GOVERNMENT OF INDIA
MINISTRY OF POWER

LOK SABHA
UNSTARRED QUESTION NO.3010
ANSWERED ON 07.08.2025

PROMOTING INNOVATION TO INCREASE EFFICIENCY AND SUSTAINABILITY OF POWER SECTOR

3010. DR. SHRIKANT EKNATH SHINDE:
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SHRI NARESH GANPAT MHASKE:

Will the Minister of POWER
be pleased to state:

(a) whether the Government is encouraging innovation in the power sector to enhance efficiency and sustainability;

(b) if so, the specific initiatives undertaken to promote research and development in power generation, transmission and distribution;

(c) whether the Government is collaborating with private industry and startups to drive technological advancements in the sector and if so, details thereof;

(d) the steps being taken by the Government to integrate renewable energy and smart grid solutions for improved energy management; and

(e) whether any policy incentives are being introduced to make the power sector a key driver of economic growth and if so, the details thereof?

A N S W E R

THE MINISTER OF STATE IN THE MINISTRY OF POWER

(SHRI SHRIPAD NAIK)

(a) & (b) : Ministry of Power, through the Central Power Research Institute (CPRI), has launched R&D schemes for power sector to promote research and development in the areas of power generation, transmission, and distribution. These scheme encourages need-based, applied research in collaboration with academic institutions, industries, and utilities, aiming to address real-world challenges in the power sector. Under these schemes, a wide range of projects have been undertaken, including those aimed at renewable energy integration into the national grid, development of electric vehicle (EV) charging infrastructure, and enhancement of power quality through advanced monitoring and control systems.

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Additionally, research efforts have been directed toward enabling co-firing of biomass with coal in thermal power plants to reduce emissions, as well as strengthening cyber security frameworks to safeguard the power grid from digital threats. These projects collectively contribute to building a more efficient, secure, and sustainable power sector in India.

(c) : The Government of India actively promotes collaboration with private industry and startups to drive technological innovation in the power sector. Under the National Perspective Plan (NPP) component of the R&D scheme, joint research projects with industry and startups are encouraged. This collaborative approach aims to foster the development of cutting-edge technologies and advance them to higher Technology Readiness Levels (TRLs), paving the way for their practical deployment in real-world applications.

Further, the 'Powerthon' initiative has been launched to identify, nurture, and scale technology-driven solutions by engaging Technology Solution Providers (TSPs), including individual innovator, startups, entrepreneurs, MSMEs etc., to address critical challenges faced by Distribution Companies (DISCOMs).

(d) : The Ministry of Power has taken following broad steps to integrate renewable energy (RE) and smart grid solutions for improved energy management:

i. **Innovative products like Solar-Wind Hybrid Projects, RE projects with energy storage systems (including battery energy storage) and supply of RE power balanced with power from non-RE sources launched to reduce intermittency.**

ii. **Implementation of flexible operation of thermal power plants to facilitate grid balancing.**

iii. **Transmission plan for integration of more than 500 GW RE capacity by 2030 has been developed, which also include strong inter connection of Inter-State Transmission System (ISTS) RE schemes with the intra-state network to ensure better reliability in terms of anchoring voltage stability, angular stability, losses reduction etc.**

iv. **Framework for development of Energy Storage System (ESS) has been issued.**

v. **Renewable Energy Management Centers (REMCs) have been commissioned for smooth integration of growing RE capacity into the Grid sources. The system operators have started using these REMCs for forecasting and scheduling of RE generation to the best possible extent.**

vi. **Green Term Ahead Market (GTAM) to facilitate sale of Renewable Energy Power through exchanges and Green Day-Ahead Market to facilitate the trading of RE power to meet green targets and Real-time market to manage RE intermittency and demand variation have been launched.**

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vii. For promotion of RE projects , the waiver in the levy of ISTS charges for Solar and Wind Projects commissioned upto 30.06.2025 with gradual increase in charges leading to full ISTS charges from 01.07.2028 has been provided. ISTS charges are exempted for 25 years for offshore wind power projects commissioned by 31.12.2032.

viii. For promoting Battery Energy Storage Systems (BESS), VGF schemes for BESS capacity of about 43 GWh has been launched.

ix. Waiver of ISTS charges has been extended for electricity from BESS projects, commissioned till June 2028 , which are co-located with renewable energy projects and for Hydro Pumped Storage Plants (PSP) for which construction work is awarded by June 2028.

(e) : The power sector is a key driver to economic growth. At present, electricity accounts for approximately 22% of the country's total final energy consumption. To ensure adequate electric supply the total installed generation capacity has been increased to now 484.8 Giga watt.

Broad policy incentives aimed at making the power sector a key driver of economic growth are as follows:

i. 'Make in India' programme in power sector has already been launched for promoting manufacturing and production of goods and services in India with a view to enhancing income and employment.

ii. Approved development of 13.2 GWh BESS in various States under Viability Gap Funding (VGF) Scheme. Tendering process for 10.7 GWh has been concluded and 5.7 GWh has been contracted.

iii. The Production Linked Incentive (PLI) Scheme for National Programme on High Efficiency Solar PV Modules, for achieving manufacturing capacity of Giga Watt (GW) scale in High Efficiency Solar PV modules have been approved.

iv. PM-KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan) – In this scheme, use of agricultural solar pumps is being promoted. It is aimed at providing energy security to the farmers in India.

v. PM Surya Ghar Muft Bijlee Yojana is a Central Scheme that aims to provide free electricity to one crore households in India, who opt to install roof top solar electricity unit. The scheme will result in addition of 30 GW of Solar capacity through rooftop solar in the residential sector. It is estimated that scheme will create around 17 lakh direct jobs in manufacturing, logistics, supply chain, sales, installation, O&M and other services.

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vi. **The Government is providing Budgetary Support for cost of Enabling Infrastructure which are, i) construction of roads and bridges (ii) transmission line from power house to the nearest pooling point including upgradation of pooling substation of State /Central Transmission Utility (iii) ropeways (iv) railway siding, and (v) communication infrastructure. The strengthening of existing roads/bridges leading to the project are also eligible for central assistance under this scheme. Total outlay of the scheme is ₹12,461 crores for the period from FY 2024-25 to FY 2031-32.**

vii. **The Union Cabinet has approved the scheme for providing Central Financial Assistance (CFA) to the State Governments of NER towards their equity participation for development of Hydro Electric Projects in the North Eastern Region (NER) through Joint Venture (JV) Collaboration between State entities and Central Public Sector Undertakings. Under this scheme, the equity portion of the State Government of NER is proposed to be funded (capped at 24% of the total project equity, subject to a maximum of ₹ 750 Crore per project). This scheme has an outlay of ₹ 4136 crore.**

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