2023 LARGE-SCALE RENEWABLE ENERGY MARKET INTELLIGENCE REPORT

SOUTH AFRICA UKPACT

GreenCape

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GREENCAPE

GreenCape is a non-profit organisation that works at the interface of business, government, and academia to identify and remove barriers to economically viable green economy infrastructure solutions. Working in developing countries, GreenCape catalyses the replication and large-scale uptake of these solutions to enable each country and its citizens to prosper.

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This publication has been made possible with the financial support of UK PACT (Partnering for Accelerated Climate Transitions). UK PACT is jointly governed and funded by the UK Government's Foreign, Commonwealth and Development Office (FCDO) and the Department for Business, Energy and Industrial Strategy (BEIS) through the UK's International Climate Finance. It works in partnership with countries with high emissions reduction potential to support them in implementing and increasing their ambitions for tackling climate change. The contents of this publication are the sole responsibility of GreenCape and do not necessarily reflect the views of the funders.

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LIST OF ABBREVIATIONS AND ACRONYMS

AU	African Union
BESS	Battery energy storage systems
BW	Bid window
CAGR	Compound annual growth rate
CBAM	European Carbon Border Adjustment Mechanism
CoCT	City of Cape Town
COP26	Conference of the Parties to the 2021 UN Framework Convention on Climate Change
CSIR	Council for Scientific and Industrial Research
CSP	Concentrated solar power
DBSA	Development Bank of Southern Africa
DE	Distribution entity
DEA	Department of Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DSI	Department of Science and Innovation
DG/EG	Distributed Generation/Embedded Generation
dtic	Department of Trade, Industry and Competition
EAF	Energy availability factor
EIUG	Energy Intensive Users Group
EKF	Danmarks Eksportkredit, (Denmark Export Credit Agency)
EPC	Engineering, procurement, and construction
ERA	Electricity Regulation Act No 4 of 2006
GCCA	Generation Connection Capacity Assessment
GE	Generation entity
GFD	Green Finance Desk
GWp	Gigawatt peak
ICE	Internal Combustion Engine
ICN	International Cleantech Network
IDC	Industrial Development Corporation
IDZ	Industrial Development Zone
IEA	International Energy Agency
IEC	International Electrotechnical Commission
IEP	Integrated Energy Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IPPO	Independent Power Producers Office

IRENA	International Renewable Energy Agency
IRP	Integrated Resource Plan
kWh	Kilowatt-hour
Li-ion	Lithium-ion
MEC	Maximum Export Capacity
MES	Minimum Emission Standard
MWp	Megawatt peak
NDP	National Development Plan
OCGT	Open cycle gas turbine
OEM	Original equipment manufacturer
O&M	Operation and maintenance
PPA	Power purchase agreement
PPD	Peak plateau decline
PPPFA	Preferential Procurement Policy Framework Act
PV	Photovoltaic
R&D	Research and development
RE	Renewable energy
RECP	Renewable Energy Cooperation Programme
REFIT	Renewable energy feed-in-tariff
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RFB	Request for Bid
RFP	Request for Proposal
RMIPPPP	Risk Mitigation Independent Producer Procurement Programme
RMB	Rand Merchant Bank
RMI	Risk Mitigation Instruments
SAESA	South African Energy Storage Association
SAPVIA	South African Photovoltaic Industry Association
SAREM	South African Renewable Energy Masterplan
SARETEC	South African Renewable Energy Technology Centre
SAWEA	South African Wind Energy Association
SED	Socio-economic development
SEZ	Special Economic Zone
SIPs	Strategic infrastructure projects
SSEG	Small-scale embedded generation
SMC	Supply Management Chain
TE	Transmission Entity
VRE	Variable Renewable Energy
WACC	Weighted Average Cost of Capital
WEF	World Economic Forum

Exchange rates used: 1 USD = R17.23 (November 2022)

EXECUTIVE SUMMARY

This market intelligence report is written for foreign and local investors looking to invest directly in the South African renewable energy market. It highlights opportunities in the public and private large-scale renewable energy[1] market in South Africa.

South Africa has a single utility model through the state-owned entity Eskom. The growth in South Africa's large-scale renewable energy sector is a direct result of the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP), managed through the Independent Power Producers Office (IPPO).

Key developments influencing the market in 2022/23:

- The first Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) preferred bidders reached financial close for the three renewable energy projects.
- The capacity to be procured under REIPPPP Bid Window 6 (BW6) increased from 2 600 MW to 4 200 MW. However, out of the 56 REIPPPP BW6 bids received, only 6 eventually received preferred bidder status (1000 MW), largely due to grid constraints.
- Many BW5 bids experienced delays with financial close due to speculative bidding relying on favourable changes to market conditions (which, in the main, did not materialise), as well as other changes in (global) market conditions.
- Eskom has issued a request for proposals to facilitate investment in renewable energy generation infrastructure by leasing parcels of its land in Mpumalanga to independent power producers (IPPs).
- Amendments to section 2 of the Electricity Regulations Act (ERA) in 2021, allowed for electricity generation of up to 100 MW for own use, without the need for a generation license. This amendment has enabled rapid growth in the private generation market, with more than 1 827 MW generation capacity registered with the National Energy Regulator of South Africa (NERSA) in 2022. The 100 MW capacity limit has since been removed completely.

The public procurement of new generation capacity is mainly guided by the Integrated Resource Plan (IRP) 2019. It has the greatest growth potential and relatively low entry barriers due to the IPPO's established REIPPPP procurement framework. However, no new bid rounds have been announced following BW6.

[1] Large-scale renewable energy includes all projects of greater than 1 MW and excludes rooftop solar PV.

CLICK HERE TO WATCH A SUMMARY OF THE MIR OPPORTUNITIES

The private sector procurement of new generation capacity opportunity was mainly driven by the licensing exemptions, enabling energy intensive users[2] such as large industrial operations to generation electricity for own use (demand side) or through power purchase agreements (PPAs) and wheeling agreements. IPPs can explore multiple viable off-taker options (Eskom, municipalities and industrial or mining operations).

With the recent announcement of legislation amendments and assuming a positive long-term market outlook for the industry, there will be an increase in demand for local manufacturing of renewable energy components.

The opportunities are not without challenges. Eskom has confirmed that grid capacity in Northern Cape is exhausted and that the network in the Western Cape is at saturation point. This presents a challenge for REIPPPP bidders.

Eskom will have to improve grid capacity in constrained areas to allow for further project development.

[2] According to the Energy Intensive Users Group (EIUG). Energy intensive users are consumers that account for more than 40% of the electrical energy consumed in South Africa.

Table 1: Summary of opportunities within the large-scale renewable energy market

Macro context	
• Energy crisis • High unemployment rates • Economic recovery • Just Energy Transition • Infrastructure development plans	• Heavy industries and mining sector net-zero targets • The global[3] effort to drive a hydrogen economy and elimination of carbon dioxide (CO_2) emissions by targeting renewable energy sources for hydrogen production • COP[4] 26 (2021) & COP 27 (2022)
Opportunity	
Public procurement	
Opportunity term: Short term (present)	
Stakeholders	**Key drivers** / **Barriers**
• DMRE • IPPO • Eskom • Municipalities • Developers, IPP, EPC, OEM and O&M companies • Financiers and legal • Energy-intensive users • Industrialists	• 20 GW by 2030 (Integrated Resource Plan 2019) • Expected 35 GW decommissioned coal by 2050 • Need for grid infrastructure investment to upgrade the grid • Local governments lack capacity (financial, technical, procurement planning) to leverage opportunity to procure electricity directly from IPPs • Only municipalities in good financial standing can procure from IPPs • Policy and clarity of procurement rules
Opportunity	
Private procurement	
Opportunity term: Short to medium term (1 – 3 years)	
Stakeholders	**Key drivers** / **Barriers**
• DMRE • IPPO • Eskom • Municipalities • Developers, IPP, EPC, OEM and O&M companies • Financiers and legal • Energy-intensive users • Industrialists • Local manufacturers	• Changes in electricity regulations on new generation capacity • Declining renewable energy prices • Capital requirements • Wheeling frameworks only developed for a limited number of municipalities

[3] The International Renewable Energy Agency (IRENA) and the World Economic Forum (WEF) launched an "Enabling Measures Roadmap for Green Hydrogen" at the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (COP26) in 2021. Roadmaps launched for Japan and Europe.

[4] Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC).

Table 1 continued...

Macro context	
• Energy crisis • High unemployment rates • Economic recovery • Just Energy Transition • Infrastructure development plans	• Heavy industries and mining sector net-zero targets • The global[3] effort to drive a hydrogen economy and elimination of carbon dioxide (CO_2) emissions by targeting renewable energy sources for hydrogen production • COP[4] 26 (2021) & COP 27 (2022)
Opportunity	
Local manufacturing of renewable energy components and systems	
Opportunity term: Medium to long term (3 – 10 years)	
Stakeholders	**Key drivers**	**Barriers**
• Local manufacturers, OEMs, EPCs • DMRE, IPPO	• Local content in bid requirements • International logistical challenges	• Policy uncertainty • Procurement rule changes in REIPPPP • Challenging local content requirements • Commercial viability • Market uncertainty

WHAT'S NEW?

Since the publication of the 2022 Large-Scale Renewable Energy Market Intelligence Report, there have been several important developments in the electricity sector.

What happened in 2022[5]:

April: Eskom issues a request for proposal to enable facilitation of investment in renewable energy generation infrastructure by leasing parcels of its land in Mpumalanga to independent power producers (IPPs).

May: The Department of Mineral Resources and Energy (DMRE) announces revised timelines for the commercial close of REIPPPP Bid Window 5 (BW5) projects, extending it to the second quarter of 2022.

June: Unit 4 of the Kusile Power Station enters commercial operation.

July: First bids under the RMIPPPP reach financial close.

Government announces an increase in the capacity to be procured under BW6, from 2 600 MW to 4 200 MW, 3 200 MW onshore wind and 1 000 MW solar PV, with the aim of increasing the capacity to 5 200 MW by commencing an application to the NERSA to add an additional 1 000 MW solar PV.

[5] The references for each listed item are listed in order of appearance: (Eskom Media Room 2022f); (Eskom Media Room 2022b); (Eskom Media Room 2022g); (Groenendaal 2022); (Government Communications 2022); (Eskom Media Room 2022a); (Mail & Guardian 2022); (DMRE 2022c); (Eskom Media Room 2022h); (Eskom Media Room 2022d); (Eskom Media Room 2022i); (Creamer 2022b); (Eskom Media Room 2022j); (DMRE 2022e)

Eskom awards contracts to two successful bidders for the provision of battery storage solutions under the Battery Energy Storage System (BESS) project.

September: New Eskom board of directors appointed, with Mr Mpho Makwana as Chairperson.

October: The DMRE publishes a list of bids received under REIPPPP Bid Window 6 (BW6), with a total generation capacity of 9 666 MW, 4 116 MW of onshore wind and 5 550 MW of solar PV.

Eskom signs land lease agreements with independent clean power generators on land parcels around the Majuba and Tutuka power stations.

The tabled 2022 Medium Term Budget Policy Statement outlines government's plan to take over Eskom's R400 billion debt to facilitate its restructuring, unbundling and ability to raise capital.

The coal-fired Komati power station in Mpumalanga reaches the end of its operating life and is shut down.

November: The World Bank approves R9 billion concessional loan facility to Eskom for the repurposing of Komati power station towards a Just Energy Transition.

December: DMRE announces that only five of the BW6 bids receive preferred bidder status. (Another project was added in 2023.)

DMRE publishes amendments to Schedule 2 of the ERA, 2006, for the removal of the 100 MW licensing threshold, thus embedded generation facilities, irrespective of capacity, would be exempted from the licensing requirement.

Eskom's Chief Executive Officer, André de Ruyter, tenders his resignation; to end his term on 31 March 2023.

NERSA publishes a list of privately registered projects in 2022, amounting to 1 826 MW of new generation projects – a significant increase from 2021[6].

[6] Data sourced from NERSA: **https://www.nersa.org.za/electricity-overview/electricity-licences/**

Rolling blackouts (load shedding) continued throughout 2022, with Eskom unable to match electricity demand with available supply. In 2022, the country experienced load shedding for 3 775 hours – a 227% increase from 2021. Eskom shed 11 797 GWh of electricity in 2022 – more than 372% of the 2 521 GWh it shed in 2021.

The extent of load shedding was driven by the coal fleet's higher than planned maintenance, represented through the Energy Availability Factor (EAF). The EAF was 58% in 2022, indicating a continued decline when compared to 61,8% in 2021 and 65% in 2020[7].

[7] Data estimated from ESP: **https://esp.info/** , an application that tracks Eskom load shedding announcements.

INTRODUCTION AND PURPOSE

This market intelligence report is written for foreign and local investors looking to invest directly in the South African renewable energy market. It highlights opportunities in the public and private large-scale renewable energy market in South Africa.


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The Russian invasion of Ukraine had a major impact on global energy security. In the first three quarters of 2022, oil and gas prices were driven to their highest levels in nearly a decade, with the highest price of oil at USD 123.70 per barrel[8], forcing many countries to reconsider their energy supplies. According to the International Energy Agency (IEA 2022), Russia is the world's largest oil exporter to global markets, and its natural gas fuels the European economy. The United States, the European Union and others have imposed economic sanctions on Russia and have announced plans to wean themselves off that country's fossil fuels (Tollefson 2022).

Global annual renewable capacity additions broke a new record in 2021, increasing by 6% to almost 295 GW, despite the continuation of pandemic-driven supply chain challenges, construction delays and record-level commodity prices for raw materials. An 8% increase in renewable energy capacity was expected by the end of 2022. Solar PV and wind costs are expected to remain higher in 2023 than pre-pandemic levels due to elevated commodity and freight prices. However, their competitiveness improves due to much sharper increases in natural gas and coal prices (IEA 2022).

The South African renewable energy market follows a similar trend to the global market. Increasing global inflation and higher energy prices have a spill-over effect into South Africa's renewable energy sector. With escalating prices of imported goods, supply chain challenges and speculative bidding relying on favourable changes to market conditions, the financial feasibility of Bid Window 5 projects and RMIPPPP are under the spotlight. Despite these challenges, solar PV and onshore wind dominate the market growth, backed by a growing small-scale embedded generation market and private sector large-scale projects for energy-intensive users such as mines.

This market intelligence report (MIR) provides potential investors in the large-scale renewable energy space with a greater understanding of market opportunities in South Africa, taking into account the size of the opportunities and the level of risk involved. The MIR is compiled for foreign and local investors (persons or organisations) looking to invest in the large-scale renewable energy market through project development, asset management, equity, debt, equipment manufacture, or support services.

In what follows:

Section 2 provides an overview of the sector and describes the market size and key players.
Section 3 details the general legislative and regulatory framework governing renewable energy.
Section 4 highlights market drivers and emergent opportunities, and addresses market barriers and uncertainties that may affect the industry.
Section 5 focuses on funding and incentives.
Section 6 outlines the services that GreenCape provides to its members.

Note: GreenCape's Energy Services Market Intelligence Report explores the energy services market, including rooftop solar PV, energy storage; and energy efficiency. The energy services market is thus not covered in this Large-Scale Renewable Energy Market Intelligence Report.

For enquiries or to access GreenCape's services, contact the Renewable Energy Sector Desk at energy@green-cape.co.za

CONTACT THE RENEWABLE ENERGY SECTOR DESK HERE

[8] Data sourced from: https://www.macrotrends.net/2516/wti-crude-oil-prices-10-year-daily-chart

2023 ENERGY SERVICES MARKET INTELLIGENCE REPORT

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SECTOR OVERVIEW

The South African large-scale renewable energy capacity accounts for approximately 12% of the electrical energy generation capacity. The industry is showing growth and potential with 6 GW of large-scale connected and operational projects.


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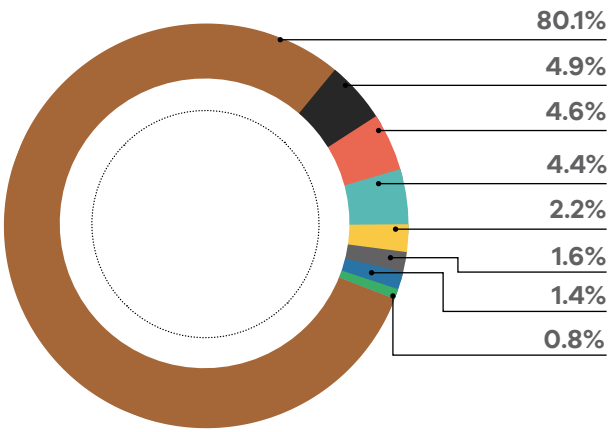
This section gives an overview of the market, describes the market size (present and future), and provides a breakdown of the basic renewable energy value chain and key players. This section aims to provide foundational information needed to explore the investment opportunities in the South African renewable energy market.

2.1. South African electricity landscape

South Africa's electricity supply is currently dominated by coal-fired power generation. The country has coal-fired generation stations with an installed capacity of 39.3 GW. This represents more than 73% of the country's total wholesale/ public nominal capacity, amounting to 53.7 GW.

These stations are primarily owned and operated by Eskom, the national power utility. In 2022, Eskom supplied ~88% of South Africa's total electricity demand. The remaining 12% of demand is met through municipalities, imports, and independent power producers (IPPs).

In 2022, contracted energy demand increased by 133 GWh relative to 2021, but was 5.2 TWh less than the demand experienced in 2019 (-2,2%), as a result of demand reduction through load shedding. The electricity mix is still dominated by coal-fired power generation, shown in **Figure 1.**



COAL	176.00 Twh	80.1%
IMPORTS	10.83 Twh	4.9%
NUCLEAR	10.07 Twh	4.6%
WIND	9.69 Twh	4.4%
SOLAR PV	4.84 Twh	2.2%
OPEN CYCLE GAS TURBINE	3.61 Twh	1.6%
HYDRO POWER	3.14 Twh	1.4%
CONCENTRATED SOLAR POWER & OTHER RENEWABLES	1.56 Twh	0.8%

Figure 1: Electricity contribution by source

Source: Eskom, 2023

A historic supply and demand imbalance in South Africa's single buyer energy model resulted in intensive load shedding continuing country-wide during 2022. In 2022, South Africa experienced load shedding for 3 775 hours; a 227% increase from 2021.[9]

The degradation of Eskom's coal fleet can be illustrated through the annual average energy availability factor (EAF) in **Figure 2**, with the data for 2022 indicating a 58% EAF.

Eskom's new board of directors have been mandated by the minister to achieve a 75% EAF, which will be challenging considering the current state of the Eskom fleet; however, no deadline has been given to achieve the EAF target (Nyathi 2022).

[9] Data sourced from Eskom's weekly system status reports: https://www.eskom.co.za/eskom-divisions/tx/system-adequacy-reports/

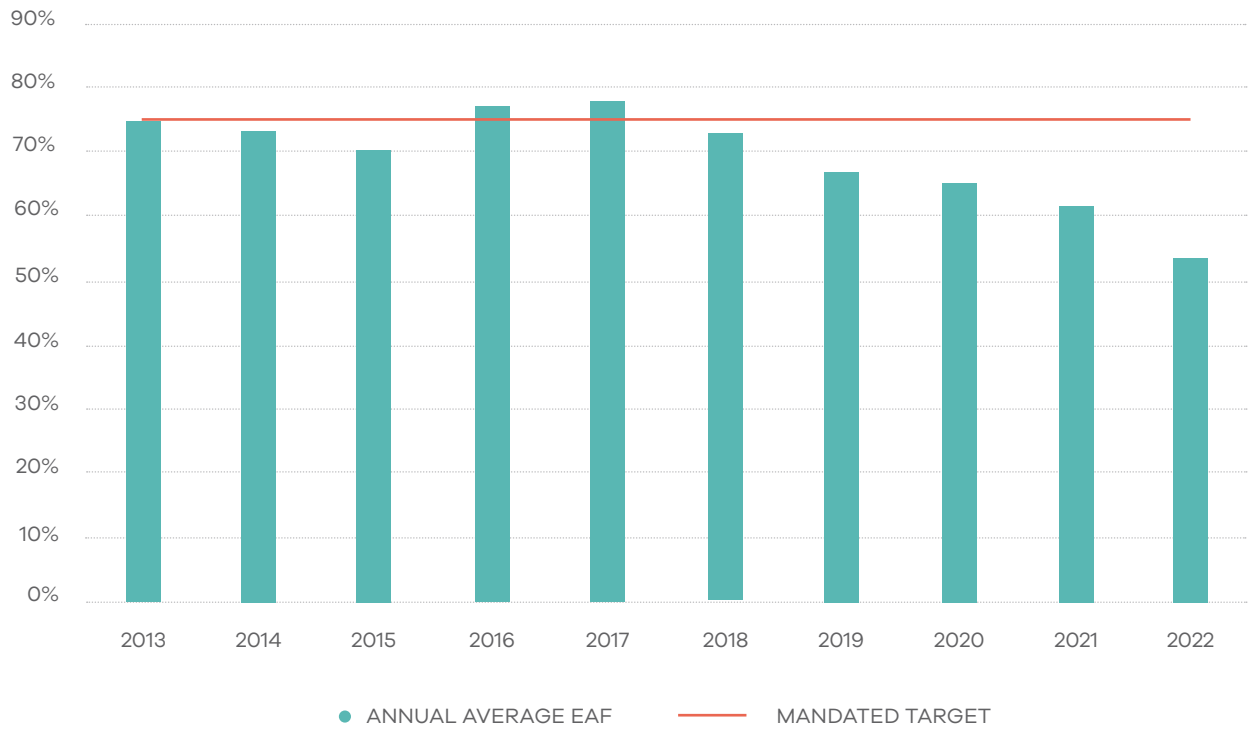


Figure 2: The average annual energy availability factor for the Eskom fleet from 2013 to 2022[10]

2.2. South Africa large-scale renewable energy market size

2.2.1. Renewable energy market development

As shown in Figure 3, the introduction of renewable energy in the South African context dates back to 2003 with the delivery of the 2003 White Paper on Renewable Energy. However, the renewable energy framework started to take shape only with the Integrated Resource Plan (IRP) 2010-2030 in 2010. The purpose of the IRP 2010 was to determine the preferred energy mix over the next 20 years.

In October 2019, the IRP 2019 with the preferred energy mix up until 2030 was released. The plan includes allocations for additional renewable energy generation amounting to 20 400 MW (excluding distributed generation of at least 4 GW) coal-fired plants of 1 500 MW, and gas-fired power plants of 3 100 MW. To begin the procurement envisioned in the IRP, in September 2020, the Minister of the DMRE issued a section 34 determination for the procurement of a further 11 813 MW of renewable energy between 2022 and 2027, of which 6 800 MW is allocated to wind and solar PV, and 513 MW to capacity generated from storage.

To facilitate the uptake of renewable energy in South Africa, as originally detailed in the 2010 IRP, the REIPPPP was established. The IPPO was created to fulfil three specific duties for the REIPPPP:

1. professional advisory services;
2. procurement management services; and
3. monitoring, evaluation and contract management services.

[10] Data sourced from (BusinessTech 2022) and (Nyathi 2022).

Figure 3: Commencement and timeline of ministerial determinations and notices for renewable energy and storage in South Africa

Renewable energy is still a relatively new market in South Africa. At the time of writing, 6 323 MW of renewable energy had been procured through the REIPPPP, with 5 661 MW generation capacity added to the national grid; 71 073 GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational in November 2013 (IPPO 2022).

Table 2: REIPPPP highlights to date, based on Eskom (2022) and DMRE (2022d)

REIPPP BW	BW1	BW2	BW3&BW3.5	BW4&4b	RMIPPP	BW5	BW6
No. of projects	28	19	18	26	11	25	6 preferred bidders announced
Capacity	1 415 MW	1 033 MW	1 628 MW	2 205 MW	2 000 MW	2 583 MW	Only 1 000 MW of 5 200 MW listed as preferred bidders
Progress	All projects connected	All projects connected	17 projects connected, 1 project in execution phase	25 projects connected and 1 in execution phase	11 preferred bidders. 3 projects currently in construction (150 MW PV with BESS)	25 preferred bidders. 6 PPAs signed. Financial close expected in January 23.	6 out 56 bids announced as preferred bidders in December 2022 and early 2023

2.2.2. Future market growth potential: the Integrated Resource Plan

The 2019 Integrated Resource Plan (IRP 2019) provides direction on how South Africa plans to meet its electricity demand over the next 10 years[11]. This can give an investor a good indication of the potential market that will exist and that can be accessed.

The IRP generally considers several scenarios, with the policy adjusted IRP being the primary plan. The **policy adjusted scenario in IRP 2019** as shown in **Figure 4** is the final IRP 2019 that was gazetted for implementation. For the period ending 2030, several policy adjustments are proposed to ensure a practical plan that will be flexible to accommodate new, innovative technologies that are not currently cost-competitive.

It aims to minimise the impact of the decommissioning of coal power plants and the changing demand profile. Some of these adjustments include decreased build limits to smooth the rollout of renewable energy. This will help sustain the industry, with the inclusion of 1 500 MW of coal-to-power to minimise the impact of job losses resulting from the decommissioning.

[11] The DMRE will continue to implement the IRP 2019 while it is being updated, a process expected to run into 2023 (Creamer 2022).

	Coal	Coal (Decom-missioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas/ Diesel	Other (Distributed generation cogen, biomass, landfill)
Current	37 149	–	1 860	2 100	2 912	1 474	1 980	300	3 830	499
2019	2 155	–2 373	–	–	–	–	244	300	–	Allocation to the extent of the short term capcity and energy gap
2020	1 433	-557	–	–	–	114	300	–	–	
2021	1 433	-1 403	–	–	–	300	818	–	–	
2022	711	-844	–	–	513	400 1 000	1 600	–	–	
2023	750	-555	–	–	–	1 000	1 600	–	–	500
2024	–	–	1 860	–	–	–	1 600	–	1 000	500
2025	–	–	–	–	–	1 000	1 600	–	–	500
2026	–	-1 219	–	–	–	–	1 600	–	–	500
2027	750	-847	–	–	–	–	1 600	–	2 000	500
2028	–	-475	–	–	–	1 000	1 600	–	–	500
2029	–	-1 694	–	–	1 575	1 000	1 600	–	–	500
2030	–	-1 050	–	2 500		1 000	1 600	–	–	500
Total Installed Capacity by 2030 (MW)	33 364		1 860	4 600	5 000	8 288	17 742	600	6 380	–
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	–
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.3	1.2	6.3	17.8	0.6	1.3	–

- Committed/already contracted capacity
- Capacity decommissioned
- New additional capacity
- Includes distributed generation capacity for own use
- Extension of koeberg plant design life
- Installed capacity

Figure 4: Policy adjusted plan IRP 2019

With the DMRE's Schedule 2 of the ERA amendment allowing generation without the need for a licence up from 1 MW to 100 MW, it is unclear whether provisions for this opportunity are accounted for within the IRP 2019. The impact of these regulatory changes is illustrated in Figure 5, through a significant increase in the amount of non-REIPPPP projects installed, as per NERSA registrations. The registered projects listed by NERSA are unlikely to cover all installed systems, but are a good indicator of the movements within the private off-taker market.

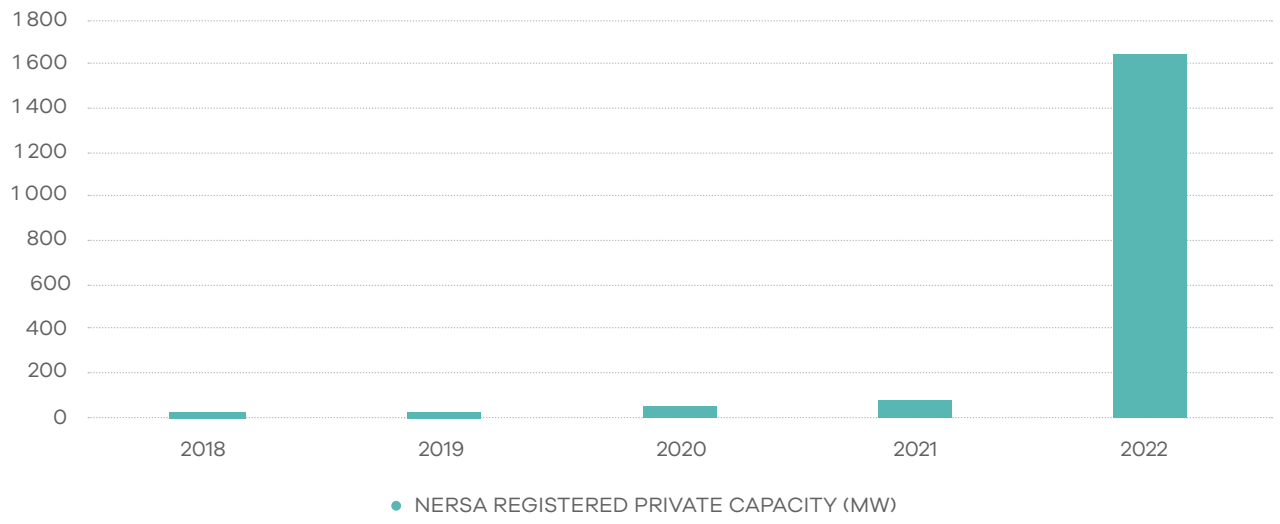


Figure 5: Cumulative capacity for NERSA registered generation facilities per year outside REIPPPP[12]

The 2019 IRP has increased the renewable energy capacity, not including distributed generation, to 33% by 2030. The renewable energy potential market for 2023 to 2030, based on the IRP 2019 plan for new additional capacity, is depicted in Table 3. (IRP 2019)

Table 3: Future pipeline based on Integrated Resource Plan 2019 for new additional capacity from 2023 to 2030

Technology	IRP 2019 new capacity (MW)
Hydro	2 500
Solar PV	5 000
Wind	12 800
CSP	0
Grid Storage	1 575
Others: distributed generation, biomass, cogen, etc.	4 000
Total	**25 875**

Based on the procured projects in the early bid windows, the renewable energy capacity of the preferred bidders for BW6 and RMIPPPP, the allocation to Eskom's BESS project and generation facilities registered under NERSA, the progress towards the IRP 2019 plan from Figure 4 is estimated in Table 4. The "other" technology category includes distributed generation, co-generation, biomass, and landfill gas.

[12] GreenCape analysis based on NERSA data.

Table 4: Progress towards renewable energy implementation to meet the IRP 2019 targets for 2030.

Technology	IRP 2019 provisions by 2030 (MW)	Procured and announced by 2022 (MW) – estimate	Capacity remaining to meet 2030 IRP plan (MW)
Hydro	4 600	2 208	2 392
PV[13]	8 288	6 339	1 949
Wind	17 742	5 328	12 412
CSP	600	600	0
Storage	5 000	3 405	1 595
Other	4 000	359	41
Total	**36 030**	**18 241**	**16 794**

The data indicates that the IRP 2019 may require an update to accommodate the rapid growth in the solar PV market for both distributed (listed under "other") and large-scale projects. The rollout of other technologies is aligned with the planned rollout from IRP 2019. Additionally, the energy crises experienced in 2022 will require an even faster rollout of projects and more capacity allocation. This has also been expressed by Eskom through their updated Transmission Development Plan (TDP) 2022 that projects a requirement of up to 53 GW of renewable energy in the next 10 years (Eskom Media Room 2022e).

2.3. South Africa's renewable energy value chain

In South Africa, the global industry players dominate the renewable energy value chain, which has a typical structure as illustrated in Figure 6.

With market developments (e.g., reduced profit margins due to decreased tariffs), there has been considerable consolidation in the market globally. Examples of such consolidation include Siemens/Gamesa, Nordex/ Acciona and LM Wind/GE.

In addition, there is considerable vertical integration from engineering, procurement and contracting (EPC) to operation and maintenance (O&M), especially in the case of solar PV.

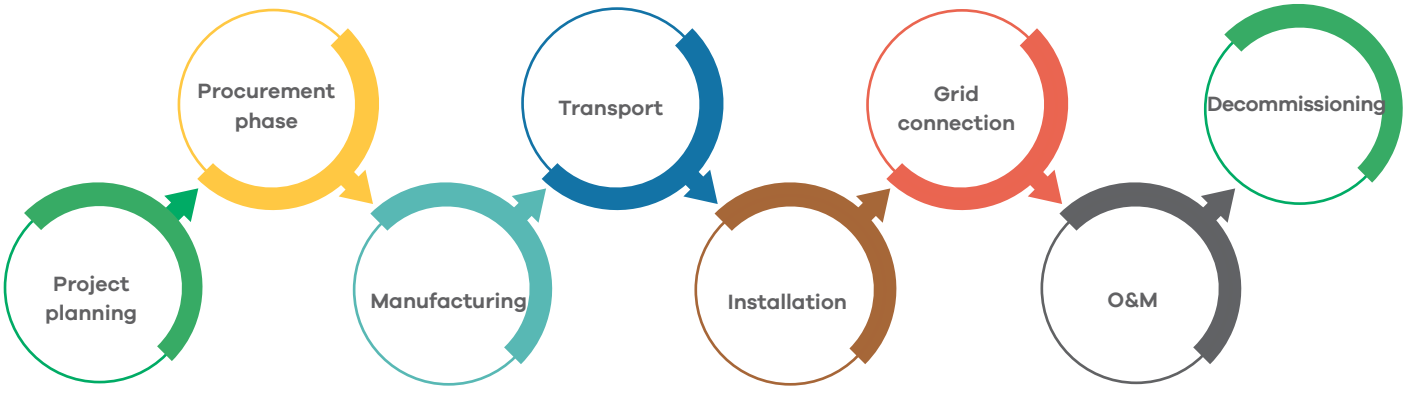


Figure 6: Renewable energy value chain (IRENA, 2017)

[13] All PV projects that are 1 MW or smaller are classified as "distributed generation" and are listed under "Other" technology.

At each node of the value chain, opportunities are available for localisation. As the South African industry gears up to meet the IRP 2019 rollout plan of 26 GW of new renewable energy and energy storage build required by 2030, the need for local value creation is increasingly growing to enable the sector to contribute to the country's infrastructural needs; economic objectives, including through establishing a local manufacturing base; and Just Transition objectives, including job creation in transition areas. Section 4 of this report highlights some of the emerging market opportunities identified along the value chain.

2.4. Key players in the South African large-scale renewable energy market

Stakeholders in the large-scale renewable energy industry developed in response to the REIPPPPP can be categorised according to the project development phases that the programme follows: development, construction, and operation and maintenance. Accordingly, the key players or company types involved in this market are described in Figure 7, indicating the project development phase in which they are typically involved.

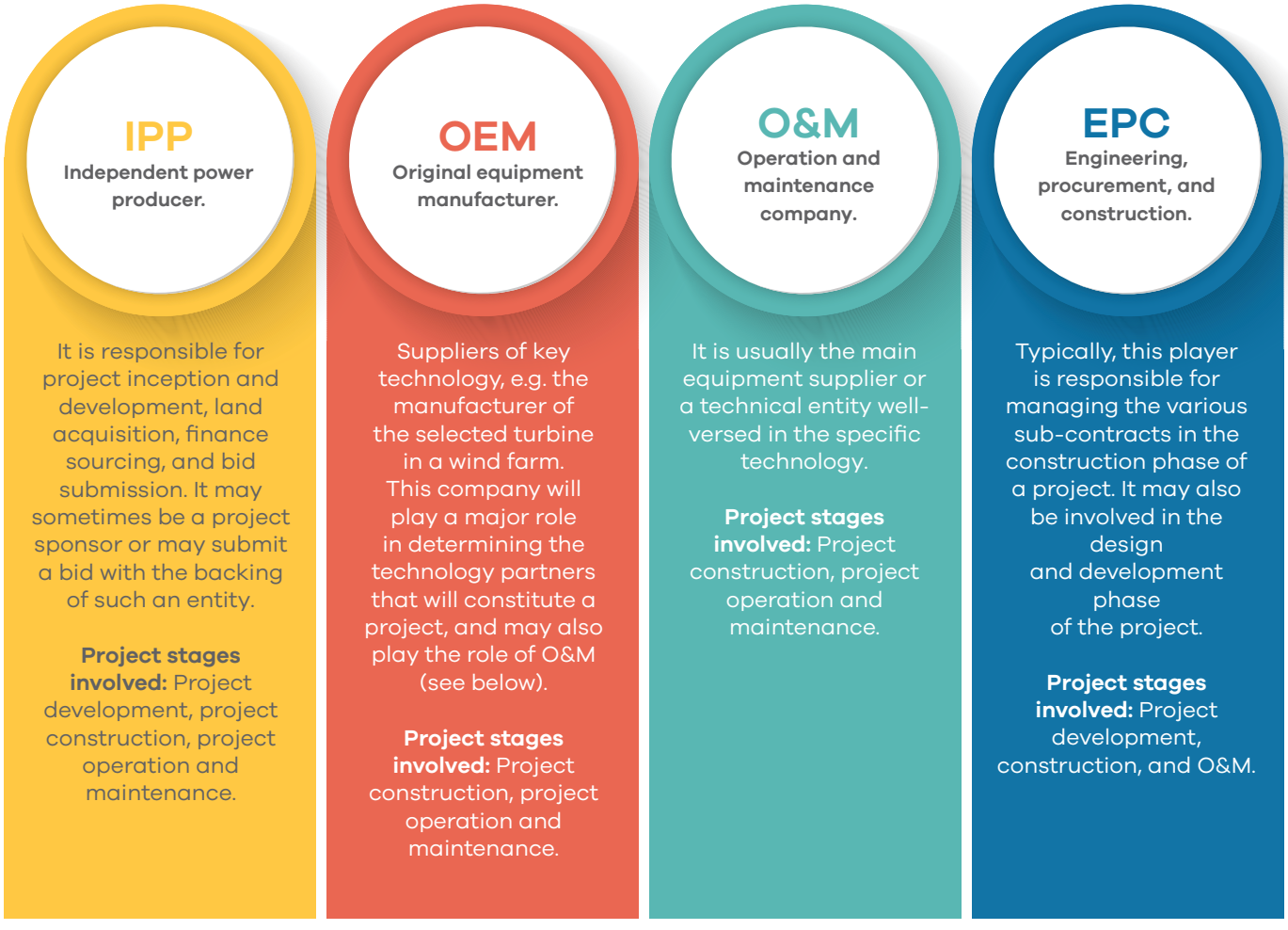


Figure 7: Typical company types involved at different stages of project life

POLICIES AND REGULATION

Policies and regulatory frameworks provide regulatory certainty to the market and guide the development of the renewable energy sector in South Africa.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This section details changes in the general legislative and regulatory framework governing large-scale renewable energy development in South Africa.

3.1. Government departments involved in the energy and electricity sector

Different government departments and related entities are involved in developing and implementing policies, plans and programmes **for the energy and electricity sectors**. The most prominent of these are listed below, drawing primarily on the 2018 South African Energy Sector Report (DoE, 2018).

Department of Mineral Resources and Energy	The mission of the DMRE is to regulate and transform the sector for the provision of secure, sustainable and affordable energy and the promotion and regulation of minerals and mining. This includes the electricity sector, governed mainly through the Electricity Regulation Act 4 of 2006. This department was previously referred to as the Department of Energy (DoE) and is also responsible for developing the Integrated Energy Plan (IEP) and Integrated Resource Plan (IRP).
National Energy Regulator of South Africa	NERSA issues licences for the operation of generation, distribution, and transmission infrastructure; regulates imports, exports, and trading of electricity; determines and approves electricity prices, tariffs, and the conditions under which electricity may be sold.
National Nuclear Regulator (NNR)	NNR regulates the operation of nuclear power stations such as Koeberg, and all elements of the South African nuclear energy value chain. Its role is to protect people, property, and the environment against nuclear damage.
Department of Public Enterprises (DPE)	The Minister of Public Enterprises is the shareholder representative of the South African government and has oversight responsibility for Eskom.
National Treasury (NT)	NT is responsible for financial and reporting oversight for Eskom (as a state-owned entity) and has played a pivotal role in providing government loans and guarantees in favour of Eskom.
Department of Water and Sanitation (DWS)	DWS oversees water allocations and ensures adequate water supply infrastructure, among others, for the South African electricity sector.
Department of Forestry, Fisheries and the Environment (DFFE)	DFFE ensures adherence to environmental compliance and rights protection relating to preventing pollution, ecological degradation, promoting conservation, and securing ecologically sustainable development.
Department of Trade, Industry and Competition (dtic)	Responsible for ensuring industrialisation including, in the case of renewable energy, through the REIPPPP's economic development component, especially local content and black economic empowerment, and development of small businesses.

3.2. Influential policies, regulations and announcements

There are a number of policy and regulations to monitor which could impact the electricity sector; these regulations are summarised below.

Carbon Tax Act	The Carbon Tax Act (Act No. 15 of 2019) aims to provide for the imposition of a tax on the carbon dioxide equivalent of greenhouse gas emissions. It defines the calculation of the tax and its application to different activities. The document is notably based on the May 2013 Carbon Tax Policy Paper. In a National Budget Speech in February 2022, the finance minister announced that the carbon tax rate would increase to R144, effective from 01 January 2022 (Godongwana 2022). This represented an increase of R10 from R134 the previous year. In line with COP26 commitments, the first phase of the carbon tax will be increasing progressively each year to USD 20 per tonne, with allowances, by the end of 2025. In the second phase from 2026 onwards, the carbon tax rate would be increased to USD 30 per tonne with allowances falling away (SAnews 2022). This tax will impact high carbon emitting industries and has the potential to increase the uptake of renewable energy projects in order to reduce the impact of the tax. This market opportunity is most impactful towards private off-taker agreements.
Integrated Resource Plan updates	The IRP specifically outlines the planning, sourcing, and quantities of electricity generation sources contributing to the county's generation mix. At the time of its promulgation, it was indicated that the IRP should be a "living plan" which would be revised every two years by the then DoE. This has not materialised. However, with the previous revision in 2019, it is expected that an update will follow soon. According to Eskom, the IRP is currently being updated and Eskom has expressed a need for even more new capacity to be added (Eskom Media Room 2022e). This update will reveal market opportunities available to renewable energy projects through the capacity allocations for each technology, but is still dependent on ministerial determinations to unlock these opportunities. It is expected that there will be an increase in solar PV and energy storage capacity.
Electricity regulations on new generation capacity and municipal bylaws	Local government plays an important role in the electricity industry in South Africa. Schedule 4B of the Constitution lists electricity and gas reticulation as a local government responsibility. In addition, section 152 of the Constitution places the responsibility on municipalities to ensure the provision of services to communities in a sustainable manner. The 2020 amendment to the Electricity Regulations on New Generation Capacity enables municipalities in good financial standing to procure or buy new generation capacity and develop their power generation projects. In preparation, an increasing amount of municipalities are investigating wheeling structures and engaging with independent power producers (IPPs) independently. There are no governing standards or regulations that apply to all municipalities. As such, each municipality will have different bylaws that apply to new generation opportunities.
Section 2 of the Electricity Regulation Act amendments	Schedule 2 of the Electricity Regulation Act provides for exemptions from the obligation in the Act to apply for (and hold) a licence from the NERSA. The 2021 gazetting of amendments to Schedule 2 of the ERA of 2006, which increased the licensing threshold for embedded generation projects from 1 MW to 100 MW, opened up the market for larger private IPP projects to proceed without acquiring a licence. A further amendment has been made in December 2022 that removed the 100 MW limit completely. This opens up the possibility of even larger projects outside of REIPPPP (DMRE 2022a).

European Carbon Border Adjustment Mechanism (CBAM)	In March 2022, the European Council agreed on the CBAM regulation that will function in parallel with the European Union's (EU's) Emissions Trading System. The main objective of this EU based environmental measure is to avoid carbon leakage from imported goods. It will also encourage partner countries to establish carbon pricing policies to fight climate change. For that purpose, CBAM targets imports of carbon-intensive products into the EU to prevent offsetting the EU's greenhouse gas emissions reduction efforts through imports of products manufactured in non-EU countries. The following products will be covered: cement, aluminium, fertilisers, electric energy production, iron, and steel (EC 2022). The CBAM does not appear to pose short-term risks to small enterprises. However, if the proposed amendments that impose more stringent measures are implemented, South African industries will be placed at significant risk. According to Trade and Industry Policy Strategies (TIPS 2022), the short-term measures are more administrative than financial for South Africa. In the medium to long term, measures of mitigating these risks for South Africa include: • Accelerating the decarbonisation of carbon-intensive industries by increasing renewable energy in production processes and investing in energy-efficient technology. • Decarbonising South Africa's electricity system by increasing renewable energy in the national grid. • Introducing more ambitious climate-change policies. • Reforming South Africa's carbon tax to reflect global carbon pricing. • Increasing the South African carbon price to stimulate heavy emitters to reform their business models and operations.
Preferential procurement regulations amendments	Following a judgement that the minister has exceeded his powers with the 2017 amendments, there is some uncertainty about the application of preferential procurement. The following excerpts from the National Treasury media statement on 8 November 2022 on preferential procurement regulations have reference (**https://www.treasury.gov.za/comm_media/press/2022/2022110801%20Media%20Statement%20-%20PPP%20Regulations%202022.pdf**): "While we are finalising the Public Procurement Bill, which will empower the Minister of Finance to set preferential procurement, the 2022 Regulations repeal the 2017 Regulations and take effect on 16 January 2023. In essence the 2022 Regulations are a placeholder while we finalise the Bill. Among other things, in terms of the 2022 Regulations, an organ of state must, in the tender documents, stipulate: • The applicable preference point system as envisaged in the regulations; • The specific goals in the invitation to submit the tender for which points may be awarded. In this instance, the specific goals are as contemplated in section 2(1)(d) of the Act which may include contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender and disability, including the implementation of programmes of the Reconstruction and Development Programme as published in Government Gazette No. 16085 dated 23 November 1994. The above, and other parts of the 2022 Regulations, are in line with the Constitutional Court judgement. Organs of state must determine their own preferential procurement policies in accordance with section 2 of the PPPFA and the thresholds and formula prescribed in the 2022 Regulations. Organs of state are currently applying the 2017 Regulations as per clarification of the Constitutional Court until the 2022 Regulations take effect on 16 January 2023. It should be noted that these Regulations deal with preferential procurement in terms of the PPPFA. The new 2022 Regulations require organs of state in the development of their procurement policies to also consider specific the programmes stipulated in the Reconstruction and Development Programme as published in Government Gazette No. 16085 dated 23 November 1994 and provides for points to be awarded for specific goals.


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EMERGING OPPORTUNITIES, DRIVERS AND BARRIERS

The evolving South African energy landscape creates opportunities for investors, financiers, project developers, component manufacturers, and suppliers in the large-scale renewable energy market.

The following large-scale renewable energy market drivers, opportunities and market barriers have been identified through engagement with various green economy stakeholders. Each is outlined in detail in the subsections below.

4.1. Market drivers

The decreasing cost of renewable energy and a conducive policy landscape has created an attractive large-scale renewable energy market in South Africa.

4.1.1. The decreasing cost of large-scale renewable energy

The REIPPPP has been lauded globally for its clear mandate, growth path and independence in its procurement approach.

This is clearly illustrated through a tariff decline of more than 88% for solar PV and 68% for onshore wind over the past ten years since the BW1 preferred bidders signed power purchase agreements (PPAs) with Eskom in 2012.

Figure 8 illustrates the decline in average tariff in the wind and solar PV sector over the six bid windows, plus expedited rounds that have been initiated, together with the capacity awarded for each bid window. In BW5, the average bid tariff price for wind came in at less than R0.49/kWh. There were no wind projects listed under the preferred bidders for BW6. The solar PV tariff for BW5 was R0.43/kWh, and for BW6 it was R0.50/kWh (see **Figure 8**).

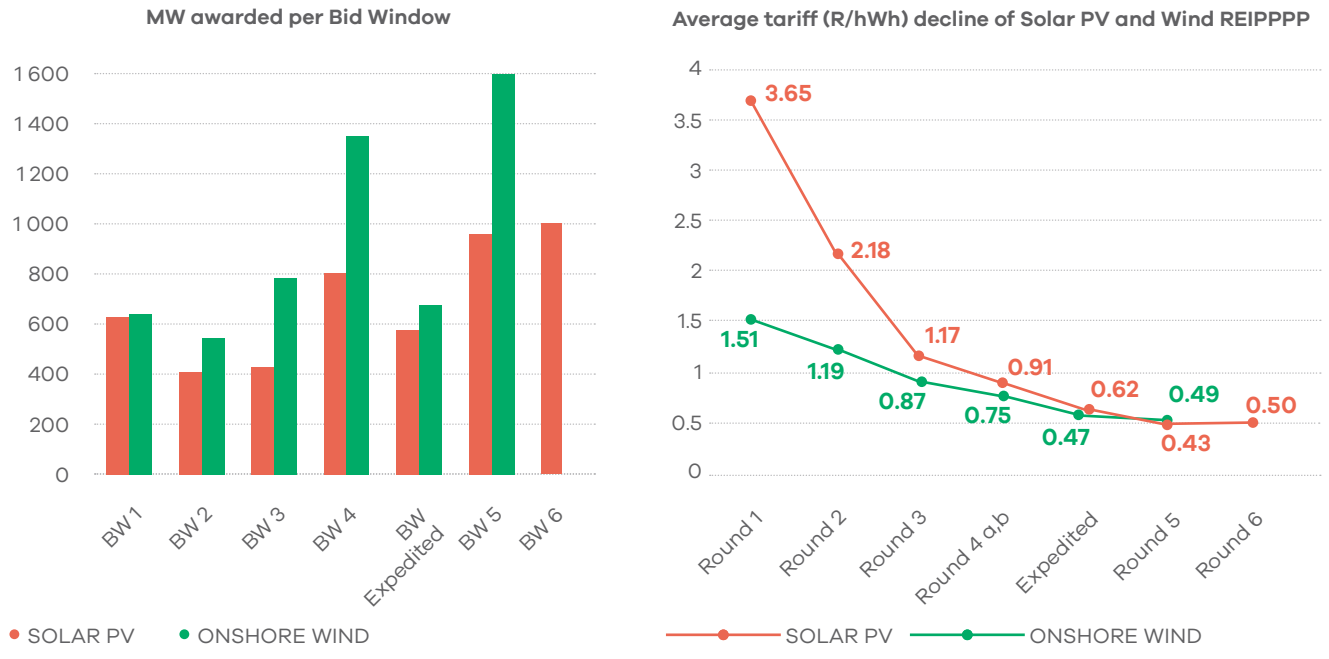

Figure 8: Tariff decline and capacity awarded for solar PV and onshore wind across all bid windows

As the price points for successful REIPPPP bids bottom out, the strategic advantage for winning bids is expected to shift to those with stronger, more innovative black economic empowerment (BEE) programmes/partnerships; agile approaches/strategies towards meeting financial close within four months (as opposed to nine months in previous rounds); and securing suitable sites where grid capacity is still available. There are also opportunities noted with the changes for BW6 which were different than previous bids (DMRE 2022):

- The first requirement for ancillary services has been included as a means to support grid stability.
- As a result of the ancillary services requirement, a new payment mechanism has been included, which entails payment for both ancillary services and energy.
- The BW6 Request for Proposals (RFP) was based on a Preferential Procurement Policy Framework Act (PPPFA) exemption. This permits DMRE to apply economic development criteria as an aspect of functionality evaluation.
- Bidders were required to demonstrate South African entity participation of at least 49%, at least 30% shareholding by black people in the IPPs, as well as 25% ownership by black people, and in particular 10% ownership by black women, in construction and operations contractors.

4.1.2. Policy and regulatory drivers of market size

Implementation of the IRP to ensure diversification of energy sources, enabling new entrants into the energy space (e.g., through the REIPPPP) and enabling generation for own use are key elements of the government's effort to provide energy security. According to a study conducted by Meridian Economics (Renaud *et al.*, 2020), the key regulatory restrictions to renewable energy development were identified as licence requirements, procurement processes and restrictions on third-party agreements. These regulatory restrictions have been largely unlocked through recent changes in policy and regulations.

The restrictions on private participation in the power sector have been removed through the amendment of Schedule 2 of the Electricity Regulation Act in 2021 to remove the 100 MW licensing threshold, thus 'embedded generation' facilities, irrespective of capacity, would be exempted from the licensing requirement (DMRE 2022e).

The centralised government-based procurement structure through REIPPPP is considered by industry experts as a lengthy administrative process and a constraint to industry growth, and insufficient to manage a suitable emergency response to the country's energy crisis.

Despite this, many project developers continued to develop projects at risk (Renaud et al., 2020). The government-based procurement process has moved forward in 2021 and 2022 through the launching of REIPPPP BW5 and BW6. However, no further bid windows have been announced at the time of publication in March 2023.

Clarity from Eskom and NERSA on wheeling agreements and tariffs, and an increase in municipal wheeling pilot projects, are enabling more projects outside the government-based procurement structure. This also enables third-party transactions or power purchase agreements (PPAs) outsidethe national procurement model.

4.1.3. International drivers

South Africa, as a signatory of the Paris Agreement on Climate Change, has ratified this agreement. A host of additional international frameworks have been undersigned to promote the green economy and combat climate change. They are listed in **Table 5**.

Table 5: Sustainable development and climate change agreements to which South Africa is a signatory

Policy Plan	Policy Aim and Description
Just Energy Transition partnership with South Africa	Announced at the Conference of the Parties to the United National Framework Convention on Climate Change (COP26) in Glasgow in November 2021, South Africa, France, Germany, the United Kingdom, United States of America and the European Union entered into a long-term partnership to support South Africa's decarbonisation efforts, focusing on the electricity system and goals set out in the updated Nationally Determined Contributions (NDCs) to effect a just transition to low carbon and climate-resilient economy. The first phase of financing will mobilise US$8.5 billion (R146 billion) through various mechanisms, including grants, concessional loans and investments and risk-sharing instruments, including mobilising the private sector.
The Paris Climate Agreement	The Paris Climate Agreement was adopted at COP21 and set a global temperature goal of staying well below a rise of 2°C, and preferably 1.5 °C, compared to pre-industrial levels.
Rio +20 Summit	The Rio +20 Conference on Sustainable Development took place in Rio de Janeiro, Brazil, from 20 to 22 June 2012. A key outcome for South Africa was the recognition of green economy policies as a viable tool for advancing sustainable development and poverty eradication. Delegates hoped to renew political commitment to sustainable development, assess the progress and implementation gaps in meeting already agreed upon commitments, and address new and emerging challenges.

The R146 billion financing pledged at COP26 is of particular significance, which aims to support the country's shift from coal to cleaner energy sources.

4.1.4. Potential future drivers

In addition to the above, other future enablers of market growth could be:

- replacement of other energy sources (heat and liquid fuels) with electricity; and
- dedicated renewable energy generation for desalination (seawater or water from secondary sources) and subsequent electrolysis for hydrogen production as an alternative energy carrier (either directly or through synthetic fuels).

Furthermore, the local manufacturing of renewable energy components could be enabled by the complementary industrial base (steel, concrete), proven ability in manufacturing (e.g., in the automotive sector) and the potential for exports, which may be further enabled by the African Continental Free Trade Agreement (AfCFTA)[14]. Renewable energy industrialisation is driven through the South African Renewable Energy Masterplan (SAREM), expected to be finalised in 2023.

[14] According to the African Union (AU), the African Continental Free Trade Agreement was conceptualised in 2012 and launched on 1 January 2021. The agreement connects 1.3 billion people across 55 African countries with a combined gross domestic product (GDP) valued at US$3.4 trillion. Primarily, the agreement aims to reduce the tariffs by 90% among member countries. The World Bank claims this agreement presents a major opportunity for increasing Africa's export by US$560 billion, mostly in manufacturing.


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4.2. Market barriers and uncertainties

Historical uncertainty about the rollout of the REIPPPP and statements made by the DMRE, Eskom and coal labour unions about the future of renewable energy have created doubt in the market. This has, to some extent, been addressed by the rollout of BW5 and BW6. However, there were no further bid window announcements made in 2022. There is also uncertainty about the timing of an updated IRP, financial closure of BW5 projects, and procurement under BW6. Further clarity on future bid windows and recent changes to Preferential Procurement Regulations are required to enable a more rapid rollout of renewable energy projects. To accommodate this rollout, a new plan is required through an updated IRP that will enable further diversification of energy sources.

4.2.1. Maintaining the country's existing manufacturing base

Recognising the REIPPPP's success in attracting investment in renewable energy infrastructure and an initial emerging local manufacturing industry, it is important that the successful implementation of renewable energy projects continues. To maintain and grow the local manufacturing base, (similar) enablers such as the local content and enterprise development components of the REIPPPP will have to be executed effectively and consistently.

A long-term market view is crucial to sustaining investor confidence through certainty and clarity on the rollout of future wind and solar capacity allocated to renewable energy generation. Beyond the uncertainty experienced by manufacturers lies the risk of projects failing to meet their local content commitments, due to constrained manufacturing capacity and programme execution. In turn, it will increase the reputational risk of South Africa as an investment destination.

4.2.2. Available grid capacity on the Eskom grid

There are grid constraints in South Africa's high-yield renewable energy areas. Eskom's Generation Connection Capacity Assessment (GCCA) 2023 Phase 1 report[15] confirms that there is no longer grid capacity in the Northern Cape and that the network in the Western Cape is at saturation point (see **Figure 9**). Eskom is aiming to accelerate grid strengthening through the introduction of additional transformers. This presents a challenge for both future private and government programmes. Only six of the 56 bids submitted during BW6 have attained preferred bidder status as a direct result of grid constraints in the Western and Northern Cape (Creamer 2022b).

[15] Available at: https://www.eskom.co.za/wp-content/uploads/2021/08/GCCA2022Document-Jun2015.pdf

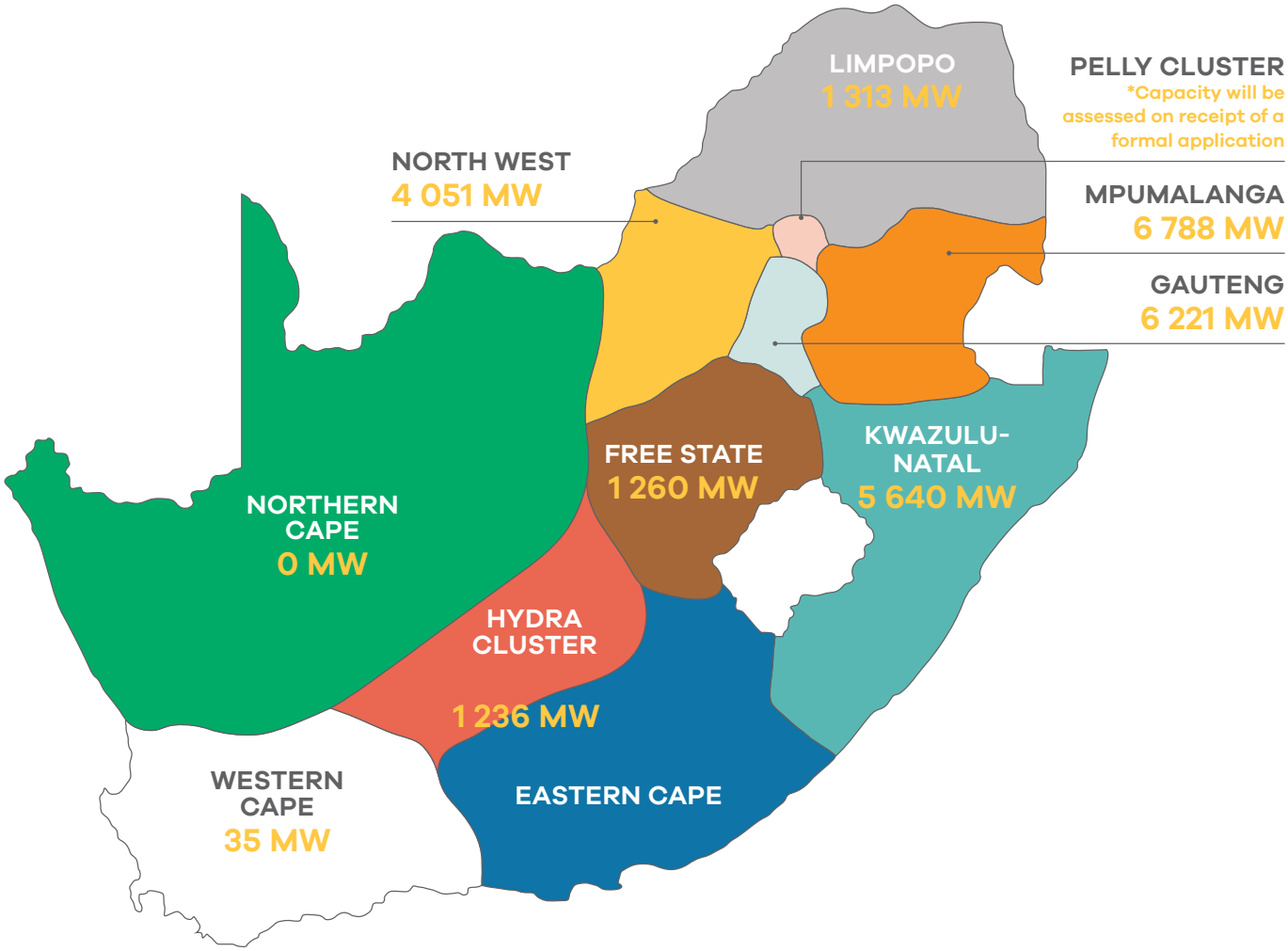

Figure 9: Eskom supply area grid capacity five pre-bid window projects based on Eskom's GGCA reports[16]

[16] Map developed from images in Eskom's Transmission Development Plan (TDP) 2023-2032 (Eskom 2022).

4.2.3. Eskom unbundling – reforming the country's electricity sector

Process and progress

At the 2019 State of the Nation Address, the President announced that Eskom Holdings SOC Ltd would be unbundled into three wholly owned subsidiaries, namely Eskom Generation (generation entity), Eskom Transmission (transmission entity), and Eskom Distribution (distribution entity). Eskom completed a process of functional separation with the establishment of divisional boards and managing directors.

This new business model aims to improve the power utility through greater transparency and accountability and allow stakeholders a more efficient approach to addressing generation, transmission, and distribution challenges separately. This unbundling process will ensure that the generation capacity runs uninterruptedly, and that South Africans will receive uninterrupted electricity.

The next step has been to complete the legal separation, setting up separate legal entities for each of the three businesses. A legally binding agreement to transfer Eskom's Transmission division to its wholly owned subsidiary, National Transmission Company South Africa SOC Limited (NTCSA), was executed in December 2021. Legal separation of the Generation and Distribution divisions was expected to be completed by December 2022 (Eskom Media Room 2022c).

Eskom's financial sustainability

Eskom's unsustainable debt status, including its failure to service the interest payments on this debt, is considered the single biggest risk to its continued operation. Eskom's debt has contributed and continues to contribute directly to South Africa's deteriorating investment grade. Despite a more than 500% tariff increase over recent years, Eskom has failed to finance its borrowings. This creates uncertainty that could affect international investors' perception of South Africa's REIPPP programme, the economy and governance.

However, the tabled 2022 Medium Term Budget Policy Statement (MTBPS) outlined government's plan to take over a portion of Eskom's R400 billion debt to facilitate its restructuring, unbundling and ability to raise capital. Further details of the debt relief are expected to be announced in the first quarter of 2023 (National Treasury 2022c).

Implications of Eskom's reform plan for the renewable energy sector in South Africa

While Eskom undergoes this transformation, the renewable energy industry is expected to gradually gain more access to the market through enabling regulatory measures from NERSA, DMRE and other relevant regulatory bodies. **Table 6** highlights key unbundling decisions and industry impacts expected from these decisions.

Table 6: Eskom unbundling decisions and related impact on the renewable energy industry

Eskom unbundling decision	Industry impact
Revision of the early bid rounds tariff prices	Revising tariff prices of early bid window rounds may add to the risk already associated with the REIPPP programme. However, the plan highlights ongoing discussions with the affected IPPs over PPA extension to offset the losses incurred by the investors and repair dented investor confidence.
The Transmission Entity (TE) will be the buyer	Core to Eskom's unbundling plan is the establishment of the Transmission Entity (TE) as a market and system operator. The TE will play a major role in enabling competition in the market, allowing renewable energy to compete with Eskom over energy procurement to the national grid. When the restructuring is completed, the buyer will be the TE. Consequently, the existing PPAs between Eskom and various IPPs will be transferred to the TE. However, it should not be of great concern to IPPs and lenders, as long as the sovereign guarantees provided by the SA Government under the implementation agreements are not adversely affected.
Open market model and intra-company electricity trading	Ideally, the TE, as a buyer, could stimulate the market through an open market model. As a transition from the existing single utility model, the TE model will encourage competition, leading to cheap and accessible clean energy for South African communities.
Eskom Generation Entity (GE) competition	Each power station will have its own PPA with predefined, fixed, and guaranteed tariffs with the TE. Eskom will likely seek to broaden its business by diversifying into various energy production sectors, including renewable energy. However, Eskom's current debt prohibits this.

4.3. Market opportunities

Changes in the country's electricity sector continue to present various opportunities in the large-scale renewable energy market.

4.3.1. Public procurement of new generation capacity

This opportunity is related to any new renewable energy capacity generated by IPPs, either being sold to the national utility (procured through the REIPPPP), or to public entities such as local municipalities. The IRP determines the total market size for electricity generation needed to meet the country's demand.

The last Integrated Resource Plan (IRP) 2019 allocations indicate 12 800 MW for wind, 5 000 MW solar photovoltaic (PV), and a minimum of 4 000 MW of embedded generation to be procured between 2023 and 2030 (see Figure 4).

Public entities will procure most of this. The IRP is currently under revision and is expected to increase the allocated capacity to renewable energy and storage.

Opportunities enabled by the decommissioning of Eskom's generation assets

An additional key outcome of the IRP 2019 is the coal decommissioning schedule. According to the IRP 2019, 5 400 MW of electricity from coal generation by Eskom would have been decommissioned by 2022, increasing to 10 500 MW by 2030 and 35 000 MW by 2050.
The 1 000 MW Komati coal-fired power station was shut down in October 2022. Its remaining unit was contributing only 121 MW (Eskom Media Room 2022d).

Next in line are Hendrina, Camden and Grootvlei power stations, with combined capacity of about 4 700 MW, to be shut down on a piecemeal basis over the next five years (Erasmus 2022).

The extent of the planned decommissioning of coal-based power generation will provide space for an entirely different energy mix, focusing on incremental capacity addition (modular) and flexible technology to complement the existing installed inflexible capacity (IRP 2019). The IRP 2019 envisioned energy mix presents an opportunity for the future of the REIPPPP as a tool that attracts investment and creates jobs in the South African economy.

It is also expected that by 2024, 1 800 MW of nuclear power generation (Koeberg) will reach end-of-life. However, Eskom has initiated preparations and processes to extend the life of this plant to 2044 (IRP 2019). Although not provided for in the IRP 2019, in June 2020 DMRE issued a successful request for information (RFI) to test the market to implement the Nuclear New Build Programme. In August 2021, NERSA then issued a Section 34 Determination concurrence for 2 500 MW of new nuclear generation capacity, which was approved in September 2021. DMRE issued a request for proposal (RFP) for a procurement framework for this 2 500 MW nuclear programme at the end of March 2022. A Section 34 Determination concurrence with suspensive conditions has been granted by NERSA. Once the suspensive conditions have been addressed, the DMRE will be able to issue an RFP to implement the Nuclear New Build Programme (DMRE 2022b).

It is of significance that the IRP is currently being updated. During the Transmission Development Plan (TDP) Public Forum in October 2022, Eskom revealed that approximately 53 GW of new additional generation capacity, particularly from renewable energy sources, including wind and solar, will be required for the period up to 2032 to ensure energy security in the country.

This 53 GW new additional power includes the current deficit of between 4 000 MW and 6 000 MW, with Eskom basing its assumptions for new generation capacity on the Integrated Resource Plan of 2019 (IRP 2019), which proposed around 26 GW of new capacity between 2023 and 2030. Eskom is placing a strong focus on the implementation of new build projects under the IRP 2019 over the next five years. An analysis of the implementation needs reflects a requirement of approximately 2 890 km of extra high voltage lines and 60 transformers, requiring a capital investment of **R72.2 billion** by FY2027 (Eskom Media Room 2022e).

Opportunities through municipal procurement

As a result of rising electricity prices, plus their efforts to enable energy security, municipalities that rely heavily on revenue from the sale of electricity to subsidise other services, have begun exploring options to procure electricity from IPPs. The 2020 amendment to the Electricity Regulations on New Generation Capacity enabled municipalities in good financial standing to procure or buy new generation capacity and develop their own power generation projects. This enables a market opportunity to develop projects with municipalities as direct offtakers of their electricity.

National Treasury has undertaken a legal and regulatory framework analysis in respect of the establishment or procurement of new generation capacity by municipalities and municipal entities. The objective is to provide guidance that will assist municipalities and municipal entities in enabling and informing the procurement of new generation capacity in a competitive, fair, cost effective, transparent and robust manner. Furthermore, guidance is provided through various scenarios that municipalities can explore (National Treasury 2022).

Some key developments within this market opportunity:

- The City of Cape Town (CoCT) issued its first tender in the new IPP, which entails buying 200 MW from IPPs within the city's electricity supply area (CoCT 2022).
- CoCT is running a pilot research project to investigate, test and finalise the wheeling facility. The application process to participate closed in June 2022.
- The City of Ekurhuleni awarded contracts to multiple IPPs in early 2022.
- The George municipal council approved the establishment of limited wheeling services, and the municipality is running a pilot project (George Municipality 2022).


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Electricity wheeling and energy trading will enable opportunities for distributed generators to increase their access to off-take agreements. As allowed by the DMRE and implemented by local municipalities, electricity wheeling will allow generators to wheel power to a willing buyer anywhere in the municipality or country. The City of Tshwane, Nelson Mandela Bay Metropolitan Municipality and CoCT are some of the major municipalities that are implementing or have already implemented legislation to allow for wheeling. The release of regulations allowing private sector energy trading will also open the market to private sector PPAs and on-sales to private consumers using the national and local distribution networks.[17]

Energy system constraints as an opportunity

As part of the broad measures to address the load shedding crisis, Eskom launched three programmes to procure much needed power for the national grid. Initially the programmes are focusing on generators capable of supplying more than one Megawatt to the grid, which could include existing IPPs with PPAs and excess generation capacity. Over time the threshold will be lowered to enable smaller producers to participate. The combined impact of the programmes is predicted to exceed 1 GW. These programmes are[18]:

- **The standard offer programme**, to procure power from companies who have existing generation capacity for a period of three years.
- **The emergency generator programme**, to procure more expensive power during periods when the grid is significantly constrained.
- **The bilateral power import programme**, to secure imports of power to the country from neighbouring countries. Eskom is already importing electricity from some of its neighbours via the Southern African Power Pool, an average 200 MW that is being used to augment Eskom's generation capacity when the grid is constrained.

Additionally, in April 2022, Eskom issued tenders for leasing part of its land that will be used to develop renewable energy projects. Eskom was targeting between 1 and 5 GW of renewable energy capacity. In June 2022, Eskom announced that it had selected 18 companies to lease land in the province of Mpumalanga to develop renewable energy projects amounting to 1.8 GW of additional capacity. The projects are capped at 100 MW, which means they will not require a licence as provided for in the amendments to the ERA. These bids will cover 4 000 ha of land, out of a total 36 000 ha available Eskom land (Eskom Media Room 2022h).

4.3.2. Private procurement of new generation capacity

The private renewable energy market in South Africa is evolving and growing rapidly, and the national regulatory environment has struggled to keep pace with this growing market. In 2022, NERSA received 379 applications for new embedded generation facilities, a total of 1 639 MW. Since the increase of the registration threshold from 1 MW to 100 MW, NERSA has received 51applications for generation facilities above 1 MW for commercial purposes.

The potential market size for this opportunity was approximated by the IRP 2019 to be ~500 MW per year (see **Figure 4**); however, this has already been exceeded in 2022. The 500 MW was put in place to control the market, but the energy crisis disincentivised enforcement. This opportunity spans all technologies (biomass, landfill gas and co-generation) that do not have technology-specific allocations in the broader IRP 2019 provisions. It is expected that solar PV will remain the dominant technology due to technical maturity, tariff structures, price and ease of implementation.

Various mining companies have publicly declared investments committed to developing solar PV, wind and battery storage and/or hybrid projects in the pipeline to take advantage of the determination.

[17] One licence has been allocated to PowerX, but the process by which more licences can be allocated is yet to be completed.

[18] Source: https://www.eskom.co.za/eskom-launches-power-purchase-programmes-to-secure-1-000mw-to-bolster-constrained-generation-capacity/

Some of the major mining companies in South Africa who announced plans for renewable energy in 2021/22 include:

- Goldfields: Building a 40 MW solar project after receiving a licence from NERSA[19];
- Royal Bafokeng Platinum: 98 MW solar PV project[20];
- Sibanye-Stillwater: 175 MW solar PV facilities across three locations (Goosen 2022);
- Anglo American Platinum: 100 MW solar plant[21];
- Exxaro secures NERSA registration for 80 MW solar project at its Grootegeluk coal mine[22];
- Harmony Gold undertakes three phases of renewable energy development: Phase 1, for a 30 MW solar PV energy plant; Phase 2, 137 MW of renewable energy at its various longer-life mines; Phase 3 is in the planning stage and progressing as anticipated[23]; and
- Impala Platinum (Implats) has aspirations to introduce 290 MW of renewable energy – 170 MW through a solar photovoltaic plant and 120 MW the subject of a wheeling arrangement[24].

The mining sector has reported a pipeline of renewable energy projects over 2 GW that could be brought on stream in 2022/2023, with an estimated cost of between R 30 billion and R40 billion. The leading technology of interest is solar PV, alongside solar-diesel hybrid power projects or battery energy storage systems for overnight operations.

4.3.3. Local manufacturing of renewable energy components and systems

Establishing a thriving manufacturing sector is a powerful engine for growth and development. This section considers the opportunities for local manufacturing of wind, solar PV, and battery components and systems.

South African Renewable Energy Masterplan (SAREM) is one of the 14 industry specific masterplans currently under development since July 2019 and due for publication in 2023. SAREM's objective is to deliver an implementable plan for driving industrialisation through the renewable energy sector and its value chain. It is a collaborative plan between social compact partners, i.e., government, industry, and labour. SAREM has identified nine key working areas to support the creation of an enabling environment for the renewable energy value chain:

- Market certainty
- Local content policy
- Input materials
- New entrant support
- Trade and export support to access regional opportunities
- Transformation
- Integration with Just Transition hotspots
- Skills and technology transfer
- System readiness

SAREM also has project committees with representatives from DMRE, dtic, DSI, PPGI, labour, and industry (with relevant industry associations) to ensure the SAREM process overcomes any blockages. At the helm of this structure is the Executive Oversight Committee (EOC) which is chaired by the Minister of DMRE; nominated labour and industry representatives provide oversight on the plan and its implementation.

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[19] Source: https://www.goldfields.com/news-article.php?articleID=10709

[20] Source: https://www.miningweekly.com/article/royal-bafokeng-looking-to-r16bn-off-balance-sheet-spend-on-98-mw-solar-plant-2022-08-10

[21] Source: https://www.angloamericanplatinum.com/media/press-releases/2021/06-10-2021

[22] Source: https://www.miningweekly.com/article/exxaro-secures-nersa-registration-for-80-mw-solar-project-at-its-grootegeluk-coal-mine-2022-06-13

[23] Source: https://www.harmony.co.za/investors/news/company-announcements/2022/1353-harmony-demonstrates-esg1-in-action-as-it-concludes-esg-linked-loans-and-starts-construction-of-three-10mw-solar-photovoltaic-plants/

[24] Source: https://www.miningweekly.com/article/implats-issues-rfi-for-renewable-energy-to-be-wheeled-to-its-south-african-sites-2022-11-25

Solar PV and wind manufacturing

South Africa has a strong base for manufacturing key renewable energy components – a strong steel and cement industry for towers, a strong extrusion industry for mounting structures, a strong electro-technical industry for key electrical components, raw and semi-processed minerals for use in batteries, and a strong boatbuilding and textile industry as a foundation for blades. The REIPPPP has been the primary mechanism for renewable energy localisation and industrialisation using local content requirements (see **Table 7**).

Table 7: Average local content as a percentage of total project cost versus threshold (IPPO 2021)

	Minimum threshold BW 1-4	BW1	BW2	BW3	BW3.5	BW4	Minimum threshold BW5	BW5
Value of Local Content Spend	25%-45%	34,4%	50,2%	47,5%	40,6%	48,6%	40%-45%	44,0%

The bulk of localisation in solar PV was in the balance of plant, mounting structures and trackers. For wind, it was the balance of plant and towers. The bulk of the imports in solar PV was in the photovoltaic module with its associated inputs such as frames, glass, and cells. In the wind value chain, the collection of components that constitute the rotor, nacelle and drivetrain are largely untapped from a local manufacturing perspective.

It is estimated that by 2030 some **14 million solar panels** and **3 600 wind turbines**[25] would be required to fulfil IRP 2019. Annual production assumes **70-90% localisation of key components** and **90% of the balance of plant** by 2030.

Even so, the South African renewable energy manufacturing sector has been in survival mode due to many factors, such as the small size of the domestic market, the threat of cheap imports, policy uncertainty, high input costs, and a limited skills base geared towards renewable energy manufacturing. It is important to the sector's future that the local market be dynamic, growing, and competitive.

A review of the barriers to competitiveness in South Africa, in general, has identified the most important aspects influencing local manufacturing competitiveness: cost and availability of labour and materials, local market attractiveness, energy cost and policies, economic, trade, financial and tax system, physical infrastructure, supplier network, and government investments in manufacturing (Deloitte, 2013).

Table 8 provides a breakdown of the local manufacturing opportunities in the solar and wind value chain, based on the past bid rounds and key input materials' availability, quality, and cost.

[25] Example based on 450W PV panels and 4MW wind turbines.


© Nicholas Fordyce

Table 8: Local manufacturing opportunities in the solar PV and wind sectors

Solar PV components	Description
Module manufacturing	Additional module manufacturing presents a short-term opportunity in the South African market. The business case for new entrants may not be strong based on local demand only, given established module manufacturing capacity.
Aluminium module frame and junction box	Expansion of aluminium module frame and junction box manufacturing facilities, provided the cost of aluminium can be reduced to be cost-competitive with imports, also presents a strong business case.
System assembly of inverters	System assembly of inverters with core imported products and some local components and manufacturing under licence would require support from local producers to meet quality standards and access to testing and certification locally. Expanding magnetics production would be possible with additional milling capacity, and enclosure and packaging production could be expanded.
Transformers	Expanding transformer production through reductions in input material costs (especially steel) and improved efficiencies to meet the standards expected by international inverter manufacturers.
Mounting structures	Mounting structures are more readily localised due to the high cost of transport but are relatively lower value components of a solar PV system. Expansion of production of steel and aluminium mounting structures could be done, provided steel production and aluminium extrusion production capacity can be expanded, and the support provided for tooling and cost of these inputs can be reduced to be cost-competitive with imports.
Cable production (AC & DC)	Expanding cable production could be enabled by expanding local conductors, insulation, and armour provided input material costs (steel, aluminium, and polymers) are addressed. Local aluminium rod production could boost local cable production.
Wind components	**Description**
Wind tower	Steel and cement towers are manufactured locally, however additional tower and tower internals manufacturing are possible.
Nacelle assembly	Local nacelle assembly (even if initially largely from imported components) is an important enabler of higher value local turbine component manufacturing. Local nacelle assembly could also expand existing casting, forging and transformer production if capacitated for renewable energy component production. However, it should be recognised that the localisation potential of all these components is currently considered medium rather than high.
Blades	Work has been done to explore the potential of a local blade manufacturing facility. A demand of 400 MW/year/OEM for a minimum of five years is required for this to be a viable option.
Cable production	Expanding cable production could be enabled by expanding local conductors, insulation, and armour, provided input material costs (steel, aluminium, and polymers) are addressed. Local aluminium rod production could boost local cable production.

Table 9 provides a breakdown of the local opportunities for input materials required to manufacture solar and wind components based on the past bid rounds and the availability, quality, and cost of key input materials.

Table 9: Input materials required to manufacture wind and solar components

Material	Currently localised for the renewable energy value chain (Y/N)	Potential for localisation for renewable energy value chain (L/M/H)	Conditions for localisation
Silicon and glass	N	M	SA production potential for rolled glass is high, but manufacturers consider it uncompetitive, especially against Asian producers with large economies of scale. The high iron content of SA silicon will require large demand/economies of scale to produce low iron solar glass.
Cement and concrete	Y	H	Already produced locally; with some competition from imports.
Iron and steel	Y	H	Existing flat-rolled and stainless steel capacity, but imported steel (China, Taiwan, Korea) dominates as local steel is not competitive (quality and cost).
Polymers and plastics	N	L-M	Diverse polymers and plastics required; The extent of localisation would depend on specifications and whether related parts are produced/assembled locally. There is no advantage to local polymers and plastics for the solar value chain.South Africa is generally an importer of (specialised) polymers and plastics.
Aluminium and alloys	Y	H	Already produced locally, but not competitively.
Copper and alloys	Y/N	L	Limited amount of copper produced locally; often imported due to inadequate local supply (quantity and quality)
Other metals and minerals (e.g. cadmium)	Y/N	L/M	Diverse metals and minerals produced in SA. The extent of localisation would depend on specifications and whether related parts are produced/assembled locally. There is an advantage to local production of specific metals and minerals to the specification required in the solar PV components.
Oil	N	L	Specialised oils required in the wind industry.
Coolant	N	L	Specialised synthetic lubricants required in the wind industry.

4.3.4. Opportunities created by large-scale battery storage development

The large-scale battery market has emerged recently, driven by the IRP 2019 provisions. Longer gas infrastructure lead time has been considered, recognising that the power systems need more energy storage, especially given the extent of wind and solar. A total allocation of 2 088 MW by 2030 has been made towards storage, with the last Ministerial Determination (2020) confirming 513 MW of the IRP 2019's provision towards storage in 2022 (Eskom Media Room 2022a). This type of procurement, led by DMRE, System Operator (SO), and IPPO, is the first of its kind in South Africa. It paves the way for additional means and opportunities that the existing renewable energy plants can contribute to alleviate the energy crises. South Africa's battery storage projects are expected to limit the impact on the existing grid by incorporating renewable energy solutions.

In July 2022, Eskom awarded contracts to two successful bidders for the provision of battery storage solutions in terms of its BESS project. This project will act as proof of concept on the delivery of the first battery energy storage project in South Africa. It will be used primarily for national peak shaving (managing demand) purposes. The secondary use of the project will be for ancillary services and local network support. The project is designed to be implemented in two phases (Eskom Media Room 2022a):

- Phase 1 includes the installation 833 MWh distributed battery storage capacity at eight sites, providing four hours of dispatchable electricity supply at approximately 199 MW capacity. This phase also includes about 2 MW of solar photovoltaic (PV) capacity.
- Phase 2 includes the installation of 616 MWh distributed battery storage at five sites, providing a dispatchable electricity capacity of 144 MW. The solar PV capacity in this phase is 58 MW.

Additionally, the 2 000 MW RMIPPPP aims to deal with a critical power supply gap. A major objective of the RMIPPPP is to reduce the usage of diesel peaking plants in South Africa that, whilst providing a system operator with necessary flexibility, are generally the most expensive generation on the grid. The RMIPPPP has been designed to meet the performance specifications stipulated by the Transmission SO, which include the need for each project to be dispatchable between 05:00 and 21:30 daily. In addition, each project was required to provide ancillary services necessary for grid stability. Three preferred bidder projects combined wind and solar with battery energy storage systems, storing excess energy and a hybrid controller to send power to the grid as needed (Eskom Media Room 2022a).

4.3.5. Potential opportunities

There are potential opportunities at early stages of development that can benefit the large-scale renewable energy market. The most notable is the green hydrogen industry that has received substantial government and media attention in 2022.

Green hydrogen

The potential for South Africa to produce, use, and export hydrogen has received much attention from the government and industry in the last two years. Electrolysis of water by renewable energy enables the production of green hydrogen, which is of particular interest for the hydrogen export market and the decarbonisation of hard-to-abate sectors (e.g., iron, steel, and cement).

At the South Africa Green Hydrogen Summit in November 2022, President Cyril Ramaphosa delivered the inaugural speech, highlighting South Africa as a key investment destination for green hydrogen production. He pointed out that South Africa had the potential to produce 6 to 13 million tons of green hydrogen and derivatives by 2050, which would require between 140 GW and 300 GW of renewable energy. This exceeds the entire South African generation capacity in 2022. The Boegoebaai Port and Rail project has been identified as a key enabler and is expected to be developed by 2028 (The Presidency 2022).

It should be noted that there are infrastructural, policy, market, and regulatory challenges to overcome before green hydrogen can be realised as a key opportunity for investors in the large-scale renewable energy industry.

Equipment end of life

In the power purchase agreement (PPA) tenure review process, industry stakeholders have engaged in discussions about the possibility of utilising the independent power producer (IPP) infrastructure once the PPA tenure with Eskom has ended. The first is to start in 2032 for BW1 projects.
This creates an opportunity for consumers to buy cheaper and cleaner electricity from an operational infrastructure that has paid off its debt and generated a return on investment. This idea presents an opportunity for South Africans to buy cheaper and cleaner renewable energy, but also in the longer term to conduct research and development (R&D) and establish clear regulatory standards for renewable energy waste management from the decommissioning of renewable energy infrastructure.

FUNDING AND INCENTIVES

A range of general and sector-specific funding solutions and incentives is available to investors, manufacturers, and service companies in the green economy. It covers Development Finance Institutions, local public and private sector financiers and investors, and a considerable range of tax incentives.


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The GreenCape Green Finance Desk (GFD) primarily acts as a facilitator in the financing of green projects and green business. The GFD works across all sector desks at GreenCape. For more support please visit https://www.greencape.co.za/content/sector/green-finance Finance databases

5.1. Finance databases

GreenCape's GFD has compiled and continues to maintain a database of climate finance sources and incentives that could be relevant to companies and projects operating in the South African green economy. A few of the available databases are highlighted below and can be sourced here: https://green-cape.co.za/archives/green-finance-databases/

5.1.1. The Green Economy Climate Finance Database 2022

The database contains information on funding opportunities, the types of funding and institutions providing the funding, and contact details. This includes information on national market players (e.g. commercial banks, microfinance banks, private equity/debt, venture capital, angel investors etc.), as well as international climate finance streams (e.g. climate funds, DFIs, multilateral institutions, bilateral development partners) and domestic sources of finance. The Green Economy Climate Finance Database 2022 analysed ~150 financing solutions valued at ~R25 billion.

The database is ideal for any entity seeking a broad range of funding solutions and financial incentives, with a largely South African focus.

Bilateral development partners, local and international development finance institutions, and government departments/ agencies make up the majority of the active financing stakeholders. Still, climate funds, commercial banks, private equity/debt, and venture capital make up most of the capital value available in the database.

Across the more than 150 climate finance opportunities, eight different financial products are available:

Debt [commercial (listed and unlisted) and concessional (listed and unlisted)] – A debt evidenced by a note which specifies, in particular, the principal amount, interest rate, and date of repayment at below-market rates. The concessionality can be achieved either through interest rates below those prevailing on the market, longer maturity or grace periods, or a combination of those.

Venture capital (limited) – Equity capital can be provided at various stages of funding rounds. Common funding rounds include early-stage seed funding in high-potential, growth companies and growth funding.

Mezzanine finance – Subordinated debt or preferred equity instrument representing a claim on a company's assets that is senior only to that of the common shares. Mezzanine financings can be structured either as debt or preferred stock.

Equity – A stock or any other security representing an ownership interest.

Guarantees and Risk Mitigation Instruments (RMIs) – RMIs facilitate access to debt and equity financing by mitigating and transferring risks from project sponsors and private lenders to third parties. Common instruments applied include contractual arrangements, joint ventures, insurance and guarantees.

Grants (very small "ticket size") – Transfers made in cash, goods or services for which no repayment is required.

Government spend – Government development finance or budget spend.

Finance products are available for almost all the sectors (biggest gaps remain in adaptation-focused and new and emerging sectors).

Still, as expected, clean energy is the focus of most of the tracked financial offerings, including energy efficiency and demand-side management and mobility/storage.

How to use the Green Economy Climate Finance Database 2022:

Each sheet is broken down into types of sources of climate finance (public, private and blended). These are covered by the government (local and international), development finance institutions, commercial and others. The diagram below details the five steps you can follow to filter the dataset for the best possible outcome.

STEP 01

Select the relevant source of finance sheet

STEP 02

Sort sheet by sector:

- Clean energy
- Energy efficiency & demand side management
- Low carbon transport
- Water conservation, supply & demand
- Agriculture, food production, fisheries and forestry
- Circular Economy
- Buildings and the built environment
- Material substitution
- General eco-system support
- Cross-sectoral

STEP 03

Sort sheet by investment instrument:

- Grant
- Concessional debt
- Debt / mezzanine debt
- Working capital
- Equity
- Budget expenditure
- Other

STEP 04

Check alignment of the size of investment and investment opportunity information.

STEP 05

Contact relevant financiers (including high-level ask, market size estimate and basic company track record).

For further information and support on any of the content provided here, please get in touch with GreenCape's Climate Finance team at **finance@greencape.co.za**

Additional resources on improving green economy financial resilience are available from: Government Funding and Incentives Database An updated document focused on government funding and incentives is available to view and download **here.**

5.1.2. Allied Crowds Database

This database is ideal for any entity seeking a broad range of financial solutions.

"**AlliedCrowds** is the first complete aggregator and directory of alternative finance providers in the developing world. We help donors, investors, and entrepreneurs navigate the alternative finance space through our reports, data, and Capital Finder, increasing the flow of capital to deserving projects globally."

Sign up to use the Capital Finder is free and allows users to access a global database where you can filter for a sector (including greentech, agriculture and social impact), type of capital (equity, lending, grant) and type of funding (crowdfunding, angel investing, venture capital, impact investing). The Entrepreneur Hub provides important tools and assistance for start-ups, including writing business plans and financial resources.

- In addition, themed databases around the Sustainable Development Goals (SDGs) and the World Green Economy Organization (WGEO) are found **here**. You can also contact Allied Crowds to create a customised funding database for you.
- An Alternative Finance glossary can be found.

ALLIED CROWDS WEBSITE

5.1.3. Finfind Database

Access to finance is the number one challenge experienced by SMEs - Finfind has been specifically developed to address this problem. Finfind is innovative, online access to finance solution that brings the providers and seekers of SME finance with a focus on finance readiness. Finfind has over 250 lenders and almost 500 loan products available to SMEs, and each lender's listing and loan product information are kept up to date daily. This database is ideal for South African SMMEs seeking funding and business advisory services or upskill themselves on finance matters.

FINFIND WEBSITE

5.1.4. RECP Database

The Africa-EU Renewable Energy Cooperation Programme (RECP) is a multi-donor programme that supports the development of markets for renewable energy in Africa. It was launched by more than 35 African and European Ministers and Commissioners under the Africa-EU Energy Partnership (AEEP).

Aside from the Finance Database, the site also hosts the Finance Catalyst, an advisory service geared towards African projects. This is supplemented with market intelligence (including RE potential, country-specific regulatory framework and key stakeholders). This database is ideal for renewable energy project developers looking to work in Africa.

RECP DATABASE

5.1.5. Government Funding and Incentives Database

An updated document focused on South African government funding and incentives is available to view and download online. These incentives cover local manufacturing, critical infrastructure grants, small enterprise development and a diverse set of sector specific incentives (i.e. Aquaculture Development and Enhancement Programme).

GOVERNMENT FUNDING AND INCENTIVE BOOKLET

5.2. South African Climate Finance Landscape

The South African Climate Finance Landscape looks at detailed project-level green economy finance data, understanding source, disbursement, instrument and use. The insights can support public and private role-players with information to shape sectoral strategies and selected policies and improve coherence and coordination between public and private level spending in the sectors. The South African Climate Finance Landscape has tracked R62.2 billion in annual climate finance invested in SA.

ACCESS TO THE SOUTH AFRICAN CLIMATE FINANCE LANDSCAPE

GREEN FINANCE DATABASE

5.3. Further funding sources

Click the buttons below to access the different funding sources.

SA INSTITUTIONS PROVIDING FUNDING FOR ENTREPRENEURS

SA BUSINESS FUNDING DIRECTORY 2016/17

THE GREEN OUTCOMES FUND

GREENCAPE'S SUPPORT TO BUSINESSES AND INVESTORS

GreenCape is a non-profit organisation that works at the interface of business, government and academia to identify and remove barriers to economically viable green economy infrastructure solutions. Our vision is a thriving prosperous Africa, mobilised by the green economy.

Working in developing countries, GreenCape catalyses the replication and large-scale uptake of green economy solutions to enable each country and its citizens to prosper. We work with businesses, investors, academia and government to help unlock the investment and employment potential of greentech and services, and to support a transition to a resilient green economy.

We assist businesses by removing barriers to their establishment and growth and provide our members with:

- free, credible and impartial market information and insights;
- access to networks of key players in government, industry, finance and academia;
- an advocacy platform to help create an enabling policy and regulatory environment for green business.

We assist local, provincial and national government to build a resilient green economy by providing:

- support on the development of standards, regulations, tools and policies
- expert technical knowledge on key sectors in the green economy;
- access to networks of key players across business, academia, and internationally

Since inception in 2010, GreenCape has grown to a multi-disciplinary team of over 40 staff members, representing backgrounds in finance, engineering, environmental science and economics.

Our market intelligence reports form part of a working body of information generated by sector desks and projects within GreenCape's three main programmes – energy, circular economy and resources.

Benefits of becoming a GreenCape member

We currently have over 3 050 members, and offer free membership. Becoming a member of GreenCape will give you access to the latest information regarding developments in the various sectors; access to tools, reports, and project information; and offer you the opportunity – through our networking events – to meet and interact with various stakeholders in the green economy.

We have facilitated and supported ~R42 billion of investments in renewable energy projects and manufacturing. From these investments, more than 19 000 jobs have been created.

Through our WISP (industrial symbiosis) programme, by connecting businesses with waste / under-used resources:

435 000 fossil GHG emissions saved (equivalent to the electrical usage of 117 840 households in SA);

Over R150 million in financial benefits (additional revenue, cost savings and private investments);

398 economy wide jobs.

135 00 tonnes of waste diverted from landfill


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