

# CEEW-CEF Market Handbook

## Q2 2022-23

01 November 2022



Image: iStock



# CEEW-CEF Market Handbook

India is undergoing an energy transition from fossil-based to clean energy. Evidence-based decision-making can accelerate the process.

## CEEW Centre For Energy Finance's Market












**Handbook** aims to help key investors, executives and policymakers with evidence-based decision-making by:

- Identifying and analysing trends critical to India's energy transition
- Presenting data-backed evidence based on the most relevant indicators
- Connecting the dots and presenting a short-term market outlook

The handbook attempts to comment and answer on some critical questions such as:

1. What is India's generation capacity and energy mix?
2. What are the key trends in renewable energy (RE) tariffs?
3. What is the current situation of the discom payment delay situation?
4. How have the power market reforms progressed?
5. What are key trends in the electric vehicles (EV) and energy storage markets?

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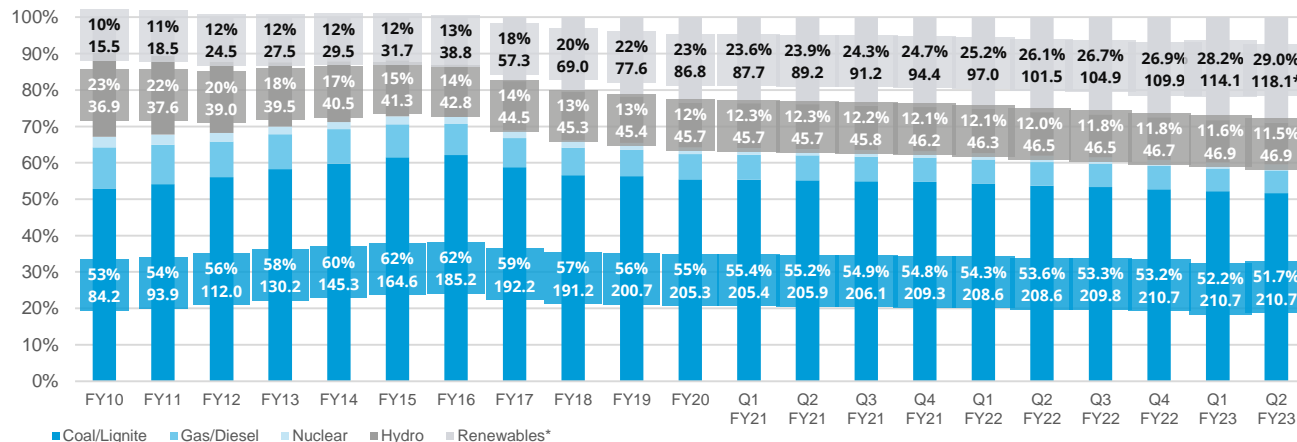
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## Generation capacity: the share of RE climbed to 29% in the total installed capacity mix; the total installed capacity stood at 408 GW

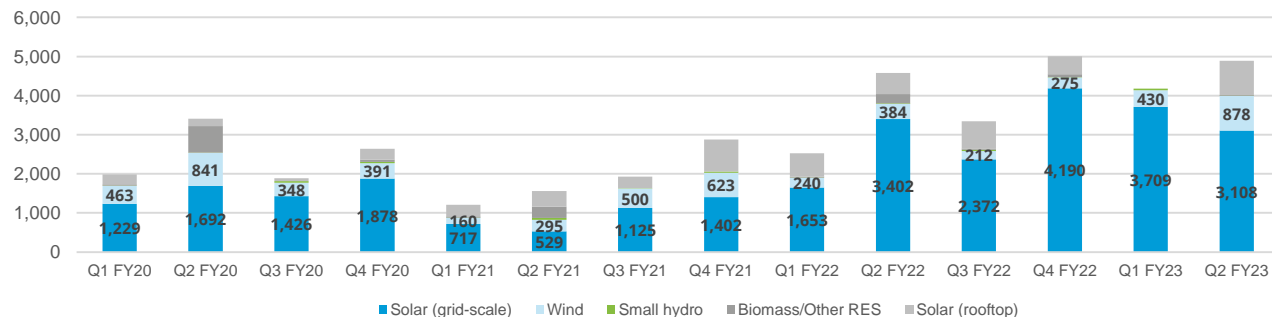
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### Installed capacity mix (GW)



Source: Central Electricity Authority (CEA). \* Includes solar rooftop capacity (7520.2 MW as of September 2022).

### RE capacity addition (MW)



Source: Ministry of New and Renewable Energy.

### Takeaways & Outlook

In Q2 FY23, a net generation capacity of 4.0 GW was added (vs 4.6 GW in Q2 FY22). Of the total net capacity addition, 99.5% came from renewable energy (RE). Diesel-based capacity of 52.66 MW was added in the Andaman and Nicobar Islands, and 32 MW of gas-based capacity was retired from the state capacity of Tripura. **No new coal or hydropower capacity was added in this quarter.** However, 6,350 MW of thermal capacity addition is planned for FY23. Similarly, out of 14,103.5 MW of under-construction hydro projects, 960 MW is likely to be commissioned in FY23.

In RE, solar (grid-scale and rooftop) continued to dominate capacity addition, accounting for 3,108 MW (77.4%) (vs 3,940 MW in Q2 FY22) of total RE addition. Wind capacity addition stood at 878 MW in Q2 FY23 (vs 384 MW in Q2 FY22).

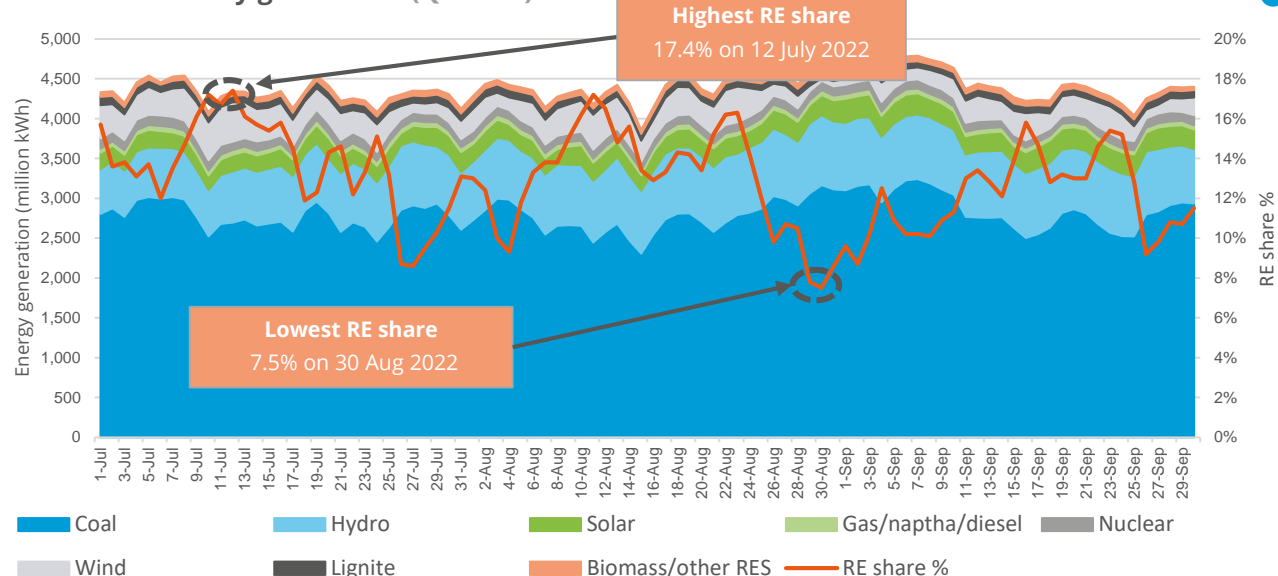
In Q2 FY23, the total installed RE capacity reached 118.1 GW, and utility-scale solar installations crossed the 50 GW mark.

In total, 3.51 GW of RE capacity was auctioned in Q2 FY23. In these auctions, grid-scale solar PV (1,750 MW) remained the dominant technology, followed by solar-wind hybrid (750 MW) and storage (510 MW) technologies.

## Energy mix: the share of RE+hydro rose significantly; on the other hand, the share of coal declined marginally

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Source-wise daily generation (Q2 FY23)



RE share snapshot

Q2 FY21			Q2 FY22		Q2 FY23	
	RE share	Day	RE share	Day	RE share	Day
<b>Highest</b>	16.8%	12 August 2020	19.2%	1 August 2021	17.4%	12 July 2022
<b>Lowest</b>	6.1%	2 September 2020	7.7%	22 August 2021	7.5%	30 August 2022
<b>Average (Daily)</b>	10.7%	NA	12.3%	NA	12.9%	NA

Source: POSOCO. Note: RE technologies include solar, wind, biomass, waste-to-energy and small hydro and do not include rooftop solar and large hydro (>25 MW) generation.

## Takeaways & Outlook

The total power generation increased by **6.8% in Q2 FY23** (404 billion kWh) compared to Q2 FY22 (378 billion kWh) and **reduced by 2.8% in comparison to Q1 FY23** (415 billion kWh), owing to above-normal rainfall during June-September.

- **July:** Up by 4.3%
- **August:** Up by 3.2%
- **September:** Up by 13.7%
- **Total Q2 FY23:** Up by 6.8%

In Q2 FY23, **RE generation increased by 12.1% vs the same quarter in the previous fiscal year (Q2 FY22)**. Coal/lignite-based generation was up by 6.2% and hydro by 12.0% for the same period.

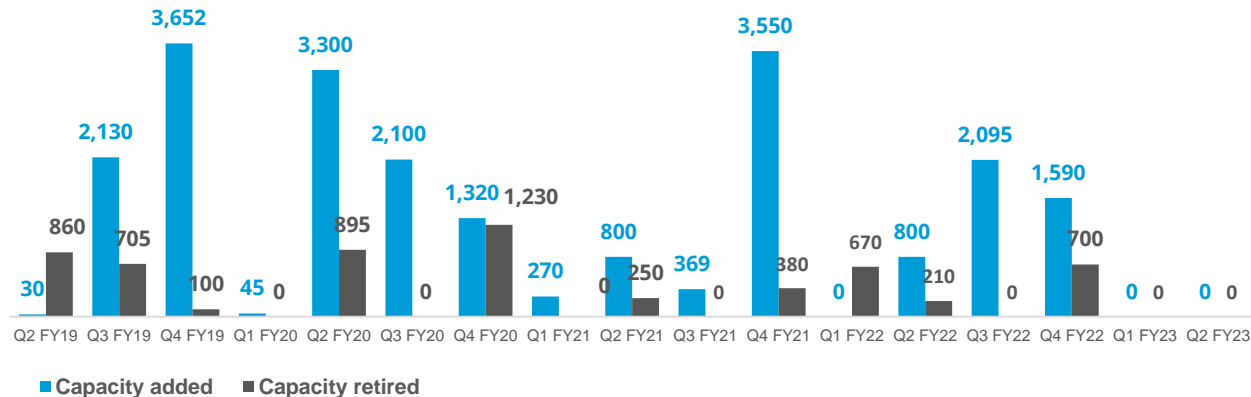
From an average daily generation perspective, **the share of RE and hydro increased, whereas coal share declined in Q2 FY23 compared to Q2 FY22.**

- **RE:** Share up from 12.3% to 12.9%
- **Hydro:** Share up from 16.5% to 17.3%
- **RE + Hydro:** Share up from 28.8% to 32.2%
- **Coal/lignite:** Share down from 66.2% to 65.8%

## Coal phase-out: no new coal capacity was added or retired in Q2 FY23; the share of conventional generation in the PFC/REC loan book continues to decline

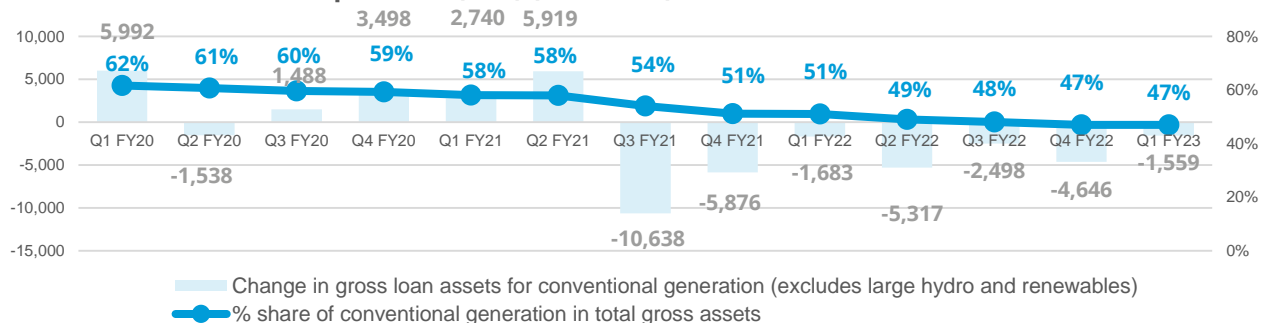
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### Coal capacity added versus retired (MW)



Source: CEA

### Coal financing by Power Finance Corporation (PFC)/ Rural Electrification Corporation (REC) (INR crore)



Source: PFC investor presentations; figures are derived from the same. Note: Sector-wise PFC loan asset data break-up is unavailable for Q2 FY23.

### Takeaways & Outlook

**No new coal capacity was either added or retired for the second consecutive quarter.** However, 94% of the thermal capacity (6,350 MW) addition planned for FY23 is to come from coal-based thermal power plants.

PFC/REC, which has financed most of the under-construction thermal power projects, has reduced its exposure to coal-based power generation. The share of conventional generation in PFC/REC's loan book continues to trend downward and has declined from 51% in Q1 FY22 to 47% in Q1 FY23.

**To compensate, PFC/REC has shifted its focus to transmission and distribution (T&D) and RE generation projects (including large hydro).** This accounts for around 42% (INR 1,57,031 crore) and 10% (INR 37,050 crore) of its total loan book as of Q1 FY23 vs 38% (INR 1,41,780 crore) and 10.3% (INR 38,271 crore) in Q1 FY22, respectively.

# RE auctions: SECI concluded its first standalone BESS auction; 36% of the total auctioned capacity came from innovative technologies

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## Notable auctions

Capacity allotted (MW)

Least tariff discovered (INR/kWh)

RUMSL, Madhya Pradesh, wind-solar hybrid, 750 MW (September 2022)

750

3.03

GUUVNL, Gujarat, solar, phase XVI, 750 MW (September 2022)

750

2.49

MSEDCL, Maharashtra, solar, phase VIII, tranche VI, 500 MW (September 2022)

500

2.82

SECI, Rajasthan, BESS, 500 MW/1000 MWh (August 2022)

500 (BESS)

NA

MSEDCL, Maharashtra, solar, phase VII, tranche III, 500 MW (August 2022)

500

2.9

KSEBL, Kerala, solar + BESS, 10 MW solar with 20 MWh BESS (July 2022)

10 (Solar)

NA

GUUVNL, Gujarat, wind, phase III, 500 MW (July 2022)

500

2.84

GUUVNL, Gujarat, solar, phase XIV, 500 MW (June 2022)

500

2.3

SECI, pan India, wind-solar hybrid, tranche-V, 1,200 MW (May 2022)

1,200

2.53

## Bid spotlight: RUMSL, Madhya Pradesh, wind-solar hybrid, 750 MW

### Tariff and winner

- **Tariff discovered:** 3.03 INR/kWh.
- **Winners:** Sprng Energy, Tata Power Renewable Energy, Renew Power, O2 Power.

### Key provisions

- **Project location:** solar and wind components of the hybrid power project may be located at the same or different locations within the state.
- **The rated contracted capacity of the solar component** shall be between a minimum of 33% or a maximum of 36% of contracted capacity.
- **Power off-take:** MPPMCL will purchase power from the hybrid project.

### Comments

- SECI has identified the advantages of hybridising the technologies, such as optimal use of transmission infrastructure and land, reduced variability in RE generation, and better grid stability and has issued tenders for 5 GW+ capacity.
- Following the central bidding agency, RUMSL issued its first wind-solar hybrid tender to fulfil the solar and non-solar RPO of the State.

## Takeaways & Outlook

RE auctioned capacity stood at 3.51 GW in Q2 FY23 and was dominated by State bidding agencies such as RUMSL's 750 MW wind-solar hybrid, MSEDCL's 500 MW solar and GUVNL's 750 MW solar and 500 MW wind auctions. **RUMSL's first wind-solar hybrid tender was oversubscribed by 530 MW. The auctioned capacity also included two BESS tenders - SECI's 500 MW/1000 MWh standalone BESS and KSEBL's 10 MW/20 MWh BESS.**

After a slower Q4 FY22, auctioned capacity picked up the pace in Q1 FY23 and maintained it in Q2 FY23.

- **Q2 FY23: 3.51 GW**
- **Q1 FY23: 3.15 GW**
- **Q4 FY22: 1.84 GW**
- **Q3 FY22: 5.09 GW**

**In the total auction mix, 50% came from solar technology, 36% (1.26 GW) from innovative technologies (wind-solar hybrid and BESS) and 14% from wind technology.**

The lowest discovered solar tariff in Q2 FY23 (GUUVNL phase XVI) was up by ~8% compared to the previous quarter (GUUVNL phase XIV).

Source: SECI and state renewable agencies.

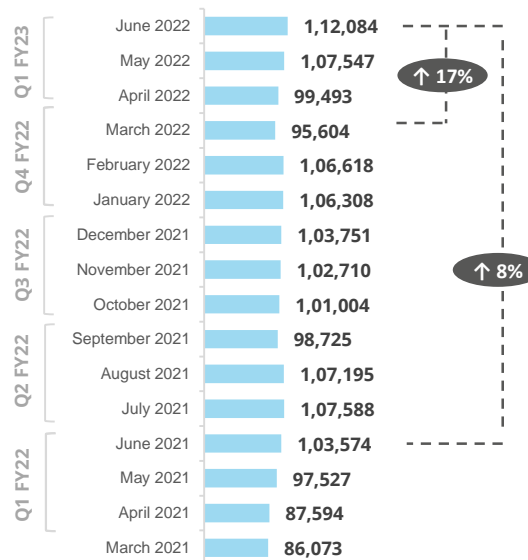
SECI = Solar Energy Corporation of India; GUUVNL = Gujarat Urja Vikas Nigam Limited; RUMSL = Rewa Ultra Mega Solar Limited; KSEBL = Kerala State Electricity Board Limited; MSEDCL = Maharashtra State Electricity Distribution Co. Ltd.; MPPMCL = Madhya Pradesh Power Management Company Limited; BESS = Battery Energy Storage System.



# Discom payables: discoms in Karnataka, Uttar Pradesh, Kerala, Himachal Pradesh and Haryana topped the MoP's latest quarterly performance assessment

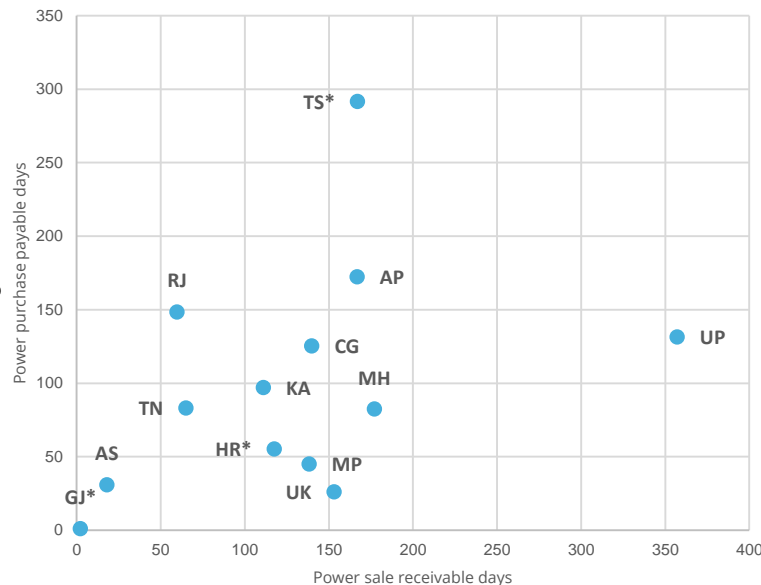
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## Amount overdue by discoms to power producers (INR crore)



Source: PRAAPTI portal (based on voluntary disclosures from power producers). Note: Data for Q2 FY23 is unavailable as PRAAPTI portal is under upgradation.

## Discom payable and receivable days for RE-rich states



Source: UDAY portal (based on data disclosed by discoms as of 31 March 2022).

\*Data not available for these states; values derived from 2019-20/ 2020-21 financial reports.

## Takeaways & Outlook

In August 2022, POSOCO issued a directive to the Indian Energy Exchange (IEX), Power Exchange of India Limited (PXIL), and Hindustan Power Exchange (HPX) to restrict the trade of electricity by 27 discoms in 13 states, including Maharashtra, Madhya Pradesh, Rajasthan, Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Bihar, Chhattisgarh, and Jharkhand under the Electricity (Late Payment Surcharge and Related Matters) Rules 2022, released in June 2022.

The RDSS scheme was officially launched in July 2022, aiming to improve the operational efficiencies and financial sustainability of the discoms.

As of Q1 FY23, pan-India AT&C losses stood at 17.91%, whereas the ACS-ARR gap stood at INR 0.26/unit. On the smart meter front, 50,00,381 smart meters have been installed as of September 2022.

According to the Ministry of Power's (MoP) Ujwal Discom Assurance Yojana (UDAY) platform, discoms in Karnataka, Uttar Pradesh, Kerala, Himachal Pradesh and Haryana topped the latest quarterly performance assessment\*\*.

\*\*As of June 2022.

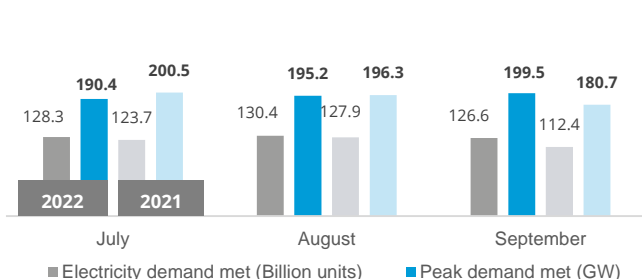
Reforms-based and results-linked, revamped distribution sector scheme (RDSS), approved in June 2021, aims to **reduce AT&C losses at pan-India levels to 12-15% by 2024-25, reduce ACS-ARR gap to zero by 2024-25, and develop institutional capabilities for modern discoms.**



# Power markets: Q2 FY23 witnessed a slight decline in peak demand; real-time market volumes showed hike

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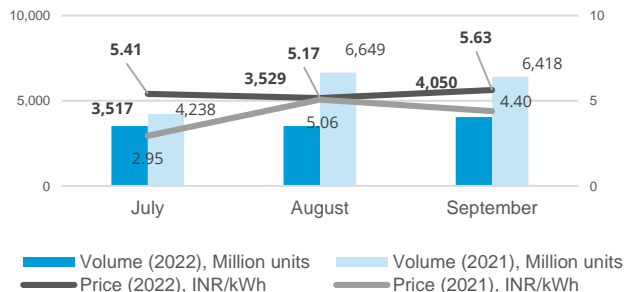
## Power supply position (Peak and electricity demand)



Source: CEA.

Peak demand met in Q2 FY23 declined compared to Q2 FY22. Above-normal rainfall contributed to the decline in peak demand. In terms of electricity demand met, there was a slight uptick of 5.8% vs that of Q2 FY22.

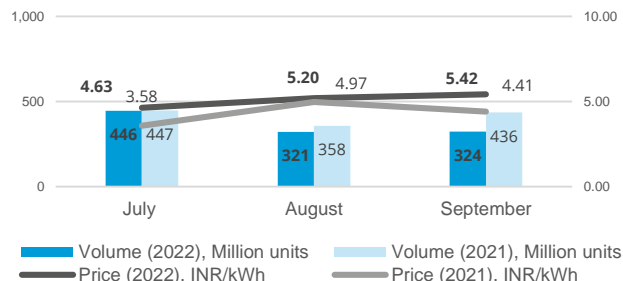
## Day-ahead spot market snapshot (IEX)



Source: IEX.

Power supply-side constraints across market segments led to an increased market clearing price (MCP). However, with a reduction in overall demand, the MCP has declined compared to Q1 FY23 but remained on the higher side compared to Q2 FY22.

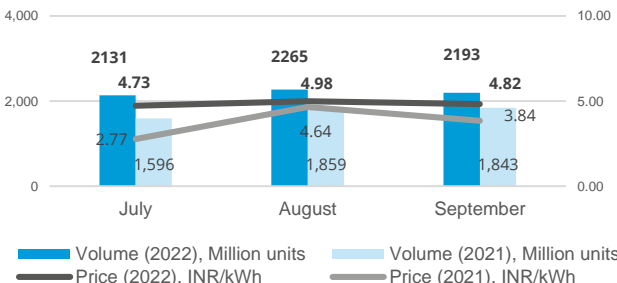
## Green term-ahead market\* snapshot (IEX)



Source: Indian Energy Exchange (IEX). \*Day-ahead contingency.

With a significant increase in the available quantum for sale, the green term-ahead market (GTAM) picked up in Q2 FY23. It witnessed the highest number of single-day participation at 614 on 5 September 2022. MCP has declined to match Q2 FY22 levels.

## Real-time market snapshot (IEX)



Source: IEX.

With the reduced cap on MCP, the real-time market (RTM) continued to witness an increase in traded volumes. Since its inception, discoms have been tapping the RTM to balance power demand-supply in real-time. It saw a 24% hike in traded volume in Q2 FY23 vs Q2 FY22.

## Takeaways & Outlook

After a consistent rise in peak power demand (met) in previous quarters, in Q2 FY23, it marginally declined to a high of 199.5 GW in September 2022 (vs 200.5 GW in July 2021) and remained below 200 GW in each month of this quarter. In energy terms, the average monthly electricity demand (met) saw an uptick of 5.8% in Q2 FY23 (vs Q2 FY22).

In April 2022, the Central Electricity Regulatory Commission (CERC) directed power exchanges to cap the price range of the MCP at INR 12/kWh for three months and, in September 2022, extended it till 31 December 2022.

In Q2 FY23, 0.99 million solar RECs and 0.92 million non-solar RECs were traded at an average price of INR 1.033/kWh and INR 1.0/kWh on IEX, respectively, whereas in Q1 FY23, a total of 0.39 million solar and 0.80 million non-solar RECs were traded at an average price of 1.97 INR/kWh and 1.00 INR/kWh on IEX, respectively.

# Policy and regulatory developments: MoP notified RPO and energy storage obligation trajectory till 2029 – 30; Jharkhand to install 4000 MW by 2027 under its solar policy 2022

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## MoP notified RPO and energy storage obligation trajectory till 2029 – 30

- In July 2022, [MoP](#) notified the renewable purchase obligation (RPO) and energy storage obligation trajectory till 2029 – 30.
- It includes wind RPO, hydropower purchase obligation (HPO), and other RPO.
- The HPO will include large hydro projects, including pumped hydro, commissioned after 8 March 2019.
- Other RPO will include technologies except for wind and hydro technologies.

## Jharkhand State Solar Policy 2022

- In July 2022, [Jharkhand Renewable Energy Development Agency](#) notified its solar policy.
- It aims to achieve 400 MW of solar capacity by 2027 under three broad project categories – utility-scale solar, distributed solar, and off-grid solar.
- All statutory clearances and approvals will be provided to the project developers through a single-window facility within 60 days.

## CSERC released draft guidelines for group and virtual net metering

- In September 2022, [CSERC](#) notified the guidelines for implementing group net metering and virtual net metering framework under CSERC (Grid Interactive Distributed Renewable Energy Sources) Regulations, 2019.
- RE projects with capacity ranging between 1 – 500 kW can avail the benefit of the group and virtual net metering and should not exceed the contracted demand of the consumer.

## Extension of PM-KUSUM yojana

- In August 2022, MNRE announced the [extension of the PM-KUSUM yojana](#) till March 2026.
- The components A, B, and C remained unchanged. However, a few amendments are notified, such as the domestic content requirement (DCR) being waived off for projects under component C awarded on or before 20 June 2023.

## 7<sup>th</sup> Revision of ALMM list - 1

- In August 2022, MNRE notified [revision – VII](#) of ALMM list – 1 to include 66 manufacturers with a cumulative capacity of 18,050 MW.
- REIL, with 23 MW capacity; Neety Euro Asia Solar Energy, with 28 MW capacity; Shivam Photovoltaics, with 30 MW capacity; Sahaj Solar, with 100 MW capacity; and Raajratna Ventures, with 96 MW capacity are the new entrants.

## West Bengal Electricity Regulatory Commission (Open Access) Regulations, 2022

- In August 2022, [WBERC](#) notified the open access regulations 2022.
- Under this, consumers with contracted demand of 100 kW will be eligible to procure green energy through open access in West Bengal.
- Long-term and medium-term open access will be given on a first-come-first-served basis.

## Takeaways & Outlook

In the latest RPO trajectory notification till 2029-30, **MoP introduced a separate obligation for wind energy (obligation to be met only by projects commissioned after 31 March 2022) to ensure continuous wind capacity addition.**

**With the announcement of its solar policy for 2022, Jharkhand has set targets to accelerate solar capacity addition** under utility-scale solar (3000 MW), distributed solar (720 MW) and off-grid solar (280 MW) by 2027. The policy includes group and virtual net metering. It has exempted the electricity duty of various solar projects. **It has also waived off cross-subsidy and additional charges for captive and third-party (within the state) open-access solar projects.**

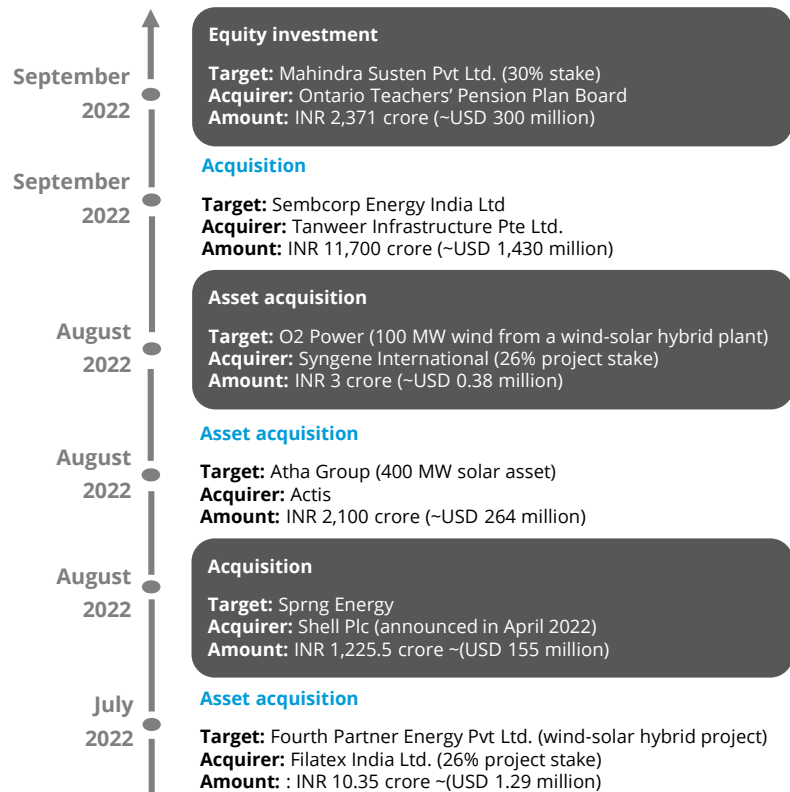
Furthermore, in September 2022, MNRE notified the guidelines for implementing the production-linked incentive (PLI) scheme (Tranche II).

In the electric vehicle (EV) segment, [Haryana](#), [Chhattisgarh](#), [Rajasthan](#), [UT of Ladakh](#), [UT of Chandigarh](#) and Jharkhand have notified their EV policy; with this, 21 Indian states have announced their EV policies.

# Renewable energy finance: market concentration in RE auctions declined in Q2 FY23 compared to previous quarters representing diverse participation in RE auctions

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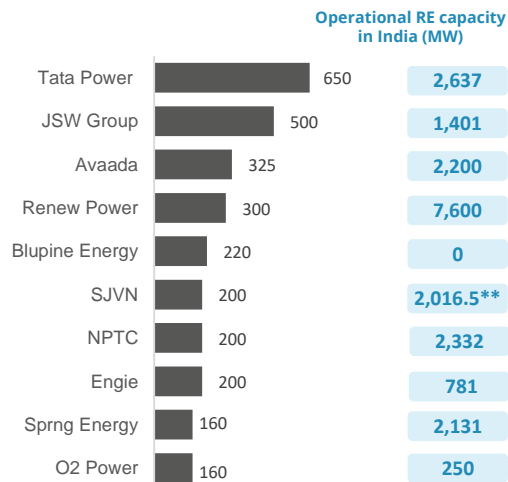
## Notable deals (Q2 FY23)



**57%** Q2 FY23  
Market concentration in  
auctioned RE capacity

*Note: Market concentration is calculated as the ratio of the top five RE capacities awarded to the total RE capacity auctioned*

## Developer-wise\* RE capacity auctioned during Q2 FY23 (3,510 MW)



*Source: CEEW-CEF Compilation. \*Note: Includes only the top 10 developers in terms of auctioned capacity. \*\*Including hydro capacity.*

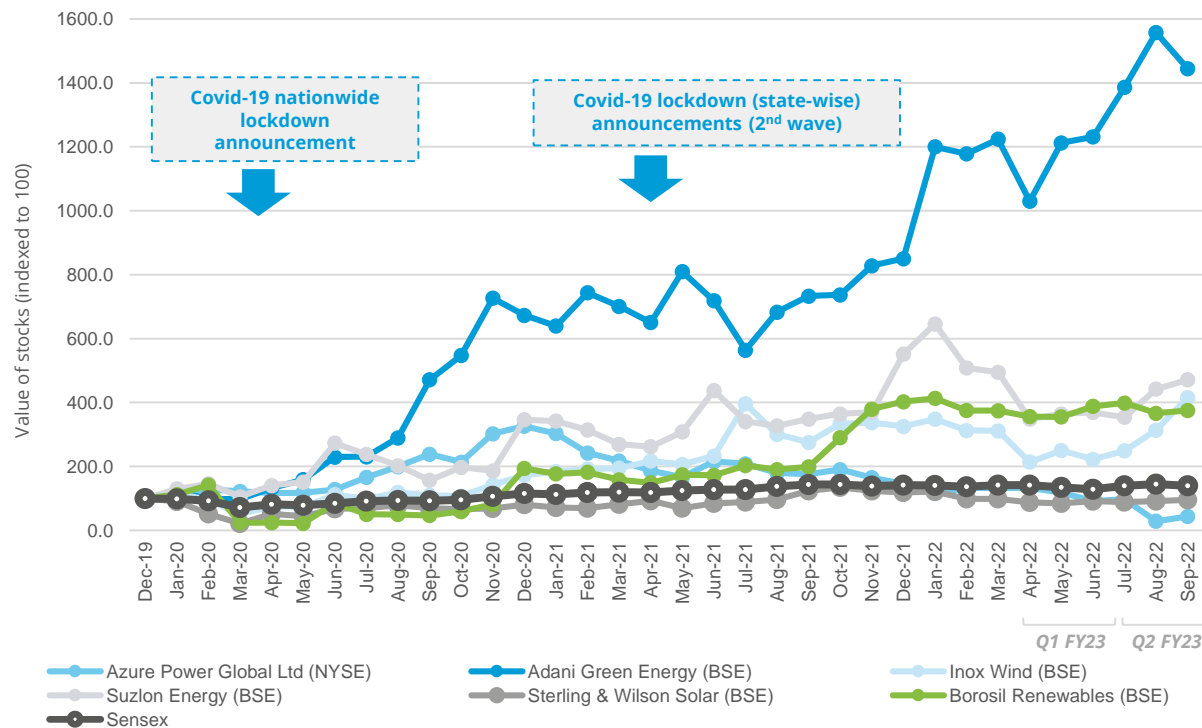
## Takeaways & Outlook

In Q2 FY23, 3.51 GW of RE capacity was auctioned. In the private sector, developers such as Tata Power, Avaada, JSW Group, Renew Power, and O2 Power emerged as winners. **A new entrant, Blupine Energy, incorporated by Actis Energy, won wind and solar capacities in GUVNL's 500 MW wind phase-III and 750 MW solar phase-XVI bids.** Among public sector undertakings (PSU), NTPC, SJVN, and GSECL were the winning bidders.

**Market concentration saw a further decline in Q2 FY23 to 57% (vs 68% in Q1 FY23 and 62% in Q2 FY22), with a diverse set of public and private sector developers participating in the auctions (a total of 18 in Q2 FY23).**

In Q2 FY23, the deal activity **primarily consisted of solar and wind asset acquisitions**; for example, Filatex India Ltd and Syngene International acquired stakes in RE projects to gain a captive open access status. In addition, Shell plc. completed Sprng Energy's acquisition, and Mahindra Susten received an equity investment to develop its renewable energy business further.

## Change in key renewable energy stock prices (indexed to 100)



Source: Money Control.

Note: Share prices are the last traded value in each month.

## Takeaways & Outlook

In Q2 FY23, most of the listed RE stocks (except the NYSE-listed solar project developer Azure Power) gained momentum and trended upwards.

The share price of RE developer **Adani Green Energy** was up by 17%, and that of Sterling and Wilson was up by 4% as of September 2022 (vs June 2022).

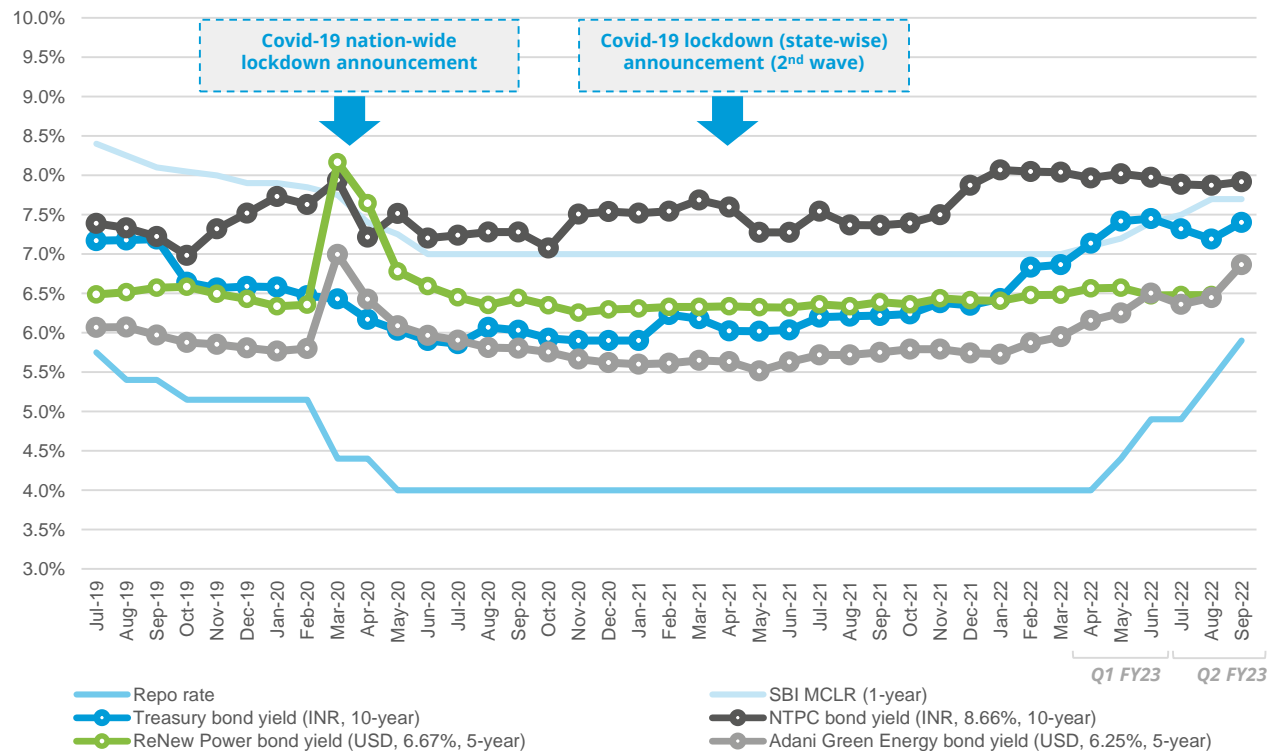
The stock prices of wind developer-manufacturers **Inox Wind** and **Suzlon Energy** were up by 87% and 28% in September 2022 (vs June 2022), respectively.

However, the share price of Borosil Renewables, which holds a near monopoly position in India's solar panel glass manufacturing, was down by 3% as of September 2022 (vs June 2022). However, it was up by 88% compared to September 2021.

## Renewable energy finance: key bond yields saw an uptick in Q2 FY23 as a result of successive repo rate hikes in the quarter

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### Bond yields\* and key financial rates



### Takeaways & Outlook

In August 2022, the Reserve Bank of India (RBI) continued to increase the policy repo rate from 4.9% to 5.4%, and again in September 2022, it increased the rate by 0.5% to 5.9%.

Key bond yields in India, including the 10-year treasury bond yield, continued to see an uptick in Q2 FY23 against the backdrop of rising interest rates, coinciding with the rupee falling to a record low in September 2022.

Continuing the trend since the beginning of FY23, in Q2 FY23, no new green bonds by RE developers were issued. However, in September 2022, the Government of India announced its plans to borrow INR 16,000 crores (USD 1.94 billion) through the issuance of sovereign green bonds (SGrBs) in the second half of the fiscal year 2022-23, as announced in the Union Budget 2022-23.

Source: Reserve Bank of India, State Bank of India, Trading Economics, Money Control and BondEvalue.

Note: Bond prices are the last traded value in each month; \* Current yield.

## SECI's 500 MW/1000 MWh standalone battery energy storage system (BESS)

SECI's 500 MW/1000 MWh standalone BESS (August 2022), Rajasthan, India.

- In April 2022, SECI issued a first-of-its-kind tender for setting up 500 MW/1000 MWh standalone battery energy storage systems (BESS).
- This project, once commissioned, will provide discoms with on-demand storage facilities.
- The project capacity to be set up under the RfS is 1000 MWh (500 MW x 2 hours); it will constitute two projects of 500 MWh (250 MW x 2 hours) capacity each.
- The buyers will be provided with two operational cycles per day, i.e., two complete charge-discharge cycles per day.
- The projects will be installed in the vicinity of the Fatehgarh-III substation (ISTS network) in Rajasthan.
- 60% of the project capacity will be off-taken by SECI, and off-take of the remaining 40% will be the developer's responsibility through third-party or market sale.

## India's recent energy storage tenders

Project location & tender issue date	Application & technology	Details
Gujarat (GUVNL), August 2022	500 MW/ 1000 MWh standalone BESS phase – I	RfS released in Q2 FY23; deadline extended
Maharashtra (MSEDCL), August 2022	250 MW RE with BESS	RfS released in Q2 FY23; deadline extended
Gujarat (GUVNL), June 2022	500 MW RE/ 250 MWh ESS phase XV	RfS released in Q1 FY23; deadline extended
Rajasthan (NTPC), April 2022	250 MW/ 500 MWh BESS	RfS released in Q1 FY23
Pan India (NTPC), January 2022	500 MW wind/solar with 3000 MWh BESS	Bid conclusion expected in Q3 FY23
Pan India (REMCL), November 2021	150 MW RE, thermal, hydro and gas with ESS in RTC manner	Bid conclusion expected in Q3 FY23
Uttar Pradesh (NTPC), June 2021	4 MW solar with 1 MW/1 MWh BESS	Results expected in Q3 FY23
Maharashtra (REMCL*), June 2021	15 MW solar with 7 MW/14 MWh BESS	Results expected in Q3 FY23
Tamil Nadu (TANGEDCO), February 2021	1 MW solar with 3 MWh BESS	Results expected in Q3 FY23

## Takeaways & Outlook

**Two new energy storage tenders were announced in Q2 FY23.** This include GUVNL's standalone 500 MW/1000 MWh BESS and MSEDCL's 250 MW RE with BESS tenders.

**In addition, two energy storage tenders were concluded in this quarter. First, in July, KSEBL's 10 MW/20 MWh BESS in Kerala was awarded to Hero Future Energies. In August 2022, JSW Renew Energy (a special purpose vehicle of JSW Energy) was declared the winner of SECI's 500 MW/1000 MWh standalone (BESS) tender under the BOOT model.** JSW Renew Energy won the capacity at INR 1.08 million per MW per month.

However, many BESS tenders from the previous quarters are yet to be concluded owing to multiple deadline extensions.

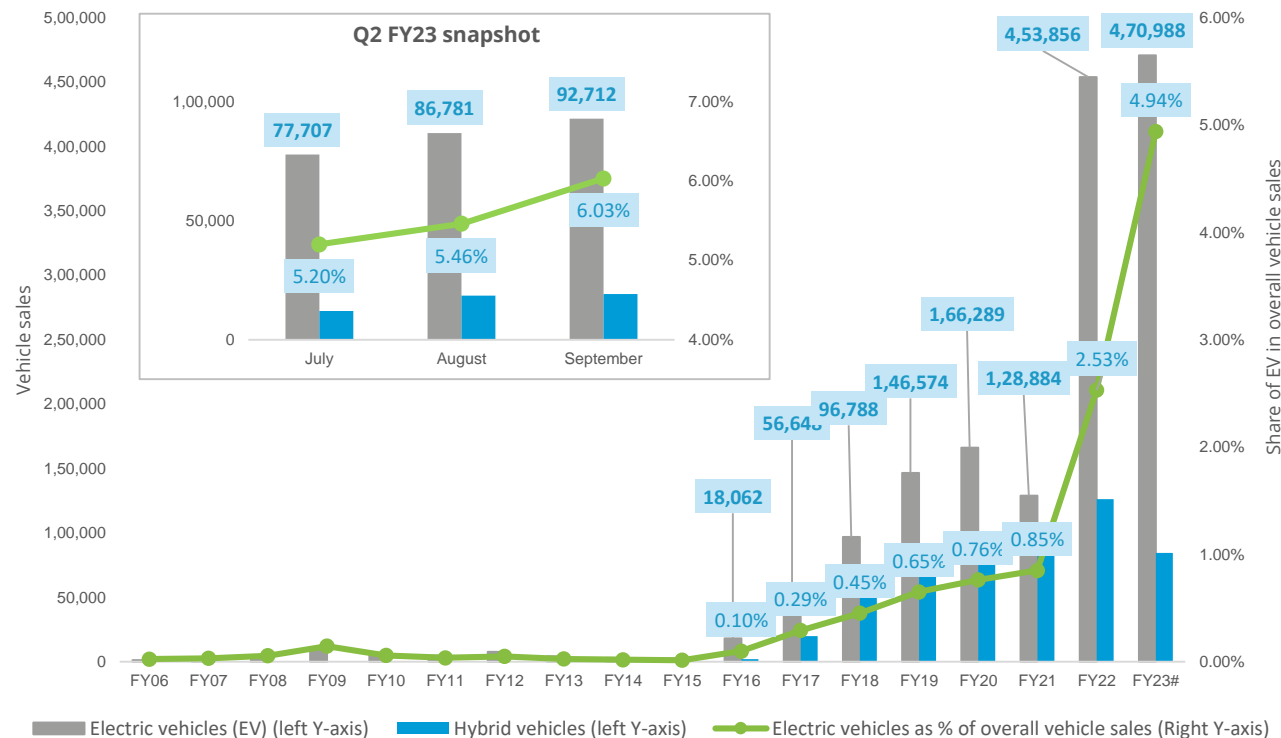
Source: MNRE [Press release](#); [SECI RfS document](#).

Source: SECI and state renewable agencies. RfS = request for selection.

# Electric mobility: EV sales increased by 20% in Q2 FY23 vs Q1 FY23; the share of EV in overall vehicle sales stood at 5.57% in Q2 FY23

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## Electric vehicle sales in India



## Takeaways & Outlook

EV sales continued to grow in Q2 FY23, with an increase of 20% compared to Q1 FY23 and a gain of 187% compared to the same quarter in the previous fiscal year. In the first six months of FY23 alone, EV sales have crossed the entire FY22 levels.

As a share of overall vehicle sales, EV sales stood at 5.57% in Q2 FY23 (vs 2.10% in Q2 FY22 and 4.34% in Q1 FY23).

In September 2022, the Ministry of Road Transport and Highways amended the safety parameters for testing EV batteries and introduced amendment 2 in AIS 156 and AIS 038 Rev.2 standards. These amendments will be implemented in two phases; phase-1 w.e.f. 1 December 2022 and phase-2 w.e.f. 31 March 2023.

**OEMs with the highest EV sales\* in Q2 FY23 were:**

- **2W:** Hero Electric (27,754), Okinawa (25,267) and Ampere (19,337)
- **3W:** PIAGGIO Vehicles (14,138), YC Electric Vehicle (7,041), Mahindra REVA Electric Vehicles (4,250)
- **4W\*\*:** Tata Motors (8,494), MG Motors (872) and Hyundai Motors (210)

*Source: Vahan Sewa dashboard (includes only registered vehicles, unregistered vehicles include low-speed vehicles (< 25 km/hr), e-rickshaws (three-wheelers) and electric two-wheelers), Electric Mobility Dashboard (2021), CEEW Centre for Energy Finance. #As of Q2 FY23; \* Based on sales data up to Q2 FY23; \*\*4W represents Light motor vehicles and Light passenger vehicles.*



# Thank you

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Date	Company	Size (USD million)	Sector	Coupon rate (%)	Rating	Tenor (Years)	Purpose
March 2022	Avaada Energy	192	Solar	6.75	AAA (CRISIL, India Ratings)	3	Refinancing of existing debt
March 2022	Greenko	750	Energy storage	5.50%	Ba1 (Moody's)	3	Refinance existing debt and fund the capital expenditures at asset level
January 2022	ReNew Power	400	Solar and wind	4.50%	BB- (Fitch)	5.25	Refinance existing debt and fund capital expenditure
September 2021	Adani Green Energy	750	Solar and wind	4.375%	Ba3 (Moody's)	3	Fund equity portion of capital expenditure for under-construction projects
August 2021	Azure Power	414	Solar	3.575%	Not available	5	Refinance existing higher cost green bond debt
July 2021	Acme Solar	334	Solar	4.70%	Not available	5	Refinancing of existing debt
July 2021	Vector Green Energy	165	Solar	6.49%	AAA (CRISIL, India Ratings)	3	Refinance existing high-cost debt of solar projects
May 2021	JSW Hydro	707	Hydro	4.50%	BB+ (EXP) (Fitch)	10	Repayment of existing green project-related rupee-denominated debt
April 2021	ReNew Power	585	Solar and wind	4.50%	BB- (Fitch)	7.25	Refinancing of existing debt
March 2021	Greenko	940	Solar and wind	3.85%	BB (Fitch)	5	Redemption of previous fund raise
March 2021	Hero Future Energies	363	Solar and wind	4.25%	BB- (Fitch)	6	Refinancing of existing debt
February 2021	ReNew Power	460	Solar and wind	4.00%	BB- (Fitch)	6	Refinancing of existing debt

Source: Climate Bonds Initiative and company press releases.

Date	Company	Size (USD million)	Sector	Coupon rate (%)	Rating	Tenor (Years)	Purpose
February 2021	Continuum Green Energy	561	Solar and wind	4.50%	BB+ (Fitch)	6	Refinancing of existing debt
October 2020	CLP Wind Farms	40	Wind	Not available	AA (India Ratings)	2 to 3	Refinancing of existing debt
October 2020	ReNew Power	325	Solar and wind	5.375%	BB- (Fitch)	3.5	Refinancing high-cost local debt
January 2020	ReNew Power	450	Solar and wind	5.875%	BB-/Stable (Fitch)	5	Refinancing of maturing debt
October 2019	Adani Green Energy	362.5	Solar and wind	4.625%	BBB- (Fitch)	20	Repaying foreign currency loans and rupee borrowings
September 2019	ReNew Power	90	Solar and wind	6.67%	BB (Fitch)	4.5	Refinancing of existing debt
September 2019	Greenko	85	Solar and wind	5.95%	BB- (Fitch)	6.75	Refinancing of existing debt
September 2019	Azure power	350	Solar	5.65%	BB (Fitch)	5	Refinancing of existing debt
September 2019	ReNew Power	300	Solar and wind	6.45%	Ba2 (Moody's)	5	Capacity expansion and repaying high cost debt
August 2019	Greenko	85	Solar and wind	6.25%	Ba1 (Moody's)	3.5	Refinancing of solar and wind projects
August 2019	Greenko	350	Solar and wind	6.25%	Ba1 (Moody's)	3.5	Refinancing of solar and wind projects
July 2019	Greenko	450	Solar and wind	5.95%	BB (Fitch)	7	Refinancing of solar and wind projects

Source: Climate Bonds Initiative and company press releases.

# 40.24%

FAME-II target met

As of Q2 FY23

**Note:** Target of selling 1,562,000 EVs (2W, 3W, 4W and buses) under FAME-II scheme by FY22.

# 477

Number of EV OEMs in India

As of Q2 FY23

# 133

Total FAME II approved models

As of Q2 FY23

### Recent electric vehicle launches



#### Mahindra XUV 400 Ev

Price: INR 15,00,000 onwards

Range: 450 km

Battery capacity: 39.4kWh



#### Kinetic Zing

Price: INR 71,500 onwards

Range: 100 km

Battery capacity: 60V/22 Ah



#### Omega Seiki Vicktor

Price: INR 500,000 onwards

Range: 250 km

Battery capacity: 20 kWh



#### HOP Oxo

Price: INR 125,000 onwards

Range: 150 km

Battery capacity: 3.75 kWh

### EV penetration

In Q2 FY23

# 4.13%

2W sold were EV

# 55.8%

3W sold were EV

# 470,902

EVs sold

As of Q2 FY23

# 21

States notified EV policies,

As of Q2 FY23

For more updates visit [CEEW-CEF Electric Mobility Dashboard](https://ceew-cef.org/electric-mobility-dashboard)



### **Build evidence**

Consistent, reliable, and up to date monitoring & analysis of clean energy markets – investment, payment schedules, market trends, etc.

### **Create coherence**

Periodic convening of multi-stakeholder groups to deliberate on market activities in clean energy

### **Design solutions**

Design and feasibility pilots of fit-for-purpose business models & financial solutions for clean energy solutions



## Making India A Leader in Solar Manufacturing



## How have India's RE Policies Impacted its Solar and Wind Projects



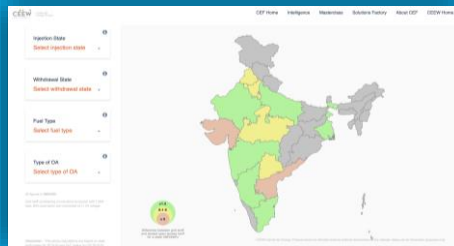
## Investment Sizing India's 2070 Net-Zero Target



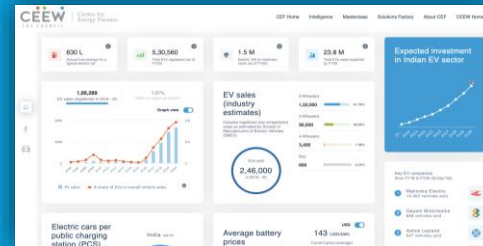
## Advancing Article 6 Negotiations



## India Renewables Dashboard



## Open Access Tool



## Electric Mobility Dashboard