GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

RAJYA SABHA
UNSTARRED QUESTION NO. 2311
TO BE ANSWERED ON 20.03.2025

Punjab's transition to green economy

2311. SHRI VIKRAMJIT SINGH SAHNEY:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

(a) details of Government's contributions toward Punjab's transition to green economy, year-wise and project-wise;
(b) the manner in which Government plans to support these initiatives as Punjab is planning to boost its renewable energy share to 43 per cent by 2030 and exploring green hydrogen from biomass;
(c) whether Government is planning to incorporate stubble into the green economy initiatives and whether any step is being taken to use the stubble for biomass energy generation;
(d) whether Government is planning to introduce a new circular economy initiative to help promote waste-to-energy generation at the State level; and
(e) if so, details thereof, if not, reasons therefor?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI KIRTI VARDHAN SINGH)

(a) India's climate action is multifaceted and it cuts across various sectors of our economy. The government is implementing several programs and schemes including National Action Plan on Climate Change (NAPCC), which is the overarching framework for climate actions. The Punjab state has prepared its State Action Plan on Climate Change, supported by the Government of India.

The government supported several projects on clean energy technology. These include (i) Thermoresistant Polymer-Derived Microporous Ceramic Membranes for Separation of Hydrogen and Carbon Monoxide/Carbon Dioxide in Hydrogen Production, implemented by IIT Ropar, Rupnagar, Punjab in 2019; (ii) Transition metals doped strontium zirconate and strontium manganite perovskite for solid oxide fuel cell applications, implemented by Thapar Institute of Engineering and Technology, Punjab in 2019; (iii) DEEP: Development of an Efficient Photoelectrode for Hydrogen Fuel from Water, implemented by CSIR – Central Scientific Instruments Organisation (CSIO), Chandigarh in 2019; (iv) Additive Manufacturing & Machine Learning based Development of Indigenous Hydrogen Fuel Cell Stack, implemented by IIT Ropar, Rupnagar, Punjab in 2021; (v) DST- IIT Kanpur Integrated Clean Energy Material Acceleration Platform on Materials MAP, implemented by IIT Ropar, Rupnagar, Punjab in 2022.

In Punjab state, the Rooftop Solar Power Plant Scheme facilitated the installation of a total of 62897 KW across 5,166 plants under the Net Metering Scheme for Domestic, Social, and Institutional usage from 2015-16 to 2021-22. Additionally, under the PM-KUSUM (Component-B) Scheme, a total of 12910 solar pumps were installed during the period from 2019 to 2024.

(b) The Government of India has taken several steps and initiatives to boost the share of renewable energy capacity in the country including the state of Punjab. These initiatives have been placed in *Annexure-I*.

Further, the Ministry of New and Renewable Energy (MNRE) through the National Green Hydrogen Mission (NGHM) has taken following initiatives to explore production of Green Hydrogen from biomass:

i Scheme Guidelines for Implementation of Pilot Projects for production and use of Green Hydrogen using innovative methods / pathways in the Residential, Commercial, Localized Community, Decentralized / Non-Conventional, applications, including any new sector or technology not covered in previous Mission Schemes has been issued in November, 2024. An objective of the scheme is to support innovative models / technologies / pathways for production of Green Hydrogen including inter – alia floating solar based Green Hydrogen production, biomass based Green Hydrogen production and production of Green Hydrogen from wastewater.

ii Under R&D Scheme of the National Green Hydrogen Mission (NGHM), five projects have been awarded in biomass-based production category of which a project on "Pilot plant demonstration of Hydrogen production from agricultural waste through integrated pyrolysis and catalytic stem reforming process" is located in Punjab.

The Department of Science and Technology (DST), has launched research and development calls for proposals aimed at enhancing renewable energy. This initiative focuses on the Hydrogen and Fuel Cell program, which seeks to develop innovative technologies that will reduce the costs associated with hydrogen production, distribution, and storage. The program also aims to diversify the feedstock available for economical hydrogen production, improve the flexibility of the power grid, and lower emissions through novel applications of low-cost hydrogen.

(c) Department of Science and Technology supported a multi-institutional collaborative project titled Development and Field Demonstration of a Paddy Straw-Based Briquetting Plant for Decentralized Applications leading to successful demonstration of system at M/s PRESPL, Village Kulburchan, District Patiala, Punjab, under a Public-Private Partnership (PPP) model. The R&D efforts enhanced the lifecycle performance of critical machinery components—such as hammer blades, shredder blades, wear rings, ram, and tikki—aiming to minimize machine downtime, leading to a significant reduction in briquette production costs.

Under the Crop Residue Management scheme, provisions for establishing paddy straw supply chains have been made, supporting industries like biomass power generation and biofuels. This includes financial assistance of 65% for projects costing up to Rs. 1.50 crores. Since the scheme's inception in 2018-19, Rs. 3698.45 crores have been allocated across Punjab, Haryana, Uttar Pradesh, and Delhi, leading to the distribution of over 3 lakh machines, including 4500 balers for straw collection. An Inter-Ministerial Committee monitors implementation, having convened multiple meetings to enhance awareness and management strategies. Various Information, Education and Communication (IEC) activities, including films and workshops, aim to educate farmers on crop residue management and its environmental impact, actively promoting recommended machinery for effective management of stubble and reducing pollution from burning.

Central Pollution Control Board (CPCB) has framed Guidelines for grant of one-time financial support under Environment Protection Charge funds for establishment of pelletization and torrefaction plants to promote utilisation of paddy straw. A total of 15 applications for establishment of pelletization and torrefaction plants under the above mentioned CPCB Guidelines have been sanctioned so far. Pellet production capacity of 15 sanctioned plants is 2.07 lakh tonne/annum. These plants are expected to utilize 2.70 lakh tonne of paddy straw per annum.

Ministry of New and Renewable Energy (MNRE) is also supporting setting up of Biomass Briquette/Pellet manufacturing plants and to support Biomass (non-bagasse) based cogeneration projects in Industries in the country, by providing Central Financial Assistance (CFA).

MNRE is also providing CFA for setting up of Waste to Energy plants for generation of Biogas, Bio-CNG/enriched Biogas/Compressed Biogas, Power/ generation of producer or syngas, from urban, industrial, agricultural wastes and municipal solid waste.

The CAQM has issued directives & advisories to various stakeholders including the 11 Thermal Power Plants (TPPs) located within 300 km of Delhi, State Governments of Punjab, Haryana and Uttar Pradesh on "Ex-Situ Stubble Management" and to establish an ecosystem and robust supply chain mechanism to boost ex-situ utilisation of straw for tackling the problem of stubble burning. CAQM has also issued directions for co-firing of 5-10% biomass with coal in these TPPs and, in captive power plants of industrial units located in NCR.

A Gazette Notification was also issued by MoEF&CC on 11.07.2023 for Environment (Utilisation of Crop residue by Thermal Power Plants) Rules, 2023. The said Rule is about mandatory utilization of minimum 5 % blend of pellets or briquettes made of crop residue along with coal by all coal based TPPs, including penal provisions for non-compliance.

Ministry of Petroleum and Natural Gas (MoPNG) has launched a scheme to provide financial assistance to Compressed Bio-gas producers for procurement of biomass aggregation equipment for ex-situ management of paddy straw.

Subsequent to opening up of alternate route i.e. Second Generation (2G) route for ethanol production, Public Sector Oil Marketing Companies under the administrative control of MoPNG are in the process of setting up 12, 2G bio-refineries with an investment of Rs.14,000 crore. In order to encourage setting up of second generation bio-fuels plants, Government has launched as scheme namely i.e. "Pradhan Mantri JI-VAN Yojana" for providing financial support to integrated bio-ethanol projects, using lignocellulosic biomass and other renewable feedstock. Under this scheme, a 2G Ethanol Project has been set up by Indian Oil Corporation Limited at Panipat, Haryana, which is expected to utilize 2 lakh metric tonnes of paddy straw per annum. Another 2G Ethanol Project with similar capacity is being set up by HPCL at Bathinda (Punjab).

(d) to (e) Under Solid Waste component of Swachh Bharat Mission – Urban 2.0 (SBM-U 2.0), launched on 01.10.2021 with the objective of attaining 100% Garbage Free Cities (GFC), central assistance of fund are provided for setting up various type of waste processing facilities such as Material Recovery Facilities (MRFs), composting plants, bio-methanation plants, Refused Derived Fuel (RDF) processing facilities, plastic waste processing facilities, waste to electricity plants, Construction and Demolition (C&D) waste plants, sanitary landfill including Waste to Energy Plants/ CBG plant.

Under SBM-U 2.0, funds to the tune ₹ 294.2 crores have been allocated under SWM component to the State of Punjab of which ₹ 84.04 crores have been released as on 17.03.2025.

Ministry of Housing & Urban Affairs (MoHUA) supplements efforts of States/UTs through Swachh Bharat Mission (SBM) by providing policy directions, financial and technical support by preparing Manuals/Standard of Procedures (SoPs) on Solid Waste Management and issue various Advisories & Guidelines time to time for choosing appropriate technologies to manage solid waste.

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(*Annexure-I*)

The steps and initiatives undertaken by the Government of India to boost the share of renewable energy capacity in the country including the state of Punjab include, inter-alia, the following:

- MNRE has issued Bidding Trajectory for issuance of RE power procurement bids of 50 GW/annum by Renewable Energy Implementing Agencies (REIAs) [REIAs: Solar Energy Corporation of India Limited (SECI), NTPC Limited, NHPC Limited, SJVN Limited] from FY 2023-24 to FY 2027-28.
- Foreign Direct Investment (FDI) has been permitted up to 100 percent under the automatic route.
- Inter State Transmission System (ISTS) charges have been waived for inter-state sale of solar and wind power for projects to be commissioned by 30th June 2025, for Green Hydrogen Projects till December 2030 and for offshore wind projects till December 2032.
- To boost RE consumption, Renewable Purchase Obligation (RPO) followed by Renewable Consumption Obligation (RCO) trajectory has been notified till 2029-30. The RCO which is applicable to all designated consumers under the Energy Conservation Act 2001 will attract penalties on non-compliance. RCO also includes specified quantum of consumption from Decentralized Renewable Energy sources.
- Project Development Cell for attracting and facilitating investments has been set up.
- Standard Bidding Guidelines for tariff based competitive bidding process for procurement of Power from Grid Connected Solar, Wind, Wind-Solar Hybrid and Firm & Dispatchable RE (FDRE) projects have been issued.
- Schemes such as Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM), PM Surya Ghar Muft Bijli Yojana, National Programme on High Efficiency Solar PV Modules, New Solar Power Scheme (for Tribal and PVTG Habitations/Villages) under Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM JANMAN) and Dharti Aabha Janjatiya Gram Utkarsh Abhiyan (DA JGUA), National Green Hydrogen Mission, Viability Gap Funding (VGF) Scheme for Offshore Wind Energy Projects have been launched.
- Scheme for setting up of Solar Parks and Ultra Mega Solar Power projects is being implemented to provide land and transmission to RE developers for installation of RE projects at large scale.
- Implementing the Waste to Energy programme, to support the setting up of Waste to Energy projects for generation of Biogas/ BioCNG/ Power/ producer or syngas from urban, industrial and agricultural wastes/residues.
- Laying of new transmission lines and creating new sub-station capacity has been funded under the Green Energy Corridor Scheme for evacuation of renewable power.
- "National Repowering and Life Extension Policy for Wind Power Projects, 2023" has been issued.
- Standard & Labelling (S&L) programs for Solar Photovoltaic modules and Grid-connected Solar Inverters have been launched.
- To augment transmission infrastructure needed for steep RE trajectory, transmission plan has been prepared till 2030.
- Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022, has been notified on 06th June 2022 with objective of ensuring access to affordable, reliable, and sustainable green energy for all. Green Energy Open Access is allowed to any consumer with contract demand of 100 kW or above through single or multiple single connection aggregating Hundred kW or more located in same electricity division of a distribution licensee.

- Green Term Ahead Market (GTAM) has been launched to facilitate sale of Renewable Energy Power through exchanges.
- Government has issued orders that power shall be dispatched against Letter of Credit (LC) or advance payment to ensure timely payment by distribution licensees to RE generators.