

India commmits to renewable energy to fuel growth



THE QUEST FOR NON-POLLUTING GREEN ENERGY IS SEEING RENEWABLE EMPHASIS ON NON-CONVENTIONAL SUPPLIES. THE COUNTRY HOPES TO DOUBLE ITS SOURCES TO 27,000 MW IN THE NEXT THREE YEARS.

By Joydeep Gupta

As the world grapples with a long-term energy crisis, a fast expanding Indian economy is prospecting for new sources to fuel growth. And its quest for non-polluting green energy is seeing renewed emphasis on non-conventional supplies to double the installed capacity from such sources to 27,000 MW over the next three years, involving an investment of \$16 billion.

India, in fact, already has one of the highest percentages of renewable energy to its overall generation capacity in the world. The country has developed such green power capacity of over 13,000 MW, which is about eight percent of the total installed potential, contributing about three percent to the electricity mix.

The Indian government's target is now to bring the share of renewable energy to 12 percent of the total power capacity in the country by 2012, which will again be one of the highest planned in the world.

"We are doing remarkably well in generating power from renewable resources. We are at the fourth spot after Germany, Spain and the US in harnessing wind energy alone," said Minister for New and Renewable Energy Vilas Muttemwar.

"Still there is much more potential that goes unused," the minister told a global seminar on non-conventional energy in the Indian capital recently, adding that India has the potential of generating 70,000 MW of power from wind energy.

Data with official agencies show that a major contribution of 9,000 MW, so far, has come from wind power - almost entirely through private investment. Now, India's wind power industry is

set to witness a structural shift, away from a captive power and tax-driven market to utility-scale development, experts maintain.

The small-hydro schemes of up to 25 MW per project are next in line with a total capacity of 2,200 MW, while biomass power projects with a combined capacity of 650 MW, based on combustion of crop residues and agro-industrial wastes, have also been set up by private developers. Apart from this, surplus power of about 900 MW is being fed to the grid from bagasse cogeneration projects, particularly in private sugar mills.

According to global consultancy Ernst and Young, India ranks third after the US and Germany in its b "Renewable Energy Country Attractiveness Index" and a key driver for renewable power development in the country is the evolving policy and regulatory framework. The Electricity Act of 2003, for example, provides for the state regulators to specify a minimum percentage of power to be procured from renewable sources.

State governments are also laying emphasis on clean sources of energy, with 16 of them fixing their renewable portfolio standards of at least 10 percent for overall renewable energy purchase. The National Electricity Policy also seeks to encourage private sector participation, and the tariff policy calls upon state regulators to provide preferential rates for the purchase of renewable power.

India also realises the impact of thermal and other conventional sources on the fragile environment and its intent in this area is specified in the National Action Plan on Climate Change



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unveiled in June 2008.

One of the eight pillars of this plan is a National Solar Mission with a stated target of generating 20,000 MW of solar power by 2020.

The country evidently has considerable potential for solar power generation as well. A pilot programme has been launched for grid-connected solar projects for which tariff support will be provided on energy fed to the grid. Indian labs are now working feverishly towards improving solar photovoltaic cells and improving solar thermal technologies.

"Solar power is expected to become economically feasible by 2015," said Anil K. Gupta, former secretary in the Ministry of Non-Conventional Energy Sources.

One major advantage of generating renewable electricity, experts say, is these sources can be largely decentralised, which makes it easier to distribute power to India's vast rural population. Decentralised generation and distribution in rural areas has now been de-licensed under the Electricity Act.

The country's National Rural Electrification Policy calls for the decentralised distribution and generation to be based on conventional and/or non-conventional sources, whichever is more suitable and economical. Renewable energy systems can be deployed even where grid connectivity exists, provided there is unmet demand and they are found to be cost-effective.

Villages that are not likely to receive grid connection are now being provided clean energy through installation of biomass gasifiers, mini-hydel units or solar photovoltaic systems. Access has been provided to 6,500 villages and hamlets through renewable sources. Apart from this, over 1.5 million home-lighting systems and solar lanterns have been provided in rural households.

The plan to provide solar lanterns is now taking off even in those villages that are connected to the grid but face frequent power outages. These lanterns provide illumination in the evening peak hours and help generate employment in villages.

Bio-fuels are also likely to play a central role in the quest for energy security and reduction of greenhouse gas emissions in the coming decades. A National Bio-fuel Policy is now being drafted that aims to develop indigenous biomass feedstock and next generation of bio-fuels to increasingly substitute petrol and diesel for transport and stationary applications.

The Indian approach to bio-fuels is based solely on non-food feedstock, to be raised on degraded or wasteland not suited to agriculture, thus avoiding a possible fuel versus food security conflict, while creating new employment opportunities in rural areas.

Renewable sources are also increasingly providing alternative solutions for captive power in industry and in mitigating energy shortages in urban areas. There is considerable saving of conventional electricity and fossil fuels through installation of solar water-heating systems, solar space heating systems, solar photovoltaic systems, biomass gasifiers and waste-to-energy systems.

Over 2.3 million square metres of solar collectors have been installed for water heating, mainly in the domestic sector. New initiatives include promotion of green buildings based on solar passive design, installation of renewable energy systems, and development of solar cities, or green cities.

India's private sector is playing a major role in the production of renewable energy equipment. There has been a major scale-up in manufacturing capability, particularly in the wind and photovoltaic sectors.

A few companies from India, such as Suzlon, have become global leaders in their fields.

They have commenced multinational operations and renewable energy equipment is increasingly being exported across continents. Investments in the renewable energy sector in India have soared and more than \$2.5 billion per annum has been invested in the extra capacity addition in the last few years.

Venture capital and private equity investments in the sector have been growing. The Indian government has recently received 14 proposals with a projected investment of about \$30 billion for the production of polysilicon, solar cells, and modules.

The Indian Renewable Energy Development Agency (IREDA), perhaps the only financial institution in the world solely created to provide financing to the renewable energy sector, has provided loans amounting to approximately \$2.2 billion for projects that together produce 3,400 MW.

India's Integrated Energy Policy Report has projected, in different scenarios, an installed capacity of 780,000-960,000 MW in 2031/32 to sustain the country's economic growth at an average of 8-9 percent per year.

Renewable sources obviously play an increasingly important part in this. A renewable power capacity addition of 14,000 MW is planned during the current five-year plan period ending in 2012. That will bring the share of renewable energy to 12 percent of the total power capacity in the country.

To get to this, the government is planning to introduce renewable energy certificates and to set up a National Renewable Standard in order to mainstream renewable energy in the national system. A carbon tax on fossil fuel based generation is to be considered to fund the upscaling of renewables.

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