Empowered lives.
Resilient nations.

DREI - Derisking Renewable Energy Investment

DREI methodology and importance (global view)
DREI Lebanon

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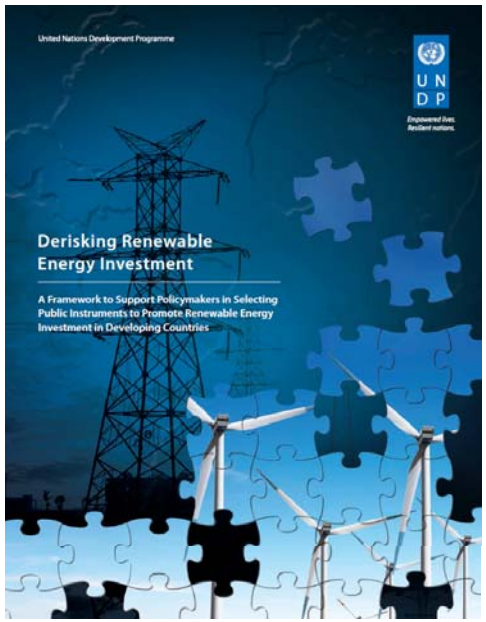
Wednesday 20 September 2017
Beirut Energy Forum




Derisking Renewable Energy Investment
History

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



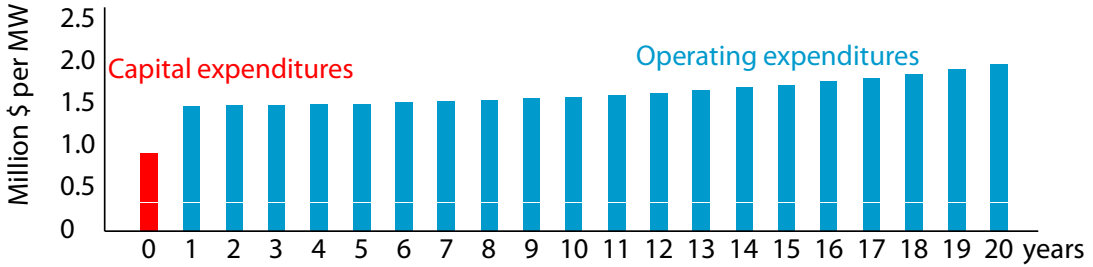
- developed in 2013 (together with ETH Zurich)
- drawn from UNPD's 20y+ experience in renewable energy for low-carbon development
- becoming more «quantitative» and focusing on **risk-return** and the issue of **financing costs**
- initial **methodology for utility-scale RE** investments

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

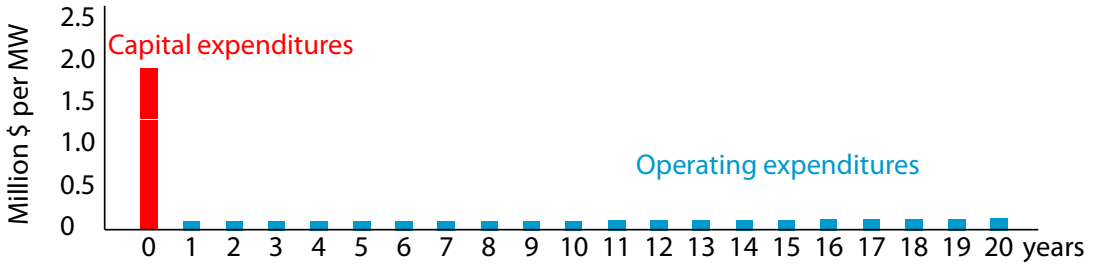
Derisking Renewable Energy Investment
The issue with RE investments

- 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)



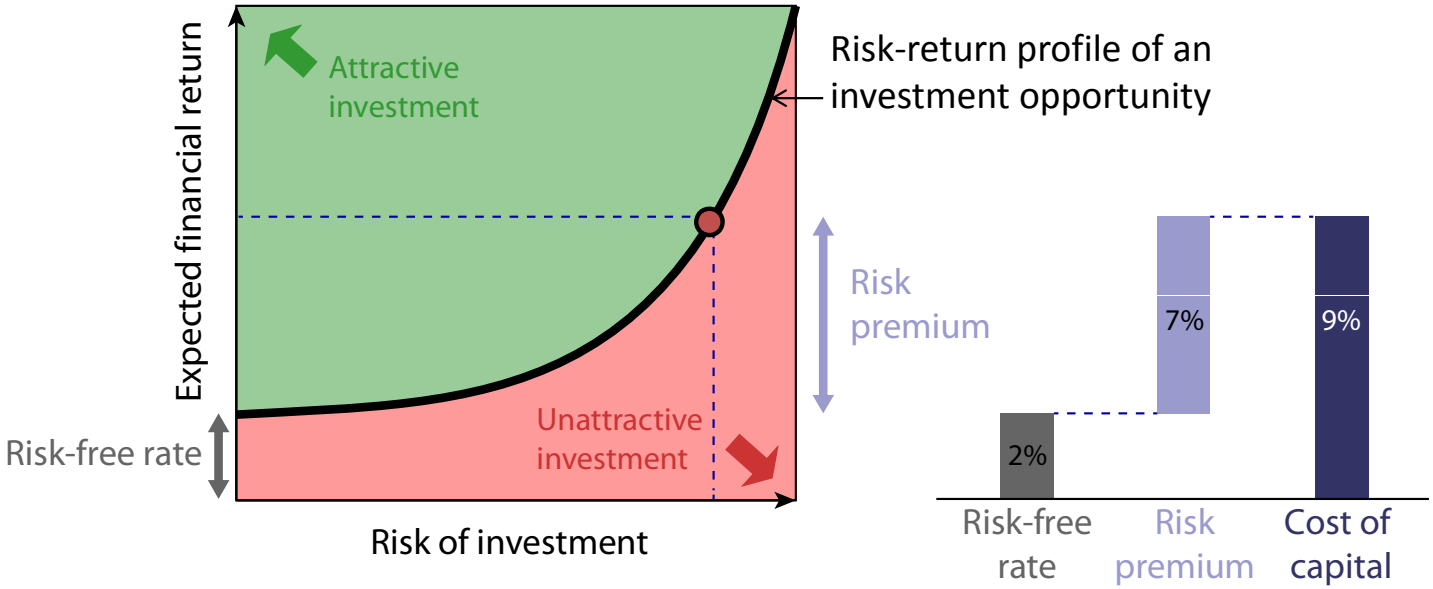
based on:
Prof. T. Schmidt, Energy Politics Group, ETH Zurich

→ For RE investments: **More up-front finance** is needed (less cash-flow finance)
→ **Risks** and the associated **costs of finance** matter much more

Derisking Renewable Energy Investment
The issue with RE investments (cont.)

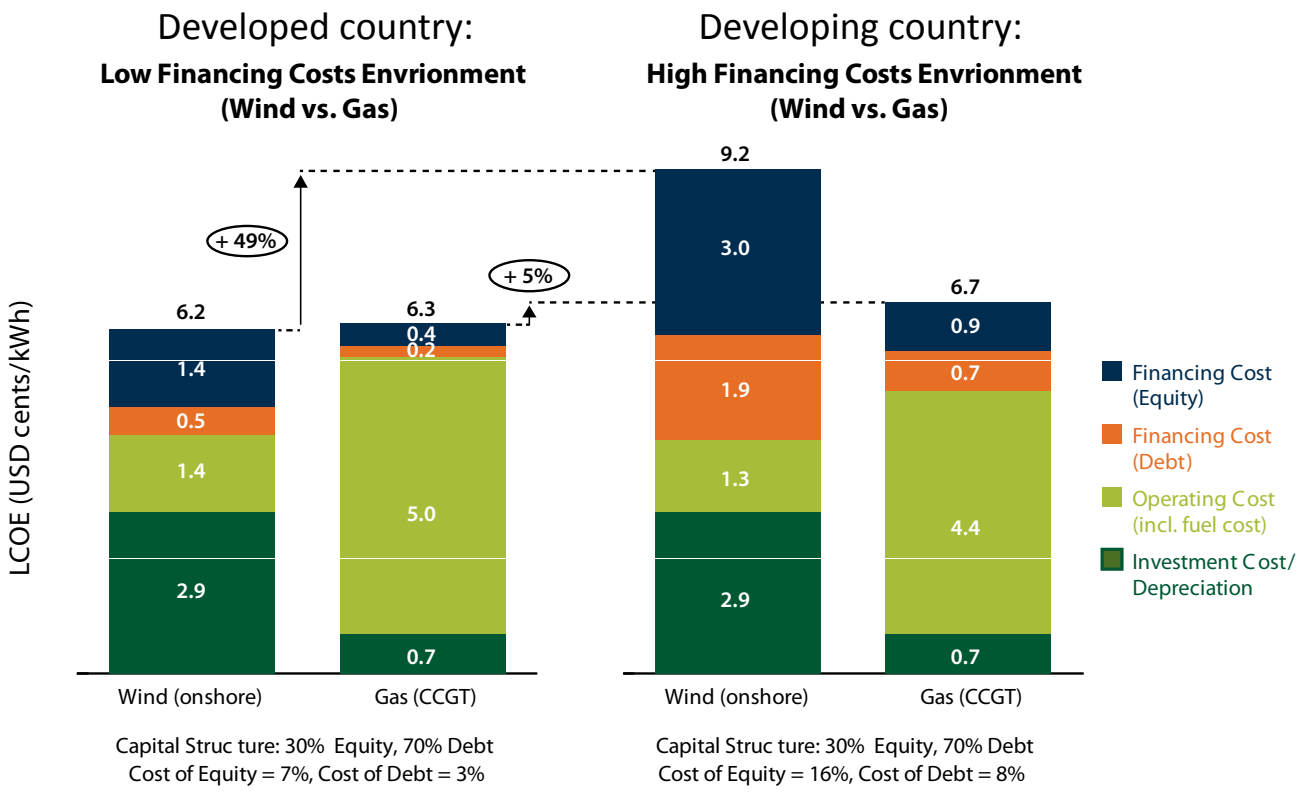
- The **objective**: to make RE investment cost competitive with the business-as-usual investment, typically fossil-fuel based energy
- The **challenge**: the high financing cost (cost of capital) in developing countries

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



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

Derisking Renewable Energy Investment
The issue with RE investments (cont.)

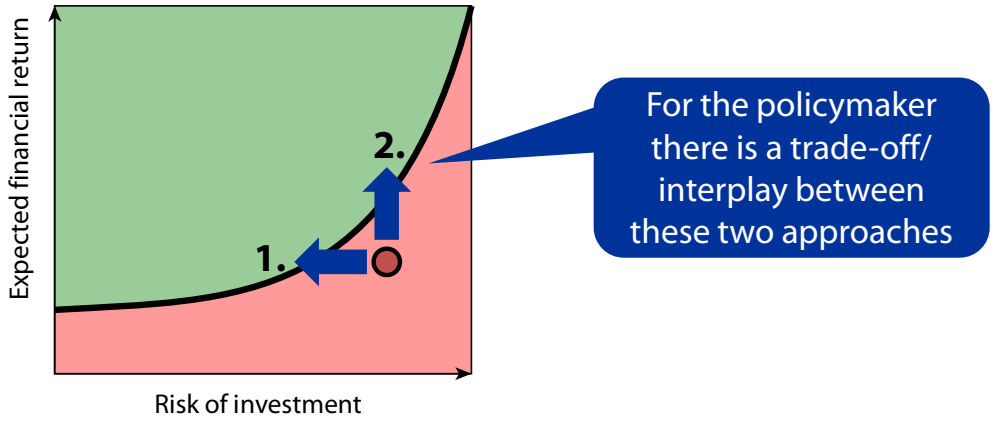


Source: Source: Derisking Renewable Energy Investment (UNDP, 2013), subsequently updated as of 2017.
All assumptions (technology costs, capital structure etc.) except for financing costs are kept constant between the developed and developing country.

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

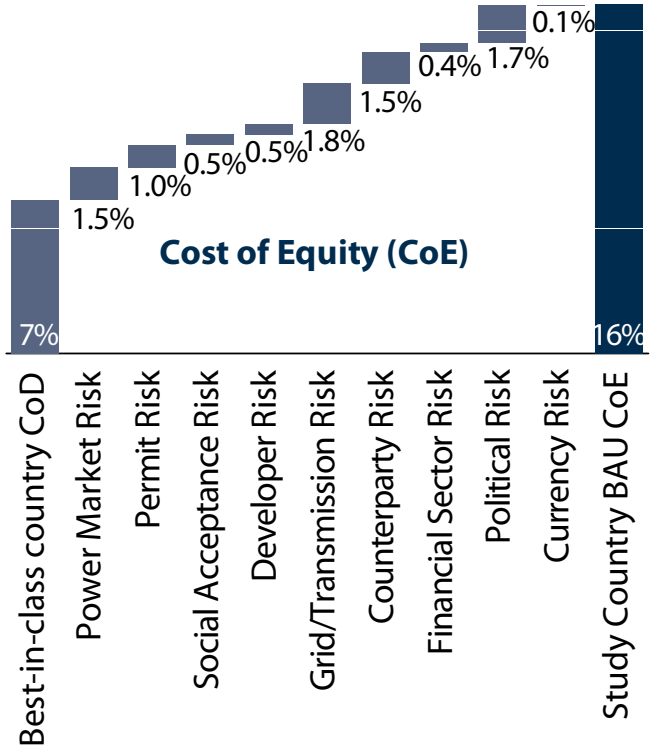
- From the policymakers perspective, there are two ways to address this challenge:
  1. **Derisk** RE by targeting investor risks that result in high financing costs
  2. **Compensate** for risks via incentive mechanisms

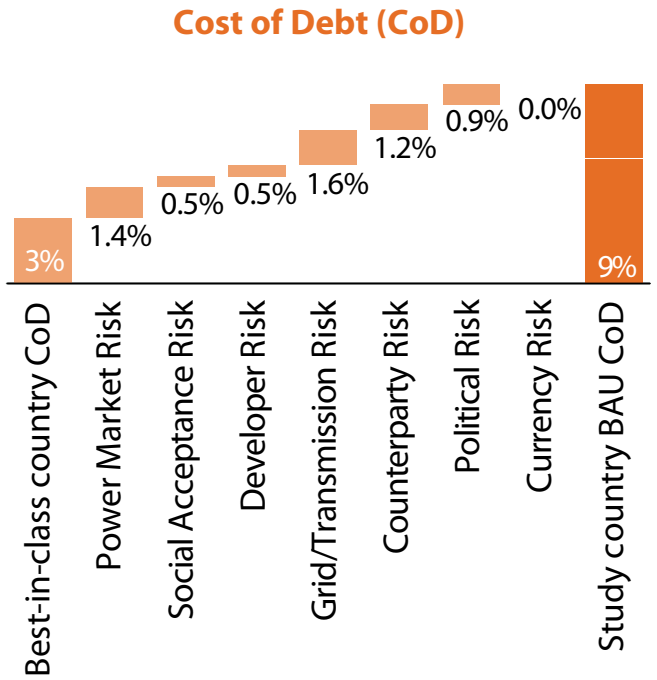


- DREI's **Theory of Change**: policymakers to derisk as much as possible, before paying for the remaining incremental costs via incentive mechanisms

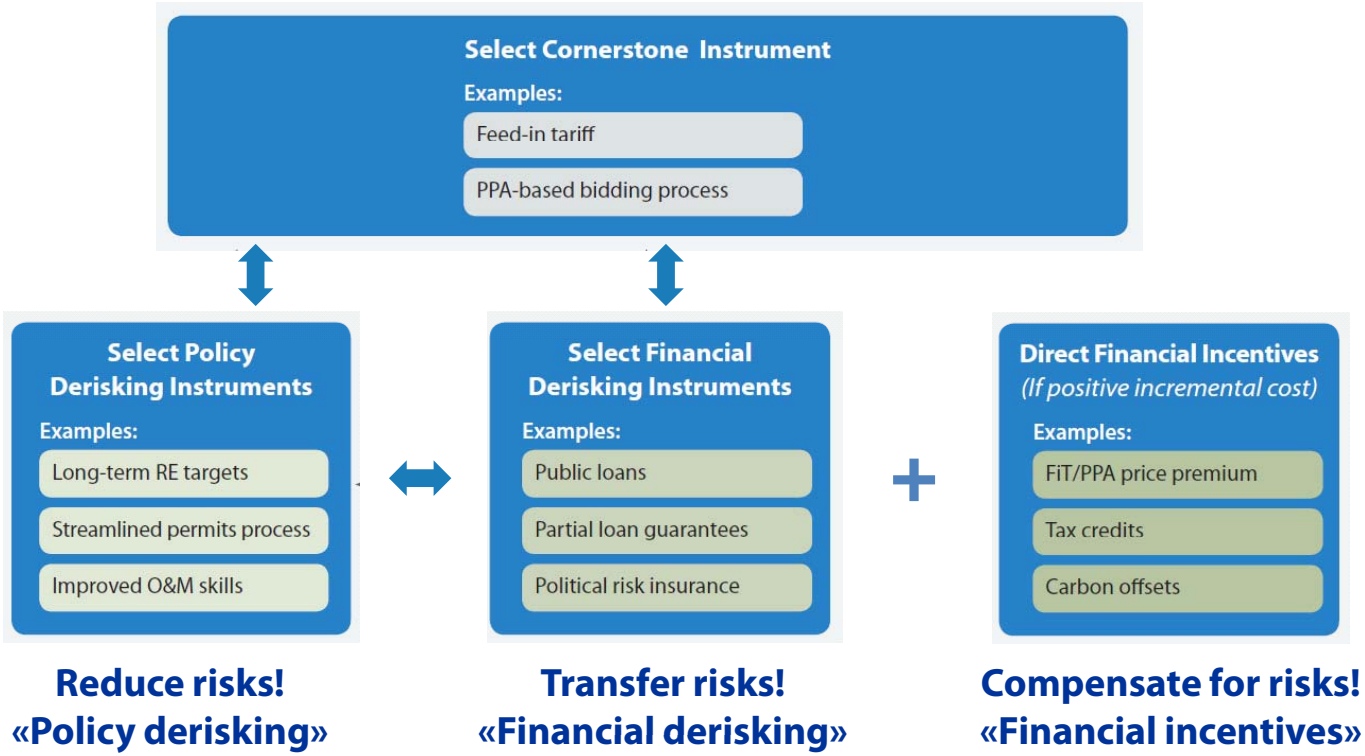
Derisking Renewable Energy Investment
DREI's approach: 1) Quantify the risk environment

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





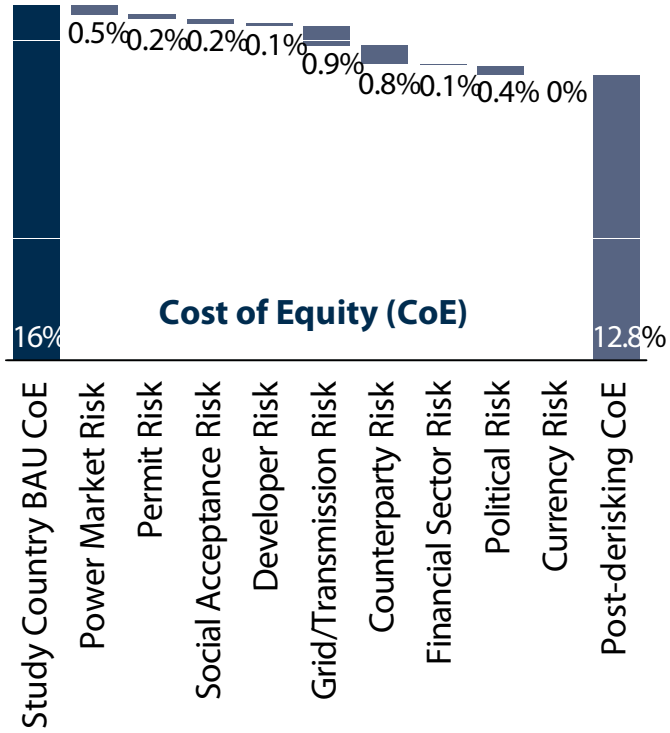
Derisking Renewable Energy Investment
DREI's approach: 2.1) Select public instrument package

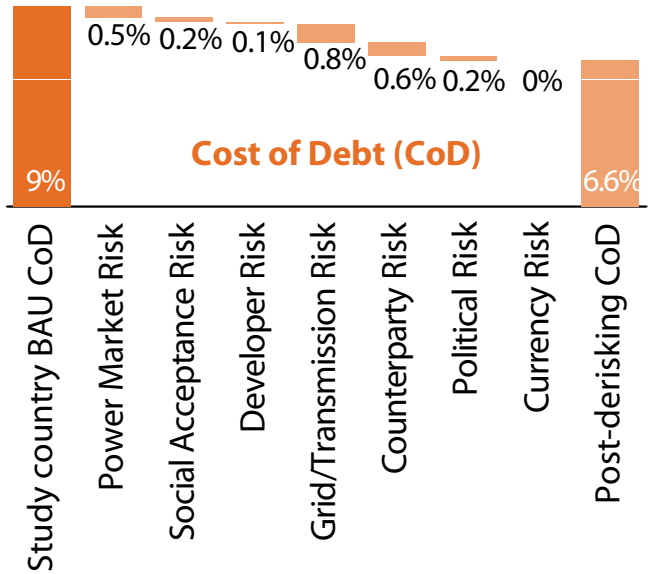


Source: UNDP, *Derisking Renewable Energy Investment (2013).*

Derisking Renewable Energy Investment
DREI's approach: 2.2) Quantify instruments' effectiveness

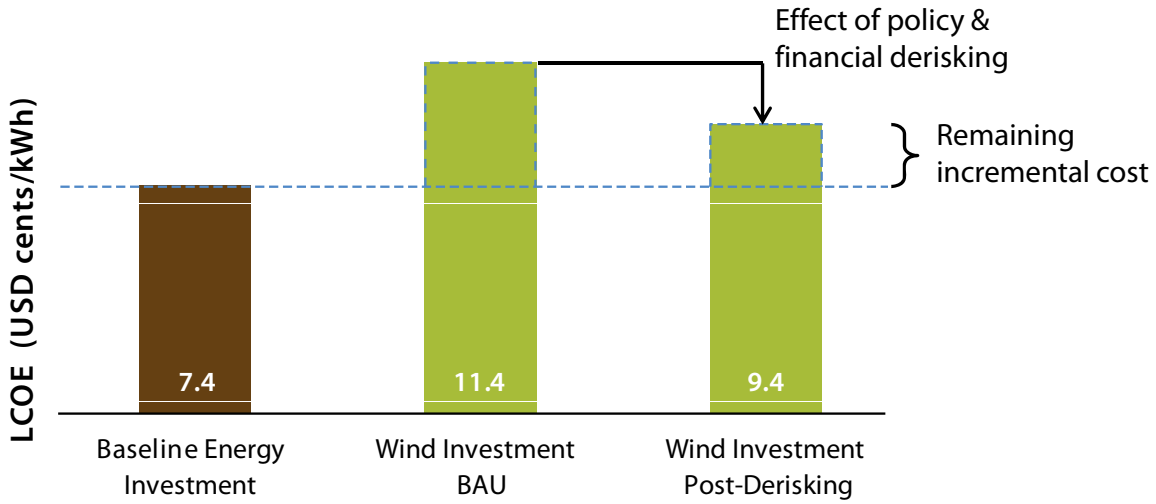
- (Reach out to investors active in the target country and perform **structured interviews**)
- Aggregate the perceived effectiveness of the instrument package into **Post-Derisking Waterfalls**





Derisking Renewable Energy Investment
DREI's approach: 3) Levelised cost

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



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**?

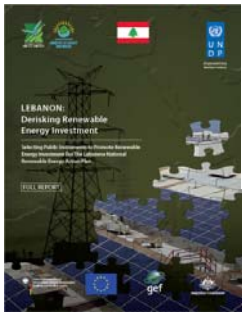
3. … increase the **affordability** of RE for end-users?

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

2030 investment target:
450 MW utility-scale wind



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

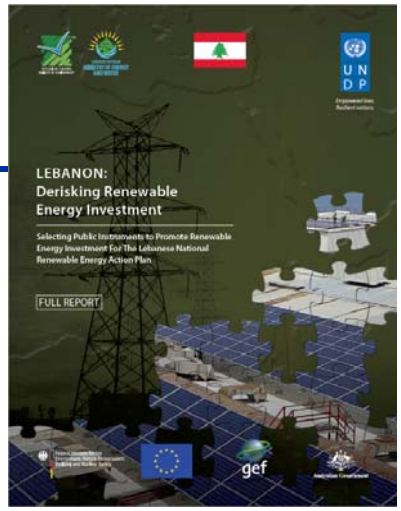
3. … increase the **affordability** of RE for end-users?

   … 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:
http://climatechange.moe.gov.lb/viewfile.aspx?id=262

Summary report:
http://climatechange.moe.gov.lb/viewfile.aspx?id=261

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

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www.undp.org/DREI

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

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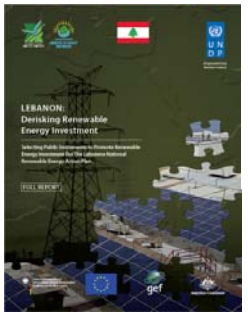
DREI Lebanon study
Foreshadowing key results

2030 investment target:
300 MW utility-scale solar PV



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 46m …**

   … of **USD 279m**

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

   … of **USD 97m** over 20 years

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

   … by lowering the LCOE from USD 10 cents to 8.2 cents per kWh

4. … benefit the **environment**?

   … by reducing carbon emissions by -5.2 million tonnes over 20 years