



सत्यमेव जयते



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## Access to Clean Energy



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### Millennium Development Goal:

Goal 7 – Ensure Environmental Sustainability

### Targets:

Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

### Relevant India Development Goal:

As a signatory to the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, the Government of India supports international efforts for mitigating the impact of greenhouse gas (GHG) emissions

### Background

At the beginning of the 11<sup>th</sup> Five-Year Plan (2007-12), it was estimated that approximately 115,000 villages and 56 percent of households did not have access to electricity. Further, it was estimated that close to 18,000 villages would not have access to grid electricity anytime in the near future. Biomass is a major source of domestic energy, particularly in rural India, where 75 percent of households rely on it for cooking. Many unorganized enterprises also use it as a source of fuel. However, this continued dependence on biomass is putting an increased pressure on the country's natural resources. At the same time, several initiatives such as the introduction of Liquefied Petroleum Gas (LPG), kerosene and biogas in rural households, have also had limited success in rural areas because of high cost, lack of supply and accessibility, and household dynamics that leave no decision-making power in the hands of women.

Against this backdrop of electricity shortages and dependence on natural resources, adoption of renewable energy sources such as small hydro and wind turbines, biomass gasification/steam boiler-based power and solar energy (lanterns, home lighting kits, mini grids) is crucial to meeting the growing energy needs of a majority of the population. Renewable energy technologies, in addition to being environment-friendly, have the potential of generating employment in rural areas. In view of this gap, pilots demonstrating the use of renewable energy sources to generate electricity have been set up across the country. However, these pilots, which are yet to be scaled up, are already facing a lot of constraints. For instance, inadequate suppliers and service providers, non-availability of standard packages, lack of institutional models, high capital cost of some sources of energy, high operation and maintenance costs, low capacity utilization factors, and inadequate capacity in management of such systems.

### Project Information

**Area:** Environment and Energy

**Budget:** US\$ 2.0 million

**Duration:** 2009–2012

**Government Counterpart:** Ministry of New and Renewable Energy (MNRE), Government of India

**Implementing Agency:** MNRE, Government of India

#### Location(s):

United Nations Development Assistance Framework (UNDAF) states - Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh

## Objectives

The project aims to enhance access of rural households to clean and renewable energy in remote un-electrified villages of the seven United Nations Development Assistance Framework (UNDAF) states and explore possibilities of generating livelihoods. The aim is to pilot programmes in a few villages and replicate lessons learnt to upscale and develop a national strategy on accelerating clean energy access. The project also seeks to develop a Renewable Energy Service Company as a viable business model and train key implementing and monitoring officials/professionals.

## Results so far

- A compendium of case studies on 'Access to Clean Energy – A glimpse of off-grid projects in India' was released at the Delhi International Renewable Energy Conference 2010, which showcases 26 case studies on gasifiers, biogas, biofuel, cook stoves, solar photovoltaics, solar thermal and other renewable energy sources
- Developed a background document on the 'Global Energy Access Centre (GEAC)', which focuses on policy research, consultancy, capacity building, knowledge centre, etc not only for India, but also for the Asia-Pacific region. The document outlines the functions and responsibilities of GEAC, its institutional structure, funding arrangements, etc
- Pilot initiatives have been chosen to demonstrate as business models for further upscaling. They are categorized into three, namely, innovative pilots, which include concepts that are ready for upscaling, products that require market development and products that link with livelihoods. These are:
  - Innovative pilot: Hydro-based power generation (hydrokinetic technology) of about 30 kW with low speed water flow – such as canal will be demonstrated at Behta Khurd and Raghunathapur in Rae Bareilly district of Uttar Pradesh
  - Upscaling of renewable:
    - Biomass gasifier-based electricity generating system (32 kW at Galimapur and 24 kW in Qutabpur) is being implemented by Saran Renewable Energy in Saran district and Ramnagar in Ballia district of Uttar Pradesh. This system will make use of Dhaincha grown on wasteland, and will provide six-hour electricity supply, support a few irrigation pumpsets, and telecom towers
    - Technology Informatics Design Endeavour (TIDE) is working to upscale fuel-efficient stoves (PYRO multipurpose stove) for commercial kitchens in Ajmer district of Rajasthan. They will pilot 200 such stoves and establish a dealer network to expand them further
    - Humana People to People India (HPPI) is working in 41 villages in Unnao and Hardoi districts of Uttar Pradesh to provide lighting through solar energy through microgrids
- Market development for Renewable Energy Technology products
  - Small Scale Infrastructure Development Fund (S3IDF) is working in Rajnandgaon district in Chhattisgarh to enhance market for renewable energy products through Green Energy Mandal and Mahila Urja Centres. The Centres will seek to create clusters of carbon-free zones with minimum GHG emissions
  - ONERGY (Punam Energy) is working in 20 villages of Bolagir district in Orissa to introduce renewable energy products such as solar LED lights, solar home electrification systems and improved cooking products through Shakti Kendras. In phase two, the enterprise aims to include water purifiers and heating systems, solar computers, refrigeration systems and irrigation solutions. By doing so, it also aims to create 100 rural entrepreneurs
- Promotion of livelihood activities
  - Gramodaya is working in Budhikhamri village in Mayurbhanj district of Orissa to provide electricity through a small biomass gasifier system to press leaf plate making unit
  - Shramik Bharti is working in Bairi Dariyav village in Ramabai Nagar district of Uttar Pradesh for Solar Power Station and Biomass gasifier system

## Looking to the Future

- Showcase business models with clean energy as a key driver and develop case studies to disseminate the information on lessons learnt
- Develop strategies to upscale acceleration of clean energy
- Demonstrate renewable energy-based livelihood activities
- Provide inputs to develop a national policy on access to clean energy

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