SAPVIA

South African Photovoltaic Industry Association

THE VOICE OF SOLAR PV IN SOUTH AFRICA

2024

# Overview of the Solar PV Industry in South Africa

## Overview of REIPPPP, Private Utility Scale Projects, and Regulatory Developments

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**Designation:** CEO
**Date:** 13 November 2024

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# About Us

## WHO WE ARE

The South African Photovoltaic Industry Association (SAPVIA) is a non-profit industry association established in 2010 and officially registered in 2013: To promote, develop and grow the Photovoltaic ("PV") industry as part of the wider renewable energy sector in South Africa.

## OUR VISION

**For solar PV to be a significant and reliable contributor to the South African electricity mix; by 2050, there is:**

- **Energy Security**, solar PV is used as an infinite daily energy resource
- **Policy and Market Alignment**, where clear laws and policies complement one another, and public-private partnerships enable the growth of the solar market, and
- **Environmental & Market Sustainability** through decarbonized energy and creation of economic development opportunities

## OUR MISSION

**As the voice of the solar PV industry in South Africa, our mission is to support and represent our members. We:**

- Shape and influence regulations and policy development
- Inform and educate members and other stakeholders
- Facilitate partnerships and collaboration
- Promote higher usage of solar PV in the public & private sector

**Through our support, our members:**

- Deploy and invest in quality solar PV
- Facilitate greater accessibility and affordability of solar PV
- Create jobs, economic opportunities and develop skills

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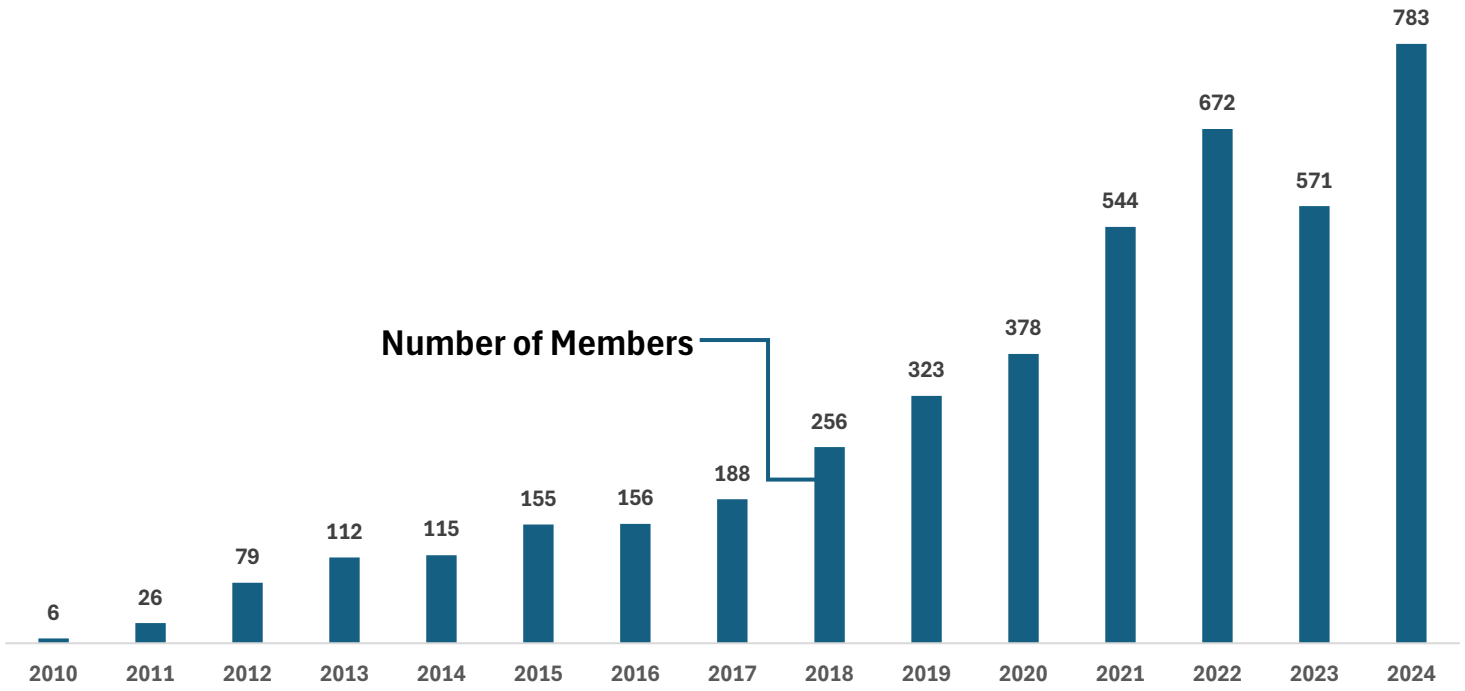
# Membership Overview

## Current membership landscape

### Overall Membership Growth Trend




### Key Insights

- **Steady Growth with Periods of Acceleration**: SAPVIA's membership shows consistent growth, with notable accelerations in certain years.
- **Exponential Growth in Recent Years:** The Association has experienced exponential growth in the last decade.

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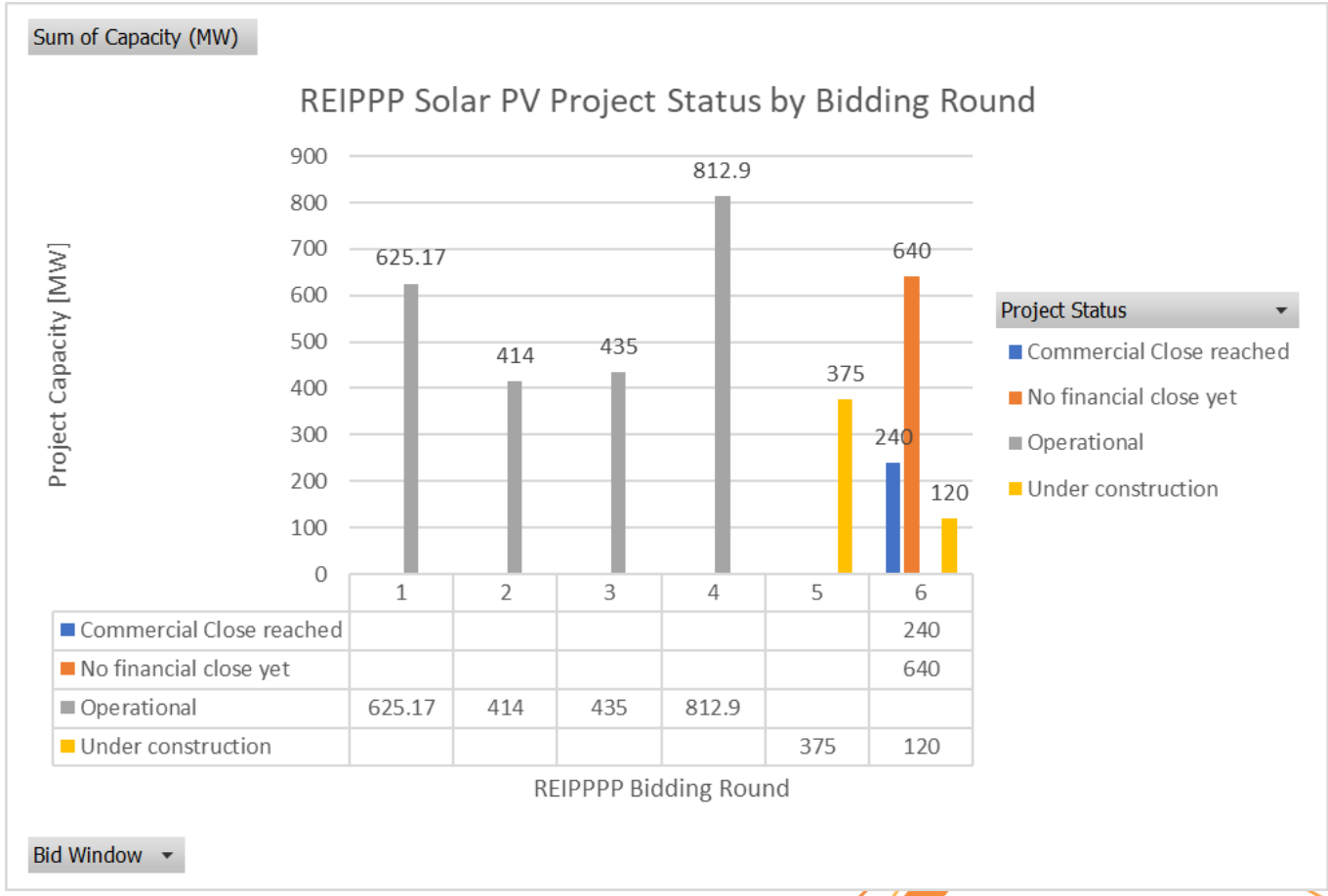
# Overview of REIPPPP and Bidding Rounds

**Goal of REIPPPP:** Accelerate energy transition by procuring renewable energy through competitive bidding
**Total Solar PV Capacity:** 3662 MW, procured across various bidding rounds (Excludes RMIPPPP projects)

## Solar PV Projects by Development Stage

| REIPPP Bidding Round | Commercial Close reached | No financial close yet (Preferred Bidder Awarded) | Operational | Under construction | Total |
|---|---|---|---|---|---|
| **1** | | | 625 | | 625 |
| **2** | | | 414 | | 414 |
| **3** | | | 435 | | 435 |
| **4** | | | 813 | | 813 |
| **5** | | | | 375 | 375 |
| **6** | 240 | 640 | | 120 | 1000 |
| **Total** | **240** | **640** | **2287** | **495** | **3662** |

*This table shows the progression of projects across development stages.*




*Excludes RMIPPPP project procurement. Example SCATEC Kenhart - 540MW Solar PV total capacity, 120MW dispatchable.



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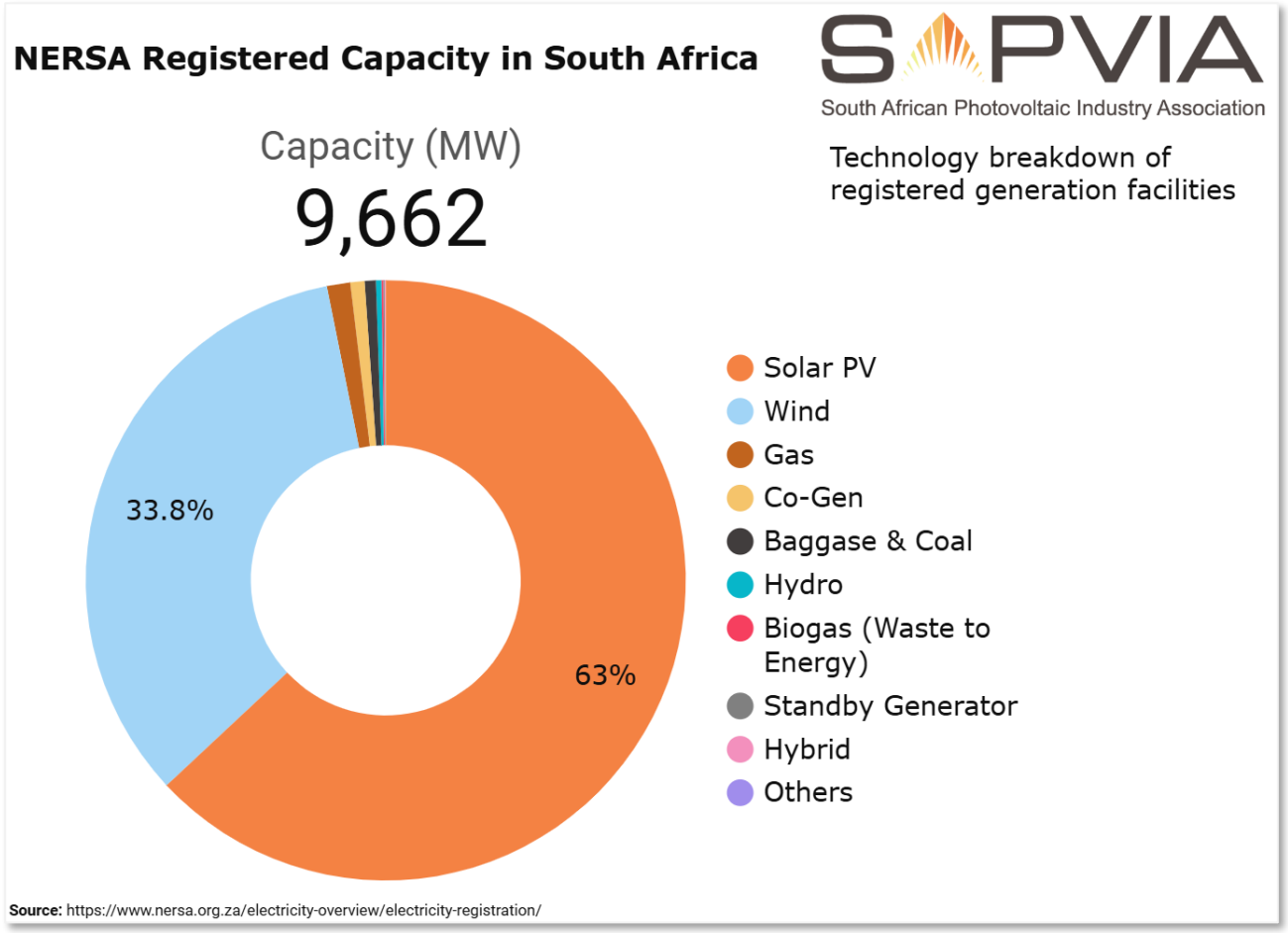
# Overview of The South African Private Market




**Minimum Size of Projects Registered: 100 kWp**

- Solar PV: 63% (6090 MW)
- Wind: 33.8% (3267 MW)

**2023 Registrations:** 4529 MW
**2024 Registrations:** 3235 MW (Year to date)

**Private Investment in Generation Capacity Driven By:**

- Security of Supply Concerns
- Energy Cost Certainty
- Supply Chain Decarbonisation/Global competitiveness
- Wheeling Agreements
- Aggregators and Traders

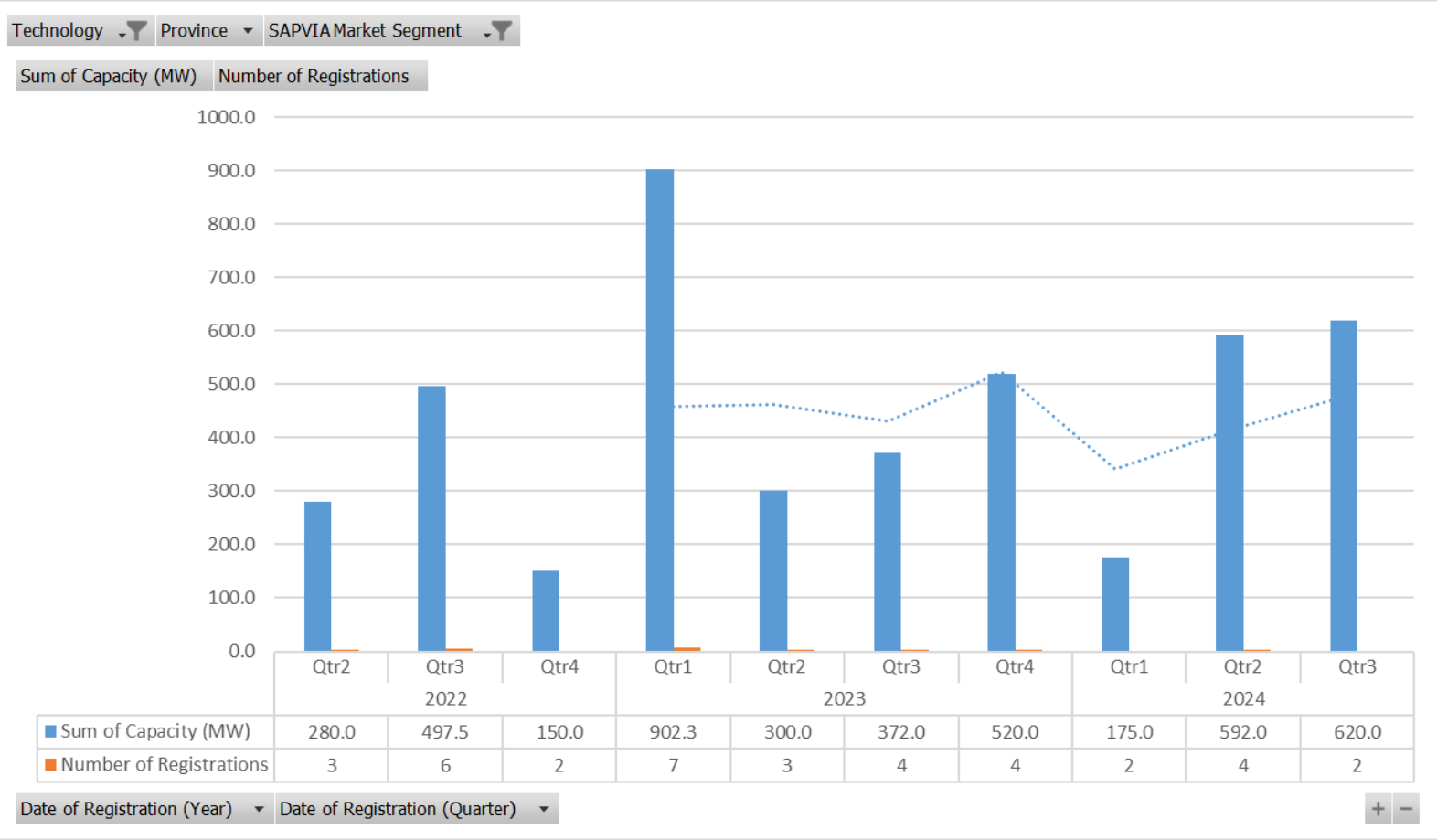
- SA PV (and wind) market was initially dominated by public utility-scale procurement through the REI4P
- Demand has swung from reliance on REI4P utility scale projects towards private projects
- Large scale commercial and industrial (C&I), Smaller scale embedded generation (SSEG) and Residential
- REI4P projects likely to remain major part of SA demand but private projects will be of a similar magnitude
- 4461MW of Solar PV Capacity likely designed for wheeling. 44% of the Total registered capacity and 73% of the Total Solar PV registered capacity.

**Link:** SAPVIA NERSA Registrations dashboard

# Private Utility

(mining from our packaged NERSA data)

## NERSA Registered Utility Scale Solar PV Projects (>50MW)




*Dashed blue line indicates quarterly rolling average of installed capacity

### NERSA REGISTRATIONS DATABASE:

- Regulatory requirement: ERA
- Financial close requirement

### 37 PROJECTS REGISTERED

- Total Capacity: 4409 MW
- Free State: 1072 MW
- Northern Cape: 1020 MW
- Northwest: 975 MW

### ENABLING ENVIRONMENT

- ERA Schedule 2 amendment, 2021. Lifting of licencing requirements from 1MW to 100MW and removal in DEC 2022

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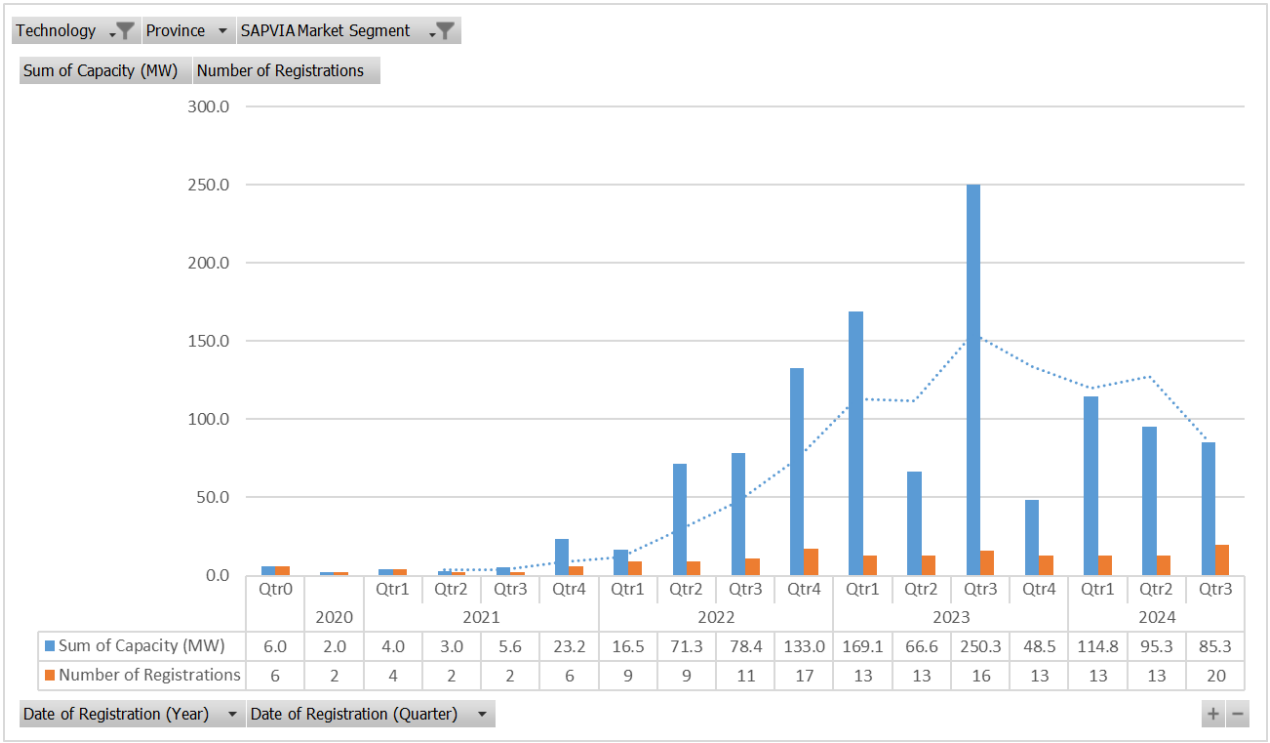
# C&I Solar Projects Registered With NERSA

- **NERSA C&I Large Scale (1-50 MW)** capacity shows robust growth.
- **NERSA SSEG (sub-1MW)** also contributes, with recent trends indicating a consistent rise as per the rolling average.

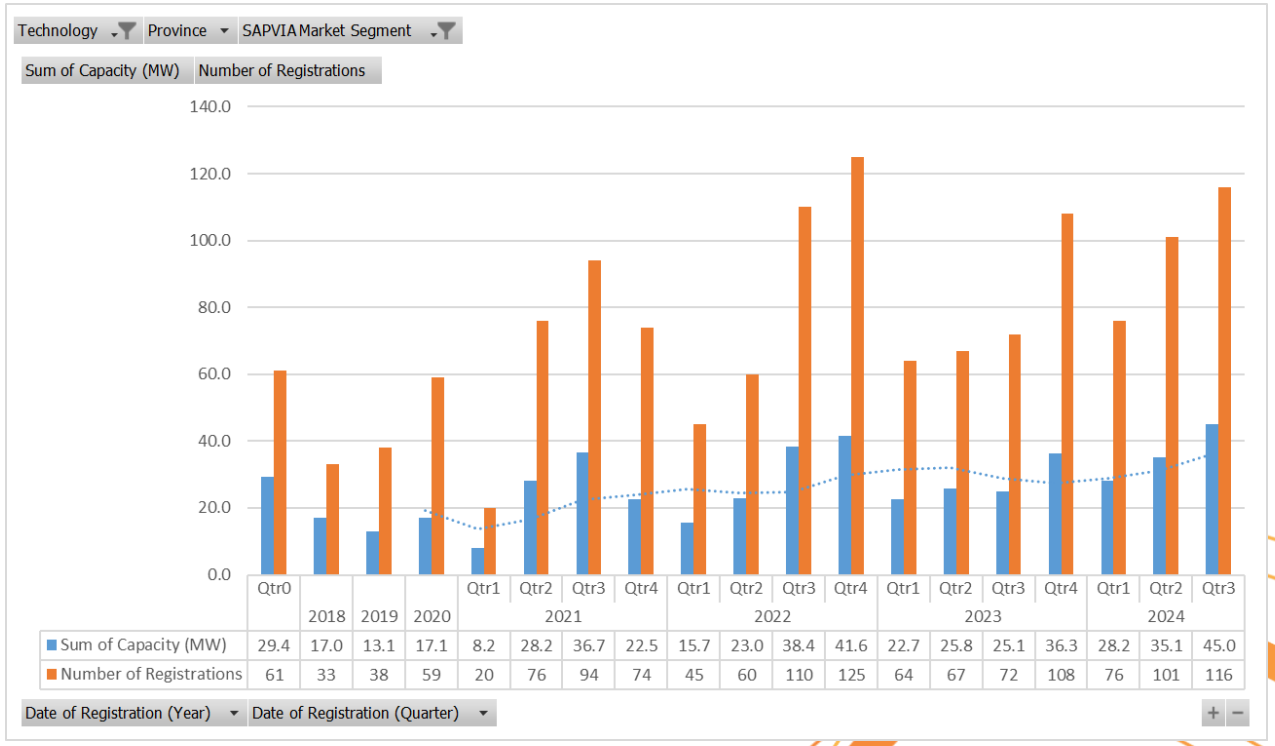
## NERSA Registered C&I large Scale Solar PV Projects (1-50MW):




| | Qtr0 | 2020 | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Qtr1 | Qtr2 | Qtr3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2021 | | | | 2022 | | | | 2023 | | | | 2024 | | |
| Sum of Capacity (MW) | 6.0 | 2.0 | 4.0 | 3.0 | 5.6 | 23.2 | 16.5 | 71.3 | 78.4 | 133.0 | 169.1 | 66.6 | 250.3 | 48.5 | 114.8 | 95.3 | 85.3 |
| Number of Registrations | 6 | 2 | 4 | 2 | 2 | 6 | 9 | 9 | 11 | 17 | 13 | 13 | 16 | 13 | 13 | 13 | 20 |

*Dashed blue line indicates quarterly rolling average of installed capacity

## NERSA Registered SSEG Solar PV Projects (<1MW):




| | Qtr0 | 2018 | 2019 | 2020 | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Qtr1 | Qtr2 | Qtr3 | Qtr4 | Qtr1 | Qtr2 | Qtr3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2021 | | | | 2022 | | | | 2023 | | | | 2024 | | |
| Sum of Capacity (MW) | 29.4 | 17.0 | 13.1 | 17.1 | 8.2 | 28.2 | 36.7 | 22.5 | 15.7 | 23.0 | 38.4 | 41.6 | 22.7 | 25.8 | 25.1 | 36.3 | 28.2 | 35.1 | 45.0 |
| Number of Registrations | 61 | 33 | 38 | 59 | 20 | 76 | 94 | 74 | 45 | 60 | 110 | 125 | 64 | 67 | 72 | 108 | 76 | 101 | 116 |

*Dashed blue line indicates quarterly rolling average of installed capacity

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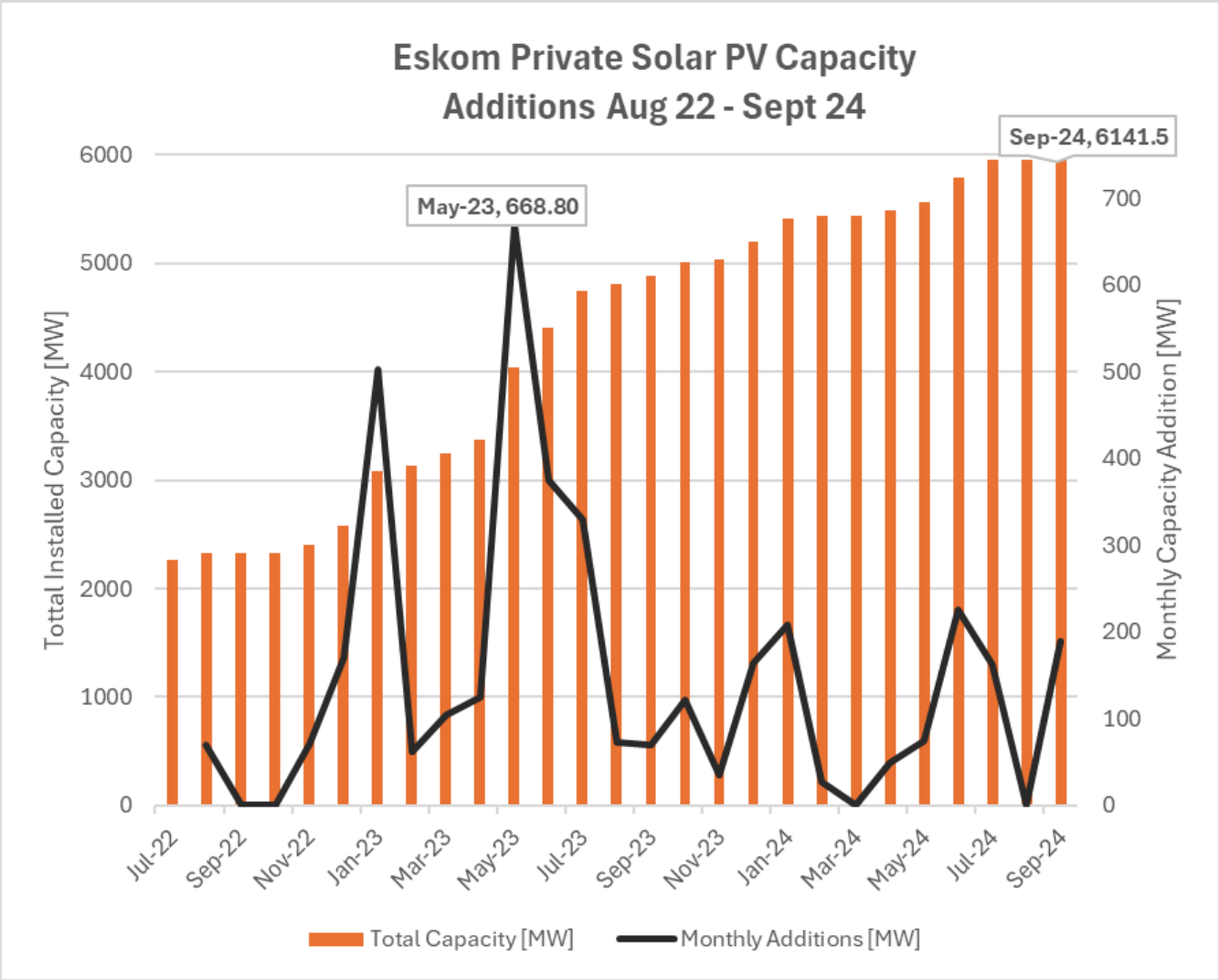
# Private Solar Capacity Additions




**Source:** Eskom/NTSCA Weekly System Status Reports

## ESKOM/NTCSA METHODOLOGY:

- System Operator load forecasting teams compare residual load on sunny and cloudy days
- Data publicly available on weekly system status reports
- Captures **ALL** private sector capacity additions. Residential, C&I and Utility scale.

- **2023 Total capacity added:** 2629 MW
- **2024 Total capacity added:** 937 MW (Year to date)

- **2023 Average Monthly capacity added:** 220 MW
- **2024 Average Monthly capacity added:** 104 MW

## TOTAL OPERATIONAL SOLAR PV CAPACITY

- REI4P: 2287 MW (Round 5 – 375 MW 2025 COD)
- RMIPPPP: 540 MW
- PRIVATE: 6142 MW
- **TOTAL: 8969 MW**

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# Residential Market

**Observations and challenges include:**

- **Market Slowdown:** A 60-80% reduction in project volumes from 2023 to 2024, attributed to reduced demand following the suspension of load-shedding in March 2024.
- **Low Compliance and Registration Rates:** Many systems connected to distribution networks remain unregistered, with non-compliance prevalent in the residential market.
- **Inconsistent installation quality:** Large variation in system installation quality and electrical safety across installation industry and municipalities.

**Key Interventions:**

- **Solar Investment Incentives:** Offer tax benefits and grants for installations. Specifically targeting middle income households.
- **National SSEG Framework:** To standardize system registration and compliance across municipalities, a national registration portal could help streamline the process.
- **National Solar PV Registration online portal and database:** To streamline and enable registration of all Solar PV systems, especially in municipalities lacking capacity to develop internal systems. Successful implementation in India.
- **National Installation Standard (SANS 10142-1 Update)**: SABS aiming for an updated version by the end of 2024, which would clarify the requirements for grid connected solar PV and BESS systems and improve compliance.

**Supply Side Intervention:**

- **Compulsory Specifications**: Currently no compulsory specifications for Solar PV and BESS.
- NRCS to be approached to adopt compulsory specifications for Solar PV equipment and BESS.

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# Recommendations on support mechanisms to increase rate of deployment of Utility Scale Solar PV capacity

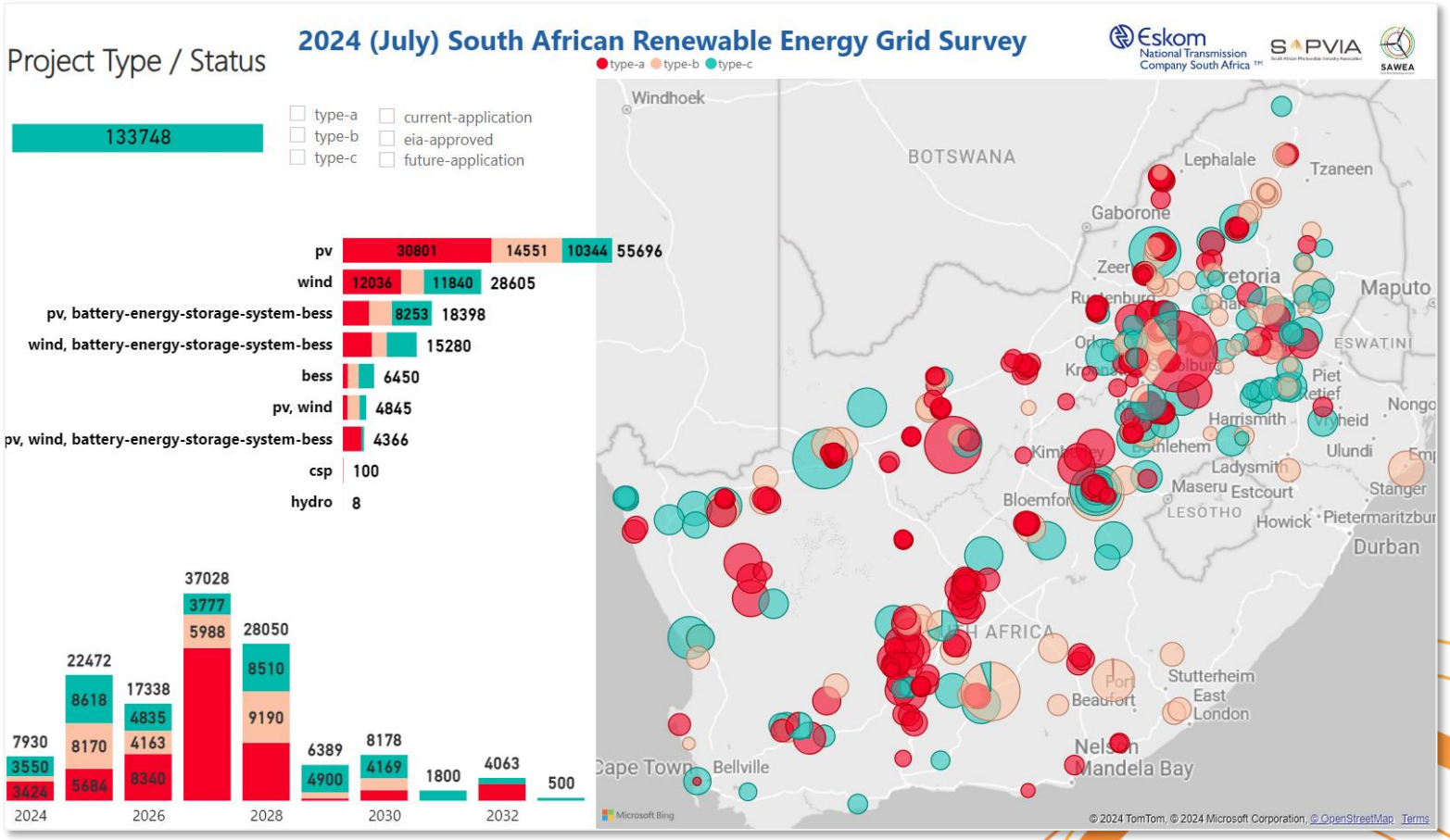
**1. Strengthen NERSA and Eskom Grid Access Unit Capacity:** Increase resources for faster licensing and compliance enforcement.

**2. Codification of grid access and grid connection queuing rules:** Reduce industry uncertainty regarding regulatory requirement for new generation facilities.

**3. Transmission infrastructure development:** To increase the available grid connection capacity in high solar potential areas (NC, FS, NW)

**4. Flexibility of connection agreement amendments**: Enable future expansion of BESS and hybrid technologies at same utility connection point.

**5. Promote uptake of grid enhancing and monitoring technology:** increase available grid capacity through active network and generation management like curtailment.

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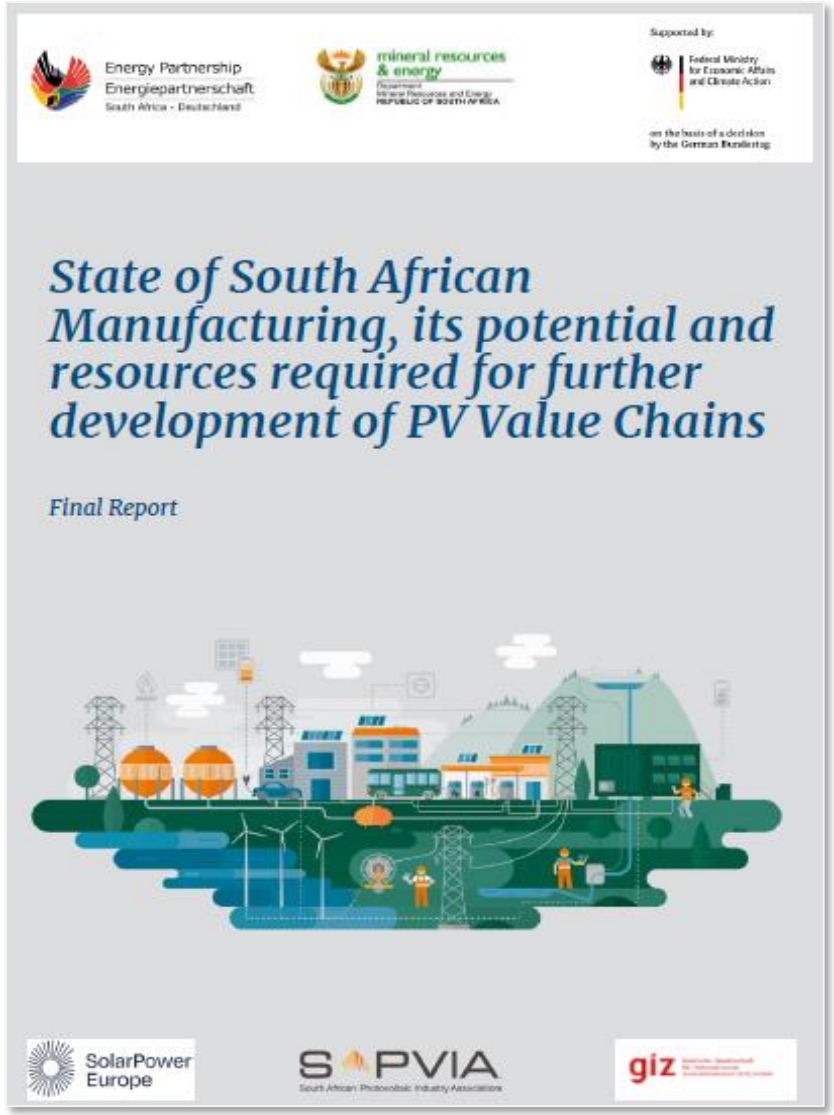
# State of SA Manufacturing




| Components | Locally Manufactured Brands | Jobs | Domestic Market Penetration |
|---|---|---|---|
| Solar PV Modules | 2 | 50 -100 | <15% |
| Inverters | 4 | 190 -0210 | 10% |
| Mounting racks | 7 | 500 -0600 | <5% |
| Combiner boxes | 3 | 650 -0700 | 75% |
| Cables | 3 | 50 -70 | 5% (Solar Cables)<br>75% LC Cables) |
| Trackers and Monitoring | 5 | 250 -300 | 75% |
| Charge controllers | <5 | 100 -150 | 30% |
| Switchgear | 4 | 400 – 450 | 50% |
| Circular breakers and surge protective devices (SPD) | 2 | 10 -20 | 30% |
| Transformers | 9 | 500 -600 | 50% (Solar); 65%(MV) |
| Conduits and fittings | 7 | 200 -220 | 75% |

**Source:** SAPVIA (2022)

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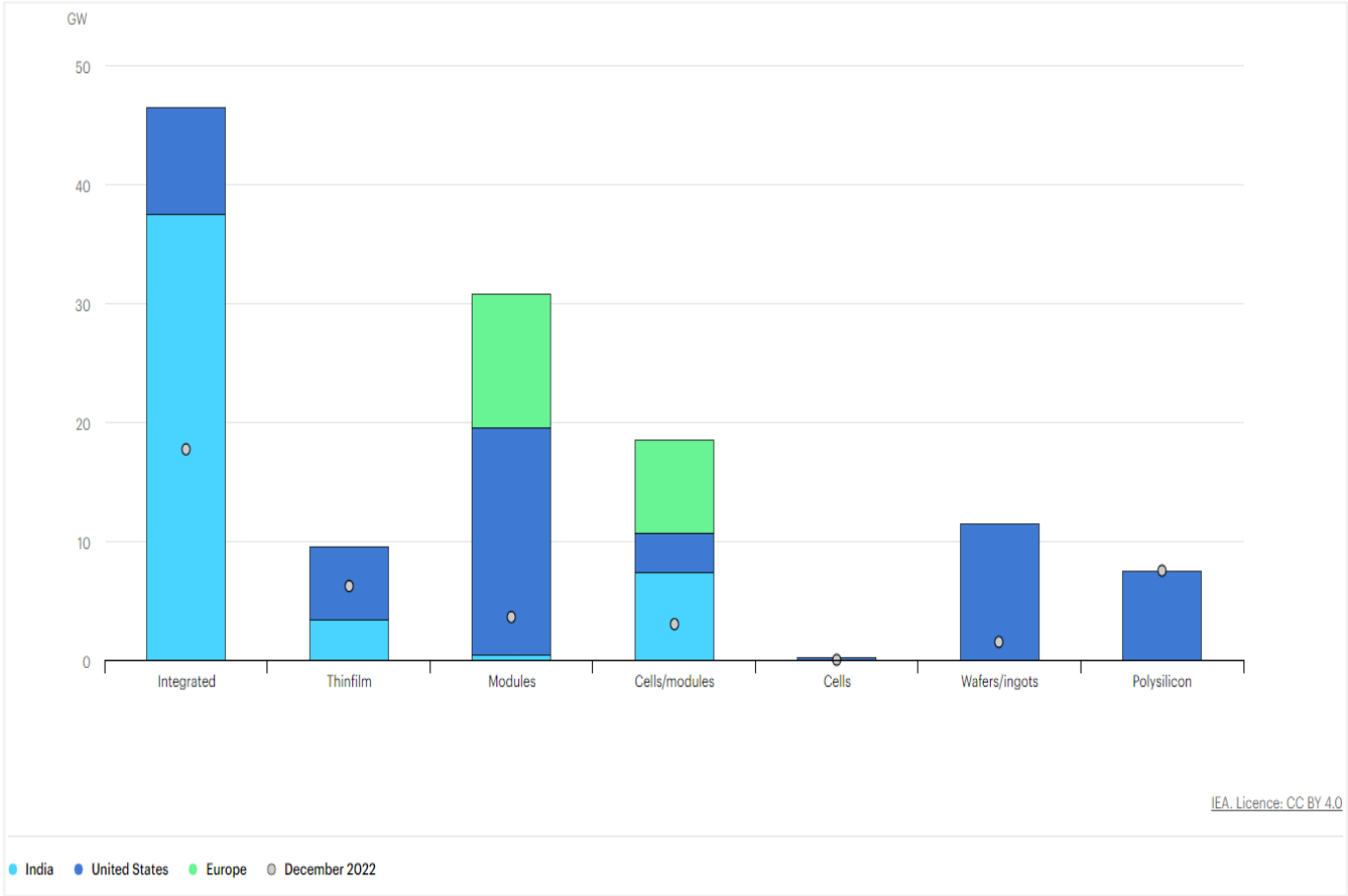
# Insights from State of Manufacturing

## Report

- China has built up overwhelming dominance in solar photovoltaic (SPV) value chains through demand and supply side policies: > 80% share in panel value chain
- Exponential reduction in PV prices: from US$5.00 per watt in 2005 to US$0.38 in 2019
- Various industrial, trade and regulatory policies, e.g.
- Inflation Reduction Act
- Green Deal Industrial Plan
- Various developing countries seeking to establish capabilities in solar PV
- India and Türkiye: targeting integrated panel and module production
- Many countries assemble modules: Vietnam, Malaysia, Thailand … South Africa
- Solar PV panel and module value chain have captured the primary attention of policy makers, including in South Africa.

**Announced solar PV manufacturing capacity by region and component, 2022-2023**



# Localisation Opportunities

## (Based on SAREM and SAPVIA scenarios)

| Modules | Mounting Structures and Trackers | Cables and Combiner Boxes | Inverters | Balance of Plant: Electrical | Balance of Plant: Civil | End of Life Management |
|---|---|---|---|---|---|---|
| Lamination | Steel profiles | AD/DC cables | Centralised inverters | DC and AC network (cables) | Installation, logistics, construction | Recycling of panels |
| Junction Box | Aluminium profiles | 1. Conductors (copper, aluminium rods) | Magnetics | Surge protection devices | Access roads and gates | Reuse (panels, structures, inverters) |
| Aluminium Frames | Tracker communication boxes | Insulation (polymers) | Enclosures | Switchgear | Miscellaneous site civils (drainage, field prep) | Recycling of steel structures and electrical components |
| Super-Substrate (glass) | Brackets and clamps | Armour (steel) | Transformers | Charge controllers and monitoring systems (excl. semi-conductors) | O&M buildings | |
| Copper wiring | | Combiner boxes | Circuit boards | Conduits and fittings | | |
| Backing Sheet | | DC cables connectors | Power stage and electronics | MV/HV transformer | | |
| Ethylene Vinyl Acetate | | Normal cables | String Inverters | Earthing grid | | |
| Silicon | | | | Control room | | |
| Poly/ monosilicon | | | | | | |
| Ingots and Wafers | | | | | | |
| Cells | | | | | | |

### KEY TO COLOURS

| |
|---|
| Moderate support measures and capabilities development required |
| Intermediate support measures and capability development required |
| Intensive support measures and capability development required. |

# Module Import Duty and Rebate

- In July 2024, a 10% import duty and rebate was introduced in response to an application received with a report of finding released in 2021.
- SAPVIA has had several positive engagements with ITAC since the introduction of the rebate including online meetings and information sharing sessions.
- ITAC has committed to issuing import permits until the end of January 2025.

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# Conclusion and Recommendations

## Key Takeaways:

- Solar PV has significant potential to solve South Africa's energy trilemma, provided regulatory and policy barriers are addressed.
- A national, streamlined framework and standardized compliance for SSEG and BESS are critical.
- Government and Parliamentary support for these reforms is essential to drive South Africa's renewable energy future.

## SAPVIA's contributions:

- Engage with stakeholders on standardized processes
- Continue to advocate for robust NERSA and Grid Access Unit  capacities.
- Monitor upcoming SANS standards release and drive NRCS applications for Solar PV and BESS equipment.
- Support informed local component manufacturing

## Final Call to Action:

Let us work together to create a robust, sustainable Solar PV ecosystem that secures our energy independence and meets environmental commitments.

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# Q&A

Thank You