

Building Business Confidence Through Collective Climate Action

May 2026

Business perspectives of climate resilience and decarbonisation in the heavy manufacturing sector of South Africa



About this project

The [NBI Pathways to Net Zero](#) showed that the pathway to Net Zero for South Africa is possible. Since publication in 2023 decarbonising has not happened at the pace and scale required.

The NBI has worked with companies as well as multiple industry associations, experts and organisations, to distil out company experiences and realities in implementing climate mitigation and adaptation strategies. The project aims to do two things, namely to establish how companies are planning to integrate resilience into their operations to adapt to climate change, and whether or not companies are decarbonising at the pace and scale required for net zero by 2050.

The findings of this project are captured in a series of findings and represent a collection of industry views.

Through desktop research and stakeholder engagements, including interviews, meetings, roundtable discussion and workshops, NBI has recorded industry's responses to climate action. The results of this work will enable the NBI to put forward a set of recommendations to ramp up climate action with the private sector, and heavy manufacturing specifically.



This project was implemented by the National Business Initiative (NBI) from May 2024 to May 2026 with support from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH through the Climate Support Programme IV (CSP IV), on behalf of the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN) under the International Climate Initiative (IKI).

The NBI is grateful for the time and resources provided by all NBI members, companies and stakeholders engaged during this project.

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Report structure

SECTION

1 | Company awareness and understanding of business' role in adaptation action

SECTION

2 | Mitigation action in the Heavy Manufacturing sector

SECTION

3 | Synthesis of findings and recommendations



Climate adaptation planning for South African business



Insights into South African companies' current adaptation planning practices, benchmarked against global practice, to identify opportunities for local relevance and support practical implementation.

Section

1

Climate-related physical impacts are already affecting business operations and exposure is increasing

Climate adaptation is no longer optional.

Climate impacts present material financial, operational, and strategic risks that organisations must deliberately plan for and manage, particularly in asset-intensive and value-chain-dependent sectors.

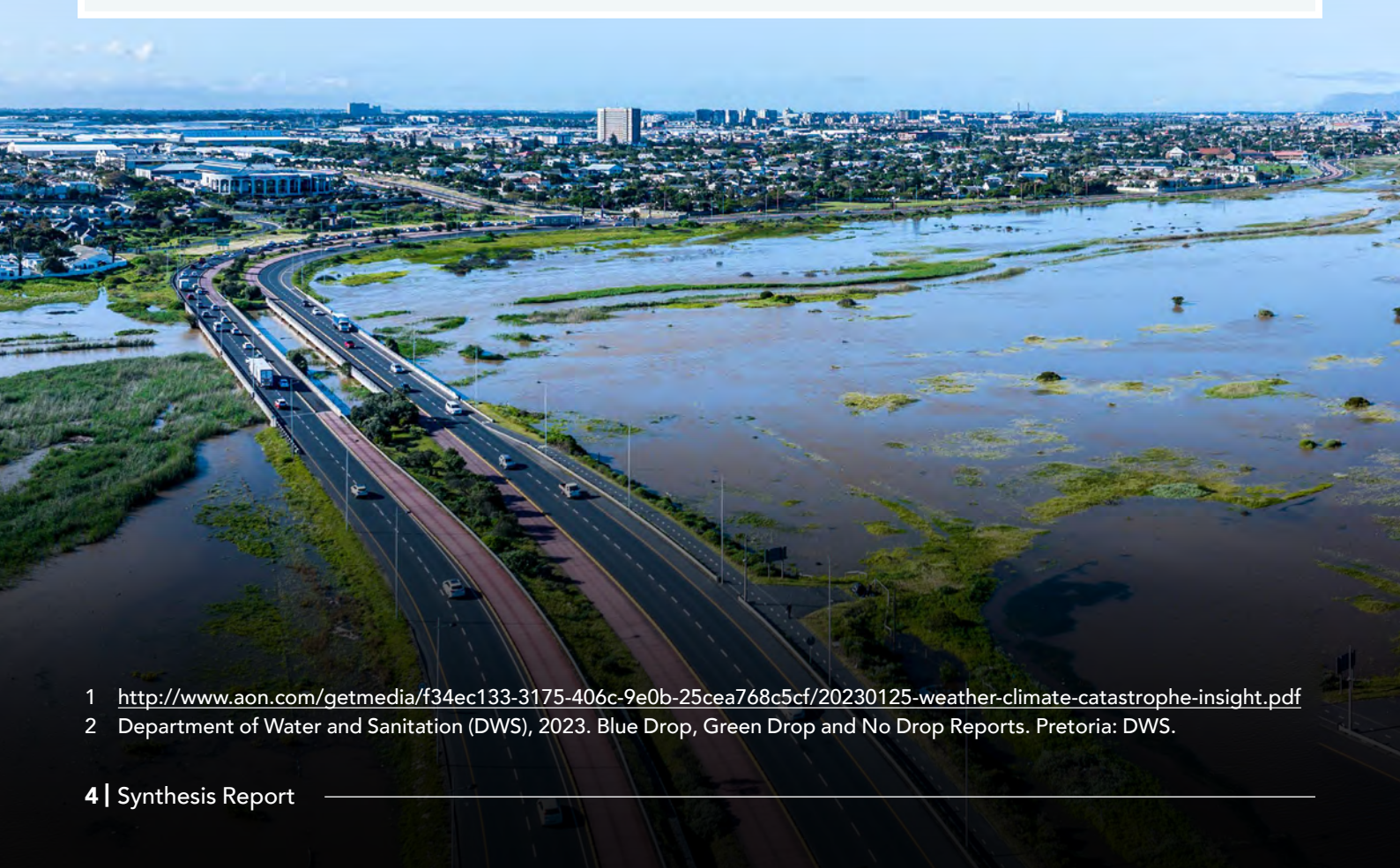
As climate risk intensifies, the resilience and competitiveness of businesses will increasingly depend on the maturity of their adaptation planning, the quality of their decisions, and their ability to act proactively and coherently in a changing operating environment.



Climate disasters are causing significant financial losses. The April 2022 KwaZulu-Natal floods caused an estimated R50-60 billion in economic damages. Severe flooding in Limpopo in early 2026 has resulted in billion-rand losses (to date full impacts are still being assessed) affecting roads, bridges and other critical infrastructure.¹



Limited water efficiency exacerbates our vulnerability to future droughts and flooding events. Nearly half of South Africa's municipal water systems are in a critical condition and current non-revenue water losses are at 47% of treated water.² A consequence of failing to adapt will be rising economic and business exposure risks.



1 <http://www.aon.com/getmedia/f34ec133-3175-406c-9e0b-25cea768c5cf/20230125-weather-climate-catastrophe-insight.pdf>
2 Department of Water and Sanitation (DWS), 2023. Blue Drop, Green Drop and No Drop Reports. Pretoria: DWS.

Increased physical risk is a “wicked risk-multiplier” on top of an already uncertain operating environment

WBCSD Adaptation Planning Guidance



Climate change is impacting economic development and investment by making some property less attractive, reducing workforce productivity, increasing disaster recovery costs, and disrupting key sectors. Increasing physical climate risks are placing pressure on infrastructure and increasing the likelihood of business disruption. As these risks intensify, insurers are tightening underwriting conditions and, in some cases, withdrawing coverage, making insurability (or the lack thereof) an increasingly important indicator of business and asset risk exposure.³



Many **businesses are not adequately protected from climate disasters**. Approximately 57-60% of global economic losses from natural catastrophes remain uninsured, highlighting a persistent insurance protection gap.⁴ Only around 18% of the losses from the April 2022 KwaZulu-Natal floods were insured, highlighting a significant protection gap.⁵



- 3 Howden, 2025. The Insurability Imperative: How insurance signals are shaping climate risk, resilience and investment. London: Howden Group. Available at: <https://www.howdengroup.com/uk-en/insurability-climate-report-2025>
- 4 Swiss Re Institute. Natural catastrophes: The USD 424bn protection gap and adaptation to counter growing exposure. <https://www.swissre.com/institute/research/topics-and-risk-dialogues/climate-and-natural-catastrophe-risk/growing-exposure/Natcat-protection-gap>
- 5 Aon South Africa (2023), Weather Catastrophes Highlight Perils of Underinsurance. <https://aon.co.za/insights/weather-catastrophes-highlight-perils-of-underinsurance/>



Despite the substantial risks,
only 35% of large businesses globally have adaptation plans

(and among those plans, few take a systemic approach to adaptation across the entire business to strengthen baseline resilience or consider potential opportunities)

[WBCSD Adaptation Planning for Business](#)

Adaptation planning is essential for business

Adaptation helps generate a competitive edge by managing the impacts of physical risks and opportunities, both now and in the future.



Climate impacts are already impacting business

Extreme flooding, wildfires, drought and unpredictable weather events are costing business money and disrupting operations **today**.



The cost of inaction is higher than the cost of action

A business-as-usual scenario means that physical climate risks could reduce annual business returns by 5-25% by 2050.⁶



Adaptation planning protects business value, because it:

- Identifies material climate risks before they become losses
- Prioritises cost-effective actions to strengthen resilience
- Shifts organisations from reactive to proactive risk management
- Reduces future cost exposure to climate variability and climate change
- Strengthens operations and supply chains



Readiness gap

Globally, most businesses are systematically exposed to foreseeable disruptions. Adaptation planning addresses this gap and enhances the organisation's ability to boost its own resilience and that of its value chain.⁷

6 World Economic Forum & Boston Consulting Group (2024). The Cost of Inaction: A CEO Guide to Navigating Climate Risk. Available at: <https://files.cmcc.it/g20climaterisks/SouthAfrica.pdf>

7 <https://www.wbcd.org/resources/adaptation-planning-for-business-navigating-uncertainty-to-build-long-term-resilience/>

How should corporate South Africa approach adaptation planning?

On 17 June 2025, the World Business Council for Sustainable Development (WBCSD) launched **Adaptation Planning for Business – Navigating uncertainty to build long-term resilience**,⁸ a practical, action-oriented guide developed in collaboration with more than 70 global business and adaptation experts. The guide responds to the growing need for businesses to move beyond identifying climate risks towards structured, decision-relevant adaptation planning.

Rather than developing a standalone South Africa-specific adaptation planning tool, NBI in consultation with German Agency for International Cooperation (GIZ) and the WBCSD, focused on contextualising the WBCSD guidance for use by South African businesses.

The goal of the contextualisation for use by South African businesses was to:

- strengthen corporate resilience and
- stimulate adaptation action that is responsive to local climate risks, regulatory conditions, and just transition priorities.

8 World Business Council for Sustainable Development (WBCSD), Adaptation Planning for Business: Navigating uncertainty to build long-term resilience (2025)

Method used to contextualise the WBCSD adaptation guidance for South African businesses while also building capacity with our participating Member companies.

1

COMPANY INTERVIEWS

- A structured questionnaire was compiled using the lens of the WBCSD guidance document.
- In August and September 2025, 18 corporate stakeholders were consulted.
- Ten companies from ten sectors – agriculture, finance, logistics, fast-moving consumer goods, telecommunications, mining, forestry, oil and gas, technology and chemicals agreed to be interviewed.
- In-person or online interviews of 60 to 90 minutes were held with the 10 company representatives.

2

INTEROPERABILITY

- A collaboration with PwC, who was also part of the expert team that supported the development of the WBCSD adaptation guidance, was formed.
- A co-designed, conceptual brief was developed with PwC to explore the interoperability of the TNFD LEAP framework with the WBCSD adaptation guidance.
- PwC led the subsequent work with input from the NBI.
- This work was presented for feedback at a 2026 data reflection workshop.

3

DATA VALIDATION

- Collated interview data was analysed against the four phases of the WBCSD guidance.
- A data reflection workshop was held in March 2026 with participating companies, practitioners and representation from WBCSD.
- At this workshop we a) validated insights from the interviews, b) collected more data c) received feedback from the WBCSD and d) supported a growing community of practice.
- Further data analysis was done thereafter.

4

CAPACITY BUILDING

- A nature-based solutions gaming workshop was held in partnership with the WBCSD in April 2026.
- This workshop's purpose was to a) build capacity of the participants by providing insights into building internal business cases (identified as a gap in the interview data) and b) further support the community of practice. The game built on practical implementation examples.
- Three articles were written and shared with companies to further enhance the capacity of NBI's corporate members:
 - Adaptation Action is Now: A Business Imperative for South Africa.
 - Climate Adaptation as Corporate Strategy.
 - Nature in Climate Transition Planning: From Parallel Agendas to Integrated Management.
- All were sent out via NBI's newsletter, On a Clear Day, which has a large subscriber database.

5

REPORTING

- All inputs and data were analysed against the WBCSD four-phase adaptation planning guidance, focusing on:
 - observed company practices.
 - key gaps and barriers.
 - opportunities for local tailoring for South Africa.
- A summary report was compiled that encompasses project findings and learnings.



Findings: Where companies seem to be making progress on adaptation planning

Four phases of the WBCSD Adaptation Planning Guidance

1

SET SCOPE AND ADAPTATION GOALS

- Awareness of physical climate risk is high, with most companies recognising their operational and financial exposure. This awareness typically only applies within their own fence lines.
- Site-level physical climate risk assessments within company fence lines are now common across sectors.
- Early discussions are underway on how climate risks affect business continuity and assets.

2

DESIGN ADAPTATION SOLUTIONS

- Adaptation responses are typically near-term, often implemented after climate impacts or operational disruptions have occurred, helping companies build practical learnings.
- There seems to be a heightened curiosity in nature-based solutions – an adaptation option – particularly because of their ability to deliver social, environmental and financial co-benefits.

3

BUILD PLAN AND IMPLEMENT

- Adaptation efforts are taking place through isolated interventions and operational responses implemented at site or business-unit level, enabling early-stage learning and testing of solutions.
- Adaptation actions are increasingly being integrated into existing operational and risk processes, representing early steps towards embedding resilience in core business functions.

4

MONITOR AND EVALUATE

- Some companies report basic tracking of climate-related disruptions and incidents, particularly where there have been operational interruptions or costs linked to these events.
- Learning on climate risk and its business implications is actively developing through practical, day-to-day experience. This contributes to a growing internal understanding across organisations.

Findings: Where adaptation planning seems to break down

Four phases of the WBCSD Adaptation Planning Guidance

1

SET SCOPE AND ADAPTATION GOALS

- Currently the scope of adaptation planning is limited largely to owned assets of a company and within company fence lines.
- Many companies lack the ability to translate climate projections into operational and financial implications, limiting decision-making and investment.
- Risks and dependencies linked to supply chains, infrastructure and local communities are rarely assessed or understood.
- Governance and ownership of adaptation planning is fragmented across sustainability, risk and operational teams, with limited formal integration into enterprise decision-making.

2

DESIGN ADAPTATION SOLUTIONS

- Climate adaptation options that are assessed are done so inconsistently making strategic planning and foresight of future risk difficult.
- Company decisions around climate change are driven mainly by cost and feasibility, not multi-criteria evaluation. The absence of multi-criteria evaluation in decision-making limits a company's ability to fully align adaptation planning and action with its broader strategic objectives, as decisions tend to prioritise single factors such as cost or compliance, rather than balancing financial, operational, environmental, and social considerations. This can result in suboptimal investments that fail to maximise long-term resilience, scaling and business value.
- Maladaptation risks and activities (actions that increase long-term vulnerability) are seldom assessed due to lack of structured evaluation frameworks.
- There is limited collaboration with suppliers, municipalities or other system actors who share the same risk and exposure.

3

BUILD PLAN AND IMPLEMENT

- There are few examples of where formal adaptation plans have been integrated into enterprise risk management or capital projects planning.
- Financing pathways to access climate adaptation financing is unclear. Additionally, climate adaptation projects struggle to compete with other capital project priorities within companies.
- Current implementation remains pilot-based or reactive to specific impacts. While reactive responses can trigger short-term action, their lack of strategic alignment and forward planning limits sustained motivation, scaling, and integration into core business strategy.

4

MONITOR AND EVALUATE

- Monitoring is limited to the impacts from weather-related events with a focus on disruption and incident response. There is limited ability to measure or monitor for resilience outcomes, or medium-term trends.
- Monitoring and evaluation systems are underdeveloped. Most companies track disruptions and incidents (e.g. flood damage, downtime), but lack structured metrics, baselines, or indicators to assess whether adaptation actions are actually reducing risk over time.

The perceived state of adaptation planning within a sample of South African companies

South African companies are increasingly aware of climate risks, but adaptation planning seems to be fragmented, near-term, and insufficiently integrated into core business systems.

- Climate adaptation planning is largely focused on immediate incidents and operational issues, with limited integration into enterprise strategy, capital projects planning or long-term business decisions.
- Adaptation is primarily treated as a risk response or cost, rather than as a driver of resilience, competitiveness or asset protection.

The main barriers to action are a lack of skills, governance structures and financial insights needed to convert climate risk insights into actionable business decisions.

- Climate data exists, but organisations often lack the requisite skills and tools to translate the data into decision-useful strategic, operational and financial insights.
- Fragmented responsibility for climate action, unclear mandates and siloed decision-making prevent integration of adaptation planning into core governance and investment processes in companies.

Adaptation planning rarely extends beyond the company fence line, **with supply chains, shared infrastructure, municipalities and communities remaining major unseen risks.**

Without structured approaches to climate risk and adaptation, companies risk escalating losses, stranded assets and declining competitiveness.

- This can create a heightened risk of escalating costs, declining asset values and reduced insurability, particularly in high-risk locations. This can ultimately result in declining competitiveness relative to better-prepared peers.

Moving from awareness to action requires embedding adaptation into governance, capital planning, operations, procurement and risk management systems, rather than treating it as a standalone or ad hoc exercise.

Adaptation planning embedded in existing business systems and extended beyond the fence line, offers a clear pathway for South African companies to protect value and competitiveness.

Without deliberate integration into strategy, governance, procurement and investment decisions, companies risk escalating losses and declining resilience.



From awareness to action

Adaptation does not require reinventing the wheel: it requires integrating physical risks into existing business systems and acting deliberately



1 | Translate climate risk into decision-useful business insights

- Companies should invest in the skills and tools needed to convert climate data into insights that outline their strategic, operational and financial implications.
- Ensure physical climate risk assessments inform strategy, capital projects planning, operations and insurance decisions, not only disclosure.



2 | Extend adaptation planning beyond the fence line

- Expand the scope of adaptation planning to include critical value-chain dependencies, surrounding infrastructure, municipalities and communities.
- Recognise that business continuity depends on system resilience, not only internal assets.



3 | Embed adaptation planning into core governance and decision-making

- Position adaptation as a core business priority linked to long-term competitiveness and business continuity
- Assign clear accountability for adaptation planning and action at senior levels within companies and within existing risk, operational and investment decisions.
- Mainstream adaptation into enterprise risk management, facilities management and core business processes, rather than treating it as an add-on.



4 | Strengthen monitoring, evaluation and learning

- Establish practical baselines, indicators and learning systems to track whether adaptation actions are reducing risk or improving operational efficiencies.
- Use monitoring to enable course correction, support scaling and demonstrate value over time.



5 | Build the financial case for adaptation investment

- Quantify historical climate-related losses, disruptions and early risk indicators, to demonstrate the cost of inaction within a company.
- Use this evidence to position adaptation as an investment in business continuity and competitiveness, not a discretionary cost.



Growing business confidence for decarbonisation in the heavy manufacturing sector

Insights into company decarbonisation journeys in the South African heavy manufacturing sector.

Net zero by 2050 is possible and reduces business risks; so why are companies not investing in decarbonisation at the pace and scale required?



Section 2



South Africa's heavy manufacturing sector in focus

The National Business Initiative, together with Business Unity South Africa and the Boston Consulting Group worked with corporate leaders from 2020 - 2023 to assess whether the pathways exist for the country's economic sectors to decarbonise by 2050, and whether this can be done in such a way as to build resilience to the impacts of climate change and to put the country onto a new, low emissions development path.

The results of this work have shown that this shift can happen, and that to realise these pathways, efforts must begin now.

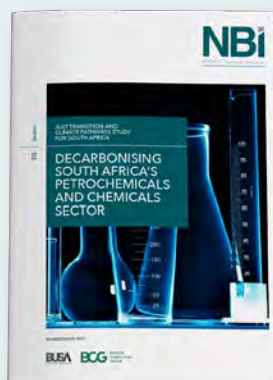
This report section is a follow on of the Just Transition and Climate Pathways study for South Africa. It focuses on the decarbonisation of South Africa's heavy manufacturing sector.

METALS		MINERALS	MACHINERY	PULP, PAPER & WOOD	CHEMICALS
					
Iron & steel • Basic iron & steel and articles of iron & steel • Ferroalloys	Non-ferrous metals • Non-ferrous metals and metal products (aluminium, zinc, lead, copper, nickel, chrome)	Non-metallic minerals • Cement • Lime • Glass • Ceramic	Heavy machinery • Motor vehicles • Other transport equipment • Parts & accessories • General purpose machinery • Special purpose machinery	Pulp, paper & wood processing • Print media • Furniture and other wood products • Sawmilling	Petrochemicals and chemicals • Fuels • Ammonia • Aromatics (e.g. plastics) • Olefins (e.g. propylene) • Methanol (e.g. solvents)

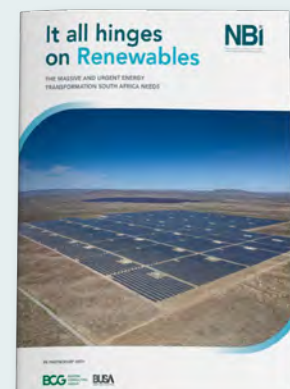
You can access the relevant NBI-BUSA-BCG Net Zero Pathways Reports here:



[Decarbonising South Africa's heavy manufacturing Sector](#)



[Decarbonising South Africa's Chemicals and Petrochemicals Sector](#)



[It all hinges on Renewables](#)

Companies from chemicals and petrochemicals have been included in the project engagements, as they:

1

Share similar constraints to decarbonisation, including being energy intensive and often hard-to-abate.

2

Play an important role in socio-economic development.

Data from the NBI-BUSA-BCG Net Zero Pathways Report have not been processed to combine the heavy manufacturing and chemicals sector results. These datasets and reports exist as separate pieces of work.

This project views the 5 major sectors (and their associated subsectors) included in the analysis as representative of energy-intensive industry. The implementation needed for decarbonisation across all sectors varies, due to differing materials, energy requirements and production scales.



The importance of heavy manufacturing in South Africa's economy

South Africa's manufacturing sector delivers significant socio-economic value through industrial growth, infrastructure development, employment and downstream value chains and skills development.

Given favourable conditions for raw material access, labour availability and production capabilities, the sector is export-orientated, attracting foreign currency investment and trade agreements.

The sector is energy intensive. Given the high reliance on fossil fuels in South Africa's energy mix, the country's heavy industry is one of the more carbon intensive globally.

Amid mounting global pressure to decarbonise and pressure from South African climate policy, the sector faces growing transition risks. Without a shift away from business-as-usual production, heavy industry stands to lose competitiveness, market access and long-term growth opportunities.



Jobs



1.1m incl. chemicals



National GDP
contribution



12% of GDP



Manufactured goods support
SA's trade balance



30% of all exports

Energy use drives the carbon intensity of South Africa's heavy industry



Carbon intensive



15% of South Africa's greenhouse gas (GHG) emissions

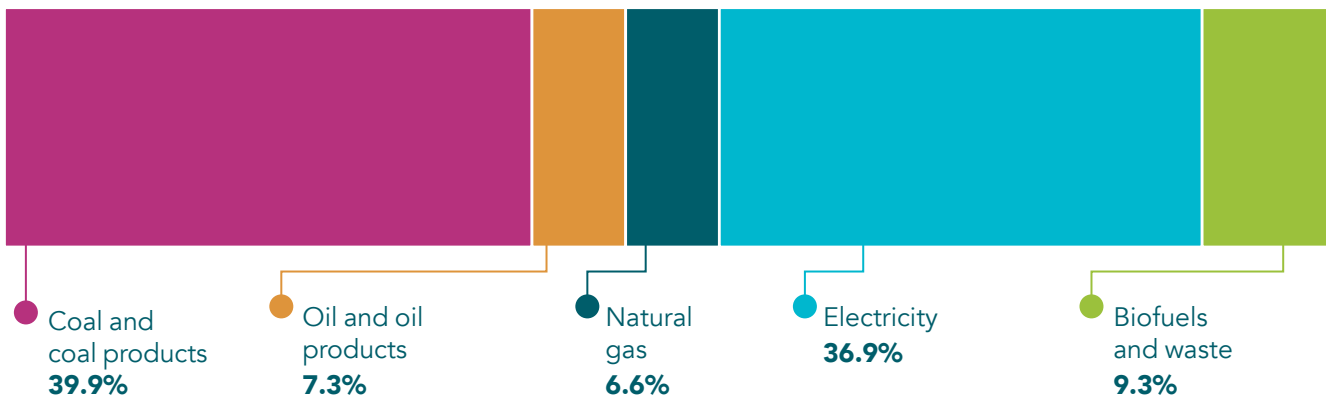


Energy intensive



37% of SA's energy consumption

Industry total final consumption by source, South Africa, 2023



Despite its economic importance, heavy manufacturing is experiencing structural issues that constrain its competitiveness and capacity



UNRELIABLE ELECTRICITY AND RISING TARIFFS

- **Electricity supply shortages have constrained growth.** Q1 2025 supply was 17% below supply in 2010.⁹
- **The cost of electricity has risen significantly.** Electricity prices have risen by an average of 20% p.a. between 2008–2017.¹⁰



UNRELIABLE INFRASTRUCTURE AND HIGH COST OF TRANSPORT

- High **transport costs** are driven by a lack of integrated networks.
- Unreliable transport-related infrastructure, including **structural failures** in railway infrastructure, as well as ports and logistics challenges.
- **Inadequate municipal service delivery and debt.** Erosion of basic service delivery and mounting debt that hinders renewable energy access.



SLOW GROWTH IN DOMESTIC DEMAND

- **Weak local economy** with a decade of slow growth impacting domestic demand, with annual GDP growth averaging just 0.7% between 2014–2024.¹¹ GDP growth has not recovered post-COVID with 1.1% growth in 2025.¹²
- **Insufficient demand for local products.** The iron and steel sector is currently operating at 48% capacity utilisation.¹³
- Challenging labour environment due to **skills shortages and transition re-skilling risks.**



INCREASING COMPETITION FROM GLOBAL MARKETS

- More **globalised markets** and **fierce price and market share competition** especially from China, India and Turkey for steel and related goods.
- **Growing demand for low-carbon products** in primary trade partner countries. Coupled with new **Border Carbon Adjustments** like the EU CBAM, putting \$1.4bn exports at risk.¹⁴
- **Unfavourable tariff structures** coupled with a **lack of strategic local procurement support.** Steel imports increased 93% from 2018–2025.¹⁵

9 TIPS The [Real Economy Bulletin](#), Fourth Quarter 2025

10 H. Bhorat; C. Rooney: State of Manufacturing in South Africa, 2017

11 NBI-BUSA-BCG, 2023

12 [The Outlier](#), 2026

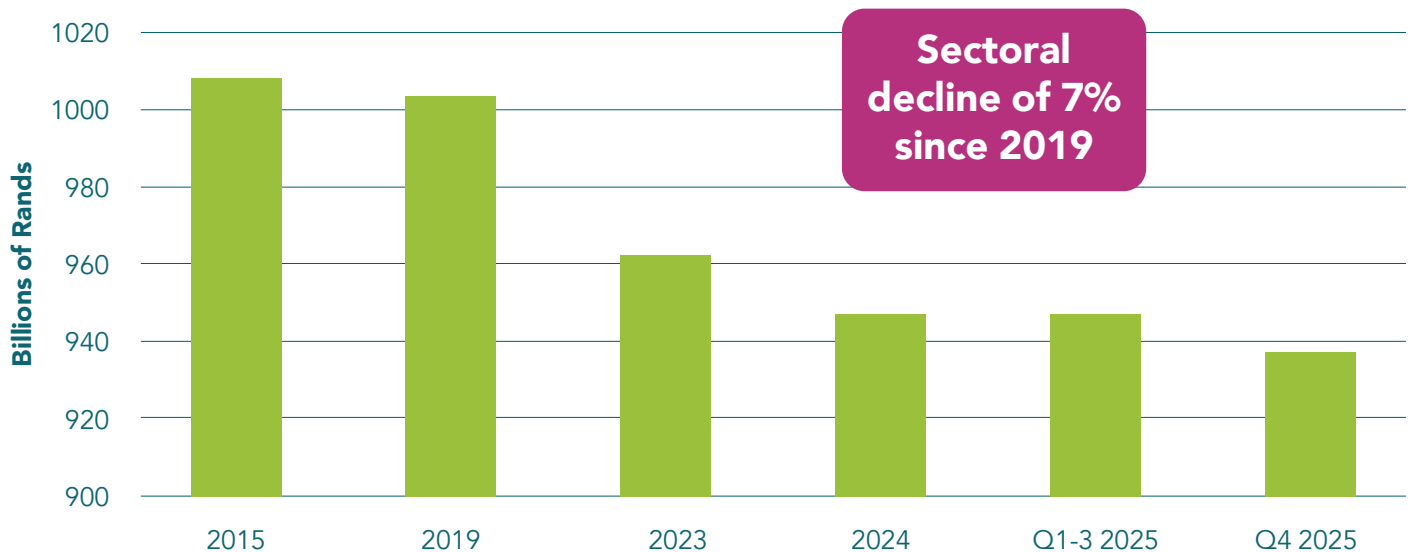
13 SEIFSA, State of the Metals and Engineering Sector, 2026

14 PCC, Carbon Border Adjustment Mechanisms and Implications for South Africa, 2023

15 SEIFSA, State of the Metals and Engineering Sector, 2026

Given these challenges, the sector is currently in decline and in some cases, deindustrialising

Value added by total manufacturing sector: 4th quarter 2015, 2019 to 2024, all quarters in 2025, in billions of constant (2025) Rand



The sector's GDP contribution has contracted every year since NBI published the Net Zero Pathways Report in 2023



News reports continuously capture the sectoral decline across heavy industry

Another smelter threatens shutdown over crippling electricity prices

Ferroglobe has warned it will cease operations unless it receives electricity tariff relief by 1 April 2026.

By Ciaran Ryan · 30 Mar 2026, 15:46

BUSINESS REFLECTION

After the Bell: ArcelorMittal woes add to SA's alarming deindustrialisation

Deindustrialisation has been happening at an alarming scale in SA. The manufacturing industry's contribution to economic output and employment has declined and been on the ropes.

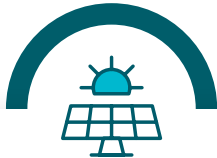
By Ray Mathaka

17 Jan 2025

14 April 2025
By Letitia Stander
Co-authored: Keshia Pheasant-Visser

Following a decline in manufacturing capacity and competitiveness across virtually all sectors of the South African economy, the metals and engineering sector is facing a crisis of "historic proportions", says industry body the Southern African Stainless Steel Development Association (Sassda) executive director Michel Basson.

Despite this context, South Africa is well-positioned to play a strong role in the emerging global green manufacturing space



WORLD-LEADING COMBINATION OF RENEWABLE ENERGY RESOURCES

- SA is in first quartile (top 10) in wind and solar resources globally. Domestically renewable energy is not only clean but more reliable & cheaper – thus, increasing industry competitiveness.
- Complementary wind and solar resources for optimal electrolyser use for the creation of green hydrogen (H₂).



PROXIMITY TO FUTURE CLEAN-TECH RAW MATERIALS

- A large share of expected future clean-tech commodities demand located in Southern Africa (e.g., Manganese, Nickel, Iron).
- Opportunity for SA to become a hub for clean tech commodities for local and global markets (further investigation required).



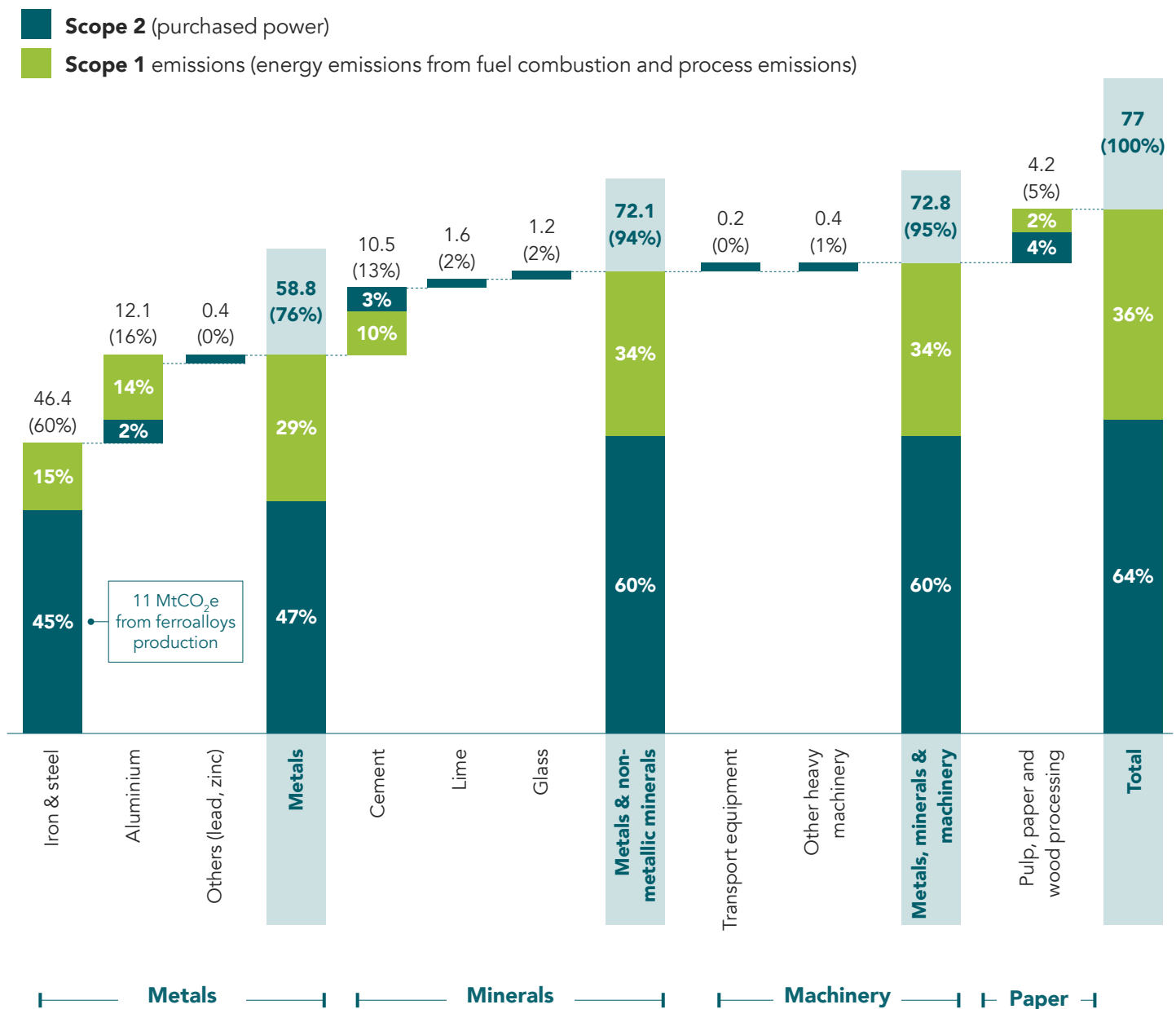
FAVOURABLE BUSINESS ENVIRONMENT & STRONG EXISTING CAPABILITIES

- Strong existing local manufacturing capabilities despite low capacity utilisation in some subsectors.
- Minimal investment required to convert already existing plant capacity.
- Sovereign credit ratings improving (S&P Global Rating in 2025 to BB), and corporate South Africa shows improving international standing and creditworthiness for investment.

SA has key **strategic advantages along the value chain** to enable the creation of **energy-intensive, climate-compatible manufacturing hubs** for local and global markets

Within heavy manufacturing, iron and steel is the largest carbon emitter (60% of sector emissions), followed by aluminium (16%) and cement (13%)

Heavy Manufacturing National Emissions Baseline in 2017 (MtCO₂e) – Scope 1 and Scope 2. Includes an additional breakdown of Scope 1 and 2 per sector

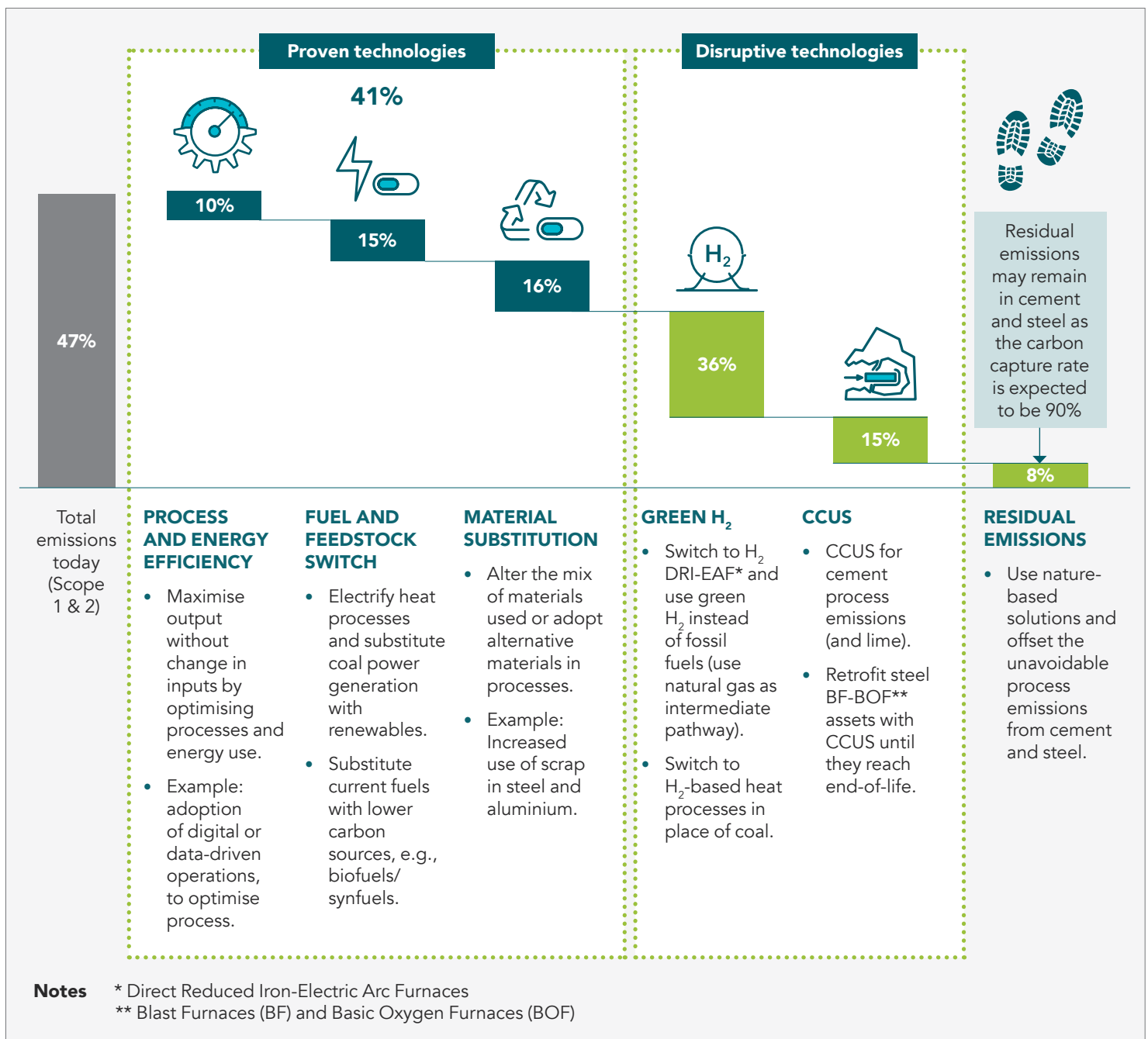


Source: GHGI (2017); Department of Energy SA - Commodity Flow and Energy balance tables (2018); NBI-BCG project team

40% of the sector's emissions can be reduced through existing technologies.

60% of emission reductions require technologies that are not yet commercially viable.

Figure 12: Overview of the 20250 mitigation potential of the heavy manufacturing decarbonisation levers



*This figure excludes the chemicals and petrochemicals sector

To decarbonise a total of 77Mt CO₂e, the heavy manufacturing sector needs large-scale **renewable energy, combined with significant operational investment**

Decarbonisation requires **150GW** of renewable energy to decarbonise the power sector alone by 2050.

An additional **170-200GW** of further renewables is needed to capture the national green hydrogen opportunity.

INSIGHT: In January 2026, 18GW of private generation capacity was registered with the National Energy Regulator (NERSA), mostly solar and wind.



Up to **R160bn** in investments are needed to upgrade manufacturing plants across South Africa

This is a large-scale transition

That needs to be structured in a way that enables industry's role as an investor and driver of green industrial growth

What do companies in heavy industry currently say about decarbonisation?

The following observations are summarised from interviews with heavy manufacturing companies held in 2025-2026.



Heavy industry participation and engagement

Over 20 months, NBI worked with 10 prominent heavy manufacturers spanning 7 sub sectors, as well as industry associations, experts and organisations to distil out why companies are not decarbonising at the pace and scale that the NBI Pathways to Net Zero have suggested. Through interviews, meetings, roundtable discussion and 3 workshops, NBI has recorded these barriers to decarbonisation.

The findings of this process represent a collection of heavy industry views.

The purpose of this analysis is to understand where best to support the private sector's decarbonisation journey. In this phase, NBI worked with a specific set of participating companies. Follow up work is required to target specific stakeholder gaps.

8

companies across 6 sectors

Metals | Minerals | Machinery | Pulp, paper & wood | Petrochemicals | Chemicals

10

additional consultations and inputs from key sector stakeholders

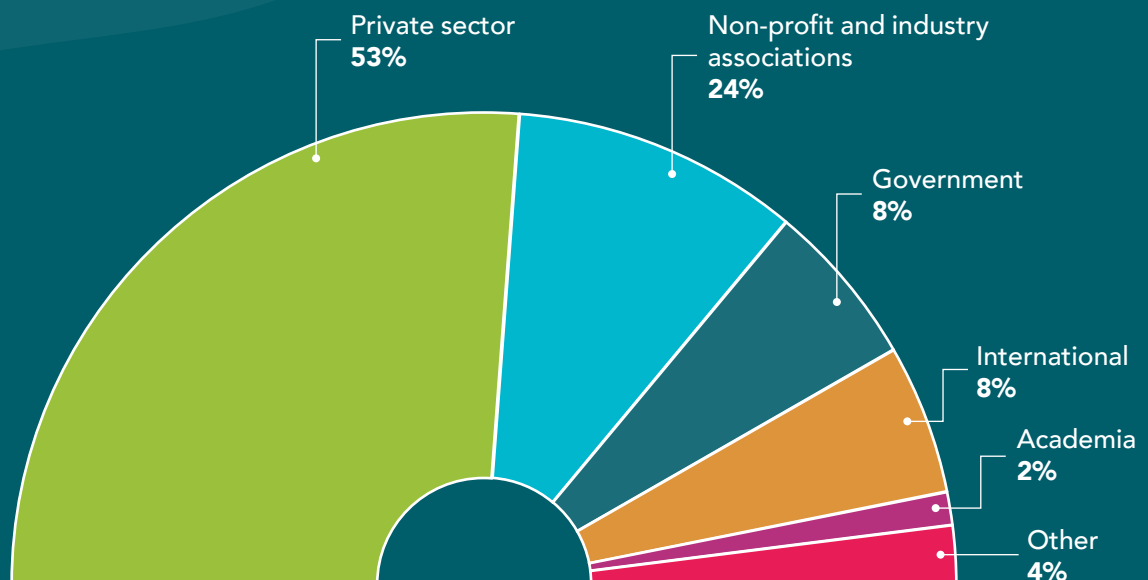
244

participants in

5

stakeholder engagement sessions

Stakeholder engagement: Who was in the room



Decarbonisation activities are underway in the sector – but not at the pace or scale required

Companies reported undertaking the following interventions:

1. **Setting science-based, time-bound targets** and reporting emissions data annually (often to multiple platforms and frameworks)
2. **Implementing “no-regret actions”** such as
 - a. **Process optimisation and energy efficiency** measures
 - b. **Renewable energy** installation on site (“behind the meter” electricity generation)
3. **Signing short- to long-term Power Purchase Agreements**, with recent shifts to include more **virtual wheeling agreements** with Independent Power Producers, to supplement own generation capacity with externally sourced renewables (“in front of the meter”)
4. **Scope 3 supplier engagement** to reduce emissions along value chains, and development of codes of conduct for new suppliers
5. **Capacity building** within the company and communities that fall within the risk and impact zone of operations
6. **Technology switches and upgrades** that have a proven return on investment, emission reductions and long-term product supply certainty (a sustainable market). Companies reported the following technology switches during interviews held in 2025:
 - a) Switching fleet vehicles to electric vehicle fleets
 - b) Switching to electric forklifts
 - c) Capital investments in modern, energy efficient electricity generating turbines
 - d) Use of new biomass boilers and waste-to-energy conversions in industries that have access to large volumes of biomass or waste
 - e) Retrofitting coal boilers with more efficient technology instead of switching to renewable energy. This includes improvements that reduce fuel use, energy waste, or emissions per unit of production
 - f) The reuse of waste oil for the production of lower carbon oil-based products
7. **Research and innovation** into low-carbon products and production for long-term emission reductions

“The decarbonisation efforts have very little to do with ‘doing good’. The efforts are all calculated to reduce operational costs”

**Interview quotation

“[The sustainability teams] have to take your business with you, or it will never get done”

**Interview quotation



Company findings: actions

Why are companies undertaking decarbonisation initiatives?

"Policy can create the right environment for technology viability and investment"

**Interview quotation

Key factors driving decarbonisation in heavy industry include:



Business opportunities. This is focused on initiatives that increase production efficiencies and reduce operational costs.



Investor expectations. Financial institutions, both local and international, are linking financing terms to sustainability-related KPIs.



Tax benefits. Certain decarbonisation efforts can receive a financial incentive (e.g. Section 12L Energy Efficiency Savings Allowance; carbon credits to offset the national carbon tax).



Electricity costs. Rising electricity prices are driving a shift towards renewable energy and decentralised options, as a more affordable option.



Compliance. Companies must report data to meet regulatory requirements (e.g. carbon tax, Sector Emissions Targets (SETs)).



Energy supply challenges. Ongoing issues with power sector recapitalisation and the approaching national gas cliff add urgency to energy diversification.



Risk management. Decarbonisation reduces exposure to grid-related costs and regulatory volatility, including tariff increases and policy changes.



Innovation and competitiveness. A small number of companies (only two reported) see decarbonisation as a means to stay ahead of global trends.



Value chain pressure. Clients and company boards increasingly expect sustainability measures be undertaken by their suppliers.

"The pace of decarbonisation will be affected by reality against ambition. [Decarbonisation] is so dependent on the reality of markets, board approvals, financing, timing in a commodity space, and customer requirements."

**Interview quotation



Company findings: barriers to decarbonisation

Insights into the voices of heavy industry

"Everyone wants to decarbonise, but no one wants to pay for it"

**Interview quotation

Structural challenges are eroding the heavy manufacturing sector's investment appetite, undermining competitiveness and driving up operational costs. Ultimately leading to plant closures and a diminishing sector.

A weak economic environment, underutilised capacity, and the absence of strong incentives to decarbonise further suppress investment. As a result, decarbonisation is often perceived as an additional business cost, risk, or compliance burden rather than a strategic opportunity.

During 2025 NBI engaged with heavy manufacturers and key sector stakeholders to better understand the current barriers to decarbonisation. This section provides the findings from that work and represents the current perceptions and challenges provided so that NBI can understand why decarbonisation is not happening at the pace and scale required.

Electricity was perceived by certain interviewees as too expensive and unreliable for energy-intensive users.

Renewable energy cannot solve for all carbon emissions in an energy-intensive, hard-to-abate sector, which often includes considerable process emissions.

Alternative technologies such as green hydrogen are promising but not yet commercially viable at scale. Carbon Capture, Utilisation and Storage (CCUS) remains a relatively niche solution in South Africa at present. Feasible CO₂ utilisation options do exist, but are relatively small scale in nature.

The heavy manufacturing sector is not well protected against cheaper imports. There is a risk that local companies will face higher production costs as they decarbonise while trying to compete with cheaper imported products. Companies are calling for more locally supportive trade policies.

Businesses reported that the carbon tax does make an impact on balance sheets. But they also argue that carbon tax revenue should be recycled back into decarbonisation activities particularly for the hard-to-abate sectors where low-carbon technologies are costly or not yet financially viable.

Currently, technology switching is primarily implemented to lower operational costs, not to lower the carbon content of product.

Heavy industry currently views the national environment as one that is difficult for business to invest heavily in decarbonisation, due to global competition, the slow overall pace of renewable energy rollout, and limited demand due to low economic growth in South Africa.



Company findings: barriers to decarbonisation

Energy access, reliability and affordability as an enabler and constraint

Heavy manufacturers require extremely large amounts of energy and electricity, and demand is expected to keep rising. Key energy-related challenges facing the sector include:

- 1. Large-scale, long-term investment required:** The hard-to-abate sector requires significant long-term investments to retrofit existing assets, upgrade to new technologies and implement process efficiencies or fuel/ feedstock switches. *NBI estimates > R160bn is needed to upgrade all plants across South Africa.*
- 2. Technology constraints:** Hard-to-abate sectors cannot yet rely on new technologies like green hydrogen or carbon capture, utilisation and storage (CCUS) to achieve net zero. One company noted that carbon-intensive products from South Africa are still cheaper (price/tonne) compared to international green products, and buyers often choose lower-cost options over those carrying a green premium.
- 3. On-site renewable energy limitations:** While on-site renewable energy investments improve energy security and reduce emissions, most companies lack sufficient land to generate the scale of electricity required for net zero decarbonisation.
- 4. PPAs fall short:** Long-term Power Purchase Agreements (PPAs) help supplement green electricity needs and provide affordable energy. However, they cannot yet meet the full baseload requirements of heavy industry, especially at night or during windless periods, due to still maturing battery storage technologies.
- 5. Grid constraints:** Access to large-scale renewable energy is limited by current grid capacity and there are currently not enough renewable energy electrons available on the grid to decarbonise the sector.
- 6. Carbon-intensive Scope 2 emissions.** Industry is reliant on electricity sourced directly from Eskom to secure baseload power for large-scale industrial production. The sector's Scope 2 emissions continue to be carbon intensive given the country's current grid emission factor.
- 7. Unreliable public electricity infrastructure.** Companies reported that failing grid infrastructure (e.g., transformer breakdowns, cable theft) force unplanned capital investments in electricity infrastructure to protect assets. This erodes operational efficiencies and undermines savings achieved through energy efficiency measures and PPAs, pushing companies towards self-sufficiency rather than collaborative decarbonisation partnerships.
- 8. Nascent electricity market.** Wheeling, along with the phasing in of the South African Wholesale Electricity Market (SAWEM) and ongoing formation of the independent national transmission company, could unlock a participatory, diversified and competitive electricity market. However, the electricity sector is in transition, leaving companies constrained by factors outside their control.
- 9. Gas cliff pushes up costs.** The 2028 gas cliff will drive up production costs as gas imports rise. Compounding this, the Department of Electricity and Energy has positioned gas as a "destination fuel" rather than a transition fuel, conflicting with the Department of Forestry, Fisheries and Environment's net zero Nationally Determined Contribution (NDC) commitment within the Paris Agreement.
- 10. Scope 3 emission challenges.** Measuring, analysing, and influencing Scope 3 emissions remains difficult, making accurate reporting a persistent barrier.





Company findings: barriers to decarbonisation

Strengthening the policy and regulatory environment

Heavy manufacturers interviewed listed the need for consistency, predictable conditions and governmental backing as necessary to commit to large investments. Key policy and regulatory barriers reported by the heavy manufacturing sector during engagements include:

- 1. Policy coherence and stakeholder confidence.** Within the current climate in South Africa a trust deficit exists between government and the private sector. Some businesses perceive government commitments to be different across different departments or not aligned to economic realities. Companies reported that inconsistent policy implementation deters long-term investment. This is particularly the case for the delivery of electricity and infrastructure where businesses have invested in private electricity provision due to a loss of confidence in the ability of public entities to supply reliable power.¹⁶
- 2. Fragmented governance and poor alignment within government** has allowed for lobbying to dominate business sector discourse among companies wishing to continue in a business-as-usual scenario.
- 3. Duplicated reporting requirements.** Regulatory inefficiency and siloed government structures create significant constraints for investment and make reporting a resource-intensive exercise.¹⁷
- 4. A lack of government support:** Companies reported a lack of effective incentives and enabling policy frameworks which undermines project bankability, fails to reward early movers and does not stimulate a market that can adjust to new green premiums given the cost of decarbonising products. Participants noted a more balanced approach that combines compliance requirements with targeted support that would encourage action from producers and consumers.
- 5. Uncertainty within regulatory environment.** While significant policy reforms have been introduced to accelerate the energy transition, stakeholders continue to identify uncertainty around procurement timelines (particularly for the TDP), regulatory processes, and tariff arrangements as barriers to investment.
- 6. Perceptions between climate ambition and implementation realities.** Some stakeholders expressed concerns that government climate commitments may not reflect a viable or globally fair pathway for a developing economy within the current political and financial climate. They emphasised the need to consider evolving global market conditions, geopolitical developments, and the competitiveness of domestic industries when designing and implementing decarbonisation policies. This feedback suggests that more needs to be done to share and work with companies on how global market investment trends remain strongly focused on low-carbon technologies (especially companies with a global footprint that have extensive experience across jurisdictions).
- 7. Weak tax signals.** After allowances, carbon tax price signals are too low to make low-carbon technologies economically viable, leading companies to delay or avoid capital investment in decarbonisation.
- 8. Carbon tax recycling gap.** Participants within heavy industry advocated for greater reinvestment of carbon tax revenues into industrial decarbonisation initiatives given the scale of investment required. Some indicated that without a clear link between revenues collected and support for emissions reduction, the carbon tax may be viewed primarily as a fiscal instrument rather than as part of a broader policy framework to accelerate the low-carbon transition.
- 9. Aligning the carbon budget and carbon price.** Some stakeholders expressed concern around the interaction between the carbon budget and carbon tax and that they should be complementary tools that support decarbonisation. Where government sees the tools as complementary, some companies believe they create overlapping compliance obligations increasing the administrative burden.

¹⁶ OECD Economic Surveys: South Africa 2025

¹⁷ World Bank's Country Private Sector Diagnostic (CPSD)



Company findings: barriers to decarbonisation

Building an enabling environment

In a challenging economic climate with many companies under pressure, heavy manufacturing in South Africa is declining. These conditions make it difficult for companies to invest in long-term investments for decarbonisation and justify new projects. Key areas that weaken an enabling environment for investment include:

1. **Weak economic environment.** Most companies believe that a generally stagnant South African economy and the absence of strong growth in energy, infrastructure and logistics undermines the sector's ability to decarbonise.
2. **Price sensitive customer base.** Company feedback highlighted that while customers increasingly want low-carbon products, they are often unwilling to pay a premium for them. Demand-led policy is needed to make green products accessible and drive change.
3. **Need for a stronger business voice.** Industry requires a more unified voice to advocate for green growth-focused development.
4. **Policy misalignment.** Energy, climate and industrial policy and planning are not adequately aligned towards a unified net zero, green industrialisation vision and future.
5. **Regulatory uncertainty.** Clear, consistent, and predictable regulation is critical to unlock private investment. While the policy frameworks are clear stakeholders reported uncertainty around the timing, sequencing and implementation thereof. This includes the carbon tax trajectory, electricity market reform and grid access, renewable energy pipeline and insufficient coordination between regulators.
6. **Financing challenges.** Sourcing international finance relies on good company financials and rigorous sustainability reporting and KPIs, leaving certain South African companies struggling to build strong investor confidence.
7. **Municipal constraints.** Almost all companies reported that struggling local government with limited capacity and considerable debt to Eskom, has undermined the ability of energy-intensive users to rely on municipal services. As a result of deteriorating municipal infrastructure companies report increasing capital and operational expenditure to address gaps, while the cost of municipal services continues to rise.





Company findings: barriers to decarbonisation

Technology constraints

Certain technologies that support net zero decarbonisation remain prohibitively expensive or are not yet commercially viable. Key technology related barriers in heavy industry include:

1

INVESTMENT UNCERTAINTY

Companies face significant uncertainty about the return on investment in new technologies or their viability, which deters large-scale adoption.

2

DIFFICULTY WITH TECHNOLOGY SWITCHING

Changes to industrial processes are not always easily accomplished. Where new technologies or technology switching do not reduce cost and risk, they are unlikely to be undertaken.

3

DATA INTEGRATION GAPS

Smart metering and advanced data measurement systems, which could support technology switching and process efficiencies, are not yet deployed at scale. This includes the use of digital twins and other more recent technological advancements.





Company findings: barriers to decarbonisation

Emerging issues that are pertinent to heavy industry

1. **Adaptation vs. mitigation imbalance:** Both physical and transition risks are impacting the business environment. Without a detailed understanding of the financial and raw material costs of climate impacts (adaptation), there is a concern that adaptation costs may outweigh the costs of reducing emissions (mitigation). Despite this, corporate obligations and discourse remain primarily focused on mitigation. Integrated action on both adaptation and mitigation is urgently needed to reduce the overall risk burden on South African companies. Some companies reported that South African businesses carry a higher adaptation burden, when compared to many developed markets.
2. **Biomass limitations.** While biomass can serve as a renewable energy source for certain industrial processes, it is not universally applicable and cannot serve as a country-wide solution, especially in energy-intensive sectors like heavy manufacturing. However, biomass use, where viable, offers great opportunities for socio-economic and adaptation benefits, and should still be considered where it makes sense.
3. **Trade-offs in decarbonisation.** Transitioning to net zero requires weighing difficult trade-offs. For example, biodiversity loss in healthy biodiverse areas where a renewable energy power plant is constructed. As another example, the generation of additional waste given the relatively shorter lifespan of renewable energy power plants (decommissioned solar panels, wind turbine blades or batteries).
4. **Artificial Intelligence impacts and opportunities.** The rise of Artificial Intelligence brings new sustainability challenges, including water-intensive data centres that could strain local resources in an arid country. Artificial Intelligence does however present an opportunity to support decarbonisation innovations through promoting data-driven efficiency in monitoring and process optimisation to reduce energy use and carbon intensity.
5. **Skills gaps.** Transitioning industries will require specialised skills, reskilling and requisite career pathways to support new value chains in a green economy. It is essential for business continuity and resilience that businesses are preparing for skills transition risks.
6. **Circular economy considerations.** Some companies commented that planning for transition must also include strategies to manage new waste streams and embed circularity into industrial processes.





Company findings: barriers to decarbonisation

Why is heavy manufacturing not leveraging decarbonisation opportunities amid rising climate requirements?

Several factors continue to weaken investment confidence and the financial case for decarbonisation in heavy manufacturing.

Geopolitical uncertainty and slowing global decarbonisation momentum have weakened confidence amongst manufacturers

After the NBI-BUSA-BCG Pathways to Net Zero project concluded in 2023, local enthusiasm has been impacted as companies get to grips with internal requirements and the costs of decarbonisation.

The large investments required in the sector are undercut by a lack of investment confidence, which the sector attributes to:

1. Current **sectoral decline** (deindustrialisation) reducing investment appetite.
2. **Slow electricity sector reform**, which makes large-scale access to renewable energy more difficult.
3. A **sub-optimal carbon pricing and tax system** for the sector, where carbon prices may be too low to materially influence investment decisions.
4. Long-term **policy uncertainty** in energy, industrial and climate policy, fragmented or siloed government action and limited government-business communication.

The **high costs** of heavy manufacturing sector decarbonisation are also not mitigated through sufficient incentives, subsidies or technical solutions that stimulate the economic case for investment.

Therefore, decarbonisation is largely treated as a **compliance and company cost** issue in heavy manufacturing, not a strategic and market opportunity.



A rapid assessment of the demand-led opportunities in the Transmission Development Plan of South Africa

Despite the barriers experienced in the sector, there are key areas of opportunity where heavy manufacturing can grow

To start with, aligning the heavy manufacturing sector to the Transmission Development Plan can maximise opportunities for localisation, industrialisation and decarbonisation.

This will trigger co-benefits: driving industrial growth through increased demand, while simultaneously contributing to national decarbonisation through grid expansion and renewable energy ramp up.



What is the Transmission Development Plan?



The Transmission Development Plan (TDP) is a national infrastructure programme that expands and modernises the transmission grid to enable new generation, resolve power sector constraints and drive economic development.

South Africa's energy transition and economic recovery agenda places key importance on the rapid expansion of its grid infrastructure. The TDP is South Africa's official 10-year roadmap for expanding and modernising the national electricity transmission network. Coordinated by the National Transmission Company of South Africa (NTCSA), the TDP identifies the required infrastructure (including transmission lines, substations, and corridors) to connect new generation capacity, particularly from renewable energy sources, to demand centres. The plan proposes the construction of more than 14,000km of new transmission lines, 210 transformers and over 100 new substations to accommodate an additional 56 GW of power generation capacity by 2034.

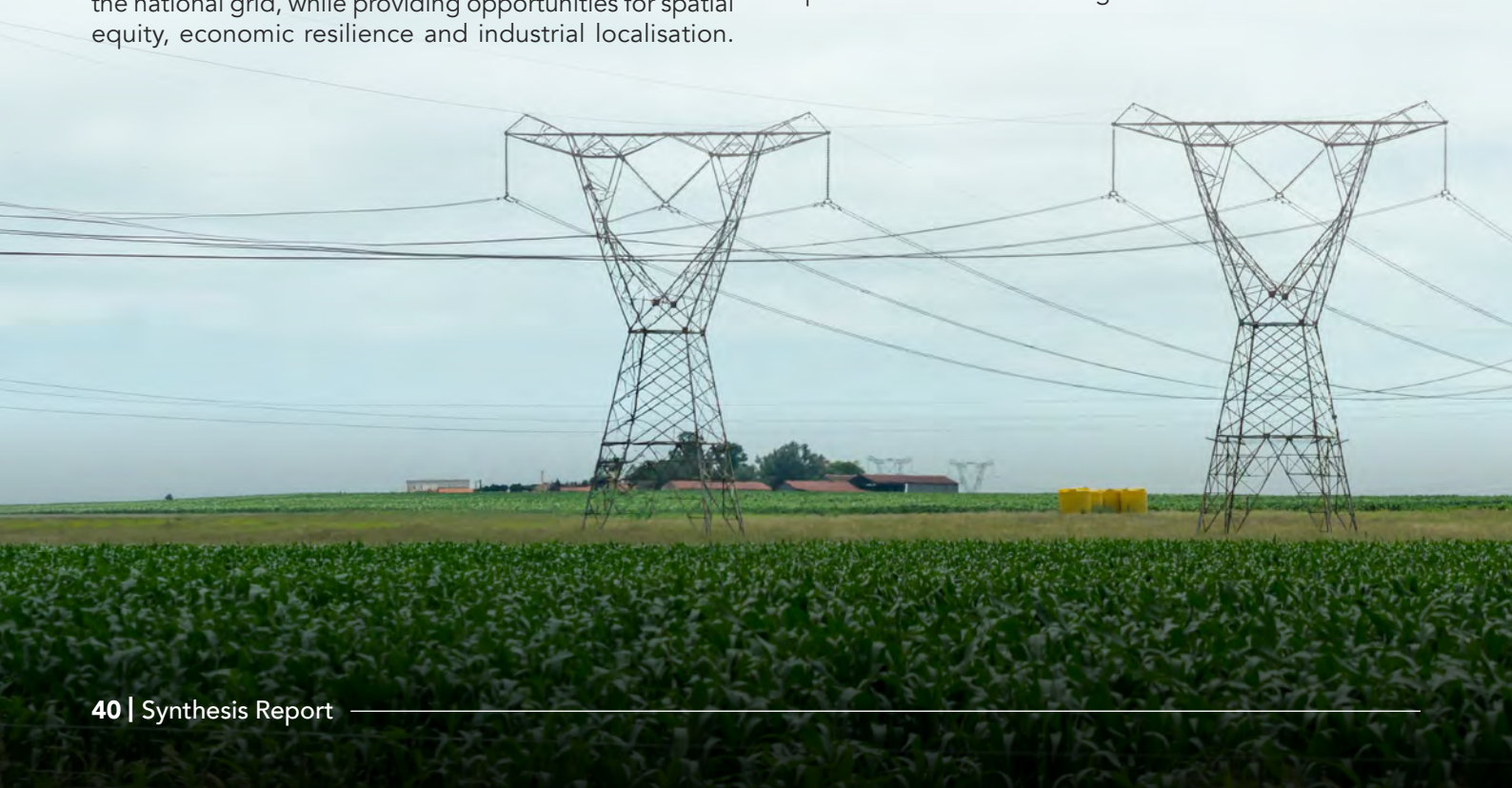
R112bn has been approved for the TDP programme over the next 5 years – a critical implementation phase.

The TDP plays a foundational role in enabling South Africa's Just Energy Transition. As the TDP is rolled out, it ensures that clean energy can be integrated reliably into the national grid, while providing opportunities for spatial equity, economic resilience and industrial localisation.

Grid expansion facilitates rural and underserved area electrification, while providing the infrastructure backbone for green industrial zones and energy-intensive economic growth.

With peak electricity demand currently at approximately 30 GW and expected to grow, the TDP addresses long-standing grid constraints that have inhibited economic growth and industrial recovery. **The TDP is not only a technical plan, but also a strategic instrument for enabling energy security, inclusive growth, and sustainable development.**

A key challenge in implementation is overcoming local supply chain constraints, as industry ramps up to meet demand. Partnerships with the Department of Electricity and Energy, National Treasury and Department of Trade Industry and Competition will support project pipelines and bankability through the Independent Transmission Projects (ITP) programme, which provides an important implementation and financing vehicle for areas of the TDP.



What is the Independent Transmission Project (ITP) Programme?



The Independent Transmission Projects (ITP) Programme mobilises private sector investment for the TDP, and is an initiative of the Department of Electricity and Energy (DoEE) and National Treasury.

In December 2023, Cabinet endorsed the ITP Programme to allow private sector participation in the development, financing, construction, and operation of new transmission infrastructure, under a robust and transparent regulatory framework.

This public-private programme aims to assist the National Transmission Company of South Africa to accelerate the rollout of the TDP. The DoEE's role is to serve as the procurer of 1 164km of 400kV (high voltage) transmission lines through the Independent Power Procurement (IPP) Office.

Progress under Phase 1 of the ITP programme includes:

- Dec 2024 - Feb 2025: A market analysis was conducted through a Request for Information (RFI)
- End July 2025: Phased procurement implemented by the IPP Office included a Pre-Qualification Tender (RFQ) to identify and shortlist capable, experienced, and financially sound bidders to proceed to the next stage of the ITP procurement process. 7 Pre-Qualified Bidders were appointed.¹⁸

- End November 2025: A Request for Proposals (RFP) from the successful bidders was originally scheduled for end November 2025. It is expected to be reissued in the 3rd Quarter of 2026.

To de-risk private sector investment, a Credit Guarantee Vehicle of approximately \$500m will be established, in partnership with the World Bank. The vehicle will ensure bankable projects in Phase 1 of the ITP. The Credit Guarantee Vehicle is expected to become operational in 2026 as a non-life insurance company with all the required licences and approvals, and regulated by the Prudential Authority (PA). National Treasury has committed to contribute about 20% of the initial capital (roughly US\$100 million) for the Credit Guarantee Vehicle.

The DoEE further recognises that localisation is a pillar of South Africa's future economic development, and aims to work with the Department of Trade Industry and Competition to ensure locally produced, designated items, value chains and industries will benefit from the demand following the ITP.



¹⁸ Media Statement, DoEE, December 2025

What does the TDP offer the South African economy if localised?

Prime Africa Consult indicates that by 2034, local procurement requirements resulting from the TDP will be worth R323.4 billion (current value) and may create over 357,000 full year jobs. This is a significant policy signal from government and a demand lever for the manufacturing sector. The TDP demonstrates significant value to the South African economy if local procurement is supported as far as possible.

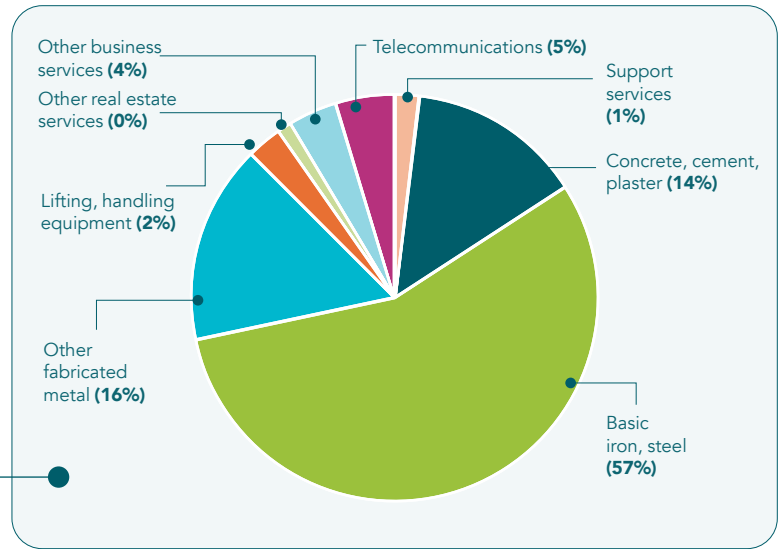
By 2034...

Total expenditure - R323,4 Bn

GDP contribution - R180,6 Bn

Employment (full year full time jobs) - 357,897 Jobs

Estimated Total TDP Expenditure across local demand areas, shown as a percentage of total for the period 2025 - 2034



Economic Sector	Estimated TDP Expenditure (R million) 2025 - 2029	Estimated TDP Expenditure (R million) 2030 - 2034	Estimated Total Expenditure (R million) 2025 - 2034
Concrete, cement, plaster	16,141	30,241	46,383
Basic iron, steel	64,566	120,964	185,530
Other fabricated metal	17,828	33,401	51,229
Lifting, handling equipment	2,633	4,933	7,566
Other real estate services	369	691	1,060
Other business services	4,880	9,143	14,023
Telecommunications	5,316	9,960	15,276
Support services	801	1,501	2,302
Total	112,534	210,834	323,368

The results above are derived from a macroeconomic modelling exercise using a Social Accounting Matrix (SAM) framework conducted by Prime Africa Consult in 2025. The SAM assesses the economic impact of the TDP planned transmission line expansion. The analysis estimates Gross Domestic Product (GDP) contribution, employment generation (in full-year job equivalents) based on compensation to employment per SIC code in each economic sector, and sectoral linkages resulting from a R323.4 billion in infrastructure investment by 2034.

There are considerable opportunities for heavy industry within the Transmission Development Plan

The TDP stimulates infrastructure investment, creates industrial demand and ultimately unblocks renewable energy access for energy-intensive users.

South Africa has access to raw materials and established value chains in:

Cement
Steel
Aluminium
Electrical equipment
Minerals



And South Africa will see an increase in demand for specific products and services through transmission grid expansion

Transmission infrastructure
Construction and civil engineering
Logistics and networks
Operations, maintenance, services and recycling
Digital infrastructure and monitoring



Which will unlock major benefits for the country

An investment of R323bn, yielding a GDP impact of R180bn until 2034.

Increased local demand and capacity to meet 56GWs of renewable energy by 2034.

Reduced CBAM exposure on about 50% of exports.

Inclusive economic development, with approximately 358k full-time, full-year jobs.

19 Prime Africa Consult, 2025

20 Eskom NTCSCA TDP 2024

21 MOEE Media Briefing - ITP Phase 1 RFQ Presentation Jul-2025

22 NBI-BUSA-BCG, 2023

A framework of recommendations for heavy manufacturing decarbonisation



South Africa must create an enabling environment that supports large-scale green industrialisation and investment, and globally competitive supply chains.

The final part of this report identifies key interventions to support this goal.

Heavy industry is currently strained, in an economy under pressure. This context should not overshadow the importance of decarbonisation – both to reduce material and trade risk, and unlock new financial opportunities.

Decarbonisation can serve as a catalyst for green industrialisation.

Drawing on industry inputs, NBI proposes a framework of recommendations to accelerate decarbonisation and economic resilience in heavy manufacturing.

The central point is clear: decarbonisation must not be a barrier or cost, but rather a **driver of reversing deindustrialisation and unlocking green industrial growth.**

Accelerating action through a framework for green industrialisation and decarbonisation:

1. Support wider industrial growth, by building the underlying conditions to enable business confidence, competitiveness and investment
2. Maximise business opportunities and technical solutions to drive rapid sector decarbonisation



Enablers for a conducive investment environment

Strong domestic demand to build capacity utilisation and support economic expansion.

A growth-oriented **policy and regulatory framework** that enables investment and industrial expansion.

Strong, aligned **leadership and commitment** from business and government.



Priority interventions that will unlock decarbonisation at scale, in the medium term

Access to **large-scale, affordable, reliable renewable energy**, coupled with improved infrastructure maintenance.

Electricity supply industry reform and commitment to sector decarbonisation, in support of sector ramp up.

Business investments triggered by optimised carbon tax and carbon budget instruments, through stronger pricing and strategic tax revenue earmarking.



Green industrialisation as a pathway to competitive sector growth and accelerated decarbonisation



Underpinned by a strong business voice for green industrialisation, supported by industry associations and enhanced stakeholder communication.

Recommendations for green industrialisation that drive competitive sectoral growth, efficiency and decarbonisation

ENABLERS FOR A CONDUCTIVE INVESTMENT ENVIRONMENT:



Industrial growth is a critical precondition to green industrialisation and the upgrading of South Africa's industrial base.

A key enabler is therefore to **stimulate domestic demand and heavy manufacturing productivity** by prioritising industrial opportunities in the Transmission Development Plan and wider national infrastructure programmes, alongside appropriately considered trade protection measures, demand led policies and local content allocations.

There is a need to **create sustained demand for green products** through green procurement mandates and relevant incentives, which support the uptake of low-carbon products, including mechanisms to recognise or enable a green premium.

South Africa requires **government and business leadership and commitment to a growth-oriented policy environment for heavy manufacturing**, in line with a long-term commitment to climate targets.

PRIORITY INTERVENTIONS THAT WILL UNLOCK DECARBONISATION AT SCALE



Facilitate the rapid roll out of renewable energy for energy access, affordability and reliability, coupled with enhanced infrastructure maintenance and grid expansion, including to reduce the rising cost of electricity.

This includes **accelerating ongoing reform in the electricity supply industry**, as a means to support the decarbonisation of industry Scope 2 emissions, including through greater price transparency and increased flexibility in the sourcing of options to meet demand. Overall, broader commitment within the energy sector to decarbonise has a strong positive knock-on effect for supporting long-term, large investments in decarbonising heavy manufacturing.

The NBI, through the **RAISE Hub**, has put forward 5 specific **policy recommendations** for large-scale renewable electricity expansion in South Africa:

- 1 ACCELERATE MARKET REFORM:**
Fast-track reforms to create a competitive electricity market and enable transparent, least-cost renewable procurement by businesses. This includes the operationalisation of the National Transmission Company of South Africa (NTCSA) as a fully independent grid and market operator, and the phased implementation of the South African Wholesale Electricity Market (SAWEM).
- 2 STRENGTHEN INTEGRATED PLANNING:**
Set clear, ambitious, and updated renewable-energy-based electricity targets that guide investment and align with national planning.
- 3 SCALE CORPORATE PROCUREMENT:**
Enable direct procurement by facilitating standardised Power Purchase Agreements (PPAs) and harmonising wheeling frameworks across municipalities.
- 4 FAST TRACK GRID INFRASTRUCTURE INVESTMENT:**
Fast-track the expansion of transmission infrastructure and prioritise grid connections for renewable projects.
- 5 EXPAND GREEN POWER OPTIONS:**
Encourage voluntary green power options for consumers and improve access to green energy.

Optimise existing regulatory mechanisms for heavy manufacturing, to encourage decarbonisation and investment. This includes considering strategic sectoral incentives, raising the sector's effective carbon tax rate and assessing the merits of recycling carbon tax revenues specifically for the heavy manufacturing sector. These measures can reinforce sectoral support to boost investment confidence, scale green industrialisation and incentivise technology investment for a hard-to-abate sector.

UNDERLYING CONDITIONS



Establish clear and structured channels of communication and collaboration between government, business, and sector associations to enhance trust, alignment, and investment confidence.

Strengthen and coordinate a unified business voice to advocate for growth-oriented green industrialisation, enabling increased investment within a constrained economic context.



Decarbonisation is not a standalone activity: it must be embedded into South Africa's green industrial growth pathway

"Greening industrialisation and industrial policy represents an opportunity for SA to shift from **fossil-fuel intensive stagnation** to a **higher value-added**, labour-absorbing and **less carbon-intensive** [competitive] economy."

Source: Nimrod Zalk, Greening South Africa's Industrial Policy, 2025 [own emphasis]



Synthesis of findings and recommendations



Section 3



A dual company focus on climate action is needed that enables industry growth and competitiveness

Operational interventions (inside the company)



Accelerate renewable energy uptake	Roll out on-site renewable energy, sign PPAs, and leverage wheeling arrangements to secure affordable, reliable electricity.
Deploy proven low-carbon technologies, maximise efficiency and "no-regret" actions	Invest in technologies with demonstrated impact and returns. Optimise industrial processes and implement upgrades that deliver cost savings and measurable emission reductions.
Strengthen compliance and carbon management	Set science-based targets, disclose emissions annually, and use tax allowances/ carbon credits to reinvest in decarbonisation projects.
Integrate climate adaptation into operations	Move beyond reactive responses by embedding climate risk into business continuity planning, expanding site-level assessments into company-wide initiatives, and piloting nature-based solutions that deliver resilience and co-benefits.
Invest in capacity building and learning	Build internal skills, training, and knowledge systems to embed climate awareness within companies. Extend capacity building to communities in the risk/impact zone to strengthen resilience and social licence to operate.
Position climate action as a competitive advantage	Treat decarbonisation and adaptation as drivers of productivity, resilience, and market differentiation. Use sustainability credentials to access new markets, secure investor confidence, grow supplier relationships and build medium-term growth opportunities.

Strategic enablers (systemic and requiring external collaboration)



Stimulate industrial growth aligned with green goals	Link decarbonisation to industrialisation by prioritising heavy manufacturing opportunities in national infrastructure programmes, trade measures and local content allocations.
Create sustained demand for green products	Advocate for green procurement mandates and incentives that recognise or enable a "green premium" for low-carbon products.
Support electricity market reform and grid expansion	Partner with government to fast-track ongoing reforms (competitive electricity market, NTCSA operationalisation, SAWEM rollout) and grid investment.
Supportive and consistent government policy and technological innovation is essential	Push for sector-specific incentives, recycling of carbon tax revenues into hard-to-abate industrial decarbonisation, and predictable long-term policy signals.
Invest in capacity building and learning	Build internal skills, training, and knowledge systems to embed climate awareness within companies. Extend capacity building to communities in the risk/impact zone to strengthen resilience and social licence to operate.
Strengthen collaboration and unified advocacy	Build structured channels of communication with government and sector associations, presenting a unified business voice to secure a growth-oriented green industrialisation agenda for both mitigation and adaptation measures.



Reference list

1. <http://www.aon.com/getmedia/f34ec133-3175-406c-9e0b-25cea768c5cf/20230125-weather-climate-catastrophe-insight.pdf>
2. Department of Water and Sanitation (DWS), 2023. Blue Drop, Green Drop and No Drop Reports. Pretoria: DWS.
3. Howden, 2025. The Insurability Imperative: How insurance signals are shaping climate risk, resilience and investment. London: Howden Group. Available at: <https://www.howdengroup.com/uk-en/insurability-climate-report-2025>
4. <https://iig.co.za/bridging-the-protection-gap-strengthening-business-resilience-against-climate-disasters-in-south-africa/>
5. Weather Catastrophes Highlight Perils of Underinsurance, AON, 2023
6. <https://files.cmcc.it/g20climaterisks/SouthAfrica.pdf>
7. <https://www.wbcsd.org/resources/adaptation-planning-for-business-navigating-uncertainty-to-build-long-term-resilience/>
8. World Business Council for Sustainable Development (WBCSD), Adaptation Planning for Business: Navigating uncertainty to build long-term resilience (2025)
9. National Business Initiative. Decarbonising South Africa's heavy manufacturing Sector. No. 7. Just Transition and Climate Pathways Study for South Africa. NBI, 2023. <https://www.nbi.org.za/focus-areas/environmental-sustainability/climate-pathways-and-a-just-transition-for-south-africa/#explore>
10. STATISTICS SOUTH AFRICA. "Quarterly Labour Force Survey Q4 2025." STATISTICAL RELEASE. February 2026.
11. South Africa Country Page. "International Energy Agency." <https://www.iea.org/countries/southafrica>
12. South African Iron & Steel Institute. SAISI's Climate Change Report. South African Iron & Steel Institute, 2025. <https://www.saisi.org/wp-content/uploads/2025/09/2025-08-26-SAIS-Climate-Change-Report-sub-2.pdf>

13. Department of Forestry, Fisheries and the Environment. "9th National Greenhouse Gas Inventory Report for the Republic of South Africa." South Africa, February 7, 2025.
14. TIPS. "The Real Economy Bulletin." n.d. <https://www.tips.org.za/manufacturing-data/the-real-economy-bulletin/item/5062-the-real-economy-bulletin-fourth-quarter-2025>
15. Bhorat, Haroon, and Christopher Rooney. State of Manufacturing in South Africa. 2017. https://commerce.uct.ac.za/sites/default/files/content_migration/commerce_uct_ac_za/1093/files/DPRU%2520WP201702.pdf
16. Tafadzwa Chibanguza. "SEIFSA STATE OF THE METALS AND ENGINEERING SECTOR 2026." March 2026.
17. The Outlier. "SA's GDP Growth since 1994." Accessed March 18, 2026. <https://theoutlier.co.za/charts/chart/17b7ca36-bf62-45ec-84f6-adf0226210fd>
18. Presidential Climate Commission. Carbon Border Adjustment Mechanisms and Implications for South Africa. Working Paper. PCC, 2023.
19. National Business Initiative. It All Hinges on Renewables: The Massive and Urgent Energy Transformation South Africa Needs. Just Transition and Climate Pathways Study for South Africa. NBI, 2022 <https://www.nbi.org.za/report/it-all-hinges-on-renewables/>.
20. Media Statement, DoEE, December 2025
21. Eskom NTC SA. "Transmission Development Plan (TDP) 2025–2034." 2024. https://www.ntcsa.co.za/wp-content/uploads/2024/12/TDP-2024-Public-Report_Rev1.pdf
22. Department of Electricity and Energy. "DOEE ITP Phase 1 RFQ Launch." Media Briefing. July 2025.
23. Nimrod Zalk. GREENING SOUTH AFRICA'S INDUSTRIAL POLICY. August 2025. <https://www.tips.org.za/research-archive/sustainable-growth/item/5006-greening-south-africa-s-industrial-policy>

