Accelerating Clean Energy Investment in India Through Innovative Green Bank Finance

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Coalition for Green Capital
No country should have to choose between standard of living and ending the age of carbon

Sources: Fractracker.org
India’s core power needs point to huge need for clean energy investment

Power Should Be:

- **Cheap**
- **Clean**
- **Plentiful**
- **Reliable**
$1 trillion of annual investment flows into fossil fuels, plus an additional half a trillion dollars in subsidies.
Instead, that same $1.5 trillion in total must be spent on renewables and clean energy every year.

Sources: OECD/IEA.
With technological development, this is now a political and business problem, not a technology problem.

Mobile communications was able to grow rapidly through political support and business change.

Just like mobile, renewables can be local and distributed.

Sources: Trak.in
India poised to become global model for sustainable growth & development

- **175 GW of renewable capacity installed by 2022**
- **100 GW of solar installed capacity by 2022**
- **Reduce emissions intensity by 33-35% by 2030 from 2005 levels**
- **40% installed generation capacity from non-fossil fuel based energy sources by 2030**
69% of electric generating capacity in India is from fossil fuels, mostly coal.

258 GW Total
34 GW Renewables

Installed renewable capacity growing at 18% per year for last 15 years

Recent rapid growth will have to accelerate to reach 175 GW of installed renewables by 2022.

**Required Growth in Renewable Capacity to Hit 2022 Target**

- 2,906 MW in 1999
- 23% Annual Growth
- 33,791 MW in 2014
- 175,000 MW in 2022

**Sources:** MNRE 2015 Annual Report.
Solar installed capacity growing 221% per year

Like renewables over all, solar growth will have to rapidly accelerate to hit 100 GW target.

Successful Indian policies to date will need to be supplemented to reach investment targets

$200 Billion by 2022
For Renewable Target

$1,450 - $2,200 Billion
by 2040
For Renewables & Efficiency

Sources: Greentech Media, IEA “India Energy Outlook 2015.”
Green Bank institutions attract and deploy capital and lower the price of clean energy

A green bank is a public financing authority that leverages private capital with limited public dollars to accelerate the growth of clean energy markets.

Deploy public capital efficiently to maximize private investment

Implement new market behavior and lower price to spark demand

Inefficient Capital Markets

Clean Energy Market

Tepid Consumer Demand
Dedicated institution, or set of institutions, needed to attract & deploy this capital, overcome barriers

**Overcome barriers and attract public and private capital**

- Institutional investors
- Development finance institutions
- Green Climate Fund
- Foreign governments
- Green bonds

**Deploy capital through innovative public-private structures**

- Lower price of clean energy
- Enable demand for clean energy
- Reduce risk with mitigation tools
- Leverage public capital (10 to 1 ratio and more)
- Increase energy access
Green banks use multiple structures to draw in more investment capital at better financing terms.
Why care about energy finance?

Electricity Price \approx \text{Finance Repayment}

CHEAPER FINANCING MEANS CHEAPER ELECTRICITY
Green Banks lower the cost of financing, make renewable electricity cheaper, more competitive

Sources: Lazard, Levelied Cost of Energy Analysis 8.0, September 2014.
Green Bank capital in action!

**Price of Solar (cents/kwh) with Increasing Green Bank Capital**

<table>
<thead>
<tr>
<th>Solar Install Cost ($/Watt)</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
</tr>
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<tr>
<td>$4.50</td>
<td>21.0</td>
<td>18.7</td>
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<td>13.3</td>
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<tr>
<td>$3.50</td>
<td>13.9</td>
<td>12.1</td>
<td>10.3</td>
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<tr>
<td>$3.00</td>
<td>10.3</td>
<td>8.8</td>
<td>7.2</td>
<td>5.7</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Notes:** Based on Brattle Model built for Connecticut solar market. Assuming Green Bank offers 2% debt for 15 years. Assumes Developer equity return of 15%, Tax equity return of 12%, total leverage of 40%, a commercial debt rate of 6%, 15-yr REC price of $0.030/kwh, and 6-yr incentive of $0.225/kwh.
Green Banks expand pool of viable projects with lower price and risk mitigation.

**Typical Capital Structure**

- **Economical Projects**
- **High Cost of Capital Pushes Prohibits Execution**

**Green Bank Capital Structure**

- Larger Pool of Economical Projects

**Technically Feasible Projects**
~20% lack electricity; 33% lack clean cooking – need capital, new business models for distributed energy

Green Banks use novel approaches, coordinate market actors to deploy distributed solutions

Notes: IEA World Energy Outlook – India.
Example: CGB’s Residential Solar Tax Equity Fund expands customer access to rooftop solar

- CGB created unique public-private financing platform
- Product enables local developers to offer financing to customers who otherwise would have to pay all upfront

Green Bank
- Subordinated Debt
- Loan Loss Reserve
- Equity

Private Investors
- Senior Debt
- Tax Equity

Residential Solar Lease Fund

Local Installers

Solar Customers
Example: Connecticut Green Bank grows distributed solar market with new financing solutions
Example: CGB’s C-PACE enables secure efficiency investment at scale

Centralized State-wide Green Bank Administration

Green Bank

Loan

Commercial Building

PACE Assessment

Tax Collector

Private Investors

Portfolio Securitization + Credit Support

Cash Purchase

Loan Payment

1

2

3

4
Green Banks help bridge the long gap between capital supply and demand for clean energy

**Green Bank Market Development Activity**

**Bridges Gap Between Supply & Demand**

- **Capital Supply**
  - Long terms, low rates
  - Customer segmentation
  - Targeted marketing
  - Advertising

- **Project Demand**
  - Easy application
  - Contractor training
  - Simple documents
  - Technical assessments
  - Project coordination
  - 100% financing
  - One-stop shop

All of this activity must occur to reduce barriers to demand – some can be done by green bank, some done by private partners.
In only 5 years, Connecticut Green Bank increased clean energy investment 20x per year!

Global Green Bank Investment: $40 Billion in next 5 years.
India can borrow, copy and share best practices from Green Banks around the world

Sources: OECD, “Green Investment Banks – Policy Perspective.”
Green Banks are quickly spreading across U.S.

Green Banks Operating Or Under Development/Consideration

CA
CO
CT
DE
DC
HI
MA
MD
NV
NY
RI
VT
VA
Global Green Bank Network just launched, hub for new Green Bank Development, knowledge sharing

- **Green Bank Creation**
  - Help Gov’t Create New Institutions

- **Attract Capital**
  - Connect Investors & DFIs with Green Banks

- **Know-How**
  - Best Practices & Data from All Green Banks
Thank You & Appendix

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