Scaling Solar: A World Bank Group solution to accelerate private investment in utility-scale solar PV
Solar PV – a Great Solution for Emerging Markets

• Prices of crystalline silicon PV cells have dropped below $0.35/W* (from 76.67 $/W in 1977)

• Many developing countries benefit from excellent irradiation levels

• Short construction periods of 3-9 months vs. 2-10 years for thermal, hydro & geothermal

• There is a need for diversification of electricity generation source in many countries to avoid fuel price/ hydrology volatility

*As per BNEF market outlook of November, 2017
A Challenge for Developing Countries to Benefit

• Limited institutional capacity
• Lack of market scale
• Lack of competition
• High transaction costs
• High perceived risks and cost of capital
The Solution: Scaling Solar

Scaling Solar is a “one stop shop” program for governments to rapidly mobilize privately funded grid connected solar projects at competitive tariffs. The program brings together a suite of World Bank Group services under a single engagement based on a templated approach to create viable markets for solar power in each client country.
What Scaling Solar Delivers

### A “One-Stop-Shop” Approach
- Whole WBG in one packaged solution:
  - Advice
  - Tendering expertise
  - Documentation
  - Competitive financing and insurance
  - Risk management and credit enhancement
- Designed with both government and developers in mind
- WBG expertise and lessons learned worldwide embedded

### A Focus on Standardization
- Fully developed documentation quickly tailored to local needs drives speed
- Consistency across countries creates a single, ‘virtual’, large scale market to attract the largest and best global bidders

### De-risking to lower tariffs and ensure success
- Coordinated delivery to address both public and private sector constraints
- Projects substantially developed to lower risk for developers and government
- WB debt, insurance and guarantee products to lower investor risk and required returns
The Process: Potential for Generation in 2 Years

1. Project Preparation
   - Technical and economic analysis
   - Site investigation
   - Legal & regulatory analysis

2. Bid Preparation
   - Template tender and project documents
   - Attachment of financing, insurance, and credit enhancement

3. Tender Process & Award
   - Request for qualification
   - Bidder consultation
   - Request for proposals
   - Proposal review and award
   - Signing of project documents

4. Financial Close
   - Finalization of contracts
   - Final project approvals
   - Finalization of loan agreements, insurance, and risk management

5. Construction & Operation
   - Construction
   - Commissioning
   - Operations
# The Benefits of Scaling Solar

<table>
<thead>
<tr>
<th>Governments and Utilities</th>
<th>Project Developers and Investors</th>
<th>International Donors &amp; Development Partners*</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Speed</td>
<td>• Market creation</td>
<td>• Reach</td>
</tr>
<tr>
<td>• Customized process</td>
<td>• Reduced development time</td>
<td>• Leverage</td>
</tr>
<tr>
<td>• Certainty</td>
<td>• Level playing field</td>
<td>• Transparency</td>
</tr>
<tr>
<td>• Competitive fixed-rate tariffs</td>
<td>• Regional scale</td>
<td>• Impact</td>
</tr>
</tbody>
</table>

*Opportunities for donors include: funding transaction advisory (steps 1-3) or provision of capital grants to all bidders to lower tariffs and improve affordability
Scaling Solar Mandates

8 active mandates in 6 countries:

Zambia
- Project size: 2 projects for a total of 75.7 MW
- Tariff: Record-low 6USct/kWh
- Status: First project completed
Round 2 (300MW) under procurement

Senegal
- Project size: 60 MW under procurement
- Tariff: Record-low 4.7 USct/kWh
- Status: Financial Close reached in July, 2019

Madagascar
- Project size: 25 MW
- Status: Pre-qualified bidders selected

Ethiopia
Round 1
- Project size: 2 projects for a total of up to 250MW
- Status: Request for Proposals closed
Round 2
- Project size: 4 projects, total of up to 750MW
- Status: Request for Pre-Qualification closed

Uzbekistan
- Project size: 100 MW
- Status: Request for Proposals issued

Togo
- Project size: up to 90 MW
- Status: Mandate signed
Scaling Solar Tender Results in Zambia

9 months: Project preparation, tender delivery and award

Top 6 bids for the West Lunga Site | Mosi-oa Tunya Site

<table>
<thead>
<tr>
<th>Company</th>
<th>Bid 1 (USc/kWh)</th>
<th>Bid 2 (USc/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neoen</td>
<td>First Solar:</td>
<td>6.015</td>
</tr>
<tr>
<td>ENEL Green Power:</td>
<td>7.799</td>
<td>7.839*</td>
</tr>
<tr>
<td>Access</td>
<td>EREN Zambia 1:</td>
<td>8.288</td>
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<tr>
<td>MULILO Zambia PV1 Consortium:</td>
<td>8.400</td>
<td>8.400</td>
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<tr>
<td>EDF Energies Nouvelles:</td>
<td>10.040</td>
<td>9.985</td>
</tr>
<tr>
<td>SEP</td>
<td>AVIC Intl:</td>
<td>10.600</td>
</tr>
</tbody>
</table>

6.0USc/kWh non-indexed is equivalent to an average in current dollars over contract life of **4.8USc/kWh**

*Winning bids
## Scaling Solar Tender Results in Senegal

**60%** tariff reduction achieved in Senegal.¹

### Top 6 bids for the Kahone | Touba Site

<table>
<thead>
<tr>
<th>Bidder</th>
<th>Bid 1</th>
<th>Bid 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGIE</td>
<td>MERIDIAM:</td>
<td>3.802€c/kWh*</td>
</tr>
<tr>
<td>Nareva Holding</td>
<td>Abu Dhabi Future Energy Company PJSC “Masdar”:</td>
<td>3.890€c/kWh</td>
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<tr>
<td>Access Infra Africa</td>
<td>Total Eren S.A.</td>
<td>4.390€c/kWh</td>
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<tr>
<td>Actis Energy 4</td>
<td>Mulilo Group Holdings Proprietary Limited:</td>
<td>4.504€c/Kwh</td>
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<tr>
<td>Scatec Solar:</td>
<td>4.600€c/kWh</td>
<td>4.630€c/kWh</td>
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<tr>
<td>Acciona Energia S.A.:</td>
<td>5.793€c/kWh</td>
<td>5.164€c/kWh</td>
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3.8€c/kWh (4.7USc/kWh) indexed at 1.2% is equivalent to an average in current dollars over contract life of **4.3USc/kWh**

¹Based on previous solar PPAs.

*Winning bids*
Participating Developers Included:
Scaling Solar vs. Regional Benchmarks

Sub-Saharan Solar PV: Comparison of Tariff and Time to Market

- Projects past financial close
- Ongoing projects as of May, 2018
- Expected time to financial close

Note: Anonymous projects x, y and z are in different countries throughout sub-Saharan Africa
Next steps for interested governments

• Receipt of an Expression of Interest from Government
• Discussions to confirm and agree:
  • Suitability of Scaling Solar in country context
  • Sufficiency of stakeholder support (MoE, MoF, Utility, Regulator)
  • Identification of a government champion to drive the project
  • A timeline from mandate to selection of a Preferred Bidder
• Signing of a mandate with the World Bank Group to:
  • Conduct technical studies
  • Run a competitive tendering process complete with standardized documents and stapled financing
• Make initial payment for advisory services as per the engagement letter
• WBG team to run due diligence process and, after consultation and agreement from Government, tendering process

6-12 months: Expected timeline from mandate to selection of preferred bidder
Why Solar Is a Great Solution for IFC Markets

Cost: Price benchmark for fixed-axis, utility scale PV systems
(2016 $/W, DC)

Source: BNEF Global PV Market Outlook Q4, 2017
Why Solar Is a Great Solution for IFC Markets

Ubication: Favorable irradiation levels in many IFC Markets

Long-term average of: Annual sum

<table>
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<tr>
<th>&lt; 700</th>
<th>900</th>
<th>1100</th>
<th>1300</th>
<th>1500</th>
<th>1700</th>
<th>1900</th>
<th>2100</th>
<th>2300</th>
<th>2500</th>
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<tbody>
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<td>kWh/m²</td>
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Daily sum

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<th>&lt; 2.0</th>
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<th>3.0</th>
<th>3.5</th>
<th>4.0</th>
<th>4.5</th>
<th>5.0</th>
<th>5.5</th>
<th>6.0</th>
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Typical Construction Periods for Energy Sources
(in months)

- **Solar**
  - High: 3 months
  - Low: 9 months

- **Wind**
  - High: 6 months
  - Low: 9 months

- **Thermal <100MW**
  - High: 24 months
  - Low: 30 months

- **Large thermal**
  - High: 60 months
  - Low: 30 months

- **Small hydropower**
  - High: 60 months
  - Low: 36 months

- **Large hydropower**
  - High: 84 months
  - Low: 60 months

- **Geothermal**
  - High: 120 months
  - Low: 84 months
Global Average Fossil Fuel Prices since 2000

Source: World Bank Commodity Price Data
South Africa Case Study

Dramatic Tariff Reductions achieved through:

- Large, repeat allocation
  - Capacity build-up
- Strong competition
  - Tariff decrease
- Inclusive Framework
  - Proven bankable
- Program expansion
  - High investor interest

Capacity per round (MW)

- +1,900 MW of solar PV power

Tariffs per round (ZAR/kWh)

- Tariff drop of -76% over 4 rounds

# of bids received and success rate (includes wind)

- Surge in investor interest and increasing selectivity in bidders afforded

- Success rate:
  - Round 1: 53%
  - Round 2: 24%
  - Round 3: 18%
  - Round 4: 7%
Scaling Solar “Template” Documents

- **Engagement Letter & ToRs for specialized Consultants**
  - Government signs a Letter of Engagement with IFC’s Advisory Services
  - A World Bank Group team is put in place
  - Specialized consultants are hired based on existing Terms of References

- **Power Purchase Agreement & Government Support Agreement**
  - Documents designed as fair, balanced & bankable
  - Prepared by World Bank Group with support of Linklaters & Norton Rose independent review

- **Pre-Qualification Document & Request for Proposals**
  - Tendering documents are ready and have been designed to attract top tier developers and investors

- **Letter of Interest and Indicative financing terms**
  - Letter of Interest and Indicative financing terms

It is critical for this set of documents to be utilized in their template forms to achieve scaled, competitive solar power within 2 years.
The World Bank Group is uniquely positioned to deliver

The World Bank Group has a long track record working across power sectors, key stakeholders and unique challenges. IDA and IBRD support client country governments with financing and advice to extend access to electricity, expand least-cost generation, create sustainable regulation and leverage the private sector. IFC is experienced in developing bankable private power projects and has a substantial track record in both tendering and financing solar power plants. MIGA provides a range of political risk insurance products to attract private capital into emerging markets.

- **Regulatory reform**
  - Working to introduce sector reform and achieve sector sustainability
  - Strengthening utilities’ performance

- **Project structuring**
  - Setting the conditions to attract private investment
  - Advising governments on PPPs
  - Negotiating key contracts

- **Project Development**
  - The $150m IFC InfraVentures fund helps cover essential early-stage costs of frontier market projects
  - IFC’s Advisory Services advise Governments in Project structuring and helps balanced deals to be struck

- **Investment**
  - Financing projects through debt, equity and mobilization of resources from other sources
  - Obtaining concessional financing from multi-donor sources

- **Monitoring**
  - Assessing projects’ consistency with IFC’s Performance Standards on environmental and social issues
  - Tracking projects’ results and sharing the lessons for wider replication and impact