

## 8.7 Case study: Remote village electrification of Jemara village in Orissa

### 8.7.1 Introduction

TERI works on design and development of biomass gasifier system for thermal and power generation purposes. Gasifiers with various capacities ranging from 10 kg/hr to 300 kg/h, is working in the field. One of the case study presented here is on a village electrification project. The project is to provide electricity to a remote village in Orissa state.

### 8.7.2 Location details:

Name of the village	Jemara
Distance from nearest city	80 km from Bilaspur
Population of the village	above 500
No. of households	120

### 8.7.3 Project details:

Capacity of the Gasifier System	20 kg/h
Capacity of the Genset	15 kVa
Peak load	9 kW
Minimum load	6 kW
Duration of operation	4 hours
Fuel used	80 – 90 kg/day
Power produced	
Specific Fuel Consumption	1.7 – 1.8 kg/kWh (Range)
Date of commissioning	13 <sup>th</sup> February, 2005
Budget layout	Rs.9 lakhs

### 8.7.4 Operation details :

Number of households electrified	115
Lighting	1600 hrs to 2200 hrs
Average load	6 to 7 kW
Other requirements	Rice huller and Oil expeller

### 8.7.5 Village Committee

A village energy security committee is formed. It consists 21 members from the village. The committee maintains a record on tariff collections and expenditure. There are two person employed for system operation and maintenance.

The committee manages operation and maintenance of the system through the tariff collected from the villagers.

### 8.7.6 Tariff rating and collection mechanism

Every house hold using electricity pays twenty five Rupees per month. Addition to the money paid every house holds contributes biomass of 30 to 40 kg per month. The biomass collected is used to feed the gasifier. The money collected is used to pay the operators and to meet the expense on O&M of the engine.

### 8.7.7 *Quality aspects*

Each and every system is tested for its quality and performance before despatching it to the site. This is very essential to avoid any unforeseen troubleshooting and rectification at the site. Since the villages are situated in the remote areas where it is difficult to access the location and to get any major rectification work done. Therefore, it is essential to ensure that the system is perfect before despatching it. Two figures show the view of the system during installation and testing.





**A view of the modified diesel engine with spark ignition system**

#### *8.7.8 Engine modification*

There is no standard gas engine available in smaller scale at the range of 10–20 kWe. The diesel engines available in the market are modified through local mechanics to run on 100% producer gas. The fuel ignition system is removed and suitable spark ignition system is introduced in the engine to start and run on gas.