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Monthly Update

January 2024

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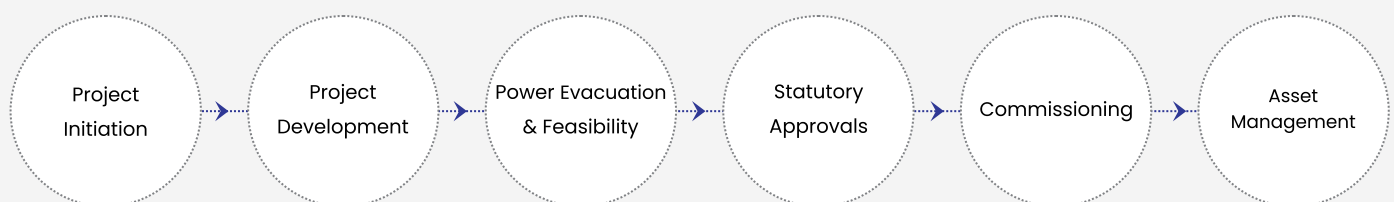


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TENDERS

New RFS Issued

- In January 2024, 12 new renewable energy (RE) tenders with a cumulative capacity of 7,532 MW were issued. SECI issued a 1500 MW ISTS-Connected solar tender (ISTS-XIV).
- MSEB Solar Agro Power Limited (MSAPL) floated solar tenders with a total capacity of 1,302 MW under Mukhyamantri Saur Krushi Vahini Yojana 2.0 in Maharashtra.
- GUVNL issued a solar tender of 1,125 MW capacity to be set up in GSECL's RE park at Khavda Gujarat.
- REMCL invited a tender of 695 MW of Round-the-clock (RTC) power from RE power projects.

Fig 1.1: New RE tenders issued in January 2024

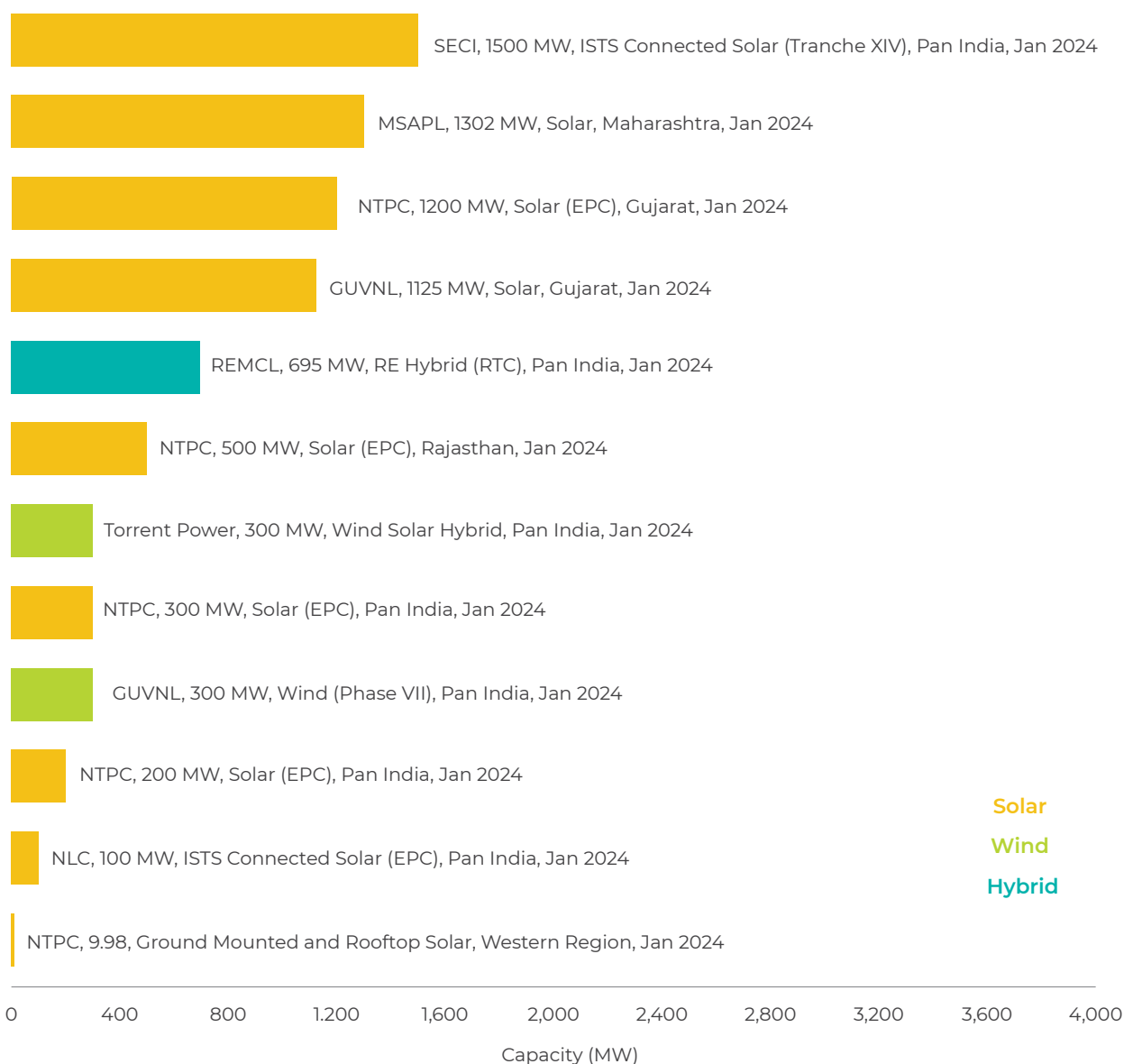


Table 1.1: RFS Issued

Tender Name	Technology	Tender Scope	Capacity (MW)	Minimum CUF	Commissioning timeline from PPA signing (months)	Bid Submission Date
SECI, 1500 MW, ISTS Connected Solar (Tranche XIV), Pan India, Jan 2024	Utility Scale Solar	Project Development	1500	17%	24	23rd-Feb-2024
NTPC, 1200 MW, Solar (EPC), Gujarat, Jan 2024	Utility Scale Solar	EPC	1200	-	-	5th-Mar-2024
MSAPL, 1302 MW, Solar, Maharashtra, Jan 2024	Small Scale Solar	Project Development	1302	19%	9	27th-Feb-2024
GUVNL, 1125 MW, Solar, Gujarat, Jan 2024	Utility Scale Solar	Project Development	1125	17%	21	15th-Feb-2024
REMCL, 695 MW, RE Hybrid (RTC), Pan India, Jan 2024	Hybrid	Project Development	695	The minimum annual availability of the project (for the first three contract years) -75% of net RTC demand The minimum annual availability of the project (for the rest of the contract years) -75% of net RTC demand	24	14th-Feb-2024

Tender Name	Technology	Tender Scope	Capacity (MW)	Minimum CUF	Commissioning timeline from PPA signing (months)	Bid Submission Date
NTPC, 500 MW, Solar (EPC), Rajasthan, Jan 2024	Utility Scale Solar	EPC	500	-	-	28th-Feb-2024
GUVNL, 300 MW, Wind (Phase VII), Pan India, Jan 2024	Wind	Project Development	300	22%	24	21st-Feb-2024
NTPC, 300 MW, Solar (EPC), Pan India, Jan 2024	Utility Scale Solar	EPC	300	-	-	27-Feb-24
Torrent Power, 300 MW, Wind Solar Hybrid, Pan India, Jan 2024	Wind Solar Hybrid	Project Development	300	50%	24	7th-Feb-2024
NTPC, 200 MW, Solar (EPC), Pan India, Jan 2024	Utility Scale Solar	EPC	200	-	-	22nd-Feb-2024
NLC, 100 MW, ISTS Connected Solar (EPC), Pan India, Jan 2024	Utility Scale Solar	EPC	100	-	15	18th-Jan-2024
NTPC, 9.98, Ground Mounted and Rooftop Solar, Western Region, Jan 2024	Utility Scale and Rooftop Solar	-	9.98	Utility Scale – 21% Rooftop – 16%	9	1st-Feb-2024

Source: JMK Research

- In addition, the government issued a tender for **setting Up 10 GWh manufacturing** capacities for Advance Chemistry Cell (ACC) under the Production Linked Incentive (PLI) Scheme. The last date for bid submission is April 22, 2024

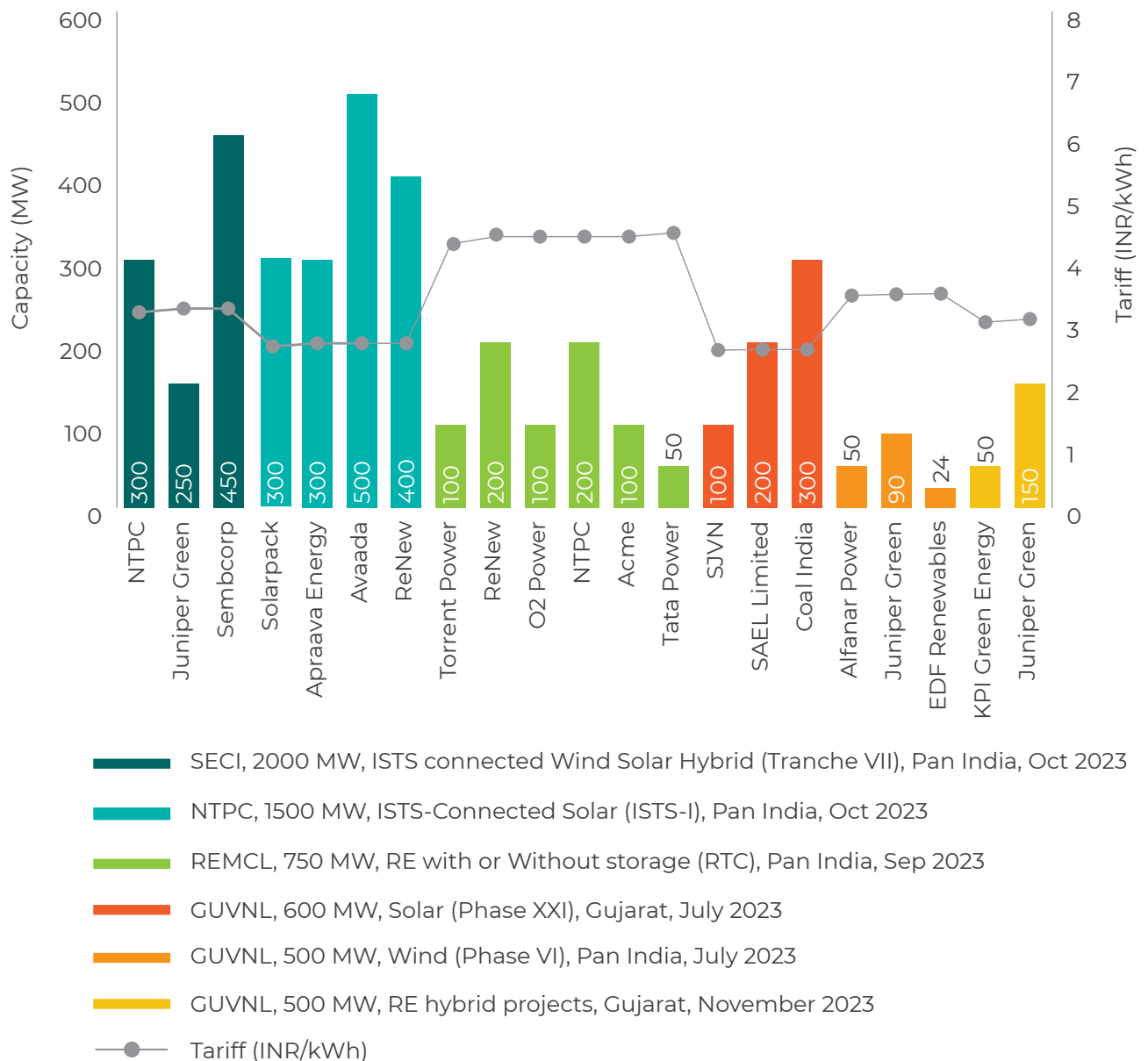
AUCTION COMPLETED

About 5,850 MW of RE tenders were auctioned and 5,214 MW capacities were allotted to various RE developers in January 2024. Out of the total auctioned capacity, 2,950 MW has been allocated to various developers under hybrid segment, 2,100 MW to solar segment and 164 MW to wind segment.

Of the auctioned capacity, Avaada won the maximum solar capacity of 500 MW followed ReNew (400 MW), Apraava ,Solarpack and Coal India (300 MW each). In wind segment, Juniper Green won the maximum capacity of 90 MW followed by Alfancar Power (50 MW).

NTPC (500 MW) and Sembcorp (450 MW) were awarded the highest capacities under hybrid segment.

Figure 1.2: Winners in the latest RE tenders



Source: JMK Research

Tender Name	Capacity Tendered (MW)	Capacity Allotted (MW)	Minimum CUF	Commissioning timeline from PPA signing (months)	Winner Details
SECI, 2000 MW, ISTS connected Wind Solar Hybrid (Tranche VII), Pan India, Oct 2023	2,000	2,000	30%	24%	<ul style="list-style-type: none"> • NTPC -300 MW (INR 3.15/kWh) • Juniper Green -150 MW (INR 3.21/kWh) • Sembcorp -450 MW (INR 3.21/kWh)
NTPC, 1500 MW, ISTS-Connected Solar (ISTS-I), Pan India, Oct 2023	1,500	1,500	21%	24	<ul style="list-style-type: none"> • Solarpack - 300 MW (INR 2.60/kWh) • Apraava Energy - 300 MW (INR 2.65/kWh) • Avaada - 500 MW (INR 2.65/kWh) • ReNew - 400 MW (INR 2.65/kWh)
REMCL, 750 MW, RE with or Without storage (RTC), Pan India, Sep 2023	750	750	-	24	<ul style="list-style-type: none"> • Torrent Power - 100 MW (INR 4.25/kWh) • ReNew - 200 MW (INR 4.37/kWh) • O2 Power - 100 MW (INR 4.37/kWh) • NTPC - 200 MW (INR 4.37/kWh) • ACME - 100 MW (INR 4.37/kWh) • Tata Power - 50 MW (INR 4.43/kWh)
GUVNL, 600 MW, Solar (Phase XXI), Gujarat, Jul 2023	600	600	17%	21	<ul style="list-style-type: none"> • SJVN - 100 MW (INR 2.54/kWh) • SAEL Limited - 200 MW (INR 2.55/kWh) • Coal India Limited - 300 MW (INR 2.55/kWh)
GUVNL, 500 MW, Wind (Phase VI), Pan India, Jul 2023	500	164	22%	24	<ul style="list-style-type: none"> • Alfancar Power - 50 MW (INR 3.42/kWh) • Juniper Green - 90 MW (INR 3.44/kWh) • EDF Renewables India - 24 MW (INR 3.45/kWh)
GUVNL, 500 MW, RE hybrid projects, Gujarat, Nov 2023	500	200	30%	24	<ul style="list-style-type: none"> • KPI Green Energy - 50 MW (INR 2.99/kWh) • Juniper Green - 150 MW (INR 3.04/kWh)

Source: JMK Research

Auction has also been concluded for SECI's green hydrogen tender where Under bucket I, entire capacity was allotted. Under bucket II, BPCL won 2000 metric tonne for INR 30 per kg of incentive. The remaining capacity of 38,000 MT was unallocated. The projects (under bucket I and bucket II) should be completed within 30 months of receiving the letter of award.

Bucket-1 (Technology Agnostic Pathways)			
Bidder's Name	Quoted Production Capacity (MT/annum)	Average Incentive (INR /kg)	Allocated Production Capacity (MT/annum)
UPL Limited	10,000	0	10,000
CESC Projects	10,500	0	10,500
Reliance Green Hydrogen	90,000	18.9	90,000
Welspun New Energy	20,000	20	20,000
Hygenco	75,000	25.0433	75,000
Torrent Power	18,000	28.89	18,000
Acme	90,000	30	90,000
Greenko ZeroC	90,000	30	90,000
JSW Energy	10,000	34.6667	6,500

Bucket-2 (Biomass Based Pathways)			
Bidder's Name	Quoted Production Capacity (MT/annum)	Average Incentive (INR /kg)	Allocated Production Capacity (MT/annum)
BPCL	2,000	30	2,000

In addition, result announced for setting up manufacturing capacities for electrolyzers in India under the Strategic Interventions for Green Hydrogen Transition (SIGHT) Scheme (Tranche-I)

Bucket-1 Electrolyser Manufacturing Capacity based on any stack technology			
Bidder's Name	Quoted Manufacturing Capacity (MW/annum)	Allocated Manufacturing Capacity (MW/annum)	Maximum Incentive Allocation* (INR Crore)
Ohmium	300	300	444
Reliance	137	137	202.76
John Cockeril /Greenko	300	300	444
Advait Infratech	100	100	148
Jindal India	300	300	444
L&T	300	63	93.24

Bucket-2 Electrolyser Manufacturing Capacity based on indigenously developed stack technology			
Bidder's Name	Quoted Manufacturing Capacity (MW/annum)	Allocated Manufacturing Capacity (MW/annum)	Maximum Incentive Allocation* (INR Crore)
Homihydrogen	101.5	101.5	150.22
Adani	300	198.5	293.78

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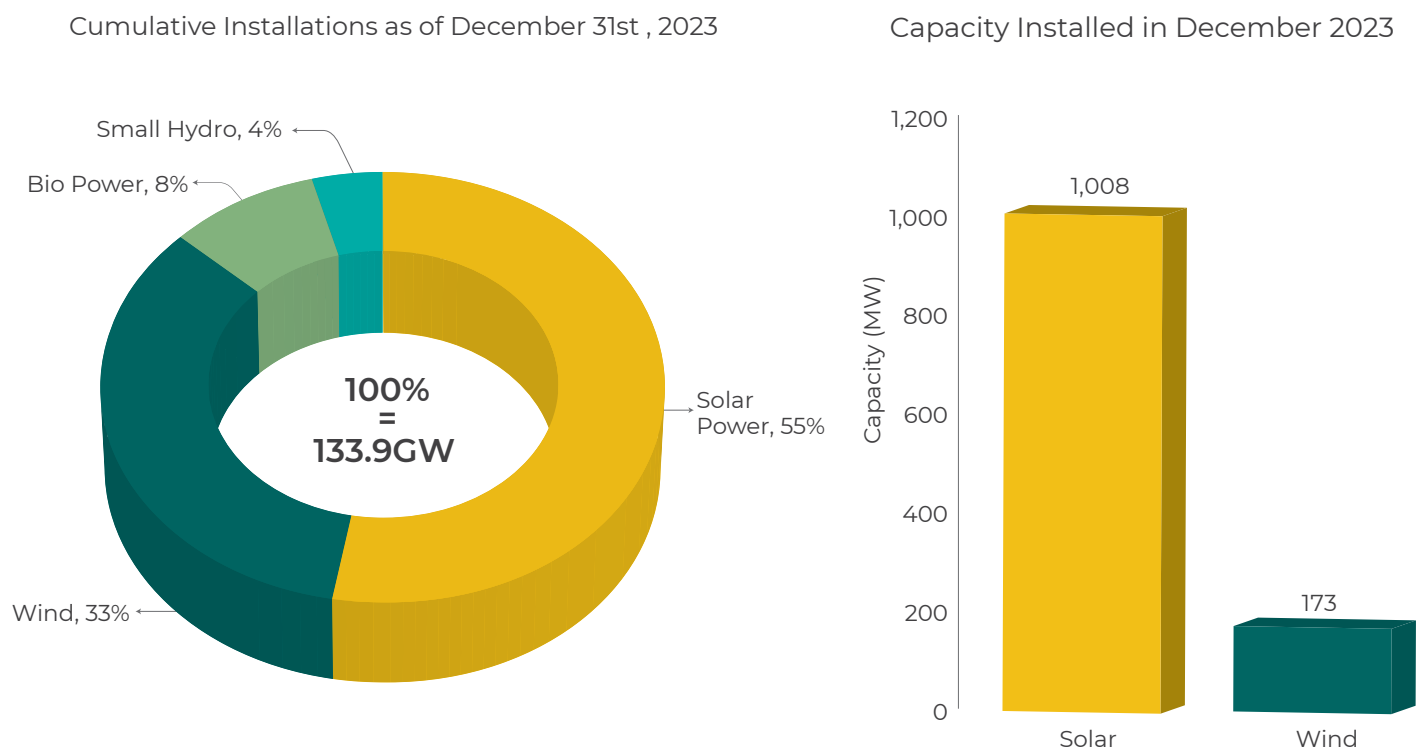
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INSTALLED CAPACITY

From January to December 2023, about 10 GW solar capacity and 2.84 GW wind capacity was added in the country, taking the cumulative RE capacity to 133.9 GW.

In December 2023, a combined total of 1181 MW of solar and wind capacity was added.

Figure 2.1: RE installations in December 2023



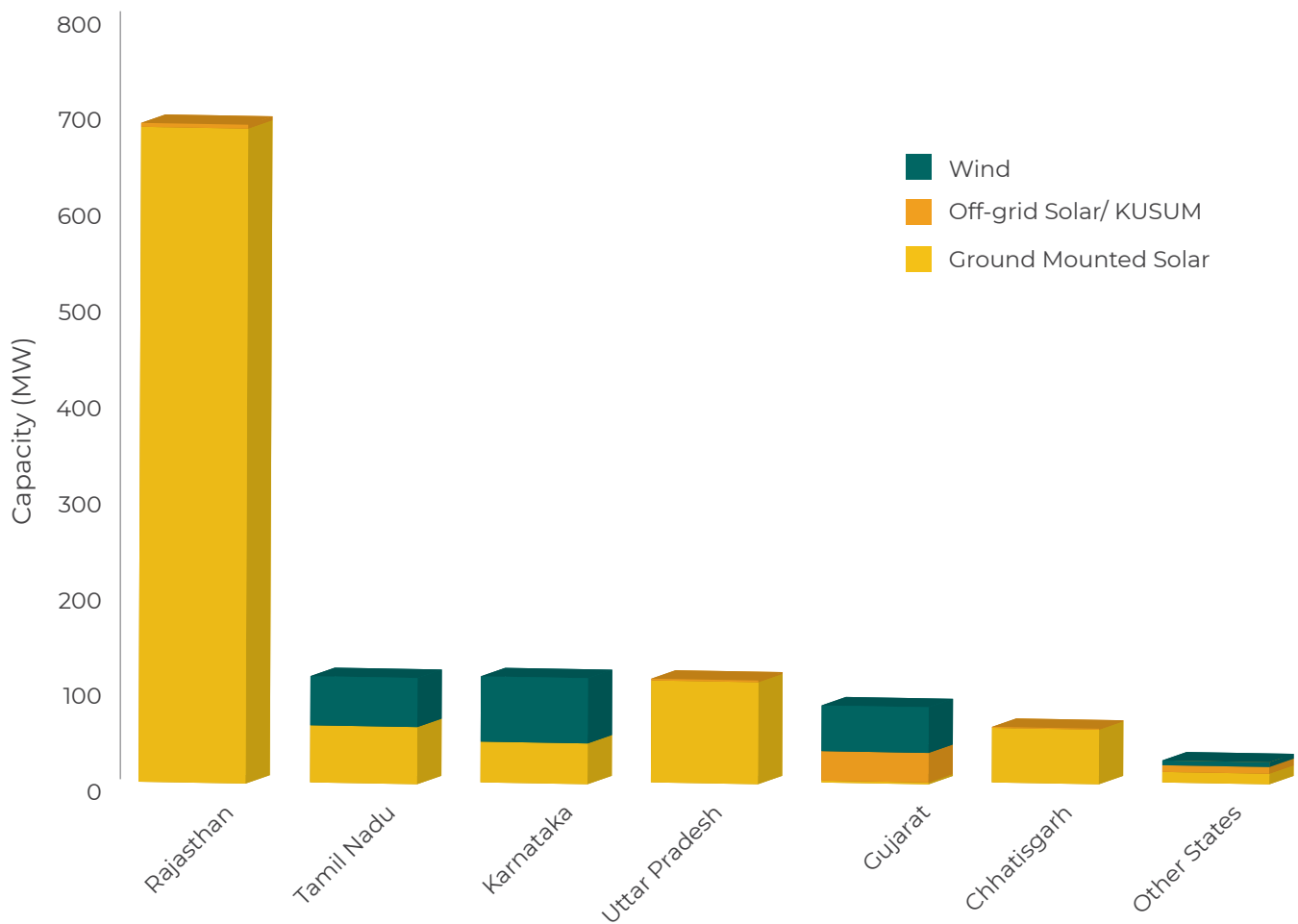
Source: MNRE, JMK Research

Note: Solar includes utility scale solar, rooftop solar and off grid/distributed solar segments

State wise solar and wind installed capacity in December 2023

Rajasthan installed the maximum solar capacity of 684 MW in December 2023 followed by Uttar Pradesh (107 MW). Karnataka, Tamil Nadu and Gujarat have added the highest wind capacities of 68 MW, 51 MW and 48 MW respectively, in the country this month.

Figure 2.2: State wise solar and wind installed capacity in December 2023



Source: MNRE, JMK Research

PROJECTS

Key announcements that were made during the month were:

- SunSource Energy commissioned the initial phase of its 75 MW open access solar project in Karnataka.
- CapitaLand India Trust (CLINT) has set up its first captive solar power plant of 21 MW in Tamil Nadu, India.
- The government had launched Lakshadweep's first on-grid solar project with an advanced battery energy storage system (BESS), developed by SECI. The project covers the islands of Kavaratti and Agatti with a combined solar capacity of 1.7 MW and a 1.4 MWh battery storage facility at Kavaratti.
- Tata Power Renewable Energy Ltd (TPREL) commissioned a 1 MW bifacial solar project with Chengmari Tea Estate in West Bengal.
- Avaada Group has signed an agreement with the Gujarat Government to develop 6 GW of wind-solar hybrid projects in Gujarat with an investment of INR 40,000 crore. The hybrid projects will supply power to various utilities of India including GUVNL, and for captive use of Avaada's green hydrogen/ammonia projects.
- Suzlon Group has won an order for the development of 225 MW wind power project for Everrenew Energy in Tamil Nadu. The power generated from this project is used for captive needs and also to target the commercial and industrial consumer segment.
- Inox Wind has received a Letter of Intent (LoI) for executing a 50 MW inter-state transmission system connected (ISTS) wind power project on a turnkey basis from NLC India. The project will be executed at the mega Dayapar site in Kutch district of Gujarat.
- The Punjab State Power Corporation Limited (PSPCL) has signed its ninth PPA where it will buy 300 MW of solar power from SECI at a tariff of INR 2.72/unit.
- Premier Energies has secured an INR 1700 crore solar module supply contract with NTPC. The company will be supplying Bifacial PV modules for the NTPC Nokh Solar Project in Rajasthan.
- New Delhi Municipal Corporation (NDMC) has collaborated with multiple Public Sector Units (PSUs) to procure 100% RE by the end of 2025. NDMC has issued consent letters to procure 150 MW and 100 MW solar power from SJVN and Solar SECI, respectively. The implementation period for the 150 MW solar power plant is 36 months, and for the 100 MW solar power plant, it is 24 months.
- Oriana Power has secured 3.93 MW of solar power projects, amounting to INR 17.49 crore in Rajasthan, Karnataka, and Haryana. The standout among these orders is a 2.75 MW floating solar project valued at approximately INR 13.6 crore, commissioned in Rajasthan. The EPC phase for this project is anticipated to conclude within the next five months. Additionally, Oriana Power has secured two more orders, including a 0.53 MW rooftop solar power project and a 0.65 MW ground-mounted project in Panipat, Haryana. Both these projects are expected to be completed by FY

2023-24.

- KPIG Energia has been awarded the execution contract for a 3 MW solar power project under the captive power producer segment. The project is scheduled to be completed in FY25.
- Emmvee signs a supply agreement to deliver 300 MWp of Bifacial MonoPERC solar module to KPI Green Energy. KPI Green Energy will install these panels to develop its own 240 MW solar plant in Gujarat.
- SJVN has signed a Power usage agreement (PUA) with Uttarakhand Power Corporation Limited (UPCL) to supply 200 MW of solar power capacity from a 1,000 MW Bikaner Solar Power Project in Rajasthan. The project is estimated to be commissioned by April 2024.
- SJVN has signed a contract agreement for the Balance of System (BoS) of 360 MW solar power project with Solar World Energy Solutions Private Limited in Gujarat. The project has been secured by SJVN on Build Own & Operate basis in open competitive bidding process conducted by Gujarat Urja Vikas Nigam Limited (GUVNL).
- Sarda Energy has awarded a contract worth INR 150 crore to Gensol Engineering for the installation of a 50 MWp solar power plant in Chhattisgarh. The projected timeline for completing the project is estimated to be between 6 to 9 months from the letter of intent's signing.
- Cleantech Solar has signed a 15-year PPA with First Solar to develop 150 MW of solar and 16.8 MW of wind-generating assets in Tamil Nadu. The

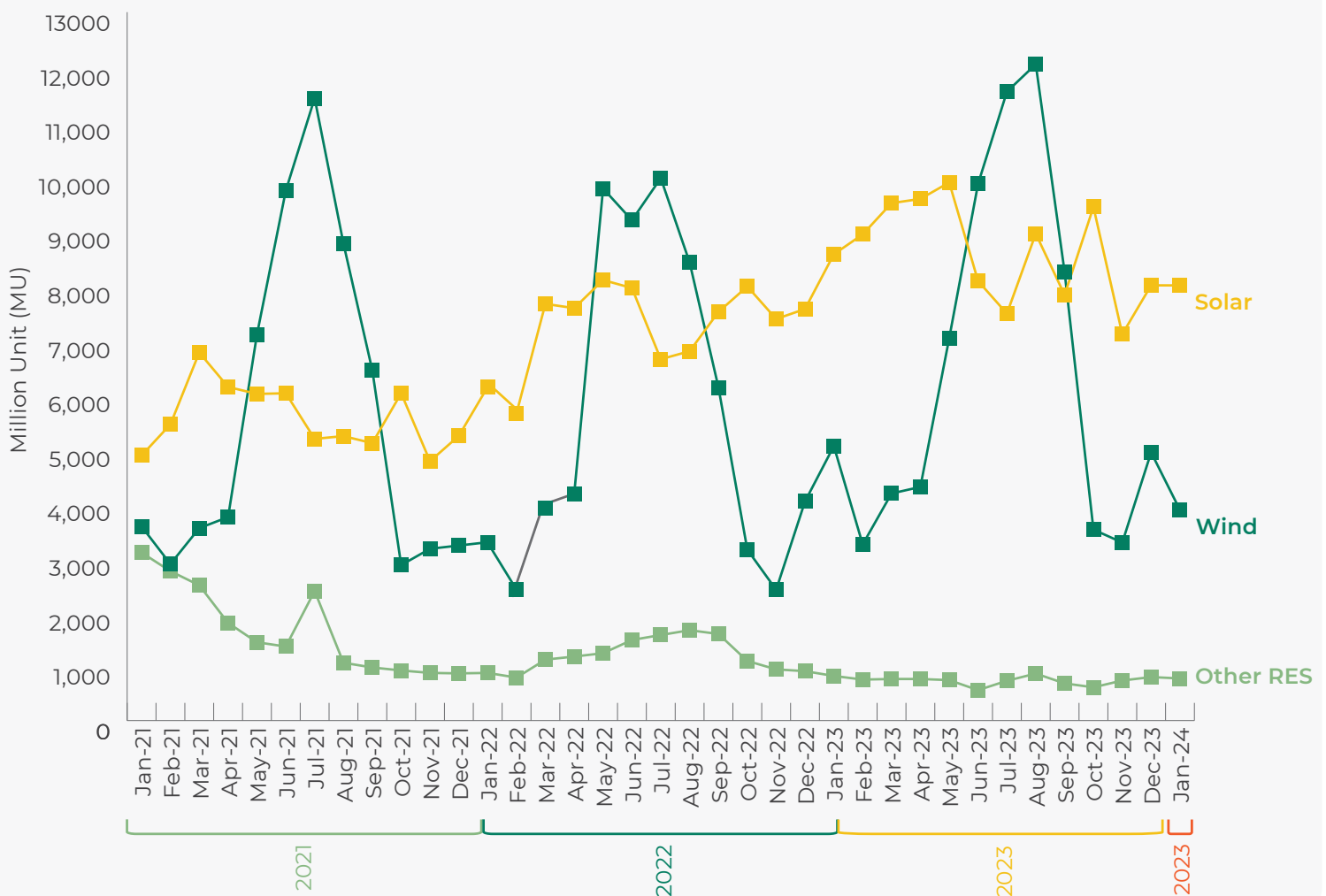
project is expected to be commissioned by the third quarter of 2024.

- Cleanmax has signed an MoU with the Government of Gujarat with an investment of INR 3500 crores. The company will develop a 250 MW wind-solar hybrid project in Gujarat.
- Ampin Energy has signed a 25-year PPA with MMRCL to develop a 6 MWp solar project for the Nagpur Metro Rail Project.
- The Uttar Pradesh government has approved the allocation of 165 acres of vacant land in Rampur Halwara village for the establishment of a 40 MW solar power plant in Ayodhya. The 40 MW solar power plant is scheduled to be fully operational in 2024. Currently, 15 MW of the project is already commissioned in Rampur Halwara and Sarairasi.
- BSES is planning to execute over 1,000 rooftop solar installations in 2024-25. BSES has already energized 6,000 rooftop solar installations so far.
- Juniper Green Energy is planning to invest INR 8,000 crore for 1 GW RE projects and is expected to be completed by early 2026.
- Pinewood Systems is planning to develop a 500 MW solar project in Maharashtra. The company will execute the project in partnership with state-owned Braithwaite & Co.

MONTHLY RE GENERATION

In January 2024, Renewable energy sources generated 12,623 MU, which is 7.9% less than the RE generation in December 2023. Wind generation decreased by around 21% on month-on-month basis, in January 2024.

Figure 3.1: Source-wise Renewable Energy Generation (MU) - India



Source: CEA, JMK Research

INVESTMENTS/PARTNERSHIPS

In January 2024, a total of \$384 million was raised in the RE sector India. The key investments during the month were:

- State Bank of India had completed the placement of \$250 million senior unsecured green floating rate notes. The funds will be allocated to eligible green projects according to the bank's ESG Financing Framework.
- Cleantech Solar has secured a long-term senior secured loan facility worth \$75.2 million from Tata Capital Ltd. Cleantech Solar will utilize the Rupee Term Loan (RTL) for the construction, development, and operations of open-access solar and wind parks across different states in India.

Table 4.1: Investment and deal in January 2024

Company Name	Deal Type	Sector	Investor	Deal value
State Bank of India	Green Bonds	Sustainability	-	\$250 million
Cleantech Solar	Debt	Solar (open access)	Tata Capital Limited	\$75.2 million
Sustainable Energy Infra Trust (SEIT)	Equity	Solar	Asian Infrastructure Investment Bank (AIIB)	\$58.4 million

Source: Industry news articles, JMK Research

Other key announcements that were made during the month were:

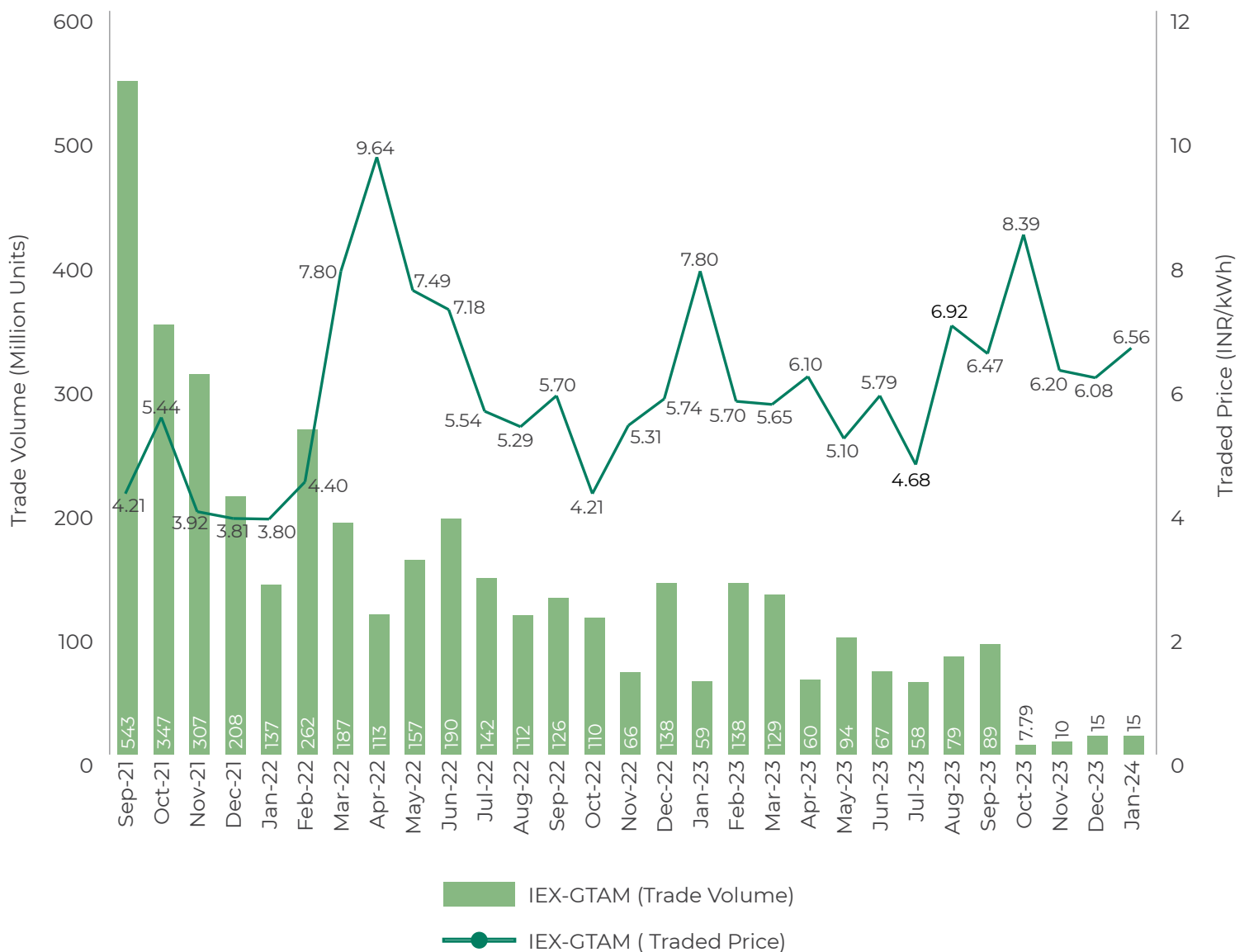
- IndiGrid has signed an agreement with Renew Solar Urja Pvt Ltd (RSPPL) to acquire a 300 MW solar project in Rajasthan. IndiGrid stated that the overall enterprise valuation, encompassing net working capital and cash, is set at INR 1,650 crore.
- SJVN has secured INR 10,000 crore construction finance facility to fund its upcoming renewable energy projects from a group of leading domestic and international lenders.
- Adani Green Energy completed the funding of the reserves for a \$750 million Holdco Bond. The sources of funds are TotalEnergies JV Proceeds (\$300 million), promoters' preferential allotment (\$281 million) and debt service reserve account, hedge reserves and interest on reserve account (\$169 million), respectively.
- Copenhagen Infrastructure Partners (CIP) have made the final investment decision (FID) on a 300 MW onshore wind project through its Growth Markets Fund I (CI GMF I) together with Viiid Renewables. The project is located at Karnataka and is expected to be executed by end of 2025.

- IREDA has collaborated partnership with Indian Overseas Bank (IOB) to co-finance renewable energy projects in India. The agreement sets the stage for co-lending and loan syndication for a diverse spectrum of renewable energy projects across the nation.
- Indowind Energy's board has approved issuing of 2.25 crore convertible warrants through preferential allotment to raise nearly INR 40 crore. The management is planning to set up wind and solar farms at a capital outlay of up to INR 400 crore to be executed over the next four years. The management has proposed to initiate the process with a rights issue amounting up to INR 50 crore.
- UltraTech Cement has acquired 26% stake in Amplus Ages by investing INR 49 crore. The completion of this acquisition is estimated within 6 months from the execution of the electricity offtake agreement, share subscriptions, and shareholders' agreement.
- KPGreenEngineering has filed preliminary papers with Sebi to raise funds through an IPO. The issuance INR 156.14 crore will be utilized to partially finance the capital expenditure towards setting up a new manufacturing unit of steel. Its extensive product range encompasses lattice tower structures, substation structures, solar mounting structures etc.
- Waaree Energies is planning to raise INR 30 billion (\$361 million) through initial public offering (IPO) for financing a solar module facility. The company will use the funds for the establishment of a 6 GW ingot, wafer, and solar cell and module manufacturing facility in Odisha.
- Rays Power Infra has filed its draft red herring prospectus (DRHP) with SEBI to raise funds for its IPO. The IPO, with a face value of INR 10, comprises a fresh issue of equity shares of up to INR 300 crore and an offer for sale (OFS) of up to 2.99 million shares by promoter selling shareholders.
- ReNew has declared the refinancing of Non-Convertible Debentures (NCDs) worth INR 23,910 million that were issued by its subsidiaries in October 2020. These NCDs were issued to India Green Energy Holdings, a Mauritius based SPV, which had raised US\$ 325 Million through senior secured bonds to subscribe to these NCDs. The USD bonds, issued at a coupon of 5.375%, were scheduled to mature in April 2024. The refinancing was done using proceeds of a long-term amortising project loan, obtained from a leading non-banking financial company (NBFC).
- Reliance Industries is planning to sell REC Solar Norway AS to Oslo-listed Elkem ASA for around \$22 million.
- Acme is also planning to raise \$300 million in fresh equity and will use the funds for green hydrogen projects.
- Agratas Energy Solutions Pvt Ltd, a subsidiary of Tata Sons Pvt Ltd, is planning to raise \$500 million through a green loan for its factories developing battery cells in India and the UK. These facilities are designed to be powered by clean energy, and the tenor is expected to be more than five years.

GTAM TRADED VOLUME

The IEX traded a total of 15 MUs in GTAM in January 2024, which is same as the volume traded in December 2023. The average trade price in IEX-GTAM for January 2024 was INR 6.56/kWh. This is about 7.9% lesser than the previous month's price.

Fig 5.1: GTAM Traded volume and Price Trend



Source: IEX, JMK Research

KEY MARKET UPDATES

Solar Manufacturing

Grew Energy collaborates with the Gujarat Government to install a 2.8 GW solar cell, wafer unit in Gujarat

Grew Energy has signed a memorandum of understanding (MoU) with the Gujarat Government worth INR 3800 crore for setting up a 2.8 GW solar cell and wafer manufacturing unit in Dholera, Gujarat. The company plans to raise the funds through a mix of internal accruals and external funding.

First Solar launched its first manufacturing facility in Tamil Nadu

First Solar has introduced its first manufacturing facility with a capacity of 3.3 GW in Tamil Nadu. This fully vertically integrated solar manufacturing plant will produce First Solar's Series 7 Solar modules, developed at the company's research centers in the U.S. and optimized for the Indian market. The company announced an investment of approximately \$700 million in the facility in India.

JSW Energy put solar module manufacturing plan on hold

JSW Energy has put its solar module manufacturing plans on hold, citing a record fall in prices of solar panels. The company said it is re-evaluating the business viability. JSW Energy, was allocated a performance-linked incentive (PLI) for quoted manufacturing capacity of 1 GW wafer + cell + module in March last year.

ALMM to keep margins of solar module makers at 12-14% next fiscal

The implementation of the Approved List of Models and Manufacturers (ALMM) from April 1, 2024, is expected to help keep operating margins of domestic module makers strong at 12-14% in FY25, in line with the level likely this fiscal. This fiscal, the profitability is expected to almost double over the previous fiscal as rising share of exports, which fetch a 15-20% premium over domestic prices, will more than offset the surge in imports in the absence of ALMM.

Godi India invests INR 8000 crore to install a 12.5 GWh Solar cell Manufacturing Unit in Telangana

Godi India has partnered with the Telangana Government to establish a 12.5 GWh of solar cell manufacturing Plant in Telangana with an investment of INR 8000 crores. A MoU is signed between the two parties and Godi will take a period of five years to build a lithium and sodium technology R&D giga-scale cell manufacturing facility in Telangana. The project is initially to set up a 2.5 GWh cell assembly line in phase 1, planning to expand the remaining 10 GWh in the second phase.

Pixon Green Energy invests INR 1,020 crore to set up 1 GW solar cell, module manufacturing capacity in Gujarat

Pixon Green Energy is set to establish an additional 1 GW of solar module manufacturing capacity in Gujarat with backward integration into 1 GW of solar cell production with an investment of INR 1,020 crore. Presently, the company operates 1 GW of solar modules and 1 GW of EVA manufacturing units in the state.

Hero Future Energies and PIXON Green Energy partner for 500 MW annual solar module supply over two years

Hero Future Energies and PIXON Green Energy collaborates for 500 MW annual solar module supply over two years.

Green Hydrogen

Jakson Green to ship first green hydrogen electrolyser in few months

Jakson Green will be shipping out their first green hydrogen electrolyser in a couple of months and is in advanced stages of partnering with technology providers for electrolyser manufacturing. Production will begin in the next fiscal year. The company launched a 100 MW electrolyser manufacturing plant a few months back, which it now plans to raise to 1 GW capacity.

Welspun World plans to install green hydrogen and green ammonia ecosystem in Gujarat

Welspun World is planning to invest INR 40,000 crore to set up a green hydrogen and green ammonia ecosystem in Gujarat. The company has also received approval from the Gujarat Government to establish renewable energy projects on 20,000 acres of land.

NTPC signs green hydrogen MoUs with GSPCL and GPPL

NTPC Green Energy Ltd (NGEL) has signed a memorandum of understanding for the blending of green hydrogen in the gas networks of Gujarat State Petroleum Corp. Ltd (GSPCL) and green hydrogen mobility by setting up green hydrogen fuelling stations in Gujarat. It has also signed an MoU with Gujarat Pipavav Port Ltd (GPPL) to develop a green hydrogen ecosystem, including the production of green ammonia, for export and

domestic market.

GIFT City partners with IGX, GSPC for global hydrogen trading mechanism

The International Financial Services Centre (IFSC) at GIFT City has entered into a strategic alliance with the Indian Gas Exchange (IGX) and Gujarat State Petroleum Corporation (GSPC). This collaboration aims to establish a pioneering Global Hydrogen Trading Mechanism, marking GIFT City as a frontrunner in the global green hydrogen market. This alliance is set to introduce the Global Hydrogen Price Index, a benchmark designed for price discovery and market information in the green hydrogen sector in India.

AM Green partners Envision Energy for wind turbines, green hydrogen projects

AM Green partners Envision Energy for wind turbines and green hydrogen projects. AM Green plans to develop green molecules like green hydrogen, green ammonia, biofuels, green caustic soda, and e-methanol in India.

India Hydrogen Alliance (IH2A) seeks a \$5 billion hydrogen transition fund from the Ministry of Finance

The Indian Hydrogen Alliance (IH2A) has proposed an increase in the budget to support the National Green Hydrogen Mission (NGHM) to the Ministry of Finance. The proposal includes the a \$5 billion National Hydrogen Transition and Development Fund, modeled after the EU Green Hydrogen Fund. This fund aims to support large-scale hydrogen projects, H2 hub development, H2 supply chains, electrolyzer manufacturing, sectoral hydrogen transition plans, skilling, and hydrogen infrastructure development in the country. Additionally, it should facilitate sectoral hydrogen transition plans with CAPEX incentives and offtake incentives, focusing on the Steel and Chemicals sectors, aligned with the SIGHT Mode 2 guidelines for the fertilizer and refinery sectors.

Acme Group collaborates with IHI to supply 0.4 MMTA Green ammonia from India to Japan

Acme Group has partnered with IHI to supply green ammonia from Odisha, India to Japan. IHI and Acme sign term sheet for long-term supply of 0.4 MMTA green ammonia from Odisha project, aiming to collaborate across the value chain, from production to logistics and market creation in Japan for emissions reduction in power generation and industrial applications.

ReNew proposes to invest INR 26,400 crore for green hydrogen project in Kerala

ReNew has proposed a total investment of INR 26,400 crore for a green hydrogen project with 220-kilo-tonnes-per-annum (KTPA) of green hydrogen production capacity in Karnataka. This green hydrogen capacity will be used to produce 1,100 KTPA of green ammonia. The project will be powered by a 2 GW capacity electrolyser, which is 14,000 million units of power annually from 5 GW to 6 GW renewable energy plants. The timeline of each phase is estimated to be 36 to 42 months.

NTPC Green Energy to invest INR 80,000 crore for Maharashtra projects

NTPC Green Energy has signed an agreement with the government of Maharashtra for the development of green hydrogen and its derivatives such as green ammonia and green methanol of up to 1 million tonne capacity per annum. The agreement also includes the creation of pumped storage projects of 2 GW and the development of renewable energy projects with or without storage up to 5 GW in the state.

Energy Storage

Reliance to commission new energy giga complex in H2 2024

Reliance Industries will commission a new energy giga complex in Gujarat in the second half of 2024. This complex consists of vertically integrated solar module manufacturing, advanced energy storage batteries, electrolyzers for the production of green hydrogen, fuel cells converting hydrogen into motive and stationary power, and power electronics.

Adani Green Energy invests INR 24,500 crore in 4.9 GW Pumped storage plants in Tamil Nadu

Adani Green Energy will invest INR 24,500 crore for setting up three Pumped storage plants in Tamil Nadu in the next five to seven years. The total capacity will be 4.9 GW across facilities in Thenmalai, Alleri, and Aliyar.

JSW Energy partnered with Telangana Government to set up 1.5 GW pumped storage project

JSW Energy and the Government of Telangana has signed an MoU for the development of a 1.5 GW pumped storage project in Telangana with an investment of INR 9,000 crore.

NHPC partnered with the Gujarat Government for the 750 MW Kuppa Pumped Hydro Project

NHPC has signed an MoU with Gujarat Power Corporation Ltd (GPCL) for the development of the 750 MW Kuppa Pumped Hydro Storage

Project in Chhota Udaipur, Gujarat with an investment of INR 4000 crore.

1.68 GW of Pumped-storage project is likely to be operational by June 2024 in Andhra Pradesh

Greenko's 1680 MW pumped storage plant is expected to be completed by March 2024 and fully operational by June 2024. This project is located in Andhra Pradesh. Greenko is also planning to set up 3 GW of solar and 550 MW of wind projects in Pinnapuram, Andhra Pradesh.

OTHER MARKET UPDATES

Not mandatory for banks and NBFCs to raise green funds

The Reserve Bank of India (RBI) said that it is not mandatory for banks and Non-Banking Financial Companies (NBFCs) to raise green funds, but in case they intend to do so they must follow the prescribed framework. In April 2023, it had issued detailed guidelines for acceptance of “green deposits” by banks and Non-Banking Financial Companies (NBFCs) wherein the funds could be used for financing activities like renewable energy, green transport and green buildings. The framework came into effect from June 1, 2023.

India's power sector to add 212 GW capacity by FY27 with an investment of around INR 10.9 lakh crore

India's power sector is planning to add 212 GW to its capacity between FY22 and FY27, significantly up from the existing capacity of 426 GW as of November 2023. The expansion will necessitate a substantial debt investment, estimated at around INR 10.9 lakh crore for the period FY22-27. A significant portion of this investment is likely to be channeled into the renewable energy sector, which is expected to comprise 14% of the total loan portfolio by FY 2024.

Government plans second phase for discom-financing scheme

The government is planning to launch another scheme to enable public sector power distribution utilities (discoms) to cut technical losses via “transition-financing” of the required capital expenditure. The new scheme would follow the expiry of the Rupees 3-trillion Revamped Distribution Sector Scheme (RDSS) launched in FY22 for five years through FY26. The proposed RDSS-II would have a similar aggregate outlay as RDSS-I.

UP government set to install solar rooftops on 25,000 Varanasi households in two months

The Uttar Pradesh government is planning to install solar rooftops on 25,000 households in Varanasi in two months. The central and the state governments will provide a subsidy of INR 150 crore and INR 75 crore respectively to 25,000 households in Varanasi.

DGTR recommends extension of anti-dumping duties for EVA backsheets

In 2019, India had imposed anti-dumping duties on EVA backsheets from China, Malaysia, Saudi Arabia, and Thailand, set to conclude in March 2024. Recently, it has proposed a five-year extension of anti-dumping duties on Ethylene Vinyl Acetate (EVA) back sheets imported from China.

Global Renewable energy capacity to reach 710 GW by 2028

The global renewable electricity capacity increased to 570 GW in 2023 with a 50% increase as compared to 2022. This rise is credited to the boom in the solar and wind market in China with a growth of 116% and 66%, respectively. In the upcoming 5 years the RE capacity is expected to rise to 710 GW in which solar and wind will constitute 96%. Global renewable capacity is expected to increase to 430GW during 2023-28 with a 73% growth from 2022. India will contribute around 14% to the growth.

Waaree Renewables plans to expand its EPC business

Waaree Renewable Technologies Ltd is planning to expand its EPC business (Engineering, Procurement and construction) and it's hoping to execute RE EPC orders of 970 MW under its pipeline by the second

quarter of the next financial year (Q2 FY2025). The company has witnessed 126% growth in its order book this year compared to last year.

Unjustified load shedding will attract penalties

The government has said that the unjustified load-shedding will be penalized going forward. The government urged DISCOMs to add capacity, sign power purchase agreements and increase efficiency. In 2030, our peak demand is going to go up from 243 GW today to 366 GW. The government also pointed out that while billing efficiency has gone up, collection efficiency remains stuck at 92.7%. The Ministry has also launched the consumers service ratings of DISCOMs. As per the ratings, NPCL (Uttar Pradesh), BYPL (Delhi) and TPDDL (Delhi) have achieved A+ ranking among all the 62 rated DISCOMs in the country.

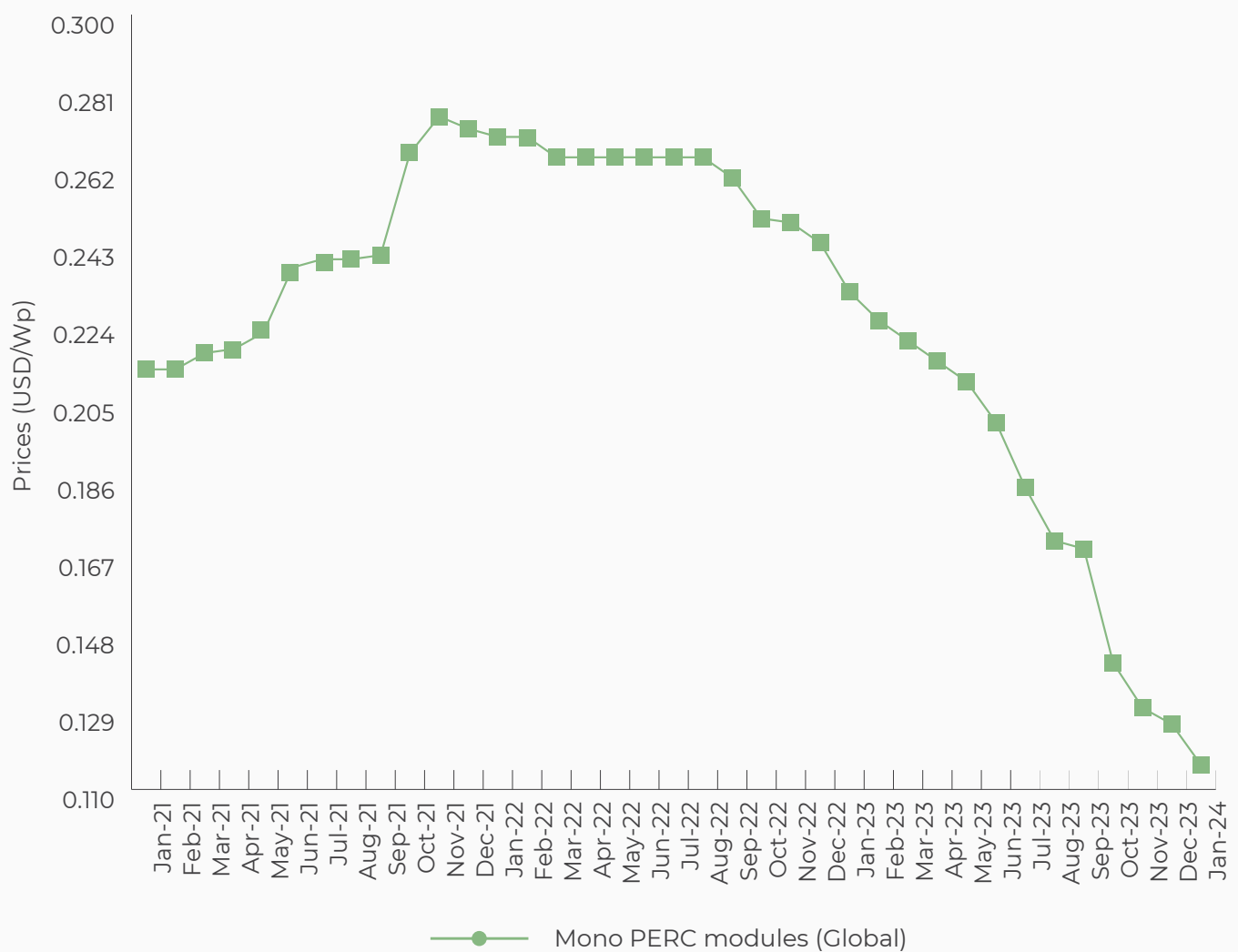
Pradhanamantri Suryodaya Yojana aims to install rooftop solar panels on 1 crore homes

The Indian Government has announced the 'Pradhan Mantri Suryodaya Yojana,' a significant step towards increasing renewable energy. This scheme aims to install rooftop solar panels on 1 crore households and also assist low and middle-income individuals with electricity through solar rooftop installations, providing additional income for surplus electricity generation. The initiative is projected to install 10 GW within a year and 40 GW by 2026. The REC board has authorized a line of credit of approximately INR 15,000 crore to central public sector undertakings (CPSEs), which will function as renewable energy service companies in implementing this scheme and commit INR 1.20 lakh crore for the rooftop solar mission.

MODULE PRICE TRENDS

Comparing on m-o-m basis, price for global mono PERC modules have decreased by 7.9% in January 2024.

Fig 7.1: Global Solar Modules Price trends



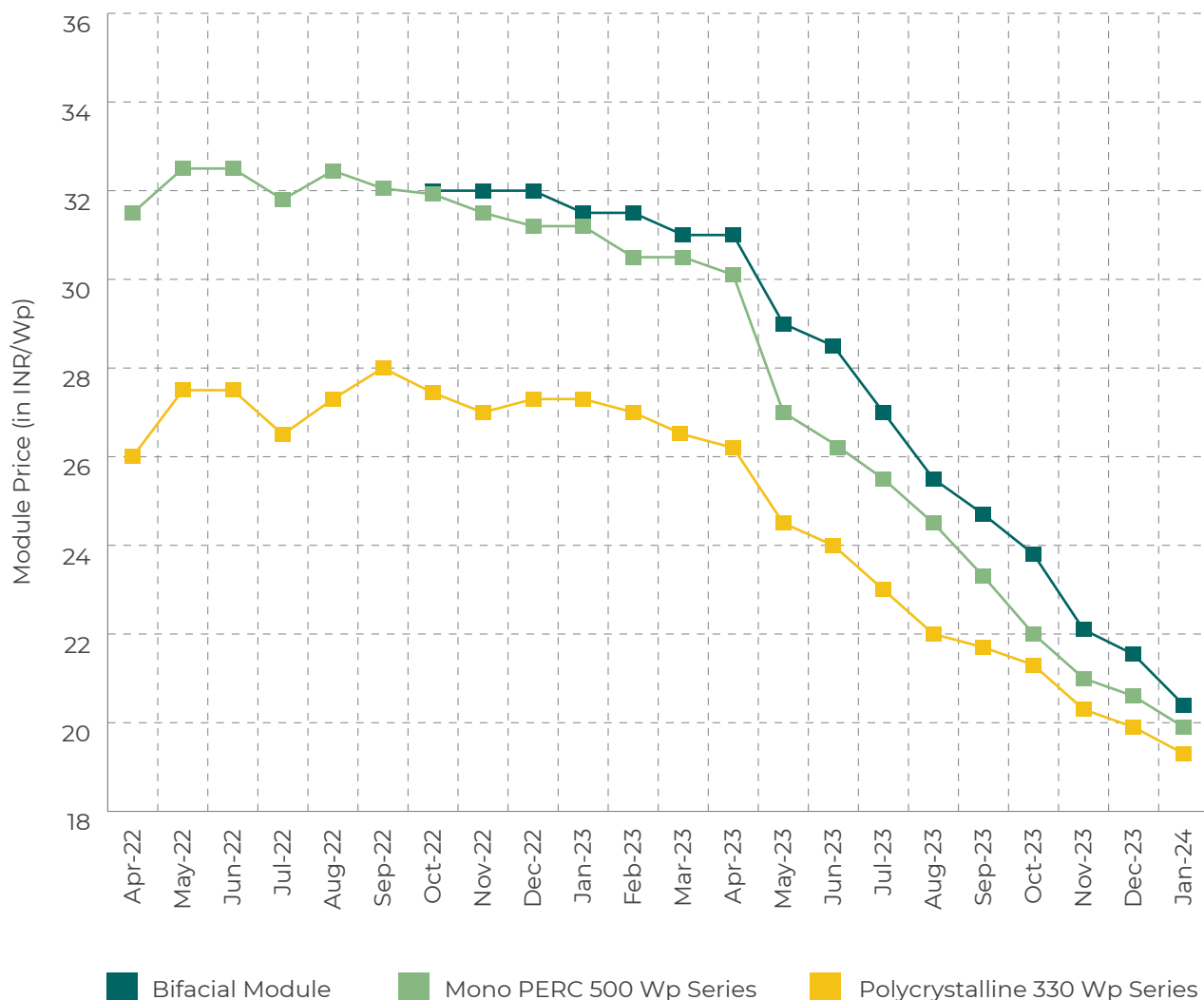
Source: PVInfoLink, JMK Research

Average prices for domestic modules

JMK Research carried out price survey from domestic suppliers for January 2024 and as per the responses received, the all-inclusive domestic module prices till project site (including freight charges, GST etc) for various categories are:

- The mono PERC 500 Wp module prices in January stood at INR 19.9/Wp, marking a 3.4% decline from December month's price. There was a 36% reduction in the price of mono PERC modules on year-on-year (YoY) basis.
- The price for Polycrystalline 330 Wp modules was INR 19.3/Wp, which is about 3% less as compared to the preceding month's price and a decrease of about 29% on YoY basis.
- The price for Bifacial modules was INR 20.4/Wp in January, which is around 5.3% less than the price of modules in December. Furthermore, there is a YoY reduction of 35%.

Fig 7.2: Average Prices for Domestic Modules



Source: JMK Research

Note: Domestic module prices are all inclusive prices till project site including freight charges, GST, etc

POLICIES AND REGULATIONS

Central Level Regulatory Updates

Policy Name	Issuing Agency	Date of Issue
MNRE issued clarifications regarding Component C (FLS) of PM KUSUM scheme	MNRE	29th-Jan-2024
CEA issued the draft of National Electricity Plan (Volume II) for transmission	CEA	24th-Jan-2024
MNRE updated ALMM list with an enlisted capacity of 22,191 MW in Jan 2024	MNRE	24th-Jan-2024
MNRE issues a guideline for implementation of KUSUM scheme	MNRE	17th-Jan-2024
MNRE forms wind repowering committee to execute National Repowering and Life extension Policy for Wind power projects 2023	MNRE	17th-Jan-2024
MNRE issues Incentive Schemes for Green Hydrogen and Green Ammonia Production and Supply (under Mode 2A and Mode 2B)	MNRE	16th-Jan-2024
MNRE instructs Renewable Energy Implementing Agency (REIA) to solve disputes within 21 days	MNRE	12th-Jan-2024
MNRE issues an order to simplify the procedure for solar rooftop installation	MNRE	11th-Jan-2024
MNRE launches New Solar Power Scheme for solarisation of tribal households	MNRE	8th-Jan-2024
MNRE hikes central financial assistance for residential rooftop solar projects	MNRE	8th-Jan-2024
CERC releases draft formulating Terms and Conditions for determining tariff	CERC	4th-Jan-2024
MoP releases amendment to remove the mandate for distribution transmission license	MoP	13th-Dec-2023

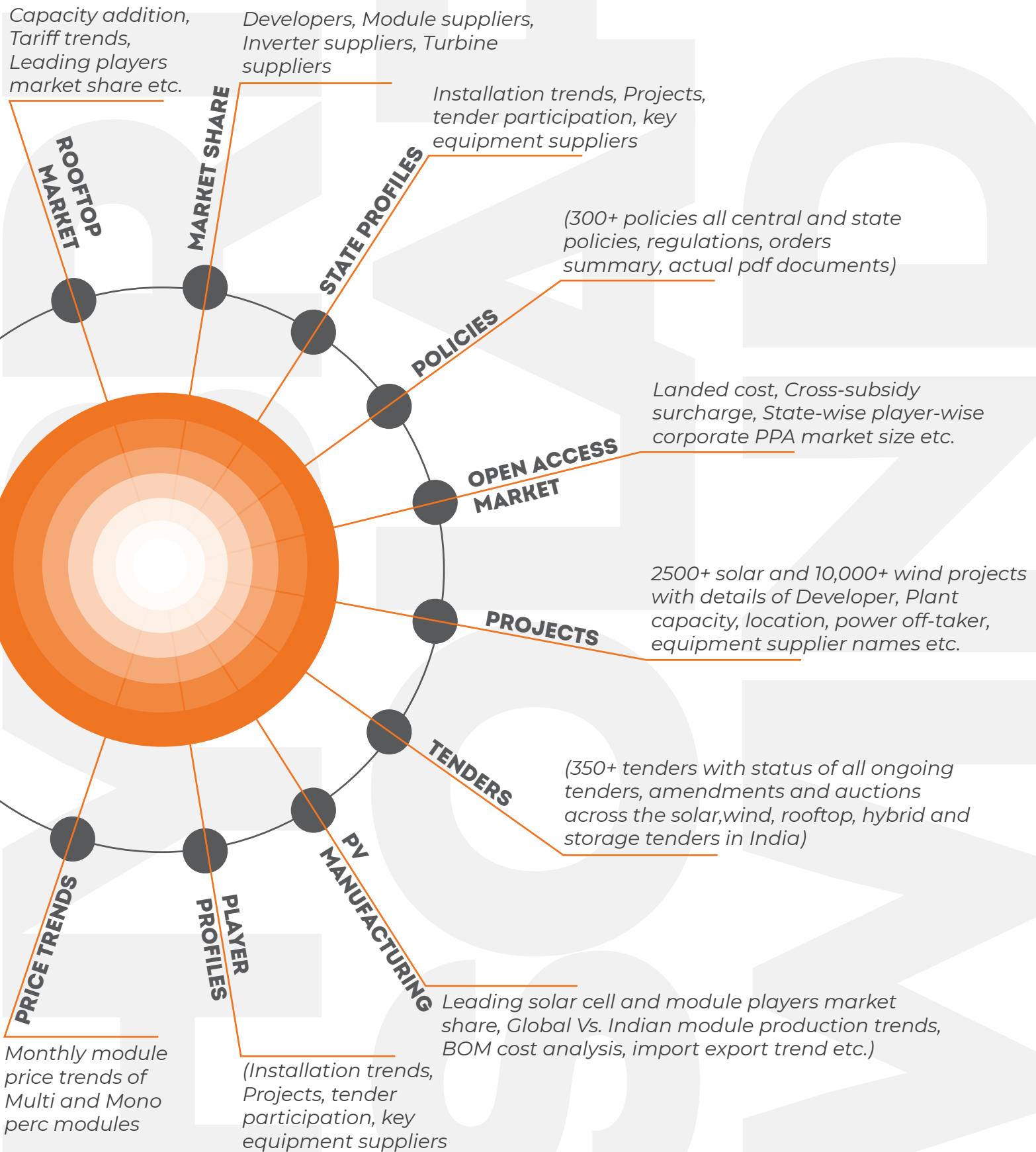
Source: JMK Research

State Level Regulatory Updates

Policy Name	Issuing Agency	Date of Issue
KERC issues draft for Implementation of Peer-to-Peer solar energy transaction through blockchain-platform Regulations 2024	KERC	10th-Jan-2024
KERC issues methodology for Time of Day (TOD) settlement for green energy open access banking charges	KERC	10th-Jan-2024
Tangedco issues Repowering and life extension draft policy for wind power projects 2024	TANGEDCO	4th-Jan-2024
KERC approves a tariff of INR 3.57/kWh for solar rooftop projects	KERC	3rd-Jan-2024
Jharkhand Electricity Regulatory Commission issues Green Energy Open Access Regulations 2024(Terms and Conditions)	JERC	1st-Jan-2024
JERC to impose green tariff of INR1.65/unit on Chandigarh	JERC	31st-Dec-2023
KERC approves compensation of INR 70.6 million to Solitaire Powertech	KERC	19th-Dec-2023
Ampyr Energy receives approval for group captive status and banking facility	KERC	19th-Dec-2023

Source: JMK Research

RE ONLINE DASHBOARD



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