UPSC Mains practice – reference note

GS-III · 06-11-2026 · 15 marks · https://www.shanmugamiasacademy.in/upsc-mains-practice/2026-11-06-rooftop-solar-storage

Over 65 lakh households have joined the PM Surya Ghar: Muft Bijli Yojana, and States such as Tamil Nadu now require new solar plants to add battery storage. Discuss the significance of rooftop solar and energy storage for India's energy transition. What challenges must be addressed to integrate them into the grid?

1. The news (2 November 2026)

- PM Narendra Modi inaugurated the Bharat Renewable Energy Summit & Expo 2026 at Bharat Mandapam, New Delhi (2–5 November), held alongside the 9th Assembly of the International Solar Alliance.
- Over 65 lakh households have joined PM Surya Ghar: Muft Bijli Yojana (launched February 2024; target 1 crore homes).
- India's non-fossil share crossed 50% of installed power capacity in 2025 – five years ahead of the 2030 target; the 2030 goal is 500 GW of non-fossil capacity.
- Tamil Nadu notified its Battery Energy Storage Systems (BESS) Policy 2026 in late October 2026.

2. PM Surya Ghar: Muft Bijli Yojana – numbers to remember

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Item	Figure	Source
Launch / approval	Launched 13.02.2024; Union Cabinet approval 29.02.2024; Ministry – MNRE	Cabinet release (PMIndia)
Outlay / target	₹75,021 crore; 1 crore households; up to 300 units free per month	Cabinet release
Central Financial Assistance	60% of system cost up to 2 kW; 40% of additional cost for 2–3 kW; capped at 3 kW (≈ ₹30,000 for 1 kW, ₹60,000 for 2 kW, ₹78,000 for 3 kW+)	Cabinet release
Loans	Collateral-free loans at about 7% for residential systems up to 3 kW	Cabinet release
Expected outcomes	30 GW rooftop capacity; 1,000 BU of power; 720 million tonnes CO_2e avoided over 25 years; about 17 lakh direct jobs	Cabinet release
Other components	A Model Solar Village in each district; incentives to Urban Local Bodies and Panchayati Raj Institutions	Cabinet release
Progress	Over 65 lakh households (Nov 2026)	PM, 02.11.2026

3. Energy storage

- Viability Gap Funding (VGF) for Battery Energy Storage Systems: ₹3,760 crore for 4,000 MWh (Union Cabinet, 06.09.2023); a further ₹5,400 crore for 30 GWh (Ministry of Power, June 2025).
- Tamil Nadu BESS Policy 2026: at least 2.5 GW / 10 GWh of storage during the three-year policy period; new solar and solar-hybrid plants of 1 MW and above must add storage of at least 10% of capacity with four-hour discharge; waiver of transmission and wheeling charges for eligible storage.
- PM Surya Sarovar Yojana (Union Cabinet, July 2026): ₹5,070 crore for about 5,000 MW of floating solar on reservoirs and ponds, with storage.

4. DISCOM finances

Indicator	Figure	Source
Profit after tax (all DISCOMs)	+₹2,701 crore in 2024-25, after a loss of ₹25,553 crore in 2023-24 (loss of ₹67,962 crore in 2013-14)	Ministry of Power (Jan 2026)
AT&C losses	22.62% (2013-14) → 15.04% (2024-25)	Ministry of Power (Jan 2026)

5. Rules to quote

- Time-of-Day tariff – Electricity (Rights of Consumers) Amendment Rules, 2023: for commercial and industrial consumers with maximum demand above 10 kW from not later than 01.04.2024; for other

consumers (except agriculture) from not later than 01.04.2025; for consumers with smart meters, immediately after installation. Solar-hour tariff lower, peak-hour tariff higher than normal.

- ALMM List-II (Approved List of Models and Manufacturers) for solar PV cells – in force from 01.06.2026.
- E-Waste (Management) Rules, 2022 – cover solar PV modules, panels and cells.

6. Value-add terms

- Prosumer, net metering vs gross metering, virtual / community net metering, duck curve, curtailment, hosting capacity, Battery Energy Storage System (BESS), pumped storage, Viability Gap Funding, Time-of-Day tariff, RESCO model, AT&C losses.

Official sources

- PM Surya Ghar: Muft Bijli Yojana – national portal (MNRE) – https://pmsuryaghar.gov.in/
- Cabinet approves PM Surya Ghar: Muft Bijli Yojana (29.02.2024) – PMIndia – https://www.pmindia.gov.in/en/news_updates/cabinet-approves-pm-surya-ghar-muft-bijli-yojana/
- PIB – Time-of-Day tariff and smart metering (Ministry of Power) – https://pib.gov.in/PressReleasePage.aspx?PRID=1945236
- Ministry of New and Renewable Energy (MNRE) – https://mnre.gov.in/

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