



AIDC
**Alternative Information
& Development Centre**

*Strengthening Alliances for a Wage-led, Low-Carbon, Sustainable and
Equitable Development Path for Southern Africa*

DISCUSSION PAPER
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Back on the Table? Green Industrial Policy and South Africa's Unmet Needs

**An Alternative Approach to
Green Industrial Policy for South Africa**



The Need for Green Industrialisation in South Africa

South Africa has more inequality and unemployment than any other country in the world. Despite being a middle-income country, around two-thirds of the population lives in poverty,ⁱ and basic needs such as clean water, housing, and access to quality healthcare or education are still unmet for many South Africans. Mass unemployment has reached crisis levels, with more than one in three South Africans unable to find work.ⁱⁱ The effects spill over into other aspects of society, contributing to high rates of crime, violence, and poverty.

A fundamental cause of these socio-economic challenges is the lack of inclusive economic growth and economic transformation. From the final years of Apartheid and throughout three decades of democracy, economic policy favoured global trade integration, mining and the financial sector, without providing strong support for productive industries. This has led to deindustrialisation - between 1990 and 2024, manufacturing's contribution to the economy fell from 24% to 13%.ⁱⁱⁱ Today, the majority of South Africa's exports are still primary commodities such as minerals and agricultural produce.

Industrialisation is extremely important for job creation and economic growth - it is seen as being the engine that drives a country's economic development because manufacturing has so many links with other parts of the economy; for every 100 people employed in a car assembly plant in Nelson Mandela Bay, 500 people may be employed in industries that are producing things that the factory or its workers need.^{iv} It is also important because manufacturing increases the value of the goods South Africa produces and sells, providing more foreign exchange and tax revenue used to provide public services, while reducing the amount of goods South Africa needs to import.

However, historically industrialisation is also associated with the polluting industries and sectors that have led to climate change, leading to droughts, floods, and heatwaves that are becoming more common. South Africa only produces around 1% of global emissions (the 14th biggest emitter of greenhouse gasses in the

world), but it is important that we do not become a bigger contributor to the problem, and that we do not invest in assets and industries that are going to fall out of use or trade.¹ Most importantly, South Africa will need to take the impacts of climate change into account and develop in a way that makes sure that people and industries are protected from the consequences.

All of this has meant that the call for **green industrialisation** is becoming increasingly popular across the world, including South Africa, and is now regularly mentioned in policy documents and speeches. For many years, industrial policy was discouraged by mainstream economists and development institutions, who saw it as state interference. But today it is often said that industrial policy is "back on the table", referring to both the increasing number of green industrial policy programmes adopted by countries across the world, and the increasing recognition of the role of active industrial policy even by its former opponents.^v The up-ending of written and unwritten global trade rules by the Trump presidency has played a major role in the opening up of political space for industrialisation.

While South African social movements, civil society, academics and trade unions have consistently engaged with issues of climate change and the just transition, there has been relatively little discussion and debate about green industrial policy. In the context of South Africa's worsening crisis of unemployment and deindustrialisation - and the consequent return of anti-immigrant protests and spontaneous violence - questions of reindustrialisation and job creation must begin to take centre stage.

This paper aims to outline the AIDC's perspective on green industrial policy as a basis for discussion, debate, and consensus-building with trade unions, social movements, and progressive experts. To this end, it focuses on answering the following questions:

- **What is South Africa's current approach to green industrial policy?**
- **Can we imagine a different approach that responds to the urgent unmet needs of South Africans, particularly the crisis of mass unemployment?**

¹ Countries are putting measures in place to monitor and tax carbon-intensive products, making them more difficult or expensive to trade.

Glossary:

Adaptation: Preparing people, nature, and the economy for the **impacts** of climate change
Backward Linkages: Where the work of one industry uses products from other industries
Beneficiation: Adding value to raw minerals through processing or downstreaming
Capital-intensive: Industries where the cost of capital is much higher than labour
CBAM: Carbon Border Adjustment Mechanism, an EU carbon tariff
Commercialised: When entities (like SOEs) are made to run as a business
COSATU: Congress of South African Trade Unions
Decarbonisation: Reducing the amount of carbon emissions in a process or industry
Downstreaming: Using raw minerals or other inputs to manufacture products
DTIC: Department of Trade, Industry, and Competition
Fiscal: To do with tax and public finances
Forward Linkages: Where the product of one industry is used for other industries
GAIN: Growth and Inclusion strategy or framework
IDS: Industrial Development Strategy
IPAP: Industrial Policy Action Plan
JET-IP: Just Energy Transition Investment Plan
Localisation: A policy to encourage the local production of certain goods or services
Mitigation: Slowing down climate change by reducing greenhouse gas emissions
MTDP: Medium Term Development Plan
NDP: National Development Plan
OEM: Original Equipment Manufacturer, companies producing original parts (not resellers)
PIC: Public Investment Corporation, manages the Government Employees Pension Fund
REIPPPP: Renewable Energy Independent Power Producer Procurement Programme
SAREM: South African Renewable Energy Masterplan
SOE: State-Owned Enterprise

Green Industrialisation in Government Policy: The Narrow View

Green industrialisation has been a feature of government policy since the first Industrial Policy Action Plans in the early 2010s, which called for the development of green industries in response to climate change, including renewable energy. The South African Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) featured localisation targets from the beginning, aiming to support a local renewable energy industry. Green industrialisation is also a cornerstone of the 2022 Just Energy Transition Investment Plan, which calls for major investments in green hydrogen and electric vehicle manufacturing. The recent 2026 Industrial Development Strategy (IDS), which is intended to be a new overarching framework guiding industrial policy, features decarbonisation as one of its three pillars, including a number of green industrialisation commitments.

In South Africa's industrial policy, green industrialisation has two related, but distinct aspects.

The first approach is defensive green industrial policy, aiming to protect South Africa's existing industries, either by reducing the amount of greenhouse gas emissions in their production, or by producing different, low-carbon products to meet the changing needs of foreign markets. For example, automotive sector policies are supporting a partial shift to the manufacturing of electric vehicles in order to protect car exports to Europe, which is planning to phase out internal combustion engine vehicles, and which is implementing a tariff on foreign goods based on the carbon emissions in producing and transporting it. We can also see the electricity sector's transition from coal to renewable energy as part of defensive industrial policy, because this will decarbonise and 'future-proof' South Africa's industrial base going forward.

The second aspect is proactive industrial policy, aiming to grow the economy by getting a head start in developing new "green" industries where other countries are not well established, and where South Africa might still gain a competitive edge. For example, green hydrogen is receiving priority attention because of South Africa's renewable energy potential and domestic reserves of platinum, which are needed for

electrolysers. Similarly, policies are being developed to increase production of South Africa's minerals which are in greater demand for green or low-carbon technologies globally.

South Africa's Green Industrialisation Policies		
Policy	Date	Focus
Industrial Policy Action Plan 1 and 2	2007 - 2013	Renewable energy localisation, energy saving goods (solar heaters, lights, etc)
Just Energy Transition Investment Plan	2022	Decarbonisation of energy grid, green hydrogen, electric vehicle manufacturing
Medium Term Development Plan	2024	Green export industries (hydrogen and related products), green steel, EVs, etc. Critical mineral beneficiation
Green Hydrogen Commercialisation Strategy	2022	Green hydrogen both upstream and down into green steel, ammonia, fertiliser and aviation fuel
South African Renewable Energy Masterplan	2025	Renewable energy component localisation
Critical Minerals Strategy	2025	Mining, export, and beneficiation of critical and transition minerals
Industrial Development Strategy	2026	Critical minerals, localisation of renewable energy and transmission infrastructure, electric vehicles and recycling

South Africa's approach to green industrialisation is an extension of the international discourse around "green growth"

and sustainable development. From the early 21st century, sustainable development has posed a political problem for policymakers as it linked economic growth to environmental degradation. Green growth emerged as a response to this problem by suggesting that not only can rapid growth be made compatible with environmental concerns, but that environmental policy can actually drive growth itself.^{vi} While politically advantageous, the concept of green growth as it is used in green industrial policy has been criticised for minimising the structural changes required to deal with the reality of climate change, and for reducing environmental policy to opportunities for profit-making in the green economy.

Limitations of the Narrow View

Despite featuring some sensible policy proposals, South Africa's current green industrial policy does not sufficiently grapple with issues of structural transformation, employment, and climate adaptation.

Unemployment:

South Africa's green industrial policies target the protection of existing export industries and the creation of new high-value industries. While this is important to protect jobs, the specific industries targeted are highly capital-intensive. Iron and steel have among the highest fixed capital costs per worker of any industry,^{vii} while the transition to electric vehicles is likely to lead to job losses given that electric vehicles require far less assembly than internal combustion engine vehicles. Green hydrogen is particularly capital intensive and requires relatively little, high-skilled labour - jobs which are likely to be imported, especially in the early stages of this industry's development. This also applies to renewable energy, as both utility-scale wind and solar energy require little ongoing labour beyond that required for construction and installation.^{viii}

Over the next decade, South Africa will need to create around 750,000 jobs **each year** just to keep up with the growth of the labour force.^{ix} For comparison, an optimistic estimate for the green hydrogen industry is the creation of an average of around 23,000 jobs each year over 28 years.^x The localisation of renewable energy and battery manufacturing is expected to create a total of only 28,000 jobs by 2030.^{xi} The only way for the capital-intensive development of green industries to make a dent in the unemployment crisis, aside

from supporting public employment programmes with tax revenue, would be for industrial policy to prioritise the development of more labour-intensive downstream industries.

Support for downstream activities and local linkages receives plenty of mention in the IDS, but concrete commitments are severely lacking in the implementation plan. For example, the medium and end-term targets for the critical minerals sector are to simply increase value addition through beneficiation, but this is too vague, as beneficiation does not equate to downstreaming. Beneficiation may refer to only moving one or two steps down the value chain through smelting or concentrating before export, going from pit-to-smelter-to-port, while downstreaming refers to actually using South Africa's mineral resources in well-developed value chains. In this regard, concrete commitments are largely lacking, and it is highly doubtful whether the politically powerful mining industry would be willing to support downstream industries with lower-priced inputs, instead of chasing export sales.

Export-Led Green Growth over Adaptation:

A flaw in the narrow green industrialisation agenda is the fact that it prioritises decarbonisation and investment in green value chains for export while neglecting adaptation and the impacts of climate change. A significant reason for this is the fact that Europe, South Africa's second biggest export market, has started implementing tariffs (the Carbon Border Adjustment Mechanism) based on the emissions required to produce and transport products, and plans to transition to electric vehicles. While it is important to protect exports, the "green" in South Africa's green industrialisation plans seems to refer mostly to meeting the demands of other states for "green" inputs and critical minerals, neglecting South Africa's own needs in relation to not only the unemployment crisis, as discussed previously, but also the climate crisis.

The question of climate adaptation receives far too little attention given that South Africa will be severely affected by the impacts climate change, with the region expected to warm at roughly double the global rate.^{xii} More frequent and intensive droughts will worsen South Africa's existing water-scarcity and threaten already-limited arable land, potentially leading to the collapse of the maize and cattle industries under severe warming.^{xiii} In other parts of the country, a lack of decent housing and the unequal provision

of infrastructure make intensive floods particularly damaging. Widespread poverty means that people are less able to take their own measures to prepare for and recover from extreme weather, including heatwaves. There will be a great need for a range of industrial products and new technologies related to adaptation: from water storage and pumps, to agricultural drones, to sustainable building materials for housing and informal settlement upgrading. This is an opportunity to reorient production towards meeting climate needs while also establishing South Africa's capabilities in an area that is becoming increasingly globally (and especially regionally) relevant while being more labour intensive, but it is completely absent from the current conception of green industrialisation.

One possible reason for this omission is the reality that those who need adaptation the most are the least able to pay, while the demand for critical minerals and high-tech green products comes from wealthy states, corporations and consumers. This is where public procurement and investment should play a critical role, and more developmental green industrial policy agenda could link revenues from export-oriented industries to the financing of adaptation.

Fiscal Constraints and Public Investment:

Two critical and related issues for South Africa's green industrial agenda are its lack of ambition, and its subordination to fiscal constraints. Putting aside questions around its objectives and prioritisation, the current industrial development strategy is severely limited in the tools it aims to employ to accomplish its existing goals of diversification, digitalisation, and decarbonisation.

Fiscal incentives are one of the main tools to be deployed in pursuit of these goals. The IDS calls for the expansion of various general and specific sectoral fiscal measures such as the chrome export tax or a proposed incentive for low-carbon manufacturing technologies. These are not problematic proposals - South Africa has relatively few corporate tax incentives, and the IDS sensibly proposes tying new tax measures to measurable outcomes as well as sunset dates - but the problem is that the Department of Trade, Industry (DTIC) is not able to sustain even piecemeal fiscal support on its budget. The IDS' Annexure 7 shows that the DTIC's budget has

fallen by 40% in real terms between 2013/14 and 2025/26, while funding for incentives has fallen by 33% between 2019/20 and 2025/26 alone. The National Treasury has developed tunnel vision around their objective of lowering the debt-to-GDP ratio and achieving a primary budget surplus, and in doing so it has developed self-defeating policies; cutting allocations to the DTIC limits industrial development and GDP growth, which will in turn undermine their objective of lowering the debt-to-GDP ratio.

State-owned enterprises can play a crucial role in industrial development by acting in support of long-term developmental objectives, instead of responding only to short-term market forces. They can build vertical integration, stimulate demand or provide critical inputs in key sectors or industries, drive research & development spending and build a country's industrial capabilities. However, in response to fiscal constraints, and in line with the overarching direction of the government's new economic policy falling under the Growth and Inclusion strategy,⁶ South Africa's industrial development framework sees a diminished role for public enterprises. Instead, emphasis is placed on carving out a greater role for the private sector to fulfil public functions through parcelling out (concessioning) infrastructure to private operators, the establishment of markets in the rail, water, and electricity sectors, and public private partnerships to drive infrastructure development. These reforms will place crucial SOEs such as Transnet and Eskom under competitive pressure, while in some cases causing the loss of their most profitable consumer base. In the case of Eskom, this will make it even more difficult to subsidise energy-intensive industrial customers such as smelters, without support from Treasury.

While mention is made of the need to localise inputs into initiatives such as the expansion of the transmission grid or rail, there is little in terms of concrete support or cross-sectoral collaboration between SOEs and manufacturers. The recent scandal surrounding the procurement of railway tracks from foreign OEMs is instructive, as industry representatives claimed that local firms would have been able to provide these inputs if given necessary support from government, but that there was insufficient prior engagement around this in order to prepare local industry.^{xiv}

⁶ See the AIDC's 2026 [briefing paper on GAIN](#)

Fiscal pressure within the state as well as commercialised SOEs undermines the ability of state procurement to fulfil a strategic role in industrial development, as it forces those in charge of procurement decisions to take the option with the lowest-cost in the short term, rather than the greatest benefit in the long term.

Radical, Needs-Based Green Industrialisation as an Alternative

Despite the return of industrial policy to development discourse, the role of industrial development is still understood in limited terms, as increasing the value of an economy, supporting economic growth and increasing self-reliance. These are worthwhile goals, but it has long been understood that industrial development also has a role to play in transforming socio-economic relations, creating jobs, alleviating poverty, and increasing the living standards for ordinary people. Given South Africa's complex crises, these are roles that green industrial policy must urgently take up.

What would it mean to take South Africa's socio-economic and environmental realities as a starting point for rethinking green industrial policy? A first step is to **shift towards an industrial development framework that places socio-economic transformation at its centre**, integrating objectives such as poverty alleviation and job creation *alongside* its traditional goals of GDP growth and value addition. Industrial policy should be seen as a key tool by means of which socio-economic development can be achieved and society can be transformed. This kind of societal transformation is not a foreign concept to industrial development but is instead one of its most striking outcomes. Countries like China, India and South Korea have seen major changes to their class, political, and social structures in only a few decades as a result of their industrialisation efforts. Rather, the point that distinguishes radical industrial policy is that it consciously and actively pursues this kind of structural change instead of treating it as a byproduct. This may mean opting to support certain industries for their potential to provide jobs, support environmental objectives, or challenge entrenched interest groups even if they are not the most competitive or value-creating of all possible choices.

A second point of departure is to **recognise the potential for industrial policy to support the immense public investment required to eliminate deep poverty and mass unemployment, and to meet the basic needs of people living in South Africa**. The current view in government is that industrial policy competes with social policy for limited budget resources - but there is no reason why industrial policy should not be **connected with social and environmental policy such as public housing, infrastructure and employment programmes**. There is a wide range of possible forward and backward linkages that can be actively exploited by radical green industrial policy in order to support social policy by providing a cheap or reliable domestic supply of inputs like building materials or medicine, using the demand created by public programmes to stimulate and support new industries, or focusing industrial research and development towards pressing socio-economic and environmental problems. While the manufacturing sector itself won't directly create the jobs needed to resolve the unemployment crisis, it can support and be supported by the public employment and investment programmes that are the real locus of job creation.

The third point is to **reorient South Africa's climate response** towards measures that are most relevant for both the country and the region, shifting focus away from purely reducing carbon emissions, and **towards the increasingly pressing need for adaptation**. This includes the development, production, and installation of energy and water saving technologies, low-cost sustainable and resilient building materials, agricultural tools and drought-resilient crops. Closely related to this is the need to massively scale up research and development investment from around 0.6% of GDP since 2019, to at least the NDP target of 1.5% of GDP.

It should also be recognised that adaptation extends beyond the obvious weather-related measures. Climate change is likely to intensify the burden on the public health system through both adverse weather as well as the introduction of new diseases. While mitigation measures must still be pursued, the focus ought to be on measures with developmental benefit, such as the expansion of public transport or shifting the energy mix toward low-carbon and renewable energy sources and the localisation of inputs therein.

What could radical industrial policy look like?

Need	Policy Solution	Industrial Linkages
Housing - Estimated backlog of 2.6mn units	Public housing programmes, including social housing and subsidies for affordable development	Create demand for steel, glass, concrete, appliances, furniture. Support R&D into building materials
Clean, Affordable Energy	Expansion of transmission grid, utility-driven renewable energy rollout	Create demand for steel, stimulate local manufacturing of solar panels, wind turbines, batteries, and electrical equipment.
Drought adaptation - rural and agricultural	Water storage and reticulation, use management and treatment, large- and small-scale irrigation, land restoration	Support R&D into agricultural and water processing, recycling technologies. Demand for pumps, meters and tanks. Potential for localised agro-processing hubs. Green fertiliser.
Accessible urban transport (for poverty alleviation and climate mitigation)	Integrated public transit with light rail, electric buses, expansion beyond existing routes	Support local electric vehicle and battery industries, as well as rail and rolling stock manufacturing. Benefits other industries.
Accessible and quality healthcare	Increased public health employment, medicines and equipment procurement and localisation	Support development of the local pharmaceutical industry, low tech (hospital beds, PPE) and high-tech medical technology.

Procurement and Sustainability

Public procurement has a critical role to play in a radical needs-based industrial policy framework as it provides a level of guaranteed demand that allows linked industries to develop, with local content provisions protecting nascent industries from foreign competition. However, this will only be successful if the state proactively engages with relevant industries around the trajectory and needs of public investment programmes, ensuring that firms develop the capabilities needed by the time procurement takes place, and that they are prepared when procurement winds down. Implementation must also be consistent, and adhere to a planned trajectory - South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) is a cautionary tale of how stop-start procurement processes can undermine localisation and stifle or collapse emerging industries, with the Renewable Energy masterplan noting that "much of the industrial capability built in the inception period of the REIPPPP has been dormant or lost"^{xv} due to its uneven implementation.

Strategic procurement and industrial policy need to form part of long-term integrated planning processes, rather than being developed in departmental silos. This will allow the needs of public investment programmes to be identified and matched with South Africa's industrial capabilities long before procurement actually takes place, with adequate support measures and engagements with industrial sectors taking place to ensure that missing capabilities are developed by the time the first orders for pipes, pylons, tracks or trains come through.

While public procurement is essential in order to create the initial conditions required for these supporting industries to develop, it is also true that no intensive public procurement and investment programme can be sustained indefinitely. It is therefore crucial that these industries are developed in a sustainable manner that can survive without the guarantee of state procurement. Subsidies, incentives, technical assistance, and other forms of industrial support should be provided with conditions that support this goal in addition to supporting developmental outcomes, enabling firms to shift towards export markets when public demand subsides. This is another area where the development of a "climate adaptation sector" becomes strategic, given that the world is on track to warm by at

least 2.5 degrees on average by the end of the century, while some countries, many in Sub-Saharan Africa, will face even greater increases. Conditionalities tied to performance will need to be carefully designed and monitored to prevent rent-seeking and ensure reciprocity from firms.

There is justified scepticism around the efficacy of large-scale public procurement in South Africa, given the prevalence of corruption at the local government level as well as historical scandals around state-owned enterprise procurement, such as the construction of Medupi and Kusile power stations and the procurement of Transnet rolling stock. Stronger penalties for corruption and greater funding for state oversight bodies such as the new Procurement Tribunal will help, but more radical options also need to be explored. One example can be found in Brazil's *Fome Zero* hunger relief programme in the 2000s, which included the procurement of food for schools and feeding schemes from small-scale family farmers. In order to combat corruption and overcome political opposition, *Fome Zero* included the establishment of social oversight committees at a local level, consisting of community members, social movements and trade union representatives. A similar policy could be applied in service of a needs-based agenda in South Africa. For example, public hospitals could have oversight committees consisting of workers and community members intended to monitor the procurement of key goods such as hospital beds or medication.

Regardless of the mechanism, it is critical that administrative decisions around procurement are subject to democratic scrutiny and oversight, because they play a crucial role in industrialisation. If billions of Rand are going to be spent on infrastructure, then we must make sure that this contributes to this country's development in as many ways as possible.

Support for Radical Green Industrial Policy

This vision of radical green industrial policy is not a totally new idea. The One Million Climate Jobs campaign - endorsed by a wide range of social movements, trade unions, NGOs and universities - contained many of these elements, while COSATU's Policy Framework on Climate Change, adopted in 2011, recognised the need for a low-carbon development pathway as one of its core principles, calling for development that recognises the need for mitigation, adaptation,

and decent jobs. Importantly, COSATU recognised the need to focus production on meeting the country's own needs.

We also need to start thinking even more seriously about focusing production and consumption on meeting basic needs. This implies starting to think about growth in a different way. We need to start thinking of measuring growth not in money terms ("gross domestic product") but in terms of targets for housing, health, education, access to services, and even in terms of leisure, happiness and wellbeing.

- COSATU Policy Framework on Climate Change (2011)

Elements of such a vision can also be found in the debates around industrial strategy in the early 1990s, when progressive forces were engaged in heated discussions around South Africa's future post-apartheid economy. In the debates around the Industrial Strategy Project, questions of mass employment through industrialisation and the production of basic needs were central issues. More recently, a number of political parties have expressed their support for some elements of such a framework in their 2024 election manifestos.

That said, radical needs-based green industrial policy will face strong political resistance, mostly due to the fact that it will require expanded and sustained public spending towards both industrial support and social infrastructure. In the current environment where fiscal space is purported to be constrained, this will mean increased tax measures, particularly targeting non-productive capital flows and ultra-high net worth individuals. The AIDC's recent *Fair Tax Monitor* discusses possible interventions in detail. Capital within the South African economy will need to be redirected towards productive industrial investment rather than speculative or overseas investments, possibly through measures such as prescribed assets or shifts in the investment mandate of public fund managers such as the PIC. All of this will provoke a significant reaction from the financial sector and the National Treasury, given that it is likely to endanger South Africa's credit rating and threaten the portfolios of large asset managers while reducing foreign capital inflows. Measures to overcome and mitigate this will be discussed in a future briefing paper.

The other major source of resistance to radical green industrial policy is likely to come from large, established corporations and investors in South Africa's "minerals-energy complex". If we want South Africa's mineral resources to support its own development, then one powerful option can be to ensure that upstream companies in mining, chemicals, or metals sectors will provide basic inputs like minerals, metals and chemicals to downstream industries at a lower price, thereby making our own manufactured goods cheaper. This can both help "stretch" each Rand of public investment, and support the development of local manufacturers. However, like all companies, firms in mining and heavy industrial

sectors, such as ferro-alloy and chrome smelters, are interested in maximising their profit and therefore want to sell their products at the maximum price to international markets instead of subsidising local producers. In order to overcome such opposition, radical industrial policy will need to be backed by a strong political coalition, with support from trade unions and social movements. Because upstream industries are reliant on fixed assets and resources, they are more exposed to political pressure, and may be open to negotiating such compromises in return for safeguards against expropriation or support from industrial unions.

Notes

ⁱ Statistics South Africa, *Poverty trends in South Africa: An examination of absolute poverty between 2006 and 2023*, (2025).

ⁱⁱ Statistics South Africa, *Quarterly Labour Force Survey: Q1 2026*, (2026).

ⁱⁱⁱ World Bank, Manufacturing, value added (% of GDP) - South Africa, Accessed July 2026.

<https://data.worldbank.org/indicator/NV.IND.MANF.ZS?locations=ZA>

^{iv} <https://www.dailymaverick.co.za/opinionista/2026-02-19-sas-automotive-industry-at-a-crossroads-as-policy-delays-risk-jobs-and-growth/>

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^{viii} Natalia Fabra *et al*, *Do Renewable Energy Investments Create Jobs?*, Journal of Public Economics, vol 239, 105212, (2024).

^{ix} <https://www.dailymaverick.co.za/opinionista/2026-03-16-why-the-current-jobs-debate-fails-to-grasp-the-scale-of-sas-unemployment-crisis/>

^x Department of Trade, Industry, and Competition, *Summary of the Green Hydrogen Commercialisation Panel Report*, (DTIC, 2022).

^{xi} Department of Trade, Industry and Competition, *South African Renewable Energy Masterplan*, (South African Government, 2025).

^{xii} Francois Engelbrecht, and Jessica Steinkopf, *Projections of Future Climate Change in Southern Africa*, Working Paper, (UNU-WIDER, 2025). <https://satied.wider.unu.edu/sites/default/files/Working%20Paper%20258.pdf>.

^{xiii} Ibid.

^{xiv} <https://www.freightnews.co.za/article/transnet-withdraws-restricted-rail-supply-tender>

^{xv} South African Renewable Energy Masterplan, 28.