

POLICY OF MINISTRY OF POWER

FOR

BIOMASS UTILIZATION FOR POWER GENERATION

THROUGH CO- FIRING IN PULVERIZED COAL

FIREF BOILERS

Biomass Utilisation for Power Generation through Co-firing in Coal Based Power Plants

1. Introduction

Stubble burning has been cited as a major cause of recent smog in north-west India. Stubble burning is deliberate setting fire of the straw stubble that remains after harvesting of paddy and other crops. During the months of October and November of each year, farmers in north-west India burn an estimated 30-40 million tonnes of crop waste from their paddy fields after harvesting. The primary reasons for stubble burning are; (a) reduce the cost of clearing the field for next crop, (b) reduce the turnaround time between harvesting and sowing for next (winter) crop and (c) lack of other alternatives, viz. availability of appropriate agricultural implements, viz., implements to take out the stubble and "Happy Seeders" for zero tilling sowing etc.

1.1. Various options for safely disposing such bio-mass are (i) setting up power plants exclusively based on bio-mass, (ii) co-firing of pellets made out of bio-mass in the coal based thermal plants, (iii) *in-situ* incorporation of bio-mass into the soil using appropriate agricultural implements or composting and (iv) manufacturing of various products such as Ethanol, Bio CNG and Board etc.

2. Biomass co-firing in coal based power plants

The estimated 30-40 million metric tonnes of paddy straw that remains un-utilised and burnt in north-west India has potential to generate about 6000-8000 MW and 45000 million units of electricity annually, by co-firing it along with coal in existing coal fired power plants. Biomass co-firing has a potential to create a market for large scale consumption of agro residue and convert it into electricity in eco-friendly and cost effective manner while mitigating problem of air quality deterioration. Market mechanism for agro residue utilisation will also enable additional income to farmers.

2.1 The existing power plant infrastructure cannot directly use raw agro residue bio-mass in a pulverised coal fired type boiler and it is required to be processed into dense bio-mass in the form of pellets. The densification of biomass in the form of pellets also reduces its transportation cost, which is a major component in overall fuel price. Promoting agro-residue processing capacity into pellets for power sector shall also create employment opportunities and develop entrepreneurship.

2.2 Biomass co-firing is a well proven technology. With increasing environmental awareness, power plants all over the world has adopted, biomass co-firing as a strategy to combat pollution. According to open source data, 230 plants across globe, majority located in European and American countries, have experience of biomass co-firing. UNFCCC recognizes biomass co-firing as a carbon neutral technology for mitigation of carbon emission from coal based power plants.



3. Status of Biomass co-firing in India

NTPC has successfully demonstrated the co-firing of 7% blend of biomass pellets with coal in its Dadri power plant. This can be replicated in other coal fired power plants too. The blend of coal and pellets can safely be pulverized in power plants having bowl mills/vertical roller mills/beater mills. However, this method is not suitable for power plant having ball and tube type of mills due to higher risk of fire hazard. Approximately, 2.5 to 3.0 lakh tonnes of Biomass pellets are required for 7% blending in a thermal power plant of 1000MW capacity.

4. Benefits of using biomass pellets co-firing in Coal based power plants

- a) Eliminate/minimize burning of agro-residue and create economic value of agro residue by promoting its use as fuel in power plants in co-firing mode.
- b) Improve the air quality index while creating additional income for farmers.
- c) Encourage the establishment of decentralised pellets manufacturing units and generate employment opportunities.

5. Biomass Utilisation for Power Generation through Co-firing in Coal based power plants.

Therefore, in order to promote use of the bio-mass pellets, all the Power plants/Utilities are hereby advised as follows:

- a) All fluidised bed and pulverised coal units(coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, shall endeavour to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspects etc.
- b) CEA shall develop/issue Specifications for the pellets. CEA will also provide technical assistance/advise to Utilities on how to use bio-mass pellets for blending with coal in coal based thermal power plants.
- c) The Appropriate Commission will determine the compensation (for plants other than those whose Tariff has been already determined under section 62 of Electricity Act) to be allowed in tariff for increase in cost of generation on account of using bio-mass pallets, viz., cost of pellets, increase in auxiliary power consumption (APC) and plant heat rate (HR) etc. Increase in cost of generation will not be taken into account for the purpose of merit order for despatch of electricity. The Appropriate Commission shall devise a suitable mechanism to ensure the use of biomass as per (a) above.

