CLIMATE POLICY INITIATIVE

ISB | Bharti Institute of Public Policy

Reaching India's Renewable Energy Targets Cost-Effectively: A Foreign Exchange Hedging Facility

Arsalan Ali Farooquee
Gireesh Shrimali

June 2015

Executive Summary

Acknowledgements

The authors thank CPI staff David Nelson, Ruby Barcklay, Maggie Young, and Amira Hankin for internal review. We thank Darrell Duffie, Timothy Irwin, and Robert Sheppard for their feedback and guidance. We thank participants in our primary research for their contribution. We also thank ISB for its continued support toward our research efforts. The views expressed in this paper are the authors' own.

Descriptors

Sector	Renewable energy finance
Region	India
Keywords	Currency hedging, renewable energy finance, India
Contact	Gireesh Shrimali: gireesh.shrimali@cpidelhi.org

About CPI

Climate Policy Initiative is a team of analysts and advisors that works to improve the most important energy and land use policies around the world, with a particular focus on finance. An independent organization supported in part by a grant from the Open Society Foundations, CPI works in places that provide the most potential for policy impact including Brazil, China, Europe, India, Indonesia, and the United States.

Our work helps nations grow while addressing increasingly scarce resources and climate risk. This is a complex challenge in which policy plays a crucial role.

About ISB

The Indian School of Business (ISB) is a global business school offering world-class management education across its two campuses – Hyderabad and Mohali. The School has grown at a rapid pace over the twelve years since its inception and already has several notable accomplishments to its credit– it is the youngest school ever to consistently rank among the top Global MBA programmes, the first institution in South Asia to receive the prestigious AACSB accreditation, one of the largest providers of Executive Education in Asia, and the most research productive Indian management institution. A vibrant pool of research-oriented resident faculty and strong academic associations with leading global B-schools, have helped the ISB fast emerge as a premier global Business school in the emerging markets. For more details visit www.isb.edu.

Executive Summary

India has ambitious renewable energy targets for 2022, but because of the government's limited budget, a cost-effective policy path is crucial to achieving those targets. Achieving India's renewable energy targets cost-effectively faces two key barriers – a shortage of debt and inferior terms of debt (CPI, 2012). The estimated availability of private capital for infrastructure investment during the 12th Five Year Plan is 27% lower than what's required (RBI, 2012). In addition, inferior terms of debt, specifically high cost, short tenor, and variable interest rates, increase the cost renewable energy in India by 30% compared to the US (CPI, 2012). This directly increases the cost of government support. More debt at attractive terms, specifically reduced cost, extended tenor debt, is needed to achieve India's renewable energy targets.

Reducing the cost of foreign debt by reducing the currency hedging cost can mobilize foreign capital and spur investments in renewable energy.

Foreign debt can increase debt available for renewable energy and can also provide a cheaper source of capital. However, when a renewable energy project is financed by a foreign loan, it requires a currency hedge to protect against the risk of devaluation. Market-based currency hedging in India is expensive, adding approximately 7 percentage points to the cost of debt. This makes fully-hedged foreign debt nearly as expensive as domestic debt.

Reducing the cost of foreign debt by reducing the currency hedging cost can mobilize foreign capital and spur investments in renewable energy by reducing the cost of capital. This would then reduce the delivered cost of renewable energy, making renewable energy more competitive with electricity generated from fossil fuels (CPI, 2012), as well as reduce the government cost of support (CPI, 2014).

The Indian government has recognized the role that cheaper currency hedging mechanisms can play in expanding renewable energy capacity.

There is an argument that governments should bear currency risk in some strategic situations, and participate in the provision of currency hedging. One reason is that macroeconomic conditions are key drivers of currency movements and foreign exchange rates, and government policy can influence macroeconomic conditions.

In the case of India, another argument for government-sponsored currency hedging is that bearing the currency risk for renewable energy offsets the risk the government (and the economy as a whole) takes on the currency risk related to future imported fossil-fuel purchases. This is particularly relevant for imported coal, which is the marginal fossil fuel that additional renewable energy is likely to replace (CPI, 2015).

The Indian government has shown interest in providing a government-sponsored exchange rate hedging facility. However, the design of the facility would be a large undertaking that has to be carefully considered, given that currency movements can be uncertain and volatile. In providing currency hedging for renewable energy projects, the government might consider the following questions: what are the expected costs and risks of providing such hedging? How can the government cover unexpected and extreme movements in foreign exchange rates? And what is the market risk premium for taking currency risks?

Governments can bear currency risk and provide currency hedging to lower the cost.

We provide insights into these questions by examining a government-sponsored foreign exchange rate (FX) hedging facility, which could be a cheaper and effective currency hedging mechanism. Under an FX hedging facility, the gover nment can provide project developers or off-takers (depending on the power purchase agreement) a currency hedging solution through a standalone fund that covers debt payments for underlying USD loans.

We analyze this FX hedging facility using a representative probabilistic model, whose key parameters are derived from the history of the INR-USD exchange rates, and of the future movements of foreign exchange rates.

Expected Cost of the FX Hedging Facility

The FX hedging facility, with an expected cost of 3.5 percentage points, may reduce hedging costs by nearly 50%, and the cost of government support by up to 54%.

Our analysis reveals that the expected cost – or the average cost across all potential outcomes represented by our probabilistic model – to provide a 10 year currency hedge via the FX hedging facility is approximately 3.5 percentage points per year, 50% below market rates.[1] At the current capital cost of solar energy, this amounts to 16% of the underlying loan amount.

The FX hedging facility would reduce the cost of renewable energy by reducing the cost of debt and, therefore, the cost of capital through a reduction in the cost of debt and an increase in the debt to equity ratio. This would then reduce the total cost of support – the total subsidies required – for renewable energy (CPI, 2014).[2]

The cost of government support can be reduced by up to 54%, and the cost of renewable energy by up to 19%.

The implications for the cost of renewable energy as well as for the cost of support for the government are:

- If the expected cost of the FX hedging facility is borne by the government, the cost of debt for the developer can be reduced by 7 percentage points, the cost of renewable energy by 19%, and the cost of government support by 54%.
- If the expected cost of the FX hedging facility is passed onto the developer, the cost of debt can be reduced by 3.5 percentage points, the cost of renewable energy by 9%, and the cost of government support by 33%.

Risks of the FX Hedging Facility

However, **the government should be aware of the risk exposure of the FX hedging facility.** Our results show that there are ways for the government to manage the risks to which the FX hedging facility is exposed. One way to protect against the risk of unexpected and extreme movements in foreign exchange rates, and to ensure that the FX hedging facility does not default, is a capital buffer, or a reserve. Based on our statistical model, for example, for the FX hedging facility to achieve India's current sovereign rating of BBB-, the cumulative capital buffer requirement for 10 years would be INR 14.26 million/MW, or almost 30% of the underlying loan amount.

The government should also be aware that the expected cost of the FX hedging facility of 3.5 percentage points doesn't take into account the cost of a capital buffer – i.e., the risk-premium that the market would place on maintaining this capital buffer. Using foreign exchange option pricing theory, we explicitly calculate the risk-premium as 2.76 percentage points, which largely accounts for the difference between the cost of currency hedging in the market and the expected cost of the FX hedging facility.

This project presents preliminary insights into a government-sponsored currency hedging facility as a potential way to lower the cost of foreign debt for renewable energy, and specifically into the expected costs, risks, and considerations for its design. We acknowledge that our estimates may not fully take into account exchange rate fluctuations resulting from catastrophic political and macroeconomic events; and, in particular, to the extent that these events are under the government's control, the government can also influence the related risks.

1 In the context of a probabilistic model, the expected (or average) cost means a statistic that is higher than 50% of the potential cost outcomes and lower than the other 50%.

2 This includes: the feed-in premium embedded in a renewable energy power purchase agreement; other subsidies such as an interest subsidy; and, changes in taxes.

References (Executive Summary only)

CPI (2012). Meeting India's Renewable Energy Targets: The Financing Challenge. http://climatepolicyinitiative.org/publication/meeting-indias-renewable-energy-targets-the-financing-challenge/

CPI (2014). Solving India's Renewable Energy Financing Challenge: Which Federal Policies can be Most Effective? http://climatepolicyinitiative.org/publication/solving-indias-renewable-energy-financing-challenge-which-federal-policies-can-be-most-effective/

CPI (2015). Reaching India's Renewable Targets Cost-effectively. http://climatepolicyinitiative.org/wp-content/uploads/2015/04/Reaching-Indias-Renewable-Energy-Targets-Cost-Effectively.pdf