



GOVERNMENT OF INDIA

**MINISTRY OF NEW  
AND RENEWABLE ENERGY**

# Solutions for reducing India's coal use in power today: The role of biomass

A presentation by  
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# Overview on Biomass Potential



- Biomass is available in the form of forestry waste, residue from agricultural operation, processed waste from industry, municipal/urban solid waste.
- The residue from agricultural operation or crop residue – 2G or lignocellulosic type are of numerous varieties, seasonal in nature, location specific.
- Major crop residue from agricultural operation are: paddy straw, wheat straw, mustard, maize and cotton stalk, corn cob, sugarcane trash etc.
- Recognizing this, MNRE, awarded country's biomass potential assessment study to the Administrative Staff College of India (ASCI), Hyderabad. The Report was submitted in March 2021.

Report prepared by	Publishing Year	Total Biomass (Million Ton)	Surplus Biomass (Million Ton)	Bioenergy Potential (GW)
ASCI	2021	754	228	28

# Biomass Potential in India .....ASCI assessment

- Survey for the study was conducted in 254 districts of India. The potential from biomass has been assessed from 54 crops.
- India's has a total geographical area of 328 million hectares (Mha) out of which the net cropped area accounts for 45% i.e. 147 Mha
- Total Biomass Production / Annum – 750 MMT
- Total Surplus Biomass – 228 MMT
- High Potential States – Punjab (3 GW), UP (2.8 GW), Gujarat (2.6 GW), Maharashtra (2.6 GW) & MP (2.5 GW)



# Crop-wise Biomass Power Potential in India



## Rice

A: 46.15 Mn Ha  
S: 41.72 MT  
P: **5682.46 MWe**



## Potato

A: 1.69 Mn Ha  
S: 17.37 MT  
P: **1617.08 MWe**



## Cotton

A: 12.46 Mn Ha  
S: 46.24 MT  
P: **5590.08 MWe**



## Coconut

A: 1.86 Mn Ha  
S: 8.51 MT  
P: **1168.8 MWe**



## Wheat

A: 34 Mn Ha  
S: 33.37 MT  
P: **4505.30 MWe**



## Banana

A: 0.32 Mn Ha  
S: 7.26 MT  
P: **936.71 MWe**



## Maize

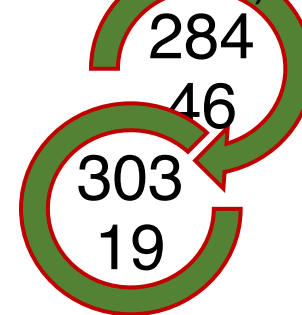
A: 9.75 Mn Ha  
S: 15.21 MT  
P: **1776.35 MWe**

*A- Area, S- Surplus, P- Power potential*

**These seven crops contribute to over 75% of total Biomass Power Potential**

**Sugarcane: 867.92 MWe, Oilseeds: 679.65 MWe  
Arhar: 591.76 MWe, Castor: 534.16 MWe**

**Biomass Power  
Potential in MWe  
(Assessment 2015-18)**



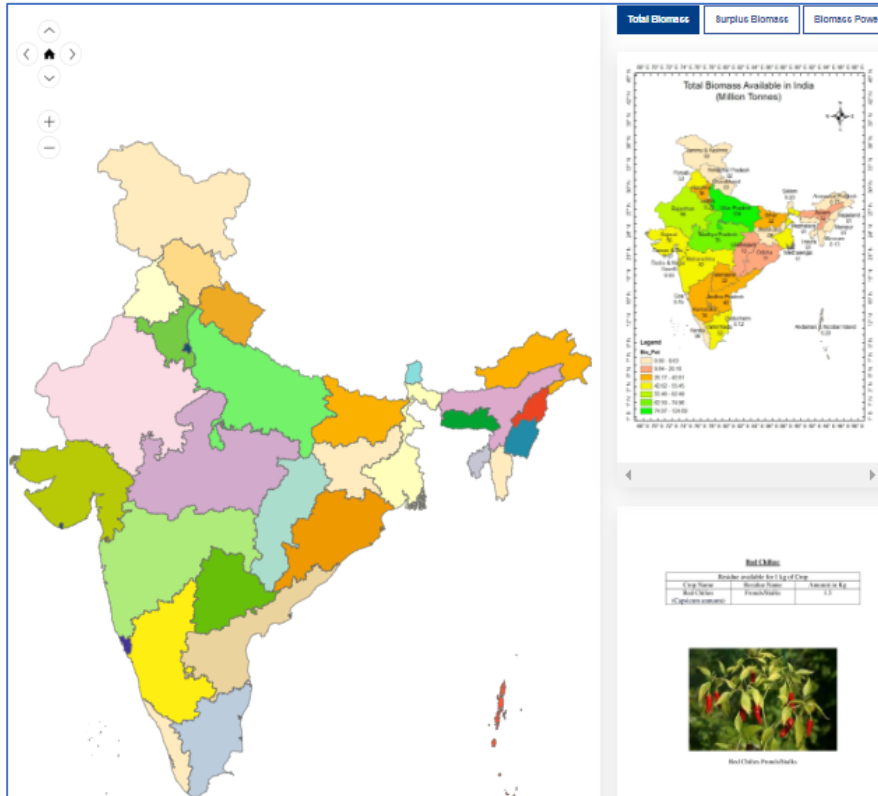
**Biomass Power  
Potential in MWe  
(Projections  
2019-20)**

**These 11 crops contribute to over 84% of total Biomass Power Potential**

# National Biomass Atlas



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<https://www.nibe.res.in/biomass-atlas.php>

- Graphically presents state-wise total and surplus biomass availability in the country
- State-wise and Crop-wise surplus biomass availability for the different important crops.
- State-wise and crop-wise fractions of different residues available per crop for various important crops.
- Images of the different crops considered with their crop residue ratios.
- Atlas provides easier access and understanding of the Indian bioenergy availability scenario to stakeholders including academics, government officials, industry, entrepreneurs, and policymakers.

# Waste to Energy Programme: CFA pattern



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Type of project	CFA Pattern
<b>Biogas generation</b>	Rs 0.25 per 12000cum/day
<b>BioCNG generation</b>	Rs 4.0 Crore per 4800 kg/day (for BioCNG generation from new biogas plant) Rs 3.0 Crore per 4800 kg/day (for BioCNG generation from existing Biogas plant)
<b>Power generation based on Biogas</b>	Rs 0.75 Crore/MW (for power generation from new biogas plant) Rs 0.5 Crore/MW (for power generation from existing Biogas plant)
<b>Power based on bio &amp; agro-industrial waste</b>	Rs 0.4 Crore/MW
<b>Biomass Gasifier</b>	Rs. 2,500 per kWe with dual fuel engines for electrical application Rs. 15,000 per kWe with 100% gas engines for electrical application Rs. 2 lakh per 300 kWth for thermal applications

20% higher CFA for special category states (NE Region, Sikkim, Himachal Pradesh and Uttarakhand, Jammu & Kashmir, Ladakh, Lakshadweep, Andaman & Nicobar Islands) and Gaushalas/Shelters



**Biomass Programme: CFA pattern**

<b>Project Type</b>	<b>Minimum eligible capacity for availing CFA</b>	<b>Rate of CFA</b>	<b>Maximum CFA per project</b>
<b>Briquette / Pellet Manufacturing plants</b>	1 TPH	Rs. 9.00 Lakh per TPH	Rs 45.00 Lakhs
<b>Biomass (Non-bagasse) cogeneration projects</b>	0.5 MW	Rs. 40.00 Lakhs per MW	Rs. 5.00 Crores



## Biomass Utilization

	Installed Capacity	Quantity of Biomass required per day (TPD)
Briquette/Pellet (MTPH)	420.60	3364.80
Non bagasse cogeneration (MW)	10355.35	82842.78
CBG (TPD)	1753.47	28303
Total		114510.58



## Initiatives by other Ministries

- As per Ministry of Power's Biomass Co-firing Policy, all Thermal Power Plants (TPPS) in the country are mandated to co-fire 5% biomass pellets along with coal.
- For Non-utilization of Biomass by TPPs in the National Capital and the adjoining areas, there is also a provision of imposing environmental compensation by the Commission for Air Quality Management in NCR and adjoining areas.
- Because of the above mandates, on the national level, the requirement of torrefied pellets for achieving 5% co-firing in TPPs is about 11,000 tonnes per day (TPD) and that of non-torrefied pellets in the country for co-firing is approx. 90,000 TPD.

THANK YOU