

BIOMASS ENERGY FOR RURAL INDIA PROJECT

Towards Bio Energy Security in Rural India

1. Project Period : April 2001 to December 2006. Three extensions. December 2008 & thereafter to December 2010 & finally to December 2012.

2. Project Progress :

Objective : Overcoming technological, technical, capacity & financial barriers in establishing Carbon negative bioenergy operational modules.

a. Setting up large capacity gasifier electrification plants connected to grid for producing Carbon negative bioelectricity using woody biomass. Construction of one megawatt capacity gasifiers power plant completed. 300 kw is operational. 7,90,775 kwh of green electricity generated till July 2011 resulting in a saving of 625 tonnes of Carbon emissions.

Kabbigere : 100 kw capacity : Two gasifier systems : Operational : Have generated 6,35, 132 kwh of bioelectricity till July 2011.
200 kw capacity: One gasifier system. Operational: Has generated 155643 kwh of bioelectricity till July 2011.
100 kw capacity: Dual Fuel Mode with diesel & producer gas: One gasifier system. Not operational. Proposed to be operated using bio diesel to keep the operation green.

Boregunte: 250 kw capacity: One gasifier system. To be operationalised

Seebnayanapalya: 250 kw capacity: One gasifier system. To be operationalised.

b. Established 3000 hectares of forestry plantations in the vicinity of the power plants, in the reserved forests, common lands & farm bunds / borders as energy plantations, for meeting the biomass requirement of the gasification power plants. These plantations have resulted in the sequestration of nearly 12000 tonnes of Carbon.

c. Established community based biogas plants for reducing the usage of wood & kerosene for domestic cooking. 51 community biogas units established in 24 villages covering 175 households. The total biogas generated is estimated to be 95309 cubic metres & the savings in carbon emissions is estimated to be 148 tonnes.

d. Established 56 community bore wells with submersible pump sets & drip irrigation catering to 267 households in 24 villages. These community pump sets were envisaged to be operated with the bio electricity generated from the gasifier power plants, thereby reducing the C emissions in irrigation/agriculture from using base loads. However, as the green energy generated by BERI is evacuated to the ESCOM grid, the C negativity in community irrigation is not implemented as yet. There is a proposal to implement load shift mechanisms at Kabbigere which will enable BERI power to be given to the IP sets in the cluster villages, including the community borewells, for 1.5 to 3.00 hours over & above the ESCOM supply, during scheduled

& unscheduled ESCOM load shedding. This proposal is to be implemented during the year.

3. Utilization of GEF Grant till March 2011 & co financing leveraged by the Project:

The GEF UNDP grant amounting to Rs 1705.00 lakhs is utilised till march 2011. There is a balance of Rs 170 .00 lakhs to be disbursed towards the project activities till December 2012, out of the earmarked amount. An amount of Rs 440.00 lakhs was leveraged from the Indo Canadian Environment Facility & utilised towards the project. The Government of Karnataka has earmarked an outlay of Rs 703.00 lakhs towards the project, of which Rs 191.00 lakhs has been utilised till date. The balance would be released during the years 2012 -13. In the post project years, the project activity will be sustained by the Government of Karnataka through budgetary support.

4. Major learning opportunities & challenges :

Biomass electricity has distinctive advantages over the other renewables like wind & sun in terms of capital & operating costs, decentralisability & despatchability. One megawatt year of biomass electricity generates nearly Rs 200.00 lakhs income to the rural agrarian economy from the purchase of biomass alone. There are additional incomes in growing, harvesting & transporting the biomass. Challenges lie in increasing the productivity of biomass per unit area, in the close proximity of the gasification plants & by improving yields by good tree breeding ,tree improvement & bringing in bio technology in forestry plantation activity. The gasification technology is an appropriate technology for bio electrification of rural India. Biomass production & the supply network is critical for the sustainability of bio electricity. With the competitive & often conflicting use of the scarce resource of land & the biomass, increasing the productivity of woody biomass deserves high priority. Some 950 tonnes of biomass has been used till date to produce BERI bioelectricity. This biomass was sourced from BERI plantations raised in reserved forests, common lands & from plantations raised by local farmers using BERI seedlings. In addition, biomass was sourced from private contractors & the Karnataka State Forest Industries Corporation & the Mysore Paper Mills. The landed cost of biomass ranged from Rs.1.10 to Rs 3.00 per kilogram. The cost of transport was determining the landed cost of biomass.

5. Activities proposed in the remaining project period :

- a. Operationalisation of the 100 kw dual mode gasifier at Kabbigere with producer gas & bio diesel or with 100% biodiesel.
- b. Outsourcing the Operation & Maintenance of the Kabbigere Gasifier Systems to an Entrepreneur ,for show casing demonstration of commercial operation.
- c. Operationalisation of the 250 kw gasifier systems at Boregunte & Seebanayanapalaya.
- d. Implementing the Load Shift Mechanism at Kabbigere to give tail end support to BESCOM during scheduled & unscheduled load shedding to enable all the IP sets in the cluster village to get BERI bioelectricity for 1.5 to 3.00 hours over & above BESCOM supply.

6. Major knowledge products brought out by the Project:

Publications:

1. Biomass Gasifier Based Power Generating Systems in Southern India (2005)
2. Monitoring Greenhouse Gas Emissions (Nov.2006)
3. Indoor Air Quality Study in Project Area (March 2006)
4. Estimation of Carbon Sequestration, Carbon Stock & Flow in Project Area (May 2007)
5. Grid Interactive Biomass Gasification Based Power Generation in Rural India (Sept 2008)
6. BERI : Feed In Tariffs (Dec 2010)
7. Technical Proposal for Load Shift Mechanism at Kabbigere (April 2011)
8. BERI : Carbon Mitigation Report (June 2011)

7. Details of partners involved in the Project :

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