Towards clean, secure and affordable energy systems in Southeast Europe

Vienna, 16 November 2018

Frauke Roeser
Majority of investments in renewable energy will need to be from **private sector**

**Cost of capital is critical** for renewable energy projects

Cost of capital driven by **barriers and risks**

How can public instruments reduce the cost of capital?

What is the impact of different instruments on the financing of renewable energy projects?
Analysis of the most cost-effective public de-risking measures that address investment barriers to promote private sector investment in renewable energy

- Comparing alternative RE policy frameworks
- Quantification of risks and counter measures via interviews
- Calculation of LCOE
  - pre derisking
  - post derisking
- Calculation of Public Cost

Approach

Cost of Capital

selected policy measures
Tunisian solar plan: 30% renewable electricity production by 2030

Characteristics of power sector:

• Rising demand
• Dominance of gas powered generation (imported)
• Dominant role of state owned energy company (STEG) for production and distribution
• No private investment in utility scale wind or solar PV

Analysis aimed to examine the selection and cost-effectiveness of public de-risking measures to meet the 2030 investment targets
Quantification of risks

Impact of risk categories on financing costs for renewable energy investments in Tunisia, business-as-usual scenario
Quantification of policy package

Impact of risk categories on financing costs for wind and solar PV investments in Tunisia, post-derisking scenario

- Policy derisking measures: e.g. financial sector reform; permitting process
- Financial derisking measures: e.g. government guarantee, indexing, take or pay clause in PPA
Results - LCOE

LCOEs for baseline and wind and solar PV investment in Tunisia
For wind energy, 2030 investment target: 940 MW, the modelling identifies a set of public derisking measures with an estimated cost of EUR 110 million until 2030.

Benefits:

• Catalyse EUR 1.129 billion in private sector investment in wind investment
• Lower wind generation costs due to derisking from EUR 7.6 cents to EUR 6.3 cents per kWh
• Create economic savings related to derisking of wind of EUR 403 million over 20 years
• Reduce carbon emissions by 21.6 million tonnes of CO2 over 20 years, relative to the baseline

Investing in public de-risking cost effective to drive investments and meet policy target
Upcoming analysis

» Illustrate potential impact from renewable energy Cost Reduction Facility (CRF) and other public instruments on the financing costs of renewable energy in SEE

» Exemplary case studies onshore wind in Greece and Serbia
  • Quantify incremental investment costs for wind compared to best in class EU country
  • Determine LCOE for baseline technology and onshore wind in a pre- and post-derisking environment

» November 2018 – March 2019

» Collaboration with Agora and network partners in Greece and Serbia
Thank you for your attention!

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Additional slides
Quantification of risks - illustration

» Power Market Risk
» Permits Risk
» Social Acceptance Risk
» Grid/Transmission Risk
» Counterparty Risk
» Financing Risk
» Political Risk
» Currency/Macro. Risk
» …
Quantification of impacts - illustration

- Targets and policies
- Regulatory instruments
- Market reforms
- Insurances
- Financial instruments

![Graph showing quantification of impacts](chart.png)
## Selected policy package (Tunisia)

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Policy Derisking Instruments</th>
<th>Financial Derisking Instruments</th>
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</thead>
<tbody>
<tr>
<td><strong>Power Market Risk</strong></td>
<td>• Legislative reform to put in place effective policies/ revise them</td>
<td>NA</td>
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<td></td>
<td>• PPA tender</td>
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<td></td>
<td>• Independent regulator</td>
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<tr>
<td><strong>Permits Risk</strong></td>
<td>• Streamlined process for permitting</td>
<td>NA</td>
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<tr>
<td></td>
<td>• Enforcement and recourse mechanism</td>
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<tr>
<td><strong>Social Acceptance Risk</strong></td>
<td>• Awareness-raising campaigns</td>
<td>NA</td>
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<td></td>
<td>• Promote/ pilot community-based approaches</td>
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<tr>
<td><strong>Developer Risk</strong></td>
<td>• Resource assessment (only for wind energy)</td>
<td>NA</td>
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<tr>
<td></td>
<td>• Research and development into technology standards (Support to pilot projects on solar PV in desert environments)</td>
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<td></td>
<td>• Technology support and O&amp;M assistance</td>
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<tr>
<td><strong>Grid/Transmission Risk</strong></td>
<td>• Transparent, up-to-date grid code</td>
<td>Take-or-pay clause¹ in PPA</td>
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<td>• Grid management/ planning (develop and update long-term national transmission/ grid plan to include intermittent RE)</td>
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<td>• Capacity building for the supervision center to organize/ control dispatching</td>
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<td><strong>Counterparty Risk</strong></td>
<td>• Strengthen the utility’s management</td>
<td>Government (sovereign) guarantee</td>
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<td>• Implementing sustainable cost recovery policies</td>
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<tr>
<td><strong>Financing Risk</strong></td>
<td>• Domestic financial sector reform</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Political Risk</strong></td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Currency/ Macroecon. Risk</strong></td>
<td>NA</td>
<td>Partial indexing</td>
</tr>
</tbody>
</table>
Calculation of Public Cost (Tunisia)

» Independent Regulator
  » 30 FTE's: 16,000€ annual salary
  » 5 large consultancy contracts: 300,000 € each

» Streamlined process for permitting (e.g. dedicated one-stop shop for RE permits)
  » 2 FTE's
  » 1 small consultancy contract every two years: 50,000€ each

» Concessional Public Loans
  » 30% of overall debt financed investment
  » 245 million € of public loans with 25% default rate
  » 61 million € of costs
DREI - Concept

Source: UNDP, De-risking renewable energy (DREI) 2015