Building Blocks for Scaling Up Renewable Energy: Mobilizing Finance
OUTLINE

• How Renewable Energy Projects are Financed
• Key Trends in Financing Large Scale Renewable Energy
• USAID’s Role in Mobilizing Finance for Renewable Energy
• Discussion
How Renewable Energy Projects are Financed
Stages of RE Project Development

**Challenge: Increase number of well-structured, bankable projects for financing**

**Start-up**
- Pre-feasibility assessment, Conceptual studies, LOIs

**Financing:**
- Project sponsor/developer (equity)
- Multilateral/bilateral grants and technical assistance (e.g. USTDA, PIDG, SEFA)

**Development**
- Feasibility studies, preliminary engineering, resource assessment

**Financing:**
- Bilateral Funds (Public)
- Well-Capitalized Developers
- Multilateral/bilateral grants and technical assistance (e.g. USTDA, PIDG, SEFA)

**Project Structuring & Negotiation**
- Negotiation of PPA or Government Contract, Construction Contract, Implementation Agreements

**Financing:**
- Equity partners
- DFI/MDB (debt)

**Construction**
- Financing:
  - Equity partners
  - DFI/MDB debt
  - Commercial Banks
  - Bonds
  - Institutional Investors (Pension Funds, Sovereign Wealth Funds)

**Challenge: Provide long-term funding/exit options** (Commercial banks can no longer fulfill this role with new reg. requirements)

**Commercial Operation**
- Financing:
  - Bonds
  - Institutional Investors (Pension Funds, Sovereign Wealth Funds)
What Drives Investor Decision Making?

Core Decision Factor = Risk vs. Return

- Overall Portfolio Performance
- Diversify
- New Market Segments
- Core Interest: Return on investment (ROI)
- Core Interest: Invest in high growth sectors and countries
- Core Interest: Manage Risk
- Certainty
- Deploy Capital
- Strengthen Brand
- Bankable firms/projects
Cost of Capital – Expected IRRs for Projects

- 3-5% US BBB utility bond
- 5%-7% US junk bond
- 7% - 11%: Spanish on-shore wind market premium IRR
- 8.4%: Spain on-shore wind FIT IRR
- 8.6%: FIRR for AES Meghnaghat Bangladesh IPP
- 9% - 15%: Spain utility PV IRR
- 10%: Unlevered average IRR for solar PV projects in China
- 11%: Turkish on-shore wind FIT IRR
- 12% China on-shore wind IRR in 2011
- 14.5% Lake Turkana wind real IRR
- 16.5%: IRR Indonesia Tengarang 13 MW gas cogen IPP
- 17% real ROE 400 MW Nobelsfonteine wind
- 17-19% real IRR Aga Khan IPPs in Africa
- 18% Lake Turkana real equity IRR
- 18% IRR for Pakistan HUBCO
- 18% IPP Nigeria
- 19%: Turkish on-shore wind FIT IRR
- 20% Pakistan PPIB IRR for new IPPs
- 22% Okija IPP Nigeria

- 6.5%: IRR Saudi Electric Co. 1800 MW Riyadh IPP
- 8.5%: IRR Saudi Electric Co. 1200 MW Rabigh IPP
- 10%: Unlevered average IRR for solar PV projects in China
- 11%: Turkish on-shore wind FIT IRR
- 12% China on-shore wind IRR in 2011
- 13%: Indian on-shore wind IRRs
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- 3% 5% 7% 9% 12% 13% 15% 17% 19%
Project Risk and Mitigation Approaches

Risk and Mitigation Methods for Infrastructure Project Development

High Risk
- High Return
- Exploration Risk
- Land Ownership
- Regulatory & Institutional Risks

Moderate Return
- Developer Risk
- Fuel Availability
- Permitting Risk

Lack of Local Financing
- Project Cashflow and Financing Mismatch

Lower Risk
- Lower Return
- Contractor Risk
- Supply Chain Risk
- Export/Import Risk
- Political Risk

- Currency Risk
- Off-taker
- Creditworthiness
- Contract Breach

Project Phase
- Pre-Feasibility
  - Ex: Concept identification, pre-feasibility analysis, investor outreach, LOI
- Feasibility/Project Development
  - Ex: PPA and contract document negotiations, project financing
- Project Structuring and Negotiation
  - Ex: Legal entity formation, construction agreement, insurance agreements
- Construction
  - EX: Milestone review, verification of completion, construction bond removal
- Commercial Operation
  - Ex: Operating the asset, delivering energy to off-taker, receiving payment

Available Risk Mitigation Tools

- Technical Assistance
- Project Prep Facilities

- PPA Termination, Put-Call Clauses
- Political Risk Insurance
- Partial Risk Guarantee
- Currency Risk Hedging

- Performance Bond
- All-Risk Policy

- Payment Default Coverage
- Com’l Insurance (all-risk policy, property casualty, liability)
- Escrow Accounts
- Sovereign Guarantee
- First Loss Cap. Fund
Key Trends in Financing Large-Scale Renewable Energy
Trend #1: Securitizing Operating Assets

• Energy companies are spinning off their operating assets into yieldcos and operating companies, creating opportunities for different types of investors (e.g., income investors and socially responsible investors)
Trend #2: The Rise of Large Developers and On-Balance Sheet Financing

Experienced developers are winning the latest auctions

Winners of last three offshore wind auctions:
- Near-shore auction: Vattenfall ($55/MWh)
- Borssele I & II: Dong Energy ($66/MWh)
- Horns Rev III: Vattenfall ($81/MWh)

Source: Bloomberg New Energy Finance
Trend #3: The Growth of Green Bonds for RE

- According to the Climate Bonds Initiative, there are over $130 billion of green bonds for renewable energy outstanding.
- 36% of outstanding solar bonds and 60% of wind bonds have a tenor of 10 years or more.
- 70% of issuance was in USD ($41.8bn), RMB ($23.3bn) and EUR ($23.2bn), with bonds being issued in 21 different currencies.

### Trend #3: The Growth of Green Bonds for RE

<table>
<thead>
<tr>
<th>Issuer</th>
<th>2016 issuance</th>
<th>Use of Proceeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai Pudong Development Bank</td>
<td>RMB 50bn (USD 7.6bn)</td>
<td>Renewable energy, energy efficiency, low carbon transport, water and waste management, adaptation</td>
</tr>
<tr>
<td>European Investment Bank</td>
<td>USD 4.1bn (in CAD, EUR, GBP, SEK and USD)</td>
<td>Renewable energy, energy efficiency</td>
</tr>
<tr>
<td>Bank of China</td>
<td>USD 3bn (in RMB, EUR and USD)</td>
<td>Renewable energy, pollution prevention</td>
</tr>
<tr>
<td>Mexico City Airport Trust</td>
<td>USD 2 bn</td>
<td>Renewable energy, energy efficiency, low carbon buildings, water and wastewater management, pollution prevention, adaptation</td>
</tr>
<tr>
<td>Électricité de France</td>
<td>EUR 1.75bn (USD 1.9 bn)</td>
<td>Renewable energy</td>
</tr>
<tr>
<td>Iberdrola</td>
<td>EUR 1.7bn (USD 1.9 bn)</td>
<td>Renewable energy</td>
</tr>
<tr>
<td>TenneT Holdings</td>
<td>EUR 1.5bn (USD 1.8 bn)</td>
<td>Renewable energy transmission infrastructure</td>
</tr>
<tr>
<td>Toyota</td>
<td>USD 1.6 bn</td>
<td>Low emissions vehicles, hybrid vehicles, electric vehicles</td>
</tr>
<tr>
<td>Apple Inc.</td>
<td>USD 1.5 bn</td>
<td>Renewable energy, low carbon buildings, energy, waste, water</td>
</tr>
<tr>
<td>New York MTA</td>
<td>USD 1.4 bn</td>
<td>Low carbon transport</td>
</tr>
</tbody>
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*only includes green bonds that align with the Climate Bonds taxonomy

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2 Climate Bonds Initiative - COP22 Green Bond Directions report
Trend #4: Increased Role of DFIs and public financing companies in large scale CE

- In India, government sponsored development banks and financial institutions financed, such as the Industrial Development Bank of India and ICICI Bank, provided over 60% of the finance for the country’s renewable energy projects.

- In South Africa, the Development Bank of South Africa and Industrial Development Corporation were significant financiers of REIPP Program projects.

- DFIs and Public Finance institutions, including the International Finance Corporation, are issuing bonds to raise finance for renewable energy projects.
USAID’s Role in Mobilizing Finance for Renewable Energy
The Roles of USAID in Mobilizing RE Finance

- Advocacy
- Risk Mitigation
- Facilitating Linkages
- Thought Leadership
- Technical Assistance for Govts.
- Demonstration
- Technical Assistance for Firms
- Brokering/Facilitation
- Convening
- Transaction Support
Catalyzing Investment Funds: CrossBoundary Africa Energy Fund

• Invests capital in distributed solar projects (100 kW to 10 MW) that provide cheaper and cleaner power to African commercial and industrial enterprises.

• An “energy as a service” model, whereby African businesses can pay a monthly tariff for their power and avoid the large upfront capital costs of clean energy installations, saving working capital for business expansion and development.

• USAID provided $1.3 repayable grant as subordinated (i.e. “first-loss”) capital that is expected to leverage $10-15M in private sector debt and equity
Mobilizing Institutional Investment for RE - NASP

• USAID has partnered with the National Association of Securities Professionals (NASP), a U.S.-based membership organization supporting women and minorities working in the securities and investment industry.

• USAID and NASP will convene a first of its kind U.S. and Africa Institutional Investor conference in sub-Saharan Africa in 2017 to facilitate relationships that build the capacity of local investors and expose U.S. financiers to investment opportunities.

• The partnership will bring U.S. financial professionals to sub-Saharan Africa to help structure and advise on transactions and financial vehicles that support infrastructure development.
Supporting Green Bonds in Peru

• Beginning to work with COFIDE, the development bank of Peru, to prepare for and issue a green bond in local currency to Peruvian institutional investors (e.g., pension funds)

• Green bond proceeds would be used to fund climate-friendly infrastructure projects in the country, including renewable energy projects
Aggregating Municipal Energy Projects in Mexico

- Partnered with Evensen Dodge to develop bond bank, which is preparing municipal infrastructure PPP projects for financing and will issue a bond to Mexico institutional investors finance a portfolio of these projects.
THANK YOU
ASANTENI SANA