



Role of Renewable Energy in Combating Climate Change by

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Introduction

- Important aspect in development of renewable energy is the displacement of fossil fuels as an energy source .
- Burning of one ton of fossil fuel on an average generates 3.2 tons of CO₂ . Fossil Fuels pollute the atmosphere by emitting other gases like NO_x. SO_x, SPM etc.
- Renewable energy technologies important for states like UP are:
 - Small hydro
 - Wind
 - Solar photovoltaics/ solar thermal
 - Biomass
 - Biofuels ?



Introduction



- As a result of climate change new investment opportunities exist for the development of technologies and installation of new power plants using renewable energy.
- There is a significant benefit from renewable energy in terms of reducing Green House Gas (GHG) emissions and is extremely important for mitigating the impacts of climate change .
- Planning Commission, Government of India estimates indicate that the annual CO₂ emissions could rise from the 1 billion tonnes at present to between 3.9 to 5.5 billion tonnes by 2031-32 depending on the mix of technologies used and adoption of energy efficiency measures where ever possible.
- 20,000 MW from solar energy by 2022 as per the Mahatma Gandhi National Solar Mission will lead to saving of 30 million tons of CO₂ annually.



India and Renewable Energy



- The Government of India plans to provide access to electricity to all households in 11th Five Year Plan (2007-2012).
- Electrification of 115,000 villages and 23.4 million BPL households is envisaged under the Rajiv Gandhi Gramin Vidyutikaran Yojana (RGGVY)
- Renewable energy based DDGs, which is also being promoted through RGGVY, can help mitigate climate change and also provide solution for rural electrification and sustainable livelihoods
- UNDP with its partner agencies is implementing the Biomass Energy for Rural India (BERI) project in 24 villages of Tumkur district in Karnataka .
- This is significant as about 30 % of India's energy needs are met from Biomass.

India and Rural Energy

- Energy consumption by the domestic sector in India is 42% of which 78.4% is accounted by inefficient burning of biomass in rural areas.
- In most households, the energy efficiency of traditional cooking stoves using biomass fuels such as cow dung cakes and firewood is as low as 8-9%. Just over 2% of relatively rich households in rural areas use Liquid Petroleum Gas (LPG).
- The continued use of firewood for cooking also results in significant pressures on forest resources.
- Estimates indicate that around 50% of the country's forests are impacted by firewood collection and other human activities .



India and Rural Energy

- Over 40% of households in rural India continue to use kerosene based lamps for lighting.
 - This percentage is more than 70% in States like Bihar, Jharkhand and Uttar Pradesh either due to non supply or erratic supply of electricity to rural households and huge government subsidy , even though it has been reduced recently.
- The use of 9.8 million tons of kerosene in rural and urban areas, results in approximately 31 million tonnes per year of CO₂ emissions.
 - Need to be substituted by solar lanterns .
- Therefore, the National Solar Mission and promoting efficient use of biomass can help transform the rural energy scenario and reduce GHG emissions.



BERI project

- It is demonstrating technical feasibility and financial viability of bioenergy technologies .
- Building capacity and developing appropriate mechanisms for implementation, management and monitoring
- Developing financial, institutional and market strategies to overcome barriers for large-scale replication
- Disseminating bioenergy technologies and information package



Lessons learnt from BERI

- Panchayats need to be strengthened to handle DDG in terms of manpower and governance capacities
- Biomass management (sustainability of growing, protecting, processing, and supply management) is a challenge
- Capacity development of community/Panchayat is another major challenge



UNDP- strategies and activities

- Access to clean energy
 - Develop framework for scaling up interventions for enhanced access & delivery of clean energy services
 - Inputs to develop a national strategy for “Accelerated clean energy access”
 - Energy access linked to livelihoods for 350 un-electrified villages in Chattisgarh, Madhya Pradesh, Jharkhand and Orissa
 - Capacity development of stakeholders for energy planning, implementation and replications (Administrative Training Institutes, State Rural Development Institutes, Urja Sanghathan, Rural Franchisees)
 - Support actions to reduce AT&C losses (tracking energy flows, energy audits, ITES)
- GEF-SGP Program implemented in India by UNDP
 - So far supported over 300 projects (240 completed)
 - with about 150 NGOs all over the country



UNDP Interventions

Access to clean energy

Small hydropower

- Zonal master plan for small hydro developed
- Small hydro simulator established to give real experience & training programs.
- Graduate courses introduced.

Biomass Energy for Rural India [2002 to 2009]

- 1000 kW installed for power generation: One unit handed over to the community for overall management
- Gram Panchyat is selling power to BESCO: sold 280,000 units at a tariff of Rs 2.85/unit
- MOU between Panchyat and Malavalli Power Plant Limited with equity from both

Renewable energy for Rural Livelihoods [2005-2012]

- Several small enterprises have been developed (Jharkhand, Uttarakhand, Rajasthan)
- *Addressing gender issues by supporting women solar engineers to assemble and service solar devices*



UNDP Interventions

Access to clean energy

Energy efficiency and replication

- Industries (SMEs – brick, steel re-rolling , motors)
 - For example, in the integrated steel plants, energy consumption declined by nearly 25% during 1990-2005
 - similar reductions have been recorded in sectors such as fertilizers, aluminum, paper and power plants
- Transport (urban, railways);
- Residential (electrical appliances) - % Star
Airconditioners sales increased 3100% between 2008-09 and the year ending March, 2010.
- Commercial (Green buildings) sector



UNDP Interventions

Access to clean energy

Energy efficiency and replication

- The Government of India has taken a series of measures such as reforming the energy sector and promoting energy conservation measures. The Energy Conservation Act 2001, Energy Conservation Building Code, Programme on Efficient lamps, Promotion of solar water heaters etc.
- It is estimated that annual energy efficiency will continue to increase at 1.5% per annum and overall resource use efficiency at 3% per annum, and even if the economy grows at an expected 8-9% over the next two decades, the energy intensity of GDP will continue to decline.



UNDP Interventions

Access to clean energy

Knowledge management, awareness and capacity building

- Strengthening information base (NATCOM, HDR indicators etc.);
- UN Cluster and UN Solution Exchange COP;
- Parliamentary and Legislative Forums

Constraints

- Excessive centralized control leads to lack of buy-in by the community. Lack of ownership by the local community can make DDG units non-operational
- Participation of citizens is minimal
- Experiences from the GoI-UN Joint Convergence Program shows that many times projects became non-operational due to lack of O&M, management and technical support systems
- Often sized for lighting needs of the local people with no focus on additional demand of electricity for sustainable livelihoods.
- Low capacity utilization (20-25 %) and suboptimal design of plant leads to high generation costs.
- Grid-interactive DDG units required to address the issue of economic viability



Other Renewable Initiatives

- Successful renewable energy models have led to employment generation through micro-level enterprises. For Example the West Bengal Renewable Energy Development Agency (WBREDA) project in the Sunderbans that involve solar photovoltaics, biomass gasifiers and wind farms
- Despite number of programs and interventions, DDG has not been fully successful .



UN Solution Exchange-Climate Change Community

- Facilitated by UNDP as Energy accounts for over 60 % of GHG emissions globally and climate change is taking centre stage in the global environment agenda.
- Objective is to utilize existing knowledge (expert knowledge and tacit knowledge) about use of renewable energy and the constraints in its implementation for meeting development objectives and MDGs.
- Renewable energy and DDGs are closely linked and using the Solution Exchange Platform interesting insights were obtained through the cross posted query with the Decentralization Community of Practice on Rural Electrification –Decentralized Distributed Generation. This query was floated on behalf of Ministry of Power.
- Another query on Business Models for Upscaling Climate Responsive Technologies highlighted Renewable Energy technologies . This query was floated on behalf of MNRE.



Conclusions

- It is clear that renewable energy is one of the major thrust areas for mitigating climate change.
- UNDP is working very closely with the Government of India in promoting and implementing projects on renewable energy.
- Solution Exchange- Climate Change Community, facilitated by UNDP is being effectively utilized to learn from the tacit knowledge of practitioners and identify the constraints being faced in the field.
- For inclusive growth to be a reality in the near future there is a need to recognize renewable energy and environment as key developmental issues rather than technical or sectoral issues.



Thank You for Your Attention!