GOVERNMENT OF INDIA
MINISTRY OF POWER

LOK SABHA
UNSTARRED QUESTION NO.3093
ANSWERED ON 18.12.2025

BATTERY ENERGY STORAGE SYSTEM

†3093. SHRI GANESH SINGH:

Will the Minister of POWER be pleased to state:

(a) the concrete steps that have been taken by the Government so far to develop and deploy energy-storage technology to handle the intermittency of renewable energy and maintain grid stability;

(b) whether the Government is contemplating adopting best practices from countries with high renewable-energy share such as Battery Energy Storage Systems (BESS), pumped-hydro storage and advanced grid-management systems in India's energy-transition strategy, if so, the details thereof; and

(c) whether any proposal exists to release a national action-plan or roadmap to increase energy-storage capacity, reduce costs and deploy large-scale storage infrastructure in the upcoming years, if so, the details thereof?

A N S W E R

THE MINISTER OF STATE IN THE MINISTRY OF POWER

(SHRI SHRIPAD NAIK)

(a) : To address the intermittency of renewable energy and to maintain grid stability, the Government of India has taken a series of coordinated policy, regulatory, demand-side and supply-side measures to promote the development and deployment of energy-storage technologies, including Battery Energy Storage Systems (BESS) and Pumped Storage Projects (PSPs). Details of the measures taken are placed in the Annexure.

(b) : The Government is drawing upon global best practices from countries with high renewable-energy penetration as part of India's energy-transition strategy. International experience demonstrates that Pumped-hydro storage and BESS, and advanced grid-management systems play a critical role in managing variability and intermittency of renewable energy. In line with these practices, energy storage systems in India are being positioned to provide ancillary grid services such as frequency control, voltage regulation, peak shifting, congestion management and black-start support across different time scales. Accordingly, under the Central Electricity Regulatory Commission (Ancillary Services) Regulations, 2022, energy storage systems have been made eligible to provide Secondary Reserve Ancillary Services and Tertiary Reserve Ancillary Services, subject to specified conditions, thereby supporting real-time grid stability and reliable system operation. Renewable Energy Management Centres (REMCs) have been established for monitoring, forecasting and scheduling of Renewable resources. Automatic Generation Control (AGC) is being used for balancing supply and demand to manage variability of renewable energy.

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(c) : Government has put in place a planning framework to guide large-scale deployment of energy storage capacity in the coming years. The Central Electricity Authority (CEA) has estimated a requirement of about 336 GWh of energy storage capacity by 2029-30 and about 411 GWh by 2031-32 to facilitate reliable integration of renewable energy. Further, Guidelines for Preparation of Resource Adequacy Plans (RAP) were issued on 28.06.2023, which incorporate energy storage systems as an important element of power sector planning. These guidelines establish a mechanism to ensure that adequate generation, storage and demand-responsive resources are available to reliably meet expected peak demand and maintain grid stability. Together, the National Electricity Plan and Resource Adequacy framework provide a roadmap for scaling up energy-storage capacity, improving system reliability and enabling India's energy transition.

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ANNEXURE REFERRED IN REPLY TO PART (a) OF UNSTARRED QUESTION NO. 3093 ANSWERED IN THE LOK SABHA ON 18.12.2025

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I. Policy and Regulatory Measures

1. **The Electricity Rules were amended in December 2022 to explicitly recognise Energy Storage Systems (ESS) as an integral part of the power system, enabling their participation across generation, transmission and distribution functions.**

2. **In October 2022, ESS were included in the Harmonised Master List of Infrastructure of the Ministry of Finance, facilitating access to long-tenure and lower-cost financing.**

3. **In June 2023, the Government issued Guidelines for Preparation of Resource Adequacy Plans by State utilities, under which energy storage has been incorporated as a key planning resource for meeting peak demand and ensuring system reliability.**

4. **A National Framework for Promotion of Energy Storage Systems was issued in September 2023, providing a comprehensive roadmap for deployment, market integration and regulatory facilitation of storage technologies.**

5. **To enhance safety and reliability of BESS installations and standardise design and construction practices, Draft CEA (Measures Relating to Safety and Electric Supply) (First Amendment) Regulations, 2025 and Draft Technical Standards for Construction of BESS Regulations, 2025 have been issued.**

II. Demand-Side Enablers and Market Development Measures

6. **Waiver of Inter-State Transmission System (ISTS) charges has been provided for co-located BESS projects commissioned and PSPs awarded up to June 2028, to improve project viability (initial waiver was notified in November 2021).**

7. **In January 2022, CERC allowed storage-based resources to provide ancillary services, including secondary and tertiary reserves, enabling ESS to support real-time grid balancing alongside conventional generators.**

8. **Tariff-Based Competitive Bidding (TBCB) Guidelines for procurement of BESS by distribution licensees were notified in March 2022, creating a transparent mechanism for large-scale storage procurement.**

9. **Under the Electricity (Rights of Consumers) Rules, 2020, amended in December 2022, consumers using diesel generator sets have been mandated to shift to cleaner backup solutions, including energy storage, within timelines specified by State Commissions.**

10. **Electricity supplied from BESS has been allowed to participate in the High-Price Day-Ahead Market, launched in March 2023, enabling storage to respond to peak price signals similar to gas-based generation.**

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11. The Government is implementing two Viability Gap Funding (VGF) schemes to support development of approximately 43 GWh of Battery Energy Storage Systems, launched in March 2024 and June 2025, to accelerate early-stage deployment.

III. Supply-Side and Manufacturing-Focused Measures

12. The Ministry of Heavy Industries is implementing a Production-Linked Incentive (PLI) Scheme with an outlay of ₹18,100 crore for establishing 50 GWh of Advanced Chemistry Cell manufacturing capacity, of which 10 GWh is earmarked for grid-scale storage (June 2021).

13. For pumped storage projects, a grant for enabling infrastructure is provided at the rate of ₹1 crore per MW for the first 200 MW and ₹0.75 crore per MW thereafter (September 2023).

14. CERC has allowed separate grid connectivity during non-solar hours, enabling additional renewable capacity at existing substations and facilitating storage-based shifting of power to evening and night hours (September 2025).

15. Statutory concurrence of the Central Electricity Authority has been dispensed with for closed-loop, off-stream pumped storage projects to expedite project development (August 2025).

16. Through amendment of the Electricity Rules in September 2025, energy storage systems have been permitted to be developed, owned, leased or operated by consumers, expanding the range of ownership and business models.

17. In February 2025, CEA issued an advisory on co-location of ESS with solar power projects, recommending storage capacity of at least 10% of installed solar capacity for a minimum duration of two hours, to improve dispatchability of solar power.

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