

RES sale in the market in different countries of MEDREG and ECRB Region The Case of Lebanon



**MEDREG – ECRB Joint Workshop
on
“Integrating RES in the Electricity Networks and Balancing Mechanism
in MEDREG and ECRB Regions”**

By Dr. Sorina Mortada

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Challenges in the Lebanese Electricity Sector

- More than 96% of primary energy is imported
- Shortage in electricity supply
- Burden on the Lebanese National Economy (subsidies)



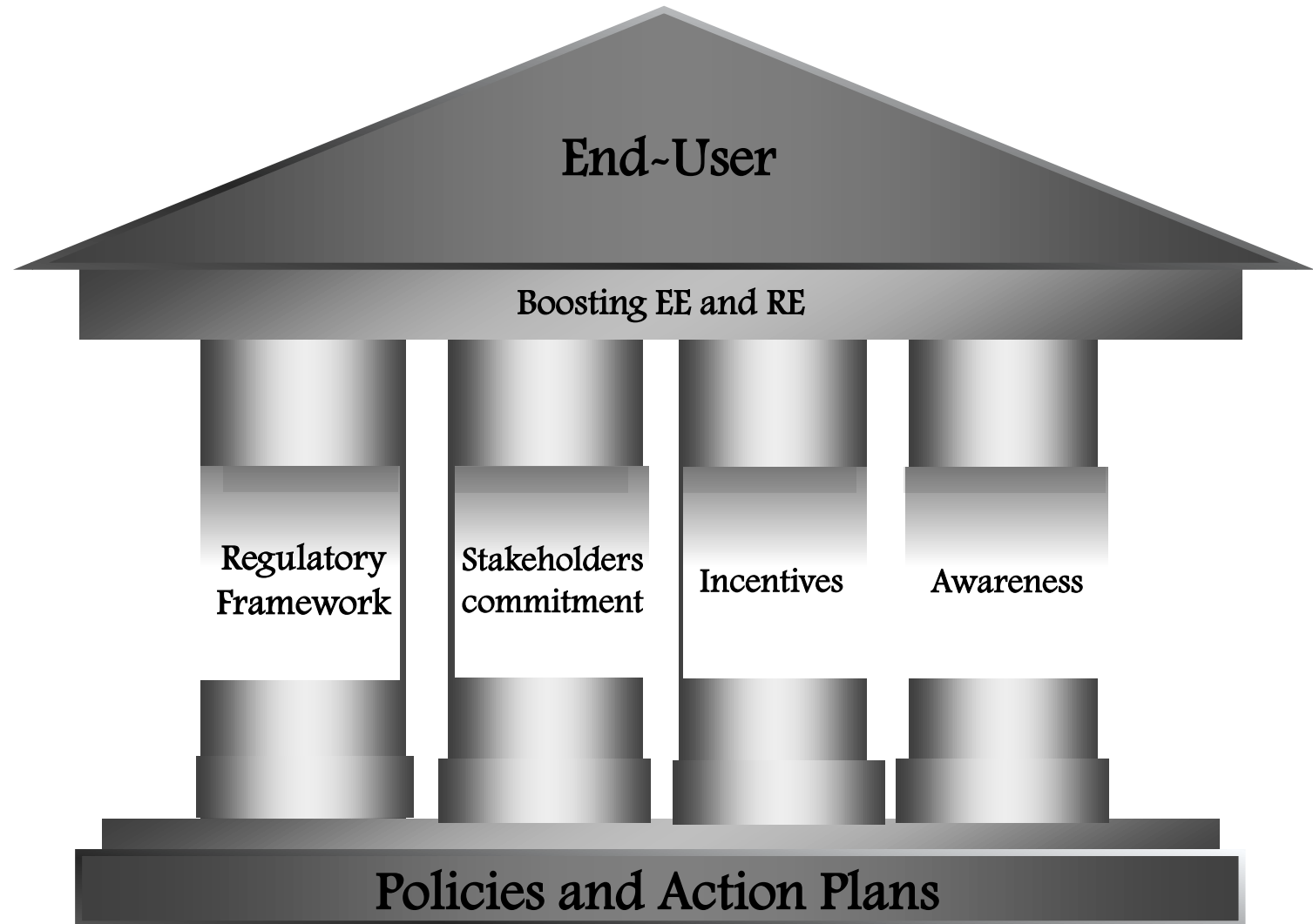
EDL-National Utility



Private Generators

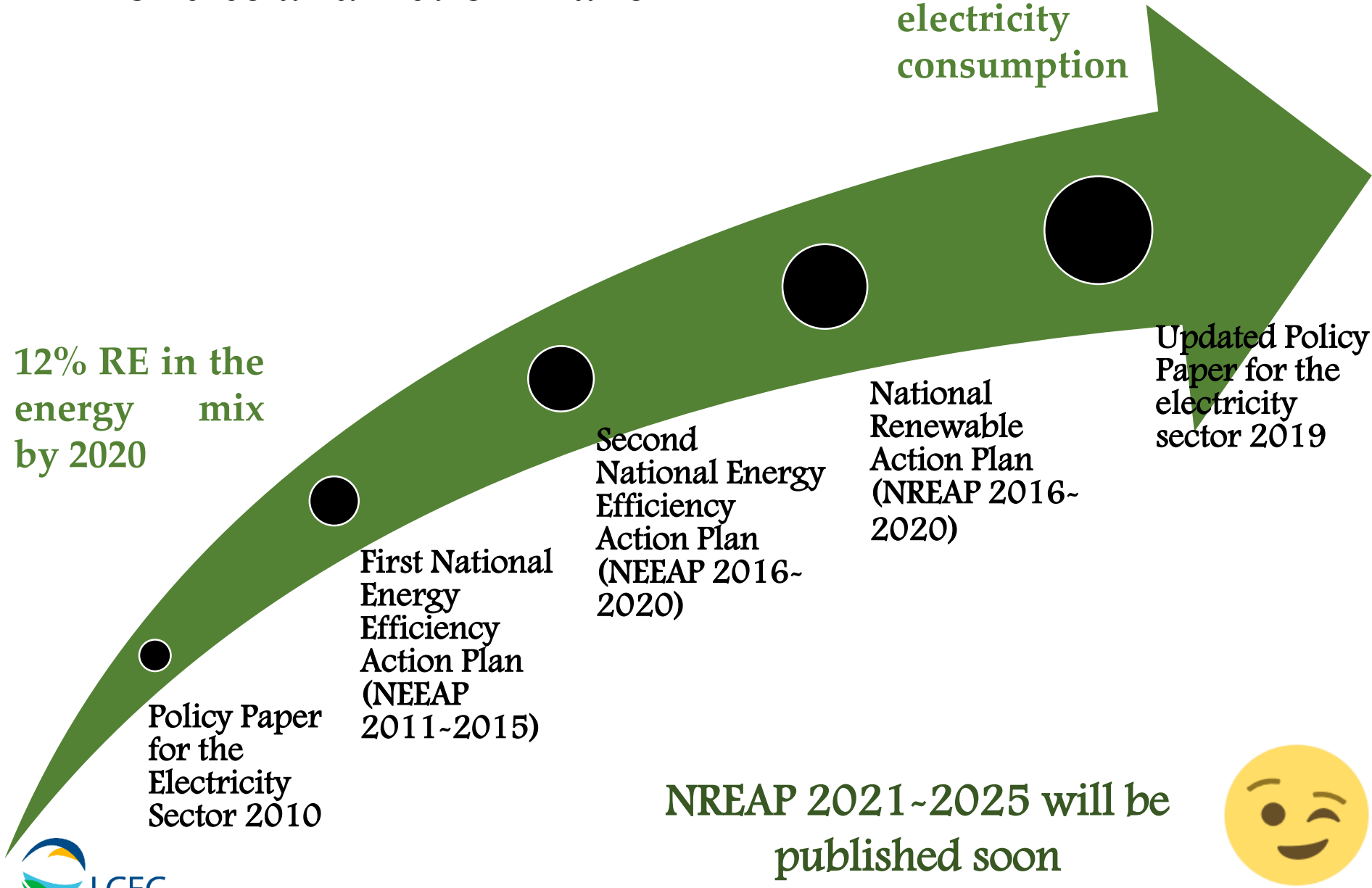
To ensure Energy Security and reduce emissions coming from old conventional power plants and private generators using diesel oil → Increase RE sources in the Lebanese Energy Mix

Boosting EE and RE



Policies and Action Plans

30% RE of 2030
electricity
consumption



12% RE in the
energy mix
by 2020

Updated Policy
Paper for the
electricity
sector 2019

Policy Paper
for the
Electricity
Sector 2010

First National
Energy
Efficiency
Action Plan
(NEEAP
2011-2015)

Second
National Energy
Efficiency
Action Plan
(NEEAP 2016-
2020)

National
Renewable
Action Plan
(NREAP 2016-
2020)

NREAP 2021-2025 will be
published soon



NREAP 2016-2020

Year	2010	2015	2020	2025	2030
Source	MW	MW	MW	MW	MW
Wind			200.00	350.0	450.0
PV, CPV			150.00	200.0	300.0
Distributed PV			100.00	125.0	150.0
CSP			50.00	50.0	100.0
SWH	211,988 m ²	413,988 m ²	1,053,988 m ²	1,345,185 m ²	1,716,835 m ²
Total Hydro	190.00	190.00	331.50	402.3	473.0
Geothermal			1.30	6.5	15.0

And contribute to Lebanon's New Target of 30% renewable energy from total electricity consumption in 2030

Stakeholders Commitment

- National: ministries, IRI, Libnor, EDL...
- International:
 - Grant from RVO for feasibility of CSP in Hermel region Northern Lebanon
 - MEDREG TA and WS
 - EBRD
 - World Bank Group
 - IMLES
 - ...
 - ...
 - ...

Regulatory Framework

- Energy Conservation law
- Decentralized Renewable Energy law
- Law 288 for large scale projects
- Solar Ordinance: the obligation of all types of buildings (new and under major renovation) to opt for solar water heaters and/or heat pumps for the production of domestic hot water.

Incentives

1- Ten public bids for PV installation in ten public buildings initiated and financed by the Ministry of Energy and Water

Facility/Owner	Capacity (kWp)
The Ministry of Energy and Water	135.30
Directorate of Engineering and Planning - LAF	155.70
El Helou Barrack	32.30
Lebanese Army Health Dispensary of Qobbeh	54.40
Lebanese Army Health Dispensary of Ablah	54.40
Wheat Silos at Beirut Port	220.00
Casino du Liban	315.24



155.7 kWp at the Lebanese Army – Directorate of Engineering

The project was commissioned ten days before the terrible Port explosion that shook the country on 4 August 2020. The system was fully destroyed.



220 kWp at the Wheat Silos at the Port of Beirut

Incentives

2- Net Metering

3- National Heat Pumps programme: 30% grant for systems and 100% for the monitoring system

4- Solar PV Public Street Lighting Initiative

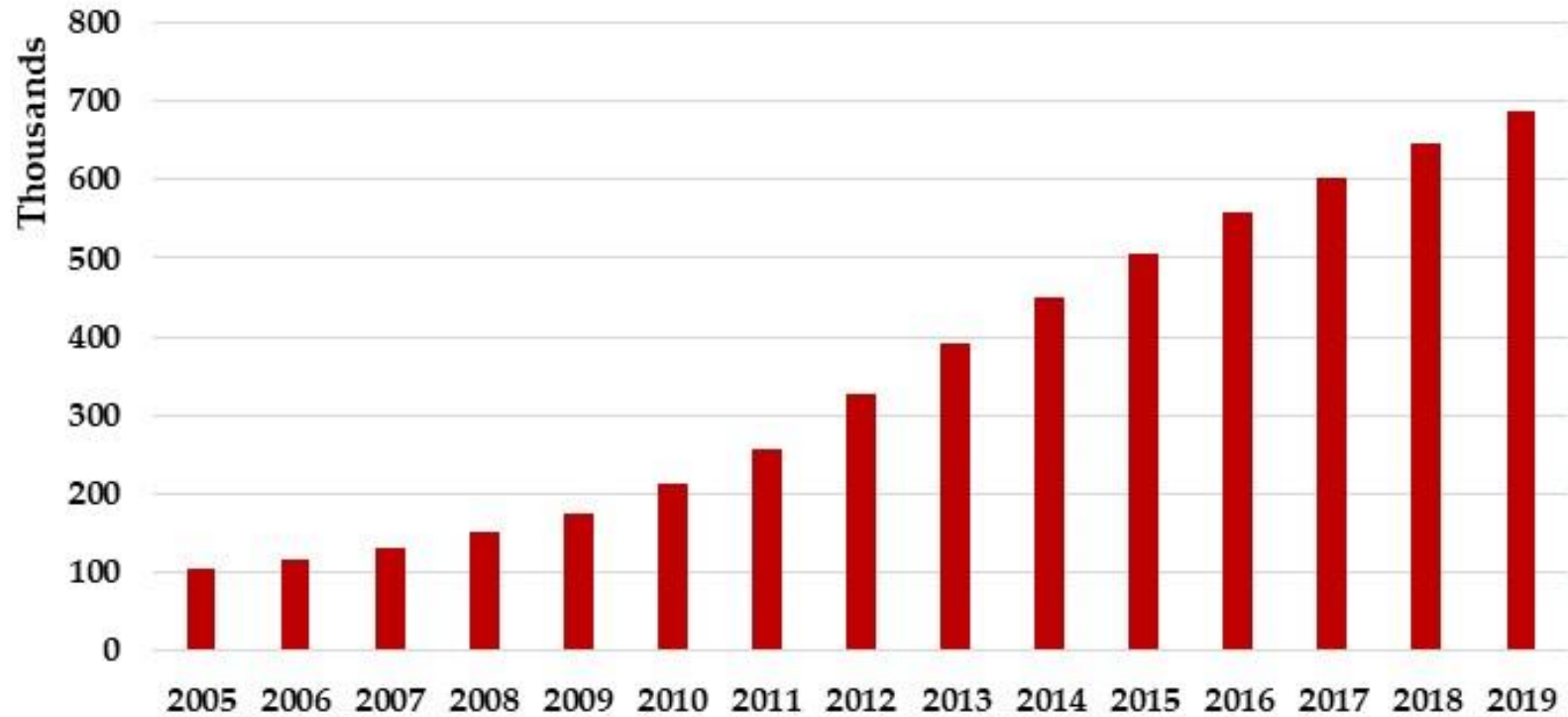
5-International initiatives: CEDRO-UNDP, USAID-Rene Mouawad Foundation ...

6- Solar Water Heaters Programme:

200 USD subsidy for 7,311 system from a total of 7,500 available subsidies.

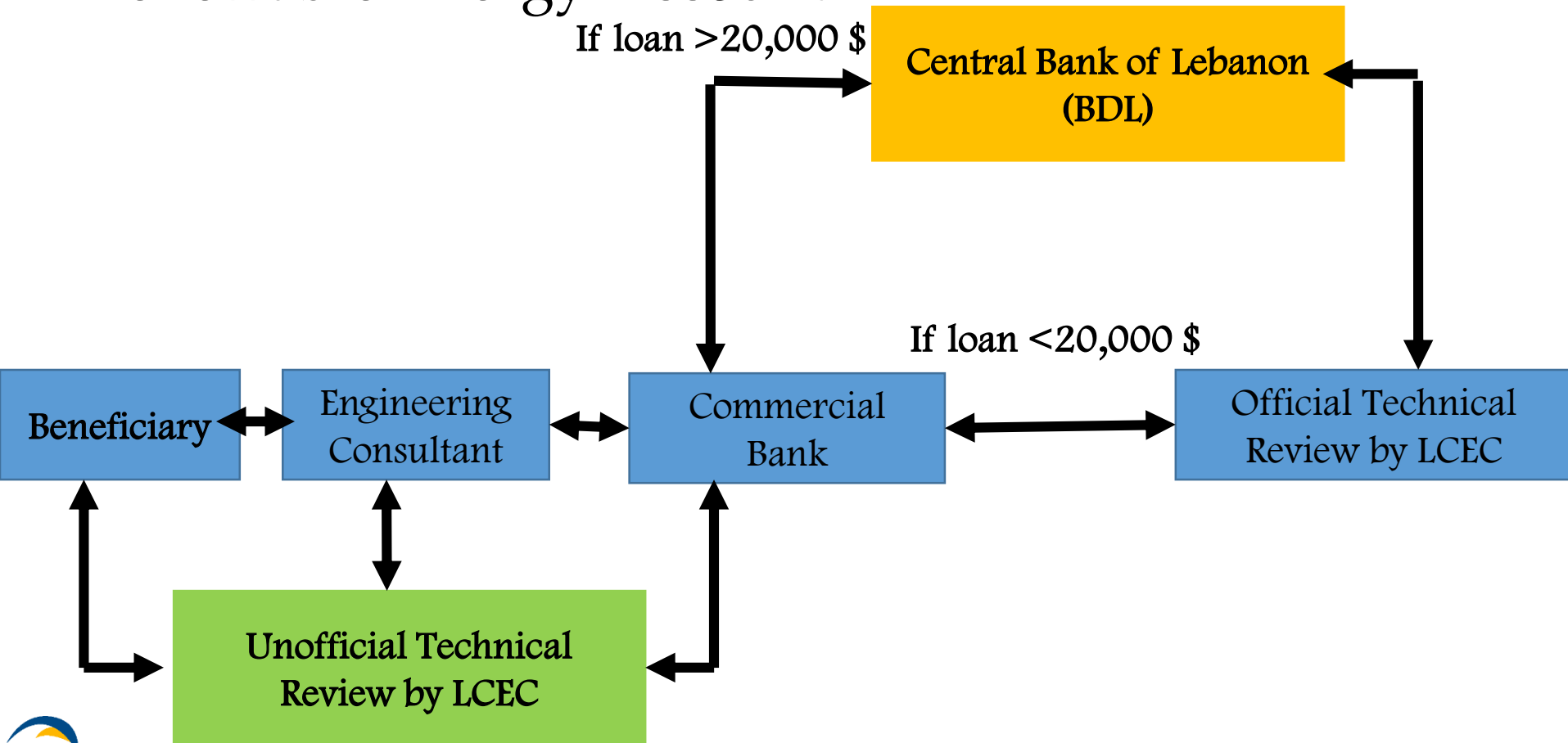
Incentives

SQM collectors installed



Incentives

7- NEEREA: National Energy Efficiency and Renewable Energy Account



Incentives: NEEREA

- By June 2020, more than 1,000 projects approved
- Total amount since 2012 = more than 600 Million USD.
- 76% of the projects : Solar PV
- 42% of loans amount: Green buildings.

Incentives: NEEREA



- These projects all together contribute to an annual saving of 73,253,210 USD.



- Until today, NEEREA has achieved to reduce yearly energy consumption by 260,163,325 kWh and 281,245 tons of CO2.

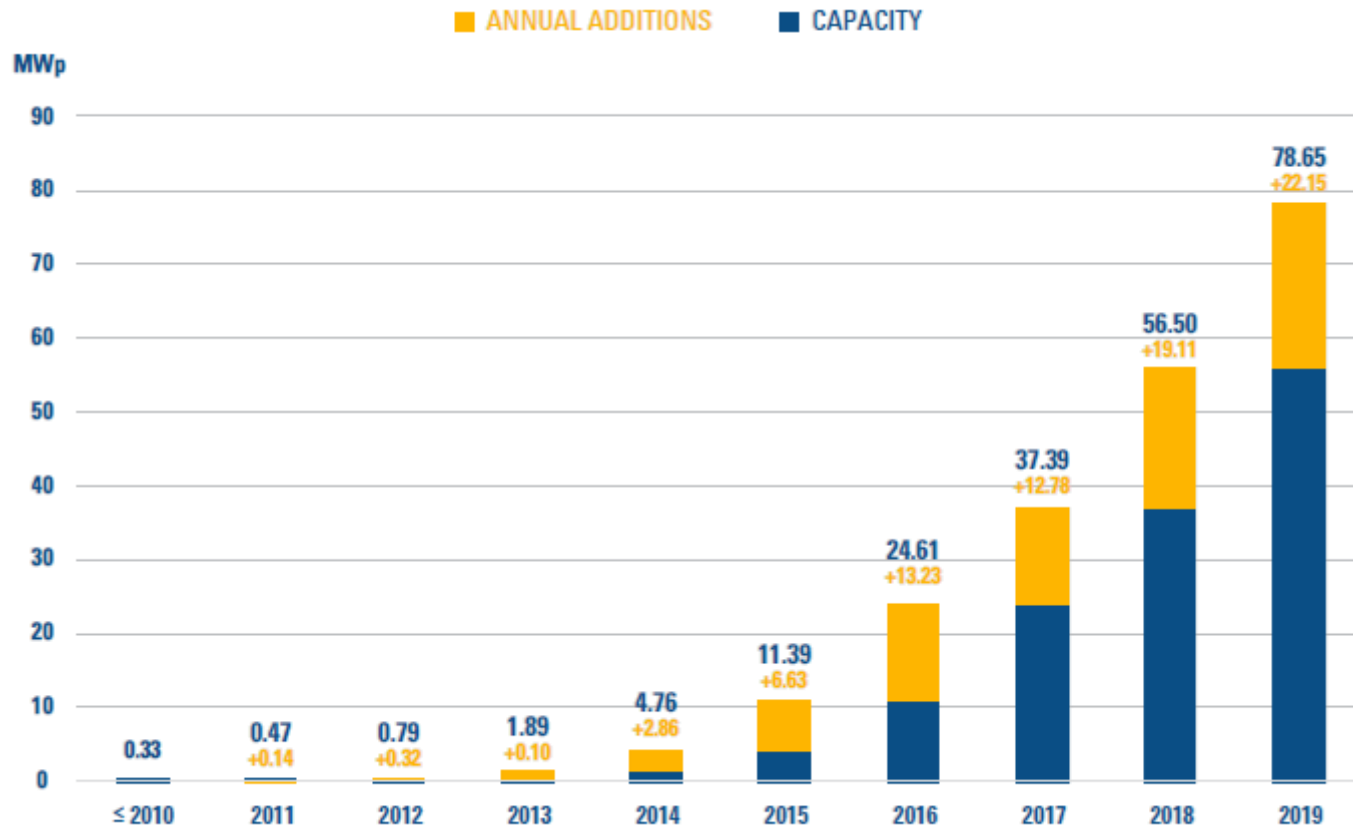


- The EU grant has been provided to 59 different projects that had NEEREA Loans

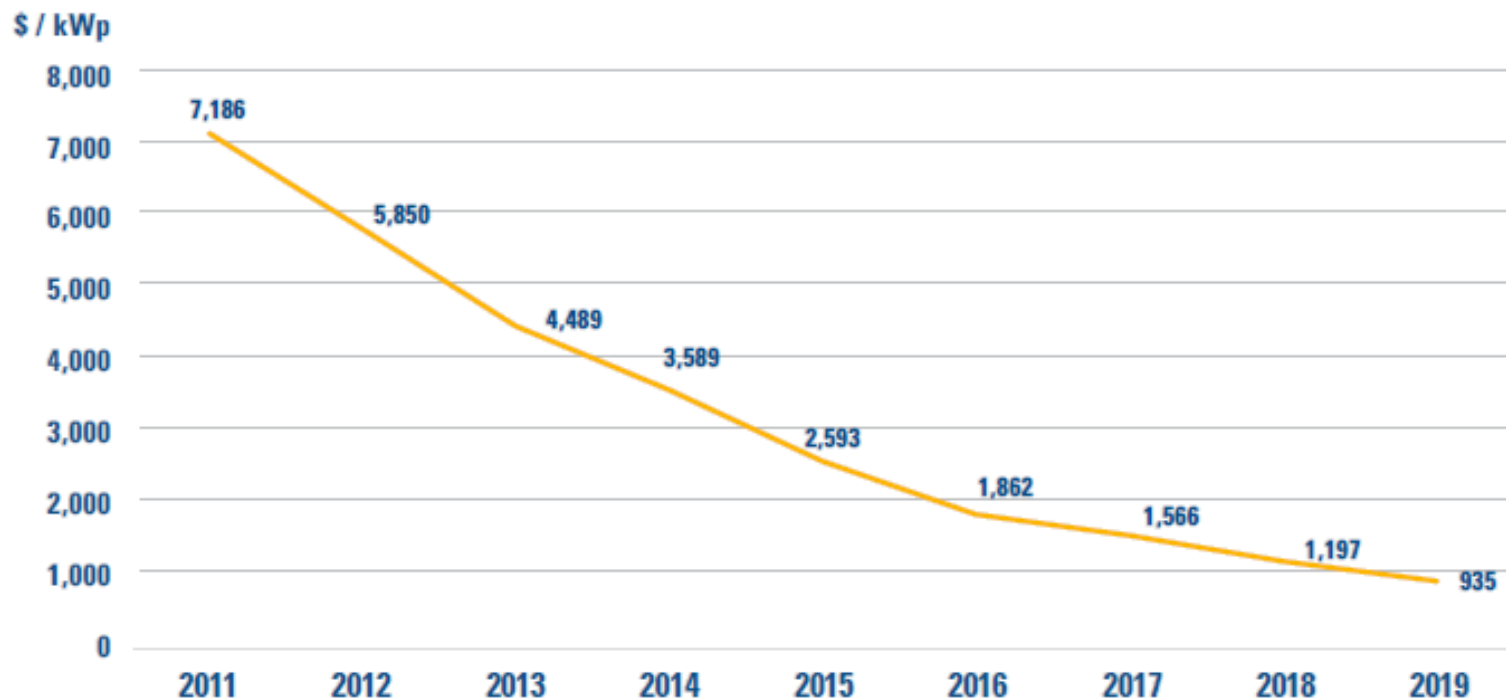


- NEEREA created sustainable job opportunities; 76 new energy companies recently entered the energy market with 40% more of job vacancies.

Solar PV Market in Lebanon

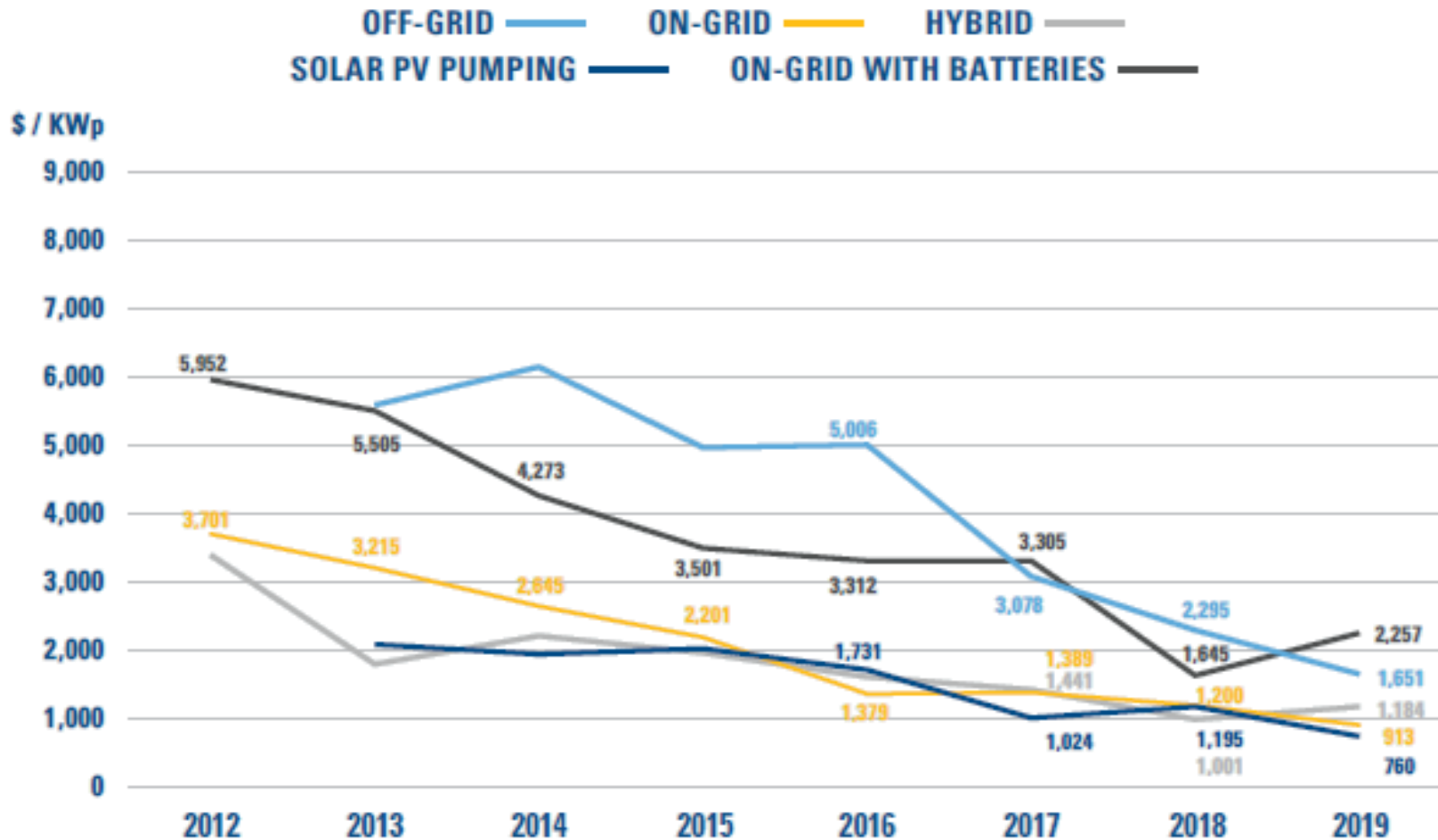


Yearly Average Solar PV Turnkey Price (\$/kWp)

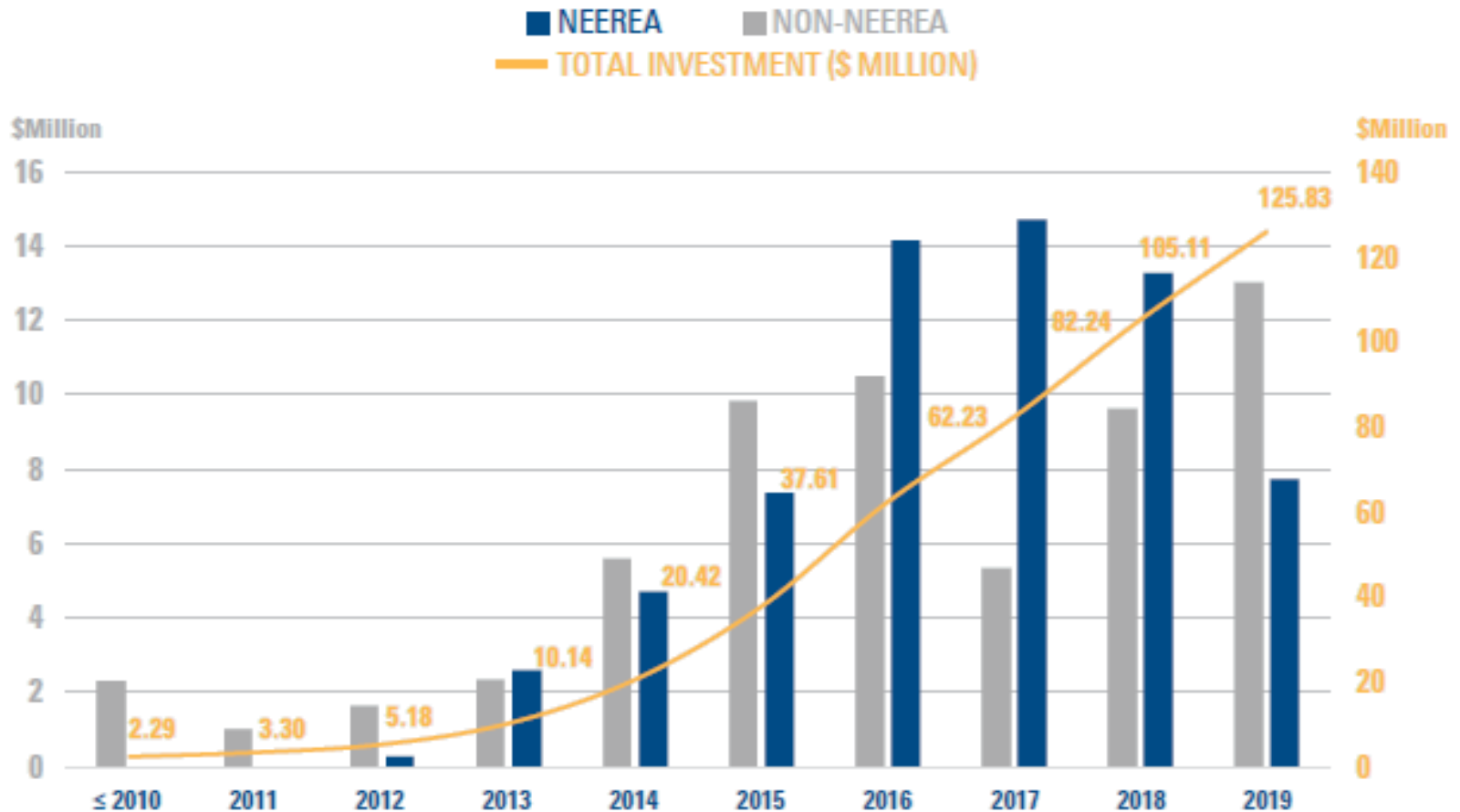


The turnkey price of solar PV continued its steady decrease from \$7,186 per kWp in 2011 to \$935 in 2019. This constitutes a remarkable price drop of 87% in a span of nine years.

Yearly Average Solar PV Turnkey Price By Project Type (\$/kWp)



Solar PV Investment (\$Million)



Total cumulative investment in the solar PV sector grew from \$2.29 Million in 2010 to \$125.83 Million in 2019.

Large Scale Projects

Wind 1st round: 226 MW PPA

- 20-year Power Purchase Agreement signed in February 2018
- Land acquisition
- Environmental Impact Assessment
- Interconnection on high voltage network according with EDL requirements
- 10.4 USc/kWh (or the equivalent of 156 LBP/kWh based on BDL's official exchange rate) for the first 2 years, to account for the required auxiliary grid infrastructure upgrade and development, and at 9.6 USc/kWh (or the equivalent of 144 LBP/kWh based on BDL's official exchange rate) afterwards and until the end of the term of the PPA.

Large Scale Projects

- First Round- Solar PV- 180 MW (12 farms)
- Second Round- Solar PV- 360 MW (24 farms)
- Third Round- Solar PV- 180 MW (12 farms)
- Solar PV with storage- 210-300 MW
- CSP with storage- 50 MW

315.24 kWp at the Casino du Liban



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