







The Industrial Development Corporation's

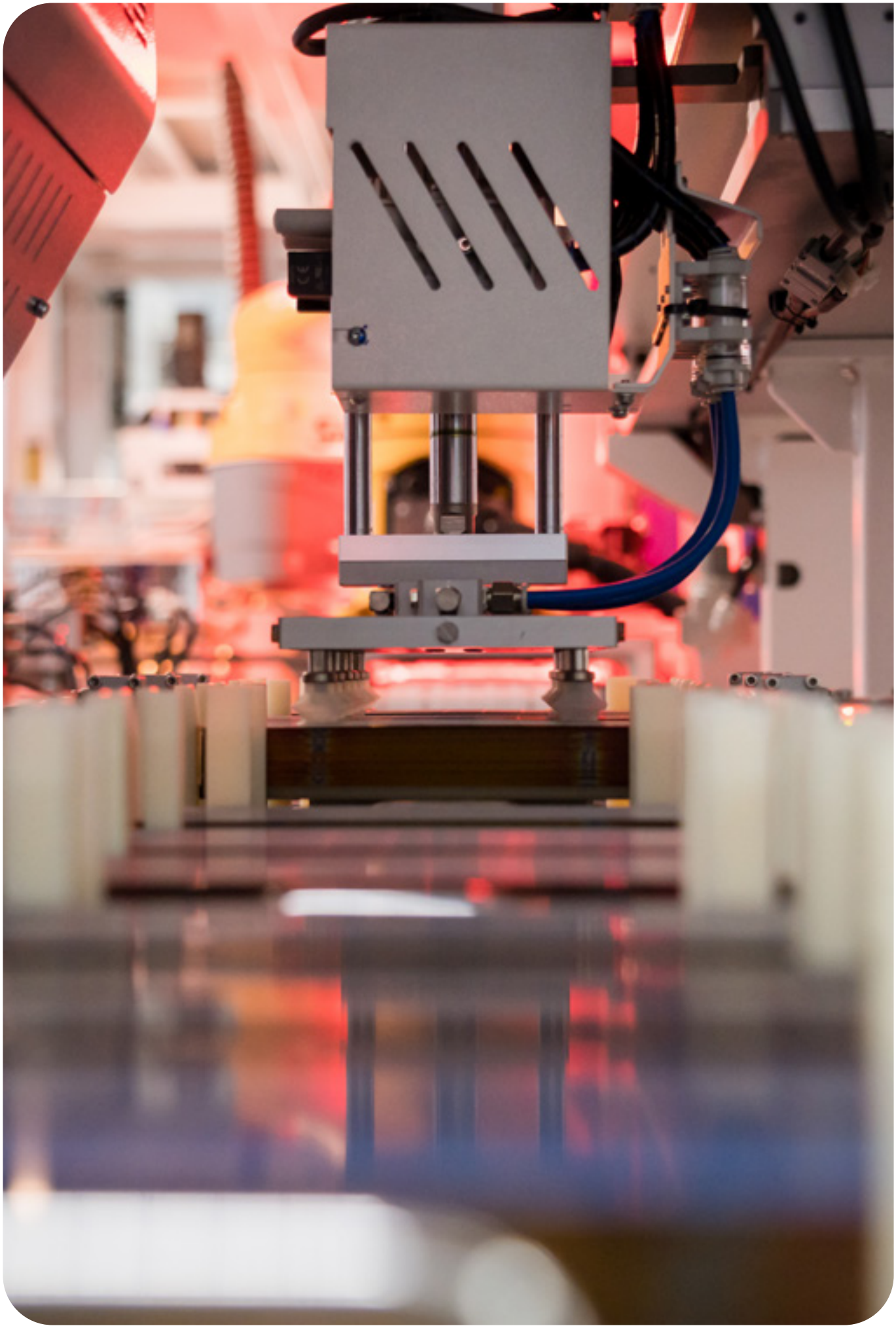
Sustainable Industrial Development Pathways



IDC

Industrial Development Corporation

Partnering you. Growing the economy. Developing Africa



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1. NAVIGATING SUSTAINABLE INDUSTRIALISATION FOR DEVELOPING ECONOMIES



The Industrial Development Corporation (IDC)[1] has a strategic imperative to promote inclusive and sustainable industrialisation that creates employment in South Africa and the rest of Africa.[2] In line with economic theory and practice, the IDC considers industrialisation to be a key driver of long-term economic progress[3] and is critical to addressing South Africa's triple challenges of unemployment, poverty and inequality.[4]

However, traditional models of industrialisation that rely on fossil fuels, the exploitation of scarce resources and unregulated globalisation are proving to be inherently vulnerable and unsustainable. Traditional models of industrialisation through increased productivity, trade and market integration have historically relied on fossil fuels, which result in greenhouse gas (GHG) emissions linked to climate change. In turn, climate change and the efforts to counter it are having a significant impact on agricultural and industrial production, as well as the organisation of global value chains. As a result, it is essential to identify new pathways for economic development that can leverage the positive effects of industrialisation on economic progress, promote inclusive prosperity, and decouple this prosperity from environmental damage.

The new pathways must also support countries to achieve commitments to reduce GHG emissions. South Africa is a party to the Conferences of the Parties to the United Nations Framework Convention on Climate Change (COP), which has enabled significant advances in models of global cooperation to face climate change and its effects. The Paris Climate Agreement aims to hold global warming to well below 2.0°C and to "pursue efforts" to limit it to 1.5°C. To accomplish this, countries have submitted Nationally Determined Contributions (NDCs) outlining their post-2020 climate actions.

South Africa has committed to mitigation targets of between 398 and 510 Mt CO2 equivalent (CO2-eq) by 2025, between 350 and 420 Mt CO2-eq in 2030, and achieving net-zero by 2050[5]. The country has articulated its approach to reducing emissions in the Low Emission Development Strategy 2050 and the Climate Change Bill passed in October 2023. The short-term priorities are detailed in the Just-Energy Transition Investment Plan[6] (JET-IP) and Implementation Plan. The emission reduction strategies prioritise electricity (45%), synthetic fuels (largely from coal, 12%) and transport (11%) as the highest sources of emissions.

As a development finance institution (DFI) the IDC is supporting the JET-Implementation Plan. It has been actively supporting the country's energy transition for over a decade including through catalysing investments in renewable energy projects from about 2011. The Corporation continues to lead the green hydrogen (GH2) and new energy vehicles (NEV) aspects of the JET Implementation plan.

Importantly, the IDC's response to climate change goes beyond its role in the JET. To fulfil its industrial development mandate in the context of climate change, the Corporation has adopted an integrated sustainable industrialisation model that allows it to design enabling solutions that are able to transform productive sectors of the economy in a manner that promotes socially inclusive growth for low carbon transitions. This integrated model allows the IDC to internally coordinate its decisions and facilitate partnerships with investors, technology owners and other stakeholders to drive sustainable industrial development in South Africa and the rest of Africa. The IDC recognises that an energy transition on its own may lead to a negative net impact on the economy and thus seeks to align the energy transition with a transition of production sectors.

[1] The Corporation was formed as an Act of the South African Parliament and it prescribes the IDC "…to proactively maximise its development impact through effective and sustainable industrial development, not only in South Africa but across the continent".

[2] Though the IDC has a mandate to support industrialisation in South Africa and the rest of Africa, the paper focuses on South Africa to manage the nuances between country industrialisation paths and therefore required for climate change responses.

[3] Prebisch, R. (1950). The economic development of Latin America and its principal problems Economic Bulletin for Latin America, No. 7. New York: United Nations Department of Economic Affairs; Hirschman, A. (1958). The Strategy of Economic Development. New Haven: Yale University Press; Kaldor, N. (1966). Causes of the Slow Rate of Economic Growth of the United Kingdom: An Inaugural Lecture. Cambridge: Cambridge University Press; Altenburg, T., & Rodrik, D. (2017). Green industrial policy: Accelerating structural change towards wealthy green economies. Green Industrial Policy; United Nations Industrial Development Organization [UNIDO], 2016

[4] Goga, S., & Mondliwa, P. (2021). Structural transformation, economic power, and inequality in South Africa. Structural transformation in South Africa, 165-188.

[5] South African Cabinet, 2021

[6] South Africa's Just Energy Transition Investment Plan 2023 -2027

The IDC has set an ambitious strategy to support South Africa's transition to a sustainable industrialisation model that seeks to:

1. Go beyond mitigating harm, focusing on creating long-run inclusive growth and employment through low carbon transitions. South Africa is pre-maturely de-industrialising, with the manufacturing sector's contribution to GDP having declined from 21% in 1994 to 13.6% in 2022[7]. The country's de-industrialisation has been accompanied by employment losses across manufacturing and within manufacturing there has been a decline in light and medium manufacturing, both of which are relatively more important for employment creation and have relatively lower GHG emissions. This is harming the country's long-term growth trajectory and contributing to poor socio-economic outcomes. A low carbon transition that exacerbates this de-industrialisation trend would worsen the country's triple challenges of unemployment, poverty and inequality and therefore be unjust and socially unsustainable.

2. Leverage South Africa's abundant renewable energy sources and Southern Africa's critical minerals to foster international competitiveness of industry, in the same way that energy from cheap coal drove the country's initial industrialisation phase. Resource-based and energy intensive sectors including minerals; wood, pulp, paper & printing; basic and refined chemicals; and basic metals account for approximately 60% of South Africa's merchandise export basket, making the country's exports vulnerable to carbon taxes and climate related non-tariff barriers. Historically, industry competitiveness was in part fostered by cheap electricity (primarily produced from coal) leading to a pattern of industrialisation which is capital and energy intensive (heavy manufacturing), landing South Africa in the top 15 largest per capita carbon dioxide emitters in the world.[8] Renewable energy, green hydrogen and critical minerals are the key to maintaining the existing industries and taking up opportunities created by the transition.

3. Support collective transformation and ecosystem development to maximise shared benefits. The transition implies significant changes in supply chains and thus linkages within the economy. For example, the required automotive transition is accompanied by a change in the components used. It entails a discontinuation of over 100 internal combustion engine vehicle parts and introduction of 40 electric vehicle parts, representing a net loss in the supply chain. The biggest value-added item, the battery, does not require the same capabilities as the highest value item in an internal combustion engine (ICE) vehicle, the engine. As such it is important to invest in building production capabilities in new industries and supply chains.

4. Support the climate resilience of sectors that are vulnerable to the physical risks of climate change, including through the development of regional value chains. The 6th Assessment Report of the Inter-governmental Panel on Climate Change (IPCC)[9] predicts that global warming and its effects will proceed twice as fast on the African continent, with rapid desertification, bush encroachment, extreme seaboard storms and more frequent and intense fires and floods. These changes in climate and shifts in weather patterns will disrupt agricultural production, food systems and damage to infrastructure may disrupt the movement of goods. Supporting the resilience of the vulnerable sectors is critical for social sustainability of the economy.

IDC's sustainable industrial development pathways sets out the Corporation's approach to navigating the tensions between industrial development and climate change. It highlights the progress made to-date and shares the priorities going forward. The IDC recognises the importance of partnerships with funders, industry, technology owners, policy makers and other stakeholders in achieving a successful transition for the South African economy that fosters shared economic prosperity at lower GHG emissions. Consequently, the IDC is sharing its approach as a foundation for fostering partnerships.

[7] Statistics South Africa.

[8] South Africa generated 405 million metric tons of carbon dioxide ($MtCO_2$) emissions from fossil fuel combustion and industrial purposes in 2022. This was a decrease of roughly three percent compared with 2021 levels (Statistica, 2023).

[9] Chapter 9: Africa | Climate Change 2022: Impacts, Adaptation and Vulnerability (ipcc.ch)

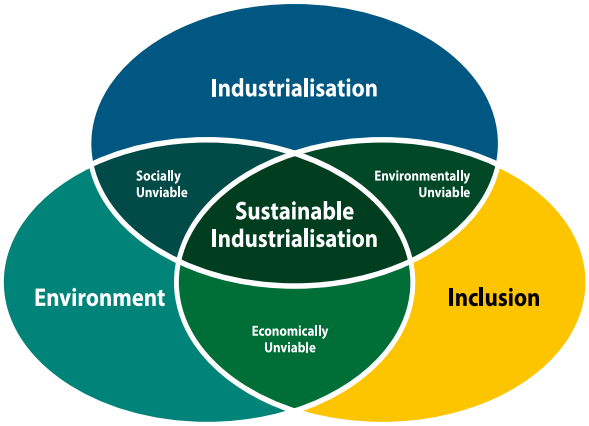
2. IDC'S PATHWAYS TOWARDS SUSTAINABLE INDUSTRIALISATION



IDC has framed sustainable industrialisation as the maintenance and expansion of industrial capacity in a manner that is socially inclusive and environmentally responsible. In other words, long-term industrialisation that drives development by creating shared prosperity and equitable distribution of benefits; advancing economic competitiveness; and safeguarding the environment by decoupling the prosperity generated by industrial activities from excessive natural resource use and negative environmental impacts.[10]

The framing recognises that industrialisation continues to be an important driver of economic development as different sectors have different characteristics that are relevant for growth. For example, manufacturing has been accorded a special role in driving economic growth because it is characterised by dynamic increasing returns to scale; a high propensity for learning-by-doing; greater scope for technological and organisational capabilities development; tradability and hence importance for balance of payments; strong growth-pulling intersectoral (especially backward) linkages; and its importance as the locale for economy-wide technological progress.[11] In addition, the evolving nature of sectors has given rise to new activities at the interfaces of agriculture and manufacturing, dubbed the *"industrialisation of freshness"* and manufacturing and services, dubbed the *"servification of production"* that are increasingly showing some of the traditional properties associated with manufacturing that are critical for structural transformation. The IDC's approach to sustainable industrialisation is thus not only focused on the manufacturing sector but rather the structural transformation and the low carbon transition of the broader economy towards higher value-adding, productivity and employment creating activities. Where structural transformation can be understood as a complex, long-term historical process entailing both structural change in the sectoral composition of an economy and broader societal changes in the productive organisations, institutions and political economy of a country.[12]

This approach acknowledges that industrial development and structural transformation are intimately linked and a productive transformation of the economy as a critical driver of inclusive and sustainable structural transformation.[13]



Sustainable industrialisation is being pursued through four main pillars:

- **Catalysing low carbon transitions and green growth,** whereby the IDC is supporting firms to adopt and adapt cleaner technologies, fuels and processes in the transition to higher productivity sectors like manufacturing, including supporting existing hard-to-abate sectors to transition. This is in recognition that an energy transition that is not accompanied by a production transition will have net negative impact on the economy and socioeconomic outcomes.
- **Facilitating economic diversification and jobs-rich industrialisation,** whereby the IDC is supporting investments in higher value-adding and productivity activities that are labour absorbing within sectors (sectoral deepening). The South African industrial structure is dominated by minerals and minerals-related activities that are energy intensive. A transition towards medium and high-technology manufacturing is associated with increases in value added, higher employment and lower levels of GHG emissions.[14]
- **Supporting resilience to physical climate risks:** Including supporting firms to adopt and adapt technologies and processes to support climate resilience, particularly in the agricultural sector.

[10] This approach aligns with Sustainable Development Goal 9 and the framing of sustainable industrialisation by the United Nations Conference on Trade and Development and the United Nations Industrial Development Organisation.

[11, 12, 13] Andreoni, A., Mondliwa, P., Roberts, S., & Tregenna, F. (2021). Framing structural transformation in South Africa and beyond. Structural Transformation in South Africa. The Challenges of Inclusive Industrial Development in a Middle-Income Country, 1-27.

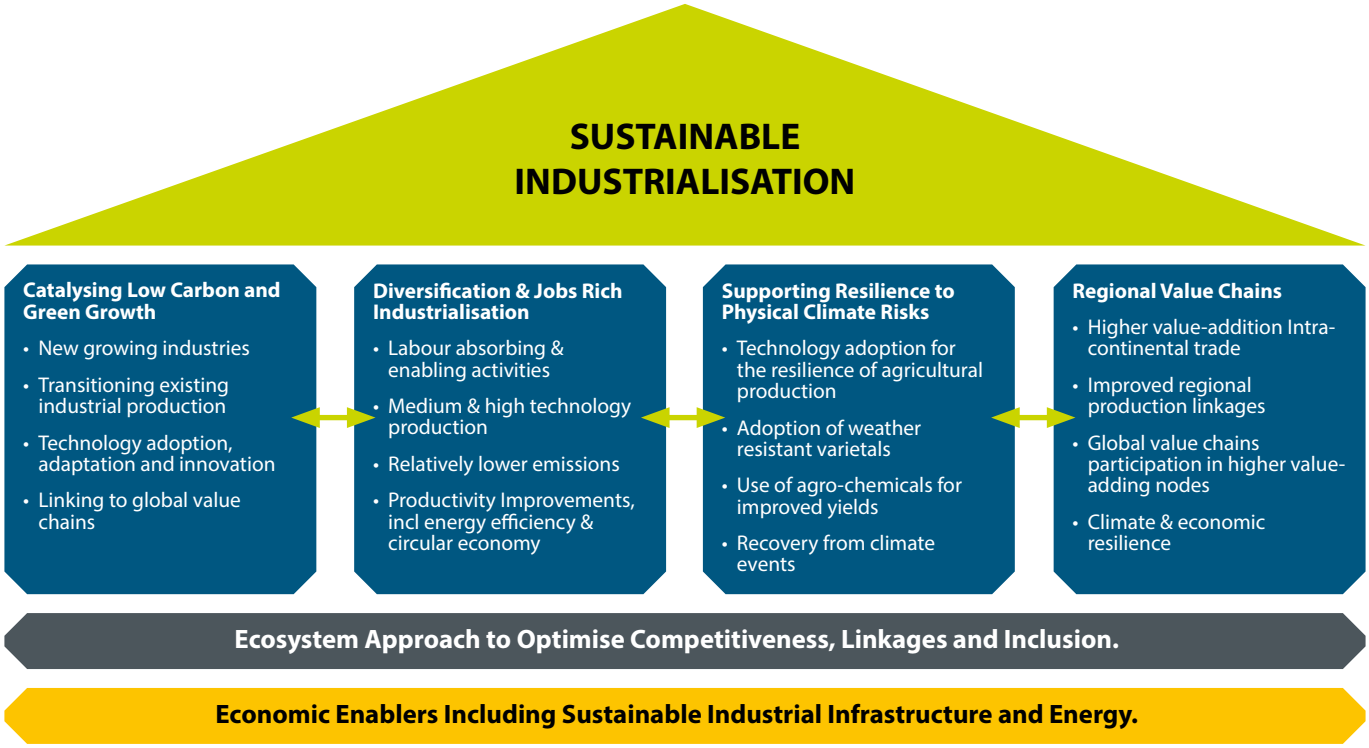
[14] Avenyo, E. K., & Tregenna, F. (2022). Greening manufacturing: Technology intensity and carbon dioxide emissions in developing countries. Applied energy, 324, 119726.

- **Supporting the development of regional value chains** to optimise the industrialisation opportunity offered by the SADC region's critical minerals endowments and adapt against extreme weather changes for food security.

The pillars are not mutually exclusive and reinforce each other. For example, diversification is also being pursued through the low carbon transitions and green growth, whereby the IDC supports backward integration into diversified manufacturing production of components for new green industries. The pillars are supported by the cross-cutting ecosystem approach to optimise competitiveness, linkage development and inclusion; and supporting economic enablers such as sustainable industrial infrastructure and energy.

Source: IDC

Figure 1: IDC Sustainable Industrialisation Approach



Source: IDC

This approach to sustainable industrialisation and structural transformation supports the maintenance and expansion of South Africa's industrial capacity; facilitates shifts to more sophisticated activities with scope for cumulative productivity while enabling the country's low carbon transition and thus supports a more equitable distribution of income, quality employment, and environmental protection.[15]

The IDC acknowledges the environment within which the DFI operate. As such, the Corporation has adopted additional interventions over above its mandate so it could effectively assist in addressing South Africa's socio-economic challenges of unemployment, poverty and inequality. These are discussed in section 4.

[15] Sectoral deepening typically triggers increased employment and wages, creating the conditions for more equitable income distribution.

3. FINANCING SOUTH AFRICA'S SUSTAINABLE INDUSTRIALISATION



Funding thus has a significant role to play in promoting South Africa's sustainable industrialisation. There is a need for 'patient capital' because of the time needed to build the scale required to be competitive in new economic activities and the requirements of learning and capabilities development. This is particularly important in the new green industries, some of which require a level of de-risking. This de-risking role is traditionally played by DFIs such as the IDC.

IDC is a state-owned DFI, established in 1940 to promote industrial development. The Corporation has an asset base of R161 billion (USD 8,6 billion) and approved funding of R20,7 billion (USD 1,1 billion) in the financial year ending March 2023. In addition to its on-balance sheet funding, the Corporation manages 11 funds on behalf of the South African government and international DFIs.

To support the effective execution of the sustainable industrialisation model, the IDC has adopted a proactive approach that maximises the development impact of its activities, encompassing:

- **Integrated Industry Planning** - this supports the creation of conducive ecosystems and value propositions and aligns all IDC competencies towards specific value chain plans.
- **Project Development** – the support and funding of needle moving and catalytic projects that are not yet bankable.
- **Business Development** – the pro-active engagement with and support to industry operators to build a pipeline of potential strategic investments.
- **Programme and Fund Management** – the management of specialised and off-balance sheet funds with partners in all operational dimensions.
- **Investments and financing** – the ability to perform comprehensive in-house due diligences and the solutioning around risk-mitigants and optimal financial structuring.
- **Portfolio value creation** – the support provided to portfolio investments to grow and enhance their potential and impact.



The IDC was instrumental in the development of some of South Africa's industrial giants including Sasol, Arcelor Mittal South Africa (formerly Iscor), Mozal Aluminium Smelter, Kumba Iron Ore and BHP Billiton. The Corporation supported the establishment of these companies and the various local industry value chains such as chemicals, steel, aluminium, paper and various others. Drawing on this experience gained over 83 years in operation (see table 1) as well as the role played in de-risking and helping establish the local renewable energy industry, the Corporation is poised to play a prominent role in supporting South Africa's new path to sustainable industrialisation in the context of low carbon transitions.



Table 1: Driving South Africa's Industrial Development through the decades

1940s

Theme
Expansion of industrial capacity and meeting basic supply shortages.

Example of some initiatives
Establishment of domestic textile, wood/timber, animal feed & processed food industries and the ship repair industry. Some of the companies incl: Pinetown Woolwashery (Pty) Ltd; Fine Wool Products of SA Ltd; Masonite (Africa) Ltd; powdered milk factories; Felt and Textiles of SA; Hex River Textile Mills; Ouma's Rusks.

1950s

Theme
Securing energy resources for SA, increasing natural resource beneficiation.

Example of some initiatives
Funding of Sasol, Foskor, Phillips Carbon Black, SAICCOR; and acquisition of equity stakes in Sappi and Safmarine - contributing to development of SA's petro-chemicals, fertiliser, rubber, rayon, kraft paper, shipping industries.

Revival of cotton textiles industry - Good Hope Textiles (through IDC partnership).

1960s

Theme
Increasing beneficiation, value addition.

Example of some initiatives
Funding of large projects such as Alusaf, Automotive Components Plant, Palabora Mining, Synthetic Rubber Co, Soeker (oil), Huguenot Porcelain (Pty) Ltd (crockery) .

Consolidation of textile interests into Da Gama Textile Company (Pty) Ltd .

Submarine telecommunications cable between Europe and Cape Town.

1970s

Theme
Import replacement, resource-intensive industries to bolster export earnings in non-gold sectors, initiation of high-tech industries.

Example of some initiatives
Richards Bay Minerals - reclamation of titanium minerals from beach sand.

Financing scheme for exporters.

Construction of Atlantis Diesel Engines with Daimler Benz and Perkins.

SA Micro-Electronic Centre – collaboration with SAPO, CSIR and Siemens.

1980s

Theme
Continued import replacement, high-tech industries, agriculture as a forex earner (particularly non-traditional crops), industrial real estate development.

Example of some initiatives
Alusaf expansion completed; minority shareholding in ISCOR; Mossgas project.

Sapekoe tea estates; essential oils & ole-resins; mushrooms; asparagus; dates.

Foskor acquisition of Indian Ocean Fertiliser (formerly Triomf).

Venture capital scheme for high technology products.

Studies on electronics, processing of wool, prawn production, jewellery, cotton etc.

Table 1: Driving South Africa's Industrial Development through the decades **(Cont.)**

1990s

Theme
Competitiveness to sustain industrial capacity, export promotion, BEE, support regional (SADC) integration, services-related industries.

Example of some initiatives
Saldanha Steel; Columbus Stainless Steel/Highveld Steel/ Vanad. & Samancor JV.

Algorax automotive catalytic converters; Duferco cold-rolled & galvanised steel.

Warehousing of Metropolitan shares for NAIL BEE group; BEE funding of 1st cellular/mobile phone operators in SA.

Extension of mandate to SADC region – funding of MOZAL I in Mozambique.

2000s

Theme
Continued import replacement, high-tech industries, agriculture as a forex earner (particularly non-traditional crops), industrial real estate development.

Example of some initiatives
Funding of Mozal II in Mozambique - doubling aluminium smelter's production capacity .

Umicore Autocat SA (automotive emission control catalysts).

SA Chrome & Alloys (later named Merafe Resources).

Financing of media and motion pictures (Academy Award winning Tsotsi; Hotel Rwanda; Skin; Drum Stories of Sophiatown).

Incwala Resources (funding of community stake in the platinum sector).

Funding for Gautrain, Neotel, CNBC Africa, Tzaneen Wood Plastic Composite (fencing & decking material), blueberry projects (high-value agricultural crop).

4-star Freedom Square Hotel (Kliptown cultural & heritage precinct) .

Singisi Forest Products project through Hans Merensky Holdings (1st model of empowerment within forestry – communities with shareholding).

2010s

Theme
Focus: Alignment with objectives of NGP, IPAP, NDP, NIP; green economy, infrastructure; localisation; consolidation of SME sector support.

Example of some initiatives
Roll out of Clothing and Textiles Competitiveness Programme starts stabilising sector.

Catalytic role in REIPPPP projects (1 408 MW expected): incl. KaXu Solar One (CSP); Sunrise Energy etc.; funding for communities' shareholding in RE projects.

LPG terminal & storage facility in Saldanha, Egoli Gas, SEMONA ECO (biomass).

Sedibelo Platinum Mine.

Small Enterprise Finance Agency (sefa) established to fund SMMEs.

The IDC continues to make progress in each of its four pillars of the sustainable industrialisation pathways. In the rest of this section, the Corporation reflects on progress it has recorded to date while also highlighting future priorities.

3.1 Catalysing Low Carbon Transitions and Green Growth

As a DFI, the IDC is playing a leading role in catalysing low carbon transitions and green growth more so in the context of spearheading initiatives and investing in projects that seek to help the country achieve its net zero ambition in a manner that drives jobs-rich industrialisation.

The integrated approach to low carbon transitions and green growth acknowledges that the low carbon transition and structural transformation within and across sectors and industries will depend on this new integrated approach for sustainable industrial transformation as illustrated in figure 2:

a. Renewable energy will fuel the transition to a lower-emissions economy;

b. Transition fuels (supported by extended transmission grid, improved distribution networks and battery storage) will be critical for managing cost competitiveness during the transition and intermittency of renewable energy overall;

c. Industries will adopt new business models, powered by renewable energy with energy storage infrastructure, extended grid transmission, improved and resilient distribution networks as well as new products and solutions addressing societal needs, such as mobility;

d. Green hydrogen is critical for the transition of hard-to-abate or greening root industries;

e. The economy will need to diversify and build capabilities in the supply chains of new industries to support employment and better pay to ensure a socially viable and, to a certain extent, a just transition.

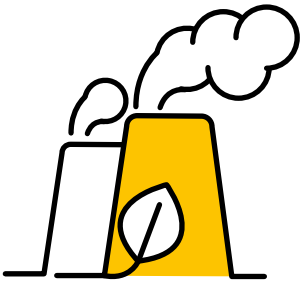
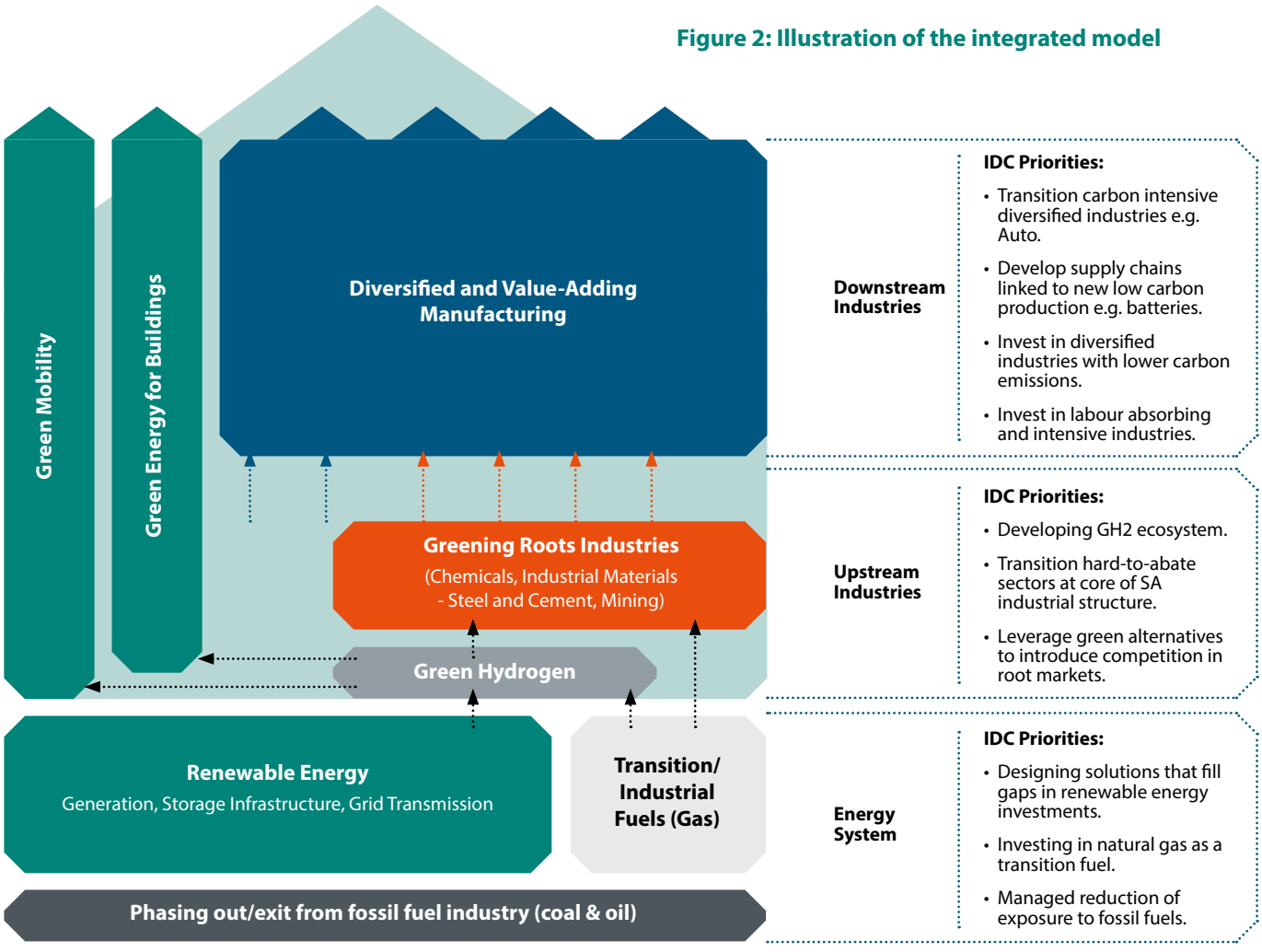


Figure 2: Illustration of the integrated model



Source: Adapted from Andreoni, Bell and Roberts (2023)

3.1.1 Catalysing Investment in Renewable Energy

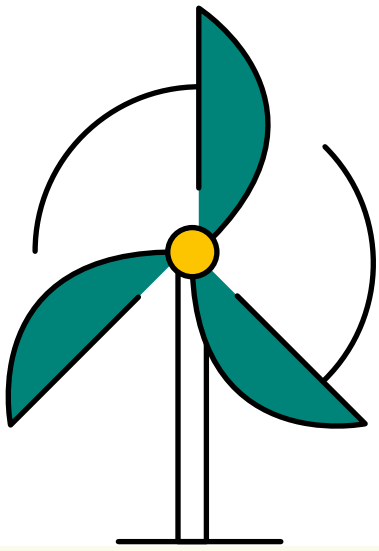
The IDC successfully catalysed investments in renewable energy, which have been important to addressing the country's energy challenges while supporting decarbonisation, transitioning and transformation of the industrial economy. SA's Renewable Energy Independent Power Producer Purchasing Programme (REIPPPP) kicked off in 2011, comprising mainly solar PV and wind energy projects, and added much needed clean additional capacity to the grid with speed and negligible capital outlay from a strained fiscus.

IDC 's role among others included de-risking the sector through early investments and facilitating participation of South African investors and businesses, particularly those owned by historically disadvantaged persons and communities. This approach has helped to foster inclusive economic participation in a sector that places onerous capital requirements for new entrants.

To date, the Corporation has invested approximately R16,5 billion (USD 880 million) in renewable energy and crowded in investments of approximately R65 billion (USD 3,5 billion). These investments catalysed a significant portion of the total of R228 billion (USD 12,1 billion) invested in the programme thus far.

	Achieved outcomes to date
Benefits to the economy	• The 99 TWh clean solar and wind energy delivered to date.
Socio-economic outcomes	• Directly facilitated 2 991 jobs. • An estimated 74 000 job years catalysed.
Environmental benefits	• 102 Mt of CO2 offset. • 120 gigalitres of water saved.

Improving competitiveness of renewable energy and the commercial case for private investments: Since the inception of REIPPPP, the contracted costs of energy declined from R4.60/kWh (USD 0,25) for solar PV and R1.90/kWh (USD 0,10) for wind energy in 2011 to below R0.50/kWh (USD 0,027) for both by 2021. The declining costs, in addition to the risk funding of early rounds, have improved the commercial case for these projects and commercial banks are now the main funders. The December 2022 policy change to introduce uncapped electricity self-generation has created a thriving market for commercial and industrial (C&I) renewable energy projects in the country. Looking ahead, the Integrated Resource Plan of 2019 (IRP 2019) indicates a minimum of 20.4 GW of wind and solar PV generation is to be added to the grid as coal generation reduces to 66% by 2040 (from 80% in 2023).[16]



[16] An update of the IRP is imminent and expected to have a more ambitious target for renewable energy contribution to SA's energy.

H1 Kenhardt - Lighting up SA

Through its Energy strategic business unit, IDC seeks to contribute meaningfully towards SA's Just Transition and to help improve the country's precarious energy supply. IDC is playing a key facilitation role in the Government's power procurement programmes.

Accordingly, the Corporation provided funding support to H1's participation in Kenhardt for construction of three 183 MW Solar PV with Battery Energy Storage System (BESS) plants, with a total output of 549MW contracted capacity. These projects are based in Kenhardt, Northern Cape. The combination and integration of Solar PV and BESS at utility scale will be the first of its kind in SA.

This project is a joint venture between H1 and Scatec. H1 is a black-owned investment company founded in 2000. H1's experience extends to construction and operating smaller-scale IPPs with private sector C&I off-takers and utility scale projects. Scatec is an experienced Norwegian renewable energy project developer with 3.5 GW installed capacity. It operates across four continents using varying technologies. The company established its operations in the SA market in 2013 and has since participated in government's Renewable Energy Independent Power Producer Procurement Programme ("REIPPP) Bid Window 3 and 4. Both H1 and Scatec have a track record of working together in developing and successfully implementing renewable energy projects in the local market.

Some of the energy priorities going forward:

a. **Energy Security:** With the advent of liberalisation in South Africa's private energy self-generation market, the IDC's focus has broadened to renewable energy solutions for C&I markets, including providing funding for the transmission grid and the localisation of essential inputs. The objective is to support the development of private energy generation for C&I for business continuity; aggregate local renewable energy demand to support investment in the local supply chains; and assist local manufacturers to be sustainably competitive.

b. **Backward integration in the renewable energy value chains:** It is imperative to develop local capabilities in designing, producing key components, constructing, operating and maintaining renewable electrification plants.[17] This will contribute to positive structural transformation and ensure that the transition to renewable energy has a positive net impact on the economy. The IDC is committed to identifying and funding localised aspects of the value chain to ensure success in the renewable energy sector.

The IDC has also developed product solutions and initiatives that allow it to effectively pursue its priorities. Some examples are included below.

IDC funds/initiatives to support energy efficiency and resilience to loadshedding

- **Commercial & Industrial Portfolio Offtake Model (C&I POM):** IDC is assisting in the alleviation of the energy crisis in South Africa by offering risk capital for shovel-ready renewable energy IPP projects that are unable to attract debt funding due to insufficient and/or un-bankable off-take agreements. This is supported by R5 billion (USD 270 million) the C&I POM that mitigates off-take risk of renewable energy projects through a portfolio approach that collectively consumes more (i.e. over-subscription) than what the IPP generates and thereby offers substitution options. This is done by aggregating C&I customers in a portfolio and matching them with IPP generation capacity.
- **Energy Resilience Transition Scheme:** A R2 billion (USD 110 million) fund administered by the IDC to support rapid deployment of embedded generation (and storage) solutions to small, micro and medium enterprises to address loadshedding issues (also targeted in vulnerable entities such as townships and rural areas.

- **Township Energy Fund:** R200 million (USD 10,7 million) of grant funding for small and medium enterprises in townships and rural communities directly affected by energy shortage, primarily aimed at the purchase of energy back-up equipment.
- **Black Economic Empowerment Energy Companies:** Provide HoldCo funding to local transformed energy companies to facilitate their growth to enable them to compete with foreign IPPs.
- **REIPPPP and C&I single off-taker:** IDC continues to participate in utility-scale REIPPPP projects and C&I single off-taker IPP projects but is now focusing on filling the gap instead of competing with other funders / banks.

3.1.2 Developing South Africa's Green Hydrogen Ecosystem

Given that there is now a commercial market for renewable energy in South Africa, the IDC is working towards establishing the linkages from renewable energy to the production of green hydrogen to facilitate the low carbon transitions of hard-to-abate industries.

Green hydrogen will play an important role in building resilience and sustainability into existing fossil fuel enabled industrial and agricultural sectors while developing new value chains. This will ultimately contribute to driving growth and development, employment and improving energy security, enabling the country to transition to a lower carbon economy. South Africa has multiple structural and strategic advantages in the development of the green hydrogen value chain, including abundant renewable energy resources, land availability and technology which will support projected GH2 costs of **USD 2,5/kg by 2030 and USD 1/kg by 2045.** South African green hydrogen is expected to achieve price parity with low-cost fossil fuel alternatives before **2050.**

Figure 6: Green Hydrogen Opportunity

Key facts:

Ambition

Long term growth aspirations could exceed 7mtpa of production by 2050

Demand

- Exports - EU (2030: 20mtpa); Japan (2040: 12mtpa; South Korea (2050: 1.2 mtpa), the United Kingdom (2050: 0.7 mtpa).
- Domestic decarbonisation – hard-to-abate sectors & mobility

Multiplier

Fuel cells, electrolysers, renewable energy, balance-of-plant, steel, petrochemicals, transport, manufacturing, pipelines

Impact

GDP Increase of R100-R250bn, 1-3% & 650,000 to 1m new jobs

Funding

The target of 3.8 mtpa by 2040 will require total investment of $164 bn by 2040.

Spatial dimension:



IDCs role:

1. Planning, co-ordination, policy support
2. Develop risk-sharing partnerships
3. Develop catalytic projects
4. Develop blended finance solutions

Developing the Green Hydrogen Ecosystem

IDC is driving the development of the green hydrogen ecosystem by financing and coordinating critical activities for the success of the industry. The Corporation has been instrumental in the development of the green hydrogen sections of SA's Just Energy Transition Investment Plan (JET-IP) and JET-IP Implementation Plan. The implementation plan estimates funding requirements to the value of R319 billion (USD 21.2 billion) over the 5 years 2023-2027. South Africa has a pipeline of 24 projects under development in the short- and medium-term, with the first nine projects having already been granted Strategic Integrated Project (SIP) status. To date the IDC has invested over R100 million (USD 5,3 million) in a strong pipeline of projects that are under development.

Full implementation of these projects would potentially lead to investment into the economy to the value of R24 billion (USD 1,2 billion). Outcomes of these projects will, in the long-run, contribute to:

- Decarbonising hard-to-abate industries, petrochemicals and steel, to support continued value addition, employment and export competitiveness.
- Expansion of South Africa's ammonia production capacity in a manner that introduces competition to the existing monopoly; supports decarbonisation of fertilisers (important for the carbon footprint of the country's agriculture) and explosives used by the mining sector.
- Reducing freight and public transport emissions, while developing domestic supply chains.
- Support the cost competitiveness of locally produced GH2 by developing appropriate infrastructure.
- Transitioning South Africa's current coal to liquids and gas to liquids petroleum production to green synthetic fuel.

Figure 7: IDC activities in the green hydrogen ecosystem



Source: IDC

Prieska Power Reserve project is taking shape

Prieska Power Reserve Project is a green hydrogen and ammonia project that aims to produce green hydrogen and ammonia through a combination of high yielding renewable solar and wind energy resources, along with the other natural resources of water and air. The estimated capital cost of the project is R11-R12 billion (for the first phase) (USD 590-640 million) and it will be located in Prieska in the Northern Cape, South Africa. The Project will produce approximately 80 000 tons/annum of green ammonia and 14 000 tons/annum of Hydrogen from renewable energy sources consisting of 180MWp Solar PV, fixed tilt and single axis tracking and 138MW of Wind. The carbon emission reduction for the Project is estimated at 168,000 million tons of CO2 per annum.

The project promoters comprising Central Energy Corporation (Pty) Ltd and Mahlako a Phala Investments (Pty) Ltd completed a concept and viability study and subsequently approached IDC to provide project development funding to the amount of R50 million (USD 2,6 million) to finalise the feasibility study for the project. The funding has been advanced to the project entity with about 80% spent to date.

The feasibility study phase is currently underway with completion thereof targeted for May 2024. A financial investment decision is expected towards the end of 2024 with production to commence in 2028.

The development impact of the project entails participation by BEE and women in the ownership structure with potential involvement by local communities, creation of 100 permanent jobs and export of a portion of the Green Ammonia product.

Opportunities for partnering with the IDC in Green Hydrogen:

1. Project partnerships – IDC co-develops and co-funds projects with industry partners which entails providing much needed equity-based project development funding. There is an urgent need to secure strategic equity partnerships for the catalytic projects that are being developed.

2. Funding partnerships – IDC is also involved in sourcing funding instruments and this entails, amongst other activities, our involvement in various capacities including the development of the $1bn SA-H2 hydrogen fund and managing of 23m euros grant funds from KfW.

3. Manufacturing partnerships – Building local manufacturing capability is a key enabler and IDC is seeking partnerships to manufacture equipment including fuel cells and electrolysers.

4. Industry development partnerships – IDC is also seeking partners that can assist with industry development activities which entail various industry development studies and influencing policy and regulatory changes.



3.1.3 Championing Early Adopters in the Electric Vehicle Ecosystem

New Energy Vehicles Transition: Challenges and Opportunities Created

The South African automotive manufacturing sector is a major contributor towards GDP (2.9%)[18], employment (>115 000)[19] and export revenue **(R227,3 billion - USD 12,2 billion)**accounting for 12,4% of South Africa's merchandise exports and has been in existence for close to 100 years. The automotive industry is the best performing diversified (non-commodity) industry and needs to transition to maintain competitiveness in international markets.[20] The combination of the domestic industry capabilities, free trade agreements and policy incentives have made competitive major export markets, including in EU and UK, despite South Africa's geographic disadvantage.

Transition risks:

- SA's main export markets have committed to zero-emission vehicles by 2035 (accounting for 46% of cars produced in SA); however domestic demand will likely have a slower transition. This undermines economies of scale.
- Potential loss of ICE-specific component manufacturing including catalytic convertors, accounting for 50% of component exports, approximately R34 billion (USD 1,9 billion).

IDC's approach to leveraging the transition opportunities and mitigating the challenges:

- Support existing OEMs and Component suppliers to transition including value chain deepening through battery production.
- Attract new OEMs to SA for localisation. IDC is a shareholder in BAICSA and is considering co-funding Stellantis 's entry in SA.
- Support diversification towards mobility/logistics and public transport projects and infrastructure.
- Support the development of regional automotive value chains to achieve shared value addition from the market access created by AfCFTA.

Financing e-mobility business

IDC, through its value chain approach, was quick to identify that South Africa's NEV transition be viewed as segments of manufacturing, transportation and various demand pathways (Figure 8). These pathways are passenger cars, public transport, e-mobility and logistics, public transport, mining and agriculture and other (maritime, aviation, rail). Each of these pathways has to transition towards low-carbon mobility due to legislation, climate mitigation or value creation drivers and each requires a different combination of solutions for the transition. Although passenger cars are the highest in terms of volume consumption, other pathways present opportunities that are perhaps less fiscally burdensome and rely on other demand levers such as ESG, shareholder value and total cost of ownership.

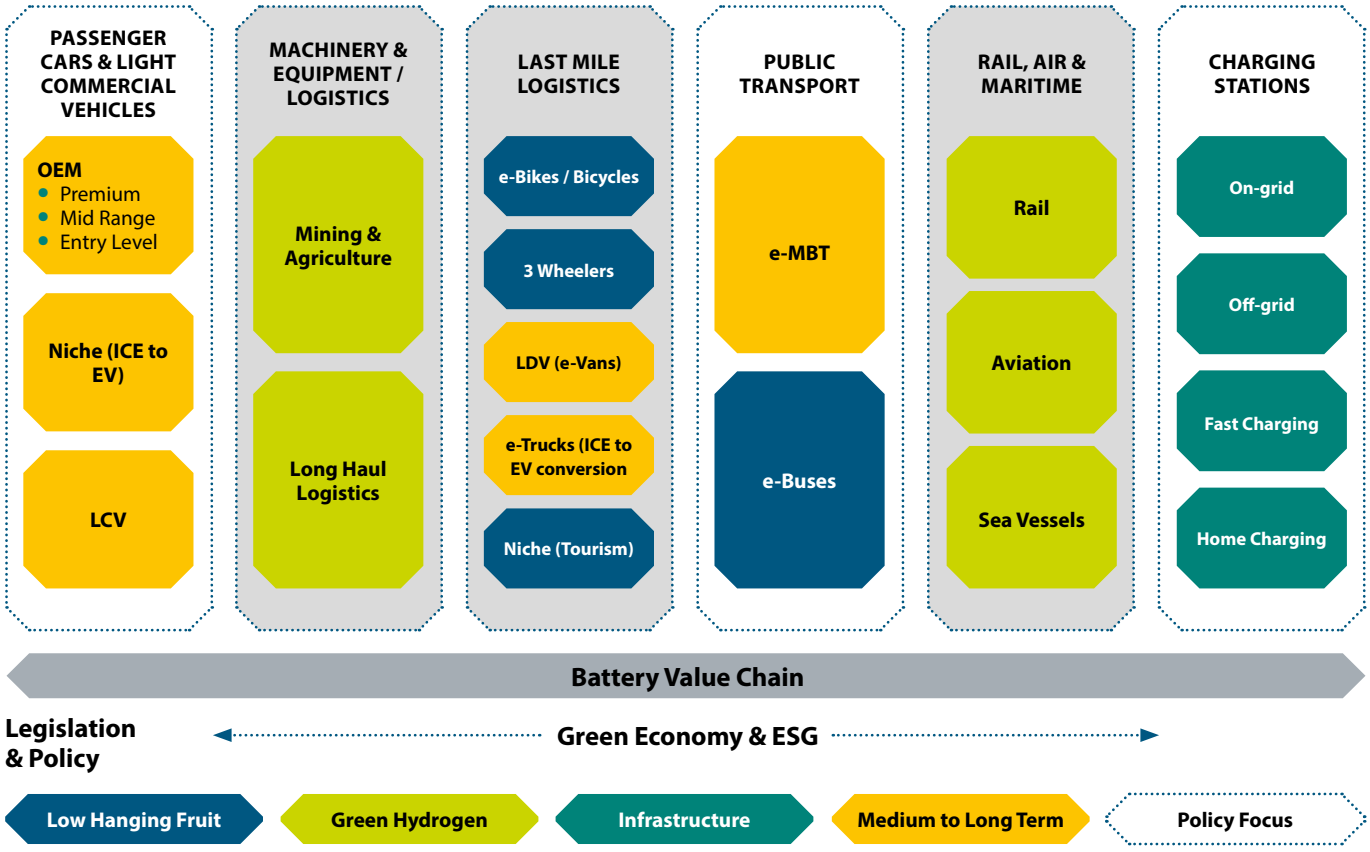


[18] Automotive Export Manual, 2023.

[19] IDC Economy-wide Impact Model

[20] South Africa has a world-class automotive assembly industry consisting of 7 OEMs and with 2 OEMs with advanced plans to produce in SA. The value chain includes close to 500 component suppliers, making a significant contribution to the almost 40% industry average local value addition.

Figure 8: NEV Segmentation and Opportunities



Source: IDC

Financing the transition for mobility entails a risk appetite for pre-revenue projects and businesses as entrepreneurs need to test new technology under local conditions and various business models which may rely on subscription rather than asset sale-based revenue. This necessitates a partnership approach amongst government, development finance and commercial lenders to support the transition; in some cases, utilising social economy funds where there are clear demonstrable linkages to communities, women, youth and social upliftment.

The IDC approach includes providing the appropriate funding solutions for the SMEs business life cycle and allowing these projects and business to achieve scale economies and thereby the linkage between SMEs and industrial base, such as automotive. However, the financing ecosystem still requires early adoption funding, and this is where the JET-IP NEV implementation plan can play a vital role.

Transforming SA's logistics landscape

Green Riders is a turnkey Green, e-mobility solution dedicated to creating a significant social impact while building a profitable company. The company currently operates a fleet of 500 e-bikes and plans to expand to 1000 bikes by 2024. Thereafter they aim to achieve close to 50 000 riders in the long term and create sustainable jobs for South Africans over the next five years, while also reducing the sector's carbon footprint, to make the planet a better place for all. Green Riders intend to recruit, train and skill thousands of people and place them on custom-designed e-bikes which are purpose-built in Cape Town for harsh African terrain. The Green Riders project has resulted in rider income doubling due to the lower total cost of ownership.

IDC, through its Social Economy funding, supported the Green Riders project due to its demonstratable positive impact on household income levels, employment of youth and women from informal and townships communities. The IDC funding has paved the way for the business to scale and consider localisation opportunities for e-bikes and associated infrastructure.

Policy Support for the NEV Transition:

The IDC coordinates its interventions with those of the country more broadly and part of this has entailed supporting government strategy development. In this regard, the Corporation was instrumental in the development of the NEV sections of the JET-IP and Implementation Plan and will be responsible for coordinating the automotive, battery value chain and e-mobility/logistics workstreams. The JET-IP (2023 – 2027) and Implementation Plan makes the important link between industrialisation, SMEs, job creation and South Africa's climate mitigation commitments. The transport sector contributes close to 10% of South Africa's total emissions, with 90% of that coming from road transport.[21] The transport sector is also a key enabler for economic activity. The JET NEV implementation plan focuses on supply-side areas such as the automotive manufacturing supply chain, investments by existing and new OEMs and the battery value chain; and demand-side areas such as public transport, e – mobility/logistics and associated charging and utility infrastructure[22] to stimulate adoption of NEVs.

3.1.4 Supporting the Development of Alternative Uses of Hemp Including as a Carbon Sink

Industrial Hemp (Cannabis Sativa) has significant carbon sink and carbon sequestration properties. The plant also has significant mine and agricultural land rehabilitation and remedial properties. Its cultivation and use in multiple demand pathways can significantly contribute to the decarbonisation of global supply chains and in carbon markets. Hemp Biochar has unique soil rehabilitation and sequestration properties.

Hemp has multiple industrial applications with whole plant (flower, seeds and stalks) usage depending on defined and different products and demand pathways that the IDC is working towards industrialising. These include:

- Hemp for biofuels, paints and distillates with multiple demand applications. For example, the global marine fleet is pivoting away from bunker fuel to hydrogen and biofuel propulsion. Although hemp biomass is marginally less productive than other agricultural crops such as sugar or sugar beet, its propensity to act as a carbon sink and sequestrator outweigh this consideration. Developing countries, SA included, have a crisis of rural poverty. Hemp cultivation and value-added processing for end user demand can significantly address employment creation and sustainable rural livelihoods.
- Hemp bioplastics and derivatives represent a significant opportunity for applications in paper, pulp and packaging, automotive and construction industry panels, alternatives to fibreglass in hemp composites with numerous applications, and for woven and technical textiles.
- Hemp biomass can be used to produce hemp oil, hemp seedcake for novel foods, as a dietary protein rich additive for protein poor diets in human food products and for animal feed.
- Hemp oil and derivatives can be used in cosmetics and wellness products and complementary medicines.

Supporting the industrialisation of hemp also facilitates the inclusion of rural communities who have established capabilities in the cultivation of cannabis, including with respect to unique landrace strains and indigenous knowledge practices, which should be protected and supported under the Nagoya Protocols and related indigenous knowledge protection mechanisms.

[21] **South Africa's Just Energy Transition Investment Plan 2023 -2027**

[22] **Through a demand pathway approach, the implementation plan proposes two programmes link projects to appropriate funding. The programmes cover transport decarbonisation projects in public transport and logistics whilst supporting local manufacturing to automotive and battery value chain investments from OEMS to SMEs. Other priority areas also include support for policy and regulations, entrepreneurial-led innovations and technology development, enhancements of existing conformity standards and capacity development for municipalities.**

3.2 Diversification and Jobs-Rich Industrialisation

The IDC acknowledges that what a country produces and exports matters for growth, inclusion and its energy intensity levels related to climate change and its impacts.[23] South Africa's industrial structure is dominated by mineral resources and resource-related manufacturing goods, which contributes to economic vulnerability arising from commodity cycles and other external shocks. This is evidenced by country's merchandise export basket, where resources and resources-related manufacturing goods account for over 60% of total exports. The implication has been start-stop growth patterns linked to the commodity cycles, with implications for the balance of payments, corporate tax revenue collection and employment. The capital-intensive nature of these activities has also meant that gains from industrialisation accrue to a small group of equity owners and employed citizens leading to the country recording the highest levels of inequality in the world. The energy intensity of these goods is also linked to the country's relatively higher emissions per capita. Though manufacturing drives growth and is generally inequality-reducing, the structure of manufacturing determines the levels and sustainability of growth as well as the distribution of the gains from growth.[24]

Consequently, part of the IDC's sustainable industrialisation strategy is to target financing activities that contribute to diversifying the country's industrial structure. This includes supporting the development of sustainable and inclusive value chains and enabling ecosystems. This includes targeting medium and high technology manufacturing as well as labour-absorbing and labour-intensive manufacturing.

3.2.1 Medium and High Technology Manufacturing

Medium and high technology manufacturing is associated with higher levels and more sustained growth at lower levels of GHG emissions and is also labour-absorbing.[25] Technological upgrading linked to medium and high technology manufacturing has been found to be critical for driving sustained growth, thereby avoiding or overcoming premature de-industrialisation.[26-27] In addition, emerging evidence indicates that the technological intensity of manufacturing activities matters for the intensity of GHG emissions, where goods with a higher technological intensity are typically associated with lower GHG emissions.[28]



[23] Hausmann, R., Hwang, J., & Rodrik, D. (2007). What you export matters. Journal of economic growth, 12, 1-25; Andreoni, A., Mondliwa, P., Roberts, S., & Tregenna, F. (2021). Framing structural transformation in South Africa and beyond. Structural Transformation in South Africa. The Challenges of Inclusive Industrial Development in a Middle-Income Country, 1-27;

[24] Baymul, C. and K. Sen (2019). 'Kuznets revisited: what do we know about the relationship between structural transformation and inequality?' Asian Development Review 36(1): 136–67.

[25] Avenyo, E. K., & Tregenna, F. (2022). Greening manufacturing: Technology intensity and carbon dioxide emissions in developing countries. Applied energy, 324, 119726.

[26] Ocampo, J. A., & Parra-Lancourt, M. (2010). The terms of trade for commodities since the mid-19th century. Revista de Historia Económica-Journal of Iberian and Latin American Economic History, 28(1), 11-43.

[27] Andreoni, A., & Tregenna, F. 11.2 The Middle-Income Trap, the Middle-Income Technology Trap, and Industrialization Challenges. Structural transformation in South Africa: The challenges of inclusive industrial development in a middle-income country.

[28] See for example, UNIDO (2020). 'Industrialization as the driver of sustained prosperity.' Vienna: UNIDO, https://www.unido.org/industrialization-driver-sustained-prosperity.

Diversifying towards medium and high technology industries, the case of machinery and equipment

IDC is supporting the diversification of the South African economy towards higher value-adding and employment-absorbing industries. The machinery and equipment industry is one of the IDC's priorities for diversification. It is a medium technology industry with scope for productivity gains and increasing South Africa's manufacturing value addition and established capabilities in niches such as mining machinery and equipment, which can be leveraged for lateral migration. The challenge is to build on these capabilities to realise export opportunities including in the continent.

The IDC's has increased investment in this value chain by 29% between 2021 and 2022. These investments – primarily in mining equipment, electronics, renewable energy and energy efficiency systems – are expected to create and/or save 850 jobs, more than double that of 2021. In one of the projects, the IDC facilitated local investment by a tier 1 original equipment manufacturer in the production of M12 bifacial photovoltaic modules with a capacity of 325MW. The IDC is also jointly developing a utility scale inverter project and funding was provided to certify and construct a reference plant to industrialise the production of 200MW capacity a year.

The localisation of electrical equipment for the transmission grid remains a priority. In the energy transmission system funding was provided for new manufacturing capacity in high-voltage transformer bushings and mini substations. The Corporation supported the manufacture of smart metering systems and funded the manufacture of smart sensors and platforms for residential application, including smart geysers, alarm sensors, automated plugs and lights, and leak and fire detection sensors. We are optimistic that the liberalisation of renewable energy in South Africa will provide a stable growth trajectory for component localisation.

Our focus will be on a continental demand stimulation strategy for end-user facilities and export driving lines of credit. In this regard, the IDC has partnered with the Export Credit Insurance Corporation of South Africa (ECIC) to develop an Intra-Africa Trade Facility – which is financed by the IDC and will benefit from 85% Commercial Risk and 100% Political Risk Cover from the ECIC. The Facility aims to facilitate and increase the expansion of South Africa's trade and investment with the rest of Africa and beyond. The facility is assisting South African manufacturers in the expansion into regional export markets for capital goods, consumable products and related services; promoting further integration and value chain linkages between South African exporters and firms in the rest of Africa; and providing funding to foreign buyers (importers) of South African goods and related services.

3.2.2 IDC Supporting Jobs-Rich Industrialisation

Labour absorbing and labour-intensive activities: South Africa has high unemployment, at 32,6% and job creation has not been keeping up with the working population growth. Unemployment contributes to the levels of poverty and inequality, together considered as the country's triple challenges. Thus the IDC is targeting the development of value chains with scope for employment creation and generating entrepreneurial opportunities.

Our funding in industrial value chains was supported by the Manufacturing Competitiveness Enhancement Fund Programme, which is managed by the IDC on behalf of the Department of Trade, Industry and Competition **(the dtic)**. This fund provides concessionary working capital for both existing (expansions) and start-up companies in the manufacturing sector and plant and equipment funding for black industrialists across manufacturing industries.

The value chains that are prioritised for supporting diversification and jobs rich industrialisation include Agriculture & Agro-processing; CTFL; Wood, Paper & Furniture; Downstream Chemicals; Automotive; Machinery & Equipment; Tradable Services (incl. tourism).

[20] Ocampo, J. A., & Parra-Lancourt, M. (2010). The terms of trade for commodities since the mid-19th century. Revista de Historia Económica-Journal of Iberian and Latin American Economic History, 28(1), 11-43.

[21] Andreoni, A., & Tregenna, F. 11.2 The Middle-Income Trap, the Middle-Income Technology Trap, and Industrialization Challenges. Structural transformation in South Africa: The challenges of inclusive industrial development in a middle-income country.

[22] See for example, UNIDO (2020). 'Industrialization as the driver of sustained prosperity.' Vienna: UNIDO, https://www.unido.org/industrialization-driver-sustained-prosperity.

Fostering Jobs Rich Industrialisation, the case of Clothing, Textiles, Leather and Footwear (CTFL)

IDC is cognisant of the importance of coordinating industrial policy interventions for value chain and ecosystem development. This has proven to be successful in the CTFL value chains in South Africa and the SADC region. In South Africa, coordination has been fostered through the IDC's support for the development and implementation of the Retail-CTFL Masterplan –the Department of Trade, Industry and Competition's industrial policy strategy for the value chain. The IDC's implementation role includes managing the Clothing, Textiles, Footwear and Leather Growth Programme, which provides grants and concessionary loans to operating entities to increase employment, improve competitiveness, grow and localise various nodes of the CTFL value chain. In 2022, the programme supported 84 businesses to the value of R1.1 billion creating and sustaining 1 599 jobs.

The IDC then coordinates its internal investment strategy with the Masterplan and proactively drives the development of the value chain by addressing gaps often neglected by the market. Part of this includes the Corporation's business development activities that have fostered relationships between firms in South Africa and other countries within SADC. The IDC is leveraging commitments from South African retailers (which operate in most countries in the region) to increase locally manufactured products to 65% by 2030 for developing the domestic and regional value chains. The short-term priorities include denim manufacturing capacity for mid- to low-value retailers, seamless garment manufacturing, commission dyeing and finishing facilities for knitted fabrics, increased woven mill capacity and stabilisation and growth of current spinning capacity. This coordinated approach has resulted in IDC's on balance sheet funding for the CTFL value chain increasing by 20%, between 2021 and 2022. These investments will create and save 2 715 job opportunities.



3.3 Supporting Climate Resilience

3.3.1 Responses to the Physical Risks of Climate Change Impacts and Extreme Weather Events.

IDC recognises that extreme weather events and shifts in weather patterns due to the changes in climate may cause disruptions to various production systems and ecosystems. IDC's focus is not only on supporting firms and industries to have the capacity to withstand climate disasters, shifts in weather events and extreme weather events but also supporting them to recover quickly from weather, seasonal and climate related shocks. An example of the IDC's work in supporting recovery from weather related disasters was the Flood Relief Fund that was created following the floods that hit South Africa in 2022. On 11 April 2022, parts of the country experienced severe flooding, resulting in significant loss of life and widescale destruction. KwaZulu-Natal province was the epicentre of the disaster, with parts of Eastern Cape and Northern Cape also affected.

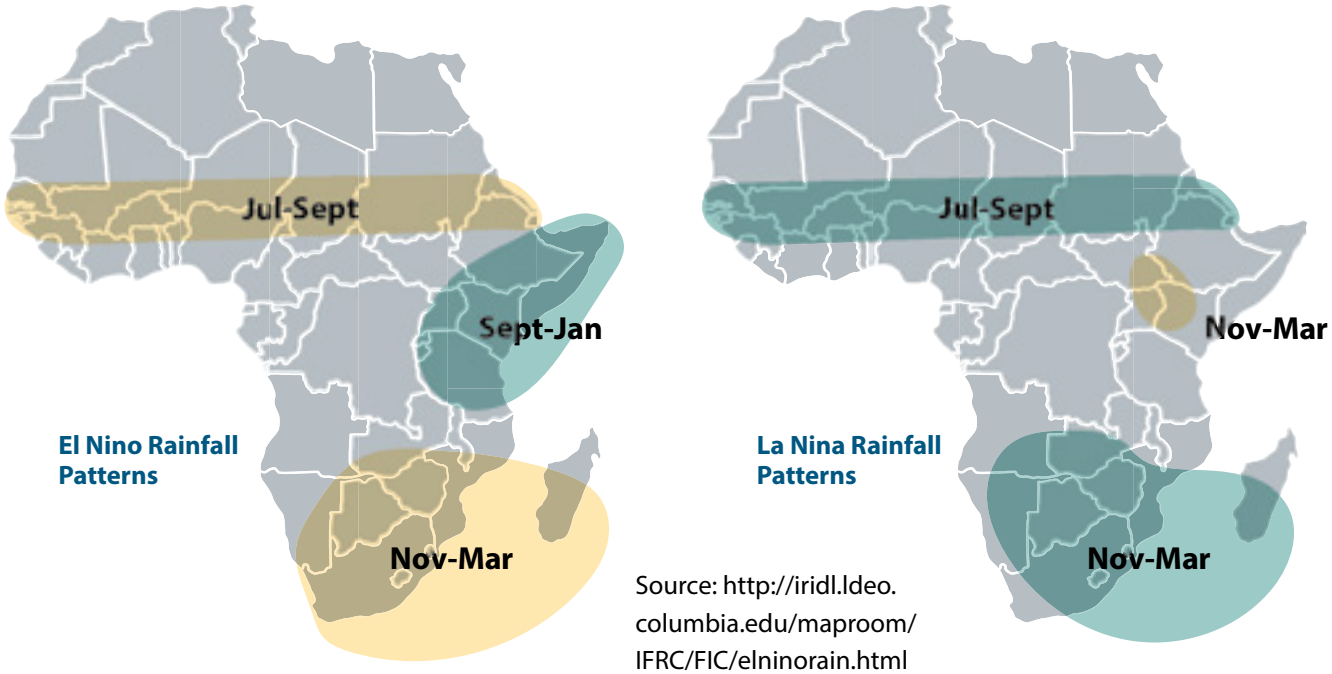
The IDC responded with its Flood Relief Fund in partnership with the Department of Trade Industry and Competition's Manufacturing Competitiveness Enhancement Programme fund. The fund was a combination of concessionary loans, grant funding for humanitarian relief and for affected formal and informal township businesses. Total funding to the value of R1.25 billion was disbursed, safeguarding more than 8 500 jobs from the shock of the floods. In addition to the funding to businesses, humanitarian aid was provided to more than 48 000 affected people.

3.3.2 Supporting Climate Resilience of Agricultural Production in South Africa and the Rest of Africa

The Challenge and Opportunity

The frequency of extreme events – such as droughts, heat waves, and floods – is increasing.[29] Extended El Nino and La Nina[30] cycles are creating challenging environments for agricultural production on the continent; however, these affect different parts of the continent at any given time (Figure 9). In the El Nino cycle that is forecasted to start towards the end of 2023, the expectation is that South Africa, Mozambique, Botswana and the southern parts of Zambia will experience droughts while the Eastern part of the country will experience good rains. The last El Nino cycle resulted in the 2015/2016 droughts in South Africa and in the event that the coming cycle is as bad, then the country ought to be positioning itself to source more crops from the parts of the continent that will have good rains during the planting season.

Figure 9: El Nino and La Nina rainfall patterns on the African continent



Source: http://iridl.ldeo.columbia.edu/maproom/IFRC/FIC/elninorain.html

The African continent and particularly sub-Saharan Africa is vulnerable to the physical risks of climate change including droughts and flooding. The Intergovernmental Panel on Climate Change (IPCC) worst-case climate change scenario predicts a reduction in mean agricultural yields by 13% in West and Central Africa, 11% in North Africa and 8% in East and Southern Africa. This will likely exacerbate the existing food security challenges.[31] Furthermore, the price levels of food and non-alcoholic beverages consumed by households are up to 35 percent higher in Sub-Saharan Africa than in other low- and middle-income countries, relative to their income levels.[32] The high food prices across Africa are the outcomes of broken food markets which fail to address the impacts of climate change and deliver increasingly unhealthy results for households and communities.[33] There are investment opportunities in solving the supply chain inefficiencies.

[29] (WMO, 2020; IPCC, 2021).

[30] East Africa has been suffering from droughts associated with the extended La Nina cycle, which meant low availability of key agricultural commodities such as maize putting upward pricing pressure on the basic food basket. This resulted in countries such as Tanzania and Zambia introducing trade restrictions for maize to ensure domestic food security, placing Kenya under significant pressures. Maize prices more than doubled between March 2022 and August 2022 and far above the price levels of other countries in Southern and East Africa.

[31] According to the Food and Agriculture Organization of the United Nations (FAO), the number of undernourished people in drought prone sub-Saharan African has increased by 45.6% since 2012.

[32] Nakamura, S., Harati, R., Lall, S. V., Dikhanov, Y. M., Hamadeh, N., Oliver, W. V., ... & Yamanaka, M. (2019). Is living in African cities expensive? Applied Economics Letters, 26(12), 1007-1012.

[33] Roberts, S. and Tshabalala, N. (2022). High Food Prices In Africa: Causes, Consequences And Agenda For Action. African Competition Forum Position Paper 01, 2022.

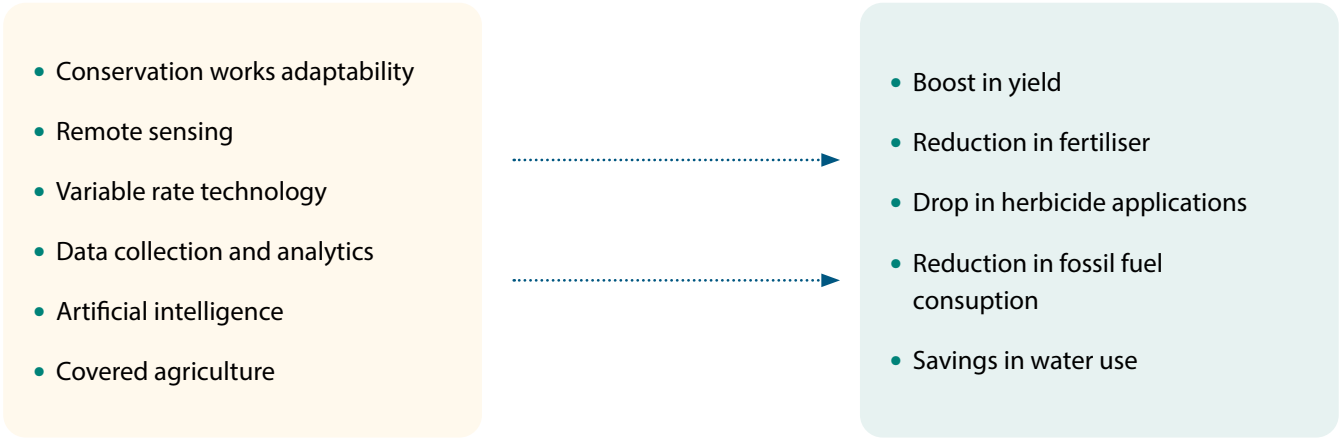
IDC's Approach to supporting climate resilience and productivity increases in food production

Investments in agriculture and food systems contributes to sustainable development by generating value addition, positive socio-economic and environmental impacts, enhancing food security and nutrition.

1. Supporting the development and growth of regional food value chains: Key to adapting and management of the El Nino and La Nina risks for the continent are better organised regional value chains. Improved intra-regional trade through broader and deeper markets are therefore an essential part of mitigating the risks associated with climate change, as when one part of the region experiences poor weather impacting negatively on production, other areas continue to have good conditions for production. Realising the potential gains from better-working agricultural markets also entails supporting smaller farmers and producers and enabling climate-smart agriculture that adapts to the effects of climate change and severe weather patterns.[34]

2. Financing activities including technology adoption that supports climate and economic resilience of the agricultural sector: This includes: production and/or supply of drought-tolerant crop varieties; supply of efficient irrigation systems[35]; production and supply of technologies related to 'precision' and 'smart' agriculture techniques, where improved data analytics are combined with analysis of soil and weather conditions, and irrigation patterns where possible, can improve the management of water and the effectiveness of the application of nutrients and agrochemicals; production and supply of fertilisers to improve yields; and production and supply of agro-chemicals such as pesticides.[36] Support investments for upstream activities (e.g. genetics or plant material or feed material) of the agricultural value chains to impact their strength and independence from major suppliers.

Figure 10: Outcomes linked to changes in production techniques and technological adoption



[34] AGRA. (2021). Africa agriculture status report. A decade of action: Building sustainable and resilient food systems in Africa (Issue 9). Nairobi, Kenya: Alliance for a Green Revolution in Africa (AGRA).

[35] Solar-powered, efficient micro-irrigation is increasing farm-level incomes by improving yields by up to 300% and reducing water usage by up to 90%;

[36] For examples, drought stressed maize plants are more susceptible to pests and increase the demand for pesticides.

3. Supporting investments efficient transportation/ logistics systems, and adequate infrastructure: A key to enabling the Africa Continental Free Trade Area (AfCFTA) is improving trade logistics on the continent starting with the SADC region. The SADC Industrialisation Strategy and Roadmap recognises high transport costs, gaps in cold storage and inefficient logistics systems as constraints on the development of regional value chains.[37] The IDC's approach to investments in the continent seeks address the key underlying factors driving high road freight rates and value chain inefficiencies. This includes addressing the identified challenges such as imbalances in production and trade within the region which leads to empty backhauls.[38] In agricultural value chains, cold storage has been identified as limiting markets for farmers and undermining growth. Going forward IDC will focus on solving transport inefficiencies in priority regional value chains.

4. Support diversification strategies with focus on sustainable new products (new industries): e.g. diversion and/or processing of sugarcane into new sustainable chemicals instead of sugar.

Diversification of the Sugar Value Chains

In support of developing new sustainable value chains and diversification, IDC and the South African sugar industry are conducting a joint scoping study to determine the viability of producing sustainable aviation fuel from molasses/sugar syrup. Significant research/analytical work (market, raw material, technical and financial) has been undertaken to assess the development of new sustainable value chains. The IDC and the industry are further considering conducting joint scoping to divert sugarcane from a sugar value to a sustainable chemical (polylactic acid) value chain which will support the manufacture of biodegradable and compostable bioplastics products.

Resilience to climate change will form the basis of the farmers and/or specific industries' financial sustainability in the long run and such resilience requires either a change in production techniques or change in technology usage/ adoption or a combination of the two.



[37] SADC, (2015).

[38] Vilakazi, T. S. (2018). The causes of high intra-regional road freight rates for food and commodities in Southern Africa. Development Southern Africa, 35(3), 388-403.

3.4 Regional Value Chains

Africa's economic potential is vast and holds significant opportunities for sustainable development. This is not based only on its abundance of natural mineral and agricultural resources but its young and growing population, vast urbanisation and rising middle class, increasing intra-African trade boosted by AfCFTA, advancements in technology and digitisation and investment in infrastructure. The IDC is mandated to support sustainable industrial development in SA and the rest of the African continent.

3.4.1 Critical Minerals: An African Industrialisation and Global Value Chain Participation Opportunity

The Opportunity

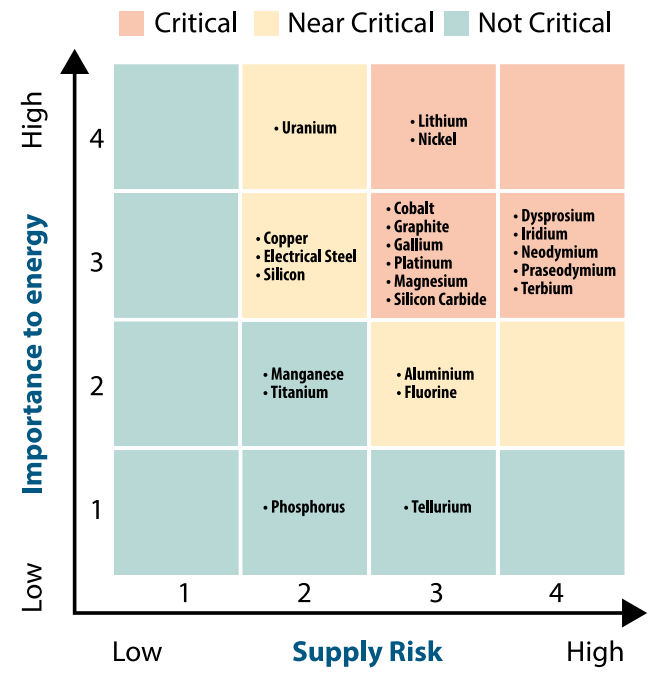
a. Critical minerals underpin clean energy systems but are also key inputs into modern technology and communications systems.

b. Global demand for critical minerals is growing and forecasted **increase by 500% to 2050**. The increasing pressure to diversify critical mineral supply chains is also supporting large investments in multiple geographies.

c. The African continent is endowed with a wide range of critical mineral resources with mining and processing capability.

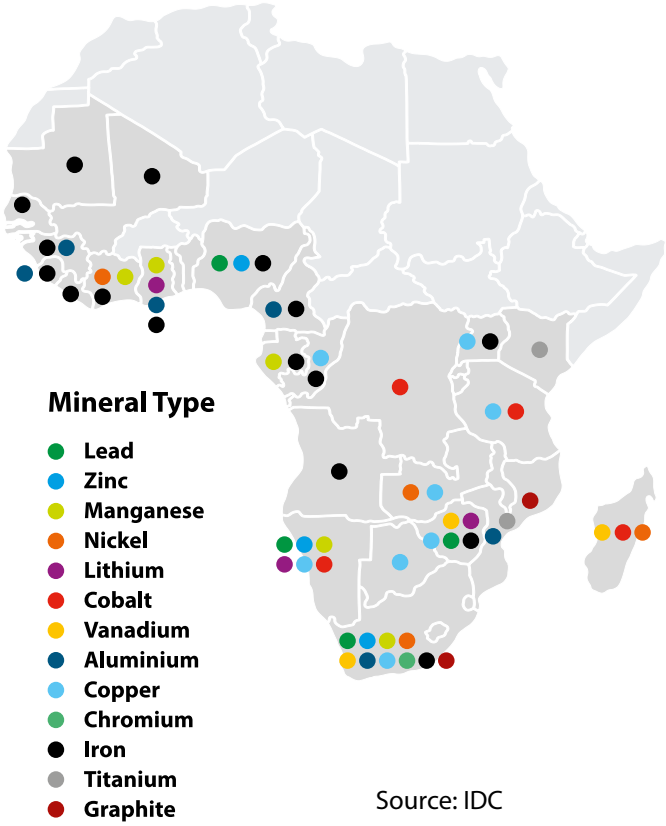
d. The energy transition can catalyse growth for the continent by through investments in the supply chains. For example, in the battery industry, the market value of the precursor is 25 times more than the mining of minerals. Developing opportunities closer to the mineral source can reduce the cost of renewable energy for consumers globally, reduce emissions and create jobs and economic opportunities for local communities and countries.

Critical minerals



Source: Critical Materials Assessment
U.S. Department of Energy

Africa's endowment of critical minerals



Source: IDC

IDC's Approach to Critical Minerals Value Chain Development

a. **Maximise the beneficiation of regional mineral resources** through the development and support for globally competitive operations leveraging our relatively strong manufacturing and industrial base, refining and technical expertise in mining and chemicals. As such the IDC has and is continuing to support several companies in the up, mid and downstream mining and metals value chains.

b. **Collaboration with current business partners** but also on proactive and targeted investments and projects with the intention to add value locally and regionally. The focus is on:

   i. Seventeen (17) Minerals that are critical for the global transition to renewables, electric vehicles, hydrogen and battery storage.

   ii. Parts of the value chain where there is a competitive advantage and existing production capability in Mining, Refining and Manufacturing.

   iii. Proactive partnerships with countries in the region based on specific minerals to target mutually beneficial value chain developments.

The IDC is actively involved across the mining and metals value chain with key projects and investments underway to support beneficiation. The intention is to proactively target investments and projects.

IDC Approach and progress to date

- Adopting an ecosystem approach to the value chain including mining and manufacturing.
- Unlocking increased exploration activity, to add new sources of mineral production and secure future production through a Junior Mining Exploration Fund.
- Engaging with OEMs to develop a regional value chain that would be directly integrated into their specific supply chains.
- Within the Lithium-Ion and Vanadium Redox Flow Batteries value chains IDC is already invested or in the process of investing in the up-, mid and downstream parts of the value chain.
- Investments and projects in iron-ore and steel are being supported. As part of the Steel Masterplan, the IDC is implementing supply, demand and financing interventions to enable the industry to become resilient, competitive and transition to green steel production as well as localise production of advanced products into downstream industries like automotives, renewables, mining and grid infrastructure.

Gilgamesh Refining Battery Minerals

Gilgamesh Mineral Processing was incorporated to develop a R500-million, 3 000-ton-a-year manufacturing facility for high-purity battery-grade cobalt sulphate. And it is doing so with IDC funding, which financed a feasibility study that reinforced the economic merit of producing the mineral. Cobalt sulphate is targeted primarily at the burgeoning global electric vehicle and energy storage system market, but also has application in the traditional cobalt market for pigments, magnets, catalysts, industrial chemicals and specialty alloys. Numerous giga-factories currently being built and planned to meet the growing demand for battery metals such as cobalt will produce an estimated 2 330GWh battery capacity by 2030. Demand is underpinned by accelerating sales of light passenger electric vehicles in line with the world economy's transition to a zero-carbon economy. Sales are forecast to reach 25 million units in 2030 and about 55 million units in 2040, a far cry from the three million units sold in 2020. Gilgamesh has concluded memoranda of understanding with reputable leading global minerals commodity traders for the supply of raw materials and product offtake.

Fundraising has started for project implementation and a strategic equity partner is being sought. The initiative should reach financial close in December 2023, with construction planned to start in the first quarter of 2024.

4. LINKING SUSTAINABLE INDUSTRIALISATION AND INCLUSION OUTCOMES



The IDC acknowledges that marginalised and vulnerable workers, poor communities and small and informal businesses will likely bear the brunt of climate change, and the transition to a low-carbon future has the potential to exacerbate inequality, unemployment and poverty, if not managed adequately.[33]

Climate change and its impacts affects everyone, but those most impacted are the most vulnerable. Existing inequities, due to factors such as gender, race and income, exacerbate the risks to people's lives and livelihoods. Inequity also impacts on people's capacity and opportunity to participate meaningfully in the transition to a low-carbon future.

To limit the losses to these groups arising from existing socioeconomic challenges, physical and transition climate risks, the IDC adopts a two-pronged approach:

- **Delivering positive socio-economic outcomes through sustainable industrialisation; and**
- **Social and Solidarity Economy funding.**



4.1 Delivering Impactful Socio-economic Outcomes through Sustainable Industrialisation

The IDC's sustainable industrialisation approach is informed by positive structural transformation dynamics with one of the objectives including reducing unemployment, supporting increased participation in the economy and reducing inequality. The approach supports:

1. **Sectoral transitioning towards the manufacturing sector**, which has been shown to have the highest indirect employment multipliers.

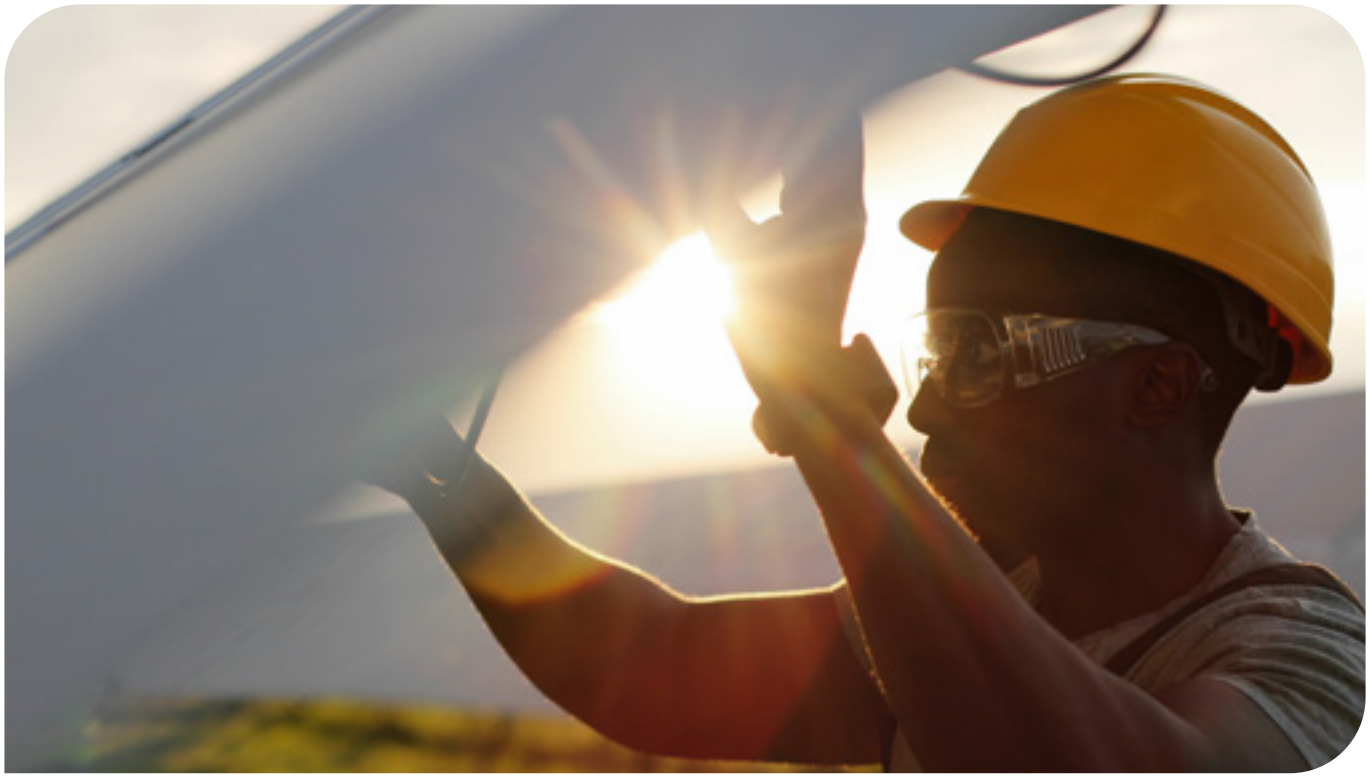
2. **Sectoral deepening towards higher productivity activities including downstream industries**, as they have relatively higher employment multipliers.[34] Sectoral transitioning and deepening from the current capital and energy-intensive industrial structure means that there are greater opportunities for people to accumulate, including through better participation of smaller firms and higher prospects of earning an income from employment.

3. **Production transitions including in hard-to-abate industries** to limit job losses and maintain/grow value addition and employment opportunities arising from green growth.

4. **Climate resilience of food systems** to reduce food insecurity and economic losses from physical risk of climate change to agricultural production.

In addition to sustainable industrialisation development and low carbon transitions, the IDC considers increased participation in the economy that addresses historical race, gender and spatial inequalities. Inclusion of marginalised communities, groups and individuals (such as youth, women, workers, Black Industrialists and previously disadvantaged people in general) in the economy and addressing spatial disparities[35] in relation to poor provinces, townships and rural areas, is embedded in the IDC's decision making including through the investment framework and development scorecard.

The IDC ensures that its funding yields positive economic and social outcomes that contribute measurably to sustainable industrial development and achieve an inclusive economy.



[33] South Africa remains one of the most unequal countries in the world, with high levels of poverty and joblessness as well as inequality in wages and asset ownership.

[34] Tregenna, F. (2012). Sources of subsectoral growth in South Africa. Oxford Development Studies, 40(2), 162-189.

[35] Innovative spatial interventions include providing support to existing initiatives including clustering, SEZs industrial parks etc.



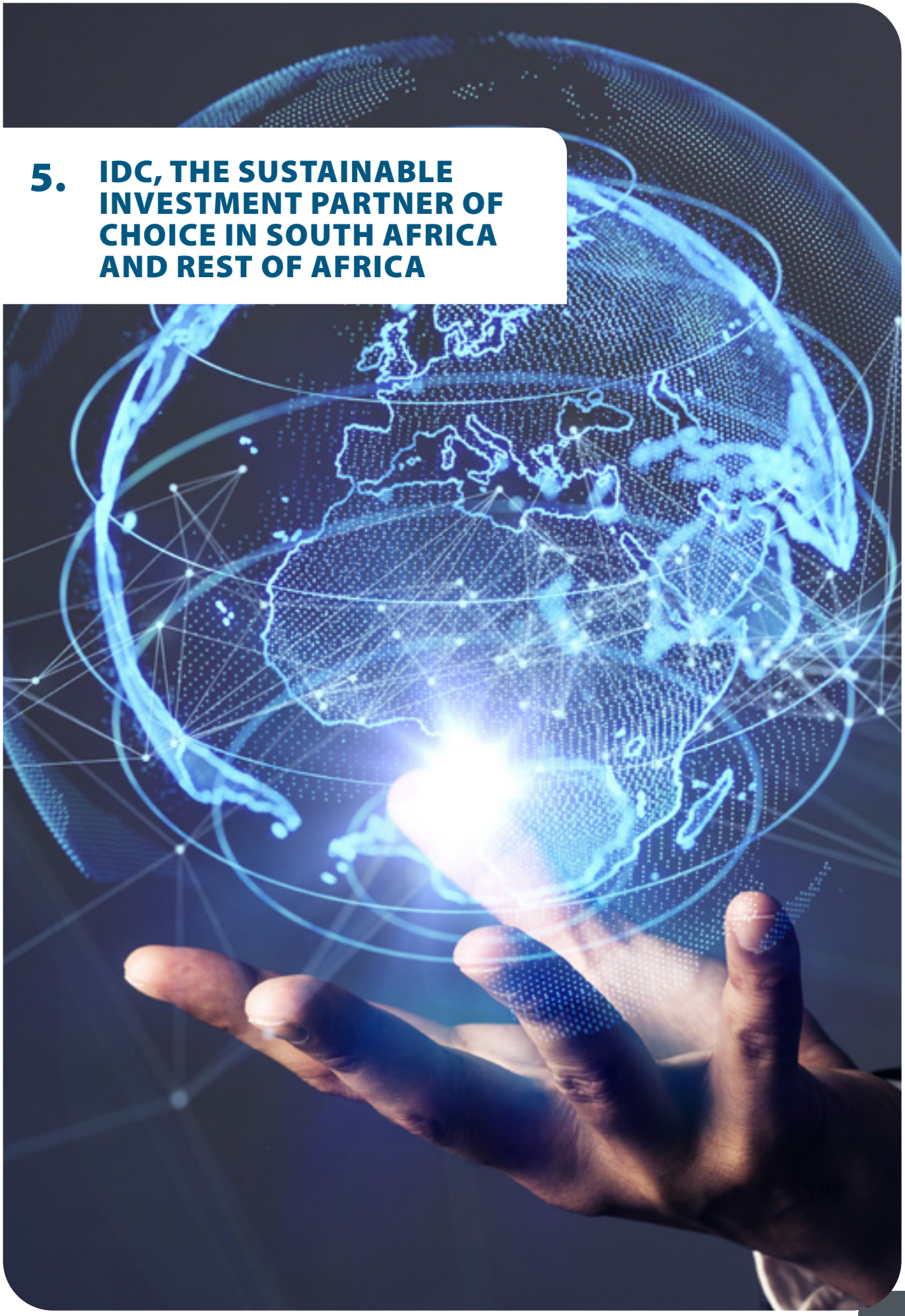
4.2 Social and Solidarity Economy Funding

The IDC is committed to South Africa's transformation agenda and drives targeted interventions to achieve more inclusive growth. The Social and Solidarity Economy is recognised by the IDC as an important sector to rebalance economic, social and environmental objectives and is key in the formulation of developmental paradigms and pathways, across economic sectors, which prioritise people and the planet. The support provided is premised on the acknowledgement that community-led and socially-owned ventures have the potential to deliver benefits over and above economic and financial outcomes as they are closely engaged with people with shared interests. They have the potential to revitalise communities by meeting local needs, developing the capacity of a community to be independent, build resilience and generate social capital.

The IDC is supporting the Social and Solidarity Economy through:

- **Managing the R2.4 billion (USD 130 million) Social Employment Fund (SEF)**, on behalf of the South African government: The SEF is designed to facilitate part-time work opportunities to 50 00 unemployed people per annum. Between June 2022 and September 2023, the fund has created 89,000 unique work opportunities. The fund creates R2 in social value for every R1 deployed. The fund contributes to the development of the social and solidarity economy and its ecosystem.
- **Social and Solidarity Economy Fund.** The IDC-created fund seeks to support innovative and effective activities that focus strategically on resolving social market failures and creating new opportunities to add social value systematically. This is done to maximise social impact and bring about positive, lasting (sustainable) change through promoting entrepreneurial endeavour and sustainable livelihoods to address economic, spatial (rural, townships) and social (race, gender etc.) inequality. Over the period 2018 to 2023, R440 million of funding – including R148 million in townships and R150 million in rural areas – has been approved for 116 projects/initiatives reaching 46 692 beneficiaries. Through these projects 4 982 jobs were created and/or saved.

5. IDC, THE SUSTAINABLE INVESTMENT PARTNER OF CHOICE IN SOUTH AFRICA AND REST OF AFRICA



The IDC is primed to partner with local and international funders, technology owners and businesses on the journey to support South Africa and the rest of Africa's sustainable industrialisation. The Corporation has built capabilities in developing projects – particularly in South Africa, with strong relationships in industry and government. This is evidenced by its project pipeline in each of the pillars of its sustainable industrialisation model. We also have a strong record in supporting industrialisation in South Africa and are making headway with our continental strategy for supporting the same in the rest of Africa. We are leveraging this experience and learning by doing in terms of the new challenges associated with industrialising new clean technologies.

Our commitment to sustainable industrialisation and development more broadly aligns with the United Nations Sustainable Development Goals (SDGs) as well as South Africa's National Development Plan (NDP). We report annually on our contribution to the achievement of the SDGs and NDP targets. We subscribe to the principles of good governance of the King Report on Corporate Governance for South Africa, 2016 (King IV) and apply the Greenhouse Gas Protocol to categorise and calculate CO2e (carbon dioxide equivalent) emissions. We also use certain Global Report Initiative standards.

In the last few years, the Corporation has prioritised the enhancement of our monitoring, evaluation and reporting capabilities and is embedding climate-related risk and opportunity identification and analysis across the organisation. The IDC stays up to date with new developments in sustainability reporting and integrates appropriate standards to underpin sustainable business. We elaborate on the recent developments on the IDC's sustainability impact plan.



5.1 The IDC's ESRG and Sustainability Impact Programme

IDC launched its long-term sustainability plan in 2020 with strategic priorities aimed at reducing South Africa's carbon intensity; embedding sustainability impact and Environmental, Social, Resilience and Governance (ESRG) practices to attract further sustainable finance for impact investing, while ensuring and balancing its financial performance. These impact practices are aligned with our commitment to good corporate citizenship, responsible impact investing and long-term sustainability.

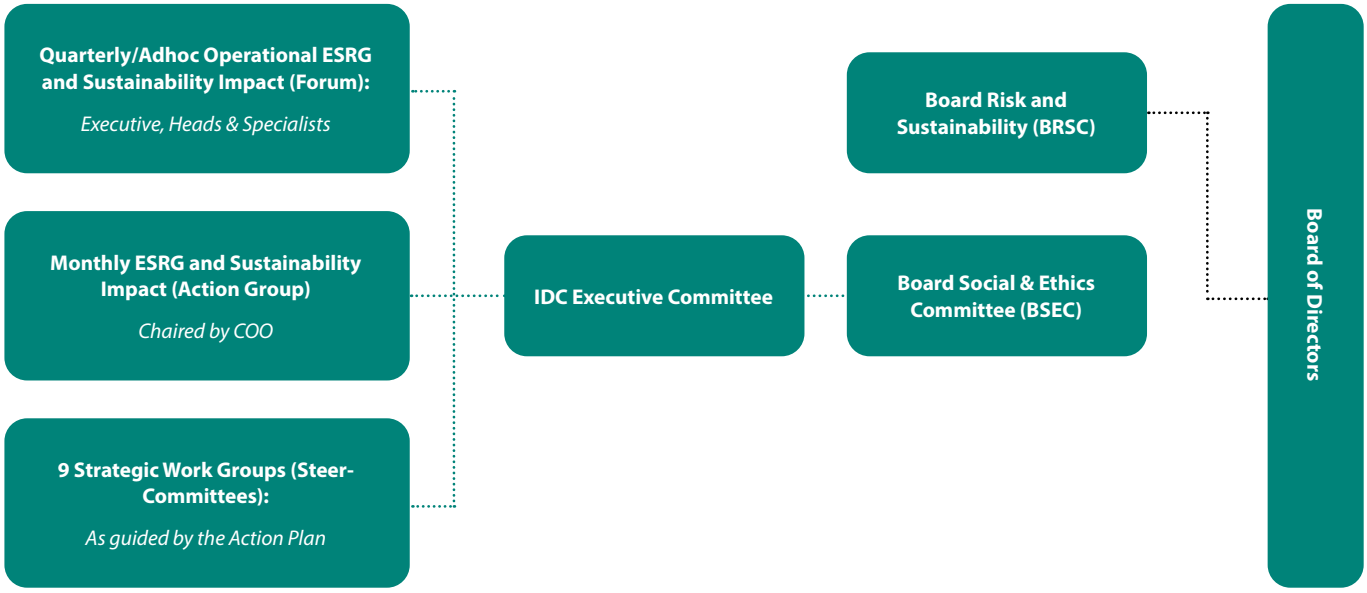
In 2022, we developed the framework for these practices supported by our responsible investment policy and an action plan. The action plan sets out the IDC's strategic objectives and strategic initiatives supported by annual strategic activities, key performance indicators, deliverables, and lead functions.

ESRG and sustainability impact considerations are integrated into our due diligence and post-monitoring processes to assist clients with statutory compliance throughout the investment cycle. The aim of integrating ESRG and sustainability impact practices into investment activities is to allow the IDC governance processes to make an informed decision about the relevance, significance and nature of ESRG risks, opportunities and impacts. The IDC screens and assesses each proposed transaction from pre-investment and due diligence stages to determine ESRG impacts, risk categorisation, environmental and social action plans to address identified gaps and monitoring/ reporting measures.

5.2 ESRG and Sustainability Impact Governance Structure

To oversee the development and implementation of ESRG and Sustainability issues, the IDC has incorporated ESRG issues into its Board Risk and Sustainability Committee (BRSC) and Board Social and Ethics Committee (BSEC), both of which advise the Board of Directors. At an operational level, an ESRG and Sustainability Action Group has been established to appraise operations with ESRG developments and an Operational ESRG Sustainability Forum with senior management to coordinate the application of the ESRG tools was introduced. The governance structure of the ESRG activities is illustrated in Figure 8.

Figure 8: ESRG and Sustainability Impact Governance Structure







IDC's ESRG governance structure has been overseeing the development and implementation of the Corporation's ESRG and sustainability impact initiatives including the:

- Adoption of the South African Green Finance Taxonomy[36] in the Corporation's classification of green assets, projects, activities and sectors for value creation and industrial development purposes.
- Development of the Sustainable Bond Framework to govern the issuance of IDC sustainable bonds.
- The development of the IDC Environment & Social Policy (with ESRG Risk Rating) and Development Score Card (DSC), both of which influence pricing.
- Development of House Views to govern the IDC's participation in carbon-intensive sectors such as liquid fuels, coal and natural gas. The House Views are informed by a balanced approach towards energy security, industrialisation and the energy transition in the context of sustainable development.

Measuring the Corporation's emissions. We have been tracking our Scope 1 and 2 emissions and making progress in their reduction. In the 2022/23 financial year, the IDC's Scope 1 and Scope 2 emissions decreased to 4 133 tCO2e from 4 429 tCO2e in the previous financial year and remain lower than the 2014 baseline of 6 220 tCO2e. We are also making progress in measuring our baseline financed emissions (Scope 3) which will form the basis for setting reduction targets in line with our sustainable industrialisation pathways. In 2022, we collected data for 60% of targeted business partners and measured the corresponding emissions in line with the Green House Gas Protocol. In this first phase, we have targeted subsidiaries, listed entities, equity exposures and loan book business partners with an exposure threshold of R100 million (USD 5,5 million). Next steps, measure all financed emissions and set an emissions reduction target.

[36] https://www.treasury.gov.za/comm_media/press/2022/SA%20Green%20Finance%20Taxonomy%20-%201st%20Edition.pdf





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