



Biomass

Date: 03.03.2020


3rd EU-India

Conference on Advanced Biofuels, New Delhi



Biomass – Availability

- Abundantly available in India
 - Renewable in Nature
 - Free from net CO₂ (carbon dioxide) emissions.
- As a natural resource, biomass, traditionally, had been playing key role in generation of energy.
 - India's has a total geographical area of 328 million hectares (Mha) out of which the net cropped area accounts for 43% i.e. 140 Mha.
 - Net irrigated area measures approximately 64 Mha (source MoA) whereas Rice & Wheat are the dominant crops (together 41%) while pulses, oilseeds and other commercial crops account for 13.8%, 15.9% & 10.2% respectively.
 - As per the estimates India generates @ 683 Million Tonnes of Biomass Waste from different crops, which is further expected to grow to @ 786 million tonnes by 2020-21.



Indian agriculture produces approximately 683 million tons
(MT) of crop residues annually from 11 major crops.

Crop Type	States
Rice	Uttar Pradesh, Punjab, West Bengal
Wheat	Uttar Pradesh, Punjab, Haryana
Bajra	Rajasthan, Gujarat, Maharashtra
Jowar	Maharashtra, Karnataka, Madhya-Pradesh, Andhra-Pradesh
Sugar Cane	Uttar Pradesh, Maharashtra, Karnataka
Cotton	Maharashtra, Uttar Pradesh, Andhra Pradesh
Ground Nut	Gujarat, Tamil Nadu, Andhra – Pradesh
Oilseeds	Madhya Pradesh, Rajasthan, Andhra-Pradesh, Karnataka, Maharashtra

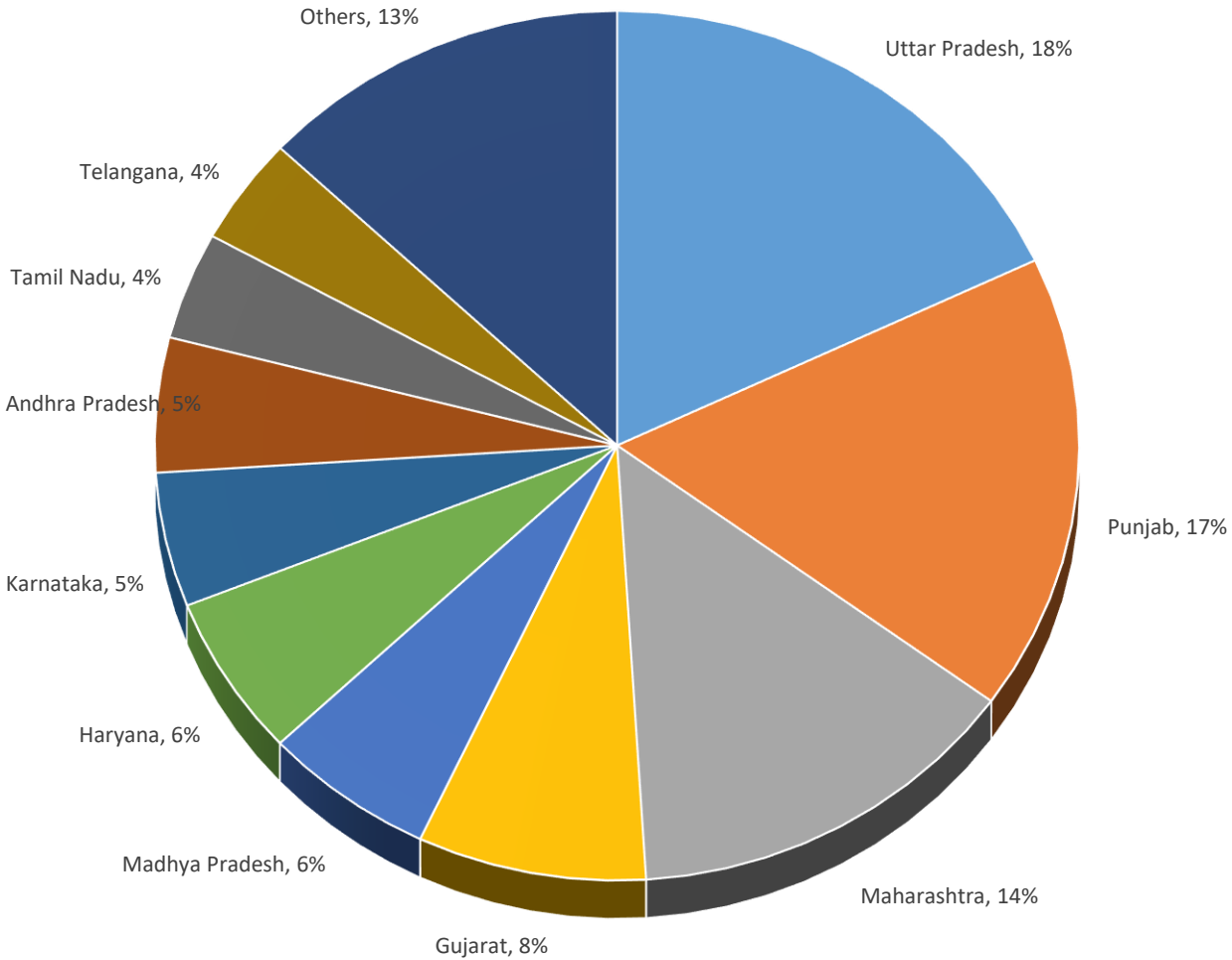


Crop Wide Total Dry & Surplus Biomass

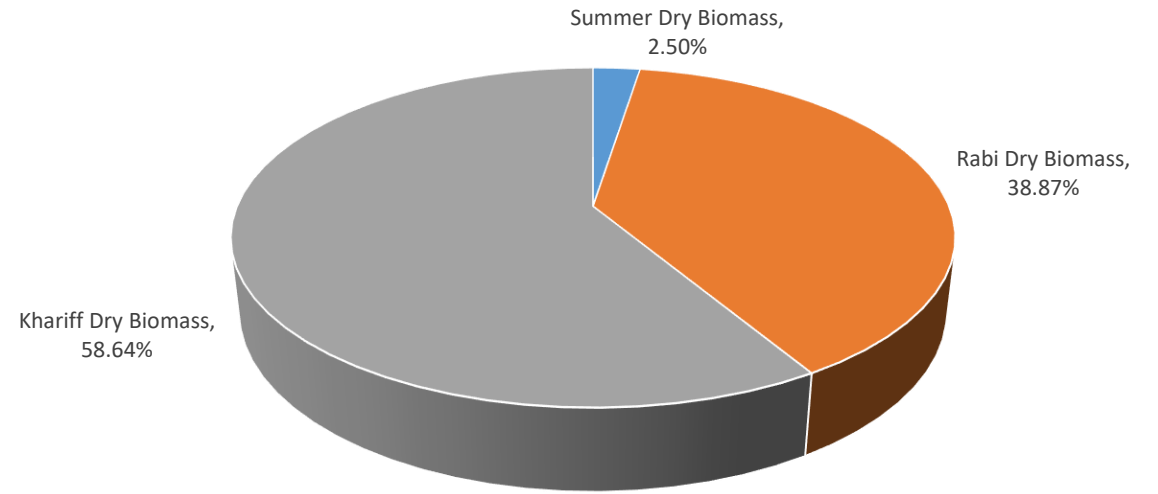
Crop	Dry Biomass (Million Tons)	Surplus Biomass (Million Tons)
Rice	225.50	43.90
Wheat	145.50	25.10
Maize	27.90	6.0
Sugarcane	119.20	41.6
Gram	26.5	8.7
Tur	9.2	1.8
Soybean	27.8	10.0
Rapeseed and Mustard	17.1	5.2
Cotton	66.6	29.7
Groundnut	12.9	3.9
Castor	4.6	3.0
All Crops	683	178.7

TIFAC 2018

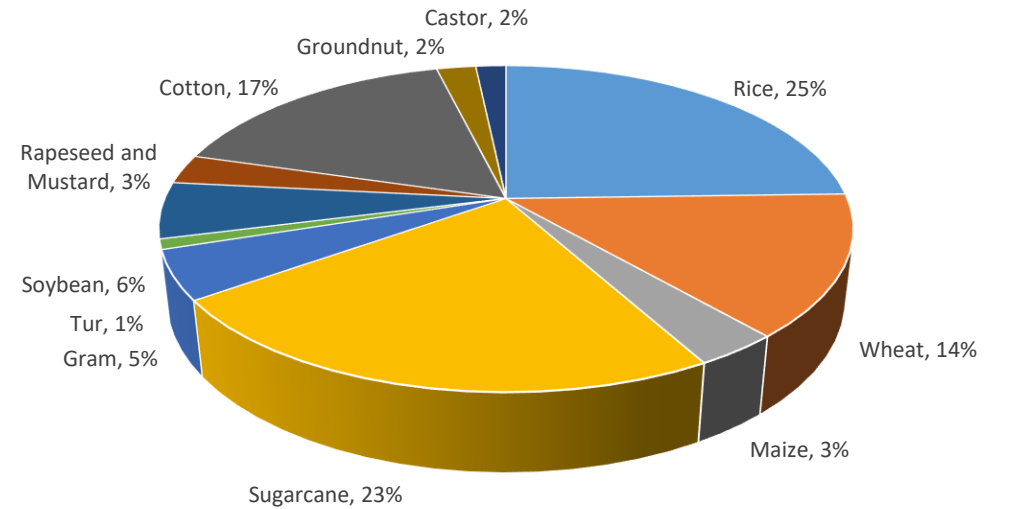
Major Crops Residue Producing States by % of Surplus Production



Dry Crop Biomass Generation



Percentage Share of Surplus Biomass Production



Biomass power & Cogeneration programme

i. Key Objectives:

- To support Biomass based Cogeneration Projects in Sugar mills and Other Industries for power generation in the country
 - from biomass like bagasse, agro-based industrial residue, crop residues, wood produced through energy plantations, weeds, wood waste produced in industrial operations.

ii. **Potential:** 18GW from surplus biomass and 8 GW of additional power could be generated through bagasse cogeneration in the country's sugar mills.

iii. **Achievement** : 9.8 GW Biomass Power and Cogeneration plants have been installed.

iv. Financial Support under the Scheme:

Project Type	Capital Subsidy
Biomass Bagasse Cogeneration Projects	Rs.25 lakh per MW on surplus exportable power
Biomass (Non-Bagasse) Cogeneration projects	Rs.50 lakh per MW on Installed capacity

Scheme to Support promotion of Biomass based cogeneration in sugar mills and other industries (up to March 2020)


Period : - 2017-18 to 2019-20

Financial Outlay: Rs170 Crores

Physical Target: 740 MW

Biomass power & Cogeneration programme - Achievements

State	Potential (including bagasse In MW)	Achievement (in MW)			Cumulative Installed Capacity (in MW)
		Biomass IPP	Bagasse Cogeneration	Non-Bagasse Cogeneration	
Andhra Pradesh	1088*	171.2	206.9	98.98	636.18* (477.08)
Bihar	846	12	100.5	8.2	120.7
Chhattisgarh	256	222.4	6	2.5	230.9
Gujarat	1276	44.5	20.8	12	77.3
Haryana	1475	19.4	102	84.26	205.66
Karnataka	2622	137.3	1729.8	15.2	1882.3
Madhya Pradesh	1386	92.5	0	12.35	104.85
Maharashtra	4170	217	2283.5	16.4	2516.9
Punjab	3338	62.5	131	123.1	316.6
Rajasthan	1132	114.3	4.95	2	121.25
Tamilnadu	1864	218.7	750.4	28.55	997.65
Telangana	1088*	60.1	98	1	636.18* (159.1)
Uttarakhand	168.3	0.12	72.6	57.5	130.22
Uttar Pradesh	3765	28	1929.5	158.01	2115.51
West Bengal	529	300	-	19.92	319.92



State	Potential (including bagasse In MW)	Achievement (in MW)			Cumulative Installed Capacity (in MW)
		Biomass IPP	Bagasse Cogeneration	Non-Bagasse Cogeneration	
Odisha	433	50.4	-	8.82	59.22
Himachal Pradesh	142	-	-	7.2	7.2
Kerala	864	-	-	0.72	0.72
Meghalaya	11	-	-	13.8	13.8
Jharkhand	107	-	-	4.3	4.3
Assam	279	-	-	-	
Manipur	15.3	-	-	-	
Nagaland	10	-	-	-	
Arunachal	9.3	-	-	-	
Tripura	3	-	-	-	
Sikkim	2.4	-	-	-	
Mizoram	1.2	-	-	-	
Goa	26	-	-	-	
J & K	43	-	-	-	
Total	26862	1750.4	7435.9	674.8	9861.18

Biomass – Electricity Generation

Total Units Consumed: 1376 BU (Year 2018-19)

RE Share: 126.75 BU (9.2%)

RE Break Up:

Wind 62 BU

Solar 39 BU

Biomass 2.7 BU

Bagasse 13.5 BU

16.3 BU (1.20% of Total Units)

Small Hydro 8.7 BU

Others 0.4 BU

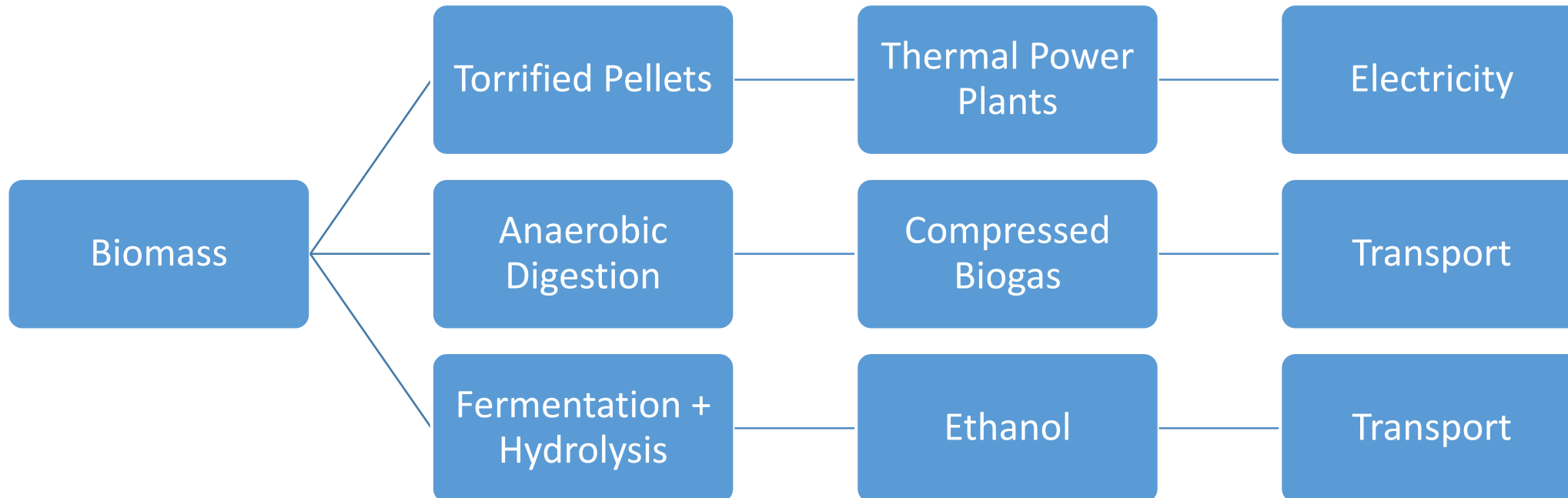
Few States like Gujarat & Rajasthan have determined separate RPO trajectory


ENERGY TECHNOLOGIES

- Biomass can be used to produce energy and fuels

MoPNG – Biofuels Policy 2018

- **Second Generation Ethanol for blending targets**
- Compressed Biogas to replace import of natural gas for transport.
- Use crop residues to co-fire coal-based power plant / 100% Biomass Power Projects



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- Ministry of Power announced the Policy for Biomass Utilization for Power Generation through co-firing in Pulverized Coal fired Boilers.
 - Subsequently an advisory was issued by CEA for utilization of Biomass in Coal Based Power Plants to an extent of 10%
 - MNRE clarified that the Power Generated from co-firing of biomass in thermal power plants is renewable and is eligible for meeting Non-Solar Renewable Purchase Obligations (RPO).
 - CERC on 18th Feb 2020 has issued the Order for "Methodology for Estimation of Electricity Generated from Biomass in Biomass Co-fired Thermal Power Plants"
 - MNRE has further undertaken fresh Biomass resource assessment across India & the study is been conducted by ASCI Hyderabad.



Thank You



Waste to Wealth

03-03-2020