DREI - Derisking Renewable Energy Investment

DREI methodology and importance (global view)
DREI Lebanon

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Wednesday 20 September 2017
Beirut Energy Forum
**Derisking Renewable Energy Investment**

**History**

“A framework to select cost-efficient public instruments to promote private investment in renewable energy”

- developed in 2013 (together with ETH Zurich)
- drawn from UNPD’s 20y+ experience in renewable energy for low-carbon development
- becoming more “quantitative” and focusing on risk-return and the issue of financing costs
- initial methodology for utility-scale RE investments

- DREI is being applied and further developed as we speak:
  - Tunisia, Nigeria, Lebanon, Kazakhstan, Belarus, Cambodia
  - small-scale RE, energy efficiency
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The issue with RE investments

• The **objective**: to make RE investment cost competitive with the business-as-usual investment, typically fossil-fuel based energy
• RE investments have a different cost structure than fossil-fuel investments:

  **Example:**
  **Costs Diesel Power** (undiscounted)

  **Example:**
  **Costs Wind Power** (undiscounted)

  based on:
  Prof. T. Schmidt, Energy Politics Group, ETH Zurich

  ➔ For RE investments: **More up-front finance** is needed (less cash-flow finance)
  ➔ **Risks** and the associated **costs of finance** matter much more
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The issue with RE investments (cont.)

- **Objective**: to make RE investment cost competitive with the business-as-usual investment, typically fossil-fuel based energy
- **Challenge**: the high financing cost (cost of capital) in developing countries

- A project’s specific risks drive the cost of capital:

![Diagram showing risk-return profile of an investment opportunity]

Risk-free rate | Risk premium | Cost of capital
---|---|---
2% | 7% | 9%

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based on: Prof. T. Schmidt, Energy Politics Group, ETH Zurich

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The issue with RE investments (cont.)

Developed country: Low Financing Costs Environment (Wind vs. Gas)
Developed country: High Financing Costs Environment (Wind vs. Gas)

Capital Structure: 30% Equity, 70% Debt
Cost of Equity = 7%, Cost of Debt = 3%

All assumptions (technology costs, capital structure etc.) except for financing costs are kept constant between the developed and developing country.
**Derisking Renewable Energy Investment**

**DREI’s theory of change for promoting RE**

- **The objective**: to make RE investment cost competitive with fossil fuel investment
- **The challenge**: the high financing cost (cost of capital) in developing countries

- From the policymakers perspective, there are two ways to address this challenge:
  1. **Derisk** RE by targeting investor risks that result in high financing costs
  2. **Compensate** for risks via incentive mechanisms

- **DREI’s Theory of Change**: policymakers to derisk as much as possible, before paying for the remaining incremental costs via incentive mechanisms

For the policymaker there is a trade-off/interplay between these two approaches
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DREI’s approach: 1) Quantify the risk environment

- Reach out to investors active in the target country and perform **structured interviews**
- Aggregate the perceived risk environment into **Financing Cost Waterfalls**

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**Cost of Equity (CoE)**

- Best-in-class country CoD: 3%
- Power Market Risk: 1.4%
- Social Acceptance Risk: 0.5%
- Developer Risk: 0.5%
- Grid/Transmission Risk: 1.6%
- Counterparty Risk: 1.2%
- Political Risk: 0.9%
- Currency Risk: 0.0%
- Study country BAU CoE: 9%

**Cost of Debt (CoD)**

- Best-in-class country CoD: 16%
- Power Market Risk: 1.5%
- Social Acceptance Risk: 1.0%
- Developer Risk: 0.5%
- Grid/Transmission Risk: 1.5%
- Counterparty Risk: 0.4%
- Political Risk: 1.7%
- Currency Risk: 0.1%
- Study country BAU CoD: 0.1%
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DREI’s approach: 2.1) Select public instrument package

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**DREI’s approach: 2.2) Quantify instruments’ effectiveness**

- (Reach out to investors active in the target country and perform *structured interviews*)
- Aggregate the perceived effectiveness of the instrument package into *Post-Derisking Waterfalls*

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**Cost of Equity (CoE)**

- 16%
- Post-derisking CoE

**Cost of Debt (CoD)**

- 9%
- Post-derisking CoD
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DREI’s approach: 3) Levelised cost

- Perform **LCOE modelling** under transparent set of assumptions, incl. about RE target, operating parameters, country specifications, etc.

![Diagram showing LCOE comparison]

<table>
<thead>
<tr>
<th></th>
<th>Baseline Energy Investment</th>
<th>Wind Investment BAU</th>
<th>Wind Investment Post-Derisking</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCOE (USD cents/kWh)</td>
<td>7.4</td>
<td>11.4</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Effect of policy & financial derisking

Remaining incremental cost
Derisking Renewable Energy Investment
DREI’s approach: 4) Evaluation

Use DREI’s financial modelling tools to evaluate four **key performance metrics**

How does the deployment of the selected public instrument package

1. … catalyse **private sector investment**?

2. … generate **economy-wide savings**?

3. … increase the **affordability** of RE for end-users?

4. … benefit the **environment**?

• On top: Perform **sensitivity analyses** on key inputs and assumptions
  • to explore the robustness of the modelling exercise
  • to explore scenarios, e.g. alternative sets of public instruments
DREI Lebanon study
Foreshadowing key results

Use DREI's financial modelling tools to evaluate four key performance metrics.

How does the deployment of the selected public instrument package?

1. … catalyse private sector investment?
   - estimated at USD 98m …
   - … of USD 635m

2. … generate economy-wide savings?
   - … of USD 221m over 20 years

3. … increase the affordability of RE for end-users?
   - … by lowering the LCOE from USD 11.4 cents to 9.4 cents per kWh

4. … benefit the environment?
   - … by reducing carbon emissions by -10 million tonnes over 20 years
**DREI Lebanon study**

Link to download the study

**Full report:**

**Summary report:**

more about the DREI Lebanon work:
**Session 13B, Talk 1, 12:00-13:30, Crystal Ballroom**

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For DREI Lebanon: Our gratitude to the ministries and support programs involved:

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Use DREI’s financial modelling tools to evaluate four key performance metrics

How does the deployment of the selected public instrument package

1. ... catalyse private sector investment?

2. ... generate economy-wide savings?

3. ... increase the affordability of RE for end-users?

4. ... benefit the environment?

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2030 investment target:
300 MW utility-scale solar PV

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1. ... of USD 279m
2. ... of USD 97m over 20 years
3. ... by lowering the LCOE from USD 10 cents to 8.2 cents per kWh
4. ... by reducing carbon emissions by -5.2 million tonnes over 20 years

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