

The Potential of Institutional Investors to Help Meet India's Renewable Energy Targets



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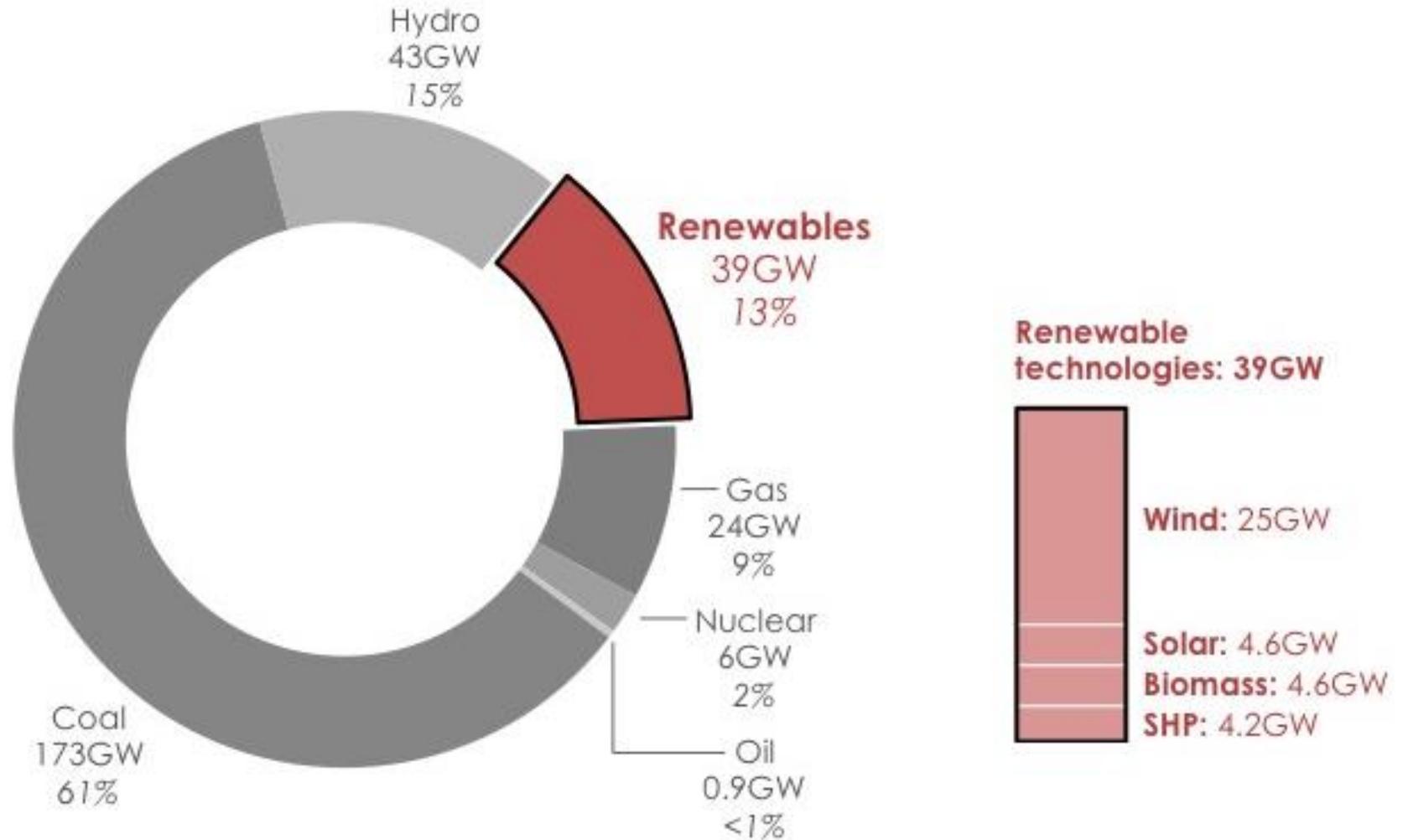
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About Climate Policy Initiative

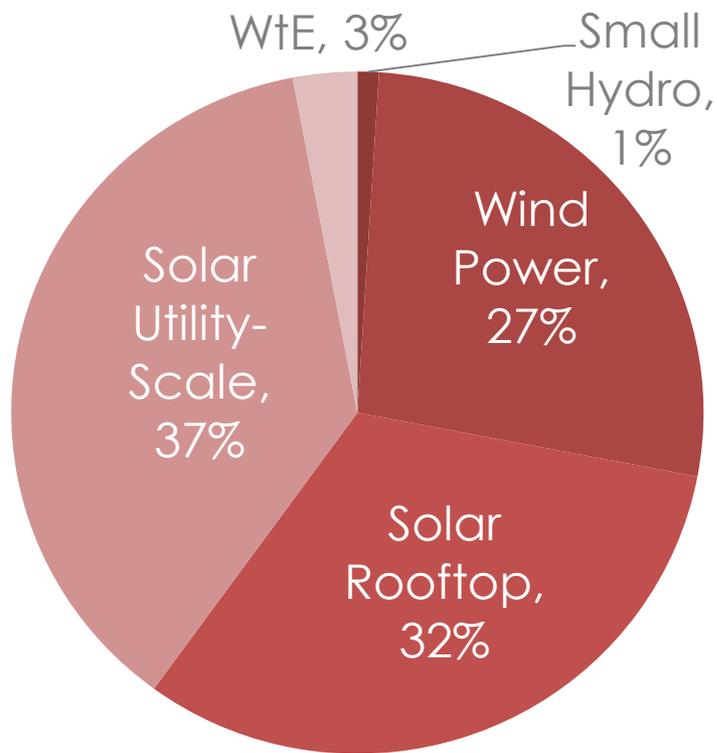
Climate Policy Initiative (CPI) works to improve the most important energy and land use policies around the world, with a particular focus on finance. We support decision makers through in-depth analysis on what works and what does not.

In India, CPI partners with ICRIER, the Indian School of Business, Shakti Sustainable Energy Foundation, and others to identify what works and what doesn't in Indian clean energy policy, and to find solutions to drive more finance.

India faces a growing electricity demand and overdependence on fossil fuels



In order to meet its renewable energy targets, India needs more availability of financing...



Investment required by technology type

Total investment required for 175 GW by 2022:

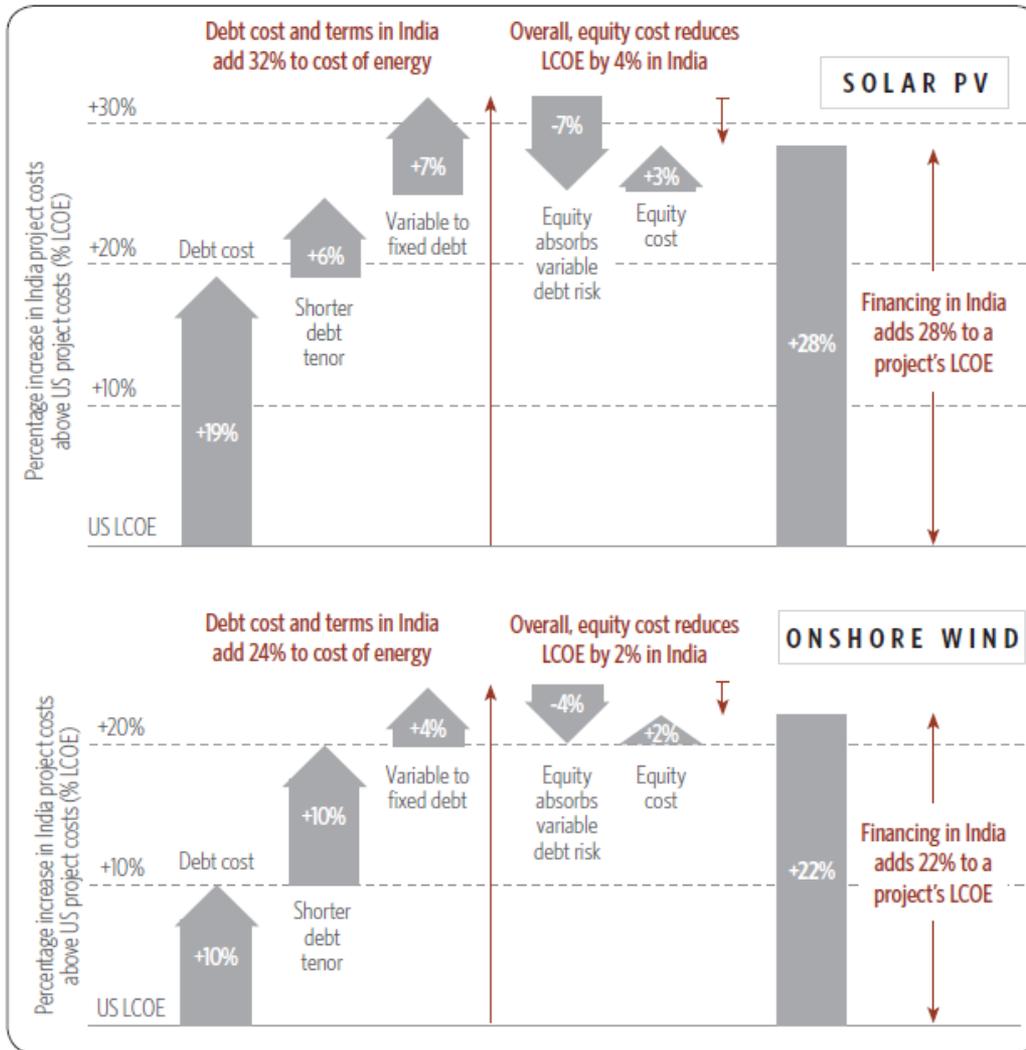
\$189 bn

Total expected investment:

up to \$166 bn

Preliminary analysis from forthcoming CPI study, July 2016

...and financing at more attractive terms.



The **high cost of debt** in India, including high and variable interest rates and short tenor of debt, adds **30%** to the cost of renewable energy.

CPI's program for increasing investment in India's renewable energy targets

1

Understand
potential investors in
renewable energy and
the barriers they face.

2

Explore policy
change solutions
to these barriers.

3

Develop financial
instrument solutions
to these barriers.

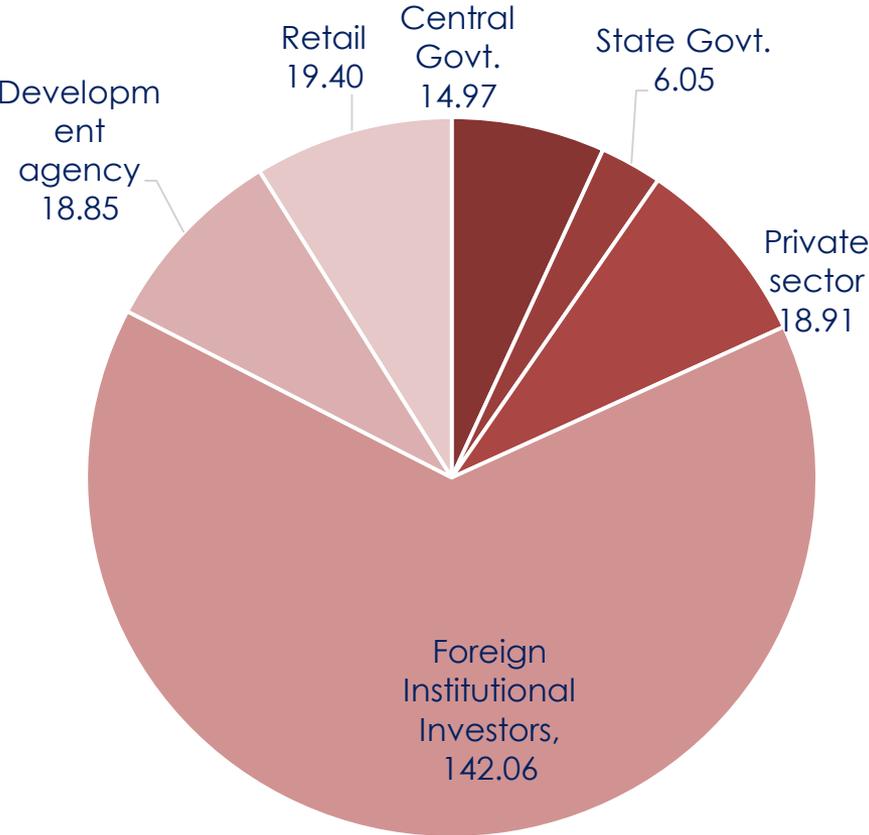
Summary of results

- In response to rising electricity demand, and to concerns around fossil fuel dependence, the government has set ambitious renewable energy targets of 175 GW by 2022.
- Meeting these targets will require significant investment.
 - \$189 billion required
 - \$166 billion expected
 - \$411 billion potential
- Institutional investors have significant potential to bridge this financing gap, but barriers to investment need to be addressed.

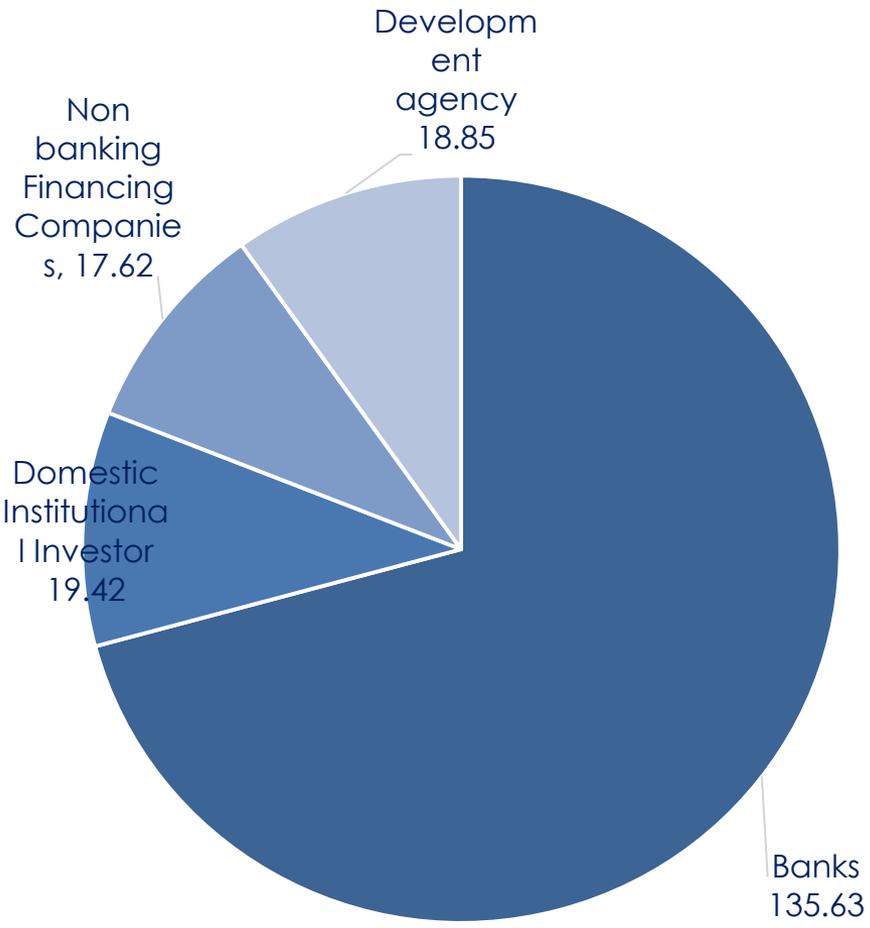
The total investment required to meet the targets by 2022 is \$189 billion.

Technology	Solar utility scale	Solar rooftop grid	Solar rooftop off-grid	Wind	SHP	(Bio +Bagg)	Total
Capacity (GW)	60	28	12	60	5	10	175 GW
Debt	49.19	27.76	14.90	35.84	0.69	4.03	\$132 bn
Equity	21.08	11.90	6.39	15.36	0.30	1.73	\$57 bn
Total	70.27	39.65	21.29	51.19	0.99	5.75	\$189 bn

Investment potential is \$411 billion, more than double the amount required



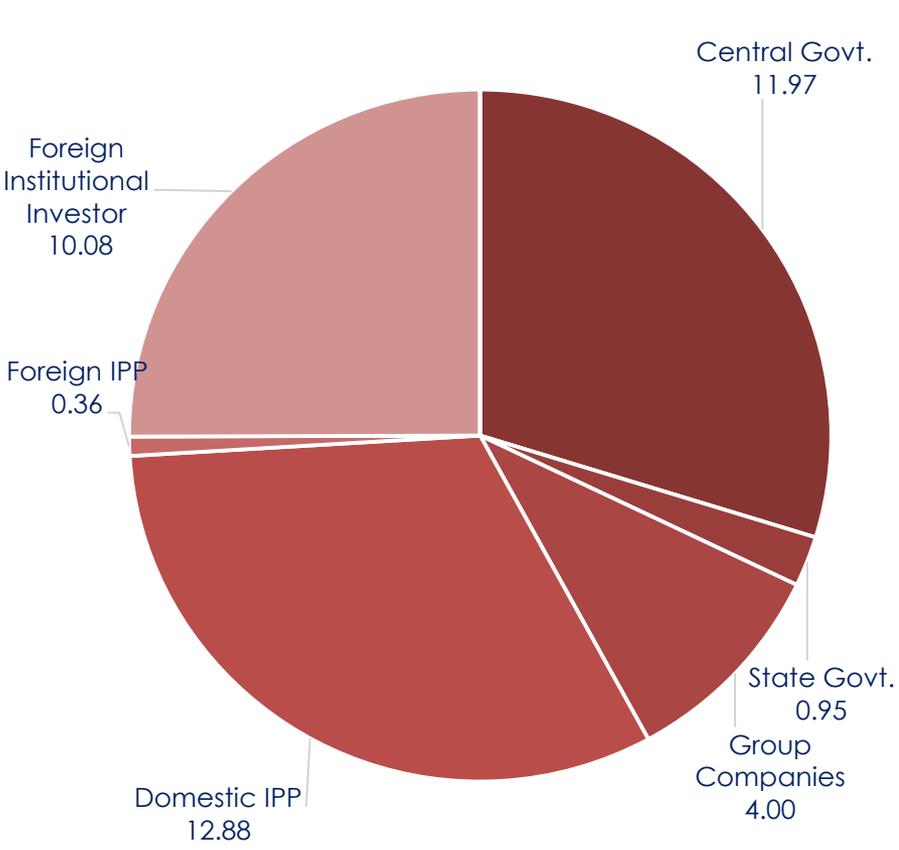
Equity (\$220 billion)



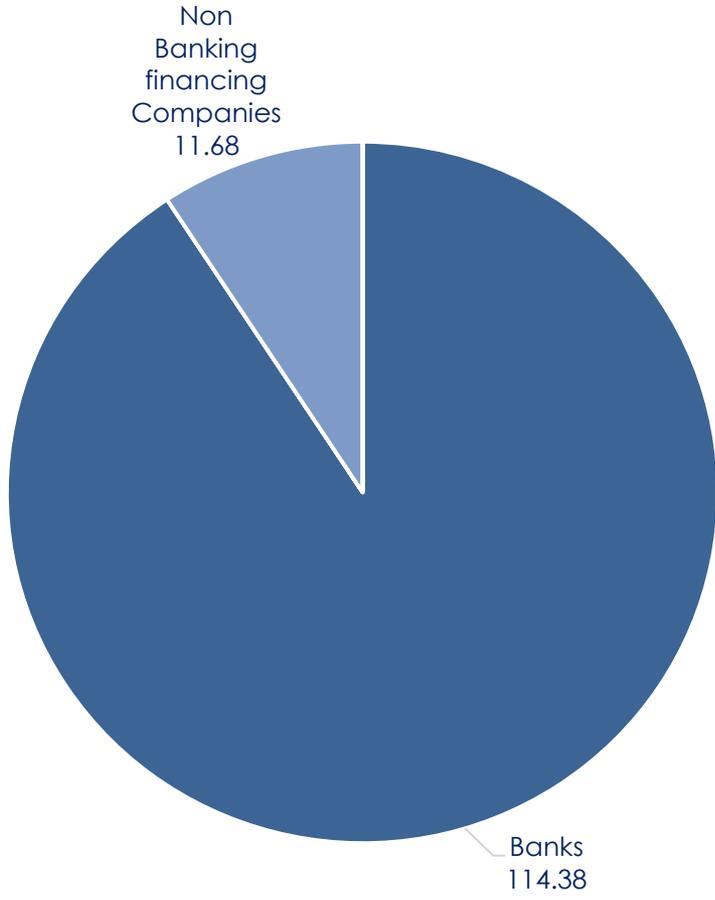
Debt (\$191 billion)

Expected investment is \$166 bn, a shortfall by 12% of the amount required

The shortfall in expected investments in equity is 41% (\$17 billion) and debt is 5% (\$6 billion).

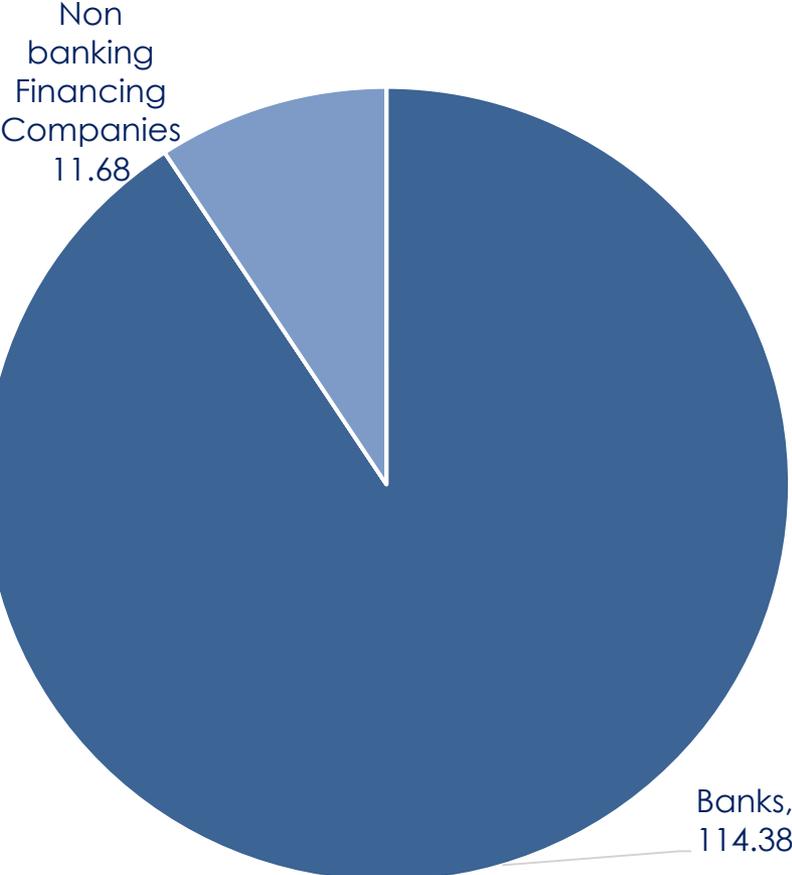


Equity (\$40 billion)

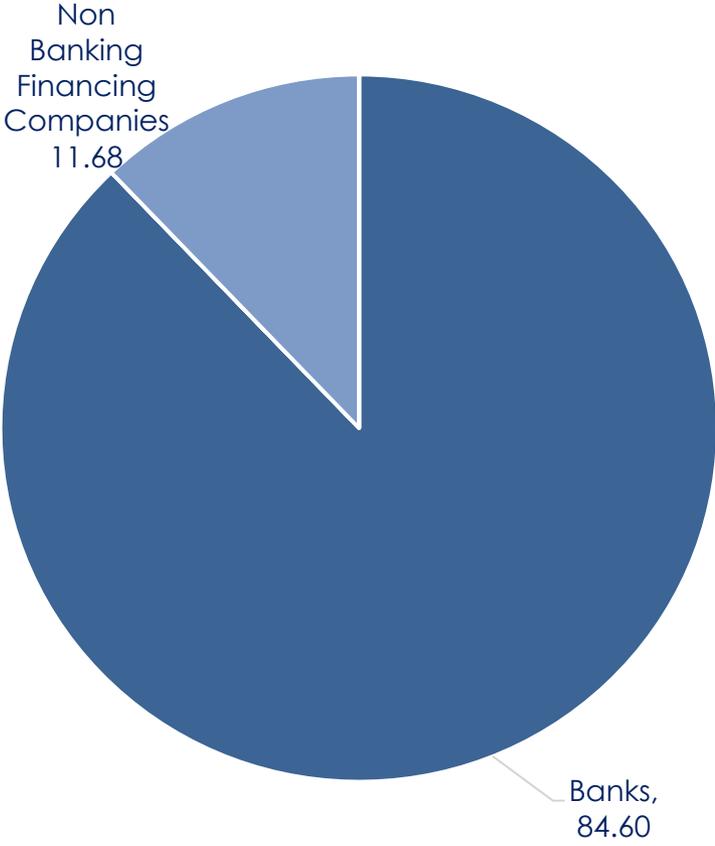


Debt (\$126 billion)

Banks are currently financing almost 88% (\$114 bn) of the debt requirement and are overexposed



Debt (\$126 billion)



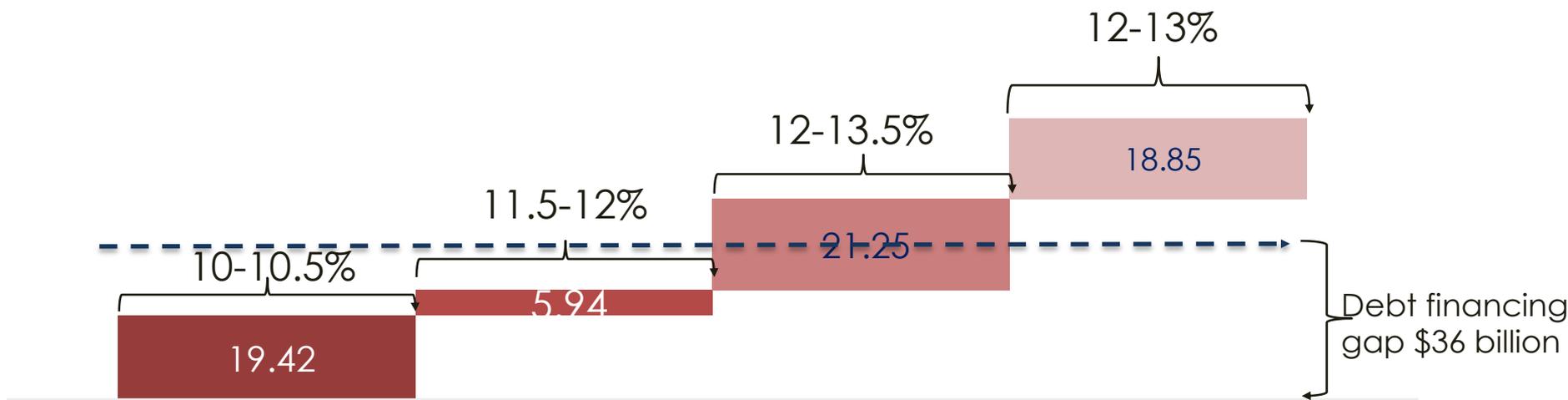
Debt (\$96 billion)

Considering that banks are stressed, their ability to finance debt may reduce to 64% (\$84.60 billion) resulting in a shortfall of 27% (\$36 billion).

Lowest cost debt should be prioritized to fill the debt financing gap

Domestic institutional investors, with the lowest cost of capital, have the ability to meet **54%** the debt financing gap.

Investor Category	Ability to fill gap	Cost of finance
Domestic institutional investors	\$19.42 billion	10-10.5%
Non banking financial companies (NBFCs)	\$5.94 billion	11.5-12%
Banks	\$21.25 billion	12-13.5%
Development agencies	\$18.85 billion	12-13%

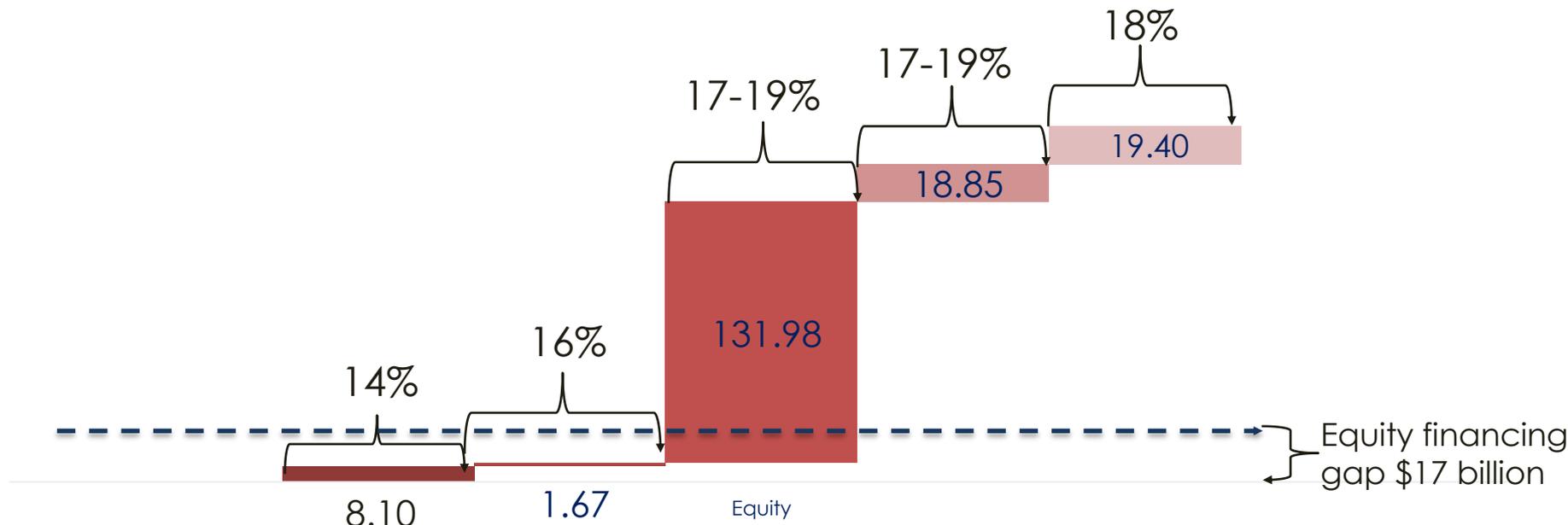


Debt

Lowest cost equity should be prioritized to fill the equity financing gap

Foreign institutional investors can meet **100%** of the gap, though govt. and private sector are the lowest cost options.

Investor Category	Ability to fill gap	Cost of finance
Government	\$8.10 billion	14.0%
Private sector	\$1.67 billion	16.0%
Foreign institutional investors	\$131.98 billion	17-19%
Development agencies	\$18.85 billion	17-19%
Retail investors	\$19.40 billion	18.0%



However, institutional investors face several key investment barriers

Foreign institutional investors

Severity of risks: 1 (highest) to 5 (lowest)

Barrier Categories	Severity	
Off-taker risk	1	Binary Risk
Lack of transmission evacuation infrastructure	2	
Currency risk	3	Non-Binary Risk
Regulatory/policy risk	4	
Unfavorable return expectations	5	

Domestic institutional investors

Barrier Categories	Severity	
Limited understanding of renewables sector	1	Binary Risk
Lack of intermediaries	2	
Lack of liquid instruments to invest in renewables	3	
Low credit rating of operational assets	4	Non-Binary Risk
Regulatory/policy risks	5	

Financial solutions to address these barriers

There is a strong need to develop a strong business case to attract institutional investors to invest in renewable energy.

Key risk	Solution	Impact on cost of financing
Off-taker risk	Payment security mechanism	100 basis points
Currency risk	Foreign exchange hedging facility	350 basis points
Lack of liquid instruments	Infrastructure debt fund for NBFCs	300 basis points
Low credit rating of operational assets	Partial credit guarantee	190 basis points

India Innovation Lab for Green Finance

P50 Risk Solutions

- A facility to reduce the cost and increase the amount of long-term debt for renewable energy projects by transferring resource risk from banks to insurers
- Potential to free up equity capital and thereby bring additional ~\$500mn of debt

Loans4SMEs

- A peer-to-peer lending platform to help small and medium enterprises operating in renewable energy and energy efficiency raise debt finance
- Potential to mobilize \$2.2bn of debt to the SME sector by 2022.

FX Hedging Facility

- Lowers currency hedging cost by targeting a particular tranche of currency risk – allows allocation of risks to suitable parties
- Can reduce cost of currency hedging by ~30% and has the potential to leverage public capital by 38 times.

Rooftop Solar Private Sector Financing Facility

- A financing facility to provide long debt financing at a reasonable rate to rooftop solar developers through aggregation of loan pools and securitization
- Can reduce the debt cost by 0.5-3% points and increase the tenor of debt by 3-5 years.

Policy solutions to address these barriers

Key risk	Solution
Transmission evacuation infrastructure issues, including curtailment	Planning, building, and managing of adequate transmission capacity
Problems faced in land acquisition	Easy/transparent mechanisms for land acquisition
Regulatory/policy risks	Unification of policy/regulations across center/state

Future Work

- Examine in detail into how the investment potential of institutional investors can be realized
 - Creation of a business case for institutional investors
 - Creation of pooled, listed vehicles, such as IDF-NBFC
- Design appropriate asset allocation models for various investor categories keeping in mind their preferred risk-return profiles
- Examine structures and characteristics of the proposed financing instruments to overcome barriers to their implementation
- Design policy level interventions to attract investment from non-traditional investor categories

Thank you!
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