



A SECOND WIND FOR INDIA'S ENERGY MARKET: FINANCING MECHANISMS TO SUPPORT INDIA'S NATIONAL WIND ENERGY MISSION

India is struggling with skyrocketing energy demands, declining energy supplies, and peak load blackouts and shortages that limit energy access.¹ The country's recent economic growth has depended largely on fossil fuels, resulting in greater energy security concerns, higher electricity pricing, and increased pollution. At the same time, the Indian government recognizes that wind energy can be a significant clean energy resource. Supported by initial government policies, India is already the fifth-largest wind energy producer, achieving 20 gigawatts (GW) of installed wind power. Yet, much more can be achieved. India's wind energy production can grow at least four to five times its current level to achieve the country's 100 GW wind energy potential.² To achieve the higher potential, the government announced plans in 2014 to launch a National Wind Energy Mission. Designing strong policies and programs that attract investment is essential to scale wind power to reach 100 GW and to breathe new life into India's wind energy market.

India's renewable energy capacity is nearly 13 percent of total generation capacity. Of the total renewable energy generation, wind energy currently makes up the majority with nearly 70 percent. The country's 100 GW wind energy potential—almost half of India's total electricity generation capacity in 2013—reveals tremendous opportunities for solving India's energy crisis through a resurgence in wind

energy installations. Wind energy is also vital to diversifying India's energy mix and is a viable means to meet demands for clean, affordable energy that creates jobs as discussed in the 12th Five-Year Plan.

Investments in the Indian wind market have fluctuated as have government policies. Financiers invested more than Rs 18,700 crore (\$3.9 billion) in wind energy to add 3,200 MW

Wind mills in Jath, Sangli district
in Maharashtra, India



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of wind capacity in financial year (FY) 2011–12. However, in FY 2012–13, wind energy capacity additions plummeted to half of the previous year, with 1,700 MW and investments amounting to only Rs 97,000 crore (\$1.8 billion). The market slump was attributed to a rollback of key government fiscal incentives, including accelerated depreciation (AD) adjustments.³ However, reinstatement of the generation-based incentive (GBI) in 2013 and its subsequent disbursement toward the end of FY 2013–14 appear to have restored investors' faith and led to the addition of 2,212 MW of wind capacity in 2013. The fluctuating market investment driven by policy changes underscores that a stable policy regime is crucial to realizing the country's enormous wind energy potential.

This report analyzes the growth of India's wind market with a focus on financing mechanisms. The key findings are:

1. India's wind market responds to incentives such as AD and GBI. Hence, policy makers must be careful not to cut off support prematurely and risk backtracking on previous gains. The domestic experience with declining wind investments related to a shift from 80 percent to 35 percent AD underscores this point.
2. Poor enforcement of Renewable Purchase Obligations (RPOs) and uncertainty about the future of Renewable Energy Certificates (RECs) has reduced lender confidence.
3. The relatively high cost and low availability of debt in India has significantly increased the cost of renewable energy projects, presenting a major barrier to the expansion of the wind market.
4. Conducive land acquisition policies, as in the states of Gujarat and Rajasthan, are vital for attracting investments to the wind energy market.
5. In drafting the forthcoming National Wind Energy Mission, consistent policy signals and strong implementation mechanisms that incorporate multi-stakeholder views are essential to grow the wind energy market to achieve India's 100 GW wind potential.

Providing strong policy support and increasing financiers' confidence are critical to increasing renewable energy investments in India. Ensuring that the wind and solar industries are learning from each other's experiences can also help both markets grow while increasing create clean energy jobs and energy access. By working with financial institutions to establish effective financing policies, instruments and mechanisms, the Indian government and wind energy stakeholders can support and enable a needed resurgence in the wind energy market that can sustainably power its future and help mitigate climate change's worst impacts.

OVERVIEW: INDIA'S WIND ENERGY MARKET

Wind energy capacity for installed electricity generation totaled 20.23 GW of the total 234.6 GW of electricity generated in India in January 2014.⁴ While renewable energy sources together account for nearly 12.6 percent of total capacity, wind accounts for 8.7 percent. Among the Indian states, Tamil Nadu led with a total installed capacity of 7,251 MW, followed by Maharashtra with 3,472 MW, Gujarat with 3,384 MW, Rajasthan with 2,734 MW, and Karnataka with 2,312 MW in January 2014.⁵ In terms of additional annual capacity coming online, Maharashtra led in FY 2013–14 with 847 MW, thanks to favorable wind policies and strong renewable purchase obligation (RPO) compliance and enforcement.⁶

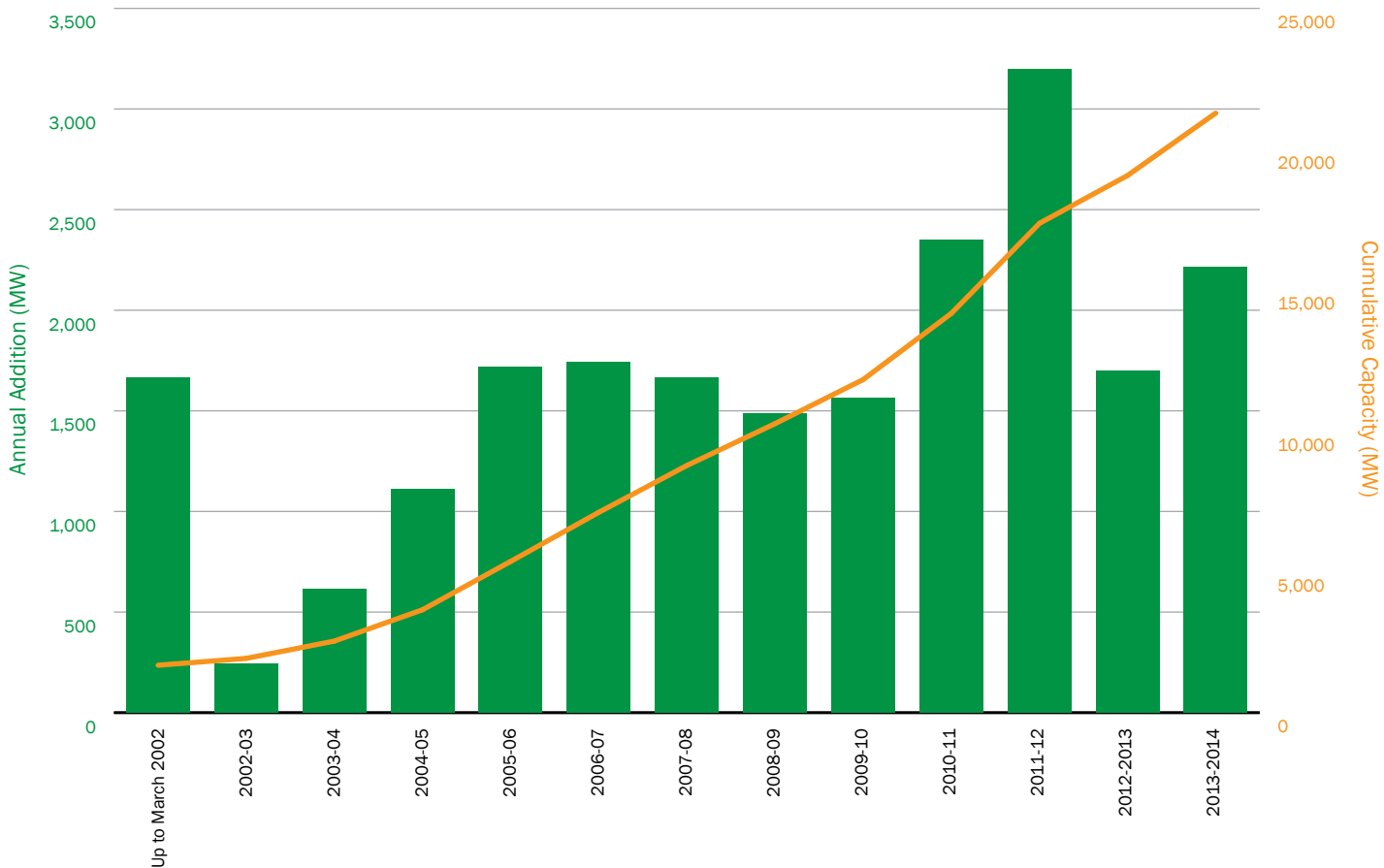
The wind energy market in India comprises a relatively tight stakeholder group. The stakeholder organizations include fewer than 20 main project developers that provide end-to-end turnkey solutions; independent power producers (IPP); policymakers and implementing agencies; turbine manufacturers, research and development institutes, and industry associations. As of 2010, the wind energy industry was estimated to be directly and indirectly employing 42,000 people in India. An additional 60,000 wind energy jobs will be needed by 2020, according to growth estimates from the Ministry of New and Renewable Energy (MNRE).⁷ These clean energy jobs include project planning, development, construction, and commissioning.

Exploring Offshore Wind Energy and Repowering Wind Farms

Offshore Wind: The Ministry of New and Renewable Energy issued a draft policy for development of offshore wind energy in 2013. The offshore wind policy aims to deploy wind farms within territorial waters (12 nautical miles). It is estimated that India has the potential to develop 350 GW of offshore wind energy.⁸ A recent study conducted by the World Institute of Sustainable Energy estimates the offshore wind potential in Tamil Nadu alone to be 127 GW at 80 meters height, but this estimate has yet to be validated.⁹

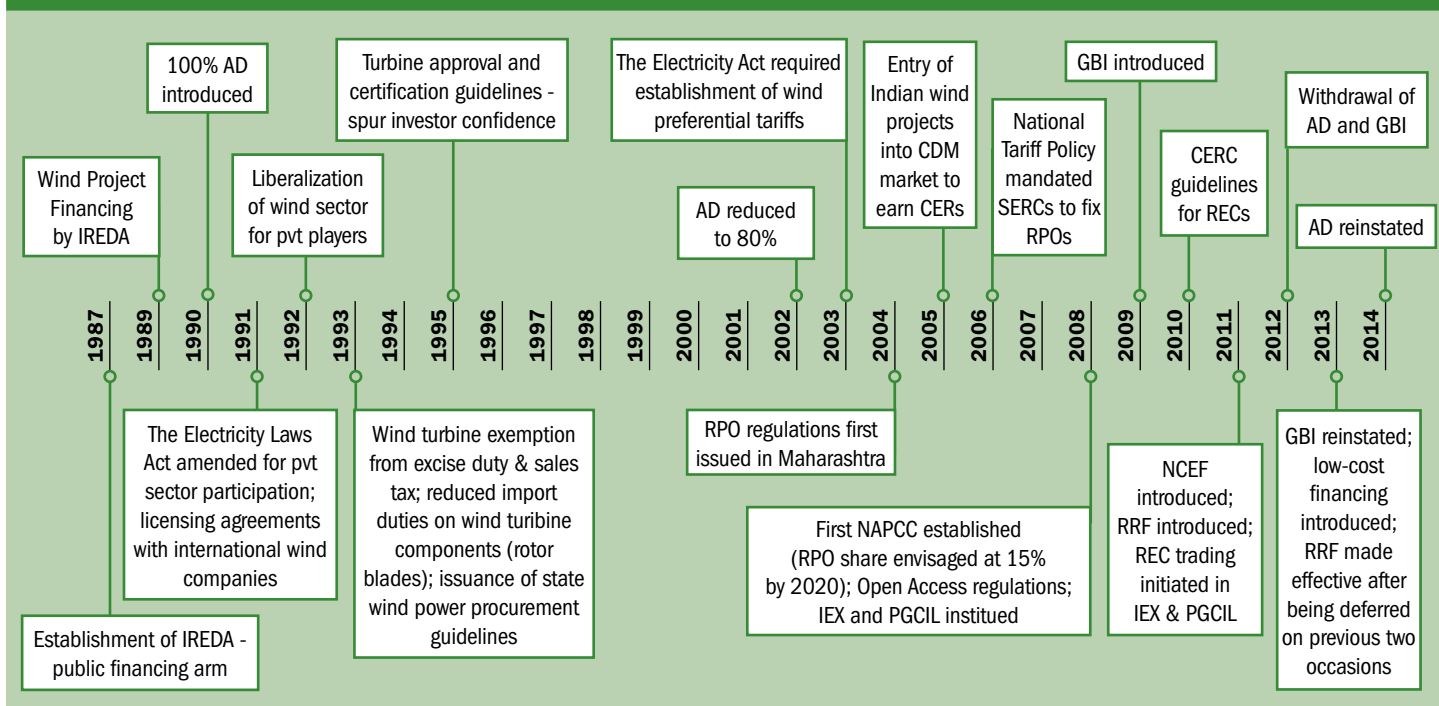
Repowering: Repowering low-capacity and aging wind turbines can lead to improved efficiency, grid integration, and higher energy yield. India's current repowering potential is estimated at approximately 2,760 MW, but there are numerous challenges related to disposal of old equipment, fragmented land ownership at existing wind farms, lack of clarity on the feed-in tariff offered to newly repowered projects, and constrained evacuation of the extra power generated.¹⁰ Addressing these policy and logistical challenges to repowering could provide an immediate wind energy opportunity.

Figure 1: Wind Installed Capacity has grown steadily in India



Source: National Institute of Wind Energy (NIWE), *Wind Power installed Capacity (MW) in India*, http://niwe.res.in/information_isw.php (accessed May 18, 2015)

Figure 2: Wind Financing Policy Evolution



Source: CEEW-NRDC research (August 2014).¹¹

KEY FINANCIAL MECHANISMS AND POLICIES FOR WIND ENERGY IN INDIA

ACCELERATED DEPRECIATION

In July 2014, the Indian government announced plans to restore the accelerated depreciation (AD) program, which could create up to 1,000 MW of wind power capacity and generate up to 30,000 direct and indirect jobs according to the Indian Wind Turbine Manufacturers' Association. From 2002 to 2012, the central government adopted an AD program, providing a tax benefit to project developers by reducing taxable income in the initial years of the project. Under the policy, independent power producers could take a tax benefit of depreciating 80 percent of their capital assets in the first year. The AD program supported market participation by large companies, small investors, and captive users (companies that generate power for their own use), leading to successful deployment of wind capacity (Figure 2). The government reduced the AD benefit to 35 percent from 80 percent in April 2012 for several reasons, including the perception that the wind market had reached scale and, in some cases, developers' misuse of the AD mechanism to receive tax breaks while sub-optimally operating wind farms. Subsequently, wind power deployment in 2012 and 2013 dropped by 47 percent and 31 percent, respectively, as compared with 2011.

GENERATION-BASED INCENTIVES

Starting in 2009, the central government adopted generation-based incentives (GBIs) of Rs 0.50 (~\$0.01) per kilowatt-hour for a period of 4 to 10 years, with a cap of Rs 10 million (~\$170,000 million) per MW. The total disbursement in a year cannot exceed one-fourth of the maximum limit of the incentive (i.e., Rs 2.5 million (\$4,000) per MW during the first four years). The objectives of the GBIs include broadening the investor base, incentivizing actual generation rather than merely the establishment of capacity, and facilitating entry of large IPPs and foreign direct investment to the wind energy market. The GBI scheme will be applicable for the remaining 12th Five-Year Plan period (2012–17), having a target of an additional 15,000 MW.¹²

NATIONAL CLEAN ENERGY FUND

Under the National Clean Energy Fund (NCEF), funded through India's coal tax, the MNRE allocates support to the Indian Renewable Energy Development Agency (IREDA). IREDA then disburses loans to wind and other renewable energy projects via banks at an approximately 8 percent interest rate, as opposed to the market interest rate of 13 to 14 percent. Renewable energy projects can receive a maximum of 50 percent of their funding through the NCEF.¹⁷

CLEAN DEVELOPMENT MECHANISM AND CARBON MARKETS

India has the second-largest number of wind power projects registered under the Clean Development Mechanism (CDM), which grants certified emission reduction (CER) units to clean energy projects under the Kyoto Protocol. As of May 2012, wind power accounted for 10 percent of all CERs issued to Indian CDM projects. This participation had spurred technology transfer of high-capacity wind turbines to India, although on average the capacity of wind turbines produced by Indian manufacturers remains below the capacity of manufacturers in other nations. Doubts raised over the future of the CDM market have dampened expectations of CERs as a viable revenue source.

RENEWABLE PURCHASE OBLIGATIONS AND RENEWABLE ENERGY CERTIFICATES

The Electricity Act of 2003 enacted mandatory Renewable Purchase Obligations (RPOs) supporting wind, solar and other clean energy sources for states. RPOs require a percentage of all electricity to be sourced from renewables and are met through direct purchase via bilateral contracts and the Renewable Energy Certificate (REC) mechanism. In 2010, the Indian government launched the REC program, which targets 15 percent renewable energy sourcing for electricity by 2020. RECs are purchased by distribution companies, open access customers (large scale consumers who can buy power directly from the open market), and

Debate over AD and GBI Programs

The 2012 modification to the AD and GBI programs provide project developers and IPPs the flexibility to use both mechanisms, with a 35 percent AD rate.¹³ The tradeoffs of the programs have been assessed with differing views. A recent analysis by the Indian School of Business and Climate Policy Initiative indicated that AD is more cost-effective in comparison to GBI because it is front-loaded (typically exhausted within four years of commissioning) and it allows the government to recover some proportion of the subsidy (through deferred tax payments in later years).¹⁴ However, one of the major drawbacks of AD is that, unlike GBI, it does not incentivize actual energy generation.¹⁵

On the other hand, a recent report by the Council on Energy, Environment and Water covering India's green industrial policies for wind and solar measured the net present value (NPV) of the total outlay while accounting for periodic subsidy (in GBI) and subsidy recovery (in the case of AD).¹⁶ The analysis indicated that in recent years, the fiscal outlay for AD (wind projects) was significantly higher than the outlay for GBI. Both instruments saw an equal interest from developers, and each led to the addition of 2 GW of capacity.

captive consumers to meet RPO obligation. A developer who sells wind-based electricity to the local distribution company can receive a GBI (Rs 0.50 per kilowatt-hour) and the state feed-in tariff (FiT)—the benchmark solar power tariff set by the MNRE. Alternatively, the developer can participate in the REC market, in which case its revenue stream would consist of the market value of the REC at the time plus a tariff on par with a conventional source of power, or a mutually determined price in the case of sale of electricity via open access.¹⁸ For wind, the price of 1 REC can range between Rs 1,500 (~\$25) and Rs 3,300 (~\$56).¹⁹

ADDITIONAL NATIONAL POLICY SUPPORT

The central government also provides the following supportive policies for the wind energy market:²⁰

- Income tax exemption on earnings from a wind energy project for 10 years.
- Concessional custom duty on certain wind turbine components such as gearboxes, yaw components, rotor blades (raw materials, parts, and sub-parts), and wind turbine controllers.
- Exemption of excise duty on wind energy generation.
- Allowable 100 percent foreign direct investment (FDI).
- Weighted income tax deduction for in-house research and development activity whereby wind turbine manufacturers may claim 200 percent of the costs incurred (other than for land and building).

National Wind Energy Mission

In early 2014, MNRE announced plans to launch a National Wind Energy Mission (NWEM) later in the year. The NWEM will operate differently than the National Solar Mission. Rather than inviting bidding for projects, MNRE will play the role of a “facilitator” to strengthen grid infrastructure for wind power, identify high wind power potential zones, clear hurdles for land issues, and regulate wind power tariffs. Measures such as accelerated depreciation (a valuable tax benefit that reduces current taxable income) that were curtailed in 2012 will be reintroduced under the NWEM.²¹

As with solar energy, there are many potential avenues to scale wind energy beyond the NWEM. States with large wind potentials—including Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Tamil Nadu—can introduce their own schemes to promote wind energy. State and central government policies can be implemented right from the start of the NWEM to ensure sufficient financing wind projects and avoid repeating the hurdles the National Solar Mission launch faced.

The proposed National Wind Energy Mission (NWEM) could be ideal for addressing financing issues for wind and could turn India into a global leader in wind energy production. MNRE can also develop the Mission’s policy instruments with direct engagement with financiers, state governments, developers, civil society leaders, and among other key stakeholders.

An Electricity Substation Dedicated to Wind Power in Jath, Maharashtra



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STATE POLICIES

Feed-in Tariffs: Developers who avail themselves of the MNRE's GBI of 0.50 per kilowatt-hour, can additionally receive a preferential tariff from the state distribution company to which they are selling electricity. Twelve state electricity regulatory commissions (SERCs) had declared a preferential FiT as of 2012. Several states have increased wind power tariffs by 2 to 15 percent to attract investments. This has subsequently shifted wind power projects from resource-rich states like Tamil Nadu and Gujarat to low-wind-density states like Rajasthan, Madhya Pradesh, and Maharashtra.

Reduced or No VAT: Tamil Nadu, Karnataka, Maharashtra, and Gujarat, among others, have policies that eliminate or reduce value-added tax (VAT) for wind turbine components.²²

Wheeling and Banking: For wind, wheeling charges (charges paid to the distribution company to use transmission infrastructure to send power from off-site locations) for the different states fall in the range of 2 percent (Madhya Pradesh and Maharashtra) to 7.5 percent (West Bengal). Tamil Nadu and Karnataka respectively allow 5 percent and 2 percent of the total wind energy fed to the grid to be banked energy that can be accessed anytime during the financial year.²³

Capital Subsidy: Maharashtra has the provision for a capital subsidy of 11 percent for wind energy project developments. Rajasthan provides soft loans equal to one-third of capital cost at low interest rates.²⁴

Green Cess Fund: The Maharashtra Development Agency (MEDA) has created a Green Cess (tax) fund. A part of this fund is used to create infrastructure for grid connectivity with proposed wind farms. Strong evacuation infrastructure promotes investments in wind.²⁵

WIND ENERGY FINANCING TRENDS

NON-RECOURSE FINANCING

The bulk of financing in the wind energy sector has been balance sheet financing because credit from private investors has traditionally been extended to wind power projects on the basis of the developer's balance sheet strength, rather than on the creditworthiness of the project itself. However, with the advent of IPPs, financial institutions are gradually beginning to consider non-recourse or limited recourse financing.²⁶ For example, IREDA (the public financing arm of the MNRE that offers loans to renewable energy projects at favorable rates compared with commercial lending) is financing wind projects on a non-recourse basis. Non-recourse lending by IREDA (for renewables including wind) increased from 6 percent in 2007 to 55 percent in 2011.²⁷ However, wind energy stakeholders have said that there is limited actual non-recourse finance available because guarantees are often given by a corporate sponsor. A recent non-recourse investment involved Standard Chartered Bank (SCB), International Finance Corporation (IFC), and DBS Bank arranging debt financing of Rs 3,579 million (\$80 million) for the IPP Simran Wind Project Ltd. Simran's wind projects in Tamil Nadu will sell power under the REC scheme. The transaction was one of the longest (10.5 years for SCB and DBS, 10 years for IFC) non-recourse project financings undertaken for a wind energy project in India, without any credit guarantees or credit insurance.²⁸

PRIVATE EQUITY (PE) FUNDING

Private equity investments in the wind energy market have experienced a surge since introduction of the federal GBI incentive in 2009—from no investors in 2010 to \$100 million in 2012 and \$200 million in 2013.²⁹ The top PE-funded company in 2013 was ReNew Power, an Indian project developer, which raised \$135 million from Goldman Sachs.

Land Acquisition and Wind Generation

To streamline land acquisition and attract investment, Rajasthan provides a 10 percent discount from market rates for land leases and land purchases for wind farms. Similarly, Gujarat, in its Wind Power Policy 2013, designates swaths of open land for wind development. Policies related to land acquisition can also deter investment, as seen in West Bengal, where policy design and implementation have resulted in unfavorable land rates for developers.

To improve wind generation, the Central Electricity Regulatory Commission (CERC) made the Renewable Regulatory Fund (RRF) mechanism effective in 2013. The RRF mechanism requires wind energy producers to schedule and forecast power generation on a day-ahead basis. Wind energy producers face unscheduled interchange (UI) charges if the actual generation deviates beyond +/- 30 percent from the scheduled generation. Wind developers assert that additional technical experience is needed to meet scheduling and forecasting requirements under the RRF. The mechanism's operation remains in flux with CERC limiting the applicability of UI charges until a future unspecified date. Investors and developers are concerned about the uncertainty of the UI charges and the RRF mechanism's effect on wind farm profitability.

Wind Mill Blade Ready for Assembly on a Construction Site in Jath, Maharashtra



Another notable beneficiary of private equity investments was NSL Renewable Power, which raised \$60 million through PE invested by Deutsche Investitions, FE Clean Energy Group, and IFC.³⁰ Bharat Light and Power raised Rs 200 crore (\$37 million) from investors including UTI Capital, VenturEast, and Draper Fisher Jurvetson.³¹ Morgan Stanley Infrastructure Partners invested \$210 million in Continuum Wind Energy in 2012, one of the largest PE investments of that year.³²

GREEN BONDS

To finance clean energy development including wind, IREDA plans to raise Rs 1,000 crore (\$16 million) in 2014 by issuing up to 20-year tax-free green bonds. Funding wind power projects with Indian government-backed green bonds could lower wind farm development costs by as much as 25 percent, according to research by the Indian School of Business and Climate Policy Initiative.

INITIAL PUBLIC OFFERINGS

Some renewable energy generation companies participate in the equity market via the initial public offering (IPO) route.³³ IPOs enable companies to drive down the cost of capital by accessing the huge pool of stock market investors. For example, in 2012, the Indian firm Infrastructure Leasing and Financial Services announced its plans to list its wind power business through an approximately \$325 million to \$406 million business trust IPO in Singapore.³⁴

MEZZANINE FINANCE

Mezzanine financing (debt capital that gives the lender the rights to convert to an ownership or equity interest in the company if the loan is not paid back in time and in full) could be an option for wind power projects if the amount of bank debt a developer can access is insufficient.³⁵ It is mostly provided in the form of convertible debentures, bonds, or preference shares. In 2013, Mytrah Energy raised \$17.5 million (preference shares) through mezzanine financing.³⁶

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DEBT REPAYMENT BY POOLING WIND FARM ASSETS

Currently, every wind farm in India is financed individually, and debt repayments can be made only from a specific project’s cash flow. Pooling wind farm revenue to service debt is considered more efficient by wind farm developers as it may reduce borrowing costs and also cut risk for lenders. CLP India (an IPP) has reached a joint agreement with three lenders—Standard Chartered, IDBI, and IDFC—to create a common pool of revenues from its wind farms to service debt. The company is the first wind-farm developer in the country to set up such a structure. The deal will enable CLP India to accelerate expansion, adding as much as 300 MW of new wind capacity a year to its portfolio of about 1,000 MW.³⁷

KEY INTERNATIONAL FINANCING MECHANISMS

Leading countries’ experiences in growing wind energy markets provide lessons for India to use in evaluating its own future policies. Due to their unique combinations of policies and incentives, the United States, China, Germany, and Spain all have wind energy markets larger than India’s, and each country has seen strong wind energy growth over the past half-decade. As of March 2013, China remains the world leader in wind power with total installations of around 80 GW. The United States has the second-most wind energy with 60 GW installed capacity, followed by Germany with 32.4 GW and Spain with 22.9 GW.³⁸

Key Wind Financing Institutions in India	
Type of Investor	Examples
Commercial banks	Public Sector Banks: SBI, Canara Bank; Punjab National Bank (PNB) Private Sector Banks: IDBI, ICICI Bank and YES Bank Foreign Banks: Morgan Stanley Infrastructure Partners; Standard Chartered; HSBC
Non-Banking Financial Company (NBFC)	IDFC; IREDA; PFC
Private Equity investors	Morgan Stanley Infrastructure Partners; IDFC; MCap Fund; PTC India Financial Services Ltd (PFS); Goldman Sachs; UTI Capital, Ascent Capital Advisors India Pvt Ltd; VenturEast and Draper Fisher Juvetson; FE Clean Energy; TVS Capital; Deutsche Investitions
Bilateral/Multilateral agencies	ADB; World Bank – IFC

Source: CEEW-NRDC research (June 2014)

UNITED STATES

Federal Tax Credits and Other Incentives: The federal wind energy production tax credit (PTC) offered by the U.S. government is an incentive of \$0.023 per kWh of electricity generated for the first 10 years of a wind farm's operations.³⁹ The PTC has resulted in significant economic benefits, most notably a tripling of wind capacity between 2007 and 2012 (representing an annual average investment of \$18 billion) and a 40 percent fall in the cost of wind electricity generation over the past three years. A congressional delay in extending the PTC significantly slowed the U.S. wind market in 2012. Reverberations continued to be felt well into 2013 due to the 18-month to 2-year commissioning timeline for wind projects.⁴⁰ In January 2013 the credit was extended for facilities coming online by the end of 2013, and wind production started to ramp back up around July of that year.⁴¹ Other federal policy incentives that have contributed to the early development of the U.S. wind energy industry, particularly in California, include the Public Utility Regulatory Policies Act (PURPA), investment tax credits, and accelerated depreciation.

State Renewable Portfolio Standards: In March 2010, California authorized utilities to use tradable renewable energy certificates (REC) to meet up to 25 percent of their renewable portfolio standard (RPS) requirements during 2011–13 and 10 percent for 2014–2016.

GERMANY

Feed-in Tariffs: Germany's support for wind energy comes through the country's Renewable Energy Act (Erneuerbare-Energien-Gesetz, or EEG). The EEG provides FiTs of €0.0893/kWh, with an annual degeneration of 1.5 percent. The FiT had been lowered in 2011 and the degeneration increased, primarily because the onshore wind energy sector was seen as a mature technology in Germany.⁴² As a result of FiT support, wind energy in Germany has grown faster than any other renewable energy source other than solar power.

Because the onshore wind energy industry requires less startup support, Germany is now focusing on boosting offshore wind energy through two tariff systems, providing €0.15/kWh for the first 12 years of operation or €0.19/kWh for the first 8 years. After the initial remuneration period, the FiT drops to €0.035/kWh.⁴³

SPAIN

Spain is the second-largest European wind energy market, after Germany, and has the fourth-largest installed capacity worldwide. The following policy and fiscal instruments have supported Spain's wind market through the 1990s and 2000s: tax-free depreciation of assets, reduction of income from certain intangible assets, local tax exemptions and FiTs. However, limits and the elimination of incentives over the past two years have led to a curtailment of new wind power installations.⁴⁴ In January 2012, Spain suspended its special registry of renewable energy projects due to budgetary concerns. Further, in February 2013, it withdrew the option to receive premium over-market FiT rates for renewable energy projects, which now receive only a fixed FiT with annual degeneration.

CHINA

Renewable Portfolio Standards: China's wind energy sector has grown at an exceptional pace since 2005.⁴⁵ The first Renewable Energy Law, enacted in 2006, specified renewable portfolio standards. Amendments to this law in 2009 obligated grid companies to absorb the full amount of renewable power produced. Deadlines and economic penalties are imposed on utilities failing to comply with the guaranteed-purchase requirement.⁴⁶

Land Availability: A wind power program running from 2003 to 2007 provided 25-year land concessions through annual competitive project bidding.

Feed-in Tariffs: Regional FiTs were introduced in 2009 based on available wind resources and applicable for the entire operational period of a wind farm. This sent a strong signal of long-term financial price stability to investors.

National Renewable Energy Fund: The government applies surcharges per kWh on electricity prices; this income is pooled with other national funding sources into a national renewable energy fund to finance FiTs for wind projects.

BRAZIL

Reverse Auction System: Brazil leads the Latin American market for wind energy and is ranked fourteenth globally with total wind capacity installations of 2.7 GW. The success of Brazil's wind market has been facilitated by a reverse price auction (a competitive bidding system) that was introduced in 2009 and attracted more than three times the investment of 2008. The auction system included financial penalties put in place to weed out speculators and unviable projects, which improved the attractiveness of the wind energy market.

Development Bank: Brazil has spurred wind energy investment through low-cost, long-term debt financing at a large scale with the help of the National Social Economic Development Bank.⁴⁷

FIVE KEY FINDINGS

- 1. Uncertainty around long-term policies and incentives, such as AD and GBI, has been the primary reason for declining investments in India's wind energy market.** Learning lessons from Spain, India must be careful not to cut off support prematurely and risk backtracking on previous gains. The domestic experience with declining wind investments related to a shift from 80 percent to 35 percent depreciation rates underscores this point.
- 2. Poor enforcement of RPOs and uncertainty about the future of RECs after 2017 has reduced lender confidence in the REC mechanism.** Experiences of China and the United States show that long-term national renewable energy policies and strong compliance with RPOs have served well to attract investments in wind. Indian states could also draw lessons from Rajasthan, which has specified a trajectory for RPOs (until FY 2016–2017) that is in line with India stated goal under the National Action Plan on Climate Change (NAPCC).
- 3. The relatively high cost and low availability of debt in India significantly increase the cost of renewable energy projects, presenting a major barrier to expanding the wind energy market.** Internationally, mechanisms such as green bonds, clean energy development banks, and tax credits have been effective in growing wind energy.

- 4. Conducive land acquisition policies, as in the states of Gujarat and Rajasthan, are vital for attracting investments to the wind energy market.** State government policies can effectively designate land for wind energy development while remaining responsive to local sensitivities and needs.
- 5. In drafting the forthcoming National Wind Energy Mission, consistent policy signals and strong implementation mechanisms that incorporate multi-stakeholder views are essential to advance wind energy.** In addition to stimulating the wind energy market in India, policies that support strong financing to scale wind energy are needed.

As demonstrated by recent policy shifts that dramatically slowed India's wind energy sector, strong and stable policy and compliance directives are needed to reinvigorate and sustain the market. The forthcoming National Wind Energy Mission can bolster investor confidence and provide that boost to support the wind energy sector. However, additional financing incentives and measures, land acquisition policies, and enforcement of RPOs would also enable the wind market to scale towards its incredible 100 GW potential in India. Together, through these policies, the Indian government and wind energy market participants can spark such a resurgence to sustainably power India's future, providing energy access, employment and energy security.

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AUTHORS

CEEW: Arunabha Ghosh, Rajeev Palakshappa, Poulami Choudhury, and Rishabh Jain

NRDC: Anjali Jaiswal, Bhaskar Deol, Nehmat Kaur, and Meredith Connolly

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Natural Resources Defense Council

40 West 20th Street
New York, NY 10011
212 727-2700
Fax 212 727-1773

www.nrdc.org



Council on Energy, Environment and Water

Thapar House
124 Janpath
New Delhi 110001
+91 11 40733300
Fax: +91 11 40733399

www.ceew.in

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