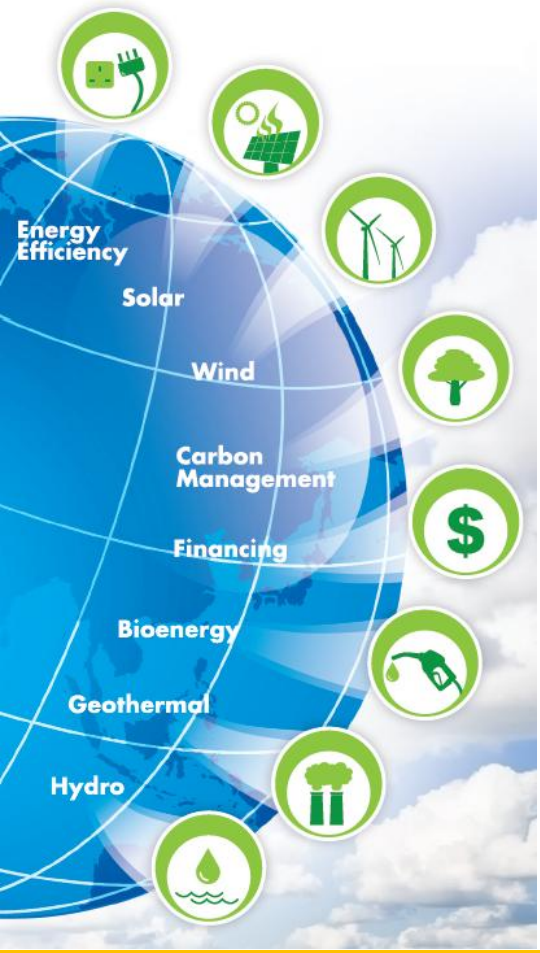
Clean Energy Market Intelligence & Project Access

Country Report Update

India
2012 Update



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ACRONYMS & ABBREVIATIONS

ADB	Asian Development Bank
B	billion
BAKOREN	National Energy Coordinating Board
BAPPENAS	National Development Planning Agency
BAU	Business as Usual
BEE	Bureau of Energy Efficiency
BPPT	Agency for Assessment and Application of Technology
CDM	Clean Development Mechanism
CECEP	China Energy
CECIC	China Energy Conservation Investment Corporation
CER	Certified Emission Reduction
CFL	Compact Fluorescent Lamps
CFO	Carbon Finance Operation
CSP	Concentrated Solar Power
CTF	Clean Technology Fund
DAE	Department of Atomic Energy
DBP	Development Bank of the Philippines
DENR	Department of Environment and Natural Resources
DNA	Designated National Authority for CDM
DOE	Department of Energy
DOST	Department of Science, Technology and Environment
DPL	Development Policy Loan
EE	Energy Efficiency
EE&C	Energy Efficiency and Conservation
ERAV	Electricity Regulatory Authority of Vietnam
ESCO	Energy Service Company
EVN	Vietnam Electricity
FI	Financial Institution
GCM	Generation Competitive Market
GHG	Green House Gas
GOI	Government of Indonesia
GoI	Government of India
GOP	Government of the Philippines
GW	Gigawatt
IFO	International Funding Organization
IGCC	Integrated Gasification Combined Cycle
IIFCL	India Infrastructure Finance Company Limited

Acronyms & Abbreviations

IPP	Independent Power Producers
IREDA	Indian Renewable Energy Development Agency
IRES	Indonesian Renewable Energy Society
IT	Information Technology
kWh	Kilowatt Hours
LBP	Land Bank of the Philippines
LFG	Landfill Gas
M	million
MARD	Ministry of Agriculture and Rural Development
MDB	Multilateral Development Banks
MEMR	Ministry of Energy and Mineral Resources
MHA	Ministry of Home Affairs
MNRE	Ministry of New and Renewable Energy
MOE	Ministry of Environment
MOF	Ministry of Finance
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MoP	Ministry of Power
MPI	Ministry of Planning and Investment
MW	Megawatt
NAPCC	National Action Plan on Climate Change
NAPOCOR	National Power Corporation
NDRC	National Development and Reform Commission
NEA	National Energy Administration
NEC	National Energy Commission
NEECP	National Energy Efficiency and Conservation Program
NEP	National Electrification Policy
NHPC	National Hydroelectric Power Corporation
NPCI	Nuclear Power Corporation of India
NTPC	National Thermal Power Corporation
ODA	Official Development Assistance
PD	Presidential Decree
PFC	Power Finance Corporation
PIU	Project Implementation Unit
PLN	Indonesian State Electricity Company
PPA	Power Purchase Agreement
PPC	Provincial Peoples Committees
PPP	Public Private Partnership
PRC	People's Republic of China
PSU	Power Sector Undertaking
PV	Photovoltaic
RA	Republic Act
RE	Renewable Energy
REAP	Renewable Energy Association of the Philippines
REMB	Renewable Energy Management Bureau
RPO	Renewable Purchase Obligations
RPS	Renewable Portfolio Standard
SBV	State Bank of Vietnam
SERC	State Energy Regulatory Commission
SOE	State-Owned Enterprises

SPV	Solar Photovoltaic
TA	Technical Assistance
TCE	Ton Coal Equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value Added Tax
VIP	Vietnam, Indonesia, Philippines
VNEEP	Vietnam National Energy Efficiency Program
WB	World Bank
WBG	World Bank Group
WESM	Wholesale Electricity Spot Market

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REGIONAL UPDATE

REPUBLIC OF INDIA

Renewable Energy & Energy Efficiency Highlights

- Clean energy investments in India reached $10.3 billion in 2011, a 52% increase since 2010. The largest increase in investment went to solar plants, as noted with a total investment of $4.2 billion last year. Over the next decade, India is expected to attract $169 billion in cumulative private investments.

- Annual clean energy investment in India is forecasted to grow by as much as 763% over the next decade under enhanced RE and EE policies.

- As of June 2012, total installed generating capacity of non-hydro renewable energy (RE) is just above 24,503. Non-hydro RE accounts for 12% of total installed generating capacity, with wind and solar being the largest contributors. Although not counted in the above RE estimate, hydropower accounts for just below 20% of total capacity.

- The Indian government set ambitious targets for the RE sector in the 12th 5-Year Plan. The plan aims to add 18,500 MW with expectation that the 13th Plan will see an additional 30,000MW of RE.

- Currently, India has the 5th largest wind generation capacity in the world. About 50% of non-hydro RE is accounted for by wind power. In the 12th Year Plan, the government of India seeks to add an additional 5,000 MW by 2015.

- After launching the Jawaharlal Nehru National Solar Mission, India seeks to become one of the leading solar countries in the world. The National Solar Mission, which aims to facilitate private sector investment in the solar industry, is expected to install 20,000 MW of solar power by 2022.

- There are significant EE targets in the 12th Year Plan. Of high importance are the new and stricter targets in the industrial sector (the largest consumer of energy in India).

- India is keen to incorporate the carbon mechanism in all its clean energy projects and already has the second largest number of projects registered for the Clean Development Mechanism (CDM).

India Energy Sector Background

At present, India's total generating capacity is 202,979MW. With a growing economy of about 8-9% per annum, India's energy sector is increasing in parallel. However, India continuously fails to meet the demand, as India can't keep up with the growing energy demands. In 2011, India finished the year with an energy deficit of 8.5%. Due to this large shortage, the government is unceasingly working on efficient action plans to sustainably meet its power demands.

In India, 56.55% of the generating capacity comes from coal, 19.24% from hydropower, 9.19% from gas, 2.35% from nuclear, negligible amounts from diesel and the rest from renewable energy (RE). Although India is fossil fuel centric, India is focusing its efforts on RE as well. As of May 2012, the total installed RE capacity was 24,503.45MW, just above 12% of the total generating capacity. India is one of the top five countries in the world for installed capacity of RE.

The table below shows the total installed capacity for different energy sectors among the five regions of India. Among these regions, the Western region generates the largest portion of the total installed capacity, followed by the Northern and Southern regions.

Table 2.1: India's Power Generating Capacity (MW) as on May 31st, 2012

Source	Northern	Western	Southern	Eastern	N. Eastern	End of 11th Plan (31.03.12)	Capacity for All India (MW)
Coal	30,0017.5	39,484.5	22,882.5	22,337.88	60.00	112,022.28	114,782.38
Gas	4,421.26	8,254.81	4,962.78	190.00	824.2	18,381.05	18,653.5
Diesel	12.99	17.48	939.32	17.2	142.74	1,199.75	1,199.75
Nuclear	1,620.00	1,840.00	1,320.00	0	0	4,780.00	4,780.00
Hydro	15,192.75	7,447.50	11,338.03	3,882.12	1,200.00	38,9990.40	39,060.40
RE	4,391.40	7,909.95	11,569.30	398.71	228.00	24,503.45	24,503.45
TOTAL	55,655.90	64,954.24	53,011.93	26,825.94	2,454.94	199,877.03	202,979.03

Source: Central Electricity Authority

To be able to meet the growing energy demands, the Indian government, under the 12th Plan, has established targets for the increase of power capacity. Beginning in 2012, India seeks to add 76,000MW by 2017 and 93,000MW by 2022. Below are the first year targets and India's achievements up until May 2012.

Table 2.2: India's Generation Capacity (MW) Addition Target/Achievement (2012-2013)

	Hydro	Thermal	Nuclear	Total
2012-2013 Target	802.00	15,154.30	2,000.00	17,956.00
Achievement up to May 2012	70.00 (8.73%)	2,820.00 (18.61%)	0 (0%)	2,890.00 (16.09%)

Source: Central Electricity Authority

The industry sector is the single largest consumer of electricity in India with 38% of total consumption. The industry sector is followed by the domestic consumption, which accounts for 24%, agriculture 22%, public service 3%, and railways 2%.

According to the government, 86% of India is electrified. However, the government's definition of electrification is when at least 10% of houses in a village have electricity. Thus, a more cohesive estimate is that of 2009, which states India is only 66.3% electrified, with the least powered places situated in the rural parts of Northeast India.

Power Sector Structure & Regulation

The Electricity Act of 2003 is the major legislation currently covering generation, transmission and distribution of electricity in India. Along with this policy, a number of other policies have been crafted to further advocate rural electrification in India.

- National Electrification Policy of 2005: obligates the power sector to supply electricity to all areas, including rural areas.
- Rural Electrification Policy of 2006: states that for villages where grid connectivity would not be feasible or cost effective, off-grid solutions based on stand-alone system may be taken up for supply of electricity.
- National Tariff Policy of 2006: deals with various parameters with respect to the fixation of tariffs.
- Ultra Mega Power Projects: strives for power for all by 2012, which would entail the addition of at least 100,000MW.
- Renewable Energy Certificates (REC) of 2011: essential for states and utilities to meet their Renewable Purchase Obligation. Trading of RECs in power exchange began on March 2011.

According to the Ministry of Power, 86.5% of India's total installed capacity is publicly owned. The state government owns about 52.5% of the power sector, while the national government owns 34%; the rest is owned by private enterprises. Most of the government companies are owned by Public Sector Units such as National Thermal Power Corporation, National Hydroelectric Power Corporation and the Nuclear Power Corporation of India Ltd.

The table below illustrates additional key government agencies that provide assistance and finance to various power generation and transmission projects in India.

Table 2.3: Key Government Agencies Relevant to the Power Sector

Agency	Key Role relevant to Energy Sector
Ministry of Power (formerly known as Ministry of Energy)	Responsible for perspective planning, policy formulation, and enactment of legislation for thermal and hydropower generation, transmission and distribution
Ministry of Coal	Responsible for policies and strategies in the exploration and development of coal and lignite reserves
Ministry of Petroleum and Natural Gas	Responsible for exploration and production of oil and natural gas and conservation or petroleum products and liquefied natural gas
Ministry of New and Renewable Energies (MNRE)	Responsible for development and deployment of new and RE that will supplement the energy requirements of the country
Department of Atomic Energy (DAE)	Responsible for development, control and use of atomic energy for the welfare of the people of India
National Thermal Power Corporation (NTPC)	India's largest power generation company with total installed capacity at 32.2GW from 15 coal-based and 7 gas based stations located across the country
National Hydroelectric Power Corporation (NHPC)	NHPC is focused on the development of hydroelectric power and plans to add 5,322MW during the 11th Plan period
The Rural Electrification Corporation Ltd	Exclusively responsible for implementation of rural electrification programs
The Power Finance Corporation (PFC)	Responsible for financing large thermal and hydro projects
The Indian Renewable Energy Development Agency	Mainly focuses on financing RE projects
India Infrastructure Finance Company Limited (IIFCL)	Mandated as a lender of last resort to public private partnership-based, medium to large scale projects in various infrastructure sectors including the energy sector; IIFCL offers maturity terms of 10 years or more for these loans
Bureau of Energy Efficiency (BEE)	Assists in developing policies and strategies with the primary objective of reducing energy intensity in the Indian economy
Central Energy Conservation Fund	Aims at providing state governments with financial help to promote EE (fund set to begin at about $11 million)

Energy Sector Highlights and Challenges

- Over the last decade, India's overall energy demand has grown at a rate of 6.4% annually; however, recently the growth rates have been above 10%, with the highest rate of annual growth of 11.3% from 2009-2010. It is the fourth largest energy consumer in the world and is expected to be the second-largest energy demander by 2035.
- India's energy shortages are due to weak domestic power production and therefore, rely heavily on energy imports. By 2030, India's dependence on energy imports is expected to exceed by more than 53%.
- India is the 3rd country with the most foreign direct investment (around $35 billion last year). Foreign investment in the RE and EE sector is expected to increase even more as India continues to liberalize the nation's economy.

Initiatives and Programs:

- Rajiv Gandhi Grameen Vidyutikaran Yojana: aims to provide access to electricity to all rural households. As of 31st of December 2011, works in 190,858 villages have been completed. Since the March 2012 targets were achieved well before due date, the program will electrify an additional 100,000 villages.
- Remote Village Electrification program: aims to electrify villages through RE sources, such as SPV home lighting systems, small hydropower plants and biomass gasification.
- Slum Electrification and Loss reduction program: provides legal and safe electricity connections in slum areas; provides electricity connections for about 21,250 slum dwelling units

Challenges:

- Energy supply: India has had to face increasing deficits in power supply, both for meeting its normal energy requirements as well as its peak load demand. From 2009 to 2010, average shortages were at 10.1% per month. For the last decade, this number has been steadily increasing as well. Also, the 11th Plan strived for an additional 62,000MW by the end of 2012, but the government already knows it will miss this target.
- Inefficient electric systems: unreliable power grids cause regular blackouts; results in at least 30% loss of power along the delivery chain; highly subsidized; not attractive to foreign investors

Renewable Energy & Energy Efficiency

Renewable Energy

With vigorous RE policies, there is obvious commitment from the Indian government to develop the RE sector. The total installed capacity of renewable power is 24,503.45MW as of May 2012, of which 50% comes from wind power. The largest contributor of RE comes from large hydropower plants. Although the government strives to make RE a stronghold in India, it is met with key challenges such as demand-supply shortages and long-term energy security.

In the 11th Year Plan, from 2006-2011, India aimed to increase the RE sector to 10% of the total energy mix in India. They successfully accomplished this by reaching 12.07% contribution by May 2012. Therefore, in the 12th Year Plan, from 2012-2017, India seeks to add an additional 18,500MW in RE with further aims to add 30,000MW by 2022. The desire to have a strong mix of wind, solar and biomass is coupled with India's target of 15% RE energy mix by 2020 (capacity addition of 5.5-6GW per annum).

Initiatives

- Introduction of Renewable Energy Certificate Mechanism: addresses the mismatch between availability of RE sources and the obligation of the states and enterprises to meet their renewable purchase obligation.
- Revised tariff guidelines: Central Electricity Regulatory Commission issues new norms for determining tariffs of electricity generated from various RE sources.
- Generation based incentives: lessening of taxes on RE sources.
- Jawaharlal Nehru National Solar Mission: establishes India as a global leader in solar energy in order to address India's energy security challenges; aims to reach an installed capacity of 20,000MW by 2020.

The table below illustrates India's aim for additional renewable energies in the 12th Year Plan.

Table 2.4: Targets for additional Renewable Energies in the upcoming years

Additional	Biomass	Bagasse	Small hydro	Solar	Wind	Total
Currently (2012)	2,665	1,253	N/A	504	14,158	
'11-'12	100	250	300	300	2,200	3,150
'12-'13	80	300	300	800	2,200	6,830
'13-'14	80	300	300	400	2,200	10,110
'14-'15	80	250	300	400	2,200	13,340
'15-'16	80	250	350	1,000	2,200	17,220

Source: Strategic Plan for New and Renewable Energy Sector for the Period 2011-17

The Southern part of India is the location of the largest percentage of the total installed capacity of RE. The table below marks the different RE targets for India's states during the 12th Year Plan.

Table 2.5: Regional targets for Renewable Energy percentage of total energy consumption in the upcoming years

State	'10-'11	'11-'12	'12-'13
Andhra Pradesh	5%	5%	5%
Assam	1.40%	2.80%	4.20%
Bihar	1.50%	2.50%	4%
Chattisgarh	5%	5.25%	5.75%
Delhi	1%	-	-
Gujarat	5%	6%	7%
Haryana	1.50%	1.50%	2%
Himachal Pradesh	10.10%	11.10%	12.10%
Jammu and Kashmir	1%	3%	5%
Jharkhand	2%	3%	4%
Goa and other Union Territories	1%	2%	3%
Karnataka	7-11%	-	-
Kerala	3%	3%	3%
Madhya Pradesh	0.80%	2.50%	4%
Maharashtra	6%	7%	8%
Manipur	2%	3%	5%
Mizoram	5%	6%	7%
Orissa	4.50%	5%	5.50%
Punjab	-	2.4%	2.9%
Rajasthan	8.50%	6%	7.10%
Tamil Nadu	14%	9%	-
Tripura	1%	1%	2%
Uttar Pradesh	4%	5%	6%
Uttarakhand	4%	4.75%	5.5%
West Bengal	10%	15%	20%

Source: Asia Pacific Renewable Energy Policy Handbook 2012

Specific Renewable Energies

Wind power

- India has the world's 5th largest wind power market.
- Wind power accounted for 50% of the total renewable power capacity in 2011 (excluding hydropower).
- In 2012, India's wind total capacity was just over 16,000 MW, as it added 3,000MW in 2011.
- By 2015, India hopes to have added up to 5,000 MW of wind power. By year 2017, India envisages the capacity to attain roughly 30,000MW.
- Challenges: inadequate infrastructure, lack of uniformity in methodology and tariff pricing, and lack of clarity on resource potential (varies from 50GW to 800GW).

Solar power

- Solar power capacity is expected to increase by 30%; the 12th Plan envisages an addition of 4-10GW.
- Jawaharlal Nehru National Solar Mission to arrive at 22 GW by 2022.
    - Additional 1,000 MW/year.
    - First phase (2010-2013): promoting off-grid systems to provide electricity to serve rural populations and capacity additions in grid-based solutions.
    - Second phase (2013-2017): focus on commercial deployment of solar power plants to scale-up and increase the penetration levels of solar power in the country; by 2017, solar power capacity is expected to reach 4-10 GW.
    - Third phase (2017-2022): focus on leading solar power to grid parity; by 2022, solar power capacity is expected to reach 22GW.
    - In 2011, mission helped to spur 62% investment increase in solar power to $12 billion.
- Challenges: unrealistic bidding by developers, financing projects, uncertainty in key operational factors (Ex. Capacity utilization).

Biomass

- In the 12th Five Year Plan, the government is launching the national bioenergy program in order to boost biomass-based power generation. The mission plans to tap 25GW of bioenergy potential.
- Jatropha cultivation used for bio-diesel; 50% of wasteland could be used to plant this crop.
- Challenges: availability and pricing of feedstock for agro-waste based biomass

Other Renewables

- Offshore wind and geothermal energy appear promising, but have only developed negligibly.

Energy Efficiency

Energy efficiency (EE) is also of utmost importance to the Indian government; however, behind the government's EE rhetoric is countless examples of how India is one of the least EE countries in Asia. For example, India's coal industry ranks among the least efficient in the industrialized world. Nonetheless, due to growing energy shortages, India has been implementing various policies to meet EE targets. The 11th Five Year Plan of India proposed to achieve energy savings of 5%. In addition, in the 12th Five Year Plan, as well as in other programs, India has laid out strategic plans to meet the EE targets. At the center stage of the 12th Five Year Plan there will be new standards and labeling of equipment and appliances, stricter measures for EE in buildings, new targets for 467 industrial units, and subsidized residential lighting and EE measures in agricultural pumping.

The Perform Achieve Trade (PAT) scheme, which came under effect in April 2012 by the Bureau of Energy Efficiency, aims to set up a domestic platform as a trading scheme, where energy intensive companies generate business benefits by trading energy saving certificates. PAT aims to incentivize sectors (most prominently, the power, iron and steel, cement, fertilizer, pulp and paper and aluminum), to implement EE measures and to comply with energy consumption targets. The government of India estimates that if the PAT is successful, it could meet half of its emissions intensity targets (a reduction of 20-25% of CO2 emissions by 2020). The overall target for each sector's energy reduction is about 5%.

The Super-Efficient Equipment Program, part of the National Mission on Enhanced Energy Efficiency, seeks to achieve annual savings of 19,598MW of power and to reduce 98.55 million tons of GHG emissions.

Opportunities for Singaporean firms in India

India offers several opportunities to Singaporean firms in the RE sectors. India has already invested $10.3 billion in clean technology in 2011 and expects to invest an additional $169 billion over the next decade. To achieve its energy targets, India also seeks significant technological and financial input from international players and the private sector.

However, to be a successful participant in the Indian market, local presence, high localization content and cost-effective pricing are important. Since new generation capacity is coming up in the private sector, there is significant flexibility in designing the engagement model (PPP, only private sector, etc) and in choosing technology. Continuous engagement with the key agencies involved in this sector is also important for successful entry into the Indian market.

Wind Energy

- Contribution to national grid targeted at 20% by 2020, compared to current share of 3%.
- High growth in generation capacity offers equipment suppliers huge growth opportunities
- Partnership of equipment suppliers and IPPs recommended for engagement in the sector.

Bioenergy

- India is already of the largest producers of bioenergy through biogas and solid waste.

Opportunities in urban centers for waste to energy, large-scale grid connected bio-digesters and new technologies.

Solar power

- Solar is the priority sector in India with large solar parks and grid connected installations being planned.
- Large opportunities exist for PV manufacturers, developers, consultants and solar park designers. It is very timely to partner with the institutions and relevant local companies now.

CDM

- India has the second largest number of projects registered for CDM with the UNFCCC, after China. The Government and the IFOs are pushing for CDM registration to improve return of these RE investments.
- There is significant opportunity for CDM consultants with a local presence in India.

Overall there are significant opportunities for Singaporean firms in the EE and RE sectors in India. The favorable regulations, encouragement to the private sector, large projects and significant funding being committed to RE are testimony to India's commitment to RE sector growth. However, given the high level of local capability and competition, local presence or partnerships are necessary for entry and growth in the market. Indian companies and government have traditionally encouraged adoption of innovative technology and will likely be keen on partnering with companies offering new and innovative technologies. Indian government agencies are also looking for companies that can provide capacity building and training to their agencies in the RE sector. Singaporean firms should engage with the ADB, World Bank and the Indian agencies while projects are being designed and innovative models sought out for the next five to ten years.

FUND MAPPING

Partnerships and Funds for Renewable Energy and Energy Efficiency Development

GLOBAL

- World Bank
- International Finance Corporation
- Asian Development Bank
- Climate Technology Initiative
- Global Environment Facility
- Seed Capital Assistance Facility
- Global Energy Efficiency and Renewable Energy Fund
- Renewable Energy and Energy Efficiency Partnership
- Global Climate Partnership Fund
- Sustainable Energy Market Development Program
- Asia Sustainability and Alternative Energy Program
- Global Energy Program
- Clinton Climate Initiative
- Clean Development Mechanism
- Clean Investment Funds
- Armstrong Asset Management (ASEACE)
- Deutsche Investitions (DEG)
- Norwegian Investment Fund for Developing Countries (Norfund)
- *No longer*: Asia-Pacific Partnership on Clean Development and Climate (APP)

INDIA

- Clean Technology Fund
    - Promotes financing for deployment of energy efficient and clean energy technologies
- USA-India "Green Partnership": Indo-U.S. Clean Energy Research and Deployment Initiative

PROJECT MATRICES

INDIA

Description of Matrices:

Update of active projects from August 2010 in India region (projects still active are marked with **)

Addition of new active projects since August 2010 in India region. Only World Bank and ADB.

Project	Project Cost (million)	Executing Agency	Background	Date Approved	Closing Date
***Financing Public Private Partnerships (PPPs) in Infrastructure through Support to the India Infrastructure Finance Company Limited (WB)*	$1,195.00	The India Infrastructure Finance Company Limited (IIFCL)	*Sector of Interest:* All RE, CDM*;* The project will provide a line of credit to the India Infrastructure Finance Company Limited (IIFCL) to finance lending to PPP-based infrastructure projects, including RE power *SEAS-Relevant Opportunities:* There is opportunity for SEAS members to contribute directly to IIFCL's selection of power projects; especially in the RE sector. In addition, there is an opportunity to offer CDM consulting services to the hydro projects already in the pipeline.	22/09/09	30/09/15
***Chiller Energy Efficiency Carbon Finance Operation*	$83.27	Industrial Development Bank of India	*Sector of Interest:* Energy Efficiency/CDM: The project aims to reduce GHG emissions by replacing old chillers with efficient non-CFC-	30/06/09	30/06/14

(WB)			based centrifugal chillers through financial incentives and CER sales. *SEAS-Relevant Opportunities:* The opportunities for SEAS members include consulting services for carbon finance and the measurement, monitoring and validation of emission reductions in relation to CDM requirements under the project. Also supply of chillers for the target companies.		
***MFF – Himachal Pradesh Clean Energy Development Investment Program (ADB)*	$1,500.00	Himachal Pradesh Power Corp. Ltd.	*Sector of Interest:* Hydro: The program will increase clean energy power production through run-of-river hydropower schemes, and will improve power sector planning, implementation, and governance in the state of Himachal Pradesh in India. *SEAS-Relevant Opportunities:* Key opportunities for SEAS include supplying equipment to the hydro power projects, consulting services for testing CDM eligibility of the projects, and CDM registration.		
***Karnataka Wind (WB)*	$45.30	N/A	*Sector of Interest:* CDM: The project will facilitate greenhouse gas emission reductions and support the	24/12/09	31/12/13

			development of the international market mechanism for trading Emission Reductions (ERs) developed under the framework of the Kyoto Protocol. *SEAS-Relevant Opportunities:* The project offers consulting opportunity for CER certification and approval for the sale of CERs for two 29.7MW wind power plants.		
***Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector (WB)*	$97.49	Watershed Management Directorate/Government Uttarakhand	*Sector of Interest:* Biomass: The objective of the project is to develop sustainable community-based activities following the Uttarakhand Decentralized Watershed Management Project (UDWDP). *SEAS-Relevant Opportunities:* The project will require supply of biomass digesters for 20 micro-watershed communities as well as the implementation of workshop training for farmers on biomass best practices.	04/08/09	31/08/13
***Haryana Power System Improvement Project (WB)*	$410.00	Government of Haryana	*Sector of Interest: EE/CDM*: The program will aim to improve the accountability, efficiency and quality of electricity services in Haryana through investments in power	04/08/09	31/12/14

			supply infrastructure, training/capacity building and technology-transfer, and overall institutional strengthening. *SEAS-Relevant Opportunities:* Opportunities include possible inclusion of smart grids in strengthening of electricity transmission and distribution component. Institutional training and capacity building for EE distribution are also possible.		
***Coal-Fired Generation Rehabilitation (WB)*	$258.00	State Generation Utilities	*Sector of Interest:* Energy Efficiency/CDM: The objective of the project is to improve EE of selected coal-fired power generation units through renovation and modernization (R&M) and improved operations and maintenance (O&M). *SEAS-Relevant Opportunities:* Opportunities under the project include supply of EE equipment for renovation and retrofitting of 604MW of old coal-fired power generation capacity. There is also opportunity to provide technical assistance to improve implementation of pilots in EE	18/06/09	30/11/14

			Renovation and Modernization.		
***Public-Private Partnership for Renewable Energy (ADB-Private Sector)*	$40	Joint Venture Company (JVC) of GE, Kyushu and NPTC	*Sector of Interest:* Wind/RE: The project will launch the Joint Venture Company (JVC) which aims to commission 500MW of additional wind power by 2012 through public-private partnership. *SEAS-Relevant Opportunities:* Opportunities for SEAS members include providing innovative wind technologies that will support and supplement General Electric (GE) of the United States and Kyushu Electric Power Company of Japan technologies who, together with ADB, will be part of this project.		
Vishnugad Pipalkoti Hydro Electric Project (WB)	$922.00	THDC India Limited	*Sector of Interest:* Hydropower/RE: The project aims to increase the supply of electricity to India's national grid through the addition of renewable energy as well as the support of capacity-building and institutional strengthening. *SEAS-Relevant Opportunities:* Opportunities for SEAS members include the supply of equipment for the construction of the hydro plant. Also, technical and financial	30/06/11	31/12/17

			consulting could be of us in the second component of the project to support capacity-building.		
BBMB Hydro Power Rehab Project – Carbon Finance (WB)	$138.88	Bhakra Beas Management Board (BBMB)	*Sector of Interest:* Hydropower/RE: The aim of the project is to improve the reliability, efficiency and safety of the implementing agency's hydraulic structures and generation equipment to meet the increasing demand for power in the Northern Electricity Grid of India. *SEAS-Relevant Opportunities:* Opportunities for SEAS members include the replacement of existing generation equipment with EE ones, and providing a state-of-the art control and protection system for better monitoring of hydropower plants.	01/06/10	31/12/18
Financing Energy Efficiency at SMEs (WB)	$59.3	Bureau of Energy Efficiency and Ministry of Power	*Sector of Interest:* Energy Efficiency: The objective of the project for India is to increase demand for energy efficiency investments in small and medium enterprises. *SEAS-Relevant Opportunities:* The opportunities for SEAS members include consulting services for capacity-building and EE awareness	27/05/10	31/12/14

			in the industry sector; SEAS members should also approach the PFIs and private industries in China to leverage project funding to fund specific EE projects as the second component aims to increase investment in EE.		
Maharashtra Solar Park and Green Grid Development Investment Program (ADB)	$425	Maharashtra State Power Generation Company Limited and Maharashtra State Power Transmission Co., Ltd.	*Sector of Interest:* Solar Energy/RE: This project aims to fund the generation and transmission of solar power in the state of Maharashtra in western India. The objective is to increase energy available through solar power, as the project will construct four solar parks, producing about 350 MW. *SEAS-Relevant Opportunities:* Opportunities for SEAS members include the supply of solar power equipment.	24/05/12	N/A
State Solar Park Development Project (ADB)	$100	Government of Gujarat, Gujarat Energy Transmission Corporation Limited	*Sector of Interest:* Solar Energy/RE: This project aims to develop a large-scale solar power park that will generate 500MW of both solar PV and concentrated solar power. *SEAS-Relevant Opportunities:* Opportunities for SEAS members include the supply of solar power	20/01/11	30/03/15

			equipment and technical assistance for the construction.		
Gujarat Solar and Smart Grid Development Investment Program (ADB)	$400	Uttar Gujarat Vij Company Limited, Paschim Gujarat Vij Company Limited and Gujarat Energy Transmission Corporation Limited	*Sector of Interest:* Solar Energy/RE: This project aims to develop the transmission and distribution network of solar power in Guajart. *SEAS-Relevant Opportunities:* Opportunities for SEAS members include the supply of solar power equipment as well as consulting services for the strengthened capacity and improved transmission grid in Gujarat	22/11/12 (to be approved)	N/A
Madhya Pradesh Energy Efficiency (ADB)	$801	N/A	*Sector of Interest:* Energy Efficiency: The aim of this project is to increase the supply of power in Madhya Pradesh by installing a high voltage distribution system and upgrading distribution lines. *SEAS-Relevant Opportunities:* Opportunities exist for SEAS member companies in the capacity building component, consulting services for EE, providing innovative technologies that promote EE in the industry sector.	17/08/11	N/A
Dahanu Solar Power	$147.5	Dahanu Solar Power Private	*Sector of Interest:* Solar Energy/RE:	N/A	N/A

Project (ADB)	Limited	This project entails the construction of a 40-MW solar PV power generation plant near the village of Dhursar. *SEAS-Relevant Opportunities:* Opportunities for SEAS members include the supply of solar power equipment as well as consulting services for the strengthened capacity and improved transmission grid.
No longer active projects: Integrated Renewable Energy Development Project (MFF) (ADB-Private Sector), CLP Wind Farms Private Limited (CWFPL) – Samana Phase II and the Saundatti Project (ADB-Private Sector)		

CDM projects from Aug '10 onwards (only two per month displayed below)		
Number	Registered	Title
1	30 Apr 12	Small Hydro Power Project by Kurmi Energy Private Limited
2	29 Apr 12	Solar PV power project at Bikaner, India
3	18 Apr 12	Rukti-II (5 MW) Small Hydro Electric Project
4	12 Apr 12	Hydroelectric Project in Kinnaur District in Himachal Pradesh
5	26 Mar 12	Tuppadahalli Wind Energy Project
6	09 Mar 12	Wind power project by TVS Energy Limited in Theni, Tamil Nadu
7	07 Mar 12	3 MW wind project by Shah Folis
8	28 Feb 12	Renewable Energy Wind Power Project in Rajasthan
9	23 Feb 12	10 MW Biomass Power Project by Shalivahana (Biomass) Power Projects Limited
10	21 Feb 12	23.1 MW Wind power project in Telagi, Karnataka
11	17 Feb 12	8.3 MW Wind Electricity Generation Project by Parakh Agro Industries Limited in Dhule, Maharashtra
12	01 Feb 12	10 MW Biomass based power Plant at Pollachi, Coimbatore district, Tamil Nadu
13	20 Jan 12	Accion Fraterna Biogas CDM project for rural communities in Anantapur, Andhra Pradesh
14	04 Jan 12	Installation of wind power project in Rajasthan and Tamil Nadu
15	29 Dec 11	Awa and Binwa Small Hydro Power Projects in Kangra District of Himachal Pradesh, India
16	23 Dec 11	Grid Connected Biomass Based Power Plant at Merta, Dist. Nagauar, Rajasthan, India
17	16 Dec 11	24 MW Kut Hydro Power Project
18	09 Dec 11	16.5 MW Wind Power Project in Surajbari, Gujarat
19	24 Nov 11	Kolar Biogas Project (with UK and Northern Ireland)