Power Generation From Biomass

Bermaco in Renewable Energy Development

Presented by
Lt. Col. Monish Ahuja (Retd.)
Director
• Bermaco – Introduction
• Biomass Power
  – Benefits
• Punjab Biomass Power Limited (PBPL) - A unique 12MW Biomass Paddy straw fired Biomass Power Plant at Ghanour, Punjab
• Punjab Renewable Energy Systems Limited (PRESPL) – Fuel Management Company
• Bermaco – International Acknowledgement
• Bermaco – Rural and Social Development
• Bermaco – Milestones (2011-12)
• Issues faced by Biomass Projects
Bermaco Energy limited

<table>
<thead>
<tr>
<th>State</th>
<th>SPV with Partners</th>
<th>Power Generation</th>
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<tbody>
<tr>
<td>Punjab</td>
<td>Punjab Biomass Power Ltd</td>
<td>108MW</td>
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<tr>
<td>Bihar</td>
<td>PTC Bermaco Green Energy Systems Ltd</td>
<td>312MW</td>
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<td><strong>Total</strong></td>
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<td><strong>420MW</strong></td>
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Bermaco has implemented a 100% Paddy Straw fired 12 MW Biomass Power Project at Ghanour, Patiala for its SPV Punjab Biomass Power Limited (PBPL). The Project Details are as follows-

- **Location:** Village : Ghanour, Patiala, Punjab
- **Plant Capacity:** : 12 MW, Condensing STG
- **Plant Configuration:** : 60 TPH Boiler
- **Fuel:** : Paddy Straw
# Bermaco Energy limited

## Subsidiary Companies

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<tr>
<th>Company Name</th>
<th>Activity</th>
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**PRESPL – Fuel Supply and Aggregation, BAS**

- GAPS Power & Infrastructure Pvt. Ltd. (Aurangabad, Maharashtra) – 13MW
- Punjab Biomass Power Ltd. (Ghanour, Punjab) – 12 MW
- AA Energy Ltd. (Gadchiroli, Maharashtra) – 10 MW
- Radico Khaitan (Aurangabad, Maharashtra) – Process Industry
- Tata Power Ltd. (Kundli, Maharashtra)
- Oleander Farms Pvt. Ltd.
- Simbhaoli Sugar Ltd. (Brijnathpur, Chilwaria – Uttarprades)h
- Auro Mira Energy

- Cotton Stalk, Maize Cob, Bagasse
- Paddy Straw, Sugarcane Trash & Energy Plantation
- Paddy Straw
- Cotton Stalk, Soya Husk, Juliflora
- 100 acres of Energy Plantation
- 200 acres of Energy Plantation
- Biomass Assessment Survey, Sugarcane Trash
- Biomass Assessment Survey
India Agri Biomass Production Profile (%)

- Paddy: 43%
- Cotton: 14%
- Maize: 7%
- Jowar: 6%
- Groundnut: 4%
- Others: 26%

Key incentives: Capital Subsidies, Preferential Tariffs, RECs and CDM

Demand drivers:
- Rapid advancement in technology making it much more economically viable
- India’s growing energy needs
Biomass Power - Benefits

• INCOME TO THE RURAL POPULATION.
• RURAL EMPLOYMENT.
• SOCIO-ECONOMIC DEVELOPMENT AND SOCIAL INTEGRATION.
• AGRICULTURAL DEVELOPMENT.
• FOREIGN EXCHANGE SAVINGS.
• AFFORDABLE CLEAN POWER COMPARED TO OTHER RE POWER.
  – LESS CAPITAL COST
  – HIGHER PLF
  – EVACUATION AND INFRASTRUCTURE CHALLENGES RELATIVELY LESS THAN OTHER RE POWER
  – CHEAP POWER FOR CONSUMPTION RATHER THAN TAX SAVINGS AS COMPARED TO OTHER RE POWER

• POVERTY ALLEVIATION.
• ENERGY SECURITY.
• CLIMATE CHANGE MITIGATION.
• DECENTRALIZED BASE-LOAD POWER
One of the principal challenges facing developers investing in a biomass project is to ensure that a secure and cost-effective supply of biomass fuel is in place. The larger fraction of cost in biomass energy generation originates from the logistics and storage operations. PRESPL is optimizing fuel purchasing through analysis, processes, technology and integrated networking.

PRESPL has been investing more in people, processes and technology to solve fuel management challenges.
PRESPL – Aggregation and supply of biomass fuel

PRESPL -

• Mitigates the risk of non-availability of fuel to Biomass Power Plant and de-risk the IPPs, making lending to the project easier for financial institutions.

• Handling a supply of approx. 700MT of biomass on a daily basis.

• Supplying
  – Paddy Straw
  – Cotton Stalk
  – Maize Cob
  – Sugarcane Trash
  – Bagasse
  – Mustard Stalk, Soya Husk
In addition to this technology being carbon neutral, there will be further improvement of the environment.

- Improvement of Wasteland Soil physical and chemical characteristics
- Improvement in underground water quality
- Firing Wood in power plant will reduce NOx and SOx emission levels in addition to reduction in CO2
- Generation of rural employment
THE HIGH COMMISSION OF THE UNITED REPUBLIC OF TANZANIA

JAB 189/424/01/A/68

The High Commission of the United Republic of Tanzania in New Delhi presents its compliments to the Eastern and South African Division of the Ministry of External Affairs of the Government of India and with reference to the Mission’s Note Verbal No: JAB 189/424/01/A/68 of 8th June, 2012 has the honour to convey to Mr. Ravi Bangar, the Joint Secretary [E&SA] that the Government of the United Republic of Tanzania [Ministry of Energy and Minerals] has been highly inspired by the BERMACO Energy Ltd notable capability and competence in renewal energy.

Hence, in the cause of ideal projection of business cooperation between the Tanzania Ministry of Energy and the BERMACO Energy Ltd. [India], the Mission has the honour to request Mr. Ravi Bangar to inform the BERMACO Management to further pursue the subject with the Ministry’s authority [address given hereunder].

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Ministry of Energy and Minerals
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The High Commission of the United Republic of Tanzania in New Delhi avails itself of this opportunity to renew to the Eastern and South African Division of the Ministry of External Affairs of the Government of India the assurances of its highest consideration.

New Delhi, Thursday, 6th September, 2012

Mr. Ravi Bangar
Joint Secretary [E&SA]
East and Southern Africa Division,
Ministry of External Affairs,
Government of India,
South Block,
New Delhi.

Copy:
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THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF ENERGY AND MINERALS

754/33 SAMORA AVENUE
P.O. Box 2000,
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In reply please quote:
Ref No.: CBE.88/407/01/110

13th June, 2012

Acting High Commissioner,
High Commission of India,
P.O.Box 2684, 82 Kinondoni Road,
Dar es Salaam, Tanzania,

Sir,

Re: BERMACO ENERGY LIMITED PROPOSAL ON FIRED
BIOMASS-BASED POWER PLANTS

Reference is made to the above heading.

We wish to acknowledge receipt of your letter Ref. No. DAR/COM/201/5/2012 dated 31st May, 2012 regarding the above subject.

We are pleased to note that your office is in full support of the Ministry’s initiatives to develop the energy sector. Linking the Ministry of Energy and Minerals with BERMACO, an energy company in India is a commendable move that shows your commitment in supporting the Ministry’s effort to ensure sustainable power supply in the country through Public Private Partnership (PPP).
Agriculture education program enhances the productivity of crops.

Extra income to farmers by way of purchase of biomass, hiring of tractors, trolleys and employment.

65% of the income from generation is returned directly to the rural community.

Electricity to rural household as the Plant is located in the village area.

Instrumental in Opening of ITI and shops

Extremely low emission of greenhouse gases compared to fossil fuels

Effective waste management practice.

Curbs stubble burning and reduces environment pollution.

Energy Plantation increases water level in the area.

Saving Foreign Exchange indirectly
Bermaco – Effects of 12MW Biomass Power Plant at Ghanour, Patiala

- Developed Village Level Entrepreneurs (VLEs) in
  - Ghanour, Aurangabad, Karjat and Gadchiroli
- Empowered the village youth to become VLEs
- Provided equipment like balers, cutters etc.
- Encouraged the VLEs to invest on Paddy Straw cutters and local transport vehicles.
- Impart regular education program of Management to VLEs
- Impart regular education program to increase the productivity of crops.
- Impart and showcase to VLEs that village and agriculture is important
Bermaco – Effects of 12MW Biomass Power Plant at Ghanour, Patiala

Effects of Power availability in rural India:

Social inclusion of the rural community

Poverty Alleviation

Taking Industry based on agriculture into rural parts of the country.

Effects of Power availability in rural India

Access to Power ensured the following:

Increased Education program

Access to Television, Media, Computers

Charging of mobiles

Setting up of shops, rural industries and cold storages
Bermaco – Milestones (2011-12)

- Setup up of Regional Office and employed 6 persons including 1 VP level person in Patna, Bihar.

- Acquired land for power plant site at Jagdishpur, Bihar and Purkhali, Punjab.

- EPC discussions finalized for 5 project sites (2 in Punjab and 3 in Bihar).

- Generated 60 million units in 2011-12.

- Employed 150 direct employment and 500 indirect employment in Ghanour / Patiala, Punjab.

- Employed 35 direct employment and 500 indirect employment in Aurangabad, Maharashtra.

- Employed 35 direct employment and 200 indirect employment for Energy Plantation in Karjat, Maharashtra.
Instrumental in restricting the migration from villages and channelizing the village youth energy positively as the employment given to them at their place since the plants are located near to villages.

- Opened nearly 750 Bank Accounts of Federal Bank Ltd. in Aurangabad district of Maharashtra for Farmers, contractors, employees, contract workers etc.

- Opened nearly 800 Bank Accounts of United Bank of India in Patiala district of Punjab for Farmers, contractors, employees, contract workers etc.

- Opened 600 Bank Accounts in Karjat district of Maharashtra for Farmers, contractors, employees, contract workers etc.

- Opened 100 Bank Accounts of UCO Bank in Jagdishpur, Bhojpur district of Bihar for Farmers, contract workers in the process of acquiring land for the power plant site there and employing security staff there.
Issues faced by Biomass Project

- TARIFF NORMS
- STATE POLICIES
- RPO
- CER
- CREDIT RISK
- FUEL PRICE UNCERTAINTY
- REGULAR TARIFF REVISION
Thank You

We acknowledge the importance of rural growth and will endeavor to improve lifestyle of the rural population of the country.

www.bermacoenergy.co.in