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Breaking New Grounds in Clean Energy

Gujarat Energy Development Agency (GEDA), one of the premier organizations in India working in the field of renewable energy development and energy conservation is shouldering the responsibility as the state nodal agency (SNA) for the Ministry of New and Renewable Energy Sources (MNRE) and the state designated agency (SDA) for Bureau of Energy Efficiency (BEE). It has played a pioneering role in the development of a long-term policy and implementing of programmes across the state.

Gujarat: Empowering a "Renewable" Future

GEDA was instrumental in introducing various technologies for mass use through design of several innovative programmes, involvement of reputed NGO network and implementation strategies and promotional initiatives. A key link in GEDA's initiatives was the establishment of a network of reputed NGOs for grass root penetration and the development of a manufacturing base.

The renewable energy technologies that have already been proven are:

- Bio, solar and wind resources as additional resources for power generation to supplement the grid.
- Electrification of remote and far flung areas where conventional energy cannot be made available because of various constraints.
- Solar and bio resources for process heat applications, heating and cooking.
- Bio, Solar and wind resources for water pumping.
- Cleaner non-polluting fuels for transport.
- Energy efficient practices, and devices, and efficient building designs.

The proactive Government of Gujarat has been and is already driving on the sustainable path way. Power generation projects /programmes from wind, solar photovoltaic and biomass have successfully demonstrated that renewables are here to deliver grid-quality power. Experiments in decentralized energy supply models especially for solar cooking, solar water heating systems in the domestic and industrial sectors and decentralized power generation projects are successful case studies that can be replicated from small to large -scale levels.

Gujarat: The Renewable Power Hub

The Gujarat Energy Development Agency has set the pace of Renewable Energy Development in the country with the foundation laid for Asia's first Solar Park in Village: Charanka (Taluka: Santalpur Taluka) District Patan bordering Pakistan.

Gujarat: Wind Energy, the Big Player

On the wind energy front the state has also embarked upon an ambitious plan to tap the large wind power potential. In 2009, the Government of Gujarat announced an amendment in the Wind Energy Policy to tap the 10,000 MWe of the Wind Power potential along the coastal areas – Saurashtra and Kachchh. Today, this policy has undergone major revisions to attract even more investors in the field.

The amendments in the Wind Power Policy 2009 include:

- Power sale tariff increased from Rs. 3. 37 to Rs 3. 50 per kWh
- Renewable energy power purchase obligation increased form the existing 2% to 10%.
- A mechanism for issuance of Renewable Energy Certificates – a market-based tradable instrument to promote renewable energy in the state and facilitate renewable energy obligation of utilities/ Open Access and captive consumers, using conventional fuel, which are not otherwise able to meet the obligation of purchase of power from renewable sources.
- GETCO (Gujarat Energy Transmission Company) will provide grid connectivity to Wind farms or permit private producers to lay transmission lines.

Today, Gujarat has already installed 3114.25 MWe of Wind Power Projects which is already catering to 7.6 % of the annual energy consumption of the State at an investment of Rs. 9500 crore. These Projects annually generate 3800

million units of electricity, saving 2.60 MT coal and reducing the carbon emissions levels by 3.80 million tonnes.

Gandhinagar, Solar City, the Smart City Development Project

The Government of Gujarat is also working on a Blue Print to make Gandhinagar a Sustainable and Smart living-in City. A Master Plan that includes: installation of two Solar Power Generating Plants of 1 MW capacity each at PDPU (Pandit Deen Dayal Petroluem University) and ash-dyke of the Gandhinaghar Thermal Power Station are underway. The Smart-City development Plan also includes installation of Solar Roof-Top Hybrid Grid-connected and Stand Alone Systems, Solar Water Heaters on Government Offices and residence, revamping of a pickup Bus Stand with a 380 KW Solar PV-based electrification System. Two Stadiums are also planned to be operated on solar power generating systems.

The fact that comfortable standard of living and quality of human life has become increasingly dependant on energy, the only way to cope up with such growing dependence is adoption of energy conservation measures and use alternative sources of energy for power generation. To exemplify the best energy practices, the Smart City Development initiative was undertaken from the state capital. A Clean-Up Action Plan to reduce the carbon footprint required n integrated action plan implementation of sustainable energy technologies was charted. The Action Plan was based on the potential for demand side measures along with the supply side augmentation through renewable energy technologies.

Gandhinagar Solar City Project

Description	**Targets**		
	Short term (till 2009)	Medium term (till 2012)	Long term (till 2015)
Energy Conservation	Reduction in present energy scenario		
Residential Sector	30%	35%	40%
Commercial Sector	15%	20&%	25%
Municipal Sector	15%	15%	15%
Active Renewable Energy System in residential and commercial sectors)			
Solar Water Heating Systems	50%	75	90%
Renewable-based power generation	5.16 MW	20.1 MW	47 MW
GHG Emission reduction (t CO2)	72080	144640	237944

The sustainable energy mix included: phasing out of Incandescent Bulbs (GLS) and Ordinary Tubular Fluorescent Lamps (TFL); installation of Solar Street Lighting and Stand Alone Systems on main roads and Solar PV on Rooftops, Solar /LED-based Traffic Signals on main roads. Several Solar Energy technologies that were installed are:

- 170 kW grid-connected Solar Photovolatic Systems installed at 17 GoG Buildings. (2 10 kW Solar PV/wind-solar hybrid power plants at Udyog Bhavan and 13 10 kW Solar PV power plants at various blocks of the Sachivalaya*).*
- 125 Solar-Wind Hybrid Roof Top Systems (capacity: 1 kW) at Government bunglows.
- 250 kW grid-connected Solar PV Power Plant on government land.
- 205 Solar Water Heating Systems (capacity: 250 lpd) on Government residential bungalows
- Solar Water Heating Systems (capacity: 15,000 lpd) on Government buildings – Civil Hospital 1000pld. Staff Training College 5000 lpd, Circuit House 6000 lpd, Rest House 3000 lpd.
- 65 Solar Photovolatic Street Lights in 9 Public Parks.
- Energy Efficient Pumps at Charedi Water Works.
- 590 Energy Efficient Street Lights as a Demonstration Project & Energy Efficient LED Lighting on "Ch" and "J" Roads, Ministers Enclave, Gandhinagar.
- Reaching out to Schools for to generate awareness on renewable energy technologies through the Mobile Demonstration Unit.
- Replaced 3750 bulbs with CFLs and replaced 10,000 ordinary tube lights with T-5 tube lights. Verify

The energy efficiency initiatives have already been taken at an investment cost of Rs 12.8 million, savings of Rs 4.96 million per year (or 1683 MWh) have already been achieved. These initiatives include,

- Demonstration project on Energy Efficient and LED Lighting Systems for the Ministers Enclave, Gandhinagar.
- Monitoring the Transformer load – sopping the three 1000 KVA Transformers at for 3 months during the winter

season.

- Replacement of HPSV 250W lights in the Ministers' Enclave with LED-based lights of 75W.
- Re-lamping the Chh Road with PS-MH200W lamps and ballasts.
- Replacement of existing HPS/HPM luminaries on the Chh and J Roads Crossing with PS-MH200W luminaries.
- On J Road, replacement of existing HPM 250W luminaries with PS-MH200W luminaries and HPM400W luminaries with PS-MH200W ones.
- Replacement of old, inefficient water-pumps at Charedi Water Works in Gandhinagar with better designed, energy-efficient pumps.
- Replacement of conventional 100 Watt lamps with 14 W T5 tube-lights has resulted in yearly savings of 2.35 million kWh.

Energy Conservation, Fighting Climate Change

The Energy Conservation Programmes plans are on anvil to install Led-based systems in Amarpura village in Gandhinagar district and conduct 500 Walk through Energy Audit in the SME sector. Awareness Generation is also one of the crucial programme to promote the concept of energy conservation. Plan to reach out to target audiences in all the sector of the economy are on anvil. Under the BURD Programme to reach out to all the Secondary Schools in the state and an Online Module and Web-based Portal has been launched for Registration and knowledge dissemination.

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