

SAMARTH POLICY

Policy In Detail, Policy Enablers



SAMARTH - POLICY OUTLINE

- **SAMARTH - Sustainable Agrarian Mission on use of Agri-Residue in Thermal Power Plants**
- From FY 2024-25, all coal based Thermal Power Plants with –
 - Bowl Mills shall mandatorily use minimum 5% of Biomass Pellets
 - Ball & Race Mills shall mandatorily use minimum 5% of Torrefied Biomass Pellets
 - Ball & Tube Mills shall mandatorily use minimum 5% of Torrefied Biomass Pellets with volatile content below 22%
- A Price Benchmarking Committee under the leadership of CEA and members from MNRE, MoPNG and other institutions shall publish the Price for Biomass Pellets w.e.f. 01.01.2024
- **Pellets use is to increase from 5% to 7% w.e.f. FY 2025-26**



SAMARTH – POLICY ENABLERS

MARKET:

Based on the raw material availability and consumption at demand side the market size would be estimated approximately Rs. 1,50,000 Cr.

GOVERNMENT SUPPORT:

Central financial assistance of 9 Lacs per MTPH from Ministry of New & Renewable

SAMARTH SCHEME:

(Sustainable Agrarian Mission on use of Agro Residue in Thermal Power Plants) Biomass Pellets are targeted to co-fire with coal to replace 5% of coal.

PLANT & MACHINER:

Reliable plant and machinery available with proven track record.

CLIENTS:

All thermal power plants due to the notification from the ministry to replace minimum 5% of coal with biomass pellets torrefied / non torrefied.



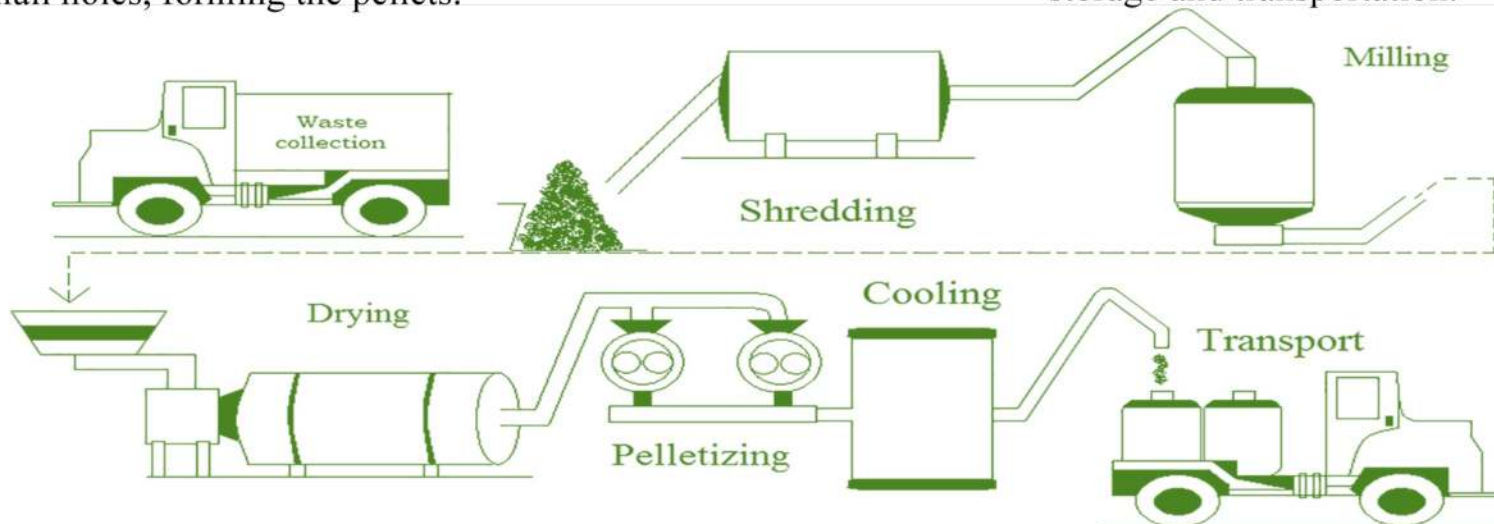
PELLETIZATION PROCESS

Manufacturing Process, Financials, Direct & Indirect Benefits, CO₂ Sequestration



MANUFACTURING PROCESS

- 1. Feedstock preparation:** The first step is to collect and prepare the biomass feedstock like shredding and drying.
- 2. Grinding / Milling:** The main goal of this step is to create a uniform and consistent feedstock that can be easily processed into pellets.
- 3. Pelletizing:** The pellet mill uses a combination of heat, pressure, and friction to force the feedstock through a die with small holes, forming the pellets.
- 4. Cooling:** The newly formed pellets are then cooled to room temperature, typically using a counter-flow cooler. The cooler removes excess moisture and prevents the pellets from sticking together.
- 5. Packaging:** The final step is to package the pellets in bags or bulk containers for storage and transportation.



TORREFIED BIOMASS PELLETS - PROCESS FLOW

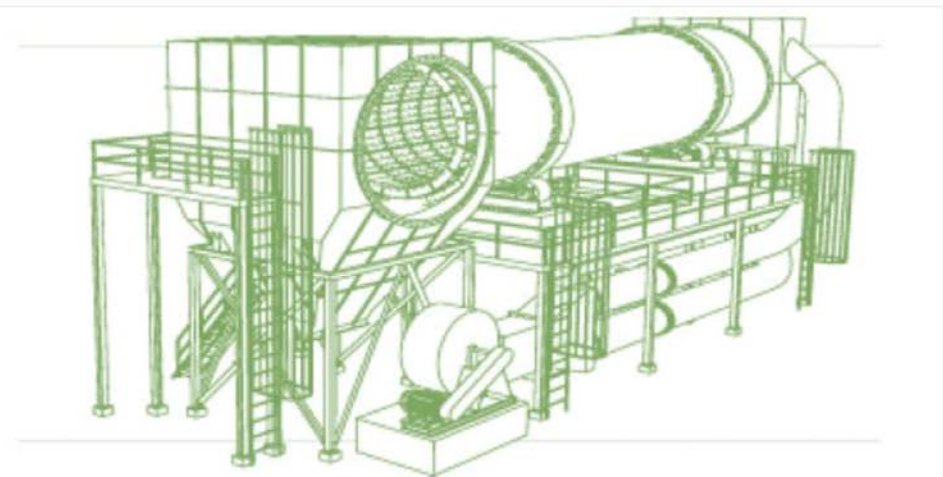


TORREFACTION – OUR PROPOSAL's USP

- In our proposed 40 TPD Biomass Pellet Manufacturing plant we shall be using an inclined type of rotary drum reactor for the torrefaction process which shall be unique of its kind in India.
- Inside the reactor the biomass will be fed at the higher high end of the drum.
- The drum will rotate at a constant low speed with the help of electric motors for uniform heating. As the drum rotates, the biomass progresses by gravity down the slope of the rotating drum and internal fixtures mix the biomass generated gas recycled using turbocharger.

In comparison to normal Pellets, Torrefied Pellet has -

- ☐ **Higher density**
- ☐ **Reduced Moisture & Ash content**
- ☐ **Reduced emissions due to low Volatile Solids**
- ☐ **Longer Storage period**



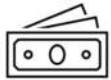
DIRECT & INDIRECT BENEFITS - 40 MTPD PLANT



CO₂ Sequestration – 36,500 Ton of CO₂ annually



Reduction in Stubble Burning – An area equivalent to 18,000 Acres is saved from burning paddy straw



Increasing Farmer's Income – Additional revenue of Paddy Straw sale (Approx. USD 20 - 40 per Acre)



Direct Employment – 14 – 15 employment per plant (Manager, Supervisor, Operators, Drivers etc.)




Indirect Employment – 150+ people under the assumption that average land parcel of 100 Acres shall be handled by each employed person (Farmers, Aggregators, Machine Operators, Transporters etc.)



CO₂ EMISSION & CARBON SEQUESTRATION – 40 MTPD PLANT

- In Open field burning, 1 Ton of Paddy Straw releases **1,460 Kg of CO₂**
- Emission during conversion of Paddy Straw to Pellets is **339 Kg of CO₂**
- 1 Ton of Torrefied Pellets of Paddy Straw release **648 Kg of CO₂**
- Approximate Calorific Value of Torrefied Pellets is **4,000 Kcal/Kg** which is **similar to the** average Calorific Value of Coal used in Power Plants
- In Thermal Power Plants, 1 Ton of Coal releases about **2,070 Kg of CO₂**



CO2 Emission	Kg/ton
Paddy Straw burning in open field	1460
Torrefied Pellet	648
Paddy Collection & Pellet Manufacturing	339
Coal in thermal power plant	2072
Effective CO2 Saving from Pellet	2545

Thus, each MT of Paddy Straw Torrefied Pellets have the potential to save approx. 2,545 Kg i.e. 2.5 Ton of CO₂

A 40 TPD Paddy Straw based Torrefied Pellets plant has the potential to save 36,500 Ton of CO₂ every year

*Above data taken from crop residue management, Ministry Of Agriculture and Farmer welfare. *Akshay Urja edition June 2017 – By Dr. V K Vijay and Dr. Ram Chandra *EPA

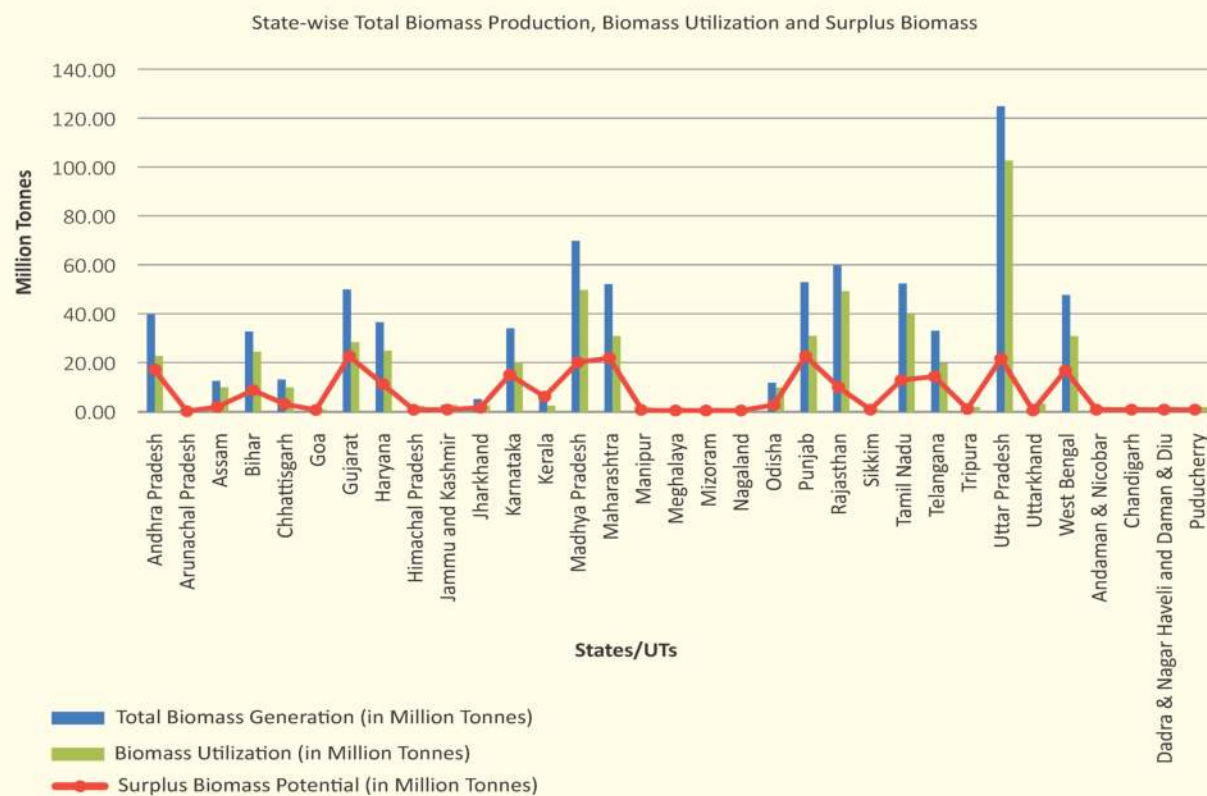


NTPC – Pellets Reqt Across Locations

S No	Location	State	Capacity (MW)	Biomass Reqt @7% (MTPD)
1	Singrauli	Uttar Pradesh	2,000	2,016
2	Korba	Chhattisgarh	2,600	2,621
3	Ramagundam	Telangana	2,600	2,621
4	Farakka	West Bengal	2,100	2,117
5	Vindhyachal	Madhya Pradesh	4,760	4,798
6	Rihand	Uttar Pradesh	3,000	3,024
7	Kahalgaon	Bihar	2,340	2,359
8	Dadri	Uttar Pradesh	1,820	1,835
9	Talcher Kaniha	Orissa	3,000	3,024
10	Feroze Gandhi, Unchahar	Uttar Pradesh	1,550	1,562
11	Simhadri	Andhra Pradesh	2,000	2,016
12	Tanda	Uttar Pradesh	1,760	1,774
13	Sipat	Chhattisgarh	2,980	3,004
14	Mouda	Maharashtra	2,320	2,339
15	Barh	Bihar	1980	1,996
16	Bongaigaon	Assam	750	756
17	Kudgi	Karnataka	2400	2,419
18	Solapur	Maharashtra	1320	1,331
19	Lara	Chhattisgarh	1600	1,613
20	Barauni	Bihar	720	726
21	Gadarwara	Madhya Pradesh	1600	1,613
22	Khargone	Madhya Pradesh	1320	1,331
23	Darlipali	Odisha	1600	1,613
24	Nabinagar-NPGC	Bihar	1980	1,996
25	Kanti	Bihar	390	393
26	North Karanpura	Jharkhand	660	665
		Total	51,150	51,559



Surplus Biomass Availability



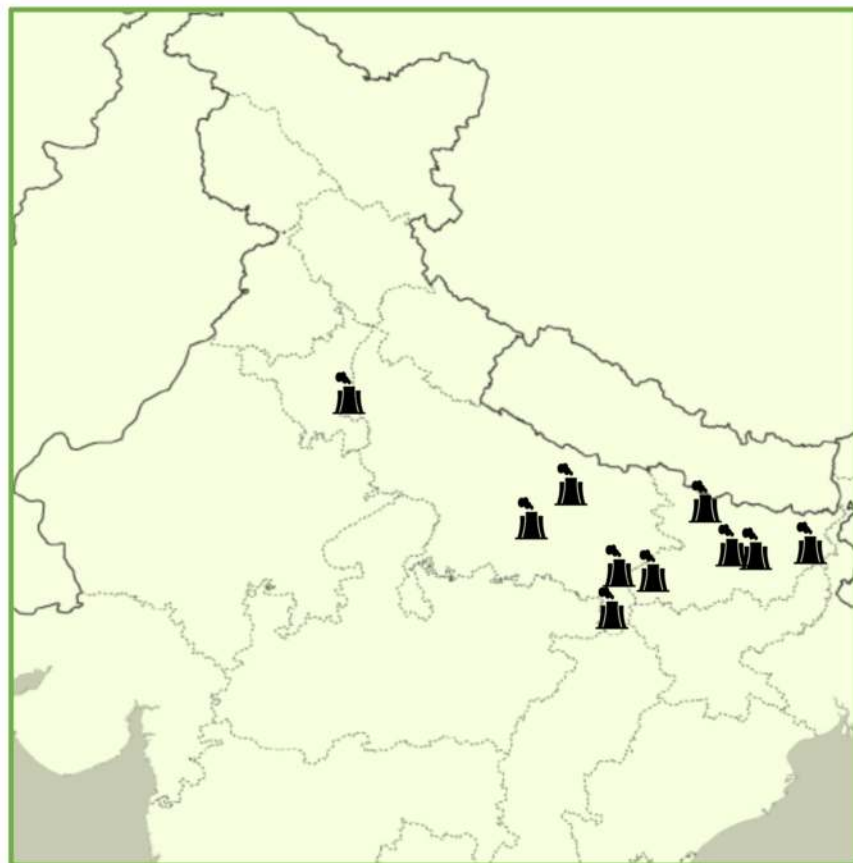
12 States with >10 Million MT of annual Surplus Biomass.

15 NTPC Coal Fired Power Plants in these 12 States

Combined Pellets requirement of these 15 NTPCs is about 28,000 MTPD



NTPC – Target Plants



S No	Location	Capacity (MW)	Biomass Reqt (MTPD)
1	Dadri, UP	1,820	1,835
2	Unchahar, UP	1,550	1,562
3	Tanda, UP	1,760	1,774
4	Rihand, UP	3,000	3,024
5	Singrauli, UP	2,000	2,016
6	Nabinagar, Bihar	1,980	1,996
7	Kanti, Bihar	390	393
8	Barh, Bihar	1,980	1,996
9	Barauni, Bihar	720	726
10	Kahalgaon, Bihar	2,340	2,359
		19,640 MW	19,798 MTPD



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Strictly Private & Confidential

Contact Us



Email

bd@zakventure.com



Phone

+91 9654953201



Website

www.Naturalgasindia.com

