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Lebanon: Derisking Renewable Energy Investment

Key Points for Decision-Makers¹

The objective of this report is to analyse the most cost-effective public derisking measures to promote private sector investment in large-scale wind energy and solar PV in Lebanon. The report sets out the results from a quantitative, investment-risk informed modelling analysis. Modelling data has been obtained from structured interviews with private sector investors and developers. The report was prepared in close coordination with both the Ministry of environment and the Ministry of Energy and Water as well as Electricité du Liban (EDL).

Context and Opportunity for Renewable Energy

Lebanon's power sector is currently (2017) characterised by a significant supply-demand imbalance, high generation costs and a lack of financial sustainability. EDL's available installed capacity is 1,616 MW, contrasting with peak demand of up to 3,000 MW. This current installed capacity is almost entirely powered by fuel oil, a relatively expensive source of power. EDL's end-user tariffs are in turn not cost-reflective, with EDL requiring a large annual subsidy, estimated at close to USD 2 billion in 2013, or 4.5% of GDP. Annual electricity demand is projected to grow at around 5% per year.

Renewable energy holds strong potential in Lebanon. This report uses 2030 investment targets for Lebanon of 450 MW in wind energy and 300 MW in solar PV, based on the 2030 vision in Lebanon's National Renewable Energy Action Plan (NREAP). Lebanon is well positioned for investment, with good renewable energy resources and a dynamic domestic business and financial sector. Renewable energy has the opportunity to contribute positively to Lebanon's power sector, increasing the reliability of the power supply, decreasing the country's dependence on fuel imports, improving the affordability of the energy mix, and reducing the need for subsidies to EDL. Renewable energy can also support Lebanon's contributions to climate change mitigation under the United Nations Framework Convention on Climate Change (UNFCCC).

“Lebanon is well positioned for renewable energy investment, with good resources and a dynamic domestic financial sector”

More on Lebanon: Derisking Renewable Energy Investment



An executive summary version and the full version of this report, as well as its financial models, were first published in September 2017 and are available to download at: www.undp.org/DRE

This 'Key Points' document was first published in June 2018.

¹ This 'Key Points for Decision-Makers' summarises the findings of the report in succinct manner. As such literature references have not been included here, but are found in the more detailed 'Full Report' version.

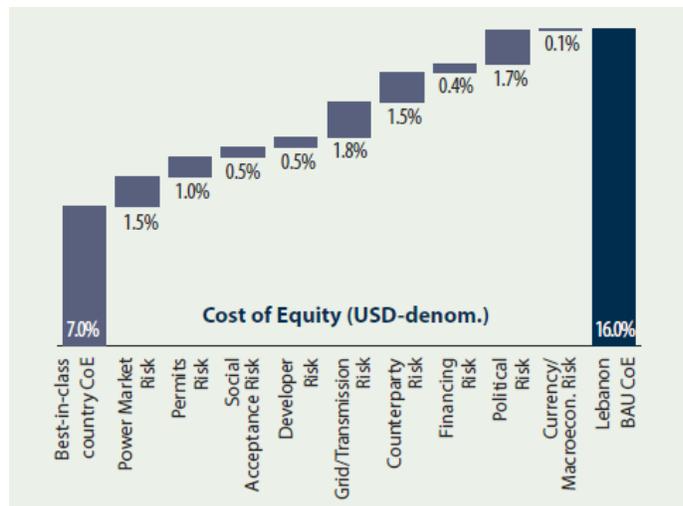
Financing Costs and Risk Environment

The modelling performs a detailed analysis of the financing costs and risk environment for wind energy and solar PV in Lebanon today.

“Power market risk, transmission risk, counterparty risk, and political risk contribute most to higher financing cost”

- Financing costs (the cost of equity and the cost of debt) for wind energy and solar PV projects are high in Lebanon. For instance, the present study finds that the cost of equity² for large-scale wind energy and solar PV in Lebanon today is 16.0%, compared with 7.0% in Germany.
- These higher financing costs reflect a range of investment risks for wind energy and solar PV in Lebanon (Figure 1, below). Four risk categories were found to contribute most to higher financing costs: 1) “power market risk” that concerns power market regulation, such as the need for well-functioning, transparent mechanisms for the sale of electricity; 2) “grid and transmission risk” that concerns the reliability of the grid; 3) “counterparty risk” that concerns the reliability of the electricity buyer; and 4) “political risk” that concerns the overall stability and peace.

Figure 1: Impact of risk categories on the cost of equity for wind energy and solar PV investment in Lebanon, business-as-usual scenario



Source: interviews with wind energy and solar PV investors and developers; modelling; best-in-class country is assumed to be Germany; see: Full Report and the Appendices therein for details.

Public Derisking Measures

For each of wind energy and solar PV, the modelling examines the selection and cost-effectiveness of public derisking measures to meet the 2030 investment targets. Public derisking measures can be understood as interventions by the government and its partners that address specific investment risks, in the form of policies, programmes or financial products.

- For wind energy, (2030 investment target: 450MW), the modelling identifies a targeted package of public derisking measures with an estimated cost of USD 98 million until 2030. These derisking measures result in the following potential benefits:
 - Catalysing USD 635 million in private sector investment in wind energy

² USD-denominated cost of equity.

“Derisking creates savings for Lebanon of USD 221m (wind), and USD 97m (solar PV), over 20 years”

- Lowering wind energy generation costs due to derisking from USD 11.4 cents to USD 9.4 cents per kWh
 - Creating economic savings related to derisking of wind energy of USD 221 million over 20 years
 - Reducing carbon emissions by 10.0 million tonnes of CO₂ over 20 years, relative to the baseline
- For solar PV, (2030 investment target: 300MW), the modelling identifies a targeted set of public derisking measures with an estimated cost of USD 46 million until 2030. When implemented, this results in the following benefits:
 - Catalysing USD 279 million in private sector investment in solar PV
 - Lowering solar PV generation costs due to derisking from USD 10.0 cents to USD 8.2 cents per kWh
 - Creating economic savings related to derisking of solar PV of USD 97 million over 20 years
 - Reducing carbon emissions by 5.2 million tonnes of CO₂ over 20 years, relative to the baseline

Table 1: The selection of public measures to achieve the targets for wind energy and solar PV

Risk Category	Policy Derisking Instrument	Financial Derisking Instrument
Power Market Risk	<ul style="list-style-type: none"> • Long-term, legally-binding RE targets • Establishment of an enabling regulatory framework • FIT/PPA tender (standardized PPA) • Independent regulator for power sector 	NA
Permits Risk	<ul style="list-style-type: none"> • Streamlined process for RE permits (dedicated one-stop shop) • Contract enforcement and recourse mechanisms 	NA
Social Acceptance Risk	<ul style="list-style-type: none"> • Awareness-raising campaigns • Stakeholder outreach, including operators of private generators 	NA
Developer Risk	<ul style="list-style-type: none"> • Capacity building for resource assessment (wind only) • Technology and Operations & Maintenance (O&M) assistance 	NA
Grid / Transmission Risk	<ul style="list-style-type: none"> • Strengthen EDL’s grid management capacity • Transparent, up-to-date grid code • Policy support for grid infrastructure development 	<ul style="list-style-type: none"> • Take-or-pay clause in PPA
Counterparty Risk	<ul style="list-style-type: none"> • Strengthen EDL’s management and operational performance 	<ul style="list-style-type: none"> • Government guarantee for PPA payments • Concessional public loans to IPPs
Financial Sector Risk	<ul style="list-style-type: none"> • Fostering financial sector reform towards green infrastructure investment • Strengthening financial sector’s familiarity with renewable energy and project finance 	<ul style="list-style-type: none"> • Concessional public loans to IPPs
Currency/ Macro-economic Risk	NA	NA
Political Risk	NA	<ul style="list-style-type: none"> • Political risk insurance for equity investments

Source: Modelling. NA indicates “Not Applicable”

Conclusion

“Public derisking measures are an opportunity towards more reliable, affordable and clean power for Lebanese citizens”

Today’s investment environment for renewable energy in Lebanon has a number of investment risks that result in high financing costs. The report’s methodology systematically identifies public derisking measures to target these risks, thereby lowering financing costs and resulting in lower generation costs.

The modelling demonstrates how investing in public derisking measures creates significant economic savings in achieving the investment objectives in Lebanon’s National Renewable Energy Action Plan. The modelling clearly shows that investing in public derisking measures should in every case be more cost-effective for Lebanon, compared to an alternative of paying higher generation costs. Therefore, implementing these public derisking measures is indeed an opportunity for policymakers in Lebanon. The end result can be more reliable, affordable and clean power for Lebanese citizens.