



SOUTH AFRICA

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TOWARDS AN EQUITABLE TRANSITION TO A LOW-CARBON CLIMATE-RESILIENT ECONOMY

OPPORTUNITIES IN SOUTH AFRICA'S SOLAR PV ENERGY VALUE CHAIN

The push for more electricity generation in South Africa, especially more renewable energy (RE), is likely to result in a significant increase in solar photovoltaic (PV) projects across the country. This could in turn drive the local demand for solar PV components and related services.

WHAT IS NEEDED TO PRODUCE SOLAR PV ENERGY?

Natural minerals and man-made materials include silica, silver, glass, cement and steel to name but a few of the items that go into the different components in a solar PV panel. The infographic (on the next page) shows the stages of the value chain and where the opportunities lie for job creation and developing a local solar PV industry.

WHAT IS THE STATE OF OUR LOCAL SOLAR PV MARKET?

Very few local firms are involved in manufacturing for solar PV. Most small firms are cautious about participating in the government's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) as constantly shifting requirements make it a difficult space for them to operate in. There is a critical need for reliable and sustainable demand, as well as policy certainty in the solar technology space.

HOW CAN SA SUPPORT LOCAL SOLAR ENERGY GROWTH?

1. Investigate the feasibility of investing into a laboratory that can provide EU standards certifications, as well as test smaller inverters for a local market.
2. Through the provision of concessional finance, guarantees, cash flow relief, and other financial products, support the growth of local small engineering businesses that manufacture components.
3. Take advantage of employment opportunities by investing in skills development through training programmes, specifically for technicians and electricians, as well as manufacturing, assembly, installation, servicing and repair of solar inverters.
4. Grow local manufacturing capabilities in solar PV modules and inverters, as well as support local demand from existing and prospective manufacturers.

SOLAR PV UPTAKE

The Integrated Resource Plan (IRP) provides that by 2030 the electricity generation mix is to comprise 10% – 8 288 MW – of solar PV energy. A more ambitious IRP would result in an increase in solar PV demand.

Through the REIPPPP, by December 2021:

- More than 6 000 MW has been allocated to private sector bidders across a variety of RE technologies, principally in wind and solar.
- More than one third of the total procured is for solar PV: 2 292 MW.
- The active solar-based generation capacity procured was 2 212 MW
- This amounted to 42 solar PV projects that had been operational for more than a year.

Distributed or small-scale embedded generation (SSEG) for own use is expected to add 4 000 MW between 2023 and 2030.

From August 2021 and the amendments to the Electricity Regulation Act (lifting the licensing exemption threshold from 1 MW to 100 MW), to the end of September 2022, a total of 1 077 MW of solar PV-based generation capacity had been registered with the National Energy Regulator of SA.

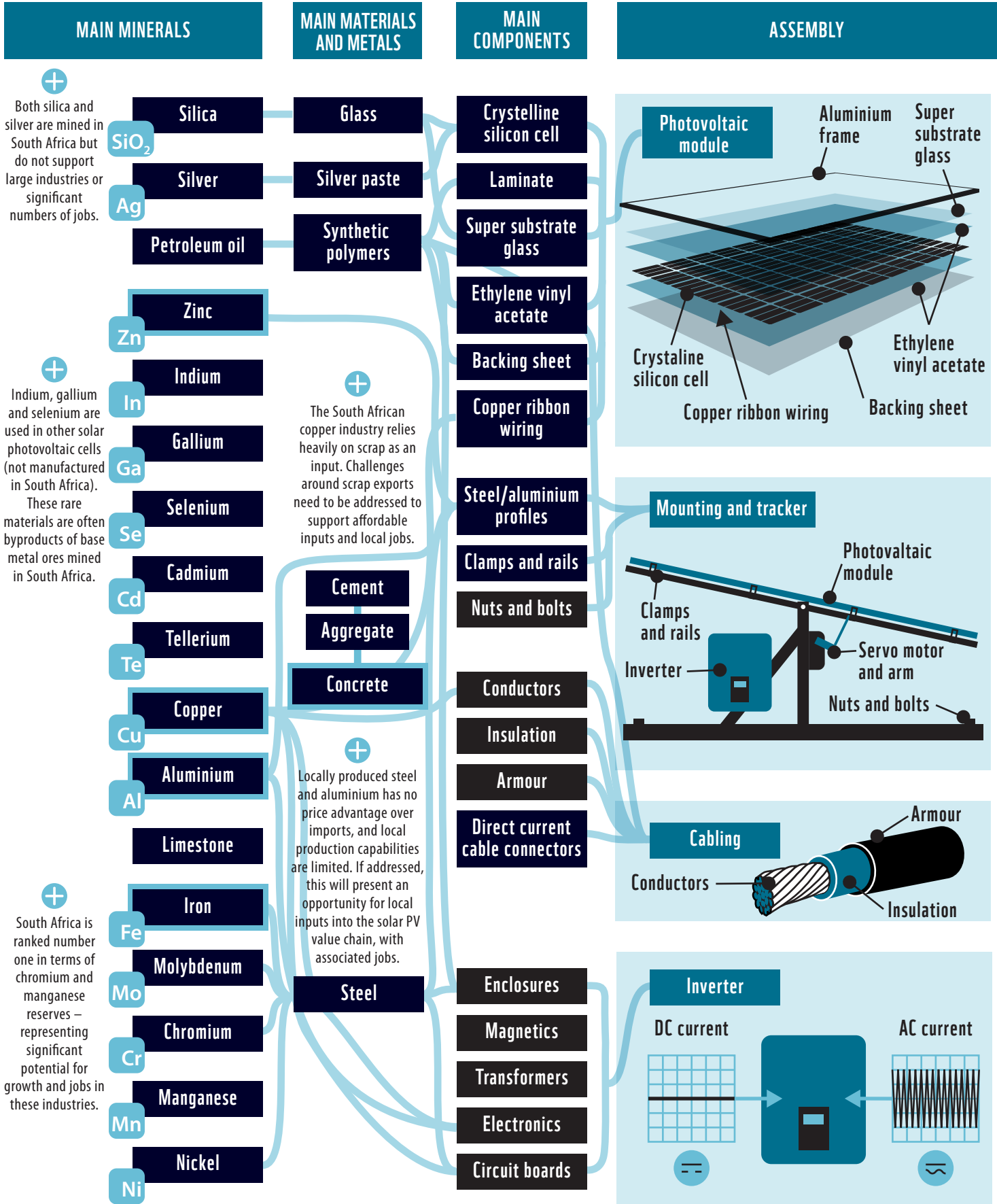


Explore further insights into South Africa's Solar PV manufacturing value chain at <https://www.tips.org.za/research-archive/sustainable-growth/green-economy-2/item/4441-insights-into-the-solar-photovoltaic-manufacturing-value-chain-in-south-africa>





MATERIALS AND MANUFACTURING VALUE CHAIN FOR SOLAR PV: OPPORTUNITIES FOR SOUTH AFRICA





15-17%
of water required
by nuclear or coal
generation

Water and energy are used in all the conversion processes throughout the value chain. On average, in terms of litres per megawatt hour, solar photovoltaic electricity generators uses about 15%-17% of the water required by nuclear and coal electricity generators.

ASSEMBLY

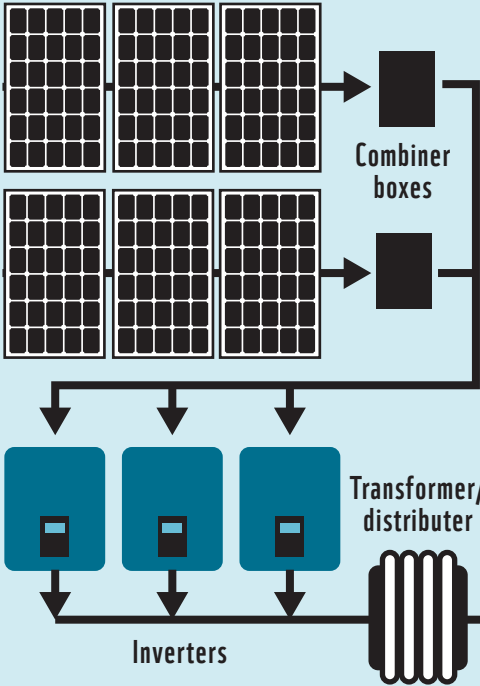
INSTALLATION

OPERATIONS & MAINTENANCE

DECOMMISSIONING AND END-OF-LIFE

Large-scale installation

Photovoltaic modules



Utility and large-scale project installation

Civil balance of plant

Electrical balance of plant

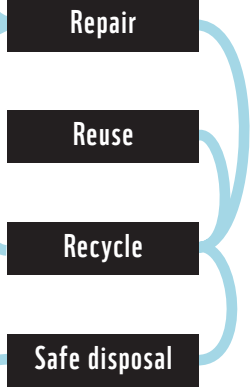
Small-scale embedded generation project installation

Parts repair

Parts replacement

Grid control and monitoring

18 000 tonnes
of solar photovoltaic panel waste was produced worldwide in 2019



≤93%
of panel content can be recycled

South Africa needs to develop the industrial capabilities to reuse and recycle panels and could become a regional hub for building skills in the reuse and recycling of solar components.

- + Two local firms manufacture crystalline silicon panels using imported parts. Support is needed to produce competitively priced local inputs.
- + Some local capabilities exist in manufacturing mounting frames particularly for commercial/industrial projects in South Africa and elsewhere on the continent. These firms need support to grow their local base.
- + Most (large) centralised inverters are imported; some assembled locally. Where small inverters are made locally, these manufacturers could grow faster with appropriate industrial development support.

+ More than 300 installation firms operate in the small-scale embedded generation market. There is a need to professionalise and train certain of these firms. This market is likely to grow and presents significant job creation potential.



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