USAID’s SCALING UP RENEWABLE ENERGY

5TH Asia Regional Dialogue of the Mitigation Action Implementation Network, Danang, Vietnam
November 30th, 2016
About the methodology

• It results in a simple set of priorities.

• It’s empirical (based on drivers in China, Brazil, Germany, India, South Africa, UK, and U.S.)

• It’s based on “Delphi” consultations: MIT, University of Dublin, NREL

• It asks a single question directly related to results: What factors seem to be strongly associated with going to scale?

• It is focused on the things USAID can influence in developing countries.
The “Building Blocks” Approach to Scaling RE

• Supporting the addition of tens of thousands of MW of RE

• Increasing the % of RE in total installed capacity and the % of RE in total electricity delivered

• Establishing the building blocks:
  – Strategic Energy Planning
  – Smart Incentives
  – Grid Integration
  – Competitive Procurement
  – Renewable Energy Zones
  – Finance
Examples

• Low Emission Development Strategies
• Intentional Nationally Determined Contributions
• Renewable Energy Targets
• Power Development Plans

“Mexico is committed to reduce unconditionally 22% of its Greenhouse Gases (below BAU) for the year 2030.” – Mexico NDC
## Smart RE Incentives

<table>
<thead>
<tr>
<th>TYPES OF INCENTIVES FOR RE</th>
<th>EXAMPLES</th>
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</thead>
<tbody>
<tr>
<td><strong>FISCAL</strong></td>
<td></td>
</tr>
<tr>
<td>Accelerated depreciation</td>
<td>Widely used</td>
</tr>
<tr>
<td>Tax credits</td>
<td>US RE Production Tax Credit</td>
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<tr>
<td>Tax exemptions</td>
<td>Texas &amp; California RE property tax exemption</td>
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<td>Customs and related exemptions</td>
<td>Kenya</td>
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<td><strong>FINANCING</strong></td>
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<tr>
<td>Financing facilities</td>
<td>India</td>
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<tr>
<td>Loan guarantees</td>
<td>U.S. for solar thermal</td>
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<tr>
<td>Capital grants</td>
<td>India GBI program</td>
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<tr>
<td>Surcharges to pay for RE</td>
<td>Germany</td>
</tr>
<tr>
<td>Special purpose bond programs</td>
<td>US Clean Renewable Energy Bond Program</td>
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<tr>
<td>Property tax financing</td>
<td>Texas local government RE loan program</td>
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<td><strong>CONTRACTUAL &amp; REGULATORY</strong></td>
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<td>Feed in Tariffs</td>
<td>Widely used</td>
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<tr>
<td>Renewable Portfolio Standards</td>
<td>Philippines RPS</td>
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<tr>
<td>PPAs awarded through reverse auctions</td>
<td>South Africa, Indian reverse auctions</td>
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<td>Consumer directed choice of RE</td>
<td>Philippines Green Energy Option</td>
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<tr>
<td>Renewable Energy Certificates</td>
<td>India's state REC program</td>
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<td>Net metering of PV</td>
<td>Widely used</td>
</tr>
<tr>
<td><strong>OPERATIONAL</strong></td>
<td></td>
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<tr>
<td>&quot;Must take&quot; requirements</td>
<td>Widely used</td>
</tr>
</tbody>
</table>
Wind & Solar Resources

... are variable, uncertain, and geographically concentrated

Wind Output – Tamil Nadu
Low-hanging fruit: Low capital cost but real political costs to change institutional context

Option costs are system-dependent and evolving over time
Locate in areas of best resources

Develop common infrastructure

Engage Private Sector

Competitive Renewable Energy Zones

The electric transmission line system developed under Texas’ Competitive Renewable Energy Zones (CREZ) initiative links existing or prospective wind projects in the Panhandle and West Texas with population centers to the east.
## Competitive Procurement of Generation

### Brazil Wind Energy Auction Prices, U.S. dollars per MWh

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</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$160</td>
<td>$87</td>
<td>$76</td>
<td>$70</td>
<td>$52</td>
<td>$52</td>
<td>$53</td>
<td>$62</td>
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</tbody>
</table>

### U.S. Wind Prices over Time, U.S. dollars MWh, Source: DOE

<table>
<thead>
<tr>
<th>Year</th>
<th>96-'99</th>
<th>00-'01</th>
<th>02-'03</th>
<th>04-'05</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<tbody>
<tr>
<td>Price</td>
<td>$42</td>
<td>$35</td>
<td>$33</td>
<td>$38</td>
<td>$50</td>
<td>$51</td>
<td>$63</td>
<td>$69</td>
<td>$60</td>
<td>$55</td>
<td>$39</td>
<td>$25</td>
</tr>
</tbody>
</table>

### Winning Bid Prices in South Africa's RE Procurement, 2009- 2013

<table>
<thead>
<tr>
<th></th>
<th>REFIT 1</th>
<th>REFIT 2</th>
<th>Auction 1</th>
<th>Auction 2</th>
<th>Auction 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>125</td>
<td>94</td>
<td>114</td>
<td>90</td>
<td>74</td>
</tr>
<tr>
<td>Solar PV</td>
<td>394</td>
<td>231</td>
<td>276</td>
<td>165</td>
<td>99</td>
</tr>
</tbody>
</table>

Countries with auction programmes and tenders

Mexico (2016) $38.8/MWh
Mexico (2016) $42.9/MWh*
Peru (2016) $37.2/MWh
Chile (2016) $29.1/MWh*
Chile (2016) $41.9/MWh*
Morocco (2016) $30/MWh
UK (2015) $69.35/MWh
France (2015) $95.1/MWh
Germany (2015) $87.35/MWh
Italy (2014) $95.62/MWh*
Dubai (2016) $30/MWh
Morocco (2016) $30/MWh
Egypt (2015) $41-50/MWh
Jordan (2016) $61-77/MWh
Abu Dhabi (2016) $24.2/MWh
Zambia (2016) $60.2/MWh
South Africa (2015) $38.32/MWh
India (2016) $76/MWh

*: Pay-as-bid auctions – price signal is lowest winning bid

Source: Bloomberg New Energy Finance
Renewable Energy Finance

Approach: Increase Access to Finance, Lower Cost of Finance

**Public**
- Loan guarantees
- Low-interest loans
- Accelerated depreciation

**Private**
- Standardized contracts
- Risk reductions
- New business models (securitization, leasing)

Source: Climate Policy Institute
How does USAID support scaling up?

- Design the **building blocks** into our new programs
- Improve our **knowledge** of what works
- **Innovate** the building blocks
- Change the way we **measure & report results**
USAID/RDMA’s programs to support scaling up of RE

**USAID Clean Power Asia: 2016-2021**

Goal: Create the enabling environment to scale grid-connected RE

- RE Target Setting
- Designation of RE zones
- Competitive procurement, smart incentives and other policy support
- Variable RE integration

**USAID CEADIR: Private Sector Window into NDCs: 2016-2017**

Goal: Promote catalytic business and financing models to accelerate private sector investment for RE development.

- Potential side event at Asia Clean Energy Forum, 5-7 June 2017 in Manila
Mr. Sithisakdi Apichatthanapath
USAID Regional Development Mission for Asia
Bangkok, Thailand
Tel: +662-257-3000
Email: sapichatthanapath@usaid.gov