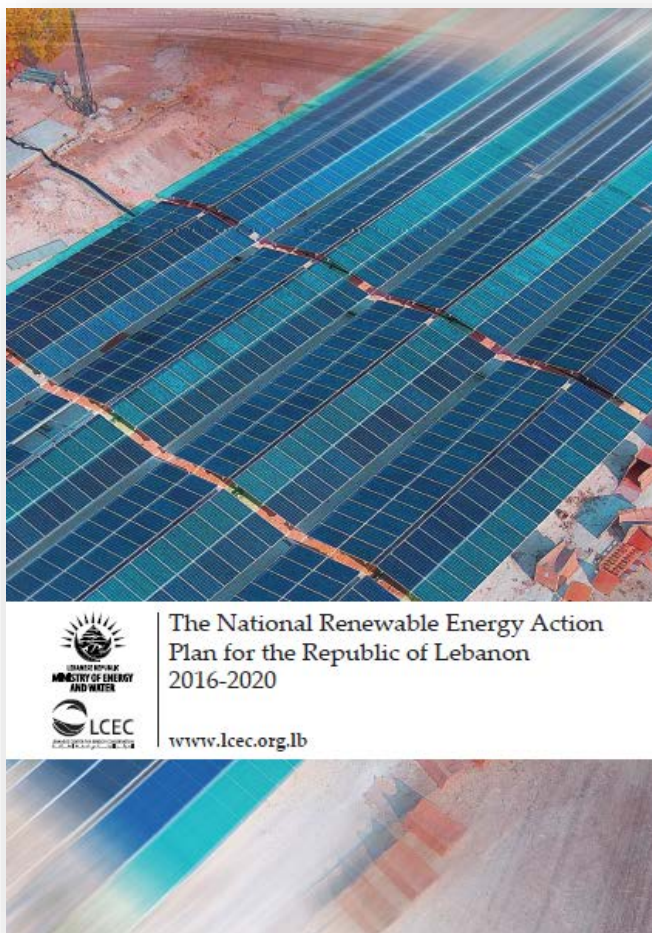
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What is LCEC

- The Lebanese Center for Energy Conservation (LCEC) is the national energy agency for Lebanon. LCEC is a governmental organization affiliated to the Lebanese Ministry of Energy and Water (MEW). Basically, it is the technical arm of the Ministry in all subjects related to energy efficiency, renewable energy, and green buildings
- LCEC offers proven expertise and support to the Government of Lebanon (GoL) to develop and implement national strategies towards saving energy, saving money, reducing greenhouse gas emissions with the final target being to improve durability, safety and comfort of the Lebanese population.

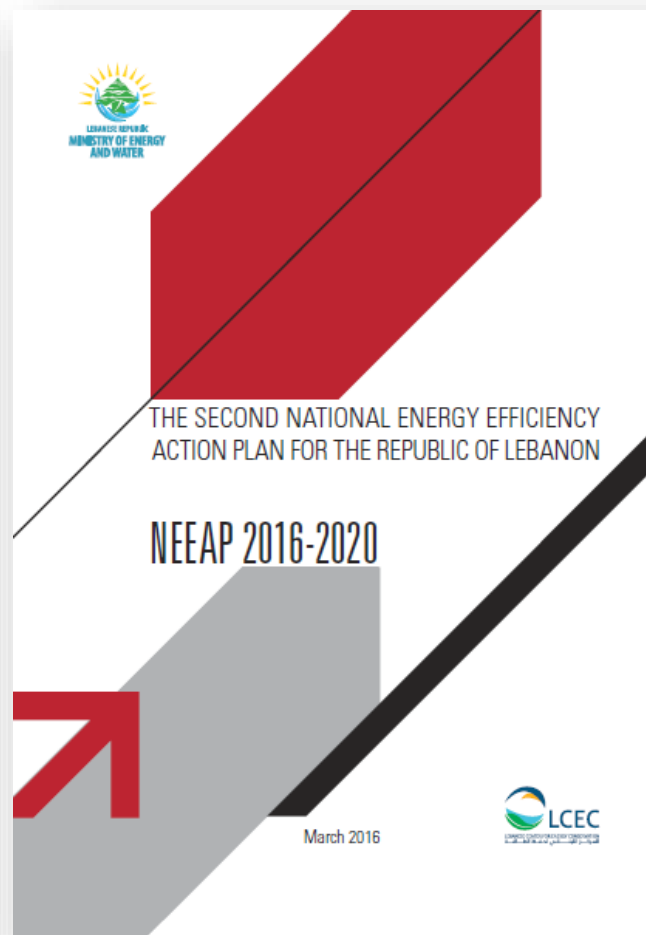
Action Plans

National Renewable Energy Action Plan 2016-2020



Details how Lebanon is going to reach the 12% RE target by 2020

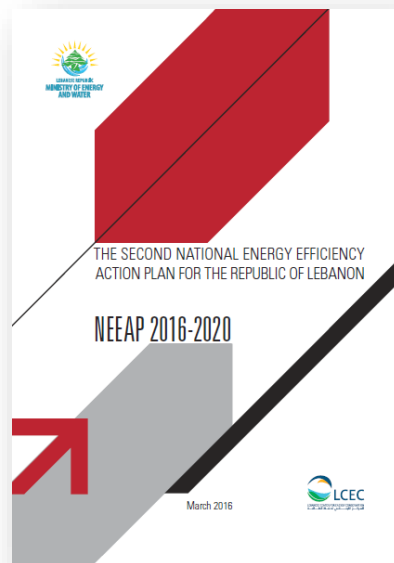
National Energy Efficiency Action Plan 2016-2020



Sets the road map to be followed by Lebanon to reach its EE objectives

NEEAP and Energy Efficiency

- NEEAP 2016-2020 states that energy audits should be mandatory for industrial facilities with consumption higher than 4562 MWh/year
- Encouraging energy efficiency measures in the industry



NEEREA

Initiative 11 of NEEAP (2011-2015): Financing Mechanisms and Incentives

“This initiative aims to provide proper financing mechanism in order to promote the use of energy efficiency and renewable energy. This is mainly linked to the collaborative work with the Ministry of Finance and the Central Bank of Lebanon.”



**National Energy Efficiency and Renewable Energy Action
(NEEREA)**

NEEREA



NEEREA Measures



- **Energy Efficiency:**
 - Building Envelope Improvement: Double Wall, Thermal Insulation (Roof, Walls, Ground), Double Glazing
 - Efficient HVAC systems (Chillers, VRF technologies etc.)
 - LED lighting systems, Motions sensors
 - BMS systems
 - Certified Green Buildings
 - Ground Source Heat Pumps
 - Air to Water Heat Pumps (NEW)
- **Renewable Energy:**
 - Solar PV systems
 - Solar Water Heating Systems
 - Concentrated Solar Heating (NEW)

Projects

- More than **755** approved loans with a total value of **440 million USD**
- More than **70** projects in the industrial field targeting different EE & RE measures
- **85** Energy Efficiency projects with a total value of **56 million USD**
- Green building loans took the biggest part with a total budget of **248 million USD**



Market Impact

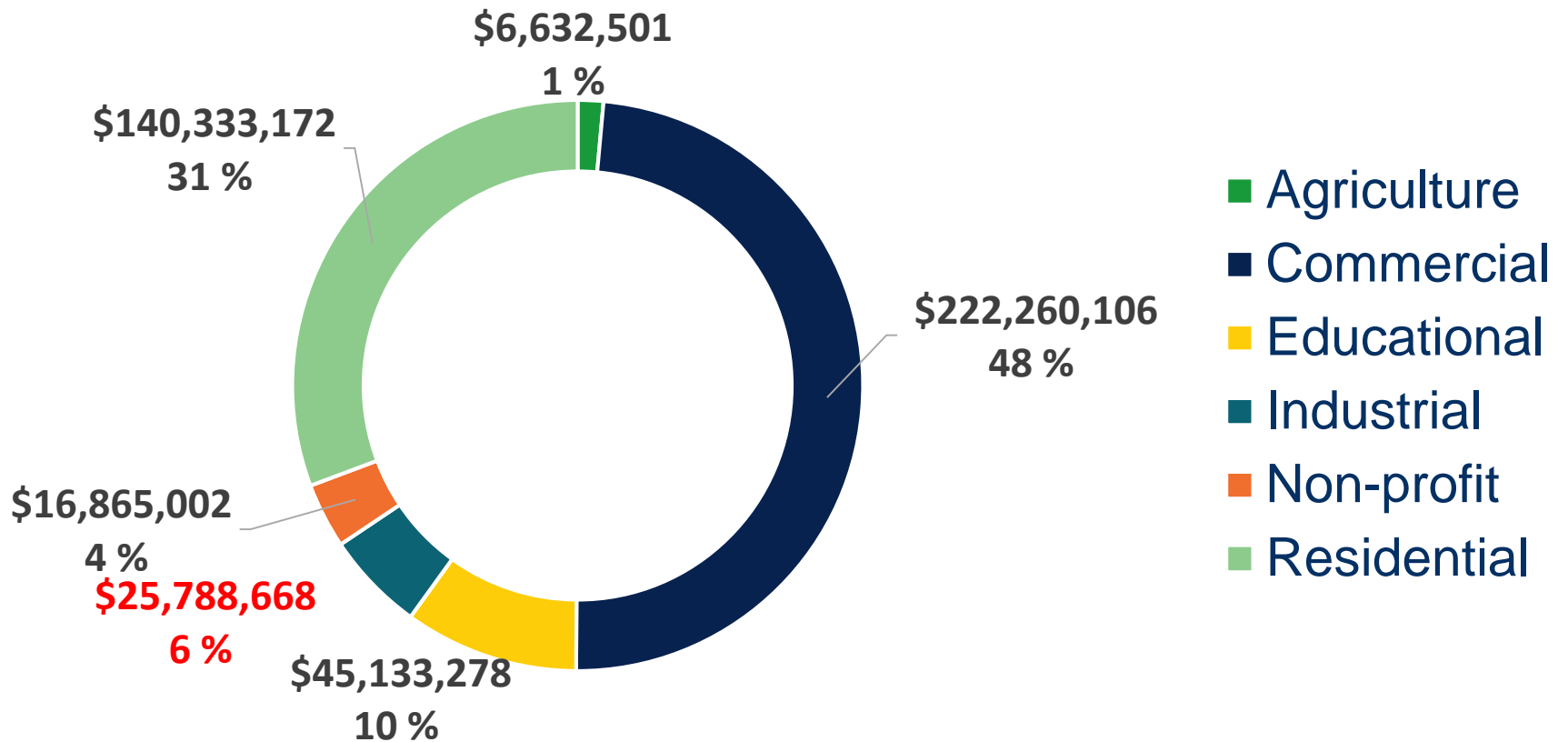
- NEEREA helped create more than **10,000** direct and indirect jobs in the sustainable energy sector in Lebanon
- The number of companies working in the field of solar water heaters rose from **25** in 2010 to more than **170** companies today
- The total installed square meters of solar collectors rose from **211,000 m^2** in 2010 to more than **600,000 m^2** in 2018
- The number of companies working in solar photovoltaic sector increased from **5** in 2010 to more than **70** companies today

Industrial Sector



NEEREA Statistics

Distribution of Projects Per Sector



Increasing Industrial Investments

- More than **1252 permitted food factories** in Lebanon
- More than **half of industrial energy consumption is heat**
- PV plants with a capacity greater than 60 kWp have to perform an energy audit for the entire facility before applying for a NEEREA loan
- Questionnaires were disseminated to industrialists to collect data about the currently used technology and is available online.

ESCOs



Why Support the Development of ESCOs

- Increase national level of energy efficiency
- Generate savings and use them for other economic activities
- Decrease the national energy and water consumption
- Decrease CO₂ emissions and improve air quality (positive indirect impact on health)
- Foster innovation and market transformation towards high-end technologies
- Create jobs

ESCOs in Lebanon

- ESCOS in Lebanon are independent energy companies as well as companies with other activities including Energy Services
- The main services provided by ESCOs are the following:
 1. Energy audits, feasibility studies
 2. Engineering design
 3. Equipment procurement
 4. Subcontractor management
 5. Construction
 6. Measurement and verification
 7. Operation and maintenance
 8. Project financing (optional)

Key measures to be implemented to foster the development of ESCOs

- Set a legislative framework & enforce mandatory energy audits
- Support the development of ISO 50001 initiatives
- Conduct pilot projects using energy performance contracting (EPC)
- Set and enforce thermal standards for buildings & incentivize the renovation of existing buildings

Work Under Progress

Plans under Development and Execution

- Scheme to subsidize energy efficient home appliance (refrigerators, ovens, ACs, and TVs) in cooperation with the Italian Ministry of Environment, Land, and Sea
- Mandatory energy audits in facilities requesting a NEEREA loan for a PV system with a capacity higher than 60 kWp
- Solar ordinance for SWHs and air to water heat pumps
- The national heat pumps project which gives a grant for the first 30 projects
- Development of NEEREA guidelines for technologies that enhance energy efficiency in all fields

Thank you!

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