

GOVERNMENT OF INDIA
MINISTRY OF POWER

RAJYA SABHA
UNSTARRED QUESTION NO.154
ANSWERED ON 20.07.2026

PROMOTION OF BIOMASS-BASED POWER GENERATION

154. SHRI SANJAY RAUT:

Will the Minister of **POWER** be pleased to state:

- (a) whether Government has assessed the potential of agricultural residues for electricity generation and production of renewable fuels through advanced biomass technologies;
- (b) details of incentives, financial assistance and policy support provided for biomass-based power projects, waste-to-energy plants and biomass collection, storage and transportation infrastructure;
- (c) whether thermal power plants have been directed to enhance co-firing of biomass pellets to reduce stubble burning and air pollution and if so, the details thereof; and
- (d) targets fixed for biomass-based power generation, reduction in carbon emissions, employment generation and utilisation of agricultural residues under various schemes during the last three years, year-wise?

A N S W E R

THE MINISTER OF STATE IN THE MINISTRY OF POWER

(SHRI SHRIPAD NAIK)

(a): Yes. The Ministry of Power, through the Central Electricity Authority (CEA) in 2026 has carried out an Evaluation Study for Assessment of Biomass Availability and Related Aspects in India, through Administrative Staff College of India (ASCI), Hyderabad. As per the study, it is estimated that gross agricultural biomass in India is around 903 Million Metric Tonne (MMT). The surplus biomass is around 206 MMT which can be utilized for power generation and production of bio-fuels besides other alternative uses.

(b): The Government has taken various measures, including incentives, financial assistance and policy support, to promote biomass-based power projects, waste-to-energy plants, and the development of biomass collection, storage and transportation infrastructure, as below:-

(i) Central Financial Assistance (CFA) under the National Bioenergy Programme of the Ministry of New and Renewable Energy (MNRE).

Ministry of New and Renewable Energy (MNRE) supports the installation of Bioenergy Projects in the country under National Bioenergy Programme (NBP), which was notified on 02.11.2022, for the period 2022-23 to 2025-26. The details of Central Financial Assistance (CFA) provided is given at **Annexure-I**.

(ii) Crop Residue Management (CRM) Scheme in the States of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and NCT of Delhi.

Ministry of Agriculture & Farmers Welfare (MoA&FW) has implemented a Central Sector Scheme on Crop Residue Management (CRM) w.e.f. 2018-19. Under CRM scheme, Credit Linked Back Ended Subsidy @ 65% is provided on the capital cost of machines for establishment of paddy straw supply chain projects. The details of CRM Scheme is given at **Annexure-II**.

(iii) Swacch Bharat Mission-Urban 2.0 (SBM-U 2.0)

Under SBM-U 2.0 being implemented by the Ministry of Housing and Urban Affairs (MoHUA), Additional Central Assistance (ACA) is available to ULBs at the rate of Rs.18 crore/ 100 tonne per day for setting up of waste to energy plants.

(c) : Yes. The Ministry of Power has issued policy directions from time to time to enhance biomass co-firing in coal-based thermal power plants for reducing stubble burning and improving air quality. The major measures include:

The Ministry of Power (MoP) issued a policy on 17.11.2017 to promote utilisation of biomass through co-firing in coal-based thermal power plants. The policy was subsequently modified on 08.10.2021, 03.05.2023 and 06.06.2023 to facilitate its implementation and strengthen the biomass ecosystem in the country.

MoP issued revised Comprehensive Policy for Co-firing of Biomass pellets [including Torrefied Charcoal made from Municipal Solid Waste (MSW)] in Coal based Thermal Power Plants in November 2025, as per which “All Coal based Thermal Power Plants (TPPs) of power generation utilities in the NCR shall on annual basis use 5% blend (by weight) of biomass pellets and additional 2% blend (by weight) either from biomass pellets and/or torrefied charcoal made from Municipal Solid Waste (MSW) w.e.f. FY 2025-26. TPPs in other regions shall on annual basis use 5% blend (by weight) either from biomass pellets and/or torrefied charcoal made from MSW along with coal w.e.f. FY 2025-26”.

(d) : No separate year-wise national targets have been fixed for biomass-based power generation, carbon emission reduction, employment generation and utilization of agricultural residues under all biomass-related schemes taken together.

However, implementation of the biomass co-firing policy measures has resulted in significant utilisation of agricultural residues through biomass co-firing in coal-based thermal power plants, generating additional income opportunities for farmers and reduction in farm fire incidents.

As on 30th June, 2026, 75 thermal power plants have co-fired around 63.06 Lakh Metric Tonnes (LMT) of biomass, resulting in avoidance of approximately 75.6 LMT of CO₂ emissions. The year-wise quantity of biomass co-fired in Thermal Power Plants (TPPs) is given below:

Parameter	FY 2023-24	FY 2024-25	FY 2025-26
Biomass pellets utilised (MT) in TPPs	3,74,857	16,18,450	30,71,938

Besides, co-firing in TPPs, the country has also established 10,869 MW of biomass-based power generation plants and the year-wise generation is given below:

Parameter	FY 2023-24	FY 2024-25	FY 2025-26
Biomass based Power Generations (in MUs)	14,242.78	13,073.99	14,082.05

MT- Metric Tonnes

MUs- Million Units

TPPs- Thermal Power Plants

**ANNEXURE REFERRED IN REPLY TO PARTS (b) OF UNSTARRED QUESTION NO. 154
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**Central Financial Assistance (CFA) Pattern under NBP (National Bioenergy Programme) of the
Ministry of New and Renewable Energy (MNRE)**

Waste to Energy Programme	Central Financial Assistance (CFA) in Rs Crore
Biogas generation	Rs 0.25 Crore per 12,000 cum/day (Maximum CFA- Rs. 5.00 Crores/project)
Compressed Bio-Gas (CBG) generation	Rs 4.0 Crore per 4800 kg/day (for CBG generation from new biogas plant) Rs 3.0 Crore per 4800 kg/day (for CBG generation from existing biogas plant) (Maximum CFA- Rs. 10.00 Crores/project)
Power generation based on Biogas	Rs 0.75 Crore/MW (for power generation from new biogas plant) Rs 0.5 Crore/MW (for power generation from existing Biogas plant) (Maximum CFA- Rs. 5.00 Crores/project)
Power based on bio & agro-industrial waste	Rs 0.4 Crore/MW (Maximum CFA- Rs. 5.00 Crores/project)
Biomass Gasifier	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

Note: 20% higher CFA under Waste to Energy (WTE) programme for special category states (NE Region, Sikkim, Himachal Pradesh and Uttarakhand, Jammu & Kashmir, Ladakh, Lakshadweep, Andaman & Nicobar Islands) and Gaushalas/Shelters.

Biomass Programme	CFA
Briquette manufacturing plants	Rs. 9.00 Lakhs/ Tonnes Per Hour (TPH) (Maximum CFA- Rs. 45.00 Lakh per project).
Non-Torrefied Pellet manufacturing plant	Rs. 21 lakhs/ TPH production capacity or 30% of the capital cost considered for plant and machinery of 1 TPH plant, whichever is lower (Maximum Rs. 105 lakhs per project)
Torrefied Pellet manufacturing plant	Rs. 42 lakhs/ TPH production capacity or 30% of the capital cost considered for plant and machinery of 1 TPH plant, whichever is lower (Maximum Rs. 210 lakhs per project)
Non-Bagasse Cogeneration Projects	Rs. 40 Lakhs/ Megawatt (Maximum CFA- Rs. 5.00 Crore per project).

Biogas Programme	CFA
Small biogas plants (1-25 m ³ /day plant capacity)	Rs. 9,800/- to Rs. 70,400/- per plant based on size of the plant in cubic meter
For Power generation and thermal application (25 - 2500 m ³ /day capacity)	Rs. 35,000/- to Rs. 45,000/- per kilowatt for power generation Rs. 17,500/- to Rs. 22,500/- per kilowatt equivalent for thermal applications. <i>Note: 20% higher than Standard CFA for NE Region, Islands, Registered Gaushalas and SC/ST beneficiaries);</i>

MW- Megawatt TPH- Tons per Hour KW- Kilo Watt Cum-Cubic Meter

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CRM (Crop Residue Management) Scheme of Ministry of Agriculture and Farmers Welfare (MoAFW)

Paddy stubble burning in Punjab, Haryana, and Uttar Pradesh is one of the factors contributing to air pollution in Delhi-NCR. However, paddy stubble burning is limited to the months of October and November.

To support the efforts of the Governments of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and NCT of Delhi to address air pollution caused due to paddy stubble burning and to subsidize machinery required for management of crop residue, a Central Sector Scheme on Crop Residue Management has been implemented w.e.f. 2018-19.

Under this scheme, financial assistance @ 50% is provided to the farmers for purchase of crop residue management machinery and @ 80% is provided to Rural Entrepreneurs (Rural youth and farmer as an entrepreneur), Cooperative Societies of Farmers (Agriculture/ Horticulture/Makhana etc.), Day-NRLM Cluster Level Federations and Self Help Groups (SHGs), Farmer Producer Organizations (FPOs) and Panchayats for establishment of Custom Hiring Centres of crop residue management machines.

Financial support of 65% on the capital cost of machines costing up to Rs. 1.50 Crore is also provided to paddy supply chain projects on the capital cost of machinery and equipment like higher HP Tractors, Cutters, Tedder, Medium to large Balers, Rakers, Loaders, Grabbers & Telehandlers.

Financial assistance to the States and ICAR is also provided for undertaking Information, Education and Communication activities for mass awareness of farmers on crop residue management.

The scheme promotes the usage of machines and equipment recommended by Indian Council of Agricultural Research (ICAR) for management of crop residues such as Super Straw Management Systems, Happy Seeder, Super Seeder, Smart Seeder, Zero Till Seed cum Fertilizer Drill, Mulcher, Shrub Master/Rotary Slasher, Paddy Straw Chopper, Hydraulically Reversible Mould Board Plough, Crop Reapers and Reaper Binders for in-situ management of crop residue and Balers & Straw Rakes for collection of straw for further ex-situ utilization.

During the period from 2018-19 to 2026-27 (as on 08.07.2026), Rs. 4,549.096 crores have been released (Punjab - Rs. 2,206.28 crores, Haryana - Rs. 1,220.42 crores, Uttar Pradesh - Rs. 911.03 crores, Madhya Pradesh - Rs. 90.218 crores, NCT of Delhi - Rs. 6.05 Crores, ICAR - Rs. 107.378 crores & others - Rs. 7.7205 Crores). The states have distributed more than 3.54 lakh machines to the individual farmers and established more than 43,508 CHCs in these States.
