CEEW
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Centre for
Energy Finance

CEEW-CEF Market Handbook Q2 2023-24

3 November 2023

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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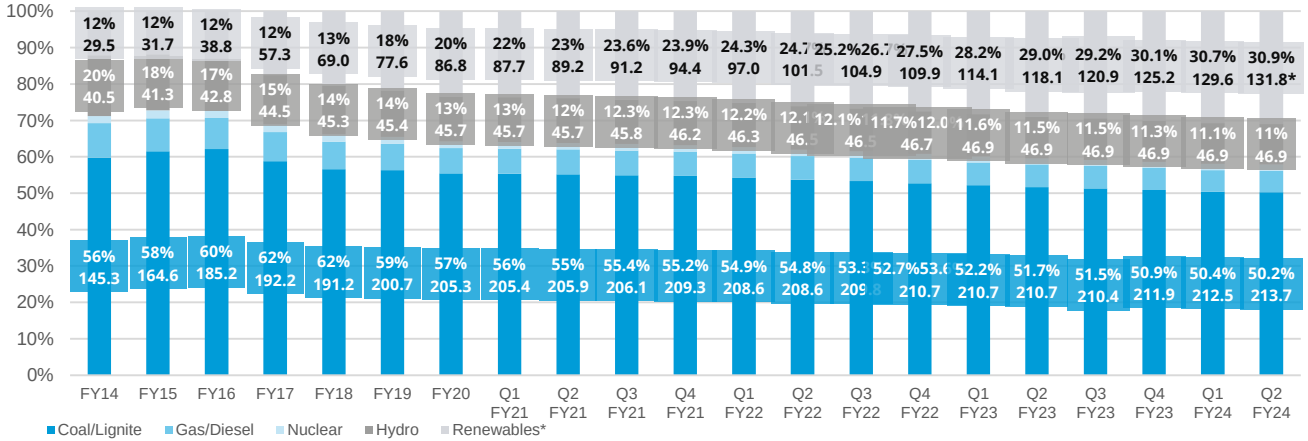
Contents

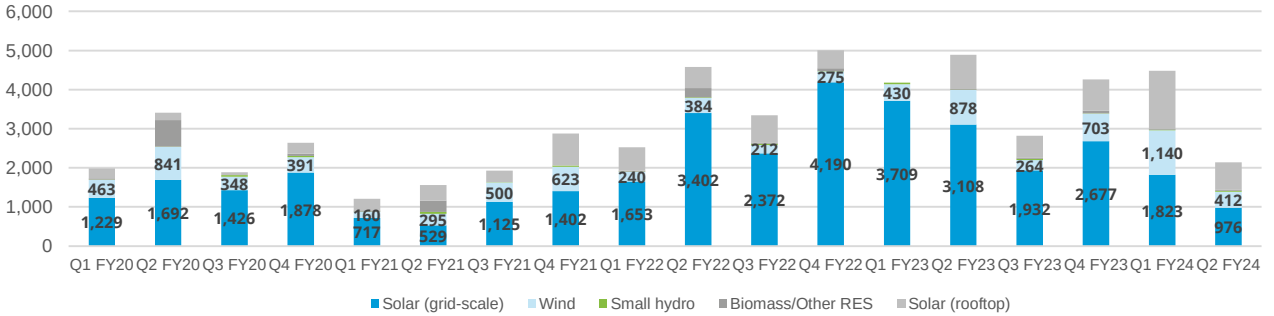
Generation capacity: total installed non-hydro RE capacity crosses 130 GW mark; solar rooftop capacity crossed 10 GW mark

Installed capacity mix (GW)



Source: *Central Electricity Authority (CEA). * Includes solar rooftop capacity (11078.95 MW as of September 2023).*

RE capacity addition (MW)



Source: *Ministry of New and Renewable Energy (MNRE); #Auctioned capacity = Awarded capacity.*

Takeaways & Outlook

In Q2 FY24, a net generation capacity of 3.5 GW was added (vs 4.0 GW in Q2 FY23). The total net capacity addition comprised renewable energy (RE) (2.1 GW), coal-based (1.2 GW) and gas-based (214 MW) capacity addition. No new large hydropower, diesel or nuclear capacity was added in this quarter.

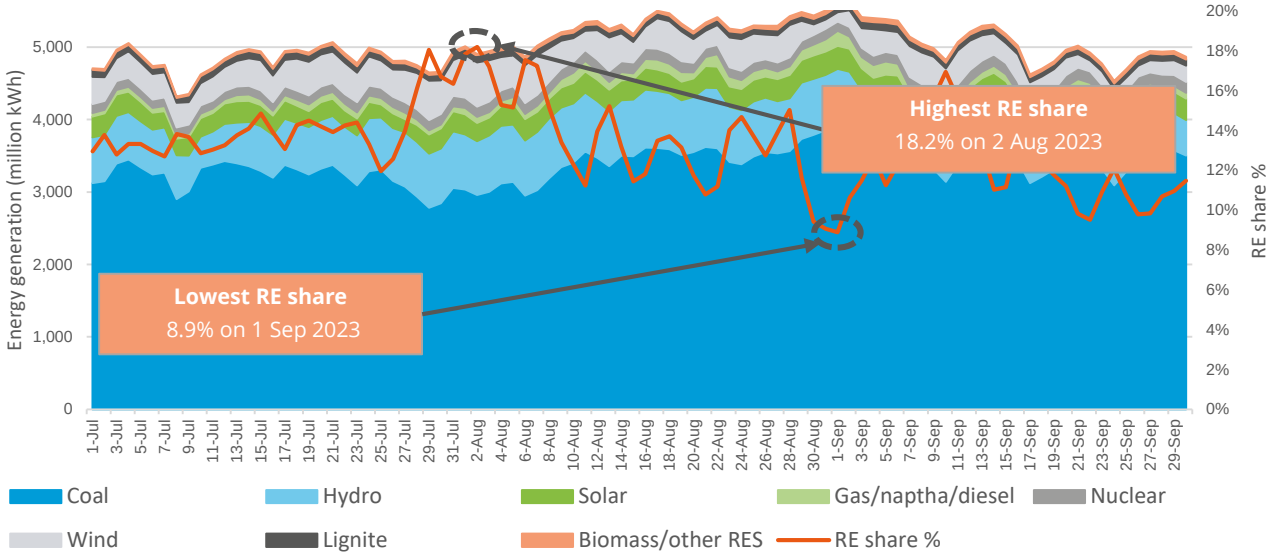
In RE, solar (grid-scale and rooftop) continued to dominate capacity addition, accounting for 1,684 MW (78.7%) (vs 3,108 MW in Q2 FY23) **of total RE addition.** Wind capacity addition stood at 412 MW (19.2%) in Q2 FY24 (vs 878 MW in Q2 FY23). Small hydro (24 MW) and biopower (22 MW) contributed 1.1% and 1.0%, respectively. A slower rate of RE capacity addition was noted in Q2 FY24 (vs Q1 FY24).

In Q2 FY24, the total installed RE capacity reached 131.8 GW, with 71.8 GW of solar, 44.2 GW of wind and 10.8 GW of biopower capacity.

In total, 5.41 GW RE capacity was auctioned# in Q2 FY24, of which grid-scale solar PV stood at 4.34 GW, solar with storage at 600 MW, wind-solar hybrid at 225 MW, and floating solar at 250 MW.

Energy mix: share of RE and coal/lignite increased whereas hydro share decreased significantly

Source-wise daily generation (Q2 FY24)



RE share snapshot

	Q2 FY22		Q2 FY23		Q2 FY24	
	RE share %	Day	RE share %	Day	RE share	Day
Highest	19.2%	1 August 2021	17.4%	12 July 2022	18.2%	2 August 2023
Lowest	7.7%	22 August 2021	7.5%	30 August 2022	8.9%	1 September 2023
Average (Daily)	12.3%	NA	12.9%	NA	13.2%	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 significantly by 15.0% in Q2 FY24 (464 billion kWh) compared to Q2 FY23 (404 billion kWh) and by 5.6% in comparison to Q1 FY24 (440 billion kWh) **owing to lower-than-expected rainfall in August 2023, resulting in hot weather conditions** versus same period previous fiscal year.

- **July: Up by 12.0%**
- **August: Up by 19.3%**
- **September: Up by 13.5%**
- **Total Q2 FY24: Up by 15.0%**

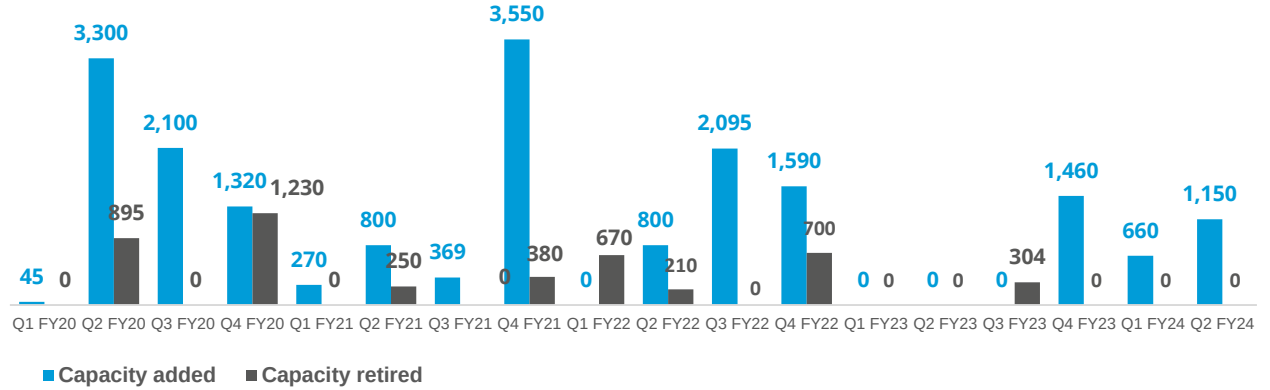
In Q2 FY24, **RE generation increased significantly by 18.2%** versus the same quarter in the previous fiscal year (Q2 FY23). **Coal/lignite-based generation was up** by 19.7%; however, **hydro decreased** by 11.2% for the same period.

From an average daily generation perspective, **the RE and coal/lignite share increased in Q2 FY24** compared to Q2 FY23, **whereas the hydro share decreased**.

- **RE:** Share up from 12.9% to 13.2%
- **Hydro:** Share down from 17.3% to 13.4%
- **RE + Hydro:** down from 30.2% to 26.6%
- **Coal/lignite:** Share up from 65.8% to 68.6%

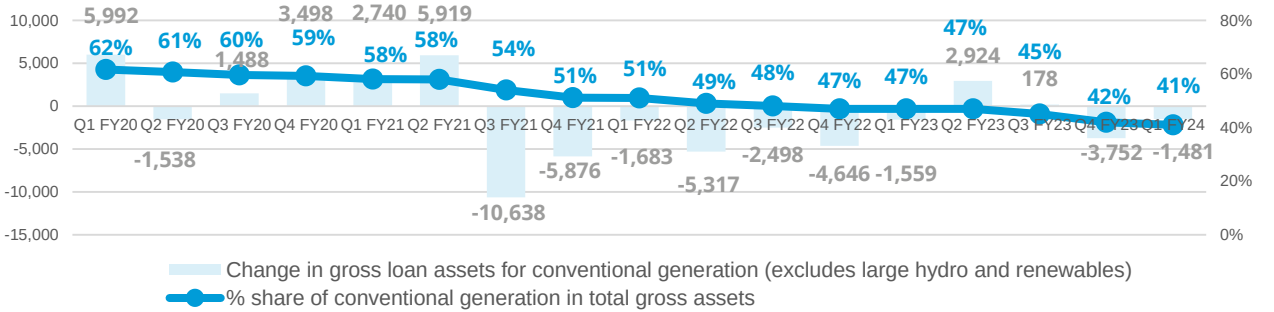
Coal phase-out: 1.15 GW of new coal capacity added, share of conventional generation in the PFC/REC loan book reduced to 41%

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 FY24.

Takeaways & Outlook

In Q2 FY24, 1,150 MW of new coal capacity was added, while no coal capacity was retired. New coal capacity includes Telangana STPP's Unit 1 (800 MW commissioned and added to the central sector of SR states), Anuppur TPP (50 MW up-rated) and Shree Cement TPP (300 MW added to the private sector of Rajasthan).

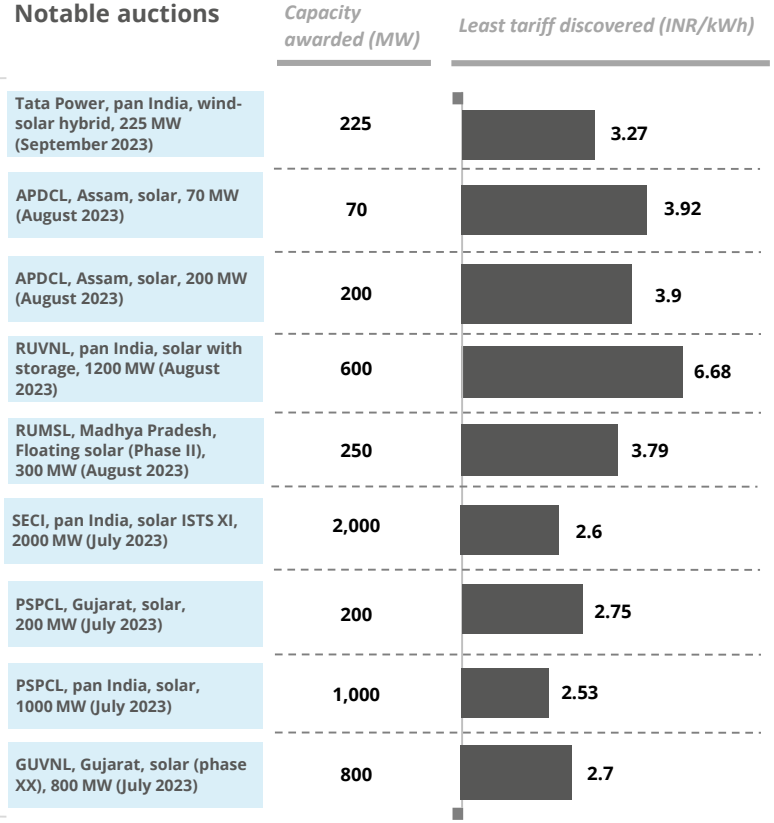
The share of **conventional generation continued to trend downward** in the PFC/REC loan book**, declining to 41% in Q1 FY24 from 47% in Q1 FY23.** In Q1 FY24, **transmission and distribution projects** accounted for ~**46%** (INR 1,99,253 crore) and **RE generation projects (including large hydro)** accounted for **11.5%** (INR 49,707 crore), versus 42% (INR 1,57,031 crore) and 10% (INR 37,050 crore) in Q1 FY23, respectively.

In this quarter, **PFC/REC extended INR 5 lakh crore funding to 20 companies** for RE projects. In addition, **PFC issued non-convertible debentures to raise up to INR 5,000 crores in the public market**. The public issue consists of three tranches of 3, 10 and 15 - years, with interest rates varying between 7.45% – 7.55% for high-income nationals, retail, institutional and non-institutional investors.

RE auctions: 5.41 GW of RE auctioned in this quarter; RUVNL's solar with storage tender concluded at 6.68 INR/kWh

Notable auctions

Q2 FY24



Bid spotlight: RUMSL, Madhya Pradesh, Floating solar (Phase II), 300 MW

Tariff and winner

- **Tariff discovered:** 3.79 INR/kWh.
- **Winners:** SJVN Limited, NTPC Renewable Energy, Hinduja Renewables Energy.

Key provisions

- **Project location:** three units of 100 MW each at Omkareshwar Reservoir, Madhya Pradesh.
- **Identification of injection point:** RUMSL will provide the power evacuation infrastructure connected at the STU/PGCIL substations.
- **Power off-take:** MPPMCL, on behalf of three state distribution companies, will purchase power from the floating solar project.

Comments

- This is the phase-II of RUMSL's Omkareshwar floating solar park, following the phase-I bidding, concluded in Q1 FY23. The lowest tariff discovered in phase-I stood at 3.21 INR/kWh with Amp Energy, NHDC and SJVN Limited emerging as the winners.
- Floating solar technology addresses the issue of land availability and can be installed on water masses like lakes, reservoirs, water canals or embankments.

Takeaways & Outlook

RE auctioned capacity stood at 5.41 GW in Q2 FY24 and was dominated by state bidding agencies such as RUVNL's 1200 MW solar with storage and PSPCL's 1000 MW solar tender. **SECI concluded only one tender** (vanilla solar) **in this quarter. KPI Green Energy was a new entrant, winning 100 MW capacity in GUVNL's 800 MW solar tender.** For solar with storage tender by RUVNL and floating solar by RUMSL, the entire tender capacity was not allotted.

Q2 FY24 witnessed a slowdown in total auctioned capacity compared to Q1 FY24, but remains higher compared to prior quarters.

- **Q2 FY24: 5.41 GW**
- **Q1 FY24: 7.65 GW**
- **Q4 FY23: 1.80 GW**
- **Q3 FY23: 1.96 GW**

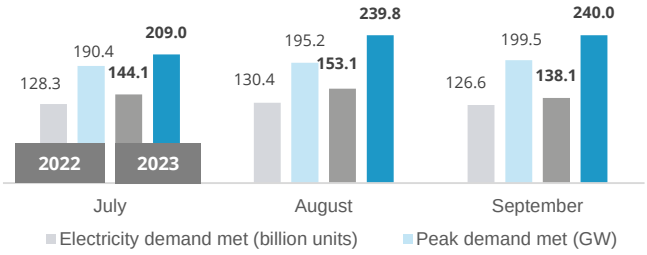
The share of vanilla solar dominated the auctioned capacity this quarter (80.1%), followed by solar with storage, floating solar and wind-solar hybrid tenders. **The lowest discovered solar tariff** in Q2 FY24 (PSPCL, 1000 MW) stood at **INR 2.53/kWh. No vanilla wind capacity was auctioned in this quarter.**

Source: SECI and state renewable agencies.

APDCL = Assam Power Distribution Company Limited; RUVNL = Rajasthan Urja Vikas Nigam Limited; RUMSL = Rewa Ultra Mega Solar Limited; SECI = Solar Energy Corporation of India; PSPCL = Punjab State Power Corporation Limited; GUVNL = Gujarat Urja Vikas Nigam Limited; SJVN = Satluj Jal Vidyut Nigam, MPPMCL = MP Power Management Company Limited.

Power markets: Q2 FY24 witnessed the highest-ever peak power demand at 240 GW

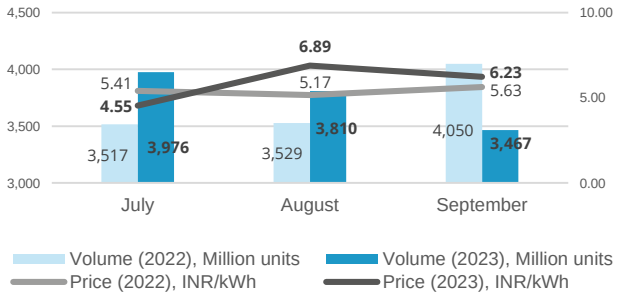
Power supply position (Peak and electricity demand)



Source: CEA.

Peak demand met in Q2 FY24 increased compared to Q2 FY23 through government interventions that ensured supply-side liquidity. Unprecedented demand surges in August – September resulted in higher demand and supply constraints.

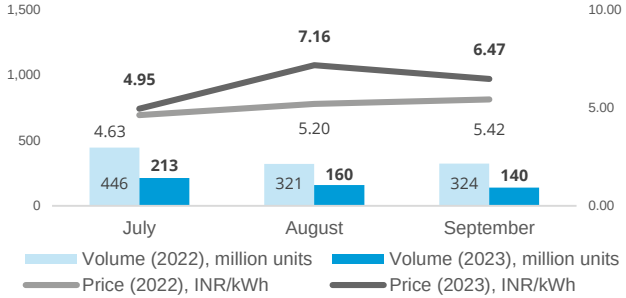
Day-ahead spot market snapshot (IEX)



Source: IEX.

Higher market clearing prices (MCP) have been recorded in Q2 FY24 amidst discoms quest to meet the country's significantly increasing electricity demand. In August 2023, volumes traded on the **day-ahead market (DAM)** recorded a significant growth of 33% (vs August 2022).

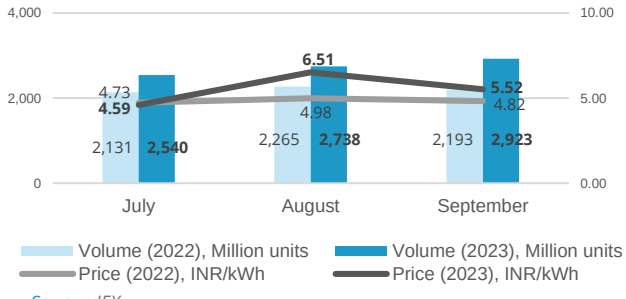
Green day ahead market snapshot (IEX)



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

Volumes traded in the **green day–ahead market (GDAM) were significantly** lower in Q2 FY24 (vs Q2 FY23), while a higher MCP was recorded compared to Q2 FY23 levels. In July 2023, GDAM witnessed 200 market participants, highest for the quarter.

Real-time market snapshot (IEX)



Source: IEX.

Real-time market (RTM) achieved its highest-ever monthly volume trade of 2923 MU in September 2023. The volumes continued recording strong growth signals since Q1 FY24, indicating the growing reliance of discoms and industries on the RTM.

Takeaways & Outlook

Q2 FY24 recorded the all-time high peak power demand in the country on 1 September 2023, standing at 240 GW. On 2 September 2023, India witnessed the highest-ever single-day electricity consumption of 5,224 MU. This is due to lower-than-expected rainfall in August – September 2023, resulting in hot weather conditions.

In August 2023, **CERC notified the** implementation of the general network access **(GNA) regulation,** Indian Electricity Grid Code **(IEGC) regulations, and transmission charges sharing regulations.** These will be **applicable w.e.f. 1 October 2023**. The exemption of ISTS charges for the sellers on power exchanges will positively impact trading volumes.

In September 2023, CEA released anticipated energy requirements and peak demand for FY 2024-25.

In Q2 FY24, 1.3 million solar RECs were traded at an average price of INR 0.57/kWh on IEX. There was no trading of non-solar RECs. In **Q2 FY24, ~0.3 million energy saving certificates (ESCerts) were traded** at the average floor price of INR 1,840/ESCert.

Policy and regulatory developments: Union Cabinet approves viability gap funding for battery energy storage systems; various states notified draft and final green energy open access regulations

MoP revised the guidelines for tariff tariff-based competitive bidding process for wind-solar projects

- In August 2023, MoP released the guidelines to promote competitive electricity procurement from hybrid projects, fulfil RPO, and facilitate transparency and fairness in procurement processes.
- The PPA term is reduced to 20 years, extendable to 25 years.
- Power supply commencement within 24 months for projects below 1000 MW and 30 months for projects above 1000 MW.

Union Cabinet approves viability gap funding for battery energy storage systems (BESS)

- In September 2023, the Union Cabinet approved the viability gap funding for battery energy storage systems (BESS).
- Financial support of up to 40% of the capital cost will be provided as budgetary support in the form of viability gap funding (VGF).
- BESS projects of a total of 4 GWh will be developed by 2030-31 under the Scheme through a competitive bidding mechanism.

SERCs in various states released draft and final green energy open access regulations in Q2 FY24

- Telangana SERC issued a draft monthly banking of open access at 8% of energy banked.
- Uttarakhand SERC updated the additional surcharge to INR 1.05/kWh for open-access consumers.
- Odisha SERC issued a draft for the promotion of renewable energy through Green Energy Open Access) Regulations, 2023.
- Karnataka SERC issued an order for Green Energy Open Access.
- Gujarat SERC issued the draft green open access regulation 2023.

CERC approves high price bilateral market segment on PXIL

- In September 2023, CERC approved PXIL's proposal to introduce the high-priced bilateral market segment and high-price term-ahead market.
- Earlier in April 2023, the Commission approved the introduction of high-price DAM.

MNRE issued a strategy for establishment of offshore wind energy projects

- In September 2023, for holistic and fast-track development of offshore wind farms, MNRE has proposed three models.
- Model A – viability gap funding (VGF) model, Model B – non-VGF with exclusivity over the seabed and Model C – non-VGF and without exclusivity over the seabed.
- Under these three models, 37 GW of capacity is expected to be auctioned by 2029-30.
- Later in September, MNRE proposed to hold bids for the development of offshore wind energy sites in Tamil Nadu.

MoP released a framework to promote energy storage systems

- In August 2023, MoP, to have 24×7 dispatchable RE power, i.e., RE-RTC (Renewable Energy- Round the Clock), released the framework. It will ensure improved grid stability and reliability with a higher RE share in the grid.

Takeaways & Outlook

Q2 FY24 was a crucial quarter for offshore wind project development in India.

In July 2023, **along with guidelines for a tariff-based competitive bidding process for power procurement** from solar-wind projects, MNRE also released similar guidelines **for solar and wind projects** this quarter.

In the latest update, MNRE included a total of 76 manufacturers with a cumulative capacity of 17,577 MW in List-I under ALMM order for Solar PV Modules with models with an efficiency equal to or greater than 19%.

In July 2023, CEA released a revised methodology for calculating AT&C losses.

The government of Rajasthan released the draft Rajasthan energy policy 2050.

On the green hydrogen front, MNRE announced the green hydrogen standard for India. In addition, a draft R&D roadmap for the green hydrogen ecosystem in India was also released.

Source: CEEW-CEF Compilation. CERC = Central Electricity Regulatory Commission; SERC = State Electricity Regulatory Commission; MoP = Ministry of Power; ALMM = Approved List of Models and Manufacturers.

Renewable energy finance: market concentration in RE auctions increases in Q2 FY24

Notable deals (Q2 FY24)

September 2023

Equity investment

Target: Ellipson
Investor: Capital A
Amount: ~INR 2 crore (USD 0.3 million)

September 2023

Equity investment

Target: Juniper Green
Acquirer: AT Capital Group and Vitol
Amount: ~INR 2,900 crore (USD 350 million)

August 2023

Equity investment

Target: Waaree Energies
Investor: ValueQuest
Amount: INR 1.000 crore (~USD 122 million)

August 2023

Debt investment

Target: ReNew Power
Investor: State Bank of India
Amount: INR 2,700 crore (~USD 326 million)

August 2023

Acquisition

Target: Virescent Renewable Energy Trust
Investor: IndiGrid
Amount: INR 4,000 crore (~USD 484 million)

July 2023

Debt investment

Target: Adani New Industries Limited
Investor: Barclays and Deutsche Bank AG
Amount: ~INR 3,278 crore (USD 394 million)

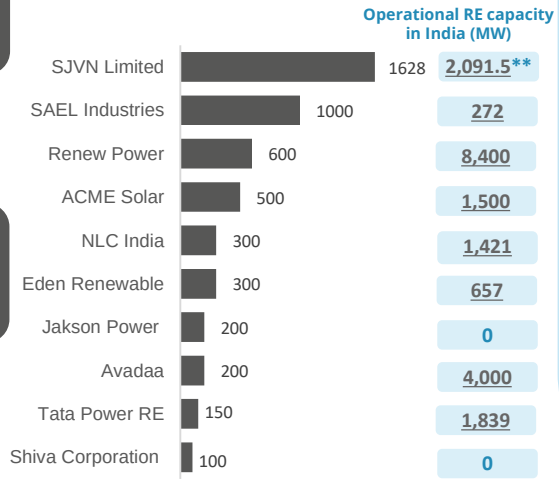
Source: CEEW-CEF Compilation.

74% Q2 FY24

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 awarded

Developer-wise* RE capacity awarded during Q2 FY24 (5,413 MW)



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

Takeaways & Outlook

In Q2 FY24, 5.41 GW of RE capacity was auctioned. In the **private sector**, among other developers, SAEL Industries, Renew Power, Avaada Energy, Acme Solar, Eden Renewables, Jackson Power, Tata Power Renewable Energy and Shiva Corporation emerged as winners**.** In addition to **NTPC and SJVN, NLC India** also emerged as a **winning bidder** in the **public sector undertakings (PSU)** category.

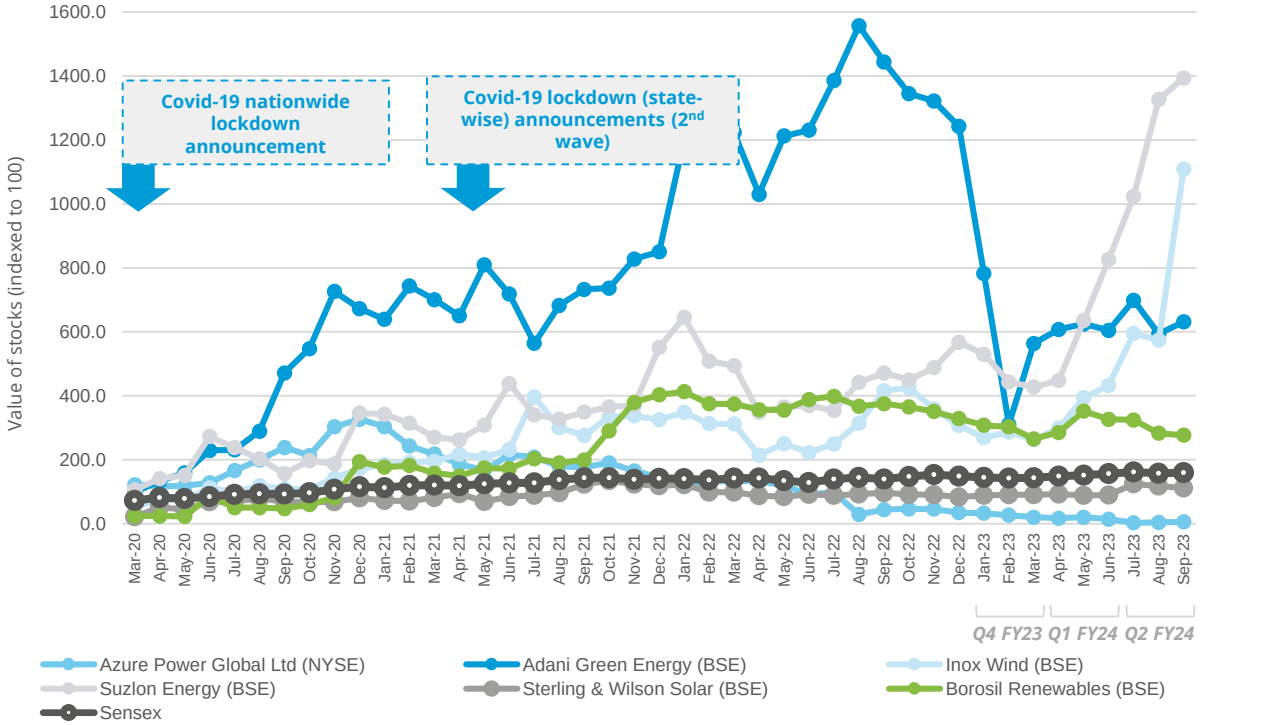
The market concentration saw a rise in Q2 FY24 to 74% (vs 57% in Q2 FY23). SJVN Limited, SAEL Industries and Renew Power accounted for ~60% of the RE auctioned capacity (out of a total of 15 bid winners in Q2 FY24).

In Q2 FY24, the deal activity consisted of both debt and equity investments from domestic and international sources for RE projects and solar module manufacturing in India. Waaree Energies and Adani New Industries Limited received investment to further their solar module manufacturing plans.

In August 2023, **India Grid Trust (IndiGrid)** completed the acquisition of India's only RE InvIT, **Virescent Renewable Energy Trust.**

Renewable energy finance: stocks of wind developer-manufacturers trended upwards

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 FY24, most listed RE stocks and the Sensex recorded a similar trend compared to Q1 FY24.

The share price of RE developer **Adani Green Energy was up by 4.36%, while Sterling and Wilson recorded an upward trend of 24.62% as of September 2023 (vs June 2023**).

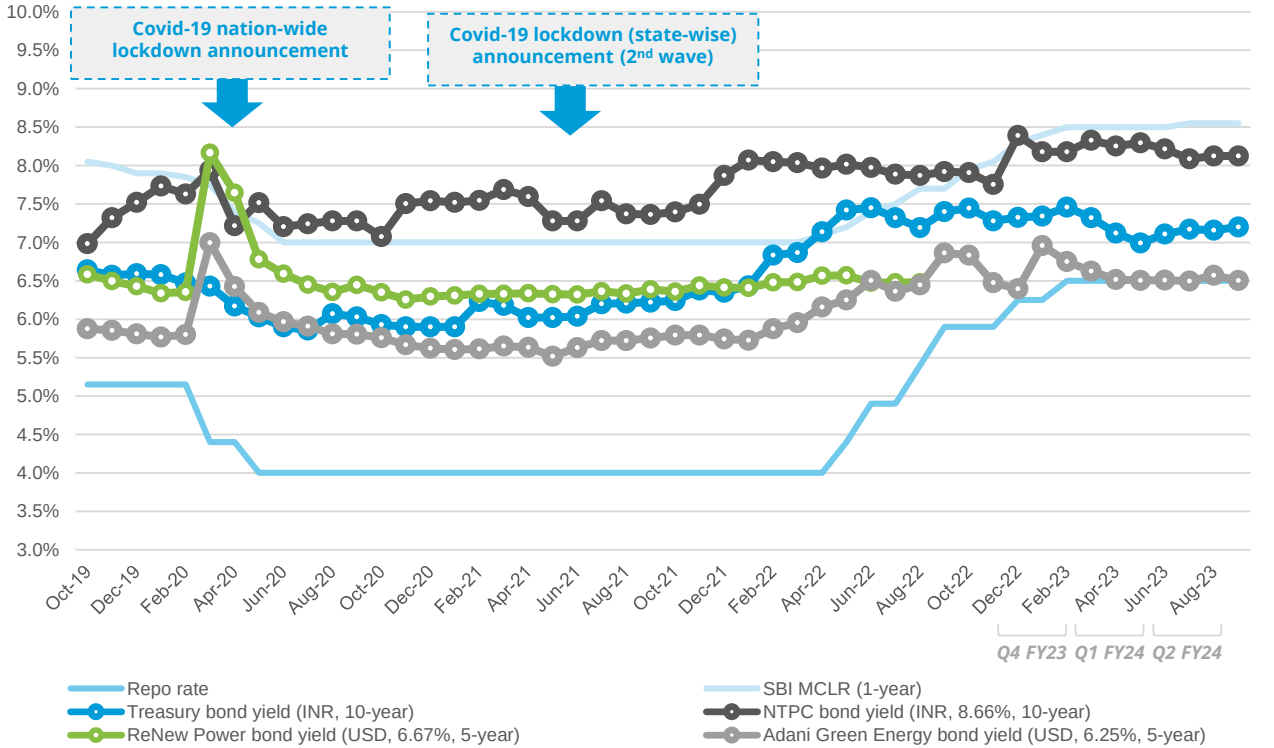
The wind developer-manufacturers continued to record strong upward trends throughout Q2 FY24. The share price of wind developer–manufacturers **Inox Wind was up by 156.22%, whereas Suzlon Energy's share price was up by 68.63% at the end of September 2023 (vs June 2023).** This followed similar trends from Q1 FY24, which can be associated with the removal of the e-reverse auction mechanism for the allotment of wind energy projects earlier this year.

The share price of **solar panel glass manufacturer, Borosil Renewables was down by 15.26% at the end of September 2023 (vs June 2023).**

NYSE–listed solar project developer Azure Power recorded a downward trend, falling by 61.58% in September 2023 (vs June 2023).

Renewable energy finance: repo rate remained constant this quarter

Bond yields* and key financial rates



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.** SLBs are issued with specific sustainability performance targets that include predefined key performance indicators (KPIs) and allow a diverse set of issuers to obtain financing via this route.*

Takeaways & Outlook

In Q2 FY24, no new green and sustainability-linked bonds (SLB)** by RE developers were issued.

In September 2023, **Government of India announced it's intention to issue additional Sovereign Green Bonds (SGrBs) worth INR 20,000 crores in the second half of FY24.** The initial tranche of SGrBs are expected in November 2023, with an offering of INR 5,000 crores.

The repo rate and reverse repo rate remained constant throughout Q2 FY24. In July 2023, the SBI MCLR (1-year) rate was increased slightly to 8.55% after remaining constant at 8.50% since February 2023.

The key bond yields, including the 10-year treasury bond yield and NTPC's 10-year bond yield, recorded an upward trend throughout the quarter.

Energy storage: five energy storage tenders announced this quarter; VGF approved for 4 GWh BESS projects; framework to promote energy storage systems released

RUVNL's solar with energy storage tender concluded - highlights

RUVNL's 1200 MW, solar with ESS tender, pan-India

- Solar power developer (SPD) is required to set up grid-connected solar power project(s) along with ESS for at least six hours during the peak demand hours as per RUVNL's requirement.
- The selection of energy storage technology is at SPD's discretion.
- The projects can be located anywhere in India and will be connected to the ISTS network. The minimum capacity to be injected at each injection point shall be 50 MW.
- Capacity of energy storage system = X/2 MW; and delivered energy in a day from ESS = 3X MWh, where X = contracted capacity.
- The project commissioning duration is kept at 24 months.

Source: RUVNL RfS document.

India's recent energy storage tenders

Project location & tender issue date	Application & technology	Details
Pan India (SECI) September 2023	1260 MW, RE with ESS (FDRE- IV)	RfS released in Q2 FY24
Pan India (SECI) September 2023	800 MW, RE with ESS (FDRE- III)	RfS released in Q2 FY24
Pan India (NTPC) July 2023	2000 MW, PHS	RfS released in Q2 FY24
Pan India (SECI) July 2023	500 MW RE with ESS (FDRE- II)	RfS released in Q2 FY24
Pan India (SECI) July 2023	1500 MW RE with ESS (FDRE- I)	RfS released in Q2 FY24
Pan India (NTPC), April 2023	1500 MW (min) with 9000 MWh ESS	RfS released in Q1 FY24, deadline extended
Gujarat (GUVNL), August 2022	500 MW/1000 MWh standalone BESS phase – I	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

Source: SECI and state renewable agencies. RfS = request for selection; ESS = energy storage system.

Takeaways & Outlook

In this quarter, SECI announced four firm and dispatchable RE power (FDRE) tenders with a cumulative capacity of 4060 MW. In addition, **NTPC announced 2000 MW of pumped hydro storage** in July 2023.

RUVNL's 1200 MW Solar with ESS tender was concluded in this quarter. Blupine Energy (100 MW) and ACME Solar (500 MW) emerged as the winners with the discovered tariff of 6.68 and 6.69 INR/unit, respectively. **However, deadlines for multiple ESS tenders** announced in the previous quarters have been extended.

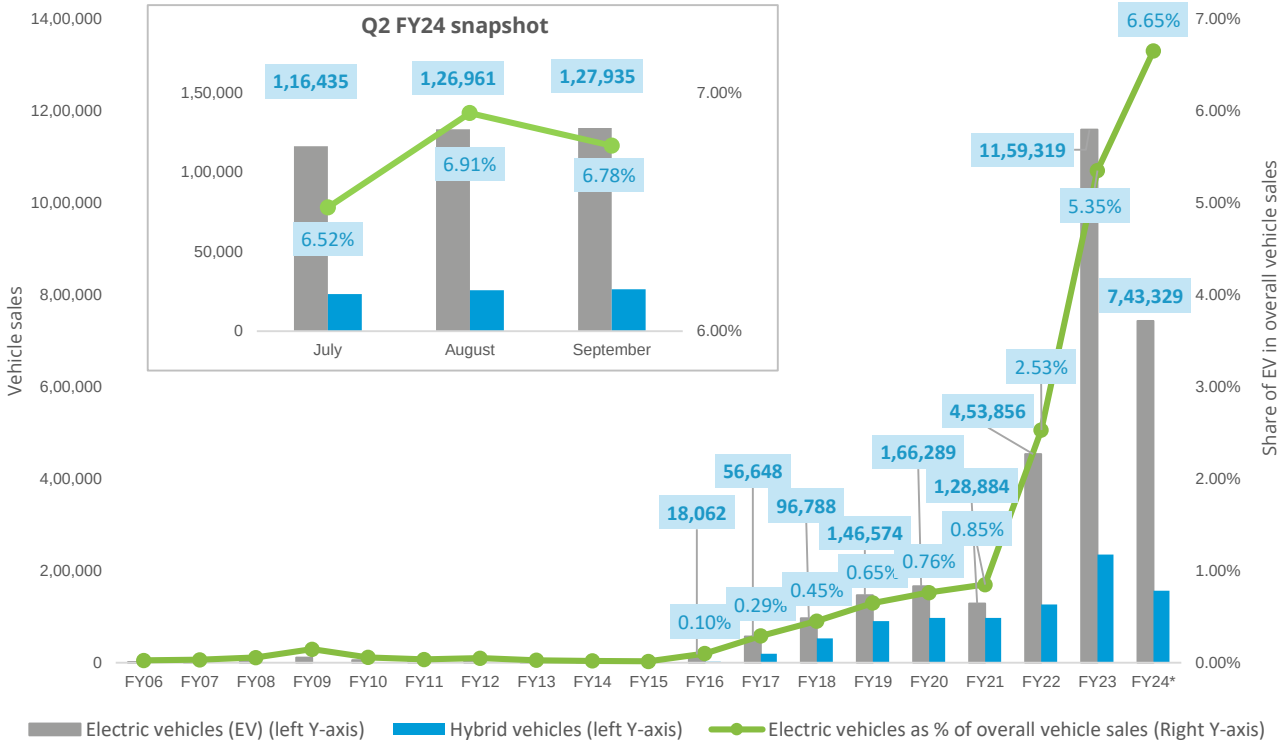
Union Cabinet approved viability gap funding for 4 GWh battery energy storage systems, and MoP released a framework to promote energy storage systems.

Serentica Renewables has signed a contract with Greenko for a cumulative capacity of 1500 MWh from Greenko's upcoming energy storage projects in Andhra Pradesh and Madhya Pradesh.

Damodar Valley Corporation (DVC) is exploring pumped hydro storage (PHS) projects; a plant is planned in Bokaro with a capacity of 1500 MW.

Electric mobility: Q2 FY24 recorded a marginal drop in EV sales vs Q1 FY24; Union Cabinet approved the *PM-eBus Sewa* scheme

Electric vehicle sales in India



Takeaways & Outlook

EV sales dropped marginally in Q2 FY24, with a **decrease of 0.18% vs Q1 FY24,** but recorded a gain of 42.59% vs Q2 FY23. **For Q2 FY24, the share of EVs in overall vehicle sales stood at 6.74%.**

In July 2023, Chandigarh revised its EV policy to offer incentives for ~42,000 vehicles. The incentives are available for permanent residents of Chandigarh to buy EVs from anywhere in India. **Delhi's EV policy was extended for another six months** following its expiry in August 2023.

Union Cabinet approved the *PM-eBus Sewa* scheme with 10,000 e-Buses to be deployed under the PPP model in 169 cities. The total estimated cost of the scheme is Rs.57,613 crore.

OEMs with the highest EV sales* in Q2 FY24 were:

- **2W:** Ola Electric (56,779), TVS Motor (41,450) and Ather Energy (20,959)
- **3W:** Mahindra and Mahindra (10,260), YC Electric (5,613) and Saera Electric (5,248)
- **4W**:** Tata Motors (9,211), MG Motors (1,960) and Mahindra and Mahindra (780)

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 (2023), CEEW Centre for Energy Finance. Based on sales data up to Q2 FY24; **4W represents Light motor vehicles and Light passenger vehicles.*

Thank you

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Annexure I: Green bond issuances (RE developers)

Date	Company	Size (USD million)	Sector	Coupon rate (%)	Rating	Tenor (Years)	Purpose
April 2023	**ReNew Power**	400	Solar and wind	7.95%	BB- (Fitch) Ba3 (Moody's)		Refinancing of existing debt and finance growth initiatives
April 2023	**SAEL**	161	Biomass		AA (CRISIL, India Ratings)	10	Finance green initiatives
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

Source: Climate Bonds Initiative and company press releases.

Annexure I: Green bond issuances (RE developers)

Date	Company	Size (USD million)	Sector	Coupon rate (%)	Rating	Tenor (Years)	Purpose
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
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

Source: Climate Bonds Initiative and company press releases.

65.81%

FAME-II target met

As of 5 October 2023

Note: *Target of selling 1,562,090 EVs (2W, 3W, 4W and buses) under FAME-II scheme by FY22.*

548

Number of EV OEMs in India

As of 5 October 2023

149

Total FAME II approved models

As of Q2 FY24

Recent electric vehicle launches

Lectrix LXS G3.0

Price: INR 97,999 onwards
Range: 100 km
Battery capacity: 3 kWh Lithium-ion

Mahindra E-Alfa Super

Price: INR 1,61,000 onwards
Range: 96 km
Battery capacity: 140 Ah lead-acid battery

BMW MINI Charged

Price: INR 53,50,000 onwards
Range: 270 km
Battery capacity: 32.6 kWh

Volvo C40 Recharge

Price: INR 61,25,000 onwards
Range: 530 km
Battery capacity: 78 kWh Lithium-ion

EV penetration

In Q2 FY24

4.75%

2W sold were EV

56.45%

3W sold were EV

3,71,472

EVs sold

in Q2 FY24

25

States notified EV policies

As of Q2 FY24

For more updates visit CEEW-CEF Electric Mobility Dashboard

Source: Vahan Sewa dashboard, CEEW Centre for Energy Finance Electric Mobility dashboard, Department of Heavy Industries, CEA.

About us: CEEW is among Asia's leading policy research institutions

Build evidence

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

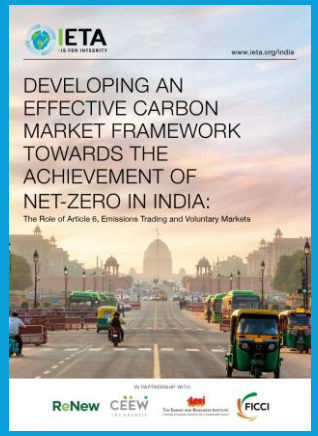
Create coherence

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

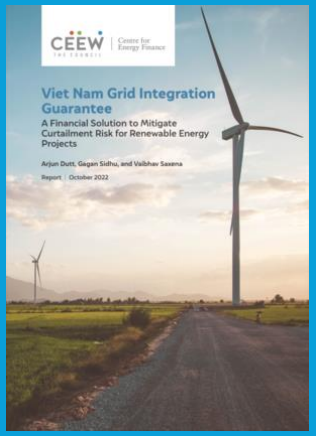
Our recent publications, dashboards and tools



Developing An Effective Carbon Market Framework Towards The Achievement Of Net-Zero In India

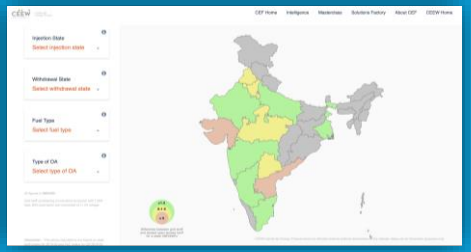
Greening India's Automotive Sector

Mobilizing Investment For Clean Energy In India



Viet Nam Grid Integration Guarantee

India Renewables Dashboard



Open Access Tool

Electric Mobility Dashboard