



“Agro Waste To Electricity”- Initiative A Solution to Purali Burning & its Pollution

India produces more than 500 million tonnes of agricultural wastes annually in which cereal crop residues accounts for about 70% of the total crop residue. Majority of the crop residues is used as fodder and fuel for domestic and industrial purposes but still there is surplus of 140 million tones and in which 92 million tones is burnt each year. As per the estimate, Punjab alone produces about 23 Million tonnes of Paddy stubble and 17 million tonnes of wheat straw every year. Of this, 80% of the rice and wheat stubble generated in Punjab are burnt in farms which alarms the rate of the air pollution in our country and also the percentage of stubble burning in Punjab has increased this year when compared to last year.

Every year from the month of October to January farmers in the northern parts like Punjab, Haryana, Uttar Pradesh and Rajasthan which burn agricultural waste jacking the air pollution levels in the national capital and the neighbouring cities- homes for over 25 million people. During November with the onset of cooler weather the smoke, fog, dust, and industrial pollution form a thick haze which serves to be a major problem in several cities like Lahore, New Delhi, Lucknow and Kanpur.

The burning of crop residues generates numerous environmental problems like increasing the emission of green house gases which leads to the global warming and significant rise in the air pollution, increase level of particulate matter (PM) which leads to climate change by releasing fine black and brown carbons into the atmosphere and smog which causes health hazards, loss of biodiversity of agricultural lands and deterioration of soil fertility. The PM emitted due to burning of stubbles in New Delhi is 20 times that from all the other sources of emission. Heat produced by burning of crop residues increases the temperature of the soil which leads to the depletion of the bacteria and fungal population in the soil



The rate of energy consumption continues to grow every day and the demand has also risen. A recently released survey suggests that 87% of the country's population has access to electricity and still 13% of Indian Households don't have any access to any electricity. According to a study, as a result of electrification and the uptake of green hydrogen the global power consumption

will almost double by 2050 so there will be high demand for energy. Thus, both self-sufficiency in electricity and proper management of agriculture waste can

be attained by this project proposal. As per the research, 200 kg of rice husk can produce 40 kw (40 Unit) of electricity per hour which can prevent about 200 tonnes of CO₂ emission annually compared to CO₂ emissions from diesel-generated electricity. If the excess heat produced is used for drying nearly 600 tonnes of CO₂ can be eliminated annually. This proposal will minimise the volume of agricultural residues by turning them into green electricity and heat, essentially by killing two birds with one stone.

This project consists of combined heat and power generation system that can transform heat into electricity. It consists of a cyclone biomass furnace where the stubbles are made into pellets and fed into the combustion chamber along with ambient air where it is burnt by using high-velocity cyclone for complete combustion. The ashes that are produced falls to the bottom of the chamber due to gravity and are disposed by screw conveyer whereas the hot air/gas passes through upper chamber for the production of electricity. Heat is transferred to the working fluid at constant pressure, increasing the temperature and pressure of the working fluid until it reaches the boiling point. The vapour then undergoes superheating, then adiabatic expansion causing decrease in temperature and pressure and thus generating power. The vapour is condensed to its original liquid state in a condenser to allow the process to be repeated.



This continuous energy can be produced by this method.

The benefits of this proposal are stated below:

- Provides renewable heat and electricity from the agricultural wastes.
- Eliminates agricultural waste and hazardous disposal practices which complies with more stringent environment.
- Burnt ashes from the crop residues serves to be good fertilisers which can enhance the soil fertility.
- Prevents CO₂ emission into the atmosphere.
- Implementation of this project is faster when compared to other methods.
- High flexibility and adoption to almost any fluctuations in the heat source.
- Efficient use of low-temperature heat.
- Lower capital and operating cost.

This proposal encourages the use of crop residue in the energy sector as a raw material. The solutions involving long-haul transportation, expensive technology or high capital investment are likely to be succeeded. The fertilisers obtained feed the nutrients in the crop residues back into the same crop land have given better performance and the yield percentage is also enhanced. This mechanism can considerably reduce the crop residues burning and also help in the production of energy through agriculture waste residues. Therefore, agricultural waste can be utilised in much needed form of electricity in rural areas. We have the expert Management Team & Technocrats who have successfully implemented these projects Internationally and now in India , specially this Problem of Purali (Agro Waste) Burning which is a major issue would be taken care.

So those who are looking to support this initiative can provide there technical expertise, land to setup this plant, local village level coordination for assistance and also can provide financial assistance to fund this plant setup across Pan Punjab wherein we are proposing to setup 1 plant in each district to cater to all the villages of that district.