

CONSULATE GENERAL OF INDIA SAN FRANCISCO

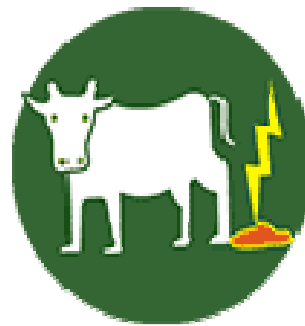
RENEWABLE ENERGY – ANOTHER GREEN REVOLUTION

A. OVERVIEW

Since the industrial revolution, the world has utilized fossil fuels as its predominant means of energy generation. Today, the world is acutely aware that the manner in which we manage energy resources will directly impact our environment. India is keenly aware of the looming effects of climate change and is striving to find affordable alternative sources of renewable energy. A famous Chief of an American Indian tribe, Chief Seattle, said “we do not own this earth, we borrow it from our children”.

India now ranks 5th in the world after Germany, Spain, China and USA in grid connected wind power installations. A total capacity of 9,654 MW

The current availability of biomass in India is estimated at about 500 million metric tonnes per year. Studies sponsored by the Ministry for New and Renewable Energy have estimated a surplus biomass availability at about 120-150 million metric tonnes per annum covering agricultural and forestry residues corresponding to a potential of about 16,000 MW.



Estimated Renewable Energy Potential and Cumulative Achievements in India, 2007

Connected to grid	Est. potential (MW)	Online (2007)
bioenergy	66,881	1,255
wind power	45,195	7,660
small hydro (25MW)	15,000	2,014
waste-to-energy (urban & industrial)	2,700	56
large-scale solar	-	2
Decentralised		
household biogas (cooking, lighting)	1.2 million units	394,000 units
home photovoltaic	-	2,2MW (peak)

Source: Ministry of New and Renewable Energy, India Biopact, 2007, CC

India is in a position to leapfrog obsolete legacy technologies that often hamper innovation elsewhere. The key is to balance large scale projects that are often costly and difficult to manage ecologically with smaller projects that can be adapted at the scale of individual homes or communities.²

Similarly, there are encouraging trends in India on Solar energy, and Solar power has been used to light up remote villages in inaccessible regions like the Ladakh region, where no other form of electricity was available earlier. The Social Work and Research Centre in Tilonia, Rajasthan, has helped train technicians that have helped install and maintain solar power in remote villages of Jammu and Kashmir, Himachal Pradesh and other states.

has been established up to 31st December, 2008 mainly in Tamil Nadu, Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Rajasthan. By 2012, this capacity is expected to increase to 10,500 MW. The Minister of State for New and Renewable Energy of India stated in June 2008 that a Generation Based Incentive (GBI) for grid connected wind power projects has been put in place and that the time has come to concentrate on the GBI for renewable energy sources.¹

The Indian government has made concrete commitments and the market for renewable energy in India is estimated at \$500 million per year and is growing by 15% annually. The government already provides substantial tax

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<http://www.hindu.com/2008/07/14/stories/2008071455350900.htm>

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<http://www.ecoworld.com/features/2007/03/17/technology-sunlight-indias-future/>

breaks for wind energy, and a wave of proposed state legislation would encourage other “clean



tech” industries to make inroads there.³

India’s role as a hub for US technology companies could be mimicked in the renewable energy market, US and Indian business leaders in the sector have called for greater deregulation and a global price on carbon emissions to help spur growth in alternative fuel sources. India is already ahead of other regional countries in luring energy firms according to the US Trade and Development Agency. The market environment is seen as more open and ready for partnerships with US firms.⁴

B. Bilateral Developments

As India pledges to spend Billions on renewable energy, there will be tremendous opportunity for US companies to help India realize her plans. Representatives of more than a dozen US companies, including General Electric Co and DuPont Co., make trips to India aimed at drumming up new business for America’s burgeoning clean-energy industry. The companies are selling technology including solar power, energy-efficient building materials, clean coal, wind power and more experimental power

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http://www.businessweek.com/globalbiz/content/sep2008/gb20080924_351367.htm

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http://economictimes.indiatimes.com/News/Economy/Foreign_Trade/India_ripe_renewable_energy_market/articleshow/2510674.cms

sources, such as gasification technology developed by Utah-based Emery Energy Co.⁵

With India and US recognizing a strategic partnership as “indispensable and inevitable” in the 21st century the two countries are increasingly engaged in critical issues such as renewable and alternative energy, clean energy technology and energy efficiency amongst other ways of cooperation. Our shared commitment to democracy lends strength to the partnership and a deeper engagement.⁶

Under US-India Energy Dialogue established in May 2005, a Working Group on New Technologies and renewable Energy (WGNTe) is in place to coordinate cooperation activities between the two countries in renewable energy. Possible cooperation activities for research in low grid regimes and solar areas have been identified during the First Working Group meeting held in November 2005, during the Workshop on Methodology and Modeling techniques for Assessing Wind and Solar Resources held during November 2006 and thereafter. Interaction is going on with US Department of Energy (USDOE) and Ministry of New and Renewable Energy (MNRE) for cooperation activities in solar and wind energy.

To tap into a new energy source, US and Indian organizations are exploring ways to use methane gas from Indian landfills for fuel, heating and electricity. The National Environmental Engineering Research Institute (NEERI) and the US Environmental Protection Agency (EPA) are partners in the joint initiative. Other partners in the study include the Texas State Energy Office and Mack Trucks Inc. The investigations are funded by EPA as part of the agency’s Methane to Markets partnership. They did a study on the Gorai landfill, Mumbai to convert methane gas to LPG gas and other alternatives. A two day workshop in Ahmedabad in early April 2009 was held to highlight beneficial uses for landfill gas. It was cosponsored by India’s Ministry of Urban

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http://online.wsj.com/public/article_print/SB117683343696872885-kE48_XVfHuzqaHMD0Ozha0N7nZ4_20080419.html

⁶ <http://sify.com/news/fullstory.php?id=14799256>

Development and EPA, which also included a tour of the existing Ahmedabad dumpsite and its new sanitary engineered landfill under construction. 50 municipal commissioners and engineers attended the workshop.⁷

Power Purchase Agreement and innovative financing combined with Carbon Credits may be a viable solution in the long run. The attempt to build India's first solar housing complex in Kolkata is an interesting move in that direction.⁸

India's Foreign Secretary chaired a joint meeting with US Under Secretary of Energy in New Delhi on 4th April, 2008. The meeting concluded a week of bilateral India-US energy discussions aimed at strengthening and expanding ongoing collaboration in research and development of renewable energy and alternative fuel and other energy options, encourage open and competitive markets and dramatically increase energy efficiency.



Also, at the meeting India's Secretary of Petroleum and Natural Gas and US Under Secretary of Energy signed a Memorandum of Understanding (MOU) for cooperation in Gas Hydrates to guide future efforts in expanding the use of gas hydrates as a clean, abundant natural energy resource. The MOU provides a framework for the nations to exchange information and analyses, conduct joint studies and projects, exchange scientific and technical personnel and facilitate the establishment of a Gas Hydrate Technology Center in India in order

⁷ <http://www.america.gov/st/energy-english/2009/April/20090409151211abretnuh0.5346338.html>

⁸ <http://re-research.in/ideas-we-like.php>

to increase understanding of the geologic occurrence of, and the potential for methane production from, natural gas hydrates in both India and USA.

The India-US dialogue was launched in May 2005 by Deputy Chairman of the Planning Commission of India Dr Montek Singh Ahluwalia and US Secretary of Energy Samuel W Bodman to increase energy cooperation between the nations. The Dialogue fulfills a commitment made during a September 2004 meeting between Prime Minister Manmohan Singh and US President George Bush to promote trade and investment in the energy sector.⁹

C. Recent Developments

On 3rd February, 2009, India's Ministry of New and Renewable Energy (MNRE) and US Department of Energy (DOE) signed a Memorandum of Understanding (MOU) to establish a framework of cooperation covering scientific, technical and policy aspects of production, conversion, utilization, distribution and marketing of biofuels in a sustainable and environmentally friendly manner and in accordance with national priorities and socio-economic development strategies and goals. They intend to establish a Joint Working Group composed of representatives from DOE and MNRE. MNRE plans to coordinate the participation of other Indian Government ministries under this MOU.

The DOE also plans to coordinate participation of other US Government agencies under this MOU, such as the US Department of Agriculture. Areas of cooperation under the MOU include biofuel feed-stock production based on sustainable biomass, advanced conversion technologies for first generation biofuels and emerging technologies for second generation biofuels, technologies for end-use applications in transportation sector based on large scale centralized approach, utilization of by-products of bio-diesel production processes, development of test methods, procedures and protocols, promotion and facilitation of technology transfer, joint ventures, and investments in the biofuel sector in India and establishment of a continuing dialogue on biofuels between the two countries including

⁹ <http://www.energy.gov/news/6143.htm>

exchange of visits, information exchange and capacity building.

Forms of cooperation under the MOU are exchange of publicly available scientific and technical information, organization of seminars, workshops and other meetings on agreed topics, exchange of scientists, engineers and other specialists, visits by specialist teams or experts to each others facilities and field visits to research labs, renewable energy installations and industrial sites for technical exchange and experience sharing on renewable energy technologies and identification of areas/projects suitable for possible future conduct of joint research and development, and pilot scale and demonstration projects.

D. Upcoming Events

A. ITPO is organizing Enviro Tech and Energy Tech, twin shows on environment and energy technologies during 11-14 December, 2009 to be held at New Delhi.

Energy Tech aims at helping accelerate the growth of the energy sector in India and assist in achieving the target, "Energy Independence" and Power for All by 2012. Enviro Tech would focus on the environment related issues by showcasing products and technologies to the entrepreneurs, policy makers and other s related to this field and to create awareness amongst the common men.

B. The 4th India International Renewable Energy Conference and Exhibition, 2010 (IIREC, 2010) is to be held from 27-29 October, 2010 at New Delhi.

This event will be the 4th global conference on renewable energy, following events at Washington in 2008, Beijing in 2005 and Bonn in 2004. IIREC 2010 will build on the success of the previous conferences with the support of national and international sponsors. Cabinet-level government functionaries from a number of countries will join civil society partners and private sector leaders to discuss the opportunities and challenges of a global, rapid deployment of renewable energy.

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