RE UPDATE Q4 2024

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CONTENTS

EXECUTIVE SUMMARY

In Q4 2024 (October-December 2024), about 5.3 GW of utility-scale solar capacity was added in India, representing a 47.2% increase compared to the previous quarter's installations. In the wind segment, about 0.8 GW was added, representing a 12.7% increase from the installations in Q3 2024.

From January to December 2024, India added about 18.5 GW of new utility-scale solar capacity, marking an increase of ~2.8 times compared to the annual solar installations of 6.5 GW in 2023. During 2024, about 4.59 GW of new rooftop solar capacity was added in the country, a 53% increase compared to 2023. In the wind sector, about 3.4 GW of new capacity was added in 2024, up by 21% as compared to 2023.

According to JMK Research, in CY2025, about ~32.3 GW of new solar capacity is expected to be added in India (22.8 GW from utility-scale, 7.5 GW from rooftop solar and another 2 GW from off-grid component). Whereas in the wind segment, it is projected that around 4.5 GW of new capacity is likely to be added in CY2025.

Further, according to the Q4 2024 equipment shipment data received by JMK Research, more than 12.5 GW of central and string inverters and more than 9.88 GW of modules were shipped in India in Q4 2024. Sungrow was the leading inverter supplier with a 25.6% share, followed by Sineng (15.2%) and FIMER (13.6%) this quarter. Waaree was the leading module supplier, contributing around 17% share of total module shipments in India. Among the Chinese/International suppliers, Jinko supplied 6% share of module shipments in the Indian market, followed by Trina (3%).

Regarding tender activity, in Q4 2024, 73 GW of utility scale renewable energy tenders were issued, reflecting an increase of 28% from last year (2023). In Q4 2024, 11 new tenders representing a total capacity of approximately 9.4 GW were issued across the solar, wind, wind-solar hybrid and RE with storage segments reflecting a decrease of 50% as compared to previous quarter (Q3 2024).

In 2024, a total capacity of 49 GW was allocated to various renewable energy developers. In Q4 2024, the total allocated capacity reached 14,796 MW, reflecting a twofold increase compared to Q3 2024.

Among the total capacity awarded in the solar segment, SAEL and Renew, secured the highest capacities of 780 MW and 550 MW, respectively. Gentari Renewables, EG Green and Sunsure Energy were the new entrants in the wind solar hybrid segment in this quarter.

In Q4 2024, the lowest-winning tariff in the solar segment was INR 2.15/kWh quoted by Waaree Energies under RUMSL's 170 MW solar tender marking a decline of 13% in comparison to lowest tariff discovered in Q3 2024. The lowest-winning tariff in the wind-solar hybrid segment in Q4 2024 was INR 3.19/kWh quoted by Datta Infra under the SJVN 1200 MW ISTS Connected Wind Solar Hybrid tender which is 7% lower than the lowest wind-solar hybrid tariff discovered in the previous quarter (Q3 2024).

The investment flow in the RE sector in Q4 2024 was more than $4661 million, which is about 91.52% higher than the investments in Q3 2024. A total capacity of 5.32 GW was acquired in the fourth quarter of 2024.

In Q4 2024, India witnessed a noteworthy shift in its solar photovoltaic (PV) module exports, valued at INR 18,719 million (approximately US$ 222.41 million), reflecting a decline of 62%. In 2024, the leading seven players shipped 3.24 GW of solar PV modules.

The report also analyzes module price trends in India, details of investments and deals, and elaborates on the PV manufacturing landscape in further sections.

INSTALLATION TRENDS

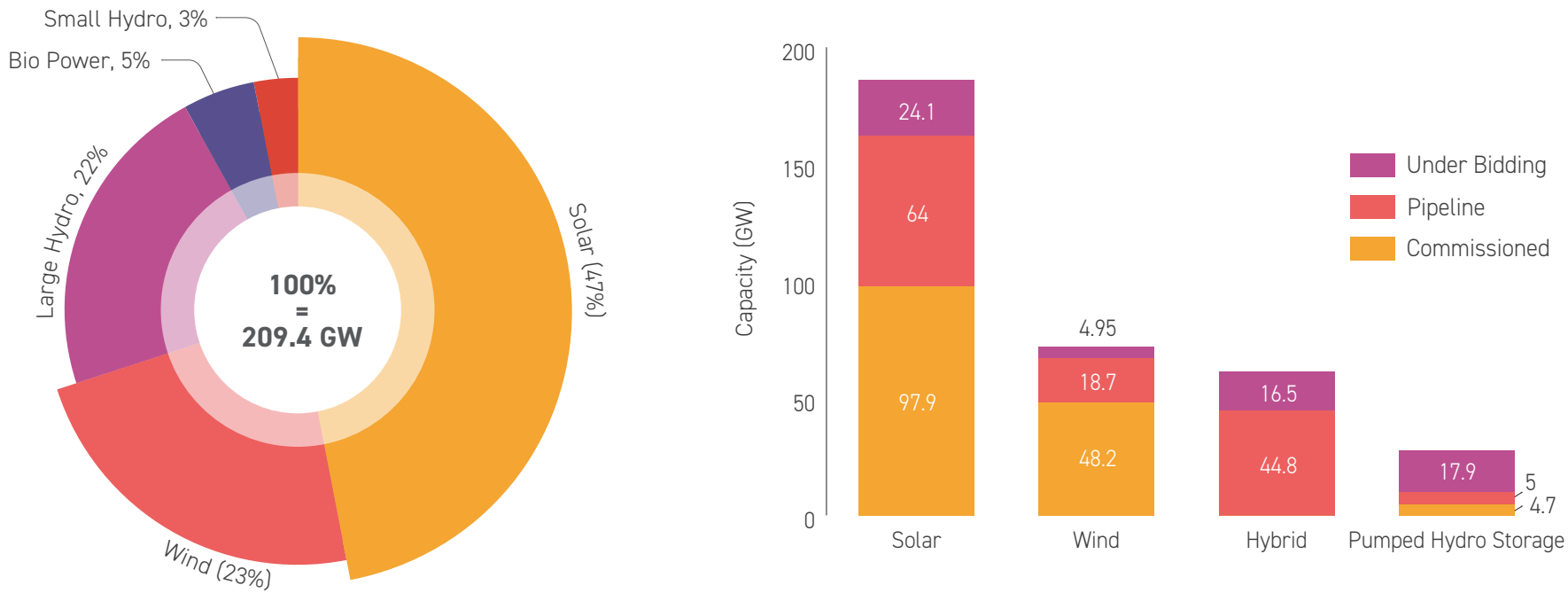
Cumulative installation trends

India's renewable capacity installation reached 209.4 GW as of December 31, 2024. Solar continues to be the major contributor with a 47% share in the total renewable mix, followed by wind (23%) and large hydro with a 22% share.

As of December 31, 2024, about 97.9 GW of solar and 48.2 GW of wind capacity were installed in India. The current pipeline of combined capacity of solar, wind, hybrid and storage projects are around 132.5 GW, which is likely to be commissioned in the next 4-5 years. Another 63.5 GW of projects are under the bidding phase i.e., where tenders have been issued but auctions are not yet concluded.

The Central Electricity Authority (CEA) aims to achieve 500 GW of renewable energy capacity by 2030 and over 600 GW of installed renewable energy capacity by 2032 in India. As per the estimates, India needs to add approximately 45-50 GW of renewable energy capacity annually by 2030.

Figure 2.1: RE Installations trends, as of December 31, 2024



Source: MNRE, JMK Research
Note: Solar includes utility-scale solar, rooftop solar, distributed/ off-grid solar

INSTALLATION TRENDS

Yearly installation trends

Utility-Scale Solar: India added about 18.5 GW of new utility-scale solar capacity in 2024, marking an increase of ~2.8 times compared to the annual solar installations of 6.5 GW in 2023.

In 2024, Rajasthan leads with 7.09 GW capacity, followed by Gujarat with 4.32 GW and Tamil Nadu with 1.73 GW. These top 3 states account for 71% of India's total solar utility-scale solar installation.

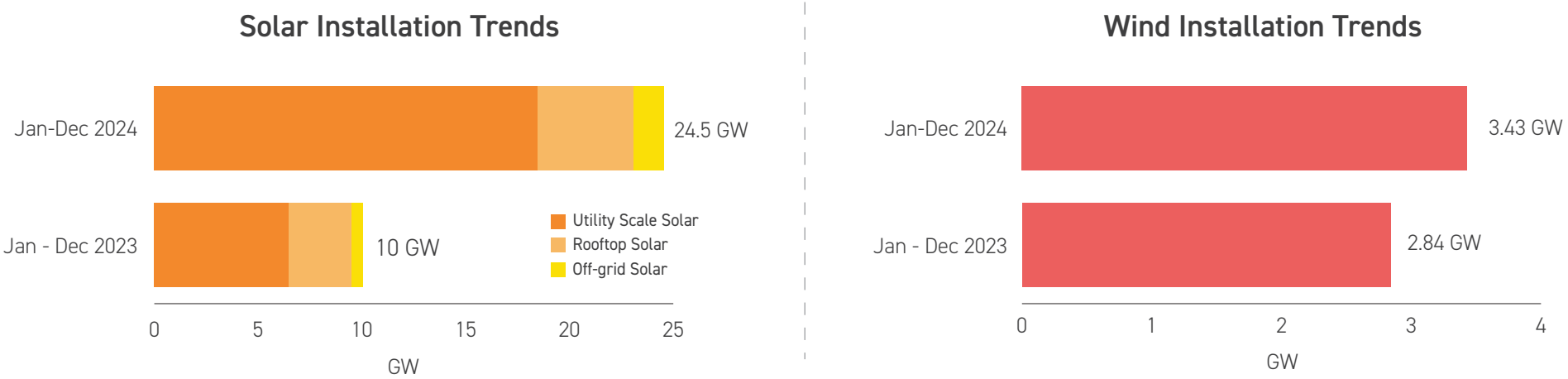
Rooftop Solar: India added about 4.59 GW of new rooftop solar capacity in 2024, a 53% increase compared to 2023. This growth can be attributed to the launch of the PM Surya Ghar: Muft Bijli Yojana. As of January 2025, the scheme has already benefitted 8.46 lakh households through rooftop solar installations.

The top five states with the highest number of households benefiting from the scheme were Gujarat, with a 41.5% share, followed by Maharashtra at 22.8%, Uttar Pradesh at 8.69%, Kerala at 7.7%, and Rajasthan with a 3.14% share.

Off-grid Solar: In the off-grid/distributed solar segment, about 1.48 GW was added in 2024, representing about a 197% increase compared to the annual off-grid/distributed solar installations in the same period last year.

Wind: In the wind sector, about 3.4 GW of new capacity was added in 2024, up by 21% as compared to 2023. Gujarat (1250 MW), Karnataka (1135 MW), and Tamil Nadu (980 MW) accounted for about 98% of the new wind capacity added in 2024.

Figure 2.2 Solar and Wind capacity addition trends in India

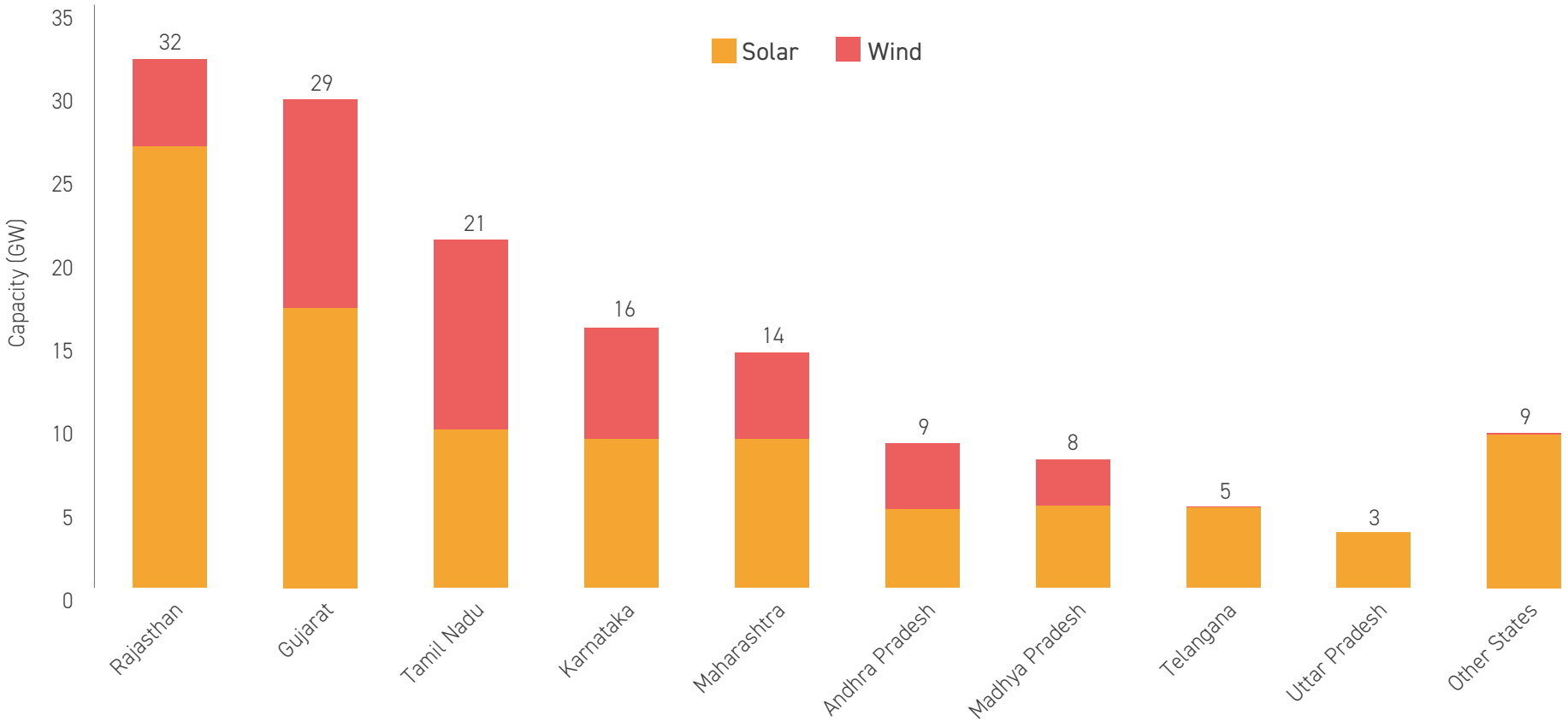


Source: JMK Research

State wise installations

As of December 31, 2024, the top five states Rajasthan, Gujarat, Tamil Nadu, Karnataka and Maharashtra collectively accounted for approximately 72.3% of the total solar capacity installed in India. Additionally, these same states have installed the maximum wind energy projects, contributing to 85.2% of the total wind capacity installed in the country.

Figure 2.3: State-wise solar and wind capacity addition in India as of December 2024



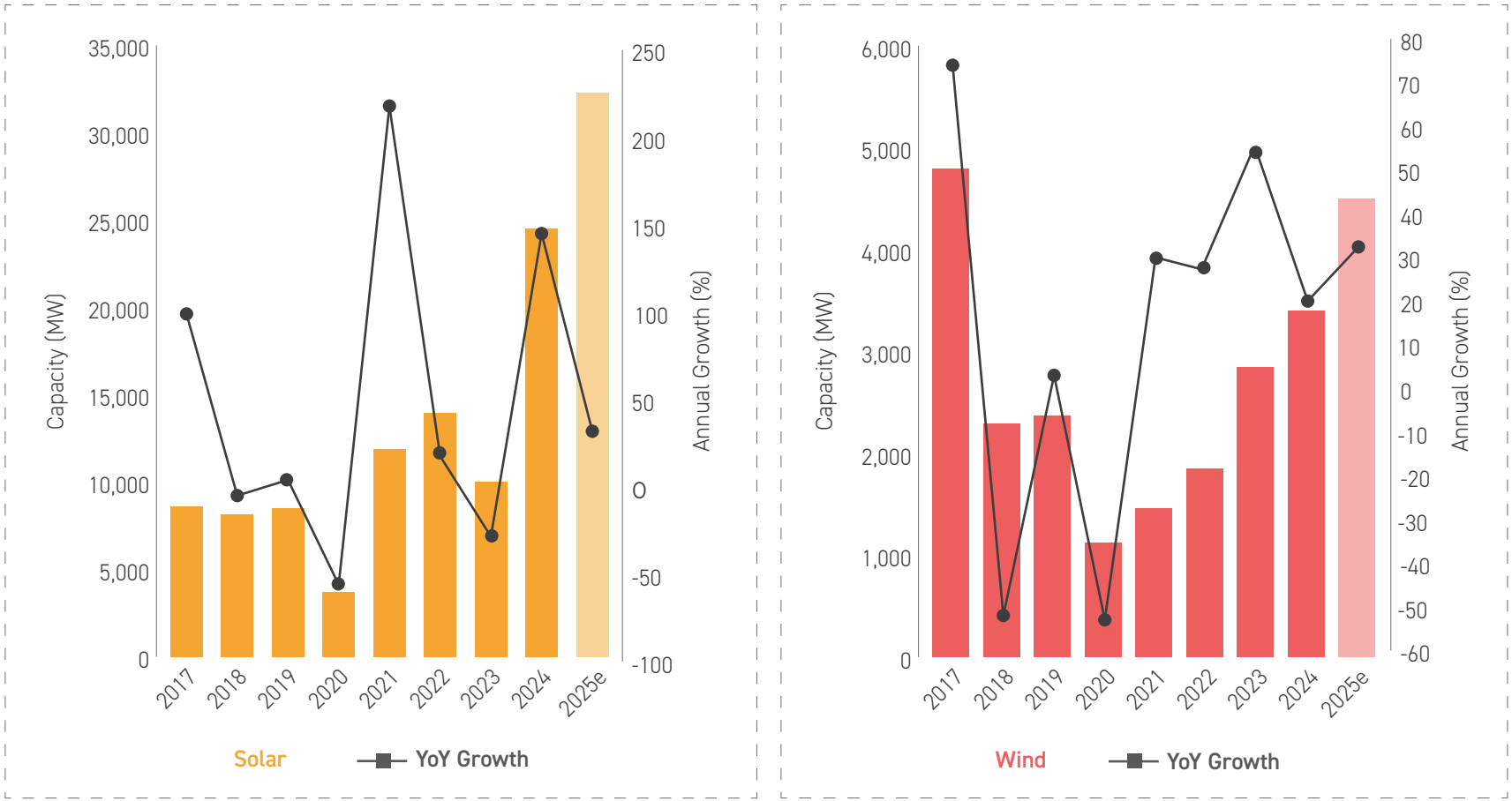
Source: MNRE, JMK Research
Note: Solar capacity includes utility-scale solar, rooftop solar, distributed/ off-grid solar capacity

INSTALLATION TRENDS

Yearly Projections

According to JMK Research, in CY2025, about ~32.3 GW of new solar capacity is expected to be added in India (22.8 GW from utility-scale, 7.5 GW from rooftop solar and another 2 GW from off-grid component). Whereas in the wind segment, it is projected that around 4.5 GW of new capacity is likely to be added in CY2025.

Figure 2.4: Year-wise solar and wind installation trends in India



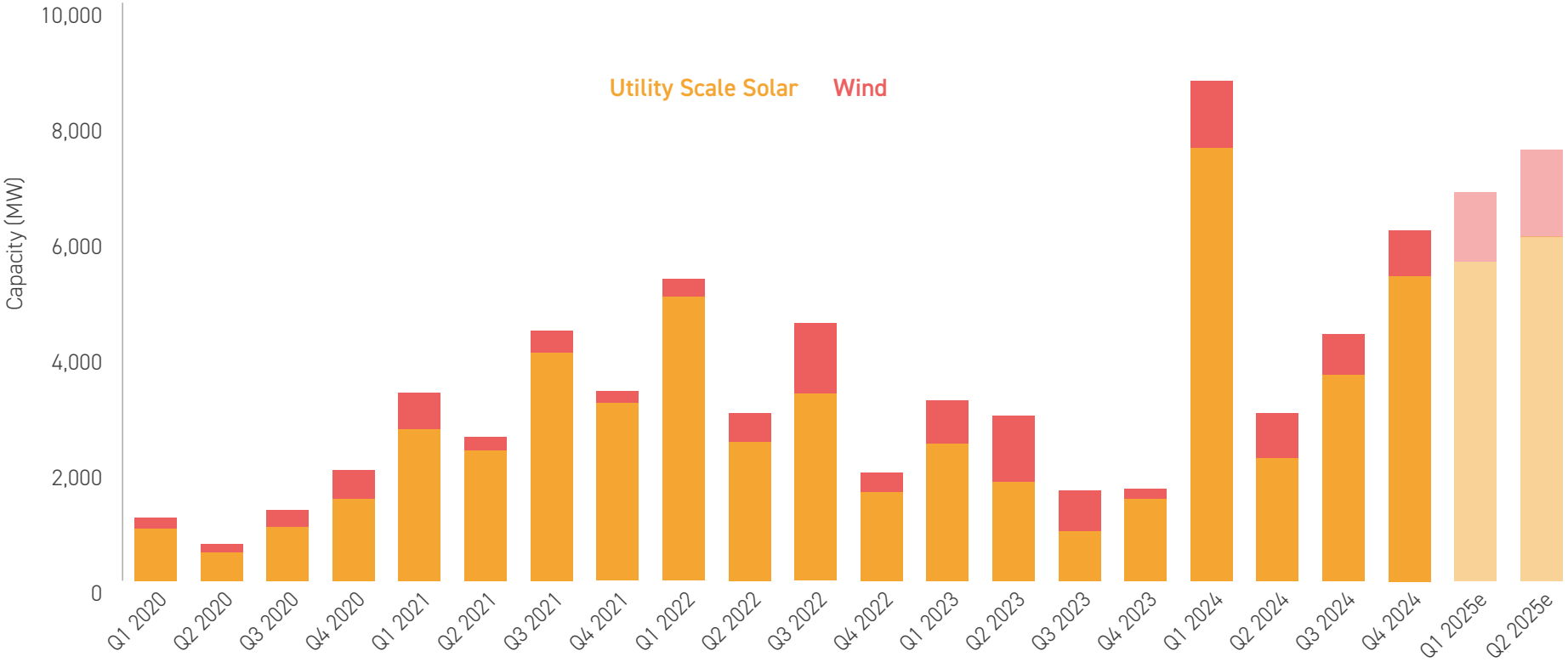
Source: MNRE, JMK Research
Note: Solar includes Utility Scale Solar, Rooftop Solar and Off grid solar capacity

Quarterly trends

In Q4 2024 (October-December 2024), about 5.3 GW of utility-scale solar capacity was added in India, representing a 47.2% increase compared to the previous quarter's installations. In the wind segment, about 0.8 GW was added, representing a 12.7% increase from the installations in Q3 2024.

In the next two quarters, about 11.5 GW of utility-scale solar and 2.7 GW of wind capacities are expected to be installed in the country.

Figure 2.5: Quarter-wise utility scale solar and wind installations



Source: MNRE, CEA, JMK Research

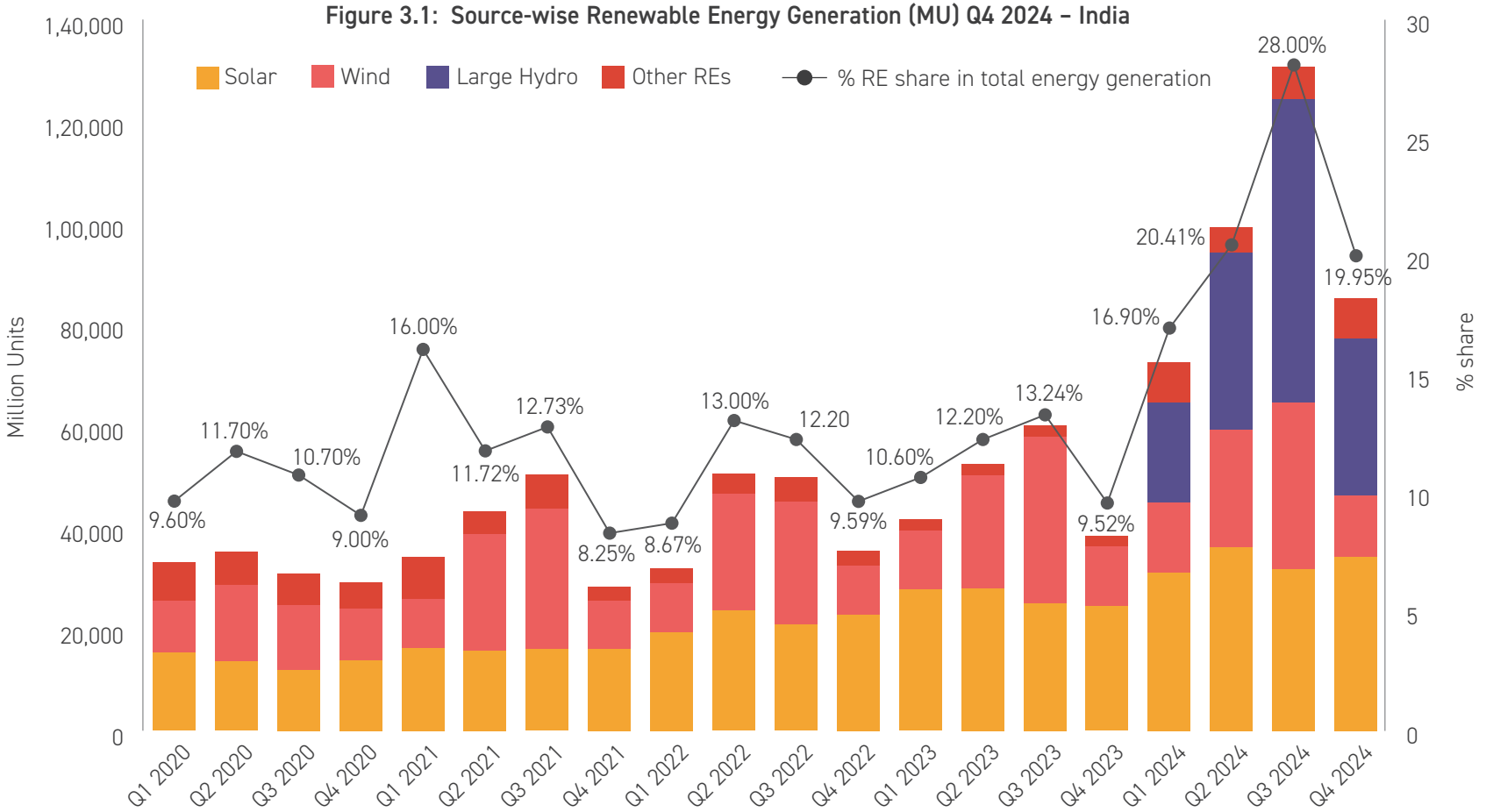
QUARTERLY RE GENERATION

In Q4 2024, RE accounted for 19.95% of the total energy generated i.e. 426.35 BUs with a cumulative RE generation of 85.07 BUs, decreased by around 37% from the previous quarter.

The decline in RE generation can be attributed to a significant reduction in wind power generation, marking a decline of 63% in Q4 2024. In India, wind generation typically decreases during the winter months due to lower wind speeds.

Solar generation accounted for 40.2% of the overall RE generation in Q4 2024 followed by large hydro (36.3%), wind (14.2%) and other RES (including biomass, bagasse, waste heat, and small hydro) at 9.3%.

Figure 3.1: Source-wise Renewable Energy Generation (MU) Q4 2024 – India



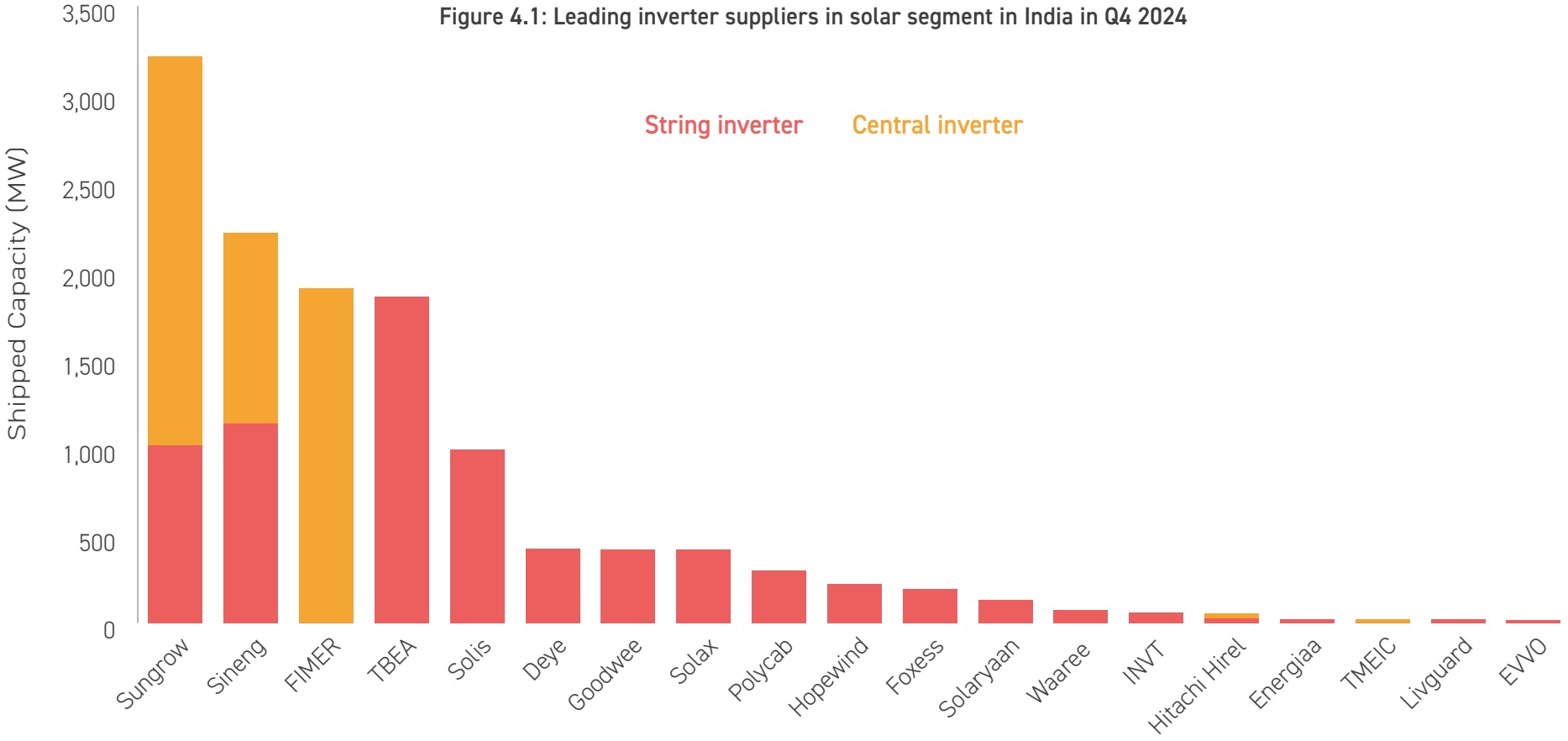
Source: CEA, JMK Research
Note: Hydro Power is included from 2024 onwards by CEA

MARKET SHARES

Inverter Suppliers

For Q4 2024, we have received more than 12.5 GW of shipment data from 19 players providing both central and string inverters in India. Sungrow is the leading inverter supplier with 25.6% share followed by Sineng (15.2%) and FIMER (13.6%) .

Figure 4.1: Leading inverter suppliers in solar segment in India in Q4 2024



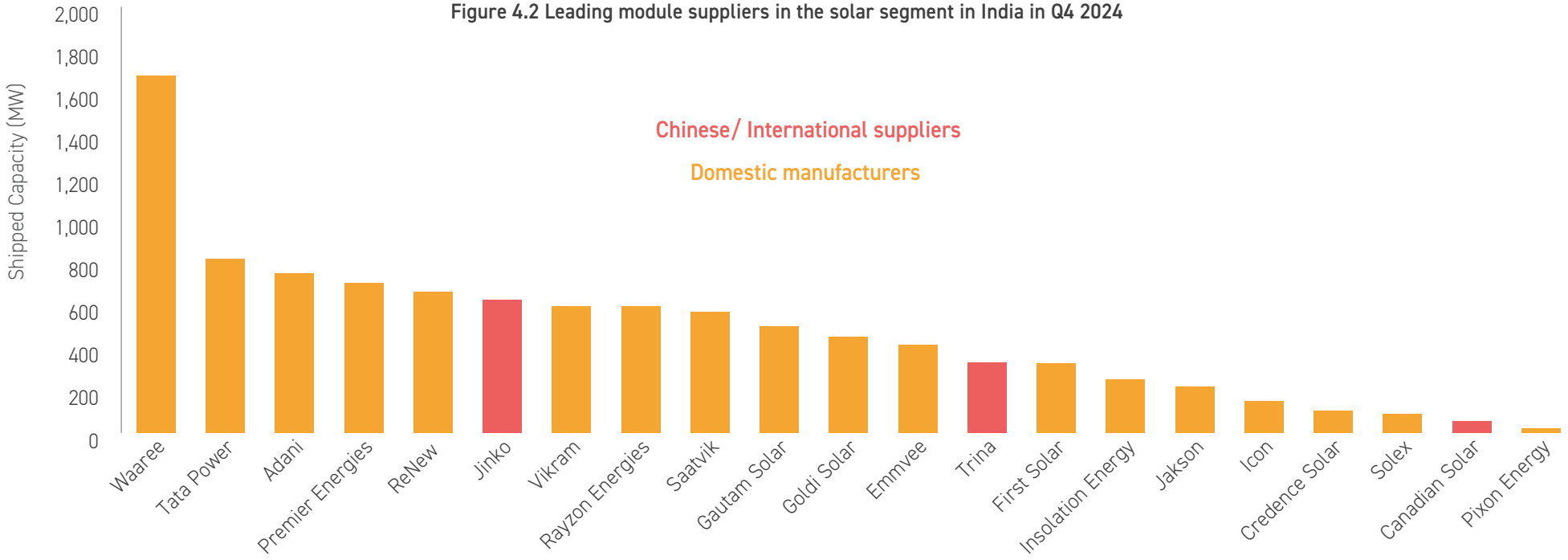
Source: JMK Research
Note: Leading players are listed based on their shipment numbers in Q4 2024 in India. Kehua, SMA, Delta, INVT and Havells have not shared their quarterly data, hence not included.

MARKET SHARES

Module Suppliers

In Q4 CY 2024, 9.88 GW of modules were shipped by 21 players to the Indian market. In Q4 2024, shipments by Chinese players have declined. Jinko supplied 6% of the total module shipment in Q4 2024 with a decrease of 17% as compared to Q3 2024. Indian players like Waaree accounted for 17% of the total module shipment in Q4 2024 followed by Tata power (6%) and Adani (8%).

Figure 4.2 Leading module suppliers in the solar segment in India in Q4 2024



Source: JMK Research
Note: Leading players are listed based on their shipment numbers in Q4 2024 in India. Longi, Znshine, Risen Energy, Renewsys and Bluebird have not shared their quarterly data, hence not included. Data is based on self-declaration by companies

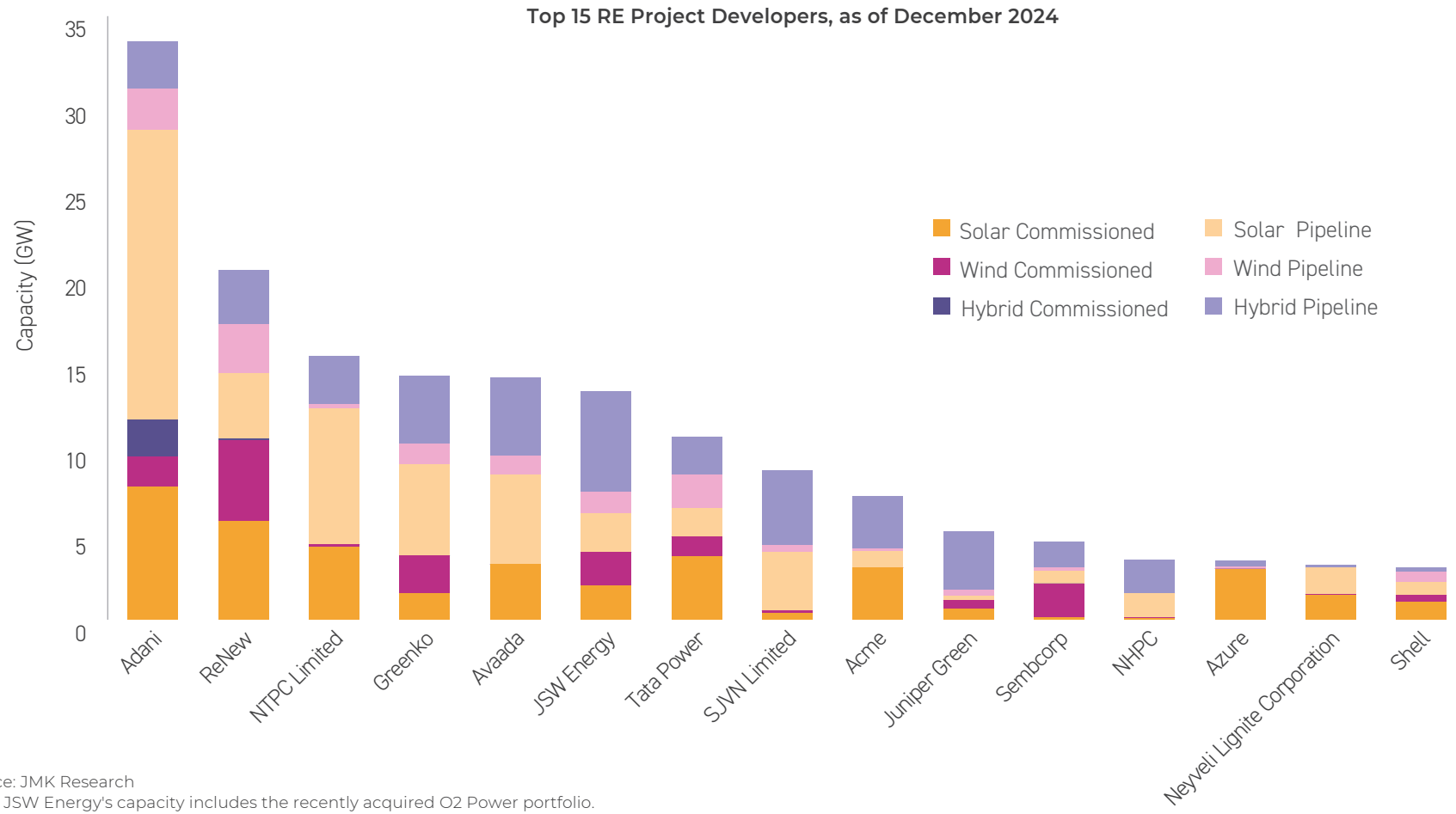
MARKET SHARES

Project Developers

As of December 31, 2024, the top five players in terms of cumulative installations and pipeline capacity across utility-scale solar, wind, and hybrid segments are Adani (33.6 GW), ReNew (20.3 GW), NTPC (15.3 GW), Greenko (14.1 GW) and Avaada (14 GW).

The commissioned capacity of the top five players increased by 6.1% compared to the previous quarter (Q3 2024).

Figure 4.3: Top 15 project developers across utility-scale solar, wind and hybrid segment as of December 31, 2024



Source: JMK Research
Note: JSW Energy's capacity includes the recently acquired O2 Power portfolio.

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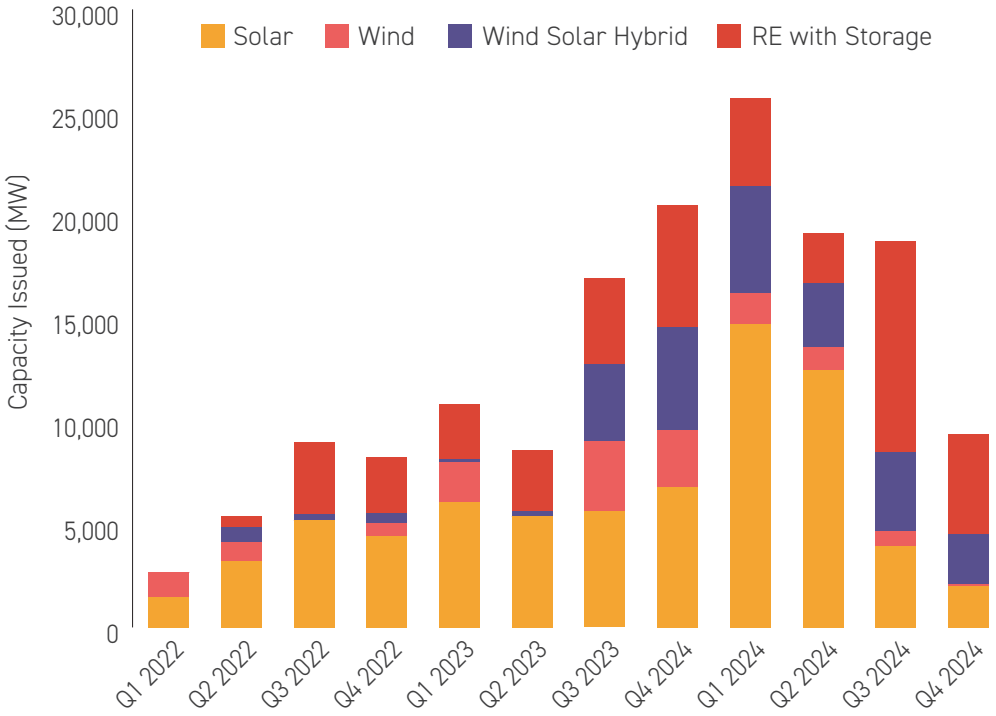
TENDERS

Tenders Issued

In 2024, 73 GW of utility scale renewable energy tenders were issued, reflecting an increase of 28% from last year (2023).

In Q4 2024, 11 new tenders were issued representing a total capacity of 9.4 GW which reflects a decrease of 50% as compared to previous quarter (Q3 2024)

Figure 5.1: Quarter-wise renewable energy tender issuance trajectory, by tender type



Source: JMK Research

Note: Only utility-scale project development renewable energy tenders are included for Solar, Wind, Wind Solar hybrid projects and RE with storage.

Solar

Solar tenders accounted for 21% share of the total issued capacity in Q4 2024 showing a decline of 50% as compared to Q3 2024. This decline is largely due to increasing demand for firm power during peak hours from distribution companies (Discoms).

Wind

In Q4 2024, wind tenders accounted for 2% share of the total issued capacity. Compared to Q3 2024, wind tender issuance decreased by 86% in Q4 2024. This decline in tenders is largely due to the increasing tariffs and lack of suitable sites for wind projects. Additionally, unavailability of off takers for plain vanilla wind tenders can be the main reason for this fall.

Wind Solar Hybrid

Wind Solar Hybrid segment accounted for about 26% share of the total renewable energy tenders issued in India during Q4 2024 reflecting a decline of 38% as compared to the previous quarter.

Renewable Energy with Storage

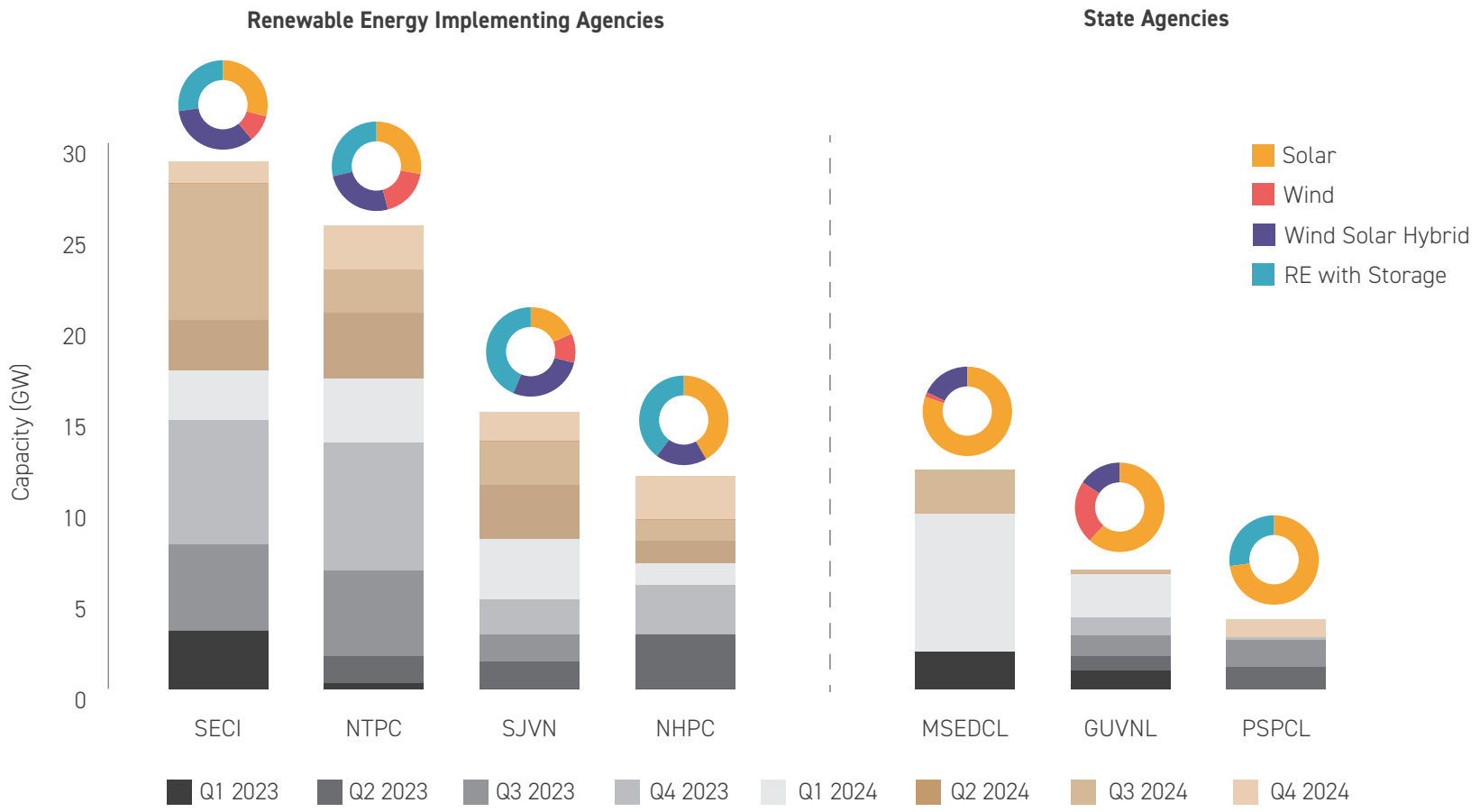
In Q4 2024, ~4.9 GW of RE with storage tenders were issued accounting for 52% share of the total RE capacity issued. In Q4 2024, tender issuance dropped by 52% compared to the third quarter of 2024.

Issuance by central and state authorities

Renewable Energy Implementing Agencies (REIAs) such as SECI, SJVN, NTPC, and NHPC accounted for a share of 58% of the total issued capacity in 2024. SECI issued a capacity of 14.2 GW followed by NTPC (11.91 GW), SJVN (10.3 GW) and NHPC (6 GW) in 2024.

During this quarter, a staggering 80% (7.6 GW) of project development tenders were issued by central renewable energy agencies, including SECI, SJVN, NTPC, and NHPC.

Figure 5.2 Renewable energy tender issuance trajectory, by agency type, quarter wise



Source: JMK Research
Note: Only utility-scale project development renewable energy tenders are included for Solar, Wind, Wind Solar hybrid projects and RE with storage.

In Q4 2024, NHPC issued Interstate Transmission System (ISTS) connected tenders of 1.2 GW each for Solar and Wind Solar Hybrid segment. Additionally, SJVN issued a wind tender of 100 MW. In Q4 2024, REIAs issued 3.9 GW of RE with storage tenders and PSPCL, a state authority issued 1000 MW RE with storage (FDRE) tender.

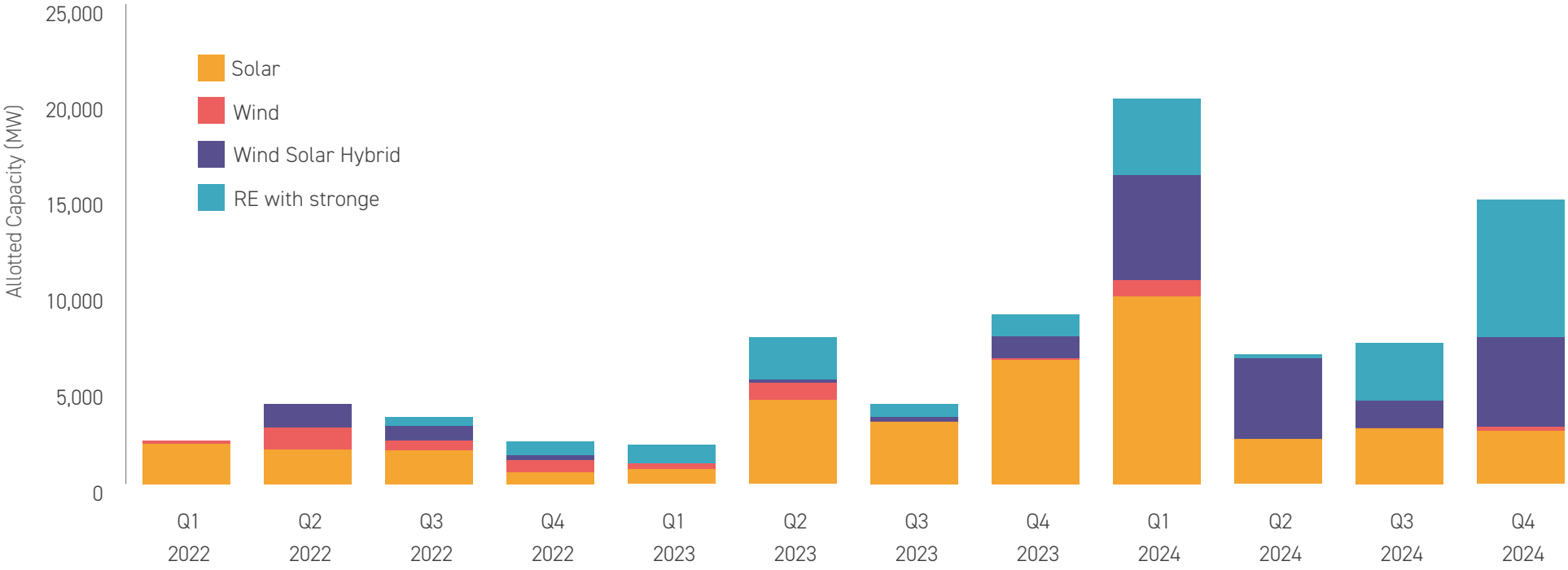
Figure 5.3: Renewable energy tender issuance (Q4 2024)

Source: JMK Research

Allotted Capacities

In 2024, a significant capacity of 49 GW was allotted to various RE developers. Additionally, Solar segment accounted for a share 36% of the total allotted capacity followed by WSH (32%), RE with storage (29%) and Wind (3%). In Q4 2024, the total allocated capacity reached 14,796 MW, reflecting a twofold increase compared to Q3 2024.

Figure 5.4: Renewable energy tender allotment trajectory, by tender type, quarter wise



Source: JMK Research

Solar

In Q4 2024, 2.75 GW was allotted under the solar segment, which represents 19% of the total capacity allotted. In the last three quarters, there has been a significant decline in allocations in solar segment. Specifically, compared to Q1 2024, there was a decline of 72% in Q4 2024 in the allocation of solar tenders. The plain vanilla solar market is shifting towards Solar with Battery Energy Storage Systems (BESS), leading to reduced interest in traditional solar projects.

Wind

In Q4 2024, only 240 MW was allocated, and there were no allocations in the wind segment during the second and third quarters. This trend highlights a significant lack of interest and investment in wind energy.

Wind Solar Hybrid

A capacity of 4.65 GW was allocated in Q4 2024 for the Wind-Solar Hybrid (WSH) segment which is three times the capacity issued in Q3 2024.

RE with Storage

In Q4 2024, 7.16 GW was allocated in the renewable energy with storage segment, which is double the capacity issued in Q3 2024. RE power procurement formats include peak power supply, round-the-clock (RTC) service, and flexible dispatch renewable energy (FDRE). Notably, FDRE tenders accounted for 44% of the total capacity allocated, indicating a strong preference among developers.

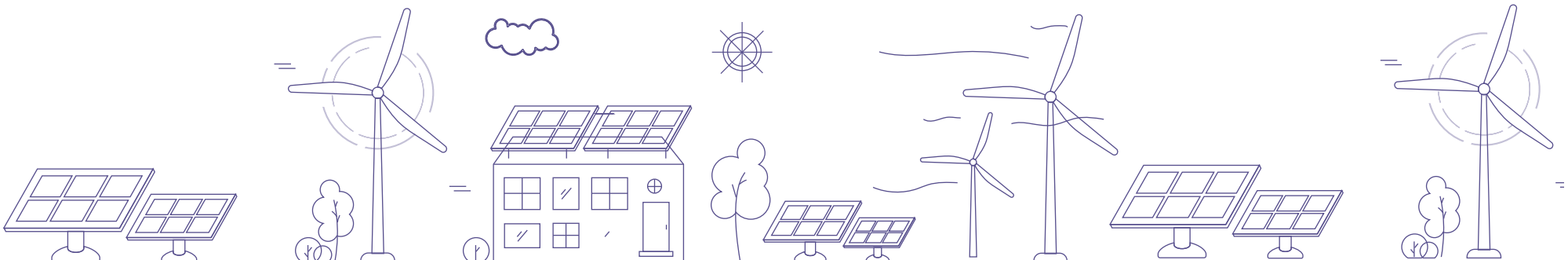
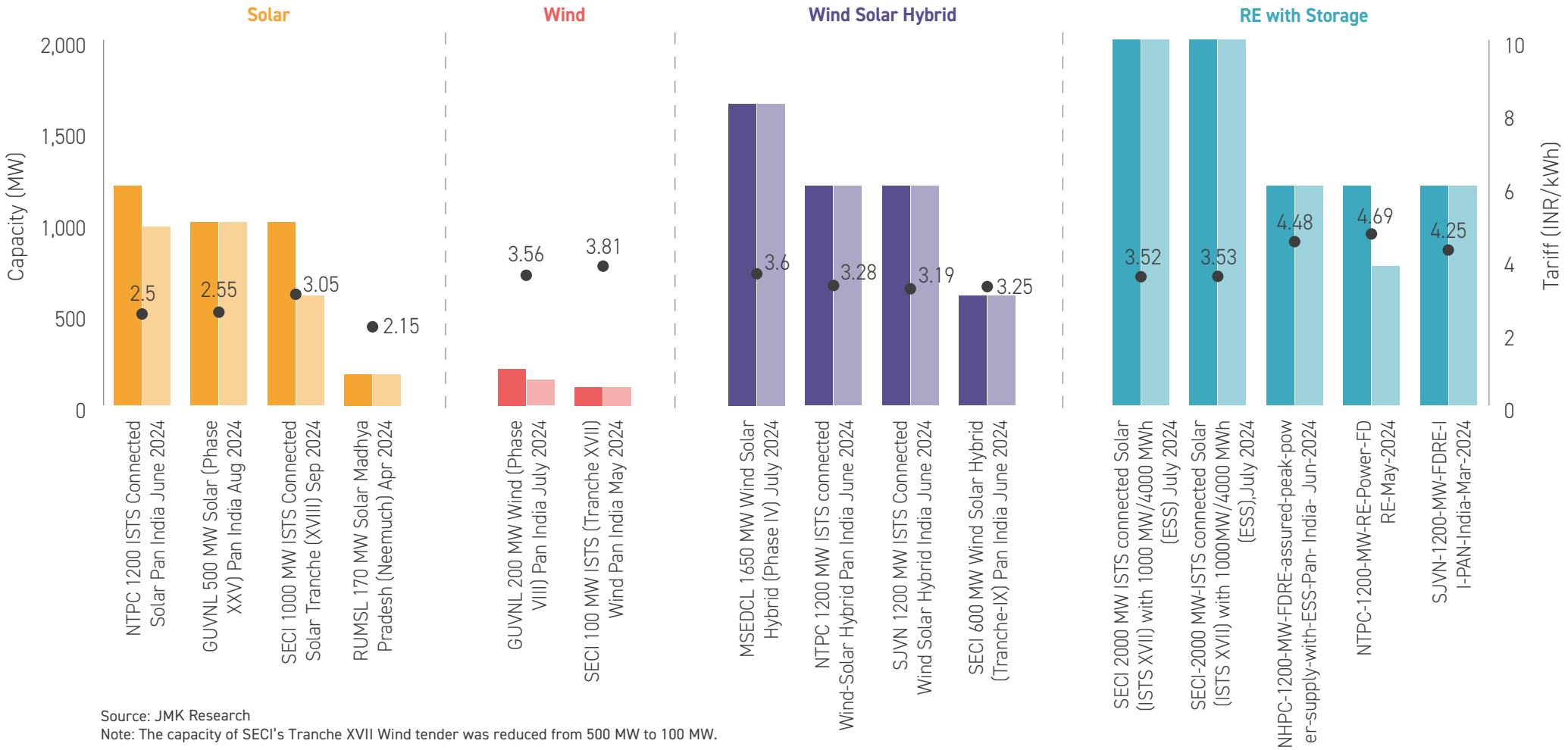


Figure 5.6: RE tenders allotted in Q4 2024



Source: JMK Research
Note: The capacity of SECI's Tranche XVII Wind tender was reduced from 500 MW to 100 MW.

Under Subscription

A capacity of 1,124 MW remained undersubscribed in Q4 2024. The solar segment experienced an undersubscription of 624 MW followed by wind segment with an undersubscription of 60 MW. In the RE with storage segment, a capacity of 440 MW remained undersubscribed in Q4 2024. This can be attributed to aggressive bidding, unavailability of off-takers, lack of transmission infrastructure etc. On the other hand, there was no undersubscription seen in the Wind-Solar Hybrid segment.

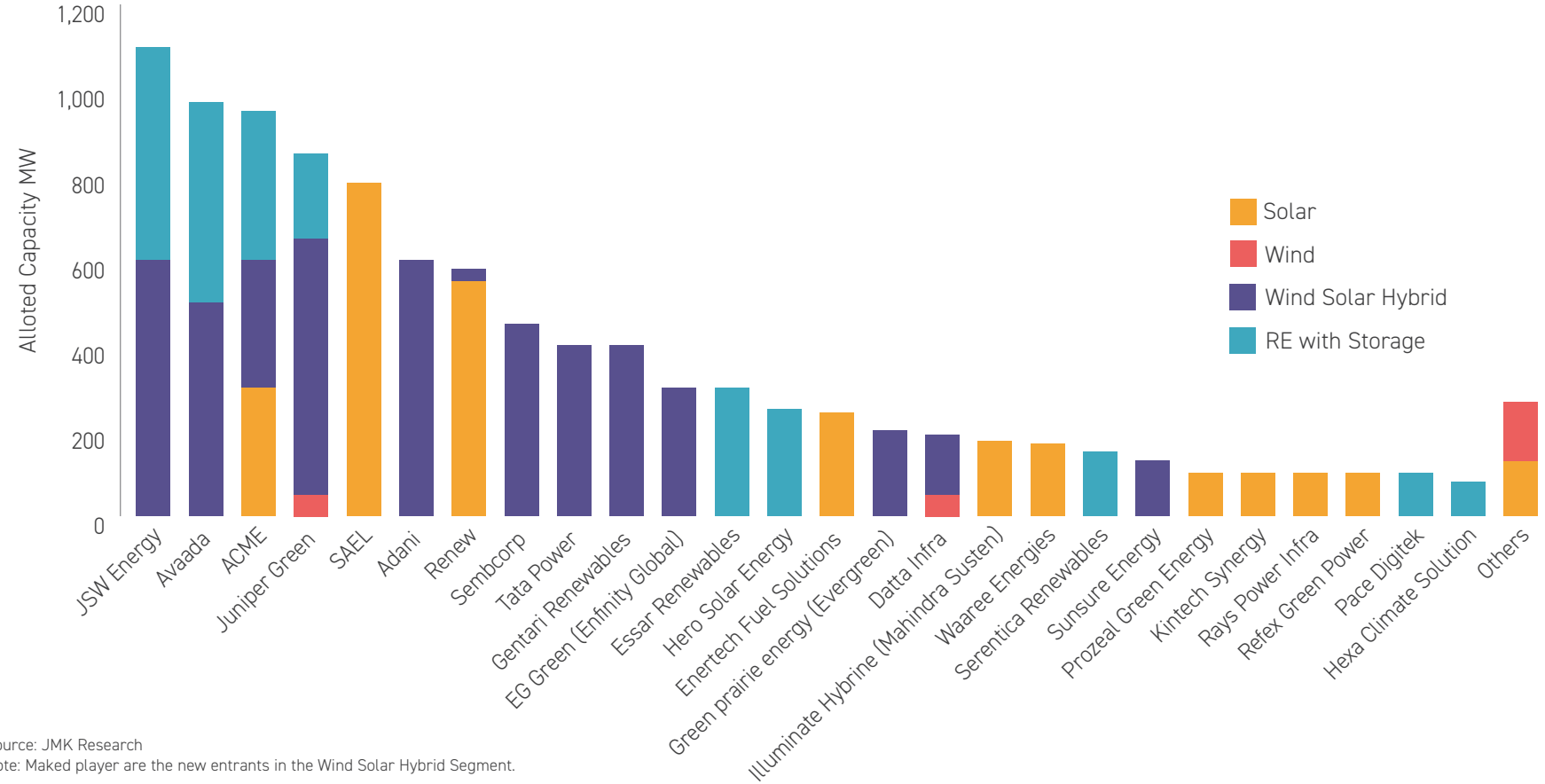
In Q4 2024, 33 private-sector RE developers emerged as successful bidders, including JSW Energy, ACME, Juniper Green, SAEL, and Acme Solar.

The top five solar developers accounted for approximately 38% of the total RE capacity allocated during this quarter. Among the total capacity awarded in the solar segment, SAEL and Renew, secured the highest capacities of 780 MW and 550 MW, respectively.

The top 5 winners in Wind Solar Hybrid segment accounted for 59% of the total allotted capacity. Additionally, Gentari Renewables, EG Green and Sunsure Energy were the new entrants in the wind solar hybrid segment in this quarter accounting for 18% of the total allotted capacity in Q4 2024.

Additionally, in the RE with storage segment, top 5 players accounted for 78% of the total capacity allocated under the RE with storage segment.

Figure 5.7: Developer-wise project won across segments in Q4 2024

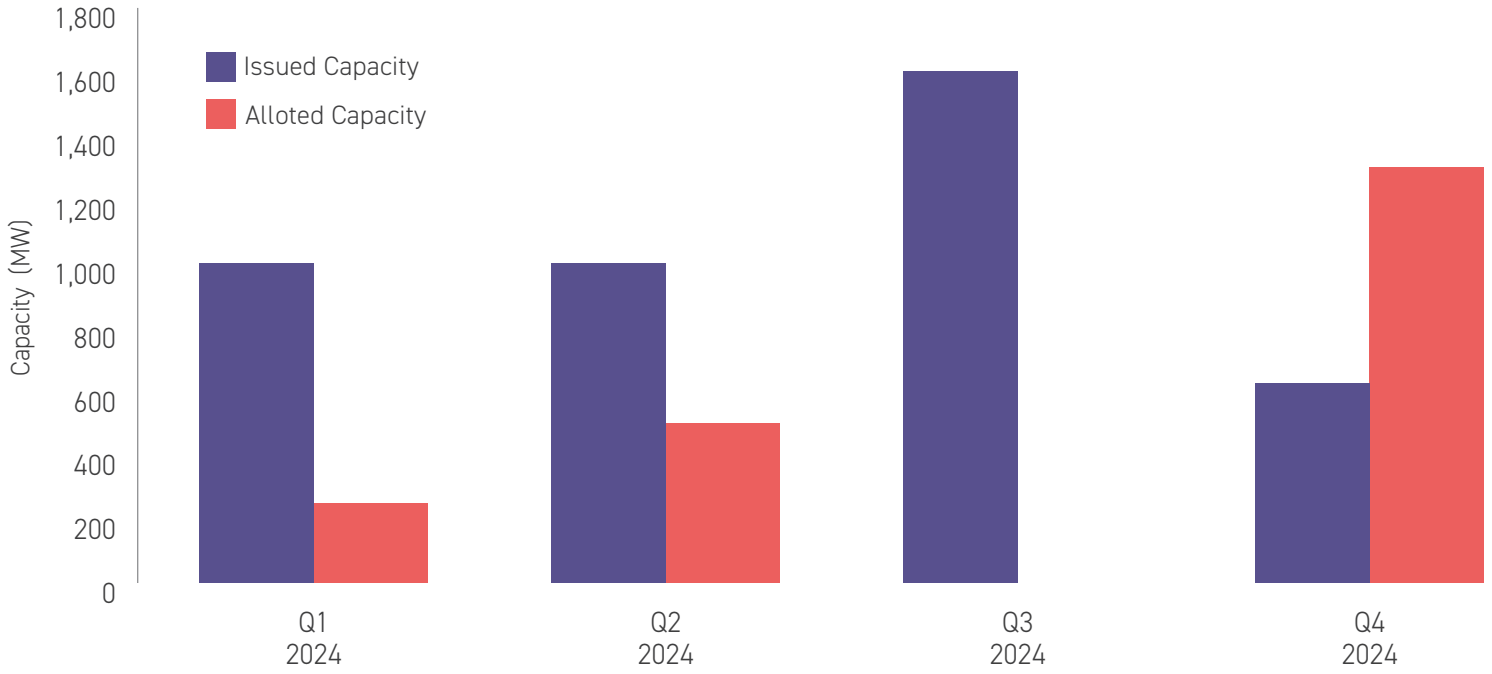


Source: JMK Research
Note: Maked player are the new entrants in the Wind Solar Hybrid Segment.

Standalone Energy Storage Tenders

The issuance of standalone BESS tenders in 2024 increased by 687% year-over-year, while there was a 61% decrease quarter-over-quarter in Q4 2024.

Figure 5.8 Quarter-wise standalone BESS storage tender issuance and allotment trajectory



Source: JMK Research

Standalone BESS Tenders Issued in Q4 2024

In the fourth quarter of 2024, the total capacity issued for standalone BESS tenders was 625 MW. The central agencies issued 80% of the tenders, while the state agencies issued remaining 20% of these tenders.

During this quarter, RVUNL issued its first standalone BESS tender, with a capacity of 500 MW under RVUNL's 500 MW/1000 MWh BESS tender.

Additionally, SECI issued 125 MW/500 MWh standalone BESS tender in Q4 2024.

Allotted Capacities of Standalone BESS Tenders in Q4 2024

In Q4 2024, around 1,300 MW of standalone BESS tenders were auctioned.

HG Infra, Kintech Synergy, Bhilwara Energy, and Advait Infratech were some of the winners in the standalone BESS segment this quarter. Collectively, these players accounted for 57.7% of the total capacities allocated to various developers.

Table 5.1: Standalone BESS tenders allotment in Q4 2024

Tender Name	Allotment Issue Date	Issuing Agency	Capacity	State	Winner Details
NVVN 500 MW/1000 MWh Standalone BESS Pan India Sep 2024	Oct-24	NVVN	500 MW/1000 MWh	Rajasthan	• Indigird 2 Ltd - 250 MW /500 MWh (INR 2,36,999/MW/Month) • Kintech Synergy - 65 MW /130 MWh (INR 2,37,490/MW/Month) • HG Infra Engineering - 185 MW / 370 MWh (INR 2,38,000/MW/Month)
GUVNL 500 MW/1000 MWh Standalone BESS (Phase IV) Gujarat Aug 2024	Dec-24	GUVNL	500 MW/1000 MWh	Kerala	• HG Infra Engineering - 250 MW /500 MWh (INR 2,25,985/MW/Month) • Kintech synergy - 100 MW/ 200 MWh (INR 2,25,985/MW/Month) • Bhilwara energy - 100 MW/200 MWh (INR 2,25,993/ MW/Month)
MSEDCL 300 MW/600 MWh Standalone BESS Maharashtra Aug 2024	Oct-24	MSEDCL	300 MW/600 MWh	Maharashtra	• Pace Digtek – 300 MW/600 MWh (INR 2,19,000/MW/Month

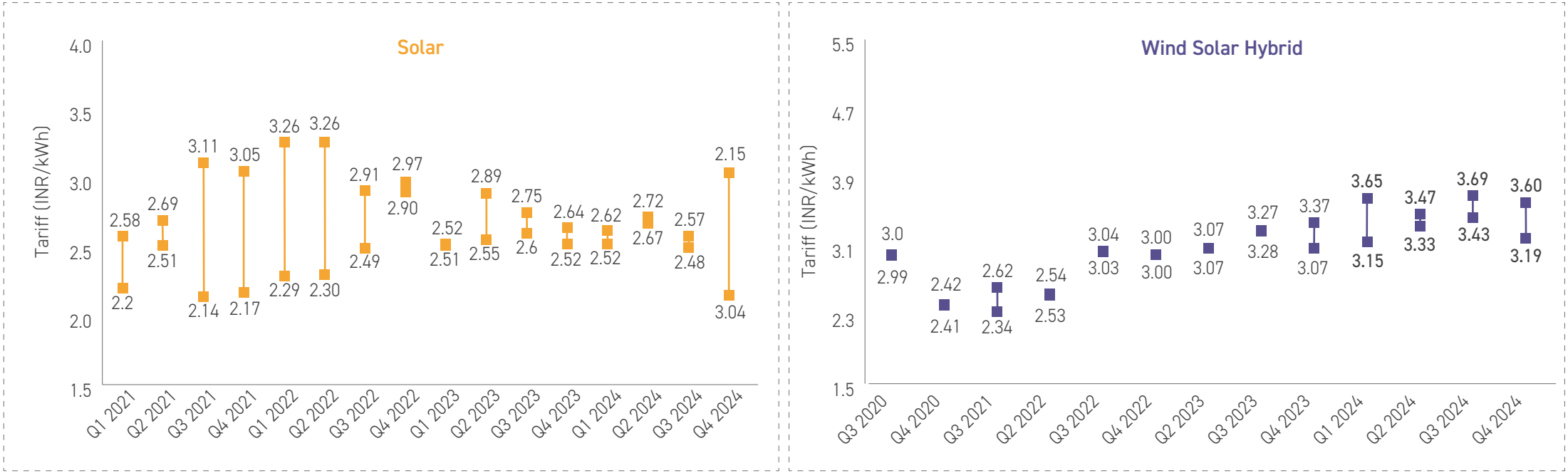
Source: JMK Research

Tariff Trends

In Q4 2024, the lowest-winning tariff in the solar segment was INR 2.15/kWh quoted by Waaree Energies under RUMSL's 170 MW solar tender marking a decline of 13% in comparison to lowest tariff discovered in Q3 2024. SECI's 1000 MW ISTS (Tranche XVIII) ISTS connected solar tender has discovered highest tariff of INR 3.04/kWh.

The lowest-winning tariff in the wind-solar hybrid segment in Q4 2024 was INR 3.19/kWh quoted by Datta Infra under the SJVN 1200 MW ISTS Connected Wind Solar Hybrid tender which is 7% lower than the lowest wind-solar hybrid tariff discovered in the previous quarter (Q3 2024).

Figure 5.11: Lowest winning Tariff range in auctioned RE tenders



Source: JMK Research

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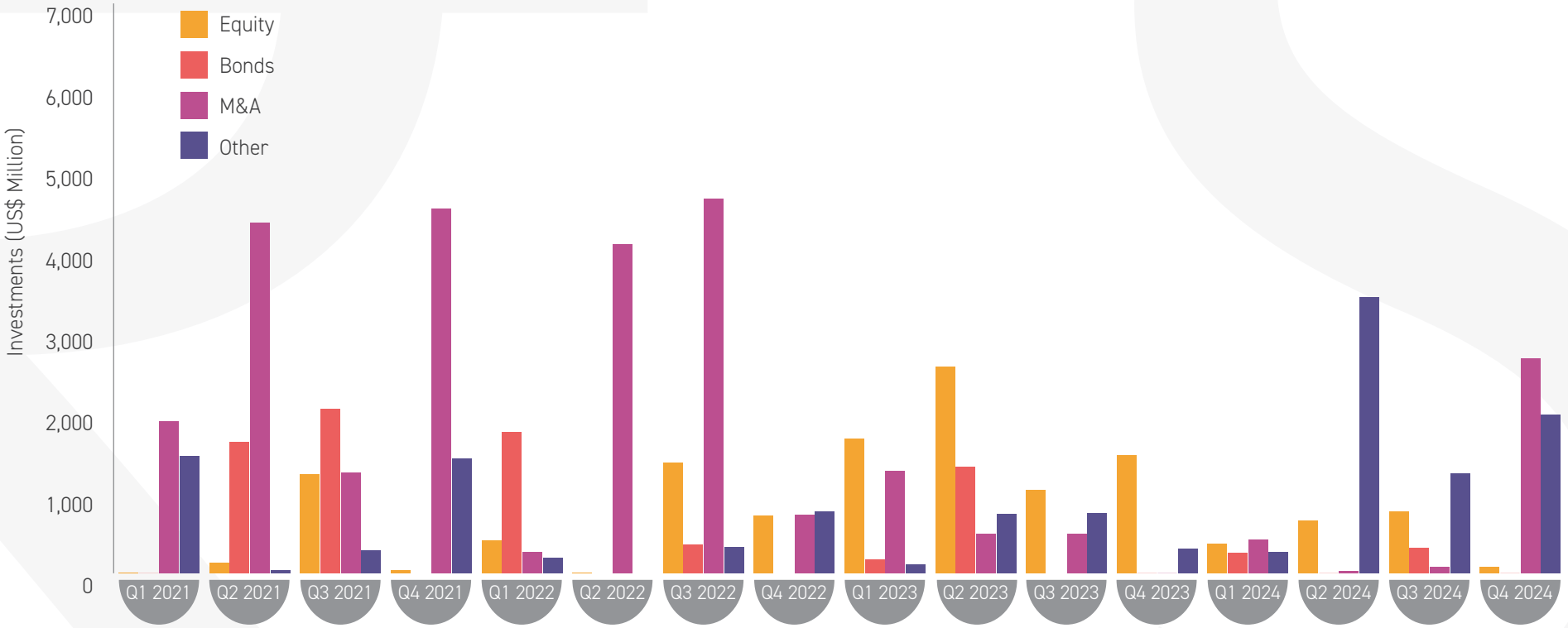
FINANCING DEALS

The investment flow in the RE sector in Q4 2024 was more than $4661.65 million, which is about 97.52% more than the investments in Q3 2024. Of these investments, 18.17% was raised from debt and 1.56% from equity. A total capacity of 5.32 GW was acquired in the fourth quarter of 2024.

Figure 6.1: : Quarter-wise investment flow in Indian RE sector (US$ million)



Source: JMK Research
Note: Others include debt, mezzanine funding, IPO etc

Key Investments across segments in Q4 2024:

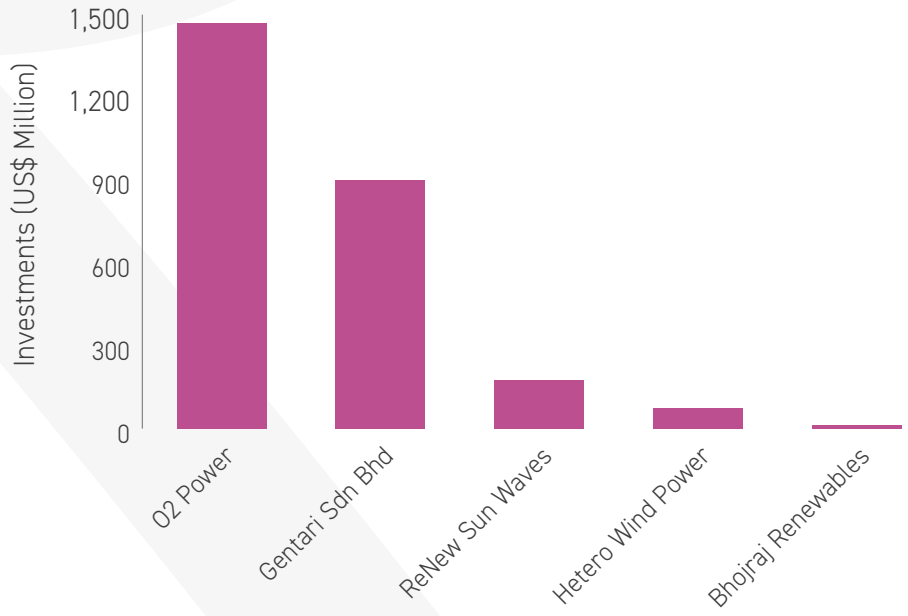
PV Manufacturing: In the PV manufacturing segment, investments of $59.27 million were made, which accounted for 1.27% of the total flow of investments. Some of the key deals are:

- Solarworld Energy solutions secured $12.9 million in pre – IPO placement round from ValueQuest Investment Advisors and other investors. Major part of the funding will be utilized to build a 1.2 GW solar manufacturing facility in Madhya Pradesh.
- Insolation Energy has raised about $47.8 million from investors through preferential allotment of equity shares.

EPC: Roofsol Energy, Maharashtra based solar EPC provider, accounted for 0.06% of the total investment flow. It raised $3.03 million through equity funding, led by Equity4life IH Analytics. Roofsol will utilize the funds to develop its OPEX business for developing solar projects.

Project Developers: The cumulative investment raised by project developers was $4017.75 million, which is 86.18% of the total investment flow.

Figure 6.2: Major Acquisitions of RE players in Q4 2024



Acquisition:

- JSW Energy has signed a definitive agreement to acquire a 4,696 MW RE platform from O2 Power with an enterprise value of approximately ~$1470 million.
- Gentari has acquired Brookfield Asset Management's 2.2 GW of RE assets located in Rajasthan, Gujarat, South India, and Madhya Pradesh for an enterprise value of $900 million. This acquisition includes both operational and under-construction projects.
- Anzen India Energy Yield Plus Trust has acquired 300 MW solar project of ReNew Sun Waves. The approximate deal value was $176 million.

Source: News Articles, JMK Research

Note: Hexa Climate Solutions scaled up its portfolio by acquisition of 200 MW operational and under- development solar and wind projects from Ravindra Energy Limited (REL). The enterprise deal value is not disclosed.

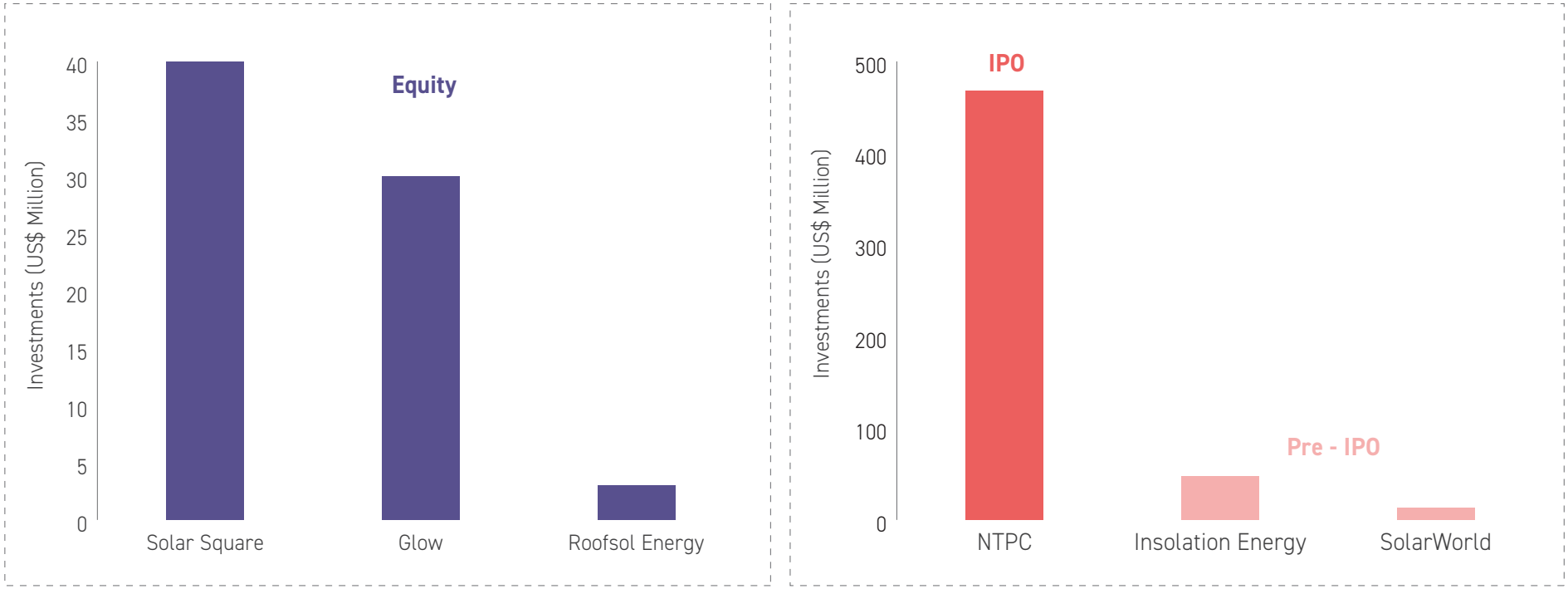
Equity:

- SolarSquare has raised $40 million in series B funding, led by Lightspeed. The company plans to use the funding to expand operations.

Debt:

- ACME Solar has raised a cumulative funding of $676.7 million from various investors:
  - ACME Sun Solar secured $ 444.7 million term loan from REC Ltd. for the development and construction of a 320 MW firm and dispatchable renewable energy (FDRE) project in collaboration with SJVN.
  - ACME Renewtech, subsidiary of ACME Solar Holdings has secured $232 million term loan from Power Finance Corporation, to fund development of 300 MW solar – wind hybrid project.

Figure 6.3: Equity Investments and IPO/ Pre – IPO raised by RE players in Q4 2024



Source: JMK Research
Note: Pre- IPO is considered as the preferential allotment of stocks of a company in advance of its listing on public exchange.

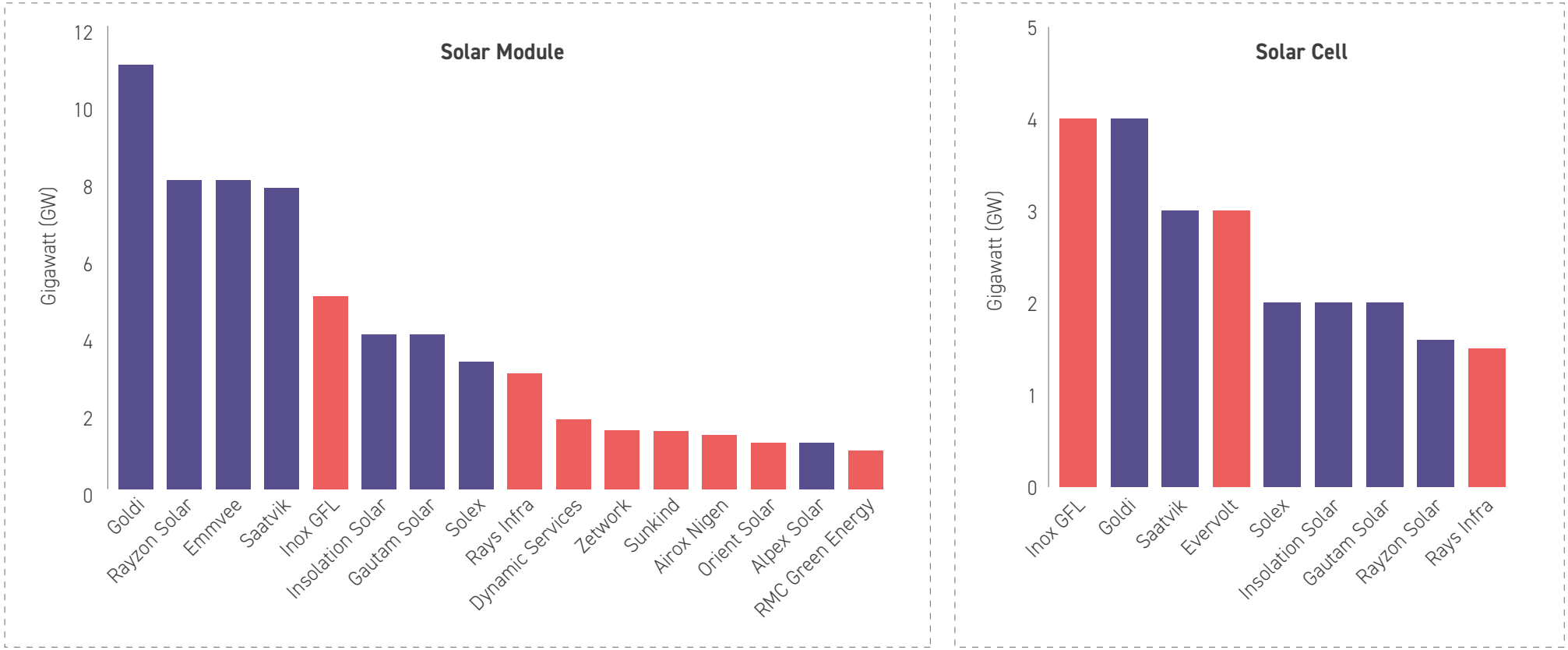
SOLAR PV MANUFACTURING

Solar Module and Cell capacity announcements by leading players in Q4 2024

In Q4 2024, 16 domestic manufacturers announced plans to establish approximately 64 GW of solar module manufacturing capacity by 2026. Several new entrants are emerging in the market to capture the growing demand in the market.

Additionally, in Q4 2024, 9 solar cell manufacturers announced plans for around 24 GW of new capacity, with three new players announcing a combined total of 8.5 GW of new capacities.

Figure 7.1: Solar Module and Cell Planned Manufacturing facilities by players in Q4 2024



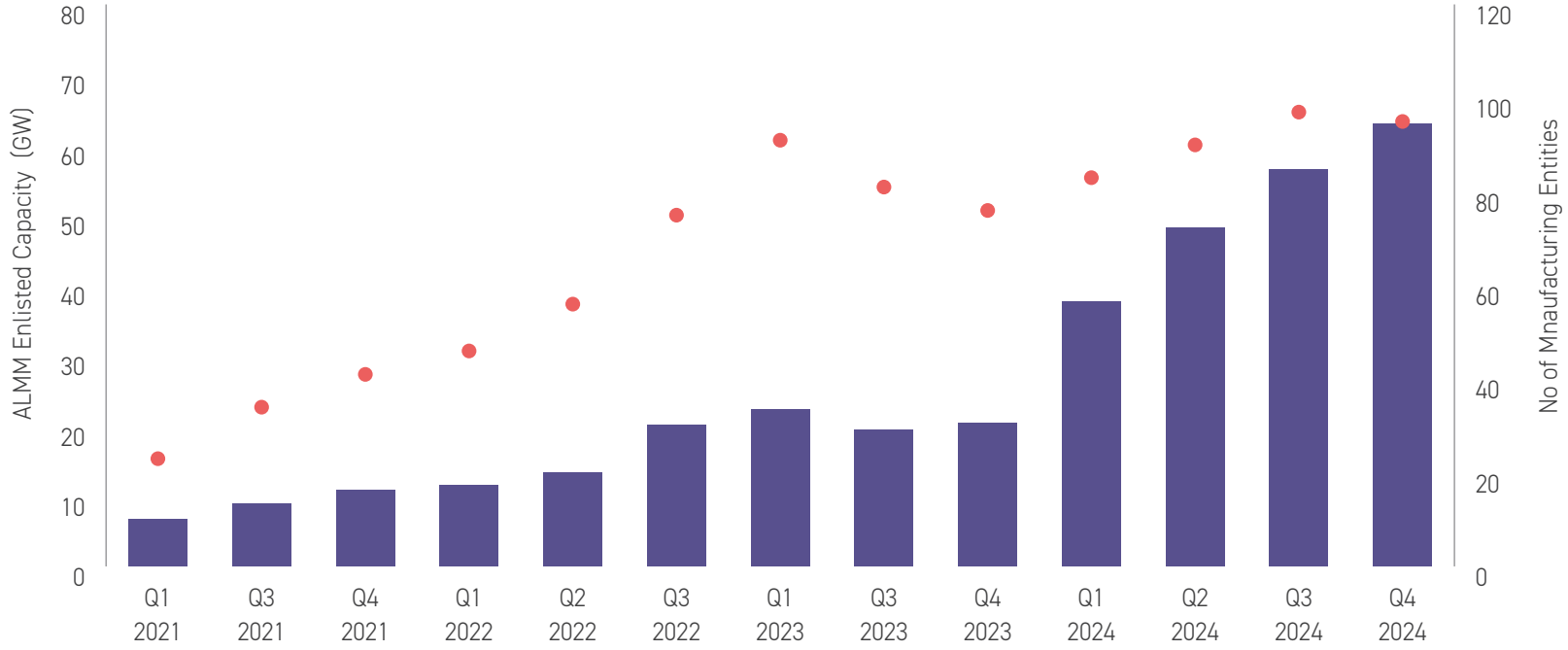
Source: News Articles, JMK Research

ALMM Enlisted Capacity Trend

As of December 2024, a capacity of 63.03 GW capacity was enlisted under the ALMM with 95 active manufacturers. In Q4 2024 (Oct-Dec), manufacturers have added a capacity of 6.68 GW. Existing players increased their registered capacity by 5.9 GW in Q4 2024. Two new entrants have registered a capacity of 0.78 GW.

In Q4 2024, SAEL added a module manufacturing capacity of 2065 MW under ALMM followed by Saatvik (1174 MW), Renew (910 MW).

Figure 7.2: ALMM enlisted capacity quarter wise



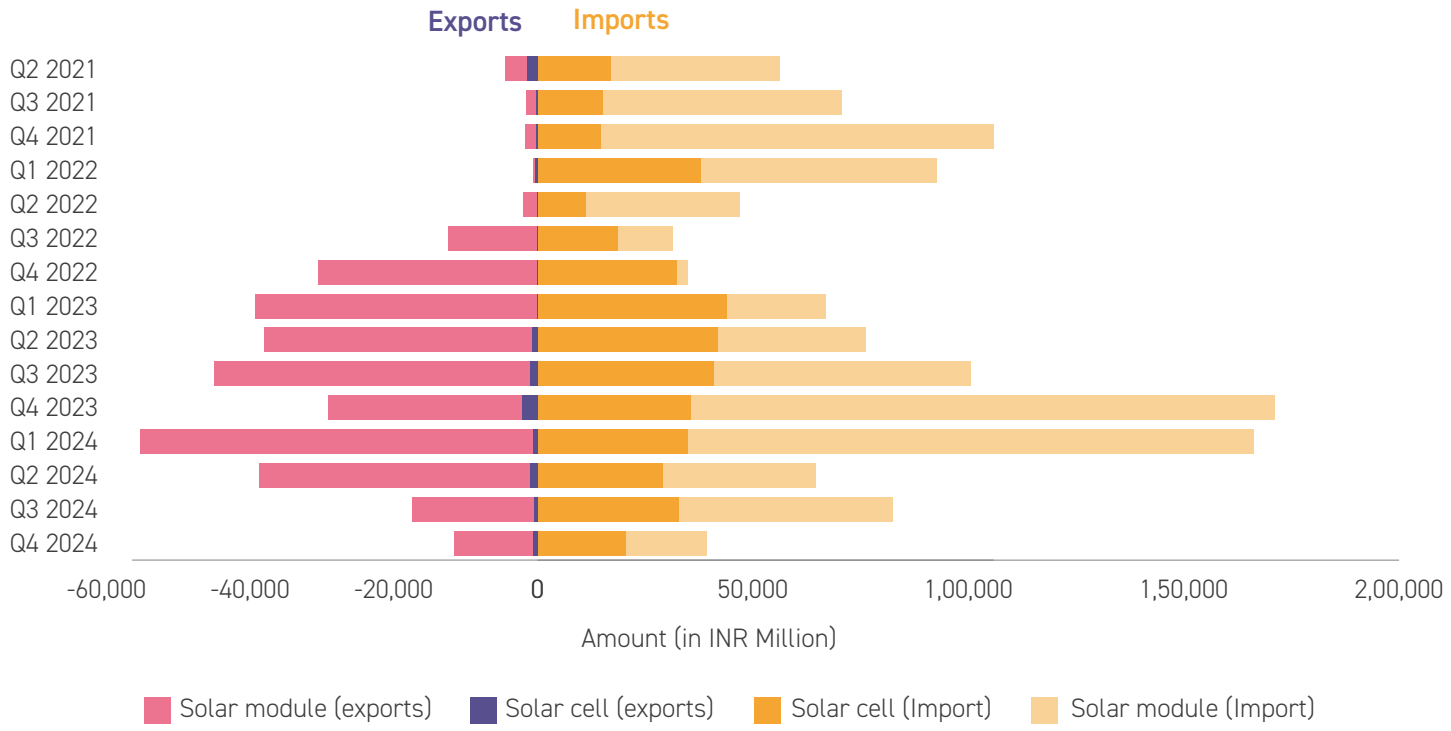
Source: JMK Research

The top 10 players have an enlisted capacity of 39.48 GW, i.e., ~69% of the total enlisted module manufacturing capacity. The top 3 players with 21.2 GW registered capacity are Waaree with 11.92 GW followed by Tata solar (5.22 GW) and Adani Mundra (4.07 GW).

Quarterly Import-Export Statistics

In Q4 2024, India witnessed a noteworthy shift in its solar photovoltaic (PV) module exports, valued at INR 18,719 million (approximately US$ 222.41 million), reflecting a decline of 62%. Furthermore, solar cell imports have plummeted by 37%, as manufacturers have started producing solar cells in India.

Figure 7.3: Quarter-wise import-export data of solar cells and modules



Source: Ministry of Commerce and Industry, JMK Research

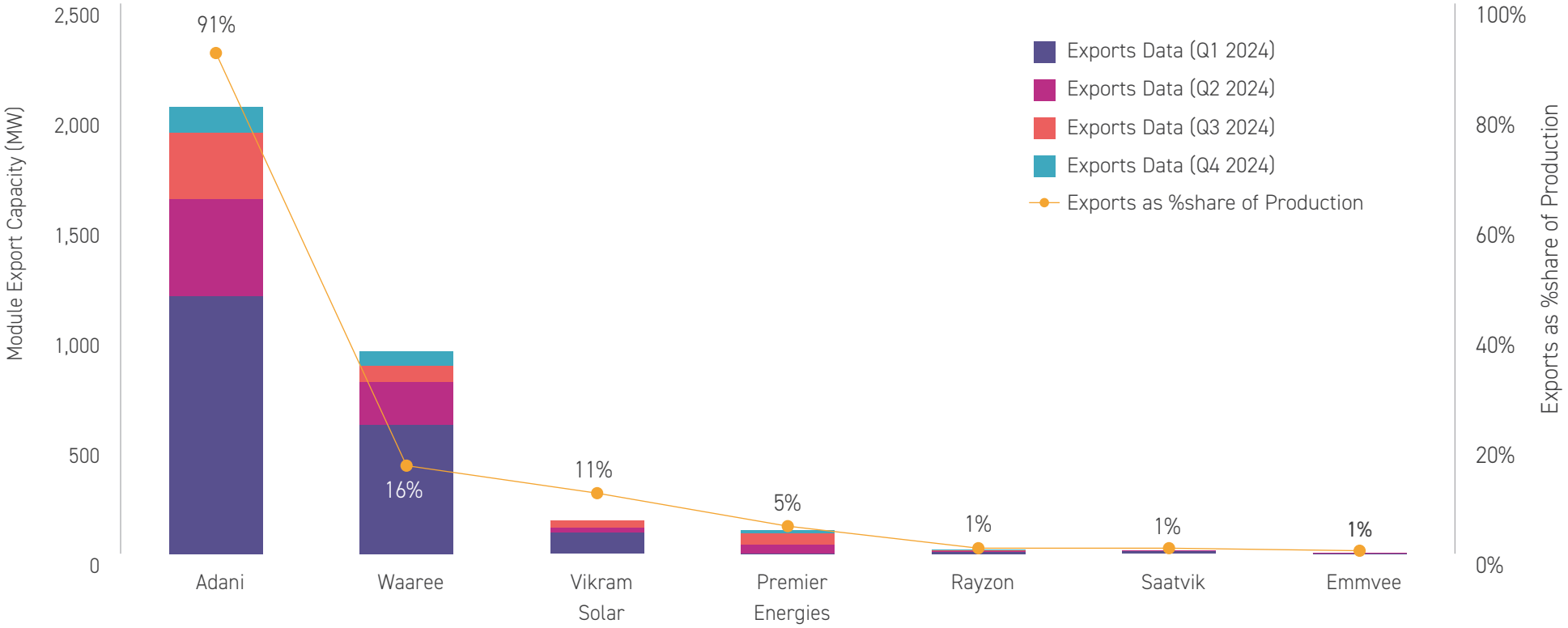
Note: Q4 2024 (YTD) includes data for Oct and November 2024. December data is not yet released by the Ministry of Commerce and Industry

In Q4 2024, India exported solar PV modules valued at $130 million, reflecting a significant decline of 36%. The USA decisively remained the dominant export market, accounting for nearly 99% of all solar PV module exports during this period.

Exports by Key Domestic Players

In 2024, leading seven players exported solar PV modules of 3.24 GW, a decline of nearly 2 GW as compared to 2023. Adani has exported 91% of its total module production in 2024. While other players accounted for lower percentage shares – Waaree (16%), Vikram solar (11%).

Figure 7.4: Leading domestic module suppliers export data quarter wise



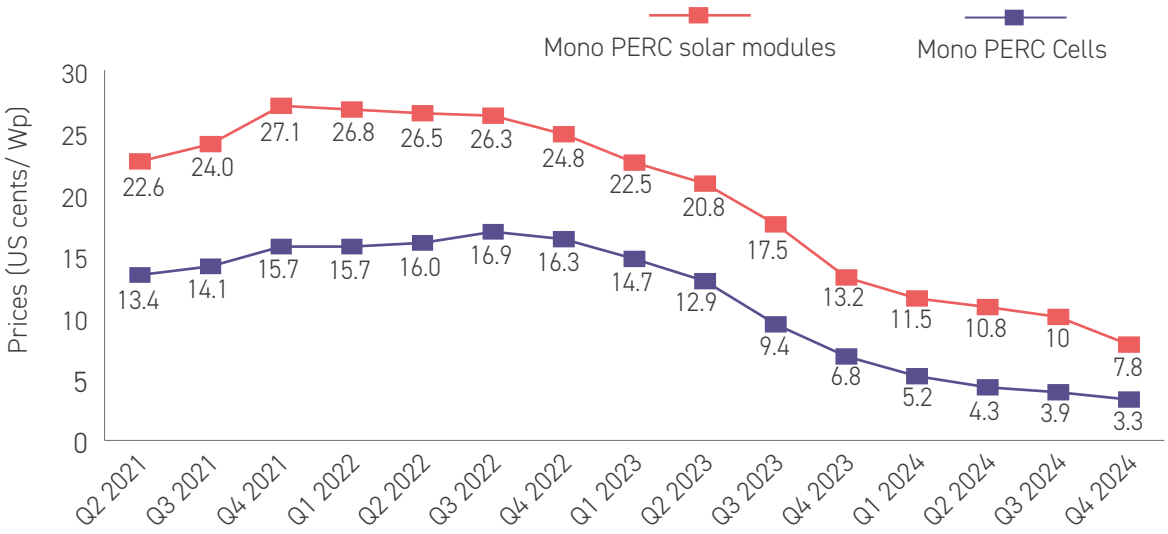
Source: JMK Research

PRICE TRENDS

Global Average Prices for Modules

- In Q4 2024, solar cell and mono-PERC module prices in the overseas market decreased by 15% and 22.4% QoQ, respectively.
- Moreover, on a year-over-year basis, solar cell prices dropped significantly by 62%, and mono PERC module prices decreased by 46%.

Figure 8.1 : Global price trends of solar cells and modules in Q4 2024



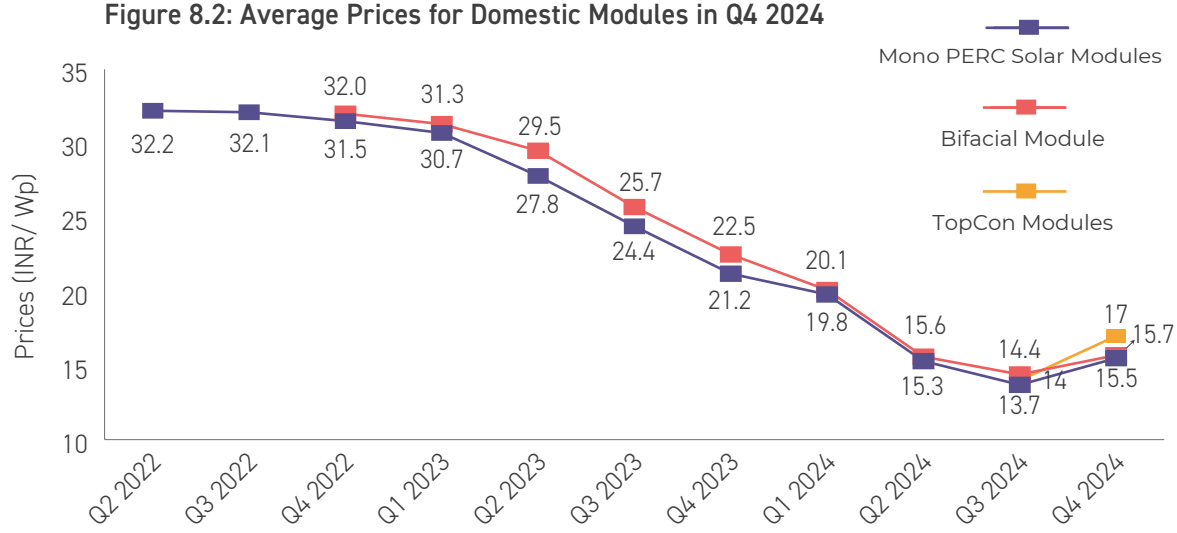
Source: PV Info, JMK Research

Average Prices for Domestic Modules

In Q4 2024, the price of mono PERC 500 Wp modules was INR 17/Wp, marking a 13% increase from Q3 2024 and 38% decline year over year. Additionally, bifacial modules were priced at INR 15.7/Wp, an increase of 12% from the previous quarter and a 40% decrease year over year.The domestic prices TopCon modules in Q4 2024 saw an increase of around 21% compared to Q3 2024.

This notable price hike of INR 2.5/Wp – INR3/Wp can be attributed to the imposition of a 10% BCD and anti-dumping duties on solar glass.

Figure 8.2: Average Prices for Domestic Modules in Q4 2024

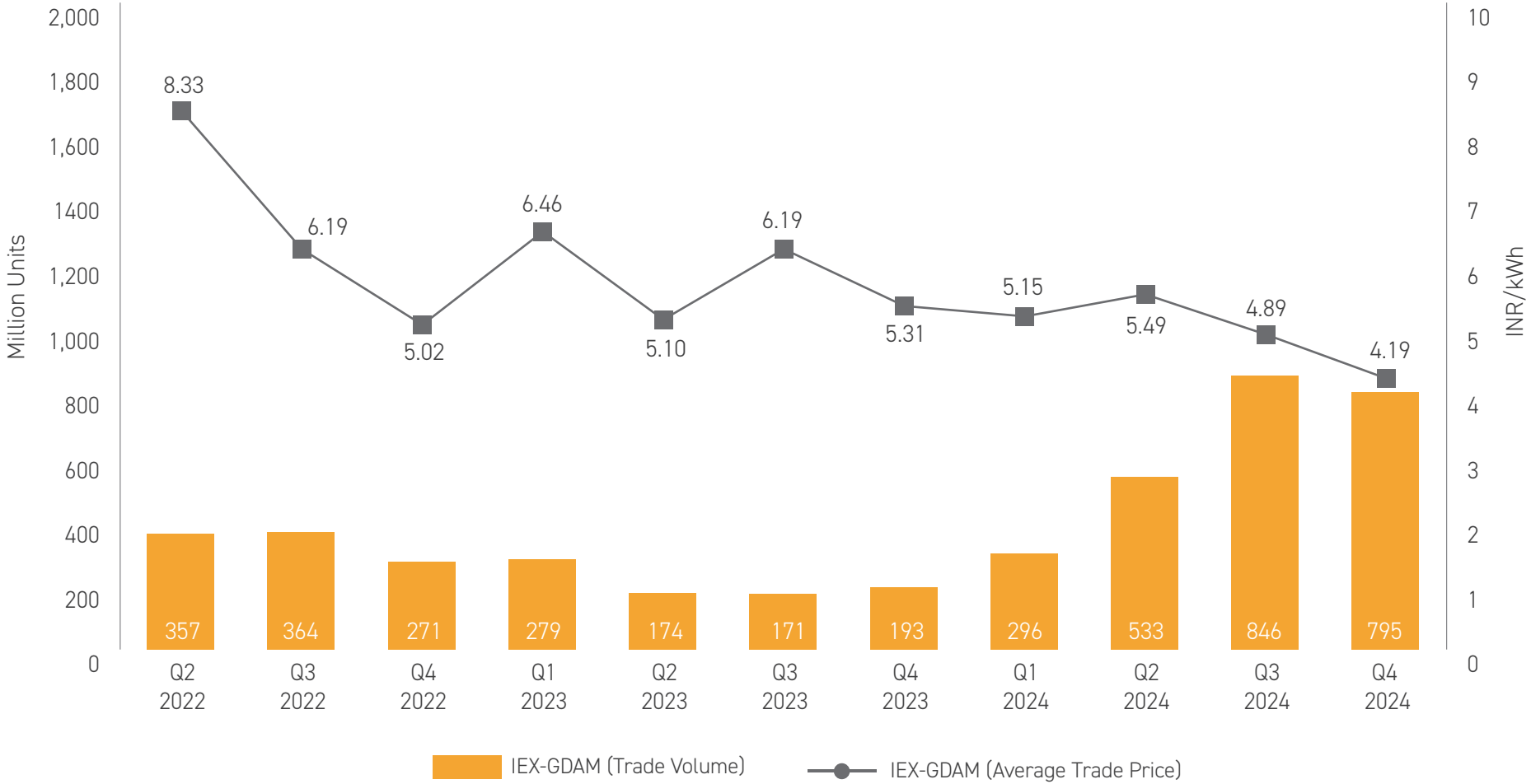


Source: JMK Research
Note: Domestic module prices are all inclusive prices till project site including freight charges, GST, etc

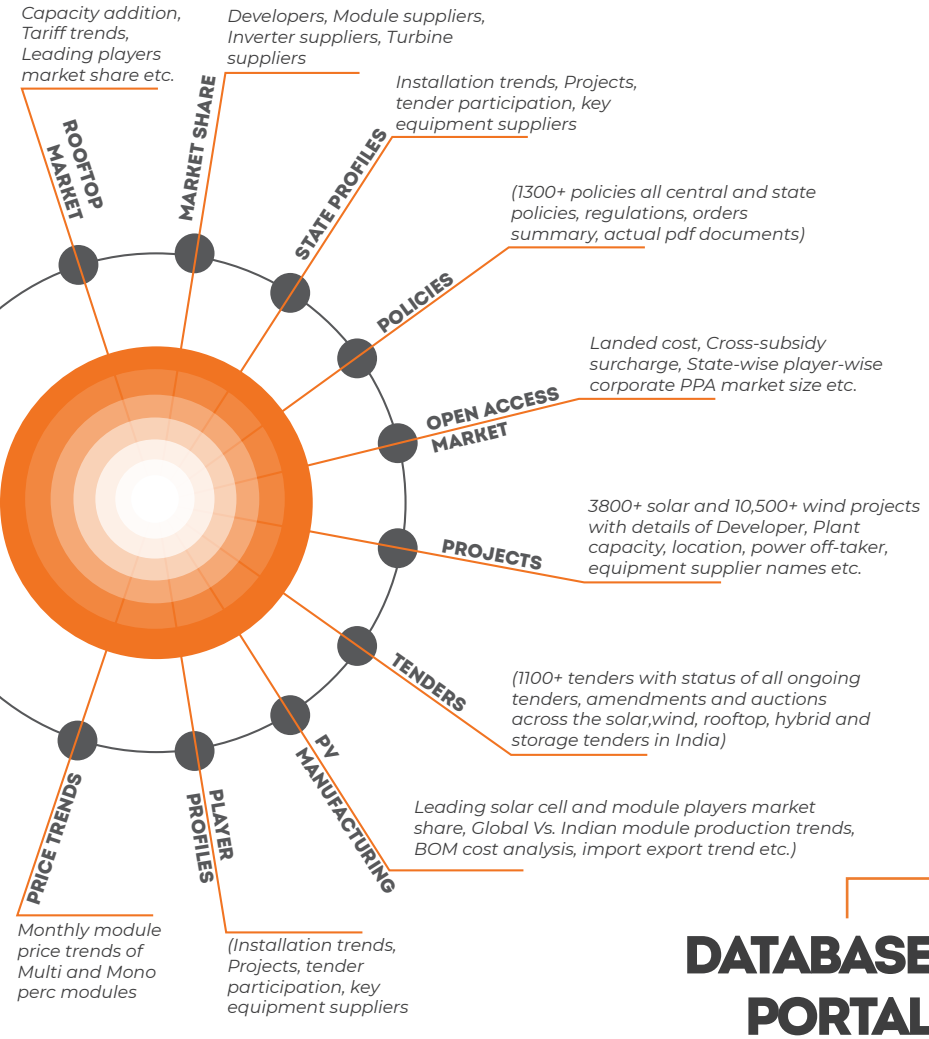
GDAM TRADED VOLUME

The IEX traded a total volume of about 795 MU in GDAM in Q4 2024, which is 0.6% less than the volume traded in Q3 2024. The average trade price in IEX-GDAM for Q4 2024 was INR 4.19/kWh which is 14% less than the price in Q3 2024. This significant decrease in price is due to the increased supply side liquidity in the DAM segment contributing to moderating prices on the exchange.

Figure 9.1: Quarter wise GDAM Traded volume and Price Trend



Source: IEX, JMK Research



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