



**Ensuring  
Sustainable  
Biomass Supply  
at  
Malwa Biomass  
Power Plant**

## Malwa Biomass Power Plant - Ensuring Sustainable Biomass Supply

Punjab is called as the "Granary of India". It is an ideal region for growing variety of crops such as rice, cotton, sugarcane, pearl millet, maize, barley, fruits and wheat being the major crop. Punjab produces 43% of India's wheat and 15% of India's rice.

Being an agrarian state, Punjab produces large amount of agro residues both from the fields and processing industries. The Government of Punjab has estimated the power potential from the agro residues as over 1,500 MW. In general, most of these agro residues generated are wasted or burnt in the field, which creates large amount of CO<sub>2</sub> emissions and other local pollution.

In concern to the global emissions, the Malwa Power Private Limited (MPPL) implemented the first grid connected biomass power plant in Punjab. The 7.5 MW power plant was commissioned at village Gulabewalla in Muktsar district of Punjab in 2005. The Malwa Biomass Power Plant was developed as a Special Purpose Vehicle (SPV) of Dee Development Engineers Private Limited for the generation of power using biomass. The electricity is sold to Punjab State Electricity Board (PSEB) under a Power Purchase Agreement (PPA).



The biomass power plant consists of Thermax make AFBC (Atmospheric Fluidized Bed Combustion) boiler and a 7.5 MW bleed cum condensing steam turbine.

### *Ensuring sustainable biomass power supply for the plant operation*

MPPL set up the biomass power plant with a view of using the rice husk as a biomass fuel. During the first year of operation in 2005-06, the plant was operated solely on rice husk. But with the substantial increase in price of rice husk in Punjab, the company decided to shift the plant operation to alternative fuel resource, cotton sticks. Sixty percent of the total fuel requirement was satisfied with cotton sticks but the key challenge in using cotton sticks was transportation due to its large volumes. Therefore MPPL created a biomass procurement and storage infrastructure to ensure uninterrupted supply of biomass fuel for the power plant.

In the year 2006-07, MPPL set up seven fuel procurement centres in the village so that farmers can sell their cotton sticks easily. However, the transportation of wet biomass was cumbersome.

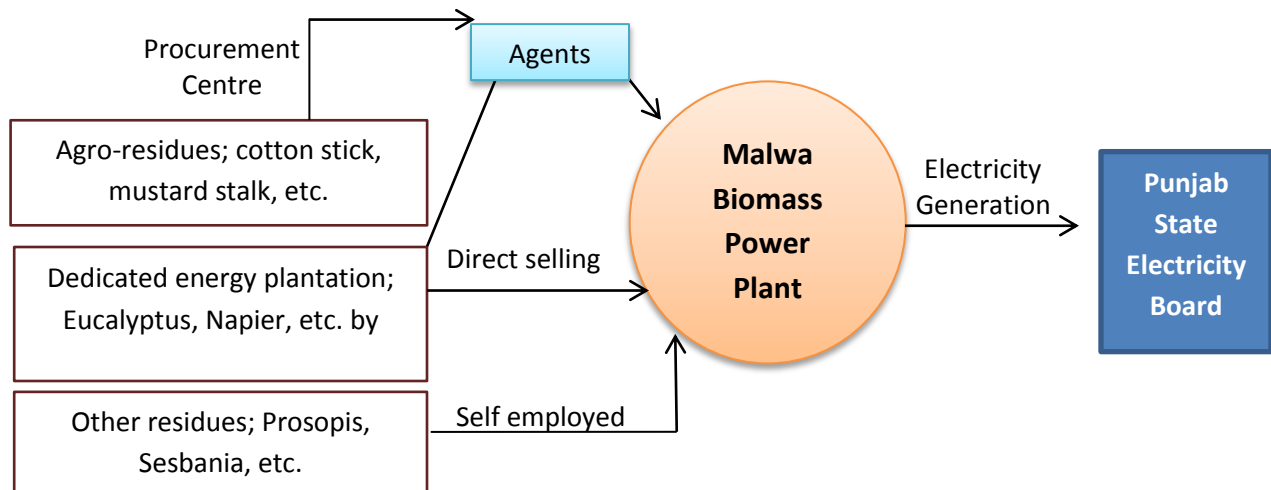
Project at a glance	
Capacity	7.5 MW
Location	Gulabewlla, Muktsar, Punjab
Technology	Atmospheric Fluidized Bed Combustion (AFBC) Boiler by Thermax
Steam production	31.5 tonnes of steam per hour at pressure of 67 atm and 465°C temperature
Feedstock	Cotton sticks, mustard husk, rice husk, etc.
Biomass consumption	72,270 metric tonnes/year
Project cost	Rupees 2,883.75 lakhs

Therefore the centres were equipped with mobile chipping machines and other necessary equipment, required for processing and transportation.

Later on the Malwa project was considered as one of the demonstration project in MNRE-UNDP/GEF project on Removal of barriers to biomass power generation in India". With the support from the project, MPPL established 25 collection centres equipped with chipping and transportation arrangements in 2007-08. More than 1,00,000 metric tonnes of wet cotton sticks were collected in the year against the fuel requirement of 72,270 metric tonnes per annum at 100% capacity utilization. As a result, the plant recorded a Plant Load Factor (PLF) of more than 90% in that year.

The success of cotton sticks for power generation motivated other entrepreneurs in the area. The Muktsar district is surrounded by large number of brick industries, which use locally available biomass for their energy requirements. MPPL faced competition with existing brick industries for supply of biomass. Since the brick making industries are profit making industries, they were able to offer better pricing to the farmers. Thus to overcome the barriers of biomass availability, MPPL decided for dedicated energy plantations for ensuring sustainable biomass supply. The biomass is now arranged from three sources;

- a) Agricultural residues such as Cotton stick, Mustard stalk, Wheat straw, Paddy straw, Sorghum husk, Moong husk, etc;
- b) Dedicated plantation of Eucalyptus tereticornis, Napier grass and Saccharum spontaneum, and
- c) Other woody resources such as Prosopis juliflora and Sesbania, firewood chips, tree barks, veneer waste and saw dust.



The approach taken for MPPL project sets a good example for other biomass projects. MPPL has established a biomass supply chain for ensuring the procurement of biomass at a reasonable price. The project has also resulted in large number of job opportunities in the area as the local people were involved in managing the biomass supply chain. Besides, many people were involved in dedicated plantation, operation and maintenance of biomass power project, etc.

