

GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY
RAJYA SABHA
UNSTARRED QUESTION NO. 3666
ANSWERED ON 24.03.2026

BIOENERGY AND AIR QUALITY CO-BENEFITS

3666. SHRI RAGHAV CHADHA

Will the Minister of NEW AND RENEWABLE ENERGY be pleased to state:

- (a) the details on the current installed capacity and annual generation from bioenergy (biogas, biomass power, bio-CNG) and trend over the last five years, year-wise ;
- (b) whether bioenergy schemes have measurably reduced crop-residue burning or unmanaged organic waste in any regions and if so, the details thereof;
- (c) the key barriers to scaling bioenergy projects, including feedstock aggregation and tariffs; and
- (d) the manner in which Government plans to integrate bioenergy strengthening into air-pollution and waste-management strategies?

ANSWER

THE MINISTER OF STATE FOR NEW & RENEWABLE ENERGY AND POWER

(SHRI SHRIPAD YESSO NAIK)

- (a) As on 28.02.2026, the details of installed capacity under bioenergy projects and annual generation from bioenergy over the last five years, year-wise is given at **Annexure-I**.
- (b) As per information received from the Central Electricity Authority (CEA):
 - Biomass co-firing in thermal power plants (TPPs) offers significant environmental and operational benefits, including reduced fossil fuel consumption, prevention of open burning of agricultural residues, improved regional air quality through lower particulate and gaseous emissions.
 - As of 28.02.2026, the co-firing of carbon-neutral biomass pellets with coal in TPPs has prevented approximately 5.7 million metric tonnes of carbon dioxide emissions in the country since its inception in FY 2019–20.
- (c) The key barriers to scaling bioenergy projects are given as under:
 - i. Feedstock Availability: Challenges in aggregation of biomass feedstock and year-round storage.
 - ii. High Capital Cost per MW: Bioenergy projects require significantly higher capital investment per MW compared to other renewable energy sources such as solar and wind, if used for generation of electricity.
- (d) The Government has taken various initiatives to integrate bioenergy for mitigation of air pollution and augment waste management strategies. The details are given at **Annexure-II**.

Annexure-I

**REFERRED TO IN REPLY TO THE RAJYA SABHA UNSTARRED QUESTION NO. 3666,
Part (a) TO BE ANSWERED ON 24.03.2026 on 'Bioenergy and air quality co-benefits'.**

A. The details on the current installed capacity and annual generation from bioenergy is given as under:

SI No	Year	Installed Capacity			Annual Generation (in Million Units) *	
		Biomass	WtE	Biogas	Biomass	Bagasse
		(MW)	(MWe)	(Nos.)		
1	2020-21	7.05	41.75	23019	3512.978	11302.84846
2	2021-22	60	80.16	0	3482.697	12573.88221
3	2022-23	42.4	75.69	9627	3161.323	12863.15931
4	2023-24	107.3	35.37	13219	3417.188	10825.59055
5	2024-25	387.8	254.41	12067	3738.674	9335.316625

* Source: Central Electricity Authority (CEA)

REFERRED TO IN REPLY TO THE RAJYA SABHA UNSTARRED QUESTION NO.

3666, Part (d) TO BE ANSWERED ON 24.03.2026 on 'Bioenergy and air quality co-benefits'.

The details of the initiatives taken by the Government to integrate bioenergy for mitigation of air pollution and augment waste management strategies are given as under:

- I.** MNRE supports installation of bioenergy plants under different components of National Bioenergy Programme (NBP) by providing Central Financial Assistance (CFA). This includes biomass-based (non-bagasse based) plants for power generation, briquettes/pellets manufacturing plants and compressed biogas (CBG/BioCNG) Plants.
- II.** Ministry of Agriculture and Farmers' Welfare (MoAF&W) under the Crop Residue Management (CRM) Scheme provide incentives for management of crop residue. 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% up to a maximum of Rs. 1.50 Crore is also provided to paddy supply chain projects on the capital cost of machinery and equipment. CRM Scheme is not applicable in the State of Maharashtra.
- III.** Central Pollution Control Board (CPCB), provides one-time financial support under Environment Protection Charge funds for establishment of pelletization and torrefaction plants to promote utilization of paddy straw.
- IV.** Ministry of Petroleum and Natural Gas, under its Biomass Aggregation Machinery (BAM) Scheme, provides support to Compressed Bio Gas (CBG) producers in procurement of biomass collection and aggregation machinery to facilitate efficient utilization of agri-residues and prevent open-field burning.
- V.** As per the information provided by the Ministry of Housing and Urban Affairs (MoHUA), under Solid Waste Management component of Swachh Bharat Mission-Urban 2.0, Central Financial Assistance (CFA) is provided for setting up various type of waste processing facilities such as Material Recovery Facilities (MRFs), Waste to Compost (WtC) plants, Bio-methanation plants, Refused Derived Fuel (RDF) processing facilities, Waste to Electricity (WtE) plants, Construction and Demolition (C&D) waste plants, sanitary landfill including CBG plant.