Just Energy Transition Implementation Plan 2023–2027

THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

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Abbreviations and Acronyms

ACT IP	Accelerated Coal Transition Investment Plan
AfDB	African Development Bank
AFD	French Development Agency
AGOA	African Growth and Opportunity Act
AIDC EC	Automotive Industry Development Centre Eastern Cape
AIS	Automotive Investment Scheme
AITF	Automotive Industry Transformation Fund
AMEU	Association of Municipal Electricity Utilities
APDP	Automotive Production Development Programme
ATR	Annual Training Report
B2B	Business-to-Business
B2G	Business-to-Government
B-BBEE	Broad-Based Black Economic Empowerment
BES IPPPP	Battery Energy Storage Independent Power Producers Procurement Programme
BEV	Battery Electric Vehicle
BII	British International Investment
BMZ	German Federal Ministry for Economic Cooperation and Development
BOO	Build Own Operate
BOOT	Build Own Operate Transfer
BOT	Build Operate Transfer
BUSA	Business Unity South Africa
CAPEX	Capital Expenditure
CBAM	Carbon Border Adjustment Mechanism
CBD	Central Business District
CfD	Contract for Difference
CHE	Council on Higher Education
CHIETA	Chemical Industries Education & Training Authority
CIF ACT IP	Climate Investment Fund Accelerating Coal Transition Investment Plan
CIF	Climate Investment Funds
CIS	Country Investment Strategy
CM	Component Manufacturer
COD	Commercial Operation Date
COGTA	Department of Cooperative Governance and Traditional Affairs
COP	Conference of the Parties
CPP	Captive Power Plant
CSP	Cities Support Programme
CSIR	Council for Scientific and Industrial Research
DBE	(National) Department of Basic Education
DBSA	Development Bank of Southern Africa
DDMP	Distribution Demand Management Programme
Devex	Development Expenditure
DFC	Development Finance Corporation
DFFE	Department of Forestry, Fisheries and Environment
DFI	Development Finance Institution
DG	Director General
DHET	Department of Higher Education and Training
DIRCO	Department of International Relations and Cooperation
DMRE	Department of Mineral Resources and Energy
DEL	Department of Employment and Labour
DoT	Department of Transport
DPE	Department of Public Enterprises

DPME	Department of Planning, Monitoring and Evaluation
DPWI	Department of Public Works and Infrastructure
DRI	Direct Reduced Iron
DSBD	Department of Small Business Development
DSI	Department of Science and Innovation
DSM	Demand-Side Metering
DTIC	Department of Trade, Industry and Competition
EBB	Energy Bounce Back
EE	Energy Efficiency
EEPBIP	Energy Efficiency in Public Buildings and Infrastructure Programme
EIB	European Investment Bank
ERA	Electricity Regulation Act
ERS	Energy Resilience Scheme
ESCO	Energy Service Company
ESIPPPP	Energy Storage Independent Power Producer Procurement Programme
EU	European Union
EWSETA	Energy and Water Sector Education and Training Authority
EXCO	Executive Committee
EV	Electric Vehicle
FBE	Free Basic Electricity
FC	Financial Close
FCEV	Fuel Cell Electric Vehicles
FEED	Front End Engineering Design
FDI	Foreign Direct Investment
FID	Final Investment Decision
Fraunhofer IKTS	Fraunhofer Institute for Ceramic Technologies and Systems
FTA	Free Trade Agreement
FTE	Full-Time Equivalent
GABS	Golden Arrow Bus Service
GDP	Gross Domestic Product
GEF	Global Environment Facility
GH2	Green Hydrogen
GHCS	Green Hydrogen Commercialisation Strategy
GHG	Greenhouse Gas
HDF	Hydrogène de France
HEI	Higher Education Institution
HRD	Human Resource Development
HRDC	Human Resource Development Council
HRS	Hydrogen Refuelling Station
HZB	Helmholtz-Zentrum Berlin
IBRD	International Bank for Reconstruction and Development
ICE	Internal Combustion Engine
IDC	Industrial Development Corporation
IDZ	Industrial Development Zone
IFC	International Finance Corporation
IFRS	International Financial Reporting Standards
ICEV	Internal Combustion Engine Vehicle
ILO	International Labour Organization
IMC	Inter-Ministerial Committee
INEP	Integrated National Electrification Programme
IPG	International Partners Group
IPM	Isondo Precious Metals
IPP	Independent Power Producer
IPT	Independent Power Transmission
IRA	Inflation Reduction Rate
IRP	Integrated Resources Plan
ITA	Income Tax Act
IUDG	Integrated Urban Development Grant
JET	Just Energy Transition

JET IP	Just Energy Transition Investment Plan
JETP	Just Energy Transition Partnership
JET PMU	JET Project Management Unit
JT	Just Transition
JV	Joint Venture
KIT	Karlsruher Institute of Technology
LCOH	Levelized Cost of Hydrogen
LCV	Light Motor Vehicle
LDV	Light Delivery Vehicle
LMI	Labour Market Intelligence
M&E	Monitoring and Evaluation
MBT	Minibus Taxis
MC	Municipal Council
MDB	Multilateral Development Bank
MEA	Membrane Electrode Assembly
MEL	Monitoring, Evaluation, and Learning
MFMA	Municipal Finance Management Act No. 56 of 2003
MGCA	Mpumalanga Green Cluster Agency
MMC	Manganese Metal Company
MOU	Memorandum of Understanding
MPRDA	Mineral and Petroleum Resources Development Act
MQA	Mining Qualifications Authority
MSA	Municipal Systems Act
MSP	Master Skills Plan
MTBPS	Medium-Term Budget Policy Statement
mtpa	Mega Tonnes Per Annum
MTREF	Medium-Term Revenue and Expenditure Framework
NAACAM	National Association of Automotive Component and Allied Manufacturers
NAAMSA	National Association of Manufacturers of South Africa
NAMB	National Artisan Moderation Body
NDC	Nationally Determined Contribution
NECOM	National Energy Crisis Committee
NERSA	National Energy Regulator of South Africa
NEV	New Energy Vehicle
NGO	Non-Governmental Organisation
NMT	Non-Motorised Transport
NOPF	National Occupational Pathways Framework
NQF	National Qualifications Framework
NRCS	National Regulator for Compulsory Specifications
NRF	National Research Foundation
NSA	National Skills Authority
NSDP	National Skills Development Plan
NSF	National Skills Fund
NSFAS	National Student Financial Aid Scheme
NT	National Treasury
NTSCA	National Transmission Company of South Africa
OEM	Original Equipment Manufacturers
OFO	Organising Framework for Occupations
OPEX	Operational Expenditure
PBL	Policy-Based Loans
PCC	Presidential Climate Commission
PIC	Public Investment Corporation
PIDG	Private Infrastructure Development Group
PG	Provincial Government
PGM	Platinum Group Metal
PLC	Professional Learning Community
PMO	Projects Management Office
PMU	Project Management Unit
PTNG	Public Transport Network Grant
POC	Proof of Concept
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PSET	Post-School Education and Training
PSETA	Public Service Sector Education and Training Authority

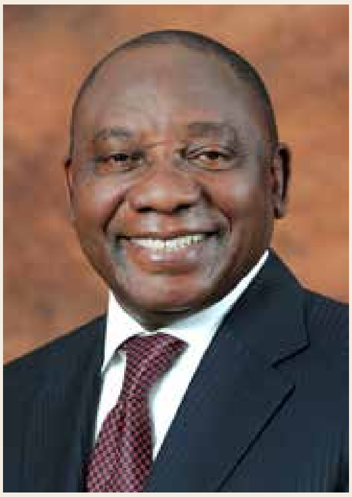
PtX	Power-to-X
PV	Photovoltaics
QCTO	Quality Council for Trades and Occupations
R&D	Research and Development
RE	Renewable Energy
REDZ	Renewable Energy Development Zone
RFP	Request for Proposals
REIPPPP	Renewable Independent Power Producer Procurement Programme
RMB	Rand Merchant Bank
ROI	Return on Investment
RPL	Recognition of Prior Learning
SABS	South African Bureau of Standards
SAF	Sustainable Aviation Fuel
SAIAMC	South African Institute for Advanced Materials Chemistry
SAICE	South African Institution of Civil Engineering
SAIVCET	South African Institute for Vocational and Continuing Education and Training
SALGA	South African Local Government Association
SANBI	South African National Biodiversity Institute
SANEA	South African National Energy Association
SANEDI	South African National Energy Development Unit
SANRAL	South Africa's National Road Network
SAPVIA	South African Photovoltaic Industry Association
SAQA	South African Qualifications Authority
SAREM	South African Renewable Energy Masterplan
SAWEA	South African Wind Energy Association
SD	Skills Development
SDZ	Skills Development Zone
SETA	Sector Education and Training Authority
SEZ	Special Economic Zones
SIP	Strategic Integrated Project
SME	Small and Medium Enterprise
SMME	Small, Medium and Micro Enterprise
SOC	State-Owned Company
SOE	State-Owned Enterprise
SPV	Special Purpose Vehicle
SSEG	Small-Scale Embedded Generation
SSP	Sector Skills Plan
TA	Technical Assistance
TBC	To be Confirmed
TBD	To be Decided
TCO	Total Cost of Ownership
TDP	Transmission Development Plan
TFC	Trust Fund Committee
TIA	Technology Innovation Agency
TNPA	Transnet National Ports Authority
TRIMS	Trade-Related Investment Measures
TSA	Transmission Service Agreement
TVET	Technical and Vocational Education and Training
Tx	Transmission
UCT	University of Cape Town
UK	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
USD	United States Dollar
UWC	University of the Western Cape
VC	Value Chain
WB	World Bank
WITS	University of Witwatersrand
WSP	Workplace Skills Plan
XtP	X-to-Power
ZAR	South African Rand

Glossary of Terms

Adaptation	In human systems, the process of adjustment to actual or expected climate and its effects, to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.
Beneficiation	The transformation of a primary material (produced by mining and extraction processes) to a more finished product which has a higher value.
Blended finance	Strategic use of development finance and philanthropic funds to mobilise private capital flows at scale, by combining investors with different financial return expectations – from concessional to market rates – to access greater levels of capital than on a standalone basis.
Carbon intensity	The amount of CO_2 emitted per unit of another indicator associated directly or indirectly with CO_2 emitting activities. The carbon intensity of electricity is the mass of CO_2 emitted per unit of electricity generated by a plant or by the electricity system. The carbon intensity of the economy is the mass of CO_2 emitted per unit of economic output.
Concessional finance	Below market rate finance provided by major financial institutions, such as development banks and multilateral funds, to developing countries to accelerate development objectives.
Decommissioning	A group of operations that remediate, dismantle, and remove the structures and components of a power station at the end of its working life.
Decarbonisation	Human actions to reduce carbon dioxide emissions from human activities; in practice, involving a transition from energy and other societal systems which emit CO_2, to those which do not, over the medium- to long-term.
Distributed generation	Generation assets that are located close to the particular load that it is intended to serve. General, but non-exclusive, characteristics of these generation assets include: an operating strategy that supports the served load; and interconnection to a distribution or sub-transmission system.
Energy poverty	The absence of sufficient choice in accessing adequate, affordable, reliable, high quality, safe, and environmentally benign energy services to support economic and human development.
Energy security	The uninterrupted availability of energy sources at affordable prices.
Green Hydrogen	Hydrogen produced by splitting water into hydrogen and oxygen using renewable electricity.
Installed capacity	The maximum rated output of installed electricity generating capacity.

Just Transition	"A Just Transition aims to achieve a quality life for all South Africans in the context of increasing the ability to adapt to the adverse impacts of climate, fostering climate resilience, and reaching net zero greenhouse gas (GHG) emissions by 2050 in line with best available science. A Just Transition contributes to the goals of decent work for all, social inclusion, and the eradication of poverty. A Just Transition puts people at the centre of decision making, especially those most impacted – the poor, youth, women, people with disabilities – empowering and equipping them for the opportunities of the future. A Just Transition builds the resilience of the economy and people through affordable, decentralised, diversely owned renewable systems; conservation of natural resources, equitable access of water resources; an environment that is not harmful to one's health and well-being; and sustainable, equitable, inclusive land-use for all, especially for the most vulnerable." Equitably distributing the costs and benefits of climate action.
Mitigation	A human intervention to reduce emissions of or enhance the absorption by sinks of GHG.
Net zero	Condition in which metric-weighted anthropogenic GHG emissions are balanced by metric-weighted anthropogenic GHG removals over a specified period. If the term is used to refer to non-CO_2 GHG as well, then the quantification of net zero GHG emissions depends on the GHG emission metric chosen to compare emissions and removals of different gases, as well as the time horizon chosen for that metric.
Readiness	The state of being fully prepared for an action to take place. In the JET Implementation Plan, readiness for a proposed capital project refers to the advanced stage of technical feasibility study approval by the implementing institution just prior to an investment decision by its relevant governing body. Readiness for an operational project refers to the implementing institution's committed management capacity to execute.
Repowering	The replacement of generating capacity which has reached the end of its life with new generating capacity on the same site and using the same grid infrastructure and on-site resources, as appropriate.
Technical assistance	The process of providing targeted and expert support for development purposes.
Transmission (electricity)	The movement or transfer of electric energy over an inter-connected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.
Transmission system operator	An entity entrusted with transporting energy in the form of natural gas or electrical power on a national or regional level, using fixed infrastructure.
Unbundling (Eskom)	Separation of the transmission, generation, and distribution functions of the public utility.
Utility-scale	A facility, normally 1 MW or larger, that generates power and feeds it into local power grids.
Wheeling agreement	An agreement between generators, consumers, and the owners/operators of the relevant transmission and distribution systems to transmit energy from a generator to an end-user located in another area through the use of existing distribution or transmission networks.

Message from President Cyril Ramaphosa



Our world faces an existential climate crisis. All nations have a responsibility to take bold measures to confront this threat through actions that are appropriate to our development paths.

The causes of global warming are well known. Its impact is being felt now, particularly by poor and marginalised communities that are most vulnerable to floods, drought, extreme heat, and food insecurity.

Developing economy countries are calling on the historic and continuing polluters of the world to meet the financial commitments needed to enable all countries to rapidly reduce greenhouse gas emissions, provide equitable access to renewable sources of energy, and build resilience to the effects of climate change.

South Africa's Nationally Determined Contribution to the global effort, compatible with the Paris Accord, was signed in 2021, contingent on securing financial support from developed economy countries. To this end, the world's first Just Energy Transition Partnership was forged, with initial funding committed by our international partners. In 2022, South Africa produced its Just Energy Transition Investment Plan 2023–2027, setting out the scale and scope of investment that is needed to meet our ambitious climate targets.

To give practical effect to achieving these ambitions, Cabinet has now approved this JET Implementation Plan, in which a wide range of stakeholders in government, business, labour, civil society, and international organisations are playing crucial roles in ground-breaking energy transition initiatives.

The JET Implementation Plan, which focuses on actions that are specific to the Investment Plan 2023–2027, is distinct from, but an important complement to, the Integrated Resource Plan (IRP), which sets out the country's future energy mix and policy landscape.

South Africa's ambitious commitment will be implemented in accordance with our domestic transition plans, which includes dealing with our current energy crisis, and in support of our foremost task of reducing poverty, unemployment, and inequality. Our country is endowed with abundant renewable energy resources and the skills and capabilities needed to play a leading role in the green economy of the future. The JET Implementation Plan outlines a clear path to harnessing this opportunity for energy security, economic growth, and job creation.

The JET Implementation Plan reaffirms the critical role of the state. Among others, government's task is to enable and facilitate the mobilisation of appropriate finance for the JET Implementation Plan from the JET partners and other sources.

While we are confident that the private sector will seize the opportunities for investment, higher levels of international grant funding will be needed to ensure that South Africa's energy transition is just and that it creates alternative sources of household income for those whose current livelihoods are tied to fossil fuels. The pace of South Africa's energy transition is thus directly dependent on what our society and economy can afford.

We have sought to ensure that there is broad consultation of this plan through the Presidential Climate Commission. We highly value the ongoing contribution of the Commission and the support of international development partners to South Africa's transition.

I am confident that South Africa's JET Implementation Plan will sharpen our focus on achieving the outcomes that truly matter, for a sustainable future that can be shared by all.

November 2023

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Executive Summary

The JET Implementation Plan is a roadmap that enables South Africa to take targeted strides towards meeting its decarbonisation commitments in a manner that delivers just outcomes for those affected by the energy transition and that contributes to inclusive economic growth, energy security, and employment at a pace, scale, and cost that is consistent with the country's socio-economic development path, needs, and affordability.

The JET Implementation Plan defines short- and medium-term outcomes in six defined Portfolios and designates key institutions to lead the identified areas of the work. The role of these institutions is to co-create solutions with stakeholders in specified planning workstreams, align and prepare programmes and projects, mobilise financing, drive performance, and monitor results. Implementation is an iterative process and the plans will evolve as the work gains momentum. Government leads the JET as regulator, enabler, and facilitator to unlock private sector investment and international financing for the country's energy transition.

The six JET Portfolios are: Electricity; Mpumalanga Just Transition; New Energy Vehicles (NEVs); Green Hydrogen (GH_2); Skills; and Municipalities. Three further Portfolios will be added for JET financing support in 2024: South African Renewable Energy Masterplan; Energy Efficiency; and Road-to-Rail.

Background and Context

At the launch of the JET IP 2023–2027 hosted by the Presidential Climate Commission (PCC) on 4 November 2022, President Cyril Ramaphosa asked the PCC to conduct public consultations on the JET Investment Plan (JET IP). The President then handed the JET IP to the Heads of Government of the International Partners Group (IPG) at the United Nations Framework Convention on Climate Change (UNFCCC) Congress of the Parties (COP27) in Egypt on 8 November 2022, and also tabled it at the G20 summit in Indonesia.

In January 2023, the Presidency established the JET Project Management Unit (PMU) to drive the JET IP implementation and prepare the JET Implementation Plan.

The JET Implementation Plan gives effect to the outcomes of the PCC's extensive 2023 stakeholder engagements with organised labour, civil society, youth organisations, business, government, and faith-based organisations and provides clarity as to how the JET IP will be realised.

South Africa's JET IP sets out the scale of investment needed (ZAR 1.5 trillion) over five years for the country's Just Transition to a low-carbon and climate-resilient economy in line with its updated Nationally Determined Contribution (NDC) which was lodged with the UNFCCC in 2021. At COP26 in 2021, five international partners pledged USD 8.5 billion (about ZAR 148.75 billion) to support South Africa's Just Energy Transition through a combination of concessional loans, commercial debt and equity, and grants. During 2023, international pledges to the JET IP grew to USD 11.6 billion (about ZAR 198.2 billion), and the South African private sector's investment in renewable energy generation is now taking root at scale, following government's significant electricity sector reforms.

The first year of the JET IP 2023–2027 implementation and the preparation of this JET Implementation Plan has been informed by the following important developments in 2023:

- Feedback from stakeholders during the PCC consultations on the JET IP
- Policy and regulatory reforms
- Eskom debt relief
- Electricity supply crisis
- Fiscal constraints
- South African Renewable Energy Masterplan (SAREM)
- Status of JET IP financing.

These developments have resulted in a JET Implementation Plan that does the following:

- Confirms South Africa's resolve to manage the JET at a **pace, scale, and cost** that is consistent with the country's socio-economic **development path, needs, and affordability**
- Reaffirms that the Just Transition – incorporating **distributive, restorative, and procedural justice** – is at the centre of South Africa's transition to a low carbon economy
- Places **co-creation by stakeholders** at the centre of JET Portfolio-specific planning for programmes and projects
- Capacitates **lead institutions** to drive each Portfolio, working collaboratively with **multi-stakeholder structures**
- Seeks to maximise **decarbonisation and just transition investments by the private sector** arising from electricity sector policy and regulatory reforms

- Shows that building electricity **grid capacity and stability** are prerequisites for the energy transition
- Finds **off-Eskom balance sheet solutions** for investments in the transmission grid and the repurposing and repowering of retiring coal power stations when they reach end of economic and operational life
- Charts a **pragmatic path to front-loading community development, repurposing, and repowering** investments while decommissioning dates are rescheduled to manage the electricity supply crisis
- Acknowledges the country's **fiscal constraints** to sovereign borrowing and the provision of guarantees
- Promotes **economic diversification, transformation, and industrialisation** in the renewable energy sector that empowers workers, marginalised communities, and black businesses
- Recognises that the pace and scale of transitioning is affected by **export markets** and their regulatory frameworks, and by **intellectual property** restrictions and **costs** of developing local industry
- Emphasises that **further funds can and must be mobilised at scale** for the JET IP, in particular in the form of **higher levels of grants from many international partners**, based on South Africa's firm pathways to achieving defined JET outcomes, its supportive policies and leadership, the commitment to good governance, and an institutionally coordinated effort.

Enablers of the JET Implementation Plan

The implementation of the JET IP is enabled by the ongoing mobilisation of mulitiple sources of finance and five key initiatives of the JET PMU:

1. The **Theory of Change** underpins JET planning at a national level, and for each Portfolio. It forms the basis for monitoring and evaluation by listing indicators that will be used to measure performance. It defines targeted impacts, medium-term outcomes (changes in performance), short-term outcomes (changes in capacity and systems), outputs, and the inputs that have been secured or are needed. This is supported by a dynamic risk management framework, from which the JET PMU and the implementing institutions can take steps to mitigate the inherent risks to success.
2. The **governance and institutional architecture** for JET implementation comprises an Inter-Ministerial Committee (IMC) that reports to Cabinet, a JET Government Steering Committee that reports to the IMC, and a JET PMU in the Presidency that accounts to the Government Steering Committee and supports the institutions that are leading each Portfolio of programmes and projects. Each Portfolio is led by a co-ordinating council/forum/committee structure comprising stakeholders from government, business, labour, and civil society.

Each Portfolio is supported by a dedicated secretariat to manage planning by defined workstreams, mobilise financing, and monitor performance. Each workstream/programme within a Portfolio is led by relevant institutional owners, involving relevant stakeholders, and supports multiple projects to proceed under their own institutional and governance arrangements.

3. A **JET Projects' Register** has been created to record all projects financed under the auspices of the JET IP. The first stage is a documentation of all grant allocations to the JET made since November 2021 when the Political Declaration was signed between South Africa and the IPG. It lists the status of JET projects by priority area/s, purpose, source groups, activities, stage, amounts, implementing institution, and funder, enabling analysis across the interventions and the inclusion of core monitoring requirements to be included. The JET Projects' Register will be a publicly accessible and transparent database, updated quarterly. The Register will be expanded in due course to include projects involving concessional and commercial funding. The JET Projects' Register will showcase the development of the JET projects' pipeline per Portfolio. It is a key building block of both the JET Funding Platform and the JET monitoring, evaluation, and learning (MEL) system.
4. A **JET Funding Platform** will be established by the JET PMU in 2024, initially in a proof-of-concept phase. It will be a matchmaking mechanism between the suppliers of grant funding and potential JET beneficiaries. It will also provide project preparation support services to JET project originators to help them prepare plans and apply for grants. It will provide the public with regular analysis of the deployment of grant funds to JET projects. Grant-makers who will be invited to be members of the JET Funding Platform include international donors, Multilateral Development Banks (MDBs), Development Finance Institutions (DFIs), philanthropies, and corporates. The JET PMU will invite the PCC and the grant-making members to nominate Advisory Board members from government, business, trade unions, and civil society organisations.
5. A **monitoring, evaluation, and learning (MEL) system** that supports the hierarchy of indicators developed with relevant stakeholders for the JET Implementation Plan as a whole, and for each Portfolio – from impact to outputs levels. This collaborative work will continue, to define annual milestones, and to develop a responsive and public MEL system which feeds into decision-making and continuous learning.

Key Features of the Six JET Implementation Plan Portfolios

Electricity:

Four large parallel programmes are targeted for JET financing:

- Large-scale and distributed Renewable Energy (RE) generation and battery storage, mostly by the private sector
- Large-scale transmission grid expansion, led by Eskom/National Transmission Company of South Africa (NTCSA), with opportunities for investment by the private sector through various partnership models to be piloted urgently and scaled up
- Widespread investment in maintenance and upgrades of distribution systems in Eskom and municipalities
- The front-loading of repurposing and repowering investments by the private sector, and alternative livelihoods for workers, communities, and SMMEs at the retiring coal power plants, with decommissioning schedules that do not disrupt electricity supply.

Mpumalanga Just Transition:

Four parallel efforts require JET funding to drive the transition in Mpumalanga:

- Utilising the JET Funding Platform and its project preparation support to link appropriate sources of finance to immediate JET projects identified by the Provincial Government to achieve tangible community benefits
- Implementing the Accelerating Coal Transition Investment Plan (ACT IP) in a manner that front-loads repurposing, repowering, and community development at selected Eskom coal power stations, ahead of decommissioning
- Promoting community-driven projects that empower local people to shift their dependence on coal value chains by developing new economic opportunities alongside existing activities, and by playing stronger roles in defining their transition plans
- Augmenting existing structures in Mpumalanga's overall plan with specific national JET Portfolios and workstreams, particularly in skills development and municipal capabilities for the just transition.

New Energy Vehicles:

Five programmes require JET financing support:

- Supply-side incentives for the automotive industry to unlock New Energy Vehicle (NEV) production and supply chain investments and protect and grow manufacturing employment
- Co-funding for investments in NEV auto assembly and supplier parts, component manufacturing and supply chains, and early-stage investments in project and business development for decarbonising transport and logistics supply chains and associated charging infrastructure
- Project preparation for investments in NEV public transport (taxis and buses) and associated charging infrastructure
- Investments in the battery industry, including battery precursor materials and components, minerals beneficiation, and extraction
- Planning for a national charging infrastructure network.

Green Hydrogen:

Seven workstreams are scoped, requiring JET financing support:

- Funding: to mobilise grant and first-loss funding from dedicated Green Hydrogen (GH_2) global funds to de-risk early stages in project development
- Supply: to secure access to key global technologies, secure co-development rights, and support local manufacturing
- Demand: to secure export trade deals and long-term off-take agreements
- Shared infrastructure: to coordinate, accelerate and provide visibility on development of all infrastructure projects (port, grid, pipeline, rail) and plan for shared infrastructure development costs between developers
- Technology incubation and workforce skills: fast-track research and development funding for public and private innovation and building South Africa's competitive advantage
- Policies and regulations: develop a wheeling framework and cost regime for GH_2 producers across the national grid
- Community engagement: roll out an engagement strategy on socio-economic benefits of the GH_2 industry and address local concerns with concrete benefits.

Skills:

Five flagship interventions require JET financing support, each with quick wins identified:

- Establishment of a three-tier JET skills ecosystem to coordinate and align JET skills activities across multiple institutions and stakeholders, in alignment with Department of Higher Education and Training's (DHET's) national Skills Masterplan 2030
- Establishment of Skills Development Zones (SDZs) (local learning networks) focused on three core value chains: in Mpumalanga (renewable energy and transmission); in the Eastern Cape (NEVs); and in the Northern Cape (GH_2), anchored in local education institutions in partnership with business to support community and local economic development initiatives
- JET skills needs assessments for each of these three core JET value chains, and the implications for tertiary eduction institutions
- JET capacity development for government and key government institutions
- Support for foundational skills development involving upskilling teachers and integrating sustainable energy concepts into school curricula.

Municipalities:

Three workstreams require JET financing support, in the context of an inter-governmental approach to managing the risks and challenges of the municipal energy transition:

- Capability development: including the municipal JET coordination structures, secretariat, and databases, municipal readiness assessments, cost-of-supply studies, and capability plans per municipality
- Finance structuring: quantification and financing plans for municipal distribution infrastructure maintenance and upgrades, for new distribution infrastructure, and the development of suitable financing mechanisms
- Energy access: efficient application of the Free Basic Electricity (FBE) grant, energy efficiency in households, and access to affordable energy efficient appliances.

In early 2024, each Portfolio will elaborate on work plans, targets, and monitoring indicators. The work plans will include the acceleration of quick wins to achieve momentum in the short term.

THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Chapter 1:
SCOPE AND OBJECTIVES

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- outline the scope of the Implementation Plan
- confirm the six current Portfolios and flag three additional Portfolios of the JET Implementation Plan
- clarify the objectives of the Implementation Plan.

The JET Implementation Plan 2023-2027 is a roadmap that enables South Africa to take targeted and aligned strides towards meeting its decarbonisation commitments in a manner that will deliver just outcomes for the people affected by the energy transition and that contributes to inclusive economic growth, energy security, and employment. It confirms that the South African JET will be managed at a pace, scale, and cost that is consistent with the country's socio-economic development path, needs, and affordability.

A multitude of Just Energy Transition (JET) initiatives are underway in South Africa, led by government institutions, the private sector, and civil society organisations. These are financed through government programmes, by partner governments, Development Finance Institutions (DFIs), Multilateral Development Banks (MDBs), philanthropies, corporate social investments, impact investors, and commercial investors.

It is increasingly evident that further funds can and must be mobilised at scale for the JET IP once there are firm pathways to achieving defined outcomes, underpinned by unambiguous government policy and leadership, good governance, and institutionally co-ordinated effort.

The JET Implementation Plan therefore defines short- and medium-term outcomes for each specified Portfolio and designates key institutions to lead specific areas of the work. Their roles will be to crowd in sector stakeholders and expertise, co-create solutions with stakeholders, align initiatives, mobilise finance, push for results, and monitor outcomes.

The Portfolios of the JET Implementation Plan, outlined in the chapters that follow, are:

- Electricity
- Mpumalanga Just Transition (JT)
- New Energy Vehicles (NEVs)
- Green Hydrogen (GH_2)
- Skills
- Municipalities.

Three additional Portfolios are flagged for inclusion in the JET Implementation Plan in 2024:

- South African Renewable Energy Masterplan (SAREM)
- Energy efficiency
- Road-to-rail.

South Africa is at an early and evolving stage of the JET, and there are complex challenges to overcome. Project preparation is not where it needs to be. Few of the concessional loan pledges made to the JET IP have become financing agreements, so new climate funds are not yet flowing at scale into targeted projects. There is much to be done to build institutional capability for efficient and cost-effective execution.

The JET Implementation Plan names the specific challenges in each focus area and seeks to plot pathways that will move identified priorities into actions that can deliver tangible results. It identifies the resource and capacity building needs, noting that technical assistance will be required by government institutions for years to come.

Each chapter of the JET Implementation Plan is built on feedback received from a wide range of stakeholders during the JET IP consultations conducted by the Presidential Climate Commission (PCC) in early 2023. The issues raised by stakeholders are documented and the plan shows how these issues have been addressed. In addition, the JET Project Management Unit (PMU) engaged in extensive discussions with a wide range of experts and role-players during 2023 and conducted a series of eight focus groups on key subject matters of the JET Implementation Plan during August and September 2023. All these engagements have materially shaped the content of the Implementation Plan. Critical contextual changes occurring in 2023 have a direct bearing on the scope of this Implementation Plan and the pace at which it can deliver:

1. The most positive of these changes are the material structural reforms that are being achieved in the energy sector through policy and regulatory reforms, without which the JET would not be implementable.

2. In line with this structural reform, National Treasury (NT) stepped in to relieve the unsustainable debt burden incurred by the state-owned electricity utility, Eskom. A moratorium on further Eskom borrowing is a condition of the debt relief package, effectively stalling the financing envisaged in 2022 for Eskom's access to JET IP concessional loans from DFIs and MDBs for transmission, distribution, decommissioning, repowering, and repurposing investments.
3. The country's electricity supply remains severely constrained, managed through continuous rolling blackouts that negatively affect every facet of society and the economy. Energy security needs are thus deferring the scheduled retirements of Eskom's old coal plants, impacting the pace at which decarbonisation of electricity generation was planned to materialise. The timing and scale of these deferrals is expected to be clarified before the end of 2023.
4. South Africa's fiscal position has weakened further in 2023, leading NT to curtail public spending and not increase fiscal exposure to contingent liabilities. The circumstances place brakes on NT's ability to enter into sovereign borrowing and guarantee agreements for the JET IP concessional loans.
5. In mid-2023, government published the draft South African Renewable Energy Masterplan (SAREM), which charts promising opportunities for sector growth. Furthermore, policy and incentives are expected to be clarified soon for electric vehicles (EVs). Both these policy developments bode well for unlocking new industries and creating new jobs and skills in the rapidly transforming energy sector.
6. In 2023, more international partners pledged additional grants, concessional loans, and commercial financing facilities to South Africa's JET IP, increasing the pool of available funding.

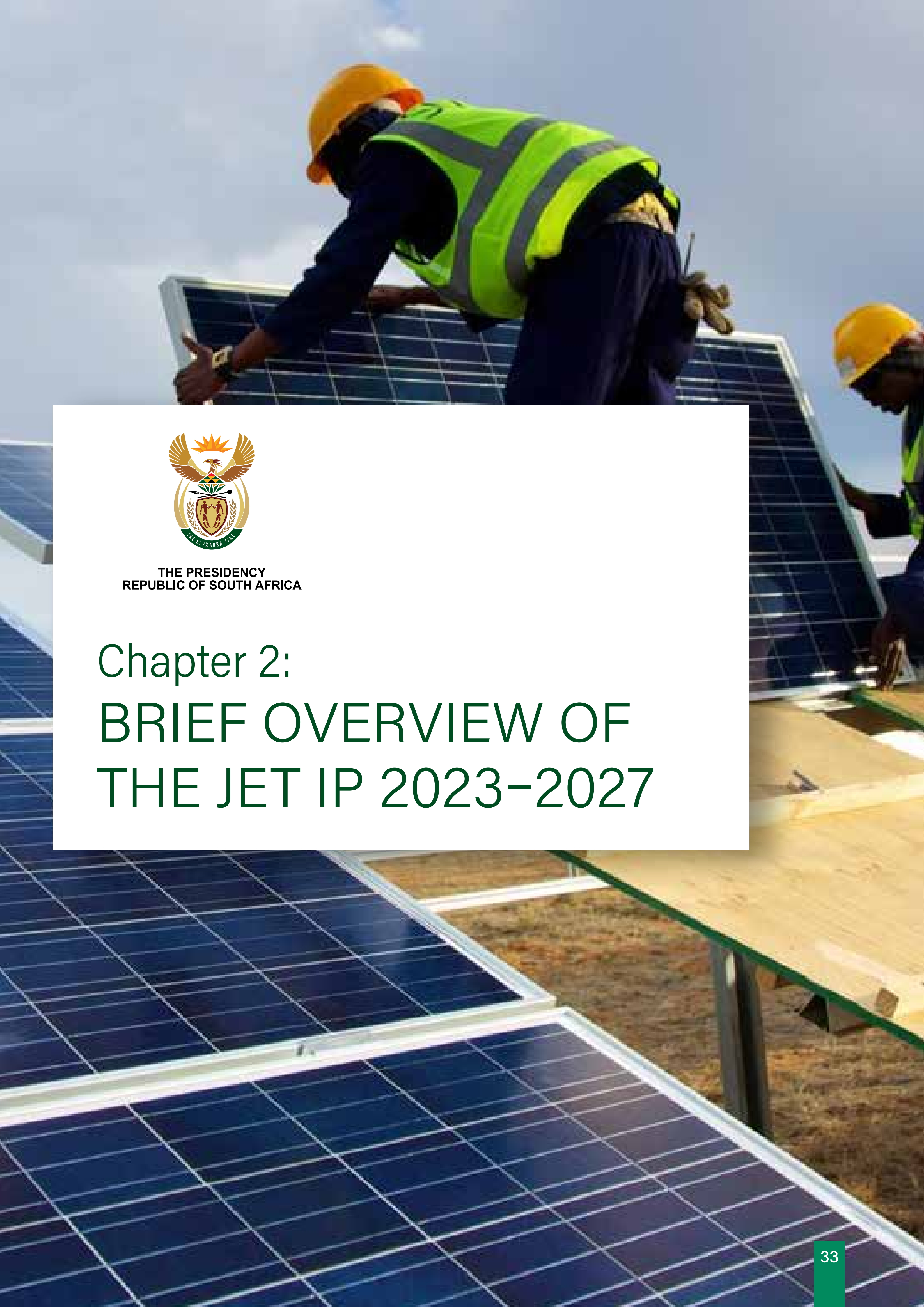
These important 2023 developments are elaborated on in Chapter 3.

In this evolving context, the objectives of the JET Implementation Plan are to build on the extensive JET work that is currently underway throughout South Africa, to provide a consolidated narration of its status, and to chart a co-ordinated way forward.

In so doing, the JET Implementation Plan seeks to provide a collaborative roadmap, outline governance and institutional arrangements for mulit-stakeholder co-creation of solutions, list outcome and impact indicators, and identify sources of financing. The specific objectives are to:

- Clarify a roadmap for each Portfolio
- Confirm governance arrangements for JET implementation
- Confirm institutional roles and responsibilities for implementation in each Portfolio
- Demonstrate that workstreams involving multiple stakeholders within each JET Portfolio will co-create JET programmes and projects
- Identify measures needed to strengthen institutional capabilities for JET execution in each Portfolio

- Identify the sources of funds and financing instruments that can be deployed for each Portfolio
- Propose ways to unlock the pledged JET IP concessional lending to South Africa, in the context of fiscal constraints and the moratorium on Eskom borrowing
- Confirm plans to establish a transparent Register of programmes and projects financed under the auspices of the JET IP
- Confirm plans to establish a JET Funding Platform as a matchmaking platform between JET grant-makers and JET projects, with project preparation support for project developers
- Confirm additional Portfolios that will be developed into JET Implementation Plans in 2024
- Confirm the indicators that will be used to monitor and evaluate JET implementation outcomes and impact over the five-year period
- Identify the key risks to achieving the stated outcomes and impact
- Mobilise further sources of appropriate financing for the JET Implementation Plan 2023–2027.



THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Chapter 2:
BRIEF OVERVIEW OF THE JET IP 2023–2027

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- provide reminders of the key features of the JET IP 2023–2027 and to provide a link to the full document
- to confirm that the JET IP and this Implementation Plan are founded on the principles of justice set out in South Africa's Just Transition Framework, and to provide a link to this policy document
- to record the steps taken by the Presidency in 2023 to lead the implementation of the JET IP.

South Africa's JET IP 2023–2027[1] sets out the scale of need and the early-stage investments required for the country's Just Transition (JT) to a low-carbon and climate-resilient economy in line with its updated Nationally Determined Contribution (NDC) lodged with the United Nations Framework Convention on Climate Change (UNFCCC) in 2021.

To decarbonise South Africa's economy within the NDC target range of 350–420 Mt CO_2eq by 2030, will require approximately ZAR 1.5 trillion over five years from multiple sources: developed countries; private sector investors; Development Finance Institutions (DFIs); Multilateral Development Banks (MDBs); government; and philanthropies. The investments are needed in three priority sectors: electricity, New Energy Vehicles (NEVs), and Green Hydrogen (GH_2). Further investments are needed in two cross-cutting areas: skills development and municipalities. The coal mining and coal-power producing province of Mpumalanga requires specific investments to diversify its economy and develop new opportunities for people dependent on the coal value chain.

South Africa's dependence on fossil fuels gives rise to a range of climate, energy, and transition risks, especially for affected workers, communities, businesses, and exporters. This challenge is in a context where poverty, inequality, unemployment, and energy insecurity are at untenably

1 The Presidency, Republic of South Africa. (2022). *JET IP 2023–2027*. (https://www.thepresidency.gov.za/content/south-africa%27s-just-energy-transition-investment-plan-jet-ip-2023-2027).

high levels across the country. The JET IP 2023–2027 is built on the Just Transition Framework[2] adopted by Cabinet in 2022, which affirms that South Africa's energy transition must be embedded in redistributive, restorative, and procedural justice. To this end, the JET IP aims to confirm South Africa's resolve to implement the Just Energy Transition (JET) in a way that protects vulnerable workers and communities, builds energy security, expands energy access, promotes industrial development, drives innovation, develops sustainable livelihoods, enables economic diversification, and spurs inclusive economic growth.

Table 1: JET IP 2023–2027 funding requirements

JET IP funding requirements 2023-2027	ZAR billion	USD billion
Electricity sector	711.4	47.2
New Energy Vehicle (NEV) sector	128.1	8.5
Green Hydrogen (GH_2) sector	319.0	21.2
Skills development	2.7	0.18
Municipal capacity	319.1	21.3
TOTAL	**1 480.3**	**98.38**

Achieving the JET IP outcomes is dependent on the scale and nature of financial support that South Africa can secure from the international community to complement domestic resources.

At the 26th Conference of the Parties (COP) in 2021, a Just Energy Transition Partnership (JETP) was forged with France, Germany, the United Kingdom (UK), the European Union (EU), and the United States of America (USA) (forming the International Partners Group (IPG)). The IPG undertook to mobilise USD 8.5 billion over five years to support South Africa's JET. The initial IPG offer of USD 8.5 billion is thus a catalytic contribution towards addressing the JET IP priorities.

President Ramaphosa launched the JET IP 2023–2027 at the Presidential Climate Commission (PCC) meeting on 4 November 2022, where he requested the PCC to engage in public consultations on the Plan with stakeholders and social partners. The President handed the JET IP to the Heads of State of the IPG at the UNFCCC COP held in Sharm El-Sheikh on 8 November 2022, and subsequently tabled it at the G20 summit held in Indonesia that month. In January 2023, the Presidency initiated the establishment of the JET Project Management Unit (PMU) to drive the implementation of the JET IP and compile the JET Implementation Plan.

2 Presidential Climate Commission. (2022). *Just Transition Framework*. (https://www.climatecommission.org.za/just-transition-framework).

THE PRESIDENCY
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Chapter 3:
2023 DEVELOPMENTS

PURPOSE

The first year of the JET IP 2023–2027 implementation and the preparation of this JET Implementation Plan has been informed by the following important developments, which are elaborated on in this chapter:

- feedback from stakeholders during the Presidential Climate Commission (PCC) consultations on the JET IP
- policy and regulatory reforms
- Eskom debt relief
- electricity supply crisis
- fiscal constraints
- South African Renewable Energy Masterplan (SAREM)
- status of JET IP financing.

3.1 Stakeholders' Feedback on the JET IP

The Presidential Climate Commission (PCC) consultation process conducted in early 2023 comprised of information-sharing sessions to familiarise stakeholders with the content of the JET IP, and formal consultation platforms for stakeholders' contributions and discussion. The purpose was to gather and consolidate views on what constitutes a Just Energy Transition (JET) for the South African economy and society, build trust and understanding between parties, identify elements of the PCC's Just Transition Framework that needed to be built into the JET IP, and establish consensus on a set of recommendations. There was active participation by civil society organisations, labour organisations, business associations, and government institutions. The PCC subsequently published two reports on the outcomes of these consultations.[3]

3 Presidential Climate Commission. (2023). *Towards a Just Transition*. (https://www.climatecommission.org.za/).

Each chapter of the JET Implementation Plan summarises focus area-specific concerns raised during the PCC stakeholder consultations and shows how these are addressed in the Plan. At an aggregate level, the following key issues from stakeholders have informed the preparation of the JET Implementation Plan:

- **Just Transition:** The resounding message was that redistributive, restorative, and procedural justice must be the basis of the JET IP, and that the JET IP must sharpen its focus and resources on communities and workers who are most at risk in the energy transition. Many were concerned about energy affordability, energy access, unemployment, poverty, inequality, skills, and the equitable sharing of JET risk and opportunities.
- **Consultation:** All constituencies wanted more consultation in the formulation of the JET IP, and more time for discussion and debate on JET IP priorities and resource needs.
- **Timeframes:** It was generally felt that South Africa should transition at a pace it can afford, coupled with an industrial strategy that will drive employment creation and economic growth in new energy technologies, including through the beneficiation of its mineral resources. There were differing views on the pace and extent of decarbonisation, with some arguing that South Africa's energy security should come before climate mitigation.
- **Financing:** There was a call for greater transparency on the financing terms of the International Partners Group (IPG) concessional loan offers, and a concern that the cost of this debt finance would further burden the national fiscus. The grant component of the IPG package was criticised as inadequate considering the scale of need for Just Transition interventions, which could not, and should not, be financed with debt.
- **Grid capacity:** Most stakeholders emphasised that grid upgrades are central to the transition to Renewable Energy (RE), and that there should be comprehensive energy security for all communities, calling on the JET IP to make adequate provision for these investments.
- **Skills:** The weighting and costing given to skills development needs in the JET IP was criticised as inadequate. South Africa's low skills base for the energy transition was highlighted, with concerns raised about poor co-ordination amongst training institutions and the need for speed and scale.
- **Municipalities:** The role of municipalities in the JET was perceived as vital, requiring more granular and participatory planning than outlined in the JET IP.
- **Green Hydrogen (GH_2):** Questions were raised about the rationale for including GH_2 in the scope of the JET IP, with concerns that it requires too much RE in the context of an energy security crisis and would draw JET IP investment away from other JET priorities.
- **New Energy Vehicles (NEVs)**: For organised labour, the transition to electric vehicles (EVs) (for export and domestic markets) was identified as critical to protecting automotive sector jobs and value chains. Civil society organisations called for support to convert public transport buses and taxis to EVs, and for an emphasis on freight logistics fleet conversions.

Investment in the NEV sector was supported for both industrial development (including in battery manufacturing) and decarbonisation outcomes.

- **Socio-economic outcomes:** Job creation, localisation, community ownership, support for black businesses, and electricity access were positioned as non-negotiable outcomes to be targeted for the JET IP.
- **Monitoring and evaluation (M&E):** A transparent and accountable M&E system needs to be established for the implementation of the JET IP. Concerns were raised about corruption and theft.

3.2 Enabling Policy and Regulatory Reforms for a Just Transition

The Government of South Africa is implementing far-reaching reforms in the energy sector to overcome the immediate energy supply constraint and to achieve long-term energy security, while supporting the transition to a low-carbon economy. These reforms will fundamentally transform the institutional landscape of the energy sector and unlock private investment in RE.

The Energy Action Plan announced by President Ramaphosa in July 2022 has five key objectives:

1. Fix Eskom and improve the availability of existing supply.
2. Enable and accelerate private investment in generation capacity.
3. Fast-track the procurement of new generation capacity from renewables, gas, and battery storage.
4. Unleash businesses and households to invest in rooftop solar.
5. Fundamentally transform the electricity sector to achieve long-term energy security.

The implementation of the Energy Action Plan is overseen by the National Energy Crisis Committee (NECOM), which is chaired by the Presidency. Several key milestones have been reached in advancing policy and regulatory reform since the announcement of the JET IP in 2022:

- **Schedule 2 of the Electricity Regulation Act (ERA), 2006, was amended in December 2022 to remove the licensing threshold for generation facilities.** This regulatory reform has enabled private investment in generation projects of any size, with the pipeline of private investment in RE sources growing at a rapid pace.
- **The Electricity Regulation Act Amendment Bill, 2002, has been formally tabled in Parliament.** In addition to outlining the powers and functions of the transmission system operator, the Bill will establish a competitive electricity market to enable greater efficiency and competition between multiple electricity generators.

- **In parallel to the introduction of the ERA Amendment Bill, 2002, a draft market code has been developed, which will outline the rules of the market.** This will ensure that the market can be established without delay once the Bill is enacted.
- **A one stop shop has been established to provide a single-entry point for RE projects to obtain the necessary authorisations.** This includes an online platform and dedicated capacity in the Department of Trade, Industry and Competition (DTIC) to facilitate applications and ensure that maximum timeframes are adhered to.
- **Timeframes have been reduced significantly for regulatory approvals required by energy projects.** The following processes are being fast-tracked:
  - Transmission infrastructure no longer needs an environmental permit in areas with low environmental impact
  - Environmental permits are now issued in 57 days for strategic infrastructure projects
  - Registration with the National Energy Regulator of South Africa (NERSA) now takes an average of 19 days
  - Grid connection now takes six months instead of nine months
  - Land-use authorisations now takes 30 days instead of 90 days.
- **Government has issued a determination for more than 14 000 MW of new generation capacity to be procured from wind, solar, and battery storage** – the remaining allocation in the Integrated Resources Plan (IRP) 2019. This will allow further bid windows to proceed on an accelerated basis.
- **Three hybrid solar and battery storage projects from the risk mitigation programme are in construction and will connect to the grid by the end of November 2023.** An additional five preferred bidders for hybrid projects from the same programme have confirmed their intention to reach financial close before the end of 2023.
- **Power Purchase Agreements (PPAs) have been signed with 19 projects from Bid Window 5 of the Renewable Independent Power Producer Procurement Programme (REIPPPP) for a total of 1 759 MW.** Of these, nine projects have already achieved commercial close, of which 784 MW is now in construction. In addition, six preferred bidders have been selected for a total of 1 000 MW from Bid Window 6. This will bring the total amount of new capacity under construction from the last two bid windows to over 2 300 MW.
- **Government has introduced expanded tax incentives for businesses and households that install solar systems.** These include a tax rebate of 25% of the cost of solar panels, as well as an increased capital depreciation allowance of 125% in the first year of installation under Section 12B of the Income Tax Act.
- **National Treasury (NT) has launched the Energy Bounce Back (EBB) Loan Guarantee Scheme to support the installation of alternative power supply by small and medium enterprises (SMEs).** The scheme aims to support 1 000 MW in additional generation capacity,

as well as facilitate resilience to loadshedding for micro and informal businesses. Government will, through a guarantee administered by the South African Reserve Bank, assume the initial losses (20%) with finance providers assuming the risk for remaining losses. The scheme will facilitate loans to SMEs, households, energy service companies (ESCOs), and suppliers.

- **A draft Net Billing Framework has been developed to standardise net billing across municipalities and is awaiting approval by NERSA.** This will ensure that all distributors have an export credit in place for small-scale embedded generators to feed power into the grid.
- **The amount of rooftop solar capacity in South Africa has increased to more than 4 000 MW, helping to reduce load shedding over the winter months.** This means that rooftop solar installations have more than doubled since the Energy Action Plan was announced – an exponential increase.
- **Eskom has introduced powerful incentives for energy-saving and energy-efficiency measures through the Distribution Demand Management Programme (DDMP).** The programme follows a performance contracting approach, with an incentive of ZAR 3 million/ MW provided for achieved demand reduction during specified periods.
- **Eskom has leased land around several power stations in Mpumalanga to developers for private energy projects.** In Phase 1, agreements have been signed for 1 800 MW of capacity to be built where transmission infrastructure is already available.
- **NERSA has approved three license applications by the National Transmission Company of South Africa (NTCSA), for the transmission network, trading, and import/export.** The process of appointing a board for the NTCSA is underway which, in addition to lender consents, represents the final hurdle for the establishment of an independent transmission company.

In support of South Africa's established climate change policies, and international commitments and obligations, the Climate Change Bill was introduced in Parliament in February 2022. Approximately 13 200 written submissions were received and country-wide public hearings were held. Parliament is currently in the final stages of preparing the Bill for tabling in the National Assembly.

The Climate Change Bill acknowledges the urgent threat that climate change presents and emphasises the need for an effective, progressive, and incremental response. It aims to provide an integrated response to climate change, including through inter-governmental co-ordination. It provides for the effective identification and management of climate change impacts, sets out how South Africa will make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations, and emphasises the commitment to a Just Transition (JT) to a low carbon economy and society. The Bill sets out the systems to achieve this, and establishes the institutional mechanisms required. Included in the Bill are requirements for all organs of state to have a climate change response, and for the establishment of reporting and monitoring systems across both the public and private sectors for both mitigation and adaptation. The Climate Change Bill is expected to be enacted in 2024.

3.3 Eskom Debt Relief

In the context of electricity sector reforms and following an assessment of options that would enable Eskom to operate sustainably without continued transfers from the national fiscus, the Minister of Finance in February 2023 announced debt relief to Eskom totaling ZAR 254 billion, effective from April 2023. The debt relief package involves advances of ZAR 78 billion in 2023/24, ZAR 66 billion in 2024/25, and ZAR 40 billion in 2025/26, covering Eskom's debt settlement requirements over the three years; and in 2025/26 government also takes on some ZAR 70 billion of Eskom's loan portfolio. The Minister of Finance has allowed Eskom to convert the loan to government-owned equity, resulting in a strengthened Eskom balance sheet. The conditions of this debt relief include a moratorium on Eskom borrowing over the debt relief period unless an explicit exemption is given by the Minister of Finance. During this time, Eskom may only incur capital expenditure from its operational income on transmission and distribution, and only on limited elements of its generation business.

The moratorium on Eskom borrowing has a significant impact on the implementation of the JET IP, in which Eskom was expected to take up pledged concessional loans for transmission, distribution, decommissioning, repurposing, and repowering.

National Treasury (NT) and the JET PMU have been working on the design of off-Eskom balance sheet financing options for investments in the transmission grid and for the repurposing and repowering of retiring coal power plants, including the implementation of the Accelerated Coal Transition Investment Plan (ACT IP), which forms a large part of the IPG financing package for the JET IP. The conclusions of this work and proposed way forward are set out in Chapter 5 of the JET Implementation Plan.

3.4 The Electricity Supply Crisis

The national electricity supply crisis worsened in 2023, with Eskom increasing its extended periods of loadshedding to curtail demand. The impact on industry, businesses, public services, and households remains severe. With few short-term options to abate the crisis, and in the interests of energy security, the Minister for Electricity in the Presidency called for a reassessment of coal plant decommissioning to extend the lives of retiring coal generation units. NT undertook independent technical studies to identify the feasibility of delays to decommissioning. Formal decisions are awaited on which power station units can and will be retained in service, for what periods, and the impact of such decisions on South Africa's decarbonisation trajectory.

These circumstances have material implications for the JET Implementation Plan which, in accordance with the IRP 2019, had earmarked financing for the scheduled decommissioning, repurposing, and repowering of Hendrina, Camden, and Grootvlei power stations as South Africa's flagship decarbonisation and Just Transition initiatives. A combination of highly concessional loans and grants from the Climate Investment Funds (CIF) and concessional loans from the World Bank (WB) and the African Development Bank (AfDB), are pledged and earmarked for Eskom's borrowing under the ACT IP, to be implemented at these three power stations over the next five years. Combined with the current moratorium on Eskom borrowing, the rescheduling of coal plant decommissioning may require adjustments to the retirement sequencing of power stations. The proposed way forward for the ACT IP is set out in Chapter 5 of the JET Implementation Plan.

3.5 The South African Renewable Energy Masterplan

Since 2021, the government, in collaboration with labour and industry, has been developing the SAREM as part of a series of industrialisation masterplans aimed at driving South Africa's industrial policy and strategy.[4] The SAREM has rallied social partners to catalyse opportunities for local manufacturing in RE and battery storage, with a focus on inclusive development, transformation, job creation, and localisation across the value chains. The SAREM vision and objectives are supported by four pillars (supporting demand, driving industrial development, fostering inclusive development, and building capabilities), that encapsulate nine high-level implementation elements prioritised by the SAREM partners during consultation. The SAREM is now being finalised for implementation.

Economic diversification and industrialisation opportunities arising from the adoption of RE were flagged in the JET IP as critical for South Africa's JET. The SAREM implementation plans will therefore be promoted for grant and concessional financing support as a Portfolio of the JET Implementation Plan from 2024.

3.6 JET IP Financing Status 2023

The JET IP 2023–2027 sets out a financing requirement of ZAR 1.5 trillion or approximately USD 85 billion[5] over five years (Table 2). The biggest proportion of this is for the decarbonisation of the electricity sector, alongside investments that mitigate the impact of the energy transition on affected workers and communities. The JET IP 2023–2027 is an invitation to donors and investors to join the South African government in financing the JET.

4 The draft SAREM, released July 2023, is available here.
5 The exchange rate used in the JET IP 2023–2027 was 15:1.

Table 2: JET IP 2023–2027 financing requirements (ZAR (USD) billions)

	Electricity[6]	NEV	GH_2	Sub-total
Infrastructure	978	83	313	1.374
Planning and implementation capacity	2.14	2	5.5	9.6
Economic diversification and innovation	40.4	43	-	83.4
Social investment and inclusion	9.6	-	-	9.6
Skills development	2.7			2.7
Sub-total	1 030.14 (58.9)	128 (7.3)	319 (18.2)	
TOTAL ZAR (USD) billions				**1 480 (84.6)**

The original IPG pledges from the European Union (EU), Germany, France, United Kingdom (UK), and the United States of America (USA), together with financing committed through the Climate Investment Funds (CIF) amount to approximately USD 8.5 billion or approximately ZAR 148.75 billion.

The 2021 IPG pledges to the JET IP have been catalytic in attracting additional pledges in 2023. The Netherlands and Denmark have formally joined the IPG with new funding commitments, and Canada, Spain, and Switzerland have allocated new resources to support the JET IP. The newly mobilised resources are set out in Table 3. The total contribution from international partners now stands at USD 11.6 billion (equivalent to ZAR 198.2 billion[7]). The pledges made in local foreign currency are tabulated in Annexure A to Chapter 3. Exchange rates applied to convert the foreign currency pledges to USD shown in Table 3 are listed in the footnote below.

6 Includes the costing of investments needed for municipalities to prepare for the energy transition.
7 Exchange rate USD1:ZAR17.05.

Table 3: International financing pledged for the JET IP as of September 2023

USD millions	Grants	Highly concessional climate loans	Concessional loans	Commercial debt/equity	Export credits	Total
ACT IP-CIF	50	450	900	875	-	**2 275**[1]
EU/EIB	125	-	1 080	216	-	**1 421**
France	4	-	1 080	-	-	**1 084**
Germany	241	-	1 048	-	-	**1 289**
UK	34	-	1 300[2]	500	-	**1 834**
US	63	-	0	1 000	-	**1 063**
Original IPG total	**517**	**450**	**5 408**	**2 591**	**-**	**8 966**
Denmark	20	-	58	65	-	**143**
Netherlands	167[3]	-	-	-	-	**167**
New IPG total	**187**	**-**	**58**	**65**	**-**	**310**
Spain	16	-	270	108	1 890	**2 284**
Switzerland	35	-	-	-	-	**35**
Canada	1	-	-	-	-	**1**
Non-IPG total	52	-	270	108	1 890	**2 320**
Grand total	**756**	**450**	**5 736**	**2 764**	**1 890**	**11 596**

Notes to Table 3:
1. Excludes an amount of USD 330 million to be mobilised from local DFIs
2. UK guarantee to increase AfDB lending to South Africa
3. Includes USD 54 million initial grant contribution from Invest International to leverage USD 1 080 million GH_2 Fund

Local foreign currency	USD (average October 2022 – September 2023)
Euro	1.08
Danish Krone	0.12
Pound Sterling	1.24

Local foreign currency	USD (average October 2022 – September 2023)
Canadian Dollar	0.77
Swiss Franc	1.09

The status on the pledged bilateral **concessional loan facilities** is as follows:

- Two concessional loans have been concluded by the NT and allocated in the form of sovereign policy-based loans (PBLs). These are EUR 300 million from the German Development Bank (KfW) and EUR 300 million from the French Development Agency (AFD).
- The Climate Investment Fund Accelerating Coal Transition Investment Plan (CIF ACT IP) funding package (including the grant component) is due to be programmed by May 2024, pending resolution on the rescheduling of coal plant decommissioning and a decision on the borrower, since there is a moratorium on Eskom borrowing for the next three years.
- Decisions on the utilisation of the remaining concessional loans and guarantees have not yet been made, given both the Eskom borrowing moratorium and NT's fiscal constraints to take on additional sovereign debt or issue sovereign guarantees. These decisions will be made on a motivated case-by-case basis.

The status on pledged **grants** is as follows:

- Approximately 50% of the pledged grant funding for the JET IP has been deployed to donor-approved projects to date, while a further 35% is in planning stages
- Some 47% of the pledged grants are being used for technical assistance, 19% for infrastructure, 11% for community development, 10% for project preparation, 10% for capacity building, and the remainder for studies and communications
- Mpumalanga Just Transition projects are attracting about 26% of grant allocations across the Portfolios.

The status on pledged commercial loan facilities is as follows:

- The commercial facilities pledged under the JET IP have not been programmed to date.

It is anticipated that at least ZAR 500 billion will be invested in the JET by the South African private sector, particularly in RE technologies, GH_2, and NEVs. Indeed, private investment is now happening at scale in RE generation, as outlined in Chapter 5, thanks to electricity sector reforms. The depth of South Africa's financial market is evidenced by the size of the asset base of financial institutions, liquidity of the listed market, the active foreign exchange market, as well as the duration and maturity of the bond market. Sources of private capital available for South Africa's JET IP include local and international commercial banks, institutional investors, and insurance companies. The private finance market has a wealth of skills and expertise that continues to enable innovation and competition. The sector's contribution to the national GDP was over ZAR 1 trillion in 2022.

In addition to commercial investments, the private sector makes material contributions to social and environmental projects through corporate social investment, enterprise development, and skills development. The proportion of these investments that contribute to the JET needs to be quantified, and opportunities for expanding their JET impact need to be built.

The international philanthropy community is a source of significant support for the JET in South Africa, particularly to civil society organisations. The scale and impact of this valuable funding needs to be collated, acknowledged, and aligned with the other sources of JET IP grant capital to achieve optimal results.

The South African Government's budgetary contributions to the JET IP through funds appropriated by Parliament has not yet been confirmed. NT has commenced with a tagging exercise to identify past expenditure that can be attributed to JET IP priorities, and to plan for future JET IP tagging. This work will be continued in 2024.

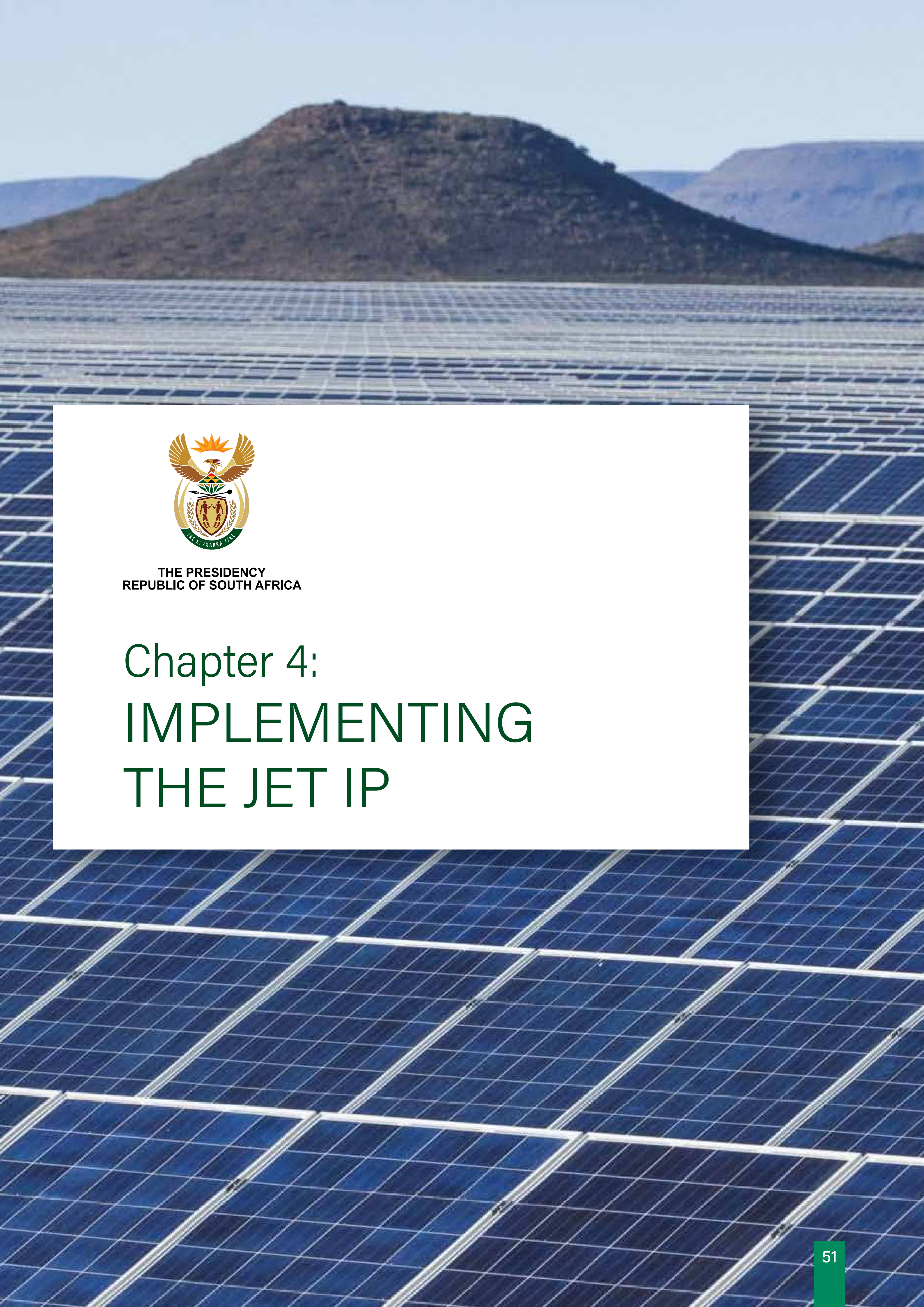
Similarly, the contributions of South Africa's two DFIs, the Development Bank of Southern Africa (DBSA) and the Industrial Development Corporation (IDC), are to be confirmed.

The extent to which international commercial investments, South African private sector resources, and public sector budget spending are contributing to the JET IP requires analysis. On the one hand, these must be measured against the South African Green Finance Taxonomy (2022), while on the other hand, clear classifications for what constitutes the 'just transition' elements of JET IP investments are still under debate.

Annexure A: International partner pledges to JET IP (in local foreign currencies) as at September 2023

Source	Pledge (millions)
ACT-CIF (USD)	**2 275**
of which: Grants	50
Highly concessional loans	450
Concessional loans	900
Commercial debt/equity	875
EU/EIB (Euro)	**1 316**
of which: Grants	116
Concessional loans	1 000
Commercial debt/equity	200
France (Euro)	**1 004**
of which: Grants	4
Concessional loans	1 000
Germany (Euro)	**1 193**
of which: Grants	223
Concessional loans	970
UK (USD)	**1 834**
of which: Grants	24
Supplementary grants (GBP)	10
Concessional loans	1300
Commercial debt/equity	500

Source	Pledge (millions)
USA (USD)	**1 063**
of which: Grants	63
Commercial debt/equity	1 000
Denmark (Krone)	**1 201**
of which: Grants	169
Concessional loans	487
Commercial debt/equity	545
Netherlands (Euro)	**155**
of which: Grants	155
Spain (Euro)	**2 115**
of which: Grants	15
Concessional loans	250
Export credits	1 750
Switzerland (Swiss Franc)	**32**
of which: Grants	32
Canada (Canadian Dollar)	**1.6**
of which: Grants	1.6



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Chapter 4: IMPLEMENTING THE JET IP

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- articulate the Theory of Change that underpins planning and performance monitoring of the Implementation Plan
- set out the governance and institutional architecture for the Implementation Plan
- confirm the creation of the JET Projects' Register
- outline the establishment of a JET Funding Platform
- provide the rationale for developing the three new Portfolios in 2024.

4.1 Context

Implementing the JET IP requires a multitude of role-players to direct their resources and effort towards decarbonising the economy and opening doors for the new sources of growth and livelihoods that come with Renewable Energy (RE).

To do this cost-effectively, unwavering commitment is needed, and co-creation by government, business, labour, civil society, and international partners for the agreed Portfolios, and thereafter, to the planning, financing, and management of programmes and projects within each Portfolio that will achieve targeted outcomes. Establishing roadmaps for this complex co-creation process across the various disciplines is the focus of the Implementation Plan.

The portfolios of work and the scale of need are set out in the JET IP 2023–2027 and are carried into the chapters of this Implementation Plan. From the wide stakeholder engagements that have informed this document, there is broad consensus that the six Portfolios are correct, and that three other Portfolios need to be included.

To move from Portfolio definitions to the delivery of effective programmes and projects, is dependent on leadership, organisation, and skills. The Implementation Plan therefore builds on existing organisational competencies and mandates in each Portfolio to create an architecture of governance and institutional responsibilities for implementation that has the best prospects for success.

Financing is available to make meaningful strides in the implementation of the JET IP, as outlined in Chapter 3. However, not all the available financing instruments are well matched with the nature of financing needed in each Portfolio, nor are they all currently usable under South Africa's fiscal constraints. This reality presents a challenge to the Just Energy Transition (JET) partnership between South Africa, the Multilateral Development Banks (MDBs), and the developed countries that have pledged concessional loan financing for the JET IP. In particular, it will require determined problem-solving and innovation by all parties to unblock the flow of concessional loans that are available for the JET IP. In the meanwhile, government's energy sector policy reforms are unleashing unprecedented levels of private investment in RE generation, and there is a promising likelihood that the private sector will be invited by government to invest in critical electricity network infrastructure. Without large-scale capital formation, the energy transition will not happen.

The grants component of the international pledges to the JET IP, whilst relatively small in the larger scale of need, is nevertheless a sizable sum and it is being deployed to projects. Further grant funds are also being pledged. An analysis of this work to date reveals that there is opportunity for improved visibility and use of the grant funds, particularly to ensure that they prioritise the Just Transition elements of the JET IP and make a meaningful difference to the lives of communities and workers impacted by the decarbonisation of the economy. It is vital that the grant funds are well deployed for this purpose.

The JET Projects' Register will create transparency and accountability for where JET IP financing is used. The first phase of establishing this Register has been to register all JET IP programmes and projects that are being supported with grant funding from the International Partners Group (IPG) and other donor countries.

During 2023, it has also become evident that the supply of grant funds for the JET IP outstrips the origination and preparation by South Africans of well-targeted projects, and that better co-ordination is needed to optimise the deployment of these valuable resources across the Portfolios. The proposition of a matchmaking JET Funding Platform will be tested with stakeholders in a proof-of-concept roll-out in 2024, followed by the design and set-up of its operating model.

4.2 Theory of Change

The Theory of Change is a widely used planning and monitoring methodology that helps management to articulate a core problem to be solved, understand the underlying causes of the problem, specify the impacts that need to be achieved, target outcomes and outputs, and define the inputs to be used. The methodology is applied by the South African Government under the leadership of the Department of Planning, Monitoring and Evaluation (DPME) and thus informs the official frameworks for national and provincial government strategic planning and Annual Performance Plans.

An overall Theory of Change has been crafted to guide the work of the JET Project Management Unit (PMU) and to form the basis for performance monitoring of the JET Implementation Plan as a whole. This is presented in Chapter 11 (Figure 30), together with the indicators that will be used to measure overall outcomes and impact (Table 41). Theories of Change and indicative indicators of performance have, in turn, been articulated as baselines for each Portfolio and are presented in the six Portfolio chapters that follow, to be adapted by the respective Portfolio's institutional leadership teams as their work proceeds.

In summary, the narrative Theory of Change for overall JET implementation is as follows:

- **Wider impact (I):** The JET IP is aiming to achieve the transition to a low-carbon, climate-resilient economy and a just, climate-resilient society by mid-century. This will require the energy transition, with RE dominating the *energy mix* (I01), and with *significant cuts in greenhouse gas (GHG) emissions* (I03). The economy will need to be diversified, taking account of opportunities for a Just Transition as well as wider *economic diversification* (I04), with the benefits spreading widely, particularly in *priority communities* (I02). There are also many co-benefits that will be realised from the *transition* (105), ranging from freeing of water resources for domestic use, agriculture, and industry from the closure of coal plants, reduction in air pollution, improvements in road conditions, to regeneration of mining-affected land. Co-benefits are developed explicitly in the PMU's Theory of Change, highlighting the impacts of a healthy society and healthy ecosystems.
- **Medium-term outcomes (MT) (three to five years):** The *changes in performance* that will enable this impact over three to five years include: *finance for JET IP* being mobilised, deployed, and spent rapidly and effectively (MT01); *widespread support* across national and international stakeholders so that interventions are coherent (MT02); and government and non-government stakeholders increasingly *able to manage and deliver* Just Transition interventions (MT03). An enhanced skills system that is working effectively (MT04) is needed to ensure that skills are available to support the transition.
- **Short-term outcomes (ST) (one to three years):** Additional *capacity and systems* will be required to achieve this over the next one to three years. There must be an *active pipeline*

of projects that are being supported over the line (ST04), with an agreed portfolio of *Just Transition interventions* which can lead to systemic changes, as well as addressing transition needs, supported by the JET Funding Platform (ST03). These require agreed *transparent funding flows* (ST01), *problem-solving* to overcome challenges (ST05), and *effective co-ordination systems* across government and with non-state actors ensuring a coherent response (ST02). There must be demonstration of sufficient compliant programmes and projects (ST06) to build support for the JET IP process.

- The targeted **JET PMU** outputs are listed in Figure 30, and the **inputs** are funds pledged or approved for the JET IP, supported by the PMU's required capacity and authority to fulfil its mandate as articulated in section 4.3.

4.3 Governance and Institutional Arrangements

The JET IP receives its political mandate from Cabinet, which in 2022 appointed an Inter-Ministerial Committee (IMC) to oversee the work. The IMC is chaired by the Minister of Forestry, Fisheries and Environment and its members include: the Minister in the Presidency; the Minister of Finance; the Minister of Mineral Resources and Energy; the Minister of Public Enterprises; the Minister in the Presidency responsible for Electricity; the Minister of Trade, Industry and Competition; the Minister of International Relations and Cooperation; and the Minister of Science and Innovation. The IMC meets as required and at least quarterly, reporting to Cabinet. The Minister of Forestry, Fisheries and Environment convenes IMC meetings with the IPG envoys and other financing partner countries, as and when required.

In 2023, the Presidency established a JET Government Steering Committee of senior officials. The mandate of the JET Government Steering Committee is to provide operational leadership, guidance, and co-ordination for the implementation of the JET IP, and to make recommendations to the IMC. It is chaired by the Director General in the Presidency, and its members include: the National Treasury (NT); the Departments of Public Enterprises; Forestry, Fisheries and Environment; Mineral Resources and Energy; Trade, Industry and Competition; International Relations and Cooperation; Science and Innovation; Higher Education and Training; Employment and Labour; Planning, Monitoring and Evaluation; the Mpumalanga Office of the Premier; Development Bank of Southern Africa (DBSA); Industrial Development Corporation (IDC); Eskom; and the Presidential Climate Commission (PCC) Secretariat. The JET Government Steering Committee meets as required and at least quarterly.

Located in the President's Project Management Office, the JET PMU is a small management team contracted in 2023 with a specific mandate to do the following:

- Provide a roadmap for the implementation of the JET IP
- Convene role-players and build partnerships for JET IP delivery

- Find innovative solutions to JET IP implementation problems
- Mobilise and guide multiple sources of finance to address JET IP needs
- Ensure transparent monitoring and evaluation of JET IP delivery and results.

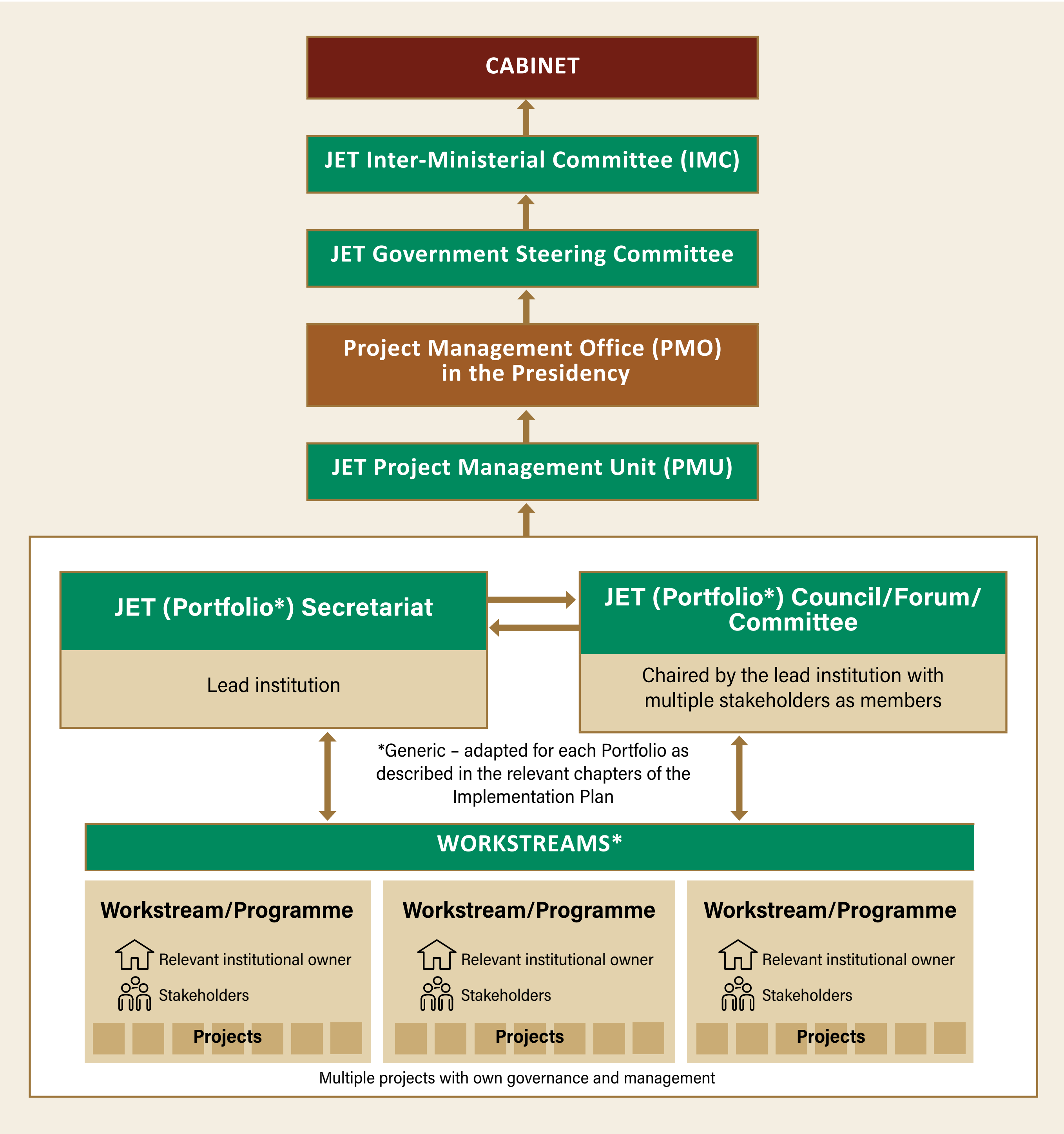
The JET PMU must therefore ensure that the path of travel for each Portfolio is confirmed, that suitable financing is mobilised from many sources (public, private, partner countries, Development Finance Institutions (DFIs), MDBs, philanthropies), and that each Portfolio is led by an institution with the capacity to manage multiple programmes and projects involving multiple stakeholders. To this end, the JET PMU provides core cross-cutting enablers to support the work of each Portfolio, in particular:

- Ongoing liaison with the IPG and other partner countries to unlock financing
- The management and publication of the JET Projects' Register
- The design and management of the JET Funding Platform
- The monitoring and evaluation (M&E) system of the JET Implementation Plan, with feedback to stakeholders for continuous improvement
- Consolidated national reporting on JET Implementation Plan progress across all Portfolios
- National and international communications on the the JET IP and the JET Implementation Plan.

Each Portfolio of the JET Implementation Plan will be chaired by a lead institution. Except for the Electricity Infrastructure Portfolio, each other Portfolio will establish (or expand an existing) JET Council/Forum/governing structure to lead and plan the JET Portfolio. These structures will comprise role-players from government, business, labour, and civil society. The institutional arrangement is to be capacitated by the establishment of a dedicated JET Secretariat competency for each Portfolio to manage the respective workstreams/programmes and monitor the projects, to liaise with the JET PMU for enabling support, and to fulfil each Portfolio's M&E requirements. The specific arrangements per Portfolio are described in the Portfolio chapters of the Implementation Plan.

The architecture of JET implementation Governance and Management is depicted in Figure 1.

Figure 1: JET Implementation Plan governance and institutional architecture



4.4 JET Projects' Register

The JET PMU has created a JET Projects' Register. Working with the IPG and other partner countries, the first phase of building the Register has been to document all the grant allocations that have been made by the international partners, per Portfolio, since November 2021 when the Political Declaration was signed between South Africa and the IPG at COP26.

The JET Projects' Register data fields include: grant purpose; source group; activities; implementing institution/s; funder; Forex sum; duration; dates for preparation/start/end; source; parties to the agreement; beneficiaries; key terms and conditions; disbursement status; project description; and contact details. From this, it has been possible to analyse: the total grant funding per donor; the amount per source and purpose; the amount per Portfolio; the amount per purpose; the amount per status; and the amount per implementor, amongst others.

The data will be updated quarterly and published on the Presidency website. It will be expanded in due course to include projects involving concessional and commercial financing from international partners, with potential to also record contributions from international philanthropies and the South African private sector.

The JET Projects' Register will showcase the development of the JET projects pipeline per Portfolio, and is a key building block for both the JET Funding Platform and monitoring, evaluation, and learning (MEL) system.

4.5 JET Funding Platform

The JET PMU will establish a JET Funding Platform in 2024, initially in a proof-of-concept phase, followed by an operating model design and resourcing. The longer-term institutional location of this JET Funding Platform will be widely consulted and investigated during the proof-of-concept phase.

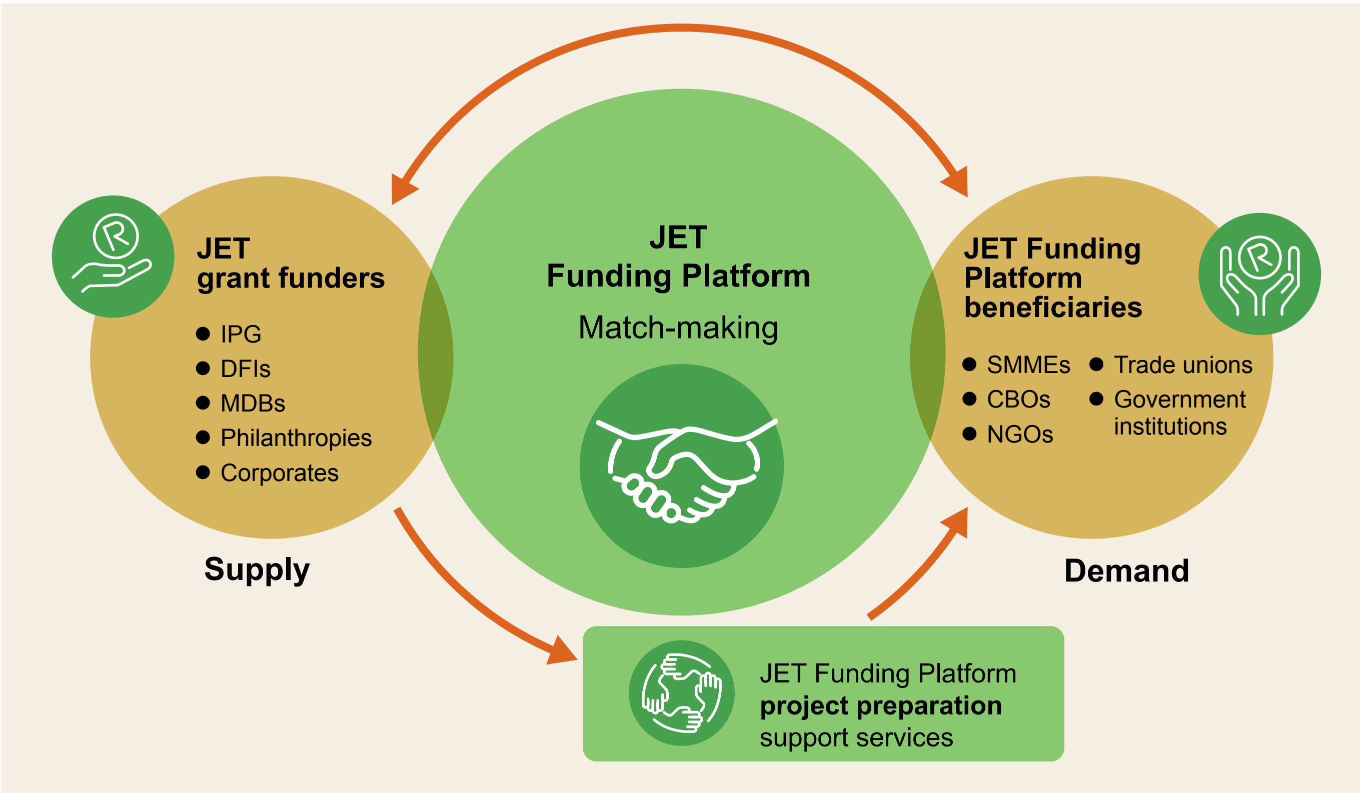
The purpose of the JET Funding Platform is to:

- Be a **matchmaker** between suppliers of grant funding and potential JET beneficiaries
- Provide **project preparation support services** to JET project originators to help them prepare plans and apply for grants
- Provide the public with **transparent data** and analysis on the deployment of grant funds to JET projects.

The JET Funding Platform will not be a 'fund of funds.' Rather, it is to be a service offered by the JET PMU that brings together the providers of grant funding for JET with the intended beneficiaries, and will give the latter assistance to prepare their applications to the providers of grants. The JET Funding Platform will recommend JET projects to the providers of grant funding. It will not play a role in grant approvals. Each grant-maker's internal approval procedures, reporting, and monitoring will continue in the normal course.

Grant-makers include the IPG members, other donor countries, MDBs, DFIs, philanthropies, and corporates. In addition to the international grant funding being made available for the JET IP, there is considerable corporate social investment, skills, and enterprise development funding that could be mobilised for the JET IP. Grant-makers with a mandate to support the JET in South Africa will be invited to become members of the JET Funding Platform and to make their grant funding information available on the JET PMU's public platform. The JET Grant Projects' Register (see section 4.4) will be further developed for this purpose.

Figure 2: JET Funding Platform



Grant funding is required for a wide range of JET IP needs, most importantly, to ensure that the energy transition is achieved in a manner that is just. The following are key focus areas for the use of grant funding under the JET IP:

- Social and economic support to communities and workers whose livelihoods are affected by coal power plant and coal mine closures, and by the transition to electric vehicles
- Community-level planning for transitioning out of coal dependency and into new economic opportunities
- Economic diversification planning and new investment promotion in Mpumalanga
- Start-up capital (combined with debt and equity) for new enterprises in transitioning coal regions
- Credit enhancement/first loss funding for small, medium and micro enterprises (SMME) loan funds in Mpumalanga
- Reskilling and upskilling for new work opportunities in the green economy, including RE, $GH_{2,}$ and New Energy Vehicles (NEVs)
- Piloting of RE community ownership models
- Technical assistance for project preparation
- Research and innovation
- Capacity building for state institutions mandated to drive JET outcomes
- Intermediaries' support for community development initiatives in Mpumalanga
- Capacity building for community-based organisations and trade unions in Mpumalanga
- Stakeholder consultations and inclusive decision-making
- Monitoring and evaluation of the JET implementation.

The need for a JET Funding Platform has arisen from a recognition that, to date, grant funding for JET has largely been used for up-stream technical assistance and capacity building, with limited direct benefits accruing to communities and workers that need to transition from coal-dependencies into alternative sources of income. There is a pressing need for demand-led skilling, entrepreneur support, local-benefit renewables projects, and direct benefits for improved livelihoods. A substantial portion of grant funding still goes to intermediaries. This status quo is partly because targeted initiatives for the JET are a relatively new focus for donor funding in South Africa, but mostly because South Africans' project preparation for this complex work is largely inadequate. There is also duplication and non-alignment between some similar/overlapping donor-funded initiatives. It is increasingly evident that a platform for co-ordination and analysis of grant funding deployment would help to optimise the use of these valuable resources.

The JET Funding Platform will be designed to be low-administration, agile, transparent, and cost-effective. It will begin with a focus on Mpumalanga projects, particularly during the proof-of-concept stage, and will expand to nationwide application thereafter.

To ensure that multiple stakeholders make ongoing contributions to this work, a JET Funding Platform Advisory Board will be established. The JET PMU will invite the PCC, as well as the grant-making members of the JET Funding Platform, to nominate Advisory Board members to serve three-year terms of office. The Advisory Board will be broadly representative of government, business, trade unions, and civil society organisations. The Advisory Board appointment procedures and terms of reference will be developed during the proof-of-concept phase in early 2024.

4.6 Additional JET Portfolios

Three new Portfolios described below will be added to the JET Implementation Plan in 2024. These Portfolios hold potential not only to boost South Africa's decarbonisation trajectory, but also to diversify economic activity and create new sources of employment and skills development.

4.6.1 South African Renewable Energy Masterpan (SAREM)

The SAREM aligns directly with the JET IP priorities in RE generation, repurposing, and repowering of retiring coal plants, the development of the GH_2 and NEV sectors, skilling of the workforce for the RE and battery value chains, and in multiple facets of the Just Transition investments needed for economic diversification in coal-dependent regions.

The booming RE market presents both demand- and supply-side opportunities for South Africa's economic development, employment creation, and social transformation. Leveraging existing industrial value chains, manufacturing and service capabilities have the potential to grow local skills and jobs, and to support the inclusive roll-out of RE to poor households. However, the current RE and battery storage market is primarily driven by imports of solar panels, batteries, inverters, turbines, cables, and input materials. The draft SAREM notes that, combined with broad industrial capabilities in connected or related value chains (such as steel, aluminium, capital equipment, and electro-technical equipment), the economy displays wide-ranging domestic capacity to supply the RE and battery sectors. As such, 12 catalytic interventions form the backbone of the SAREM, which are summarised in Table 4 and are being prepared by the Department of Mineral Resources and Energy (DMRE) for implementation in 2024.

Table 4: SAREM pillar and catalytic interventions

SAREM pillar	Objective	Intervention
Supporting demand	Clarify the market for RE and storage	Publish and update quarterly the pipeline of public procurement (e.g. REIPPPP, Energy Storage Independent Power Producer Procurement Programme (ESIPPPP), Department of Public Works and Infrastructure (DPWI), provinces, and municipalities) for RE and storage technologies
		Publish and update quarterly the pipeline of private procurement (large-, medium-, and small-scale projects) for RE and storage technologies
Driving industrial development	Establish clear localisation objectives	Establish a consistent set of local content targets and criteria for future public and private procurement programmes
	Align industrial policy and programmes with RE and storage localisation	Reactivate the 12i tax allowance incentive with a focus on supporting the development of RE and battery manufacturing value chains
		Align existing public sector programmes and policy support with the SAREM's localisation objectives (e.g. Energy Resilience Scheme, Industrial Development Corporation (IDC) funding, Department of Small Business Development (DSBD), Energy Bounce Back Loan Guarantee Scheme, and municipal/provincial procurement)
Fostering inclusive development	Establish clear transformation objectives	Develop and implement B-BBEE sector-specific scorecard for RE and storage
	Foster integration of emerging suppliers	Develop, resource, and establish a Transformation Fund to support new entrants in the value chain (e.g. competitive rates for factory investment capital, as well as warrantees/guarantees)
	Direct RE and storage activities to JT hotspots	Launch public procurement rounds for RE and storage for Mpumalanga and other JT hotspots (based on grid availability), notably leveraging Renewable Energy Development Zones (REDZs)
	Drive inclusive roll-out of RE and storage	Launch a solar PV roll-out programme for schools/clinics/etc., based on panels replaced by large projects

SAREM pillar	Objective	Intervention
Building the capabilities	Map and build skills	Develop and run a digital matchmaking platform (i.e. PowerUp) between industry, education providers, and social compact partners, creating a demand-led skills and planning communication hub to address skills priorities in the sector
	Activate skills	Consolidate and expand internship programmes/opportunities in the RE and storage sector, e.g. by participating in Yes4Youth
	Foster technology commercialisation	Establish a matchmaking platform between innovators and possible users to accelerate the adoption of new RE and storage technologies, along with an innovative funding model for de-risking costs of running trials

The development of the SAREM since 2021 has been a co-creation process involving government, industry, and labour representatives in task teams, bilateral engagements, public meetings, and written submissions contributing to a broadly agreed plan for implementation by various entities. A dedicated SAREM PMU will be responsible for driving and overseeing implementation. Costing of interventions will be done once targets are established and commitments are finalised.

Annexure A tabulates opportunities for mobilising JET IP financing in support of the catalytic interventions identified by the SAREM. These will be developed into focus areas for investments during 2024.

4.6.2 Energy Efficiency

Since electricity shortages and steep price rises began a decade ago, the South African business community has adopted certain energy efficiency measures. There is, however, far more that can be done to improve energy efficiency across all sectors of the economy. Energy efficiency measures not only play a key role in lowering demand in South Africa's electricity supply-constrained environment, but also result in a net saving in GHG emissions. Unlike demand-side management measures, which are used to curtail use, energy efficiency allows use to continue, only more efficiently.

A JET Portfolio on Energy Efficiency will focus interventions in the following programmes:

- Government buildings
- Commercial buildings
- Large industry
- Small and medium enterprises
- Households
- Standards for appliances and buildings.

Work is underway in all these areas, led by a number of experienced institutions in South Africa. The intention will be to mobilise international financing (grants, concessional loans, and targeted commercial loans) under the auspices of the JET IP, to support these efforts and to scale up the energy efficiency outcomes, tracking the GHG savings achieved.

4.6.3 Road-to-Rail

South Africa has a relatively extensive rail infrastructure network, the main corridors of which are electrified, but the use of rail for the transport of goods and passengers has deteriorated over many decades. Combinations of sector market trends, national roads quality, pricing, sector policies, regulation and deregulation, institutional reforms, and state company management choices have resulted in ever-declining rail market share. A number of initiatives have been mooted and tried for rail volumes improvement, but specific road-to-rail strategies for both freight and passengers have not taken hold, and the challenge of achieving a sustained modal shift remains elusive.

The social, economic, and environmental benefits of optimising the use of rail are well known. To this end, efforts to achieve systemic change in the modal choices of transport users will continue. Given the GHG savings that rail transport can achieve relative to road transport, the road-to-rail agenda remains an important element of South Africa's energy transition. However, the complexities and cost of achieving lasting road-to-rail results should not be underestimated.

To identify rail-friendly cargo, each freight flow segment is measured for product uniformity, terminal density, line density, distance, value, and time. In their 2021 report for SA-TIED[8], the researchers record that in 2019, 22% of tonne-km that can best be served by rail, and 35% of tonnes, was served by road, adding significant direct logistics costs and externality costs to the economy. Of the total general freight market, rail should have delivered 47 billion tonne-km in 2019, but delivered only 18 billion tonne-km, leaving a gap of nearly 30 billion tonne-km. This railable target for general freight is estimated to grow to 77 billion tonne-km by 2050, meaning that modal shift success will require the general freight railway to more than quadruple from its current size.

In passenger rail, the decline in long-distance and commuter rail numbers was largely driven by deregulation of the airline industry and cost-effective flights, together with the accessible, relatively inexpensive, door-to-door services offered by the private minibus taxi industry. Combined with unreliable, unsafe, and poor-quality passenger rail services, there is now little left of the state-owned passenger rail business.

The Presidency has recently established a National Logistics Crisis Committee (NLCC) to arrest the economic impact of the poorly performing ports and freight rail. Reform measures emanating from the NLCC include rail economic regulation and the introduction of private operators on the freight rail network. If successful, these reforms could result in greater use of rail for rail-friendly cargo. Significant policy and regulatory reforms are needed for the revitalisation of passenger rail assets.

The JET PMU will work with the relevant institutions in 2024 to develop a Portfolio of road-to-rail initiatives that have the highest prospect of lowering transport sector emissions, and which can attract concessionary climate finance for investment.

8 Havenga, J.H., de Bod, A., Simpson, Z.P., Swarts, I.E., & Witthöft, I.E. (2021). *A proposed freight and passenger raid-to-rail strategy for South Africa.* Southern Africa - Towards Inclusive Economic Development (SA-TIED).

Annexure A: Opportunities for JET IP investments in the catalytic SAREM interventions

SAREM pillar	Description of intervention	Concepts that would be aligned	Type of instruments
Supporting demand	Support demand of locally manufactured RE and battery storage components	Credit instrument to offset local manufacturing risk Support to integrate South African manufactured goods into export markets (direct demand) Instruments to support private sector off-take of local components Support (concessional loans) for the development of physical and market infrastructure (already in JET IP) Funding for energy security in industrial parks	Guarantees Orders Concessional debt Grants
Driving industrial development	Support local manufacturing	Capital for factories Export credit assistance Review quality standards (Tier 1 definition) Support integration of new manufacture into supply chains Funding and technical partnerships for testing and certification facilities Bilateral partnership (SA-USA, SA-EU) around trade and investment	High risk capital Export credit assistance Grant to review standards or encourage supply chain integration Concessional capital for energy security for industrial purposes and competitiveness Trade and investment agreements Strategic partnerships
Fostering inclusive development	Support broad-based inclusion	Concessional capital for previously marginalised groups or regions affected by the transition (JET hotspots) Transformation fund for new entrants Reducing barriers to entry through information Direct support for projects involving schools/clinics as well as low-income households and community-led ownership	Grants Highly concessional finance Guarantees

SAREM pillar	Description of intervention	Concepts that would be aligned	Type of instruments
Building the capabilities	Map and build skills, activate skills Commercialise technology	Support for matchmaking programmes, i.e. PowerUp, broadening existing skills programmes (Yes4Youth or Harambee) Dedicated commercialisation platforms Funding for de-risking technology trial costs Funding and technology partnership for Manufacturing Technology Centre and Solar Research Facility Strategic partnership (including original equipment manufacturers (OEMs) for Technology Transfer System)	Grants Technical assistance Early-stage concessional capital (small ticket size) Strategic partnerships

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Chapter 5:
ELECTRICITY

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- identify how concessional and commercial finance which is available for the JET IP can support the critical investments that are needed in South Africa's electricity infrastructure for the country to transition from predominantly coal-based power generation to increasing levels of distributed Renewable Energy (RE) generation
- articulate the challenges that the JET Implementation Plan faces in unlocking the flows of bilateral concessional loan financing which are available for the required capital investments to be made, and suggest how these can be overcome
- articulate the important financing role that the private sector is playing in the electricity sector transition
- set out practical roadmaps whose milestones will enable targeted short- and medium-term outcomes to be met.

5.1 Context

South Africa's electricity sector is central to its efforts to establish a low-carbon economy. Electricity generation accounted for 43% of the country's greenhouse gas (GHG) emissions in 2000 and 45% in 2020. The majority of these emissions are generated by 15 coal-fired power plants owned by Eskom, most of which are non-compliant with air quality emissions standards, and nine of which will reach the end of their design lives between 2022 and 2034.

South Africa's ability to meet its decarbonisation goals will depend on its ability to manage a planned and integrated programme of four parallel efforts:

- Large-scale and distributed Renewable Energy (RE) generation
- Large-scale transmission network extension
- Widespread upgrades of distribution systems

- Retiring coal-power plant decommissioning, repurposing, and repowering that does not disrupt electricity supply, and which proactively supports affected workers, communities, and value chains to transition into new economic opportunities.

This huge task must be managed in the context of the ongoing electricity supply crisis, low economic growth, high levels of poverty, unemployment, and inequality, and no fiscal capacity to borrow for capital investments of the scale that is required.

5.2 Electricity Generation

To resolve the electricity supply crisis and meet South Africa's Nationally Determined Contribution (NDC) targets and long-term decarbonisation objectives, the JET IP 2023-2027 calculates that around 6 GW of new renewable electricity capacity needs to be added to the grid each year over this period, in addition to gas/storage capacity. The estimated cost of this five-year investment is ZAR 233.4 billion in solar, ZAR 241.7 billion in wind, and ZAR 23.1 billion in battery storage, totalling some ZAR 498 billion. The JET IP targets this investment to be made by the private sector, largely through the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

Enabled by South Africa's far-reaching electricity sector reforms and the electricity supply crisis, the decarbonisation of electricity generation could happen at scale in the coming years through the roll-out of least-cost RE technologies. Between 2010 and 2021, solar photovoltaics (PV) costs in South Africa reduced by 88% (now ZAR 0.375 per kWh) and onshore wind by 68% (now ZAR 0.344 per kWh), and the contribution of RE to total electricity generation in terawatt hours increased to about 7% in 2022.[9]

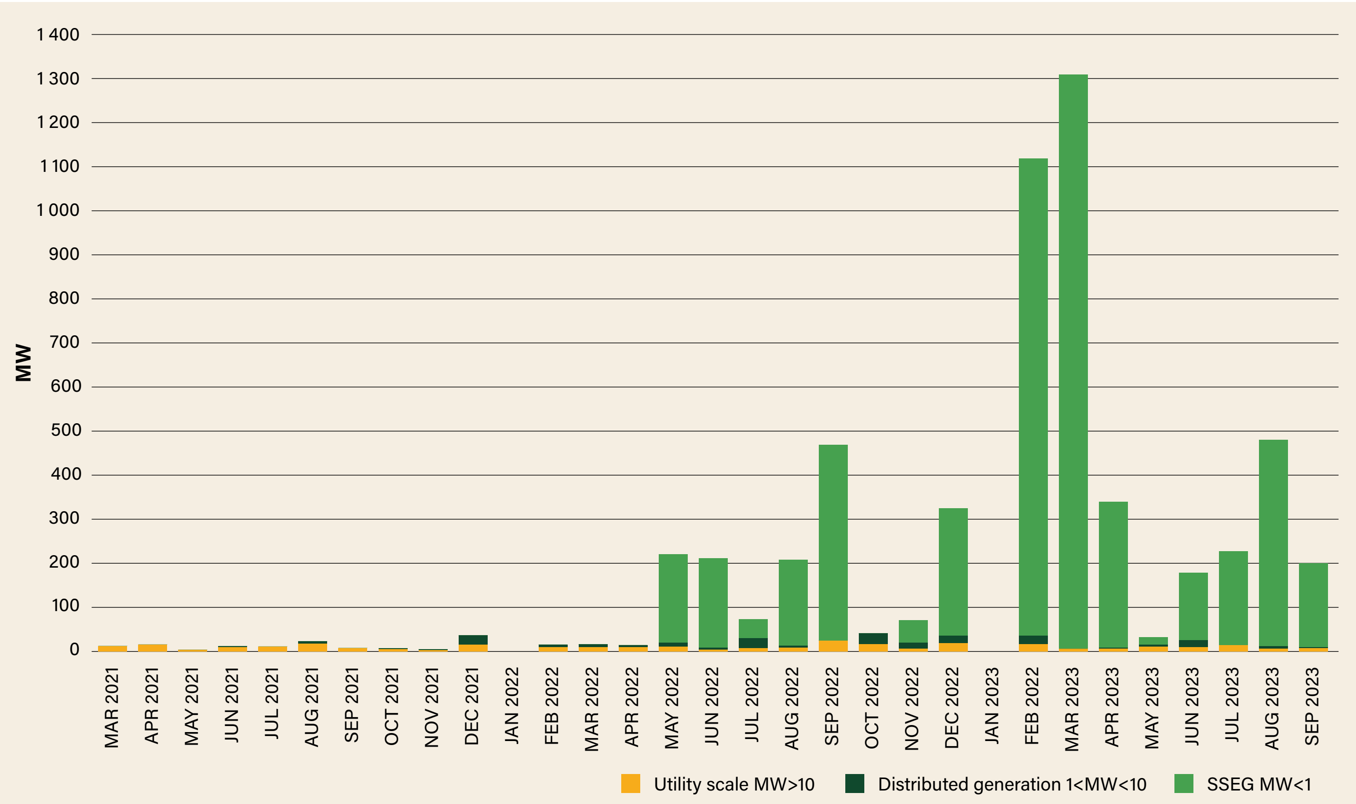
Eskom, in collaboration with the South African Wind Energy Association (SAWEA) and the South African Photovoltaic Industry Association (SAPVIA), recently released the 2023 South African Renewable Energy Grid Survey results, which reports on South Africa's RE development pipeline and its potential implications for grid planning and investment. The survey results indicate that 66 000 MW of RE generation projects are at various stages of development, of which 18 000 MW are at an advanced stage of project preparation (that is, environmental approvals granted, site measurement campaign and feasibility work completed, and a power purchase agreement signed/close to signature, or the project is ready to participate in the next REIPPPP bid window). Projects in the advanced stage of preparation can be operational within three years if granted a grid connection by Eskom or the municipality.

9 South African Renewable Energy Masterplan (SAREM) (Draft version for review dated 7 July 2023).

This means that private sector investment of some ZAR 300 billion in RE generation is possible over the next five years. The significant challenge to execution is the capacity of the transmission and distribution grids to transmit and distribute the power.

Figure 3 illustrates the high growth in large-scale private power projects since the policy reforms of 2021 and 2022.

Figure 3: 2023 South African Renewable Energy Grid Survey



The outlook for RE generation investment by the private sector is positive when considering the following:

- The policy reforms of August 2021 and December 2022, which promote scale in private electricity generation
- Government's achievements through the National Energy Crisis Committee (NECOM) and Operation Vulindlela, working with Eskom, the regulators and developers, in addressing bottlenecks to RE project developments
- Planned procurement of over 14 000 MW of new generation capacity from wind, solar PV, and battery storage through the most recent Ministerial determination, including the imminent release of Bid Window 7 of the REIPPPP

- Municipal support for small-scale embedded generation (SSEG) installations (generally combining solar PV and battery systems) in residential and commercial properties
- Tax incentives and financing mechanisms for the installation of solar panels by businesses and residents
- The South African Renewable Energy Masterplan (SAREM) initiatives to promote localisation of manufacturing for RE technologies and batteries, alongside investment in RE skills development by the private developers
- Scale-up in capital allocation from local financiers as financing models from the REIPPPP process are applied in funding large-scale private power projects.

The following enablers are important to support and expand investment in RE generation:

- **Urgent investment in transmission infrastructure:** In the last REIPPPP bid window for RE generation projects, over 3 GW was not approved because the network of transmission lines, sub-stations, and distribution lines that deliver electricity from the location of generation to businesses and consumers was insufficient. This holds especially for the high-capacity, long-distance transmission lines and sub-stations.[10] The transmission capacity challenge is now a high priority focus for government. Options for scaling up transmission infrastructure investment are set out in the sections below.
- **Distribution infrastructure:** Continued growth in small-scale and utility-scale embedded generation will only be viable if distribution grids are appropriately upgraded and maintained. Importantly, about half of all distribution grids are currently owned and maintained by the 165 licenced municipalities, for which the JET IP 2023–2027 estimates an investment requirement of about ZAR 273 billion. The municipal chapter of this Implementation Plan (Chapter 10) proposes an approach to address this challenge. Eskom owns and operates the remainder of the distribution network, with new distribution infrastructure investment requirements estimated by the JET IP 2023–2027 for both Eskom and municipal distribution systems at ZAR 127.5 billion between 2023 and 2035.
- **Wheeling framework:** The development and approval of a national wheeling framework, as well as appropriate systems to enable wheeling of electricity at municipal level, is an essential enabler for electricity generators, electricity traders, and consumers. This work is being led by NECOM, and a draft wheeling framework has been submitted to the National Energy Regulator of South Africa (NERSA) for consideration following extensive stakeholder and industry consultation.
- **A competitive market for electricity:** Government has submitted the Electricity Regulation Amendment (ERA) Bill to Parliament, which will support the restructuring of Eskom and establish a competitive market for electricity. This, together with the establishment of a market operator, the development of a market code, and the creation of the necessary

10 Extract from *Better Finance, Better Grid, a report by the Blended Finance Task Force, 2023.*

systems and platforms, will enable significantly larger investment in new generation capacity outside of long-term bilateral Power Purchase Agreements (PPAs).

- **Local manufacturing of RE technologies and batteries:** This is led under the auspices of SAREM and supported by key initiatives being planned by government and local Development Finance Institutions (DFIs). The SAREM and its forthcoming roadmap is an opportunity for future financing through JET IP pledges from international partners, DFIs, and Multilateral Development Banks (MDBs).
- **Social ownership of RE:** There is a pressing need to ensure that the benefits of RE generation impacts the lives of low-income households. Various ownership models and micro-grid technologies are at piloting stages. These must be scaled where feasible, requiring appropriate financing.

With government's policy efforts and the private sector's financial capacity now focusing on resolving these challenges, there are good prospects of unlocking the required scale of RE investments over the coming decade and witnessing the development of local manufacturing in the value chain. Combined with a programmed scheduling of old coal plant decommissioning, repowering, and repurposing, South Africa can begin to demonstrate the decarbonisation of its electricity system.

Further efforts are underway to expand battery storage capacity. The Department of Mineral Resources and Energy (DMRE) issued the first Request for Proposals (RFPs) within its Energy Storage Independent Power Producers Procurement Programme (ESIPPPP) on 7 March 2023.

ESIPPPP 1 aims to procure 513 MW of capacity and ancillary services in the Northern Cape where the sub-stations forming part of the programme are located. These efforts are crucial for achieving a sustainable and reliable electricity supply while reducing the country's dependence on fossil fuels and addressing climate change challenges. ESIPPPP 2 is currently in development and will procure a further 1 231 MW of battery storage capacity in areas where additional storage will contribute most effectively to unlocking network capacity.

The bankability of the ESIPPPP is supported by having similar attributes to the REIPPPP and is thus able to mobilise private capital. The tariff within the PPA will remain subject to NERSA approval.

The development period for this capacity is expected to take less than 24 months post-commercial close. Bidders must address economic development objectives, including, amongst others: job creation; local content; management control; skills development; enterprise and supply development; and socio-economic development.

In addition, Eskom is implementing its Battery Energy Storage System (BESS) programme, which will procure 199 MW of battery storage capacity in phase 1 and 144 MW in phase 2. Construction of several projects is already underway, with all phase 1 sites planned to be commissioned by December 2023 and phase 2 by December 2024.

Of the USD 8.5 billion (equivalent to ZAR 148 billion) of the International Partners Group's (IPG's) financing pledges to the JET IP, the three facilities set out in Table 5 are able to support private sector RE generation projects and should be able to catalyse further sources of financing. The three IPG financing facilities listed in Table 5 are also suited to supporting the development of battery storage projects, and to catalysing other sources of financing for these investments.

Table 5: International Partners Group (IPG) pledges suitable for RE generation

Lender	Facility	Instrument	Description
Development Finance Corporation (DFC) (USA)	USD 1 000 million	Commercial loans	Debt, guarantees and/or political risk insurance for private sector-led projects, with up to 30% direct equity or funds transaction in companies or funds Additionality criteria
British International Investment (BII) (UK) and Private Infrastructure Development Group (PIDG) UK	USD 500 million	Commercial facilities	Equity, debt and guarantees Additionality criteria
European Investment Bank (EIB)	EUR 200 million	Commercial loans	EIB contribution to DBSA's Embedded Generation Investment Programme that is co-financed by the Green Climate Fund

5.3 Electricity Transmission

The current electricity transmission network lacks the requisite capacity to accommodate the planned scale of RE generation which is scheduled for grid integration in the upcoming years.[11] In particular, the concentration of optimal RE resources in the Northern Cape and Eastern Cape is not matched by the grid capacity needed to transmit this power across the country. South Africa is confronted with the daunting task of constructing approximately 1 500 km of new transmission lines annually over the next decade. This is tenfold the average kilometres of transmission lines that Eskom has built in the past three years. Over the past decade, Eskom has procured and connected 4 347 km of transmission lines and 19 GVA of transformer capacity to enable the integration of power producers from rounds 1–5 of the REIPPPP. This is not at a fast enough pace or scale to address the electricity supply crisis or meet South Africa's

11 Eskom, SAWEA, SAPVIA. (2023). *South African Renewable Energy Grid Survey*.

decarbonisation commitments. The REIPPPP Bid Window 6 in 2022 was severely curtailed by the lack of grid connection capacity.

Eskom's Transmission Development Plan (TDP) estimates a financing shortfall for transmission infrastructure of about ZAR 250 billion. At this level of investment, 14 000 km of new power lines can be added by 2032 at a yearly rate of 1 500 km, up from a current yearly rate of only 300 km, as well as the installation of 122 600 MVA of new transformation capacity, representing 77% of Eskom's current installed base.

However, a number of challenges are identified in the TDP, including Eskom's liquidity position, the cost and delays associated with land acquisition, equipment procurement, environmental approvals, construction, and the substantial up-front capital requirements for long-term returns under uncertain tariff determinations by NERSA.

The TDP identifies that 16.6 GW of grid capacity for renewable generation can be unlocked by transformer investments.

Enabled by the Eskom debt relief from National Treasury (NT), Eskom transmission has secured capital projects expenditure approvals for the period 2023/24 to 2025/26. These investments are being made within Eskom's operating cash flow affordability without borrowing, in accordance with the debt relief conditions. However, the approved investments fall significantly short of meeting the national requirement.

The estimated financing gap for transmission infrastructure underscores the need to mobilise other sources of financing and other transmission project execution models. There is also increasing recognition in government that private investment in transmission is not only needed, but that there are proven models applicable in the South African context which are successful elsewhere. Furthermore, private investors, DFIs, and MDBs have confirmed their willingness and capacity to participate in both transmission and distribution infrastructure.

Given the challenges identified in the TDP, coupled with the debt relief conditions that place a moratorium on Eskom borrowing in the short term, the JET PMU in the Presidency and NT commissioned a study to evaluate off-balance sheet[12] financing mechanisms for transmission.

Table 6 summarises the key features of several off-balance sheet mechanisms, in relation to ownership, funding structure, payments, and tariff structure, as well as socio-economic benefits. This is followed by an assessment of the legal and regulatory provisions that will guide the policy choice and implementation considerations.

12 Off-balance sheet is defined in the International Financial Reporting Standards (IFRS) as items that are not recognised on a company's balance sheet, but will still have the potential to impact its financial position and performance.

Table 6: Off-balance sheet financing mechanisms

Mechanism	Ownership of assets	Funding structure	Payment/tariff structure	Socio-economic benefits
Independent Power Transmission (IPT)	Private investor will construct, own, and operate its asset IPT company is privately owned	Private investor will fund the project using its own resources, including equity and raising debt in an SPV[13]	Utility company will purchase the transmission capacity – bankability of project	Set out in the requirements and points scoring system included in the bidding process
Transmission network concession	NTSCA/Eskom SPV is privately owned	Private investor will fund the project using its own resources, including equity and raising debt in an SPV[14]	Cost-of-service approach or performance-based regulation	Set out in the requirements and points scoring system included in the bidding process
Generation-linked	IPP (generation) will connect their generation plant to the NTCSA/Eskom grid Private (IPP)	Connection cost and funding included in the construction capital of generation plant	Combined with generation tariff or separated	Set out in the requirements and points scoring system included in the bidding process
Joint venture	Joint Venture (JV) SPV holds existing and new transmission (Tx) Private investor holds majority shares in JV SPV	JV SPV raises the debt capital Shareholders will own a pro-rata equity	Vary depending on the underlying agreement – IPT, concession, or JV mechanisms	Additional socio-economic benefits during construction and operation phases

Independent Power Transmissions (IPTs) have been successfully implemented in various developing countries, providing a relatively simple solution for expanding a transmission grid. In the IPT model, the utility company (Eskom/National Transmission Company of South Africa (NTCSA)) enters a purchase or transmission services agreement (TSA) with an IPT, in which the IPT commits to providing its transmission line to the utility company, and, in return, the utility company will pay an agreed-upon availability fee. Concurrently, the IPT project company must obtain a transmission license from NERSA. Various services or purchase agreements will:

- Obligate the IPT company to design, engineer, procure, and construct the project and operate the transmission infrastructure, that is, conduct specific maintenance activities required to ensure that the line and other associated infrastructure are available to be used when

13 Special Purpose Vehicle (SPV). No direct financial contribution from the public sector and off-balance sheet for Eskom.
14 Special Purpose Vehicle (SPV). No direct financial contribution from the public sector and off-balance sheet for Eskom.

specified (note that this is not the same as operating the transmission system which remains an Eskom/NTCSA responsibility)

- Obligate the IPT company to make the capacity of the transmission infrastructure that constitutes the IPT available to Eskom/NTCSA
- Obligate Eskom/NTCSA to purchase the transmission capacity and make the payments for such capacity regardless of the quantity of energy that is transmitted by the project. Payments from Eskom/NTCSA to the IPT company will be reduced to the extent transmission capacity is not made available (availability deductions); and the project company is not obligated to expand the transmission line(s) it will construct, own, and operate.

The contractual arrangement for an IPT project can take three different forms: Build Own Operate (BOO); Build Own Operate Transfer (BOOT); or Build Operate Transfer (BOT). Procurement can be governed in one of two ways: (1) When not governed by a specific regulatory programme, Eskom/NTCSA as owner and operator of the national transmission system will handle the procurement; or (2) There could be a regulated IPT procurement programme similar to the REIPPPP through a dedicated IPT procurement office.

For an IPT financing model to be successfully implemented, several lessons[15] from South Africa's REIPPPP programme are applicable.

- An investment-friendly approach must be adopted. If deals demonstrate a reasonable level of profitability and effective management of key risks, there is a strong likelihood of attracting significant private sector interest. Operators and investors participating in the REIPPPP have displayed resilience in the face of past errors and policy changes within the power sector. While they are cautious about future policy adjustments, they remain confident in the longevity of their projects.
- External sources of financing should be exploited. International DFIs and MDBs have expressed a strong interest in transmission grid infrastructure investments and can play a pivotal role in enhancing internal capabilities for programme design and management. They can contribute to a reduction in project preparation costs, credit enhancements for project sponsors, and importantly, partial risk guarantees can bolster sovereign government guarantees.
- Well-structured, credible, and transparent procurement mechanisms and high-quality contracting documentation must be in place. A robust procurement mechanism is essential, including the issuance of RFPs, clearly defined qualifications and evaluation criteria, and the establishment of bankable purchase and implementation agreements. Transparent, cost-reflective, and unbundled pricing will need to be confirmed. Appropriate credit enhancement or security arrangements that render projects financially viable should be included.

15 World Bank. (2014). *Review of South Africa Renewable Energy IPP Process*. (https://documents1.worldbank.org/curated/en/413401468302464965/pdf/ACS88260WP0P1482120Box385262B00PUBLIC0.pdf).

Over the medium- to long-term, off-balance sheet options, such as the JV, generation-linked, and even partial divestiture, should also be explored.

Three concessional loan and three commercial loan facilities in the IPG pledge to the JET IP could be utilised for transmission grid investments. These are summarised in Table 7.

Table 7: IPG offers to the JET IP suitable for transmission grid investments

Lender	Facility	Instrument	Description
KfW	EUR 200 million	Concessional loan	Bilateral sovereign or loan to Eskom
AFD	EUR 500 million	Concessional loan	Bilateral sovereign or loan to Eskom
UK (AfDB)	USD 1 000 million	Guarantee (concessional loan)	Increases lending headroom of AfDB to the sovereign or Eskom by USD 1 billion
DFC (USA)	USD 1 000 million	Commercial facilities[16]	Debt, guarantees and/or political risk insurance for private sector-led projects, with up to 30% direct equity or funds transaction in companies or funds Additionality criteria
BII and PIDG (UK)	USD 500 million	Commercial facilities	Equity, debt, and guarantees Additionality criteria

The KfW, French Development Bank (AFD), and United Kingdom (UK) facilities are for bilateral sovereign/state-owned company (SOC) borrowing, while the Development Finance Corporation (DFC), British International Investment (BII), and Private Infrastructure Development Group (PIDG) facilities are for commercial lending to the private sector.

When the pledges were made and the JET IP 2023–2027 was compiled, it was assumed that Eskom would be in a position to enter into loan agreements to access some of these bilateral concessional funds for transmission investments. The Eskom debt relief conditions have subsequently halted this option, unless the Minister of Finance, on specific application, grants an exemption to Eskom to borrow.

In light of the pressing need to scale up transmission investment in the short term, and the length of time it will take to procure IPTs, the roadmap set out in Table 8 is recommended by the JET PMU for consideration by the relevant authorities.

16 In the case of an IPT or another form of PPP. Applies to BII and PIDG.

Table 8: Proposed roadmap for scaling up investment in transmission using JET IP facilities

	LEVEL 1: Eskom/NTCSA TDP enhancement	LEVEL 2: Piloting IPT and other private financing models	LEVEL 3: Long-term system to manage private investment in transmission
2023–2024	Eskom and NT assess Eskom/NTCSA capacity to scale and execute a larger TDP using JET IP concessional finance, subject to an exemption and sovereign guarantee approved Ministry of Finance and Eskom/NTCSA negotiate with IPG lenders to conclude optimal terms	Eskom and a suitable institution[17] agree on three pilots for IPTs An IPT procurement office[18]	Private transmission Investment policy prepared by the mandated ministries for approval by Cabinet and submission by the Shareholder Minister to the NTCSA Board
2024–2025	The chosen IPG concessional loans approved by Minister Eskom/NTCSA scales up transmission investment and purchase of transformers for key sites to unlock REIPPPP	Market engagement for the preparation of pilot procurements; conclude bid packages and open bid windows	Design of a regulatory framework or NTCSA policy for the procurement of IPTs and other private financing models
2025–2026	TDP execution at higher scale	Pilots procurement process and bids adjudication Lessons learnt inform the long-term system design	Establishment of the relevant procurement office, and preparation of procurement programme
2026–2027	TDP execution at higher scale	Three IPTs reach financial close and commence operations Lessons learnt inform the long-term system design	Procurement programme commences

17 DBSA is suitably capacitated to undertake this role based on it's mandate and track record.
18 DBSA could house this pilot procurement office.

5.4 Electricity Distribution

Significant investment will be required in the distribution network to accommodate the planned increase in RE penetration, including a significant increase in SSEG. The distribution network must be strengthened and expanded, as well as adapted to accommodate the intermittency of RE, such as wind and solar power. This necessitates the development of advanced grid management technologies, energy storage solutions, and smart grids to balance supply and demand effectively. Chapter 10 addresses the specific challenges experienced by municipalities in this regard and proposes sustainable financing mechanisms that can be deployed together with suitable governance arrangements within the framework of the Intergovernmental Fiscal Relations Act.

Eskom itself accounts for approximately 40% of electricity distribution in South Africa, with municipalities responsible for the balance. The Eskom distribution grid alone requires capital investment of ZAR 42.6 billion over the next five years to support around 250 major customers that will be added to the grid over the five-year horizon, including renewable generators. These distribution investments are closely linked to the TDP. For example, a new substation may require distribution infrastructure to connect it to the existing distribution network or to connect new bulk loads.

One of the primary challenges facing the distribution network is ageing and inefficient infrastructure. Much of the country's distribution infrastructure was constructed decades ago and has not been adequately maintained or upgraded. As a result, these networks suffer from high technical losses due to inefficiencies and are susceptible to breakdowns, leading to frequent power outages. The need for substantial investments in infrastructure upgrades and modernisations is paramount, not only to improve the reliability of the grid but also to accommodate the integration of RE sources.

The transition to New Energy Vehicles (NEVs) (see Chapter 7) also calls for distribution network planning to cater for charging infrastructure in a manner that supports the decarbonisation of the transport sector and ensures sustainability for these investments.

Equity is a central pillar of the JET, and South Africa faces the challenge of ensuring that all communities benefit from the transition. Historically, disadvantaged communities have had limited access to reliable electricity services. While significant progress has been made in expanding the distribution network to reach underserved areas, further investment is required to address energy poverty and promote social inclusion. Simultaneously, affordability remains a concern, as the cost of upgrading infrastructure and integrating renewable sources can result in higher electricity prices.

Grid resilience and cybersecurity are also emerging as critical challenges. As the energy transition progresses, the distribution network becomes more susceptible to cyberattacks and extreme weather events. Ensuring the security and resilience of the grid is paramount to prevent disruptions that could have far-reaching consequences. This includes investments in cybersecurity measures and disaster preparedness.

Regulatory and policy frameworks need to evolve to support the goals of the JET. In particular, there is a need for a coherent approach to wheeling of electricity from the Eskom network to municipal distribution networks and vice versa, to enable 'one-to-many' and 'many-to-many' electricity trading. At present, fragmented and inconsistent wheeling policies and tariffs make it difficult and time consuming to negotiate wheeling agreements, inhibiting the growth of private investment. To address this, a draft national wheeling framework has been submitted to NERSA for consideration which, if adopted, would apply to all licensed distributors.

5.5 Decommissioning, Repowering, and Repurposing of Retiring Coal Power Plants

The decommissioning of coal power plants has significant economic and social implications for employees and communities whose livelihoods are dependent on the value chains of these long-standing operations. The recent scheduled closure of the old Komati power station in Mpumalanga has highlighted the importance of site-specific planning for economic diversification, repowering, and repurposing investments to deliver new economic opportunities for the affected communities well ahead of decommissioning.

In terms of the IRP 2019 coal power plant decommissioning schedule, Eskom will decommission and repurpose 22 GW of coal-fired power plants in the Mpumalanga Province over the next 15 years, making a significant contribution to meeting South Africa's decarbonisation targets, and affecting the lives of many communities. The JET IP 2023–2027 is based on this assumption. A number of developments in 2023 are now influencing how this timeline will materialise in practice.

- The electricity supply crisis has led to a reconsideration by government and Eskom of the coal power plant decommissioning schedule, with Eskom suggesting possible delays in the decommissioning of some plants between now and 2030.
- NT has undertaken an independent study on the technical feasibility of continuing to operate the coal fleet beyond its current design life, and is currently assessing the financial and GHG emissions targets implications of doing so.
- NECOM is undertaking detailed modelling to determine the extent to which delays in the decommissioning of coal plants are necessary, based on the new capacity that is expected to materialise through implementation of the Energy Action Plan.

- The DMRE is currently updating the Integrated Resource Plan (IRP) 2019.
- The Eskom debt relief conditions prohibit Eskom from borrowing without explicit exemption from the Minister of Finance.
- Eskom's decommissioning of Komati power station in 2022 (as scheduled) has been met with criticism for not investing earlier in repurposing, repowering, and community development. The decommissioning of Komati pre-dates the JET IP, and the MDB funds that were raised by Eskom for Komati are not part of the JET IP pledges. Lessons from Komati have been well documented by the Presidential Climate Commission (PCC) and are now key inputs to the way in which the Accelerated Coal Transition Investment Plan (ACT IP) needs to be approached. The roadmap set out in this JET Implementation Plan is based on these lessons.

The work listed above will inform any future decision on changes to Eskom's decommissioning schedule. It will take into account the technical feasibility of any such changes, including: compliance with minimum emissions standards (MESs); their financial cost relative to investment in alternative energy sources; the commitments made in South Africa's NDC; other health and environmental considerations; and the extent to which any delays are necessary based on the expected supply-demand balance.

Based on the IRP 2019, South Africa submitted an expression of interest to the Climate Investment Funds (CIF) in 2020 for financing to support the decommissioning, repurposing, and repowering of retiring Eskom power stations through the CIF's Accelerating Coal Transition (ACT) Investment Programme. South Africa's ACT Investment Plan (ACT IP) was then formulated by Eskom, the Department of Forestry, Fisheries and Environment (DFFE), and the CIF and endorsed by the Clean Technology Fund's (CTF) Trust Fund Committee (TFC), to retire and replace coal generation assets, support renewable and energy efficiency programmes, and manage a Just Transition (JT) for the affected communities and workers. The endorsed ACT IP is the basis for further project developments that, if approved by the CIF TFC, would total up to USD 500 million in CIF grants and highly concessional loans, as well as co-financing in the form of MDB concessional loans, and commercial financing (together totalling USD 2.6 billion), thus forming a substantive part of the financing pledged by the international community to the JET IP at COP26 in 2021.

The ACT IP is for the phased closure of the three power plants (Hendrina, Grootvlei, and Camden), which were scheduled in the IRP 2019 to be decommissioned between 2023 and 2027 and is designed to support the following:

- Investment in repurposing and repowering with RE technology through partnerships between the public and private sectors
- Mpumalanga community-driven investments in the future Green economy, including afforestation, agriculture, tourism, and the RE value chain

- An Energy Efficiency in Public Buildings and Infrastructure Programme (EEPBIP) for social and economic development, with an initial focus on the Mpumalanga Province.

Table 9 shows the allocation of financing earmarked under the ACT IP for these initiatives. The majority of the funding is concessional loans offered by the MDBs for repurposing and capacity replacement of coal-fired power plants, combined with investment by the private sector. Of the CIF funding allocated, USD 50 million is grants, and USD 450 million is provided as highly concessional loans.

Table 9: Funding (USD) and sources for the ACT IP

Components	CIF	MDBs			Country counter-parts	Private sector	Others	Total
		IBRD	IFC	AfDB				
Project 1: Retiring and Replacing Coal-based Power Generation Capacity								
Decommissioning	10	100	-	40	-	-	-	150
Repurposing and capacity replacement	230	375	70	165	300	860	-	2 000
Socio-economic Impact	110	90	-	-	-	-	-	200
Project 2: Mpumalanga Community Development Project								
Community-driven development	100	5	-	5	-	15	30	155
Project 3: Energy Efficiency, Distributed Generation and Community Generation Programmes								
EE and distributed generation	50	5	7	45	-	-	-	100
IP Total	**500**	**570**	**70**	**255**	**300**	**875**	**30**	**2 605**

Given South Africa's ageing coal fleet, it is only a question of a few years in timing as to when these and much larger investments will need to be made in decommissioning, repowering, and repurposing at coal power plant sites across Mpumalanga. Furthermore, the lessons from Komati, the first power plant to be decommissioned, clearly conclude that it is essential to commence with repurposing, repowering projects, and community development investments well in advance of decommissioning the old coal plants. In short, workers and communities must be benefiting from the new economic opportunities long before the old sources of livelihoods are removed. The significant technical advantage supporting this approach is that there is ample transmission grid capacity in Mpumalanga to take up renewable generation. Therefore, the priority is to front-load work on the repowering, repurposing, and community development initiatives while decommissioning schedules are being re-evaluated.

With this perspective, the JET Implementation Plan sets out a high-level roadmap of three parallel levels of actions over five years that seeks to ensure that South Africa benefits from the highly concessional international financing via the CIF that is available to support the complex process of decommissioning, repowering, and repurposing coal power plants that will inevitably need to take place in the coming decade.

The ACT IP roadmap set out in Table 10 is based on the following propositions:

- Arising from the outcomes of the NT studies, any three coal power plants can be identified by Cabinet for the front-loading of repurposing, repowering, and community development initiatives. Cabinet's decision will be motivated to the CIF to request an adjustment to the original three ACT IP target sites, if needed.
- Bespoke, community-level, and co-created plans are required for each site to address the site-specific needs of transitioning away from coal-based incomes and transitioning into new economic opportunities. This work must be facilitated by suitably skilled and dedicated planning teams working with Eskom as the asset's owner, community-based organisations, trade unions, business associations, and the provincial and municipal authorities as soon as the decision is made by Cabinet on the chosen sites. Development opportunities for those affected may also be identified beyond each specific site.
- A decision is needed on whether or not Eskom will be the borrower for the bilateral concessional loans in the ACT IP package and, if not, which organ of state will take this role.
- The CIF and MDBs will be requested to approve funding draw-downs by the borrower for front-loaded community development initiatives at the chosen sites.
- The ACT IP work must be proactively managed by a dedicated Projects Management Office (PMO) whose location must be decided by a task team comprising representatives from the Presidency, Eskom, NT, DMRE, DFFE, and Department of Public Enterprises (DPE).
- Repurposing and repowering are targeted for private sector investment, and commercial capital is readily available for RE generation projects. Eskom's commercial role in these new investments will need to be resolved in a consideration, per site, of the repurposing of Eskom assets and the employment prospects for Eskom staff. The commercial model options must also ensure that both short- and long-term benefits and co-benefits materialise in a tangible way for the local communities.

Table 10: High-level roadmap for implementation of the ACT IP

	Level 1: Enablement	Level 2: Bespoke localised planning and early investments	Level 3: Repurposing and repowering
2023–2024	Recommendations to CIF to approve the front-loading of ACT IP investments in repurposing, repowering, and community projects at three CPP sites to be decided by Cabinet ACT IP task team to drive implementation (Presidency, Eskom, DPE, NT, DMRE, DFFE) Decision by Minister of Finance on whether or not Eskom can borrow from CIF and the MDBs for the ACT IP Decision on the location and resourcing of an ACT IP PMO Decisions on partnership models for repurposing and repowering, and the procurement method	Service providers[19] to develop bespoke repurposing, repowering, and community development plans with the local stakeholders at each CPP site Submission of bespoke plans for funding approvals by CIF and MDBs	Preparation of RFPs for repurposing and repowering Mobilisation of MDB and counterpart funding from local and international DFIs
2025–2027	Functioning ACT IP PMO leads planning and delivery	Draw-down of CIF grants and loans[20] for approved community development and economic diversification initiatives at each CPP site Draw-down of MDB finance[21] earmarked for impact-mitigation, community-driven projects	Procurement of repurposing and repowering partners for each site

19 Procured subject to the location of the ACT IP PMO.
20 Subject to decisions on which entity is the borrower for the ACT IP.
21 Subject to decisions on which entity is the borrower for the ACT IP.

5.6 Planning, Monitoring and Evaluation

The Theory of Change for South Africa's electricity sector envisages a transition from coal-dependent power generation to a sustainable, low-carbon future. It begins by promoting investments in RE infrastructure. As renewable capacity increases, the theory anticipates a reduction in GHG emissions and decreased reliance on coal, improving environmental sustainability. Simultaneously, the transition aims to create jobs, stimulate economic growth, and enhance energy access, particularly in underserved areas. Through policy support, private sector partnerships, and community engagement, South Africa aspires to establish a resilient and inclusive RE ecosystem that benefits both the environment and its citizens.

Figure 4: Theory of Change – Electricity

OUTPUTS (O)

O01

Decisions concluded on use of JET IP concessional loans for ACT IP and transmission investments

O02

NTCSA board appointed and executive management operational

O03

NTCSA strategy supported by an updated TDP with funding secured to meet operational objectives

O04

Off-balance sheet solutions finalised for Eskom that enable addressing South Africa's transmission investment need

O05

Creation of project management office for ACT IP

O06

Updated regulatory and legal framework for IPTs including guidelines on transmission licences

O07

Assessment conducted of the capacity and capability of relevant municipalities and Eskom for upgrading distribution infrastructure

O08

Institutional responsibility confirmed for the procurement of IPTs

O09

Investment implementation plans finalised including strategies to access the relevant operational skill and financial resources for the investment need

SHORT-TERM (ST) OUTCOMES

Changes in system and capacity

ST01

Concessional loans slgned for transmission infrastructure

ST02

Updated ACT IP approved by CIF Board

ST03

NTCSA operational and qualified non-executive directors appointed

ST04

Independent power transmission contracts are concluded with operators

ST05

IPT procurements in progress

ST06

Appropriate wheeling frameworks concluded

MEDIUM-TERM (MT) OUTCOMES
Changes in behaviour and performance

MT01
Acceleration of repowering and repurposing initiatives at chosen Eskom coal-fired power stations which support Mpumalanga's economic diversification

MT02
ACT IP provides Eskom with a blueprint to decommissioning other chosen coal-fired power stations

MT03
Required 14 000 kms of new transmission infrastructure achieved by 2032

MT04
Necessary upgrades to distribution implemented across the country

MT05
GW of RE generated through stand-alone commercial and industrial investments increases security of electricity supply and reduces energy costs

MT06
IPT contracts concluded with operators and construction commenced

JET IP IMPACT (I)

I01
GHG emissions reduced

I02
Social, economic, and environmental development co-benefits notably improved air quality

I03
Reliable, secure electricity supply

I04
Consideration of new models for the nation's electricity needs

I05
Jobs created in the electricity sector

WIDER IMPACT

Transition to a low-carbon economy and a just, climate-resilient society by mid-century

Table 11: The monitoring and evaluation (M&E) framework for JET IP investments in electricity

Narrative summary	Objective	Indicator
Impacts		
Reliable, secure electricity supply with access for low-income households	Reduction in energy poverty	Households in energy poverty
Jobs created in RE and transmission supply chains	Number of jobs created in the identified industries	Numbers
Consideration of new models for the nation's electricity needs	New models due to improved grid	New models
GHG emissions reduced	Reduced GHG emissions	CO_2 equivalent
Social, economic, and environmental co-benefits notably improved air quality	Improved air quality levels	Air quality levels
Medium-term outcomes		
Acceleration of repowering and repurposing initiatives at chosen Eskom coal-fired power stations	Repowering at coal-fired power stations	MW
	Repurposing at coal-fired power stations	Rands
ACT IP provides a blueprint to decommissioning other coal-fired power stations	Agreement on targets and standards	Approved operating standard manual
Required c.14 000 kms achieved	Grid infrastructure for renewable generation built	Km
		MW
Necessary upgrades to distribution implemented across the country	Upgraded distribution network	km
		MW
Growth in local supply chain for RE and transmission	Investment in RE supply chain	Rands
	Investment in transmission supply chain	Rands

Narrative summary	Objective	Indicator
Short-term outcomes		
Unlocking concessional funding from the IPG package	Disbursement of IPG funding	Rand
	Contract for concessional terms	Cost of finance Financial covenants
Updated ACT IP approved by CIF Board	Update ACT IP	Approved decommissioning plan Approved repowering plan Approved repurposing plan
	CIF Board approval	Approved application
Operational NTCSA	Independent transmission company with its own balance sheet	Board of Directors approved
		Take-on financial statements for NTCSA
Independent power transmission contracts are concluded with operators	Enable NTCSA to procure from the market outside of Eskom	Licence guidelines Approved procurement framework Signed contracts
Municipal support programme for distribution upgrades	Support planning at municipal levels	Implementing partners approved
Appropriate wheeling framework concluded	Approved framework	NERSA documents

THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Chapter 6:
MPUMALANGA JUST TRANSITION

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- articulate the opportunities and challenges that need consideration in the implementation of Mpumalanga's Just Energy Transition (JET)
- demonstrate the alignment between the objectives of the JET IP and the provincial government's strategy to diversify Mpumalanga's economy
- show how existing structures set up by the provincial government will be supported by the JET Project Management Unit (PMU) and national and international stakeholders to achieve JET IP outcomes.

6.1 Context

The Mpumalanga Province is at the heart of what has been termed the 'Minerals Energy Complex', the historic core of South Africa's economy, which was anchored on mining, metal, mining refining and processing, petro-chemicals, and general manufacturing.[22] The Mpumalanga Province will be the most affected by the low-carbon transition, as it is home to over 80% of the country's coal-fired power plants and 111 coal mines (of which 56 are still active), as well as Sasol's coal-to-liquid industrial complex. It is estimated that between 150 000 and 200 000 jobs are at risk (about 18% of the employed provincial labour force), including about 80 000 coal miners and 15 000 jobs in the transport sector. Other at-risk jobs are in formal and informal services, some of which have been traditionally female-dominated activities. Approximately 400 000 people are either directly or indirectly at risk.

Beyond jobs, municipalities' revenues and services will be affected. For example, coal accounts for almost half of local revenues in eMalahleni. Eskom and coal mining companies provide key

22 Nel, E., et al. (2023). *The regional implications of Just Transition in the world's most coal-dependent economy: The case of Mpumalanga, South Africa*. (https://www.frontiersin.org/articles/10.3389/frsc.2022.1059312/full).

public services, like water and electricity, to communities close to their sites. Without additional support, these municipalities may struggle to continue providing these services.[23]

The JET IP specifically recognised Mpumalanga's Just Transition (JT) investment need. The JET Implementation Plan sets out a roadmap for this investment need and details specific proactive interventions that need to be prioritised in the short term. The JET provides Mpumalanga with an opportunity to diversify its economy and attract new skills and financial capital. A relevant reference is Germany's Ruhr region, which diversified its economy from coal mining (employing 500 000 people in the mid-1950s) to a knowledge, service, and technology-based economy with a large university, and transport and engineering sectors.

Mpumalanga has certain attributes which positions it well for a similar diversification story.

- It has a well-connected infrastructure network that includes road connectivity, broadband connection, and electricity transmission lines, all built for the expansion of the mining and electricity sectors.
- It has a well-established agricultural sector, primed for growth. Mpumalanga is already a leading producer of fruits and nuts, among other agricultural products. The province possesses nearly 50% of South Africa's high potential arable land,[24] creating potential for the agricultural and tourism industries.
- The eastern part of the province is home to the Kruger National Park and other tourist hotspots, attracting millions of national and international tourists each year.
- It hosts a number of large corporates that have imported skills and resources from within the country and beyond South Africa. These corporates are incentivised to diversify their own business operations when considering the global shifts to lower carbon work.
- It has one of the youngest populations in the country, indicating the availability of a young workforce that can be trained and deployed into new industries.

Over a century of coal-driven development in Mpumalanga has had a heavy toll on the health of its citizens and has had visible impact on the environment. Like most coal regions, the province is a hotbed of pollutants, including nitrogen dioxide. Coal-powered plants and mines require large quantities of water, which disrupt hydrogeologic systems. The by-products of these two economic activities, which include acid mine drainage and surface run-off, have the potential to contaminate surface water and groundwater, threatening important water resources on which populations beyond Mpumalanga depend.

23 World Bank Group. (2022). *South Africa Country Climate and Development Report*. CCDR Series. World Bank, Washington, DC. (http://hdl.handle.net/10986/38216).
24 Centre for Strategic International Studies (CSIS) and Climate Investment Funds (CIF). (2021). *A Framework for Just Transitions*. (https://justtransitioninitiative.org/wp-content/uploads/2021/01/Framework-for-Just-Transitions_Download.pdf).

6.2 Stakeholders' Feedback

At the core of the JET are the concerns and impacts on stakeholders. To deliver on the 'just' component of the JET IP, stakeholder input needs to be the driving force that determines where investment is most critical to enable tangible impacts in Mpumalanga and beyond.

The Presidential Climate Commission (PCC) undertook a community and stakeholder consultation process in the province.[25] Some of the emerging themes included:

- **Communities understand the impact of climate change.** There is widespread acceptance that greenhouse gas (GHG) and local emissions must be reduced. Most communities, however, lack a clear understanding of the dynamics and details of what it means to achieve a Just Transition to a low-carbon and climate-resilient society. There is a clear indication that many communities fear this transition and the impact it will have on them, adding further challenges to their existing day-to-day struggles.
- **Communities are willing to support a Just Transition, but they want to see meaningful economic benefits arising from its implementation.** Community members want relevant and meaningful skills, appropriate to alternative development pathways in the transition, as well as access to ways of producing goods or services as the transition is taking place.
- **The Just Transition is a complex and nuanced discussion around trade-offs perceived between development and climate change.** Communities and individual stakeholders are concerned about the negative health and environmental impacts of mining and energy, but they are also concerned about potential job losses. In Mpumalanga, there are sections of the population who are vigorous in their defence of the mines. This is largely driven by concern for their livelihoods.
- **The government is widely seen as being unresponsive and negligent in its engagement with communities, or in responding to their concerns.** This lack of action on the side of government may hamper the Just Transition dialogue and implementation process.
- **Renewable Energy (RE) is often misunderstood.** Several community representatives expressed misinformation and a lack of understanding of the costs of, resources for, and contribution of RE to the Just Transition to a low-carbon and climate-resilient future in South Africa.
- **There is a lack of clarity as to the positioning of the Just Transition process within the provincial and district structures of South Africa.** The mainstreaming of the Just Transition process within existing provincial, district, and local governance frameworks needs to be urgently addressed to ensure coherent communication and action.

25 Presidential Climate Commission (PCC). (2022). *Community and Stakeholder Engagement on a Just Transition in South Africa*.

- **There are several local actors already working with communities on climate change and the Just Transition across the country.** The question therefore becomes: 'Is it possible to leverage financial support for these actors as partners in, and champions of, the Just Transition?'

6.3 Mpumalanga's Economic Diversification Opportunity

Mpumalanga's Green Economy Development Plan is a sub-set of the provincial government's Vision 2030 Implementation Plan and is strongly aligned to the JET objectives set out in the JET IP as per Table 12.

Table 12: JET IP objectives aligned with Mpumalanga Green Economy Development Plan objectives

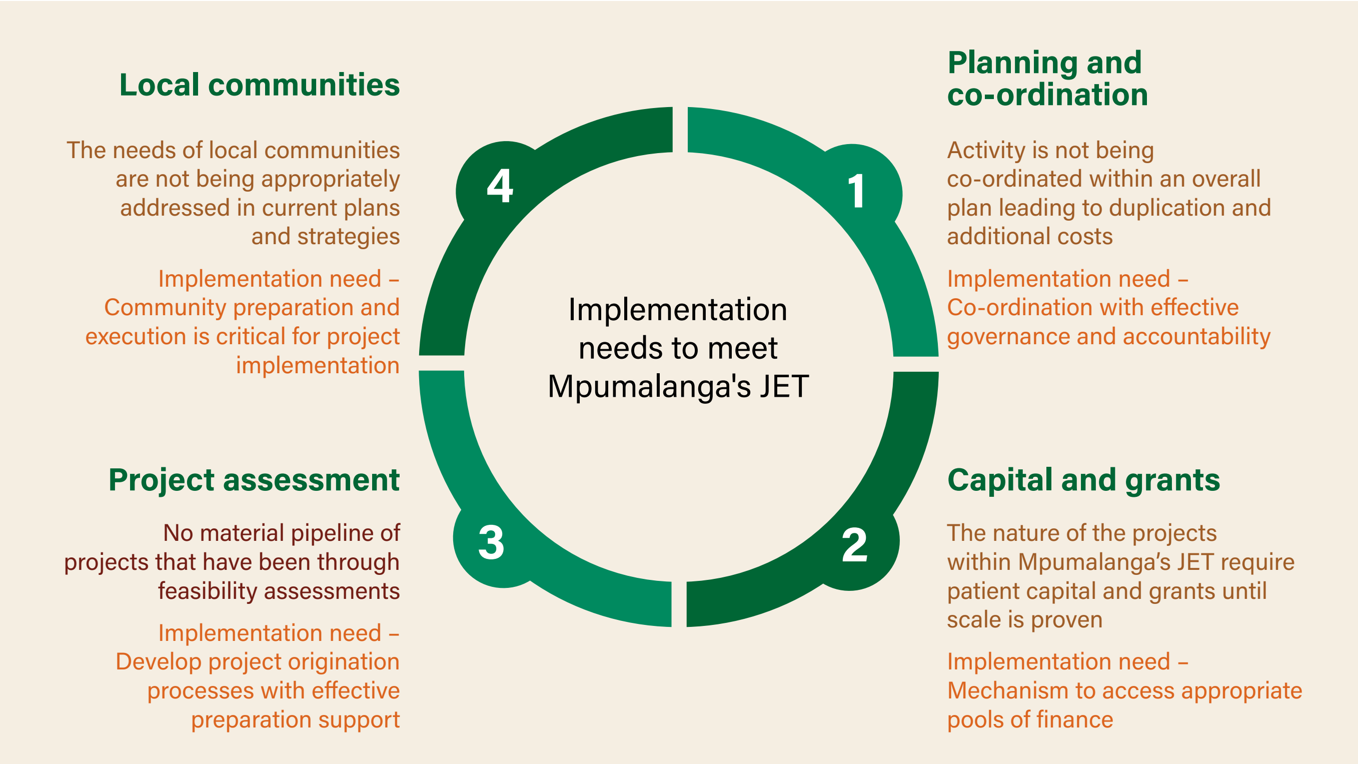
JET IP objectives	Mpumalanga Green Economy Development Plan objectives
Repurposing coal plants	RE generation with a focus on broadening the economic participation of this opportunity within the province Supporting alternative energy including Green Hydrogen (GH_2), waste-to-energy power projects, and the repurposing of existing coal-fired power stations (the latter being in partnership with the asset owner, Eskom)
Improving infrastructure and development	Investment into water infrastructure to improve drought resilience and provide a more conducive environment for industrialisation Enabling the transition of towns and urban areas through the roll-out of rooftop solar photovoltaics (PV), waste management according to circular economy principles, and the generation of electricity from landfill waste
Diversifying the local economy	Scaling agricultural opportunities by growing the existing skills in primary agriculture and promoting agri-processing development to capture a greater share of the value chain Building on the province's existing tourism footprint by enabling increased scale for existing business, whilst providing the necessary incentive to attract new hospitality enterprises to the province
Investing in youth and future generations **Building capacity for success** **Caring for the coal workforce**	Positioning Mpumalanga as a hub of skills development for the Green Economy with a specific focus on the battery storage supply chain circular economy opportunities

6.4 Implementation Roadmap for Mpumalanga

6.4.1 Challenges and Required Outputs

The key challenges and implementation needs are highlighted in Figure 5, showing the linkages with the implementation roadmap.

Figure 5: Implementation needs to meet Mpumalanga's JET



The Mpumalanga provincial government has several enabling structures in place to improve and champion co-ordination. This includes a dedicated resource in the Office of the Premier focusing on climate considerations and the creation of the Mpumalanga Green Cluster Agency (MGCA). These existing structures need to be augmented to introduce community and national role-players in the JET.

The nature of many of the Just Transition projects in Mpumalanga is that they require grant and patient capital. Sources of these financing instruments do exist in the local and global markets, but an effective mechanism is required to match projects with effective sources of funding.

Project readiness, which includes feasibility studies and the preparation of due diligence material, is dependent on the capacity of the relevant implementing agents in the province. There is recognition that the required skills within the province are not sufficient currently and that the implementation roadmap needs to consider how best to foster collaboration and increase collective capacity between interested parties.

Any co-ordinating structure needs to be complimented with a bottom-up approach to project origination, or projects will fail. This has been highlighted during the relevant stakeholder consultations and will need a specific focus in the implementation roadmap.

6.4.2 Implementation Approach

Figure 6: Mpumalanga implementation approach

Governance and co-ordination structures to be finalised. The objective is to align and streamline, taking into account national and regional considerations, alongside the needs of communities, labour, business, and industry within the province. This will improve implementation processes and outcomes.

Mapping assessment to be performed by the MGCA and the Provincial JT structures. Potential projects across the province that align to both the JET Implementation Plan and the Mpumalanga Green Economy Plan to be identified.

Principles to be set for the JET Funding Platform applications. Funding requirements of projects to be clarified for implementing agents operating within the province.

Ongoing programme management. Monitoring and evaluation whilst promoting co-ordination and resolving bottlenecks.

This approach to implementation will need to consider the following points that are consistent across all JET IP objectives:

- **Social participation** within the economic diversification opportunity needs to ensure that transition plans are co-created with the intended beneficiaries and that intended outcomes get distributed in a broad-based manner for people living in Mpumalanga.
- **Social protection** for those affected by the transition needs to be designed. In areas where similar transitions have been successful, there has been a set of social protections offered to impacted workers and communities enabling a smoother transition to new economic activities.
- Ensuring available capacity and the necessary level of resource support is required at the various **municipalities** across the province.
- Acceptance is needed that JET IP objectives must be augmented with a dedicated focus on enabling infrastructure including **road, rail, and water** across the province.
- Acknowledgement is required that many communities are anxious about the impact on lives and livelihoods that will arise with a shift away from coal. This will need a concerted effort on skills development and **front-ending repowering, and repurposing** opportunities around existing coal-fired power stations to demonstrate the future for livelihoods.

6.4.3 Mpumalanga's Overall Plan

The Mpumalanga provincial government, led by the Office of the Premier, has developed a series of plans that seek to address the challenges and opportunities presented by the Just Transition in the province. The draft Mpumalanga Just Transition Implementation Plan has identified the following six priorities:

1. Collaborate with relevant stakeholders to design and develop a strategy for the operationalisation of the Mpumalanga Just Transition and Climate Change Forum and Steering Committee and provide secretarial support to these bodies, Development Finance Institutions (DFIs), and other relevant partners.
2. Facilitate the development and implementation of a comprehensive, cohesive, and integrated suite of climate change policies and programmes.
3. Identify, monitor, and stay abreast of Just Transition initiatives planned and/or underway in Mpumalanga at a national, provincial, and local level.
4. Identify and manage technical support needs to support decision-making.
5. Advise and support the Office of the Premier, PMC, EXCO, and other relevant departments, partners, and structures on matters relating to the implementation of Just Transition initiatives in the province.

Drawing on this draft provincial plan, an interim Theory of Change has been developed with the Mpumalanga provincial government for the overall Just Transition. This Implementation Plan shows how the national initiatives for the JET IP, led by the Presidency, will contribute to the Mpumalanga plan. This Theory of Change will be revised as work progresses on the plan and strategy, with the involvement of a wider group of stakeholders. The Theory of Change is illustrated in Figure 7.

Figure 7: Theory of Change – Mpumalanga JT

INPUTS

- **Public finance**
- **Partner contributions**
- **Secretariat to drive the process**

OUTPUTS (O)

O01
Strategy for operationalisation of Mpumalanga JT developed

O02
Key co-ordination structures established

O03
Secretariat established to support government and stakeholders on JT initiatives

O04
Regular meetings and structures established for involving key stakeholders, including provincial donor co-ordination forum

O05
JT and economic diversification plan developed

O06
Comprehensive, coherent, and integrated suite of JT policies developed

O07
Pipeline of national, provincial, and local JT programmes and projects developed and tracked

O08
Strategic training interventions with SETAs, TVETs, universities, and partners

O09
Capacitation/awareness raising and involvement of communities on JT

O10
Secretariat supporting development of fundable projects and programmes

O11
M&E system for JT activities and outcomes developed

SHORT-TERM (ST) OUTCOMES
Changes in system and capacity

ST01
MUTTCCF and MUTSC operating and giving strategic direction and problem-solving

ST02
Key stakeholders involved and supporting relevant activities

ST03
JT economic diversification plan being implemented, supported by range of partners

ST04
Pipeline of projects and programmed being implemented, including quick wins

ST05
Investment happening in RE generation, transmission, and distribution

ST06
Projects being implemented to widen affordability of electricity

ST07
Communities informed and actively engaged in planning and implementing JT interventions

ST08
Advance planning for decommissioning, repurposing, and repowering

ST09
Plans being implemented for financial viability for municipalities

MEDIUM-TERM (MT) OUTCOMES
Changes in behaviour and performance

MT01
Infrastructure constructed/ rehabilitated/maintained

MT02
Agriculture thriving and more sustainable, reducing carbon intensity

MT03
Tourism thriving, while reducing carbon footprint

MT04
New industrial opportunities created, e.g. in batteries, cables

MT05
Skills enhanced to support economic opportunities and provide needed social services

MT06
Active economic and social interventions in at-risk communities creating jobs and supporting livelihoods

MT07
Municipalities financially stable

JET IP IMPACT (I)

I01
Reliable, secure electricity supply, with access for low-income households

I02
Jobs created in renewable energy, industrialisation, tourism, agriculture, etc.

I03
Sustainable livelihoods secured/strengthened for SMMEs/communities at risk from climate and transition impacts

I04
GHG emissions reduced

I05
Social, economic and environmental development co-benefits, e.g. improved air quality and regeneration

WIDER IMPACT

Transition to a low-carbon economy and a just, climate-resilient society by mid-century

As with the country as a whole, Mpumalanga aims to transition to a low-carbon economy and a just climate-resilient society by mid-century. The specific impacts Mpumalanga is looking for are as follows (as per the Theory of Change):

- A reliable and secure electricity supply that low-income households can access (I01)
- The creation of jobs both through the Just Transition, and also via economic diversification more broadly (I02) (livelihoods in a broader sense need to be more secure, especially in communities at particular risk from climate disasters or the economic shifts because of the Just Transition)
- GHG emissions must reduce (I04)
- Important co-benefits, for example, in land regeneration and improved air quality (I05).

To make the above happen, these changes in performance are needed in three to five years' time (medium-term outcomes):

- Infrastructure is constructed, rehabilitated, and maintained (MT01).
- Key sectors, including agriculture (MT02) and tourism (MT03), are thriving, and reducing their carbon intensity.
- New industrial opportunities are created for the Just Transition and economic diversification (MT04).
- To expand these sectors and improve employment and livelihoods, skills are enhanced and new skills are needed (MT05).
- Active social and economic interventions are needed, particularly in at-risk communities (MT06).
- Lastly, basic services are needed from municipalities whose finances are at-risk, and it is important that they are financially viable (MT07).

Enabling this requires these capacities and systems in place over the next one to two years (short-term outcomes):

- There must be effective leadership, direction, co-ordination, and problem-solving around the Just Transition at provincial level.
- A political forum is established with a technical Steering Committee to steer the system (ST01), with key stakeholders involved and supporting relevant activities (ST02).
- A Just Transition and Economic Diversification Plan needs to be directing investment (ST03), with a pipeline of projects and programmes being implemented, including quick wins (ST04).
- Investment is needed in RE (ST05) with projects to increase the affordability of electricity (ST06).

- Communities must be actively engaged in planning and implementing interventions (ST07), and most notably in areas where power plants are to be decommissioned, where advance planning and implementation is needed for decommissioning, repurposing, and repowering (ST08).
- Lastly, plans must be implemented to assure financial viability for municipalities (ST09).

These are the key deliverables needed in the short-term:

- A pipeline of Just Transition programmes and projects (O07) and skills development interventions (O08) needs to be facilitated by the Secretariat (O10).
- These need to be guided by a Just Transition and economic diversification plan (O05) and a strategy for operationalisation (O01), approved by the Forum which has been established (O02), and supported by a Secretariat (O03).
- Regular meetings and some structures will be needed for co-ordination of stakeholders (O04).
- Policies will need to be developed (O06) to enable these activities. Core to getting effective interventions, as well as social acceptance, is involvement of communities with awareness raising, capacity development, and involvement in Just Transition planning and interventions (O09).
- The Secretariat needs to be supported by a monitoring, evaluation, and learning (MEL) system (O11), which will link with the JET PMU MEL system.

6.5 Priority JET Interventions in Mpumalanga

Within Mpumalanga's overall plan, the JET PMU will focus on the following short-term outcomes and outputs:

- Sourcing finance for JET-related activities within Mpumalanga's plan, in particular through the JET Funding Platform (see Chapter 4)
- Enabling Mpumalanga's economic diversification plan by expediting repowering and repurposing opportunities (see Chapter 5) at the old coal power plant sites
- Ensuring that national interventions planned for skills development (see Chapter 9) and municipalities (see Chapter 10) are appropriately aligned within Mpumalanga's Implementation Plan.

This will be undertaken by:

- Utilising the JET Funding Platform to link appropriate sources of finance to the immediate project opportunities that have been identified by the provincial structures

- Implementing South Africa's Accelerated Coal Transition Investment Plan (ACT IP) in a manner that front-loads repurposing, repowering and community development at selected Eskom coal power stations, ahead of decommissioning
- Promoting community-driven projects that empower local people to shift their dependence on coal value chains by developing new economic opportunities alongside existing activities, and by playing stronger roles in defining their transition plans.
- Augmenting existing structures in Mpumalanga's overall plan with specific national JET Portfolios and workstreams as outlined in this JET Implementation Plan, particularly for skills development (see Chapter 9) and municipal capacity for the just transition (see Chapter 10).

6.5.1 JET Funding Platform

The JET PMU's JET Funding Platform (see Chapter 4) will be leveraged in Mpumalanga for the following:

- Developing appropriate standards on feasibility, due diligence, and reporting that must be applied to projects before they are included on the JET projects' pipeline and creating a repository of these reports
- Identifying interested funders and matching their offers and funding requirements with the demand-side pipeline in Mpumalanga
- Supporting sound project preparation by project originators to build grant management capability
- Creating a register of projects where funding was sourced via the JET Funding Platform to demonstrate a track record.

6.5.2 Implementing the ACT IP

The allocation of Country Investment Strategy (CIF) funding for the decommissioning, repowering, and repurposing of retiring coal power stations under the ACT IP represents a material portion of the broader International Partners Group (IPG) funding package that was pledged to South Africa. If managed well, the ACT IP will complement the province's economic diversification plan, balancing the planned retirement of coal-fired power stations with proactive interventions focused on new power generation developments and other new productive endeavours, and reskilling and caring for the coal workforce.

6.5.3 Skills Development and Municipalities

Planned provincial interventions for skills and municipalities need to be augmented with national support and capacity from these two cross-cutting Portfolios of the JET IP. This will be implemented with the introduction of two new workstreams in the provincial structures. These workstreams will include the institutional owners that are implementing skills and municipal interventions at a national level (see Chapters 9 and 10 respectively), ensuring a streamlined approach to the implementation of JET skills development and municipal JET initiatives in the province.

6.6 Outcomes and Indicators

Table 13 proposes an interim approach to monitoring and evaluation (M&E) for the Mpumalanga JET Implementation Plan.

Table 13: Proposed interim approach to M&E for Mpumalanga JET Implementation Plan

Narrative summary	Objective	Indicator
Impacts		
Reliable, secure electricity supply with access for low-income households	Reduction in energy poverty	Households in energy poverty
Jobs created in RE, industrialisation, tourism, agriculture, etc.	Number of jobs created in the identified industries	Numbers
Sustainable livelihoods secured/ strengthened for SMMEs/ communities at risk from climate and transition impacts	New SMMEs established and existing SMMEs expanded in Mpumalanga	Number of SMMEs
	Poverty levels reducing	Numbers of households below the food poverty line
GHG emissions and pollution are being reduced	Reduced GHG emissions	CO_2 equivalent emissions
	Improved water quality	Water quality
	Improved air quality	Air quality levels
Social, economic, and environmental co-benefits	Area of degraded land reduced	Hectares

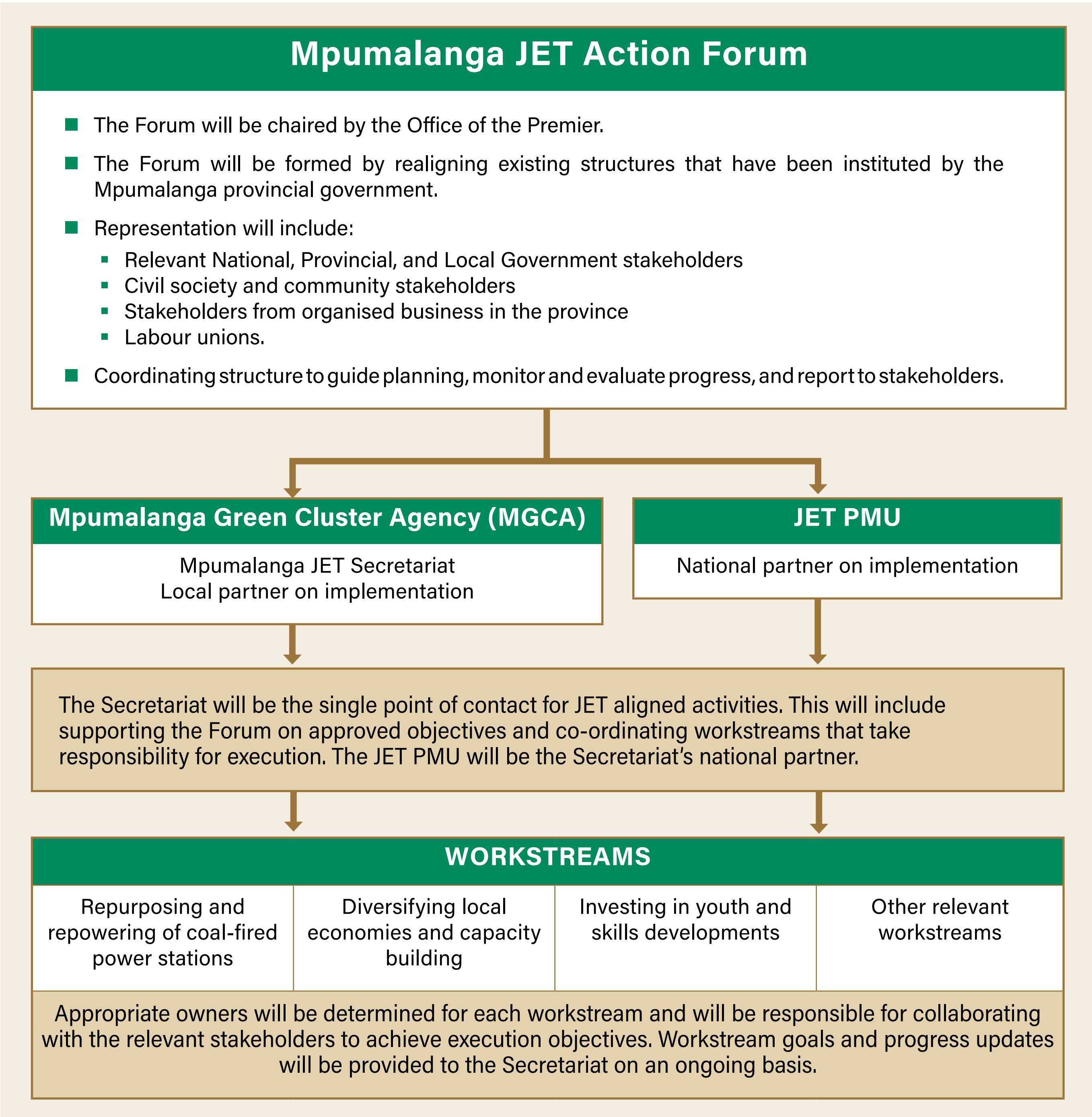
Narrative summary	Objective	Indicator
Medium-term outcomes		
Infrastructure constructed/ rehabilitated/maintained	Infrastructure constructed/ rehabilitated/maintained	RE infrastructure constructed (GW)
		Road infrastructure rehabilitated (km)
		Water infrastructure rehabilitated
		Distribution infrastructure rehabilitated/maintained (km)
Agriculture and tourism sectors thriving, with reduced carbon intensity	Agriculture sector thriving, with reduced carbon intensity	Growth in the agricultural output (Rand)
		CO_2 equivalent emissions
	Tourism sector thriving, with reduced carbon intensity	Growth in the agricultural output (Rand)
		CO_2 equivalent emissions
New industrial opportunities created in new and existing value chains	Investment and expansion in industry	Rand
Skills enhanced to support economic opportunities and provide needed social services	People skilled in relevant occupations	Numbers
Active economic and social interventions in at-risk communities creating jobs and supporting livelihoods	Interventions being implemented that support employment and livelihoods	Number and value of interventions focusing on employment and livelihoods
Municipalities financially stable	Municipalities financially stable	Number of clean audits

Narrative summary	Objective	Indicator
Short-term outcomes		
Mpumalanga JET Forum is operating and giving strategic direction and problem-solving	The Forum is meeting regularly and effectively	Meetings are happening at least quarterly, with a core group of stakeholders participating
	Member stakeholders have bought into the JET	Member role-players endorse and understand their responsibility and accountabilities as relates to the JET in Mpumalanga
JT and economic diversification plan is being implemented, supported by a range of partners	The Plan is being implemented	Components of the Plan are being implemented
		Emergent models of viable JT interventions being tested (e.g. Social Employment Fund, land regeneration)
	Stakeholders are taking on the roles required in the JET Implementation Plan	Allocation of staff and budget by key stakeholders towards actions envisaged in the Plan
Pipeline of projects and programmes is being implemented, including quick wins	Potential projects progressing as fast as possible while maintaining quality	Trends on planning/approved/disbursed JET projects
Investment happening in RE generation, transmission, and distribution	RE generation supported	MWs of new generation
	Investment mobilised in generation, transmission, and distribution	Rand
Communities actively informed and actively engaged in the planning and implementation of JT interventions	Systematic engagement with community stakeholders	Systematic involvement of communities in planning of interventions
		Number of constituencies who inputted into the JT interventions
Advanced planning for decommissioning, repurposing, and repowering	Preparation for decommissioning underway	Plans being implemented for repurposing and repowering plants being commissioned
Plans being implemented for financial viability for municipalities	Cost of supply studies available	Cost of supply studies undertaken for all municipalities
Plans being implemented for financial viability for municipalities	Municipalities implementing remedial measures	Municipalities implementing remedial measures

6.7 Governance

Guided by consultations with the provincial government, and mindful that the province has established a number of multi-stakeholder forums focused on the JET, the governance structure depicted in Figure 8 will drive Just Transition implementation in Mpumalanga.

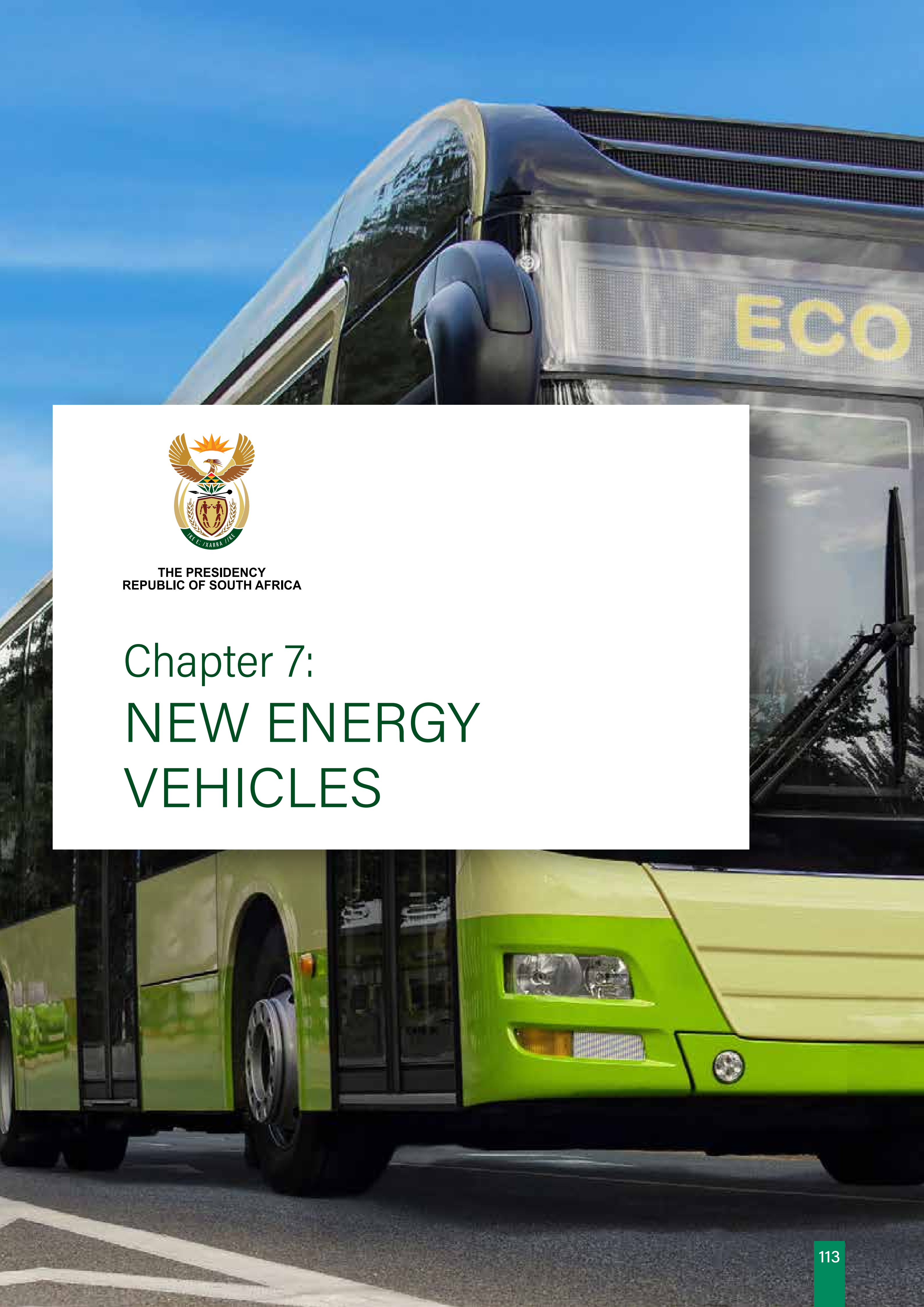
Figure 8: Mpumalanga JET implementation: Governance and institutional arrangements



The governance structure in Figure 8 brings together provincial and national institutions to drive JET implementation in Mpumalanga. Table 14 shows the main activities each key institution will be responsible for in this work.

Table 14: Key activities and institutional owners

Category	Activity	Institutional Owner
Governance and strategy	Convening the JET Forum	Office of the Premier
	Mpumalanga JET Secretariat	Mpumalanga Green Cluster Agency
	Developing strategy	Office of the Premier
	Constituting workstreams	Office of the Premier and JET PMU
	Enabling policy environment (local)	Office of the Premier
	Enabling policy environment (national)	JET PMU
Implementation	Local implementation partner	Mpumalanga Green Cluster Agency
	National implementation partner	JET PMU
Funding	Setting up JET Funding Platform	JET PMU
	Operationalisation of JET Funding Platform	JET PMU
	Project matchmaking	JET PMU
Monitoring and evaluation (M&E)	Setting KPIs and targets	All stakeholders through the Office of the Premier
	Monitoring implementation	Office of the Premier and JET PMU
	Evaluation implementation	Office of the Premier and JET PMU
	External reporting (including consultations)	Office of the Premier, Presidential Climate Commission (PCC), and JET PMU



THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Chapter 7:
NEW ENERGY VEHICLES

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- articulate actions that will drive the implementation of South Africa's transition from internal combustion engine (ICE) vehicles to New Energy Vehicles (NEVs) and stimulate growth of the local automotive and battery manufacturing value chains over the five-year period, starting 2023 until 2027/8
- assign institutional owners and targets to these actions to ensure the co-ordinated mobilisation of both effort and finance by relevant role-players in the public and private sector
- build on the work of current project developers to identify opportunities for scaling-up investments in viable business models while the NEV policy landscape is evolving.

7.1 Context

The framework for a Just Transition (JT) in South Africa[26] notes the importance of the country's automotive manufacturing industry, and the significant interdependencies between the industry and decarbonisation of the transport sector in a just and equitable manner. The rapid global transition from Internal Combustion Engine (ICE) vehicles to New Energy Vehicles (NEVs) presents both an existential challenge and a promising opportunity for South Africa. But, without a deliberate and co-ordinated local effort, the industry's sustainability is at risk and transport sector emissions will be on a trajectory that is inconsistent with the country's Nationally Determined Contribution (NDC) commitments.

26 Presidential Climate Commission (PCC). (2022).

A growing NEV sector could deliver significant Just Transition outcomes in the form of job retention in the at-risk automotive manufacturing hubs of Gauteng, KwaZulu-Natal, and the Eastern Cape. In addition, it will lead to reduced transport costs for the poor and reduced emissions along transport channels, new industrial employment in local NEV component supply chains, and continued access to export markets. A Just Transition means that the transport sector's decarbonisation effort must be undertaken in a way that contributes meaningfully to these social and economic outcomes.

The JET IP highlights the scale of investment needed for the transition to NEVs in South Africa's automotive value chain. It also notes that large numbers of South African workers and significant annual export earnings are at risk if the industry does not adapt to the rapid technological and regulatory changes occurring in South Africa's biggest vehicle export market destinations.

The JET IP estimates that an investment of ZAR 128.1 billion would be needed from 2023–2027 for the transport sector to contribute meaningfully to South Africa's decarbonisation commitments and to a Just Transition of the automotive industry. Initial work done by the Department of Trade, Industry and Competition (DTIC) estimated that, based on the most ambitious scenario of transition to NEVs, phase 1 for the NEV transition would require ZAR 68 billion until 2035 to support the local vehicle production value chain to shift from ICE to NEVs; and that a further ZAR 133 billion may be required in phase 2 to support local consumer transition. The DTIC is currently finalising the White Paper for electric vehicles (EVs) and, with National Treasury (NT), is also working on a NEV-support policy for phase 1, which is due to be announced in 2023/24.

The pace of the transition to NEVs will be affected by a number of factors, including: the availability of funding for the transition, particularly from JET IP partners; the speed of the grid transition to renewable energy; grid stability due to a reasonable reserve margin of energy supply over demand; technology developments that will affect price premiums for NEVs compared to ICE vehicles; and regulatory measures in major export markets. The scale of resources required for the transition will need stronger partnerships with both the private sector and global partners.

In this evolving landscape, the JET Implementation Plan sets out a JET Portfolio and Roadmap for the NEV sector that reflects current NEV initiatives by Development Finance Institutions (DFIs), municipalities, and the private sector, which are testing models that can be scaled as policy measures are implemented and as financing is mobilised. The JET Implementation Plan also sets out a proposition for the Industrial Development Corporation (IDC) to lead a co-ordinating platform with stakeholders to crowd in appropriate sources and types of finance to expedite growth in South Africa's NEV industry.

7.2 Stakeholders' Feedback

During the Presidential Climate Commission's (PCC's) consultations on the JET IP in early 2023, stakeholders raised several concerns about South Africa's transition to NEVs. Table 15 highlights these, categorised into themes, and shows how the concerns are addressed in this JET Implementation Plan.

Table 15: Stakeholder concerns

	Stakeholder concerns	How the concerns are addressed
Supply (jobs and localisation)	Dependency on the EU and export markets for locally made cars, places about 100 000 automotive sector jobs at risk - component and regional automotive hubs will be severely affected Eradicating poverty and inequality are more pressing matters than NEVs Investments must make a social contribution, and not just climate mitigation	The DTIC with NT, are finalising the NEV White Paper and review of the Automotive Production Development Programme (APDP) and incentive package to support the sector transition and protect employment While mostly exporting to Europe, the sector exports to over 150 countries - as the industry transitions, it will need to diversify and grow exports to other markets in Africa and the Middle East[27] Sustainable industrialisation of the automotive sector is a significant lever for increasing jobs and skills, poverty alleviation, and improved equality - in 2022, the industry created about 6 000 new jobs[28] Clarity on government's NEV policy and incentives will trigger investments in component localisation - in August 2023, ZAR 4.86 billion of investment was announced by over ten component companies[29]
Supply (battery value chain)	IDC needs to play a pivotal role in developing the battery value chain Private sector should also finance the development of the battery industry, not only DFIs and government	The DTIC, with the IDC, is currently developing the national battery strategy - the IDC currently has a ZAR 19 billion battery value chain project pipeline Investment in the battery value chain will require multiple partners from government, DFIs, and the private sector - the investment cost and risk are substantial and no one stakeholder can drive this initiative alone International incentives for battery production are increasingly competitive and difficult to match in purely financial terms - South Africa will require an appropriate policy response to support the industry's development

27 National Association of Automobile Manufacturers of South Africa (NAAMSA). (2023). *The Export Manual*.
28 NAAMSA. (2023). *The Export Manual*.
29 (https://www.moneyweb.co.za/news/economy/auto-component-companies-pledge-to-invest-r4-86bn-by-end-2024/).

	Stakeholder concerns	How the concerns are addressed
Demand (infrastructure)	Charging infrastructure should allow for renewables The transition must not make municipalities worse off	Investments in e-mobility projects demonstrate positive socio-economic impact, such as higher driver earnings and youth employment - the lower total cost of ownership (TCO) value proposition of NEVs should lower the cost of public transport Charging infrastructure investment will support investment in renewables and energy storage and lower demand on the grid Infrastructure investments for public transport and mobility will create an opportunity for municipalities and Eskom to diversify their revenue mix to a growing NEV sector and home charging
Funding	Funding must not place a burden on South Africa Different types of funding must be considered to lower the high cost of capital	Grant and concessional loan funding is needed to lower the cost to support medium-sized businesses and new entrants into the NEV transportation and manufacturing sectors and compensate for the costs of transition NEV policy incentives will further lower the cost of funding for automotive Original Equipment Manufacturing (OEMs) and supply chain localisation The rapid scaling of the public transport and mobility programmes will attract private and venture capital
Co-ordination	Strong planning alignment is required due to overlaps between GH_2, NEVs, and electricity planning	The Implementation Plan proposes that IDC play a lead co-ordinating role in both NEVs and GH_2 investments, to align and optimise industrial development within government, and developments in these sectors
Demand **(consumer purchase, public transport, logistics)**	Too much focus on EV incentives for private car use Need to focus on public transport to address inequality and justice Not enough emphasis on the role of municipalities, public transport, and logistics as drivers for decarbonisation	Presently no incentives for private car use conversions to NEVs, due to fiscal affordability constraints and timing considerations Municipalities must play a key role in the transition of public transport - three cities are planning to implement NEV bus programmes The Development Bank of South Africa (DBSA) and IDC are building funding programmes for NEV public transport and mobility/logistics to support pilots and localisation - these programmes require approximately ZAR 16 billion Road-to-rail initiatives need to be developed with the relevant SOCs

	Stakeholder concerns	How the concerns are addressed
Policy and regulation	Need for national policy commitment and an incentive programme to transition the automotive industry to NEVs Need for supply-side incentives to drive OEM conversion to NEVs Need for demand-side incentives to transition public transport to NEVs	The DTIC published a Green Paper in 2021, opening a discussion on the country's approach to NEV transition The DTIC are currently finalising the NEV White Paper, which clarifies the country's approach to the transition, including how government will incentivise the NEV transition The JET Implementation Plan recommends co-ordinated planning to design a programme of demand-side incentive measures for public transport transition to NEVs

7.3 Managing the Change

South Africa's NEV vision is articulated in the DTIC's White Paper that is currently being finalised within government. It sets out an approach on transitioning the automotive assembly and component manufacturing base from ICE to NEVs such that the country can build on its competitive industrial competency to establish a globally competitive NEV assembly and supply chain. The overarching strategy for decarbonising the transportation sector is further echoed by the Department of Transport (DoT) Green Transport Strategy (2018–2050), which aims for the transport sector to contribute 5% to South Africa's total greenhouse gas (GHG) emissions, down from about 10%. The JET IP targets transport sector emissions reduction and socio-economic benefits whilst supporting the country's manufacturing ambitions and the adoption of NEV technology and related infrastructure in the various market segments. The JET Implementation Plan strives to identify sources of financing for the identified investment needs and to co-ordinate investments.

Figure 9: Theory of Change – NEVs

OUTPUTS (O)

FUNDING

O01 Funding

Introduction of government's NEV incentive scheme for automotive value chain (DTIC)

O02 Funding

New grants and concessional loan financing secured from global and domestic sources to increase the scale at which NEV mobility and public transport projects can be implemented (IDC)

SUPPLY

O03 Supply

Reduced import taxes on NEVs and specific component parts, such as batteries and power electronics (NT)

O04 Supply

Financing sourced to enable uYilo's Kick Start Fund to scale technology uptake support for SMEs

O05 Supply

South African National Battery Value Chain Strategic Plan developed and adopted

DEMAND

O06 Demand

Collaborative plan between IDC, DBSA, DTIC, DoT, taxi industry, subsidised bus companies, provinces, and metros to adapt the use of existing subsidies for public transport to incentivise transition to NEVs (DoT)

O07 Demand

Review by NT and DTIC of the tax regime that is constraining demand for NEVs and preferred option agreed (NT)

O08 Demand

Increased international grant and concessional financing targeted through the IDC and DBSA to support early-stage preparation for a growing pipeline of mobility and public transport NEV projects by private developers (JET PMU)

O09 Demand

Government task team designs balanced and affordable demand-side incentives for NEVs, and disincentives for carbon intensive tail pipe emissions, supported by international TA (DTIC, NT)

O10 Demand

Engagement with insurance companies and commercial banks on de-risking NEV adoption (IDC/DBSA)

SHARED INFRA-STRUCTURE

O11 Shared infrastructure

Collaborative analysis between stakeholders of NEV charging infrastructure short- and long-term needs, current developments, current critical infrastructure funds, and opportunities that results in a co-ordinated national strategy and plan for investments to scale-up over the next five years (Eskom Distribution, NAAMSA)

SKILLS

O12 Skills

Consolidated national skilling and job transition programme agreed that addresses the evolving capability requirements of the NEV sector (National Association of Automobile Manufacturers of South Africa (NAAMSA), National Association of Automotive Component and Allied Manufacturers (NAACAM))

POLICY AND REGULATIONS

O13 Policy and regulations

Finalised NEV policy by DTIC and updated Green Transport Strategy by DoT

O14 Policy and regulations

Agreement between South Africa and EU on automotive trade transition plan that allows continued exports to the EU while local industry transitions its production systems (DTIC)

O15 Policy and regulations

Study leads to policy developed on a critical minerals benefits incentive policy (DTIC, NT, DMRE)

O16 Policy and regulations

Regulatory standards for NEVs developed further

SHORT-TERM (ST) OUTCOMES
Changes in system and capacity

ST01 Funding
New incentive supports OEM business case for NEV in South Africa

ST02 Funding
Current projects advance to implementation and the pipeline of NEV mobility and public transport projects increases

ST03 Supply
Pipeline of NEV mobility and public transport projects increases due to lower cost projections

ST04 Supply
Kick Start Fund supports increasing number of SMEs to take up new technology solutions

ST05 Supply
Funding raised for implementation of the battery industry value chain strategy, based on bankable business cases for battery industry projects

ST06 Demand
Solution options identified by role-players are costed and reviewed by relevant authorities

ST07 Demand
Introduction of incentives to unlock new investments in public transport

ST08 Demand
Tax reforms implemented

ST09 Demand
Current IDC and DBSA-supported projects advance to implementation, and the pipeline of NEV mobility and public transport projects increases

ST10 Demand
Demand-side incentives and disincentives implemented

ST11 Demand
Lower insurance premiums for NEVs and affordable asset finance products for NEVs

ST12 Shared infrastructure
EV charging infrastructure investments increase

ST13 Skills
Skills programme roll-out

ST14 Policy and regulations
Policy certainty and final government roadmap and position announced

ST15 Policy and regulations
Current automotive exports to EU protected under an agreed timeframe for NEV transition

ST16 Policy and regulations
Policy certainty regarding South Africa's ambition to become the critical minerals beneficiation hub for Sub-Saharan Africa

MEDIUM-TERM (MT) OUTCOMES
Changes in behaviour and performance

MT01 Funding
OEMs invest in South Africa for battery electric vehicle (BEV) production

MT02 Supply
SME growth and employment, skills development

MT03 Supply
Increased investment in battery mineral and precursor supply chain

MT04 Demand
Lower project cost for public transport NEV projects and improved viability

MT05 Demand
Public sector bus fleets are transitioning to NEVs, logistics fleet conversion moves to scale, and private NEV expanding

MT06 Skills, policy and regulations
Investors investing in battery and vehicle manufacturing and supply chains

JET IP IMPACT (I)

I01 GHG reductions

I02 Economic diversification and inclusive growth/job creation

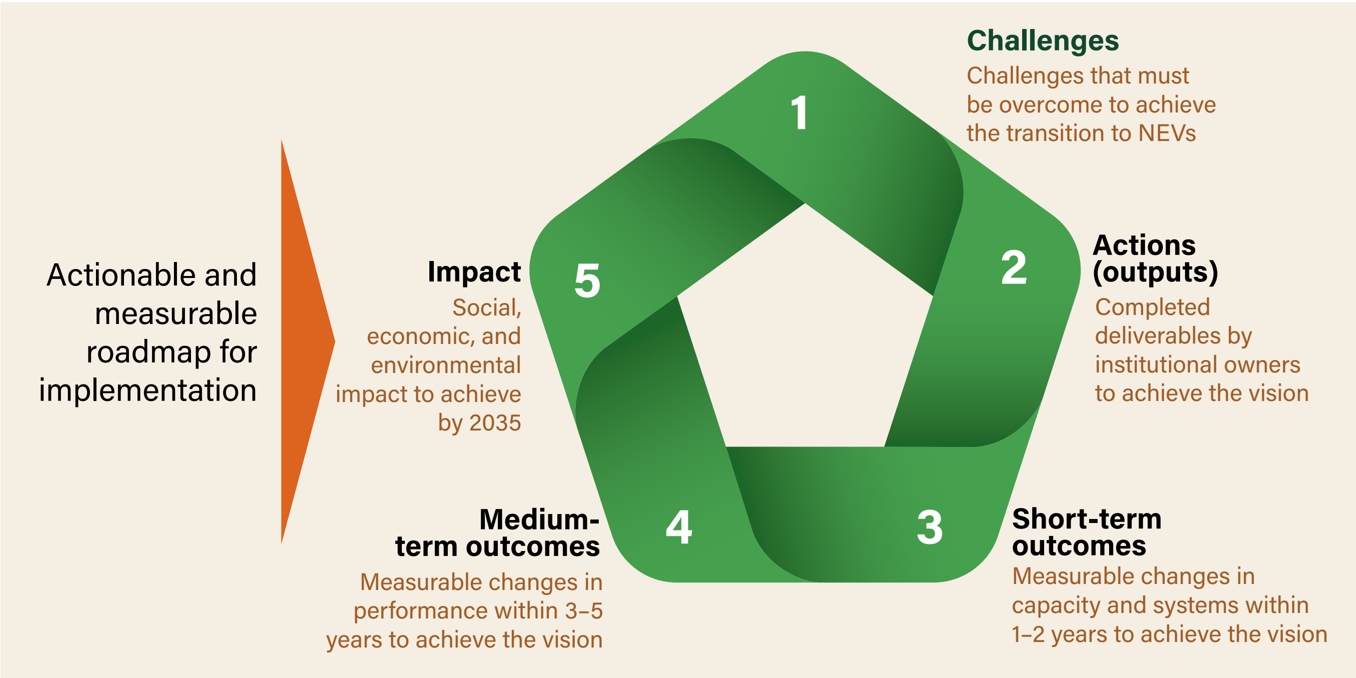
I03 Reduction in air pollution

WIDER IMPACT

Transition to a low-carbon economy and a just, climate-resilient society by mid-century

Achieving this vision requires the adoption of a co-ordinated national implementation and monitoring plan to ensure continuous progress. The JET Implementation Plan uses the Theory of Change to articulate an actionable and measurable roadmap, using five dimensions, as shown in Figure 10.

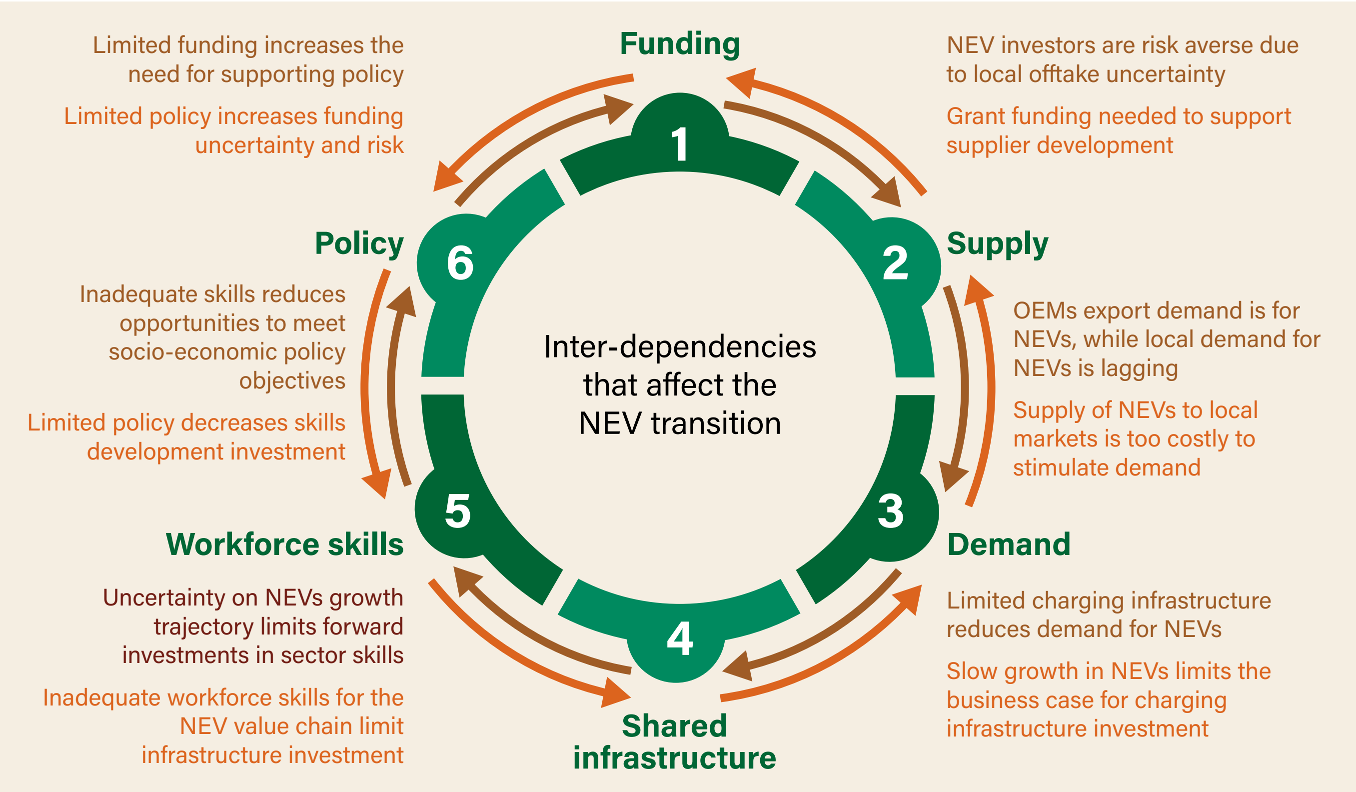
Figure 10: Five dimensions to articulate an actionable and measurable roadmap



7.3.1 Challenges and Outputs

As is typical of nascent stages in new industrial developments, there are six inter-dependent challenges that affect the achievement of the automotive sector's transition to NEVs, as shown in Figure 11.

Figure 11: Six inter-dependencies that affect the NEV transition



The transition of the automotive sector from ICE to NEVs in the next decade will be underpinned by targeted interventions to support both supply-side and demand-side requirements, as summarised in Table 16. The challenges to doing so, the sequencing of measures and goals, and the outputs required to address these challenges are described following Table 16. Table 17 shows the supply-side funding required in the next five years by instrument for automotive manufacturing, automotive supply chain, and battery value chain investments. Table 18 sets out the outcomes and impact targets.

Table 16: Supply-side and demand-side requirements

Supply-side requirements	Demand-side requirements
Investments by existing OEMs Investments by new OEMs Investments in local supply chain manufacturing, including minerals and battery supply chains	Public transport Fleet and logistics procurement, including road-to-rail initiatives Charging infrastructure Consumer purchases and local market development

7.3.1.1 **Funding challenges**

Original equipment manufacturers (OEMs) with automotive production plants in South Africa have proposed that government provide a range of cash incentives and tax reductions to support a transition to NEVs in their seven- to ten-year planning cycles, including incentives for local consumer adoption of NEVs. The DTIC and NT will make announcements on the supply-side NEV incentive programme in Q4 2023/Q1 2024, but there are fiscal constraints to what is affordable. Some OEMs have announced initial NEV production plans for South Africa, and other OEMs are likely to follow once the new Automotive Production Development Programme (APDP) NEV incentives are introduced by government. This will likely spur additional investment by component manufacturers (CMs) to meet local content targets.

Demand-side cash incentives for private vehicle users to convert to NEVs are unlikely to be viable for the fiscus in the current economic climate. This will limit the extent to which the domestic consumer markets can create demand for NEVs locally, with expectations that these manufacturing jobs will remain strongly dependant on current and new export markets, including the European Union (EU), United Kingdon (UK), and United States of America (USA).

South Africa's DFIs have taken the lead in providing blended financing support to pioneering NEV project developers and municipalities, but the availability of low-cost capital is insufficient to drive these initiatives at scale. The private sector is using commercial capital to fund some corporate fleet conversions and associated charging infrastructure, where the total cost of ownership warrants these investments. Notably, there are minimal funds earmarked for the NEV sector in the pledges of grants and concessional loans made by the International Partnership Group (IPG) and other international funders of South Africa's JET IP, either to support local demand or supply. This will need to change to enable a Just Transition from ICE to NEV production, and subsequently, in local consumption.

Funding will also be required to unlock the potential of a battery value chain in South Africa, which cuts across the transition plan, as energy storage is required for mobility, renewables, and other infrastructure. JET funds are required to catalyse this segment for the betterment of other industries in line with decarbonisation goals.

The supply-side funding required in the next five years is set out in Table 17, by instrument for automotive manufacturing, automotive supply chain, and battery value chain investments. The grant funds proposed for automotive manufacturing are in addition to the current APDP 2 Automotive Investment Scheme (AIS) incentive over the next five years.[30] For the automotive supply chain and battery value chain investments, the allocation is based on a 30% equity contribution to the total requirement. Given the early-stage nature of battery development, grant funding of ZAR 2.8 billion is proposed. Component manufacturers and assembly plants for OEMs' supply chains can afford small amounts of commercial debt due to the cash grants from APDP 2.

Table 17: Funding requirements for supply-side requirements of automotive and battery value chains (ZAR 'million) from 2023 to 2027/8

Initiatives	Grants (1)	Equity (2)	Concessional Debt (3)	Commercial Debt (4)	Notes
Automotive assembly and component manufacturing (APDP 2 NEV)[31] (A)	26 538	-	-	-	Tax free cash grant
Automotive related projects (B)	-	1 500	2 500	1 000	Project development
Battery value chain[32] (C)	2 800[33]	7 101	13 769	-	Project development
Total funding required (D):	**29 338**	**8 601**	**16 269**	**1 000**	

30 (A1) Based on: DTIC TIPS/B&M Analyst Study. (2021). *Recommendations to advance South Africa's New Energy Vehicle Market and Domestic Supply Chain* for the NEV policy White Paper which showed that ZAR 69 billion of additional AIS incentives will be required until 2035. In 2021, the DTIC proposed a 10% increase in the cash grant incentive, which places the minimum funding requirement at ZAR 8.846 billion over the five-year period.

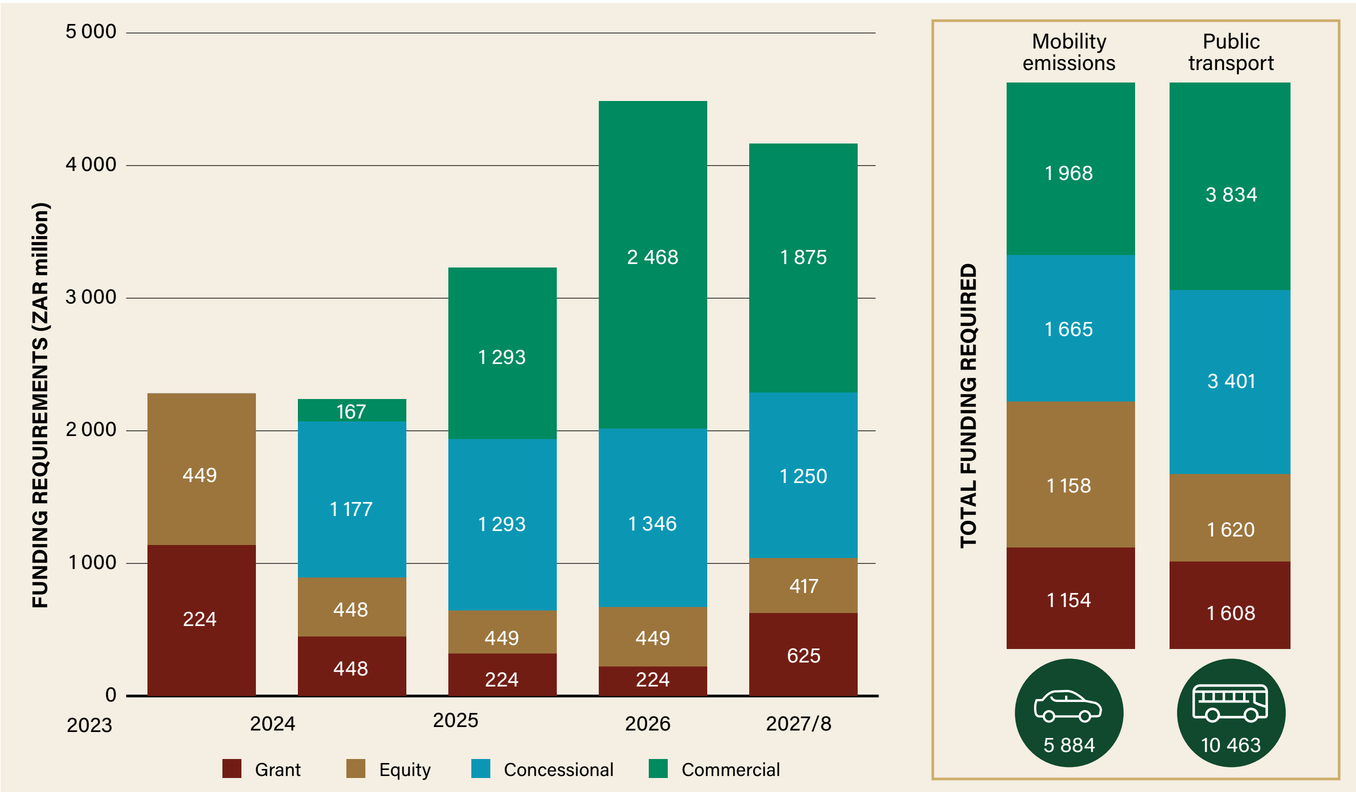
31 (A) The proposed timing for the White Paper, due in October 2023, does not allow for incorporation of that document in the IP, given the timeframe required to develop the IP, including COP commitments. Therefore, previous studies for the White Paper have been utilised for this table. It is not a reflection of the South African Government's commitment, but simply what the industry initially requested.

32 (C) Grant calc. = 11% X ZAR 23.65 billion. Equity calc. = 30% X ZAR 23.65 billion. Concessional Debt = Total – (Equity + Grant); the amounts are indicative as they reflect projects at various stages of development.

33 (C1) Based on the UK Battery Industrialisation Centre (UKBIC) and seed funding for British Volt, under the UK Government Faraday Challenge programme (https://www.ukri.org/wp-content/uploads/2021/10/UKRI-260623-FaradayBatteryChallenge-FundedProjects.pdf). The UK Government pledged 130 million Pounds and subsequently 36 million Pounds towards their programme to create a British battery industry.

Figure 12 shows the demand-side funding and instruments needed for the public transport and mobile emissions programmes from 2023 to 2027/8. These estimates exclude funding needed for a demand-side incentive programme, which has yet to be formulated. The total funding required for the public transport programme is approximately ZAR 10.46 billion and about ZAR 5.88 billion for the mobility abatement programme. The programmes assume a 50% funding headroom above the existing project pipeline estimates to cater for new projects and programme costs.

Figure 12: Funding requirements for demand-side public transport and mobility abatement programmes (ZAR 'million)



Source: IDC, from data provided by the DBSA, IDC, Green Cape, private and public sector projects, publicly available information.

NEV demand pathways take various forms from retail consumers, mining, agriculture, last-mile delivery, logistics supply chains, public transport, and the e-hailing economy. There are thus different technical, infrastructure, and funding solutions for each. Given the start-up nature of these projects, the funding mix requires higher levels of grant, equity, and concessionary funding to support proof-of-concept, piloting, and demonstration phases. Although South Africa has a mature financial services sector and several DFIs, there is limited scope to raise asset-heavy pre-seed funding, and the local venture capital market is relatively small.

Whilst the approach in the White Paper prioritises the shift of production to NEVs, this will thereafter need to be reflected in increased local consumption. Funding for the roll-out of charging infrastructure is also vital and is currently only raised in association with the mobility emissions, public transport programmes, and commercial fleet conversions. There is no current programme of national, provincial, or city-scale planning for electric charging infrastructure. This challenge is elaborated under the 'Shared infrastructure' section.

Required actions to address the funding challenge: *(1) Introduction of government's NEV incentive scheme for OEMs and CMs; and (2) New grants and concessional loan financing secured from global and domestic sources to increase the scale at which NEV mobility and public transport projects can be implemented.*

7.3.1.2 **Supply challenges**

- **Investment by OEMs:** The scale and pace of OEM investment in manufacturing plant conversions to NEV production will be influenced by the nature of government's incentive scheme due to be announced in 2023/24 to support the OEM business case. Without this, the future of OEM production in South Africa for the EU and UK NEV markets[34] post-2030 will be at risk. Relief on certain import taxes on EVs will assist with local consumer uptake, the creation of a local NEV market for OEMs to supply, and the pace at which transport sector emissions will reduce.
- **Technology innovation:** Local innovation and technology development in South Africa has struggled to bridge the gap to commercial applications. The private sector's role is vital for scaling innovation and technology development but has been slow to materialise despite available research and development incentives. The Department of Science and Innovation (DSI) through the Technology Innovation Agency (TIA) established the e-mobility programme, uYilo, in 2013. To date, uYilo has successfully supported several enterprises, such as Mellow Vans, Microcare, Lattech, EV BackOffice, Golden Arrow Bus Services (GABS), Manganese Metal Company (MMC), and has played a pivotal role in establishing accredited battery-testing facilities for the renewable and automotive industry. uYilo requires additional support to leverage capabilities for local manufacturing scalability. Through its Kick Start Fund, uYilo has demonstrated how technology transfer to market happens with targeted grants to start-up businesses, including small and medium enterprises (SMEs). With capital of only around ZAR 3 million per annum, the Kick Start Fund needs to be scaled-up to unlock trigger innovation and adoption projects.
- **Battery value chain:** Southern Africa has a natural endowment of critical minerals which should be the foundation for beneficiation and the growth of a world-class battery industry supply chain. The key minerals include lithium, manganese, cobalt, nickel, graphite, rare

34 In 2022, three out of every four vehicles produced were exported to the EU and UK (NAAMSA. 2023. *Automotive Export Manual*).

earths, and copper. The battery can make up more than 50% of the cost of an NEV,[35] making this a key focus area for local production. The implications for not localising the battery value chain could mean that the local content target of 60% by 2035 will not be achieved, and the importation of batteries by OEMs may impact the rules of origin with the EU, which requires local content of up to 60% to export vehicles to the EU duty free. This local content imperative, along with the fact that, at a global level, mobility applications make up about 69% of battery demand,[36] means that the support of OEMs is key for South Africa's ambitions to localise cell manufacturing and other NEV-related components.

The DTIC, in partnership with the IDC, is developing a battery industry value chain strategy. The IDC has an active project pipeline requiring about ZAR 19 billion investment and is also partnering with a battery cell OEM to undertake a scoping study for the localisation of cell manufacturing in South Africa.

For cell manufacturing, it will be important for OEMs (NEVs and battery) to designate capital allocation to South Africa with the view that Africa is the next growth opportunity. Challenges, such as energy, infrastructure, and requisite skills exist not only in South Africa, but elsewhere. South Africa must avoid designation as the last OEM ICE vehicle production outpost. There may be a need to create an APDP equivalent for critical minerals beneficiation for cell manufacturing to attract investment and bring the automotive and mining sectors closer.

Required actions to address the supply challenge: *(1) Introduce government's NEV incentive scheme for the automotive value chain; (2) Review policy-appropriate import taxes[37] on specific component parts, for a transition period; (3) Source financing to enable uYilo's Kick Start Fund to scale its technology uptake support for SMEs; (4) Government to adopt strategy and raise funding for implementation of the battery industry value chain strategy; and (5) Government to explore developing an incentive policy for a Battery Critical Minerals Trade-Related Investment Measures (TRIMS).*

7.3.1.3 Demand challenges

Many countries have demand-side incentives for NEV adoption in the form of cash subsides, tax incentives, access to inner cities, designated driving lanes, free parking, scrappage allowances for ICE vehicles, increased taxes on ICE imports, amongst others.[38] Given South Africa's fiscal constraints, cash incentives for private vehicle purchases are unlikely, but other incentive measures could be developed, particularly for public transport and logistics NEV uptake.

35 BloombergNEF and IDC, based on engagements with OEMs and taking into consideration other factors.

36 BloombergNEF. (2023). *Long-Term Electric Vehicle Outlook, 2023*. Lithium-ion battery demand outlook – Economic Transition Scenario, BloombergNEF, Avicenne data set.

37 Taxes incl. import duties and advalorem tax. Although import duties support local production, advalorem is an excise tax on goods. The combination can increase NEV cost by 52%.

38 Indonesia – advalorem of 90% on ICEV, NEVS exempt; Thailand – excise duty 25%–40% ICEV, 0%–8% NEVs, lower charging tariffs USD 86/MWh, Singapore – Green and carbon emissions schemes, higher taxes for polluting vehicles; Malaysia – excise duty tax 60%–105% on ICEV; Vietnam – excise duty 35%–90% for ICEV, 5%–15% for NEVs (Source: BloombergNEF).

Current fiscal funding for public transport projects can promote the adoption of NEVs, including redirecting subsidies for fossil fuels. Public funds currently allocated include the taxi recapitalisation and bus subsidy programmes. By reviewing taxes on public transport vehicles, investing in local supply chains and charging infrastructure, and reducing taxes on the fleet and delivery sector, it is possible to incentivise NEV adoption. Co-ordination between government, transport, and logistics industries, as well as public procurement optimisation for scale economies, is essential. Grant funding is necessary for technical assistance in designing cost-effective NEV programmes for public transport and logistics. Other support can include de-risking insurance cover and asset finance for NEVs.

Logistics and public transport in South Africa currently have a small-scale approach to NEV adoption. While there is a credible portfolio of projects, it lacks big-ticket items. The investment size for the public transport programme per annum is currently about ZAR 833 million (three projects) and for the mobility programme, about ZAR 555 million (14 projects), plus associated infrastructure projects. A notable case of community involvement and youth entrepreneurship is the Green Riders project in Cape Town. But, the impact of NEVs on society and the economy will only materialise with scale, that is when localisation of value chains creates sustained and skilled employment in manufacturing-scale output. The scale of NEV adoption is therefore a significant demand challenge to be addressed in order to achieve both climate mitigation and Just Transition outcomes in the transport sector.

Required actions to address the demand challenge: *(1) A collaborative plan between DTIC, DoT, the taxi industry, subsidised bus companies, provinces, and metros to adapt the use of existing subsidies for public transport to incentivise conversion to NEVs; (2) A review by NT of the tax regime that is constraining demand for NEVs and the growth of locally-produced NEV and components manufacturing, and consideration of relevant tax reforms; (3) Increased international grant and concessional financing targeted through the IDC and DBSA to support early-stage preparation for a growing pipeline of mobility and public transport NEV projects by private developers; (4) Government task team designs balanced and affordable demand-side incentives for NEVs; and (5) Programme owners' engagement with insurance companies and commercial banks on de-risking NEV adoption.*

7.3.1.4 **Shared infrastructure challenges**

Charging infrastructure is vital for the NEV transition but is difficult to finance without a predictable user base or subsidies. Furthermore, the investments are needed in charging points, as well as for auxiliary cabling and transformers in electricity distribution systems that are already backlogged in their maintenance requirements, supply constraint, and are not designed for NEV use. These distribution grids are largely owned and operated by Eskom and municipalities, both of which are financially constrained.

Charging capacity requirements differ, depending on the NEV segment's technology design, scale, phasing, vehicle types, and demand. Heavy vehicles and bus batteries have different requirements to passenger NEVs. Passenger cars may ultimately charge up to 70% of their needs at home, heralding a changed landscape for fuelling infrastructure. Instead of allowing this complexity to result in incremental and isolated investments, there is a need to plan for optimal resource allocations for NEV-enabling distribution grid upgrades and technology installations.

The current pipeline of business-to-business (B2B) and business-to-government (B2G) NEV projects include charging infrastructure investments for their projected volumes, with most providing a buffer of about 20% for additional demand, beyond which further scaled investments in charging stations would be unaffordable per project. These projects include the use of Renewable Energy (RE), to limit dependence on electricity supply from the grid, and to reduce long-term costs and emissions. In the context of no national incentives to support private vehicle NEV demand, charging infrastructure for this market segment is likely to grow in better-resourced locations as the companies provide bespoke charging stations for their customers.

The National Association Manufacturers of South Africa (NAAMSA) recently called for proposals for infrastructure projects to support the roll-out of national charging infrastructure for the light passenger and commercial vehicles markets. There are no government incentives for NEV charging infrastructure.

The DTIC has an existing critical infrastructure fund which could be considered for providing support to the development of NEV charging infrastructure. South Africa's National Road Network's (SANRAL) national roads network management could provide for the toll road concessionaires to build and operate charging infrastructure by arrangement with the existing fuel stations. Eskom's distribution division could target charging infrastructure as a business growth opportunity.

Required action to address the shared infrastructure challenge: *A collaborative analysis between Eskom Distribution, SANRAL, NAAMSA, the DTIC, DoT, IDC, and DBSA, and private sector players of South Africa's NEV charging infrastructure short- and long-term needs, current developments, and opportunities that result in a co-ordinated national strategy and plan for investments to scale-up over the next five years.*

7.3.1.5 Skills and transformation

The NEV transition will require new skills and the upskilling of existing talent supported by industry and South Africa's institutions of higher education and training. Training programmes, however, need to develop in tandem with employment opportunities in the evolving sector, and will help to stimulate such employment. Industry associations have started skills mapping for the NEV sector. Skills development in the sector must equally support opportunities to grow the number of black businesses in the NEV value chain. The skills challenges and roadmap for addressing them are elaborated in the 'Skills' chapter of the JET Implementation Plan.

Required output to address the skills challenge: *A consolidated national skilling and job transition programme that addresses the evolving capability requirements of the NEV sector.*[39]

39 Work on skills requirements has been done by NAAMSA and National Association of Automotive Component and Allied Manufacturers (NAACAM).

7.3.1.6 **Policy and regulation**

The DoT is currently updating its Green Transport Strategy which was published in 2018. The DTIC's NEV Green Paper was issued in 2021, and a White Paper on NEVs is due to be published in late 2023. The DTIC and NT are currently finalising the updated APDP 2 incentive policy for NEV production. NAAMSA has begun engaging DoT and the National Regulator for Compulsory Standards (NRCS) on updating regulations for commercial vehicles to switch to NEVs. Government's policy and regulatory regime for NEVs is thus in the process of being clarified.

In 2022, 63% of OEM's automotive vehicle production in South Africa was exported, and 37% was sold locally. In the context of rapidly changing NEV policy and regulatory regimes in the trading partner countries, there is a call for South Africa's NEV policy and regulatory regime to be expedited and for it to provide a comprehensive incentive package that simultaneously protects the OEM's ability to retain and grow its local manufacturing base for NEV production, incentivises investment in local battery manufacturing and charging infrastructure, and promotes the uptake of electric mobility, even if initially for public transport and logistics.

Simultaneously, there are a number of international trade challenges that the DTIC is addressing.

South Africa's trade agreement with the EU allows for duty-free imports of automotive vehicles into the EU if 60% of the components are manufactured in South Africa and the EU. Batteries and their components (>50% of NEV cost) are mainly sourced from China, posing a challenge to this EU trade agreement. At the same time, the EU Green Deal, Fit for 55,[40] the battery certificate, and Carbon Border Adjustment Mechanism (CBAM),[41] impose regulations on tailpipe emissions, supply chain emissions, and the use of recycled battery minerals, which could make it increasingly challenging for South Africa to export certain automotive products to the EU in the long-term.

The USA Inflation Reduction Act (IRA) favours USA-made NEVs and EV batteries and offers preferential treatment to Free Trade Agreement (FTA) countries, and countries with bilateral critical minerals agreements with the USA. South Africa does not enjoy this treatment, as the African Growth and Opportunity Act (AGOA) is not a FTA. This poses an additional potential challenge for South Africa's battery mineral beneficiation and regional value chain ambitions, whilst presenting an opportunity for partnership through a critical minerals agreement for beneficiated battery minerals and precursor material, and also allowing the USA to de-risk its supply chain.[42]

40 Vehicles must emit less than 55% emissions by 2030 and 100% by 2035, based on 2021 emissions gCO_2/km (https://www.europarl.europa.eu/news/en/press-room/20230210IPR74715/fit-for-55-zero-co2-emissions-for-new-cars-and-vans-in-2035).

41 TIPS. (2023). *The European Union's Carbon Border Adjustment Mechanism and Implications for South African Exports*.

42 The USA currently source about 46% nickel and lithium and 77% cobalt from non-FTA countries and is forecast to miss its 2029 100% local content target for batteries (S&P Global Market Intelligence Inflation Reduction Act: Impact on North America metals and minerals market: FINAL REPORT, August 2023).

Required actions to address the policy and regulatory challenge: *(1) Finalised NEV policies by DTIC that result in new investment commitments; (2) Agreement between South Africa and the EU on an automotive trade transition plan that allows continued exports to the EU while the local industry transitions its production systems; and (3) Continued development by industry and regulators on regulatory and conformity standards for NEVs.*

7.3.2 Outcomes and Impacts

An understanding of the challenges and the identification of key actions to address them, enables the targeting of short-term outcomes (measurable changes in capacity and systems within one to two years) and medium-term outcomes (measurable changes in performance within three to four years). To build this into a programme plan, institutional owners are assigned to each, as summarised in Table 18 on the next page.

Table 18: Summary of challenges, key actions (outputs) and outcomes, with the assignment of institutional leads

	Challenge	Key actions (outputs)	Institutional lead	
1	**Funding**	(1) Introduction of government's NEV incentive scheme for automotive value chain (VC)	DTIC	
		(2) New grants and concessional loan financing secured from global and domestic sources to increase the scale at which NEV mobility and public transport projects can be implemented	IDC	
2	**Supply**	(1) Reduced import taxes on NEVs and specific component parts, such as batteries and power electronics	NT	
		(2) Financing sourced to enable uYilo's Kick Start Fund to scale its technology uptake support for SMEs	IDC DSI	
		(3) South African National Battery Value Chain (VC) Strategic Plan developed	IDC DTIC	
3	**Demand**	(1) A collaborative plan between IDC, DBSA, DTIC, DoT, the taxi industry, subsidised bus companies, provinces, and metros to adapt the use of existing subsidies for public transport to incentivise conversion to NEVs	DoT	
		(2) A review by NT and the DTIC of the tax regime that is constraining demand for NEVs	NT	
		(3) Increased international grant and concessional financing targeted through the IDC and DBSA to support early-stage preparation for a growing pipeline of mobility and public transport NEV projects by private developers	JET PMU	
		(4) Government task team designs balanced and affordable demand-side incentives for NEVs, and disincentives for carbon intensive tail pipe emissions	DTIC NT	
		Engagement with insurance companies and commercial banks on de-risking NEV adoption	IDC DBSA	

	Short-term outcomes (one to two years)	Medium-term outcomes (three to four years)
	New incentive supports OEM business case for NEV in South Africa	OEMs decide to invest in South Africa for battery electric vehicle (BEV) production
	Current projects advance to implementation; pipeline of NEV mobility and public transport projects increases	Most public sector bus fleets are transitioning to NEVs; and logistics fleet conversion moves to scale
	The pipeline of NEV mobility and public transport projects increases due to lower cost projections	Most public sector bus fleets are transitioning to NEVs; and logistics fleet conversion moves to scale
	The Kick Start Fund supports double the number of SMEs to take up new technology solutions	SME growth and employment, skills development
	Strategy adoption by the government and funding raised for implementation of the battery industry VC strategy Bankable business cases for battery industry projects	Investment planning for battery industry opportunities increases in scale and scope Established battery mineral and precursor supply chain OEM announcements on investment in South Africa for cell manufacturing over the next seven to ten years
	Solution options identified by role-players are costed and reviewed by relevant authorities Introduction of incentives to unlock new investments in public transport	Lower project cost for public transport NEV projects and improved viability
	Tax analysis identifies viable options to stimulate NEV demand coupled with local production, for consideration by relevant authorities	Tax reforms boost NEV sector growth
	Current IDC and DBSA-supported projects advance to implementation; pipeline of NEV mobility and public transport projects increases	Most public sector bus fleets are transitioning to NEVs; and logistics fleet conversion moves to scale
	International technical assistance supports government to design demand-side incentives and disincentives	Demand-side incentives and disincentives implemented
	Lower insurance premiums for NEVs Affordable asset finance products for NEVs	Banks and insurers less risk averse towards NEVs

	Challenge	Key actions (outputs)	Institutional lead	
4	**Shared infrastructure**	A collaborative analysis between stakeholders, NEV charging infrastructure short- and long-term needs, current developments, current critical infrastructure funds, and opportunities that results in a co-ordinated national strategy and plan for investments to scale-up over the next five years	Eskom Distribution NAAMSA	
5	**Skills**	A consolidated national skilling and job transition programme that addresses the evolving capability requirements of the NEV sector, is developed	NAAMSA/ NAACAM	
6	**Policy and regulations**	(1) Finalised NEV policy by DTIC (2) Updated Green Transport Strategy by DoT	DTIC DoT	
		(3) Agreement between SA and the EU on an Automotive Trade Transition Plan that allows continued exports to the EU while the local industry transitions its production systems	DTIC	
		(4) Explore developing a critical minerals benefits incentive policy	DTIC NT DMRE	
		(5) Further develop regulatory standards for NEVs	DTIC NRCS	

	Short-term outcomes (one to two years)	Medium-term outcomes (three to four years)
	A shared NEV Charging Infrastructure Plan is approved by relevant authorities, attracting interest by investors	Investments commence according to the NEV Charging Infrastructure Plan
	National NEV skilling programme agreed between industry and training authorities	Skills programme roll-out
	Policy certainty and final government roadmap and position announced	Policy certainty leads to investment decisions
	Current automotive exports to EU are protected under an agreed timeframe for NEV transition	Current automotive exports to EU are protected under an agreed timeframe for NEV transition
	Policy steps to promote South Africa's ambition to become the critical minerals benefactions hub for Sub-Sahara Africa	Announcement by major battery OEM of intention to invest in cell manufacturing Attract supply chain investment
	Regulatory certainty leads to investment decisions	Regulatory regime implemented

Measurable outcomes will be quantified as outlined in Table 19.

Table 19: Quantifiable outcome measures 2023–2027/8

	Current	2025	2027/8
Grant funding secured (ZAR 'million)	-	ZAR 4 400	ZAR 5 530
Concessional funding secured (ZAR 'million)	-	ZAR 1 200	ZAR 20 000
Funding advanced to public transport projects (ZAR 'million)	-	ZAR 830	ZAR 3 331
Funding advanced to mobility projects (ZAR 'million)	ZAR 272	ZAR 760	ZAR 1 965
Funding advanced for charging infrastructure (ZAR 'million)*		ZAR 318	ZAR 1 059
Number of NEV projects funded	4	8	18
Number of SMEs (localisation/manufacturing)	2	7	12
Transport sector emissions reduction (CO_2 tonne/p.a.)		tbc	tbc
OEM investment announcements	2	2	4
Funding advanced for battery supply chain projects		tbc	ZAR 23 670
Number of direct jobs created	400	1 000	tbc

* Including associated infrastructure.

The impact of these NEV sector interventions will be measurable in GHG emissions abatement in South Africa's transport sector, improved air quality, improved and cheaper public transport, automotive sector supply chain growth, increased employment in a growing localised battery value chain, minerals beneficiation and industrialisation, related skills development, and a positive impact on the current account balance due to lower fuel imports. The value proposition for South Africa's transition to NEVs can therefore be seen across four dimensions: economic growth and investment; Just Transition for sector workers and transport users; sector decarbonisation; and Green and sustainable manufacturing.

Table 20: Impact of NEV's sector interventions

Impact (JET IP)	Impact (wider)
Measurable metrics	
SME development (number of SMEs) CO_2 emission reduction (CO_2 g/km) Automotive industry employment (number of jobs retained and added) Empowering young jobseekers (number of youth jobs created) Public charging infrastructure installed (number of chargers) Tail pipe emissions reduction (reduction in ICE vehicles) Lower investment carbon footprint (CO_2 g abated/ ZAR (USD))	Contribution to saving manufacturing jobs in the auto sector (using 2022 as base year) Contribution to South Africa's exports and trade relations with EU, UK, and US (export data) Attracting FDI to South Africa (FDI per investment) Contribution to lower fuel imports costs Air quality improvement (air quality measures)

7.4 NEV JET Portfolio

Building on the JET IP 2023–2027, the NEV JET Portfolio (Tables 21, 22, and 23) comprises three elements:

1. The introduction of supply-side incentives for the automotive industry that will unlock NEV production and NEV supply chain investments and protect automotive manufacturing employment. The funding requirement for this is approximately ZAR 26.5 billion over five years.
2. An NEV programme at the IDC that mobilises funding for and supports project preparation in NEV auto assembly and supplier parks, component manufacturing and supply chains, battery minerals extraction and beneficiation, battery precursor materials and components, logistics and commercial fleets, and associated charging infrastructure. The funding requirement for this programme is approximately ZAR 34.5 billion over five years.
3. An NEV public transport programme at DBSA that mobilises funding and project preparation support for public transport projects (taxis and buses) and the associated electric charging infrastructure. This funding requirement is approximately ZAR 10.55 billion over five years.

The plan essentially represents the intention to scale up on portfolios of pilot projects and programmes that are currently underway, to test models, and mobilise grant and concessional financing that can improve their viability and attract more investors. Once government NEV policy is adopted, demand and supply pathways will allow these pioneering initiatives to be replicated and NEVs to become normalised in South Africa's transport system. No provision has been made in the forecast funding for end-user private NEV incentives, pending the finalisation of government policy for demand-side incentives.

Table 21: Proposed NEV Portfolio and estimated investment required[43]

Programmes	Owner (label)	Description
NEV supply chain investment	DTIC (P1)	Investments required for the automotive supply chain to transition to NEVs and NEV auto projects, including assembly, infrastructure, and component manufacturing for both local and export applications
NEV auto-related projects	IDC (P2a)	New auto projects include assembly, infrastructure, and supplier part projects across scoping, piloting, and commercialisation phases for both local and export applications
NEV battery and critical mineral supply chain/battery cell manufacturing	IDC (P2b)	NEV battery mineral projects include investments in battery mineral extraction and beneficiation, and the development of precursor materials and components
Mobility emissions programme/ fund	IDC (P2c)	Decarbonising the NEV market segments for goods and services, logistics, private transport, and government fleets; charging infrastructure; and energy storage (including associated infrastructure and programme support); supply chain investments in local assembly
Public transport programme	DBSA (P3)	Support investments in public transport, such as buses, taxis, and fleets; funding the charging infrastructure and integrated energy storage (including associated infrastructure); supply chain investments in the local assembly
Total funding required		
Total funding required (public transport and mobility)		

Note: The NEV Portfolio is not exhaustive and may not include projects that are sourcing funding directly from local and international financing.

43 (P1) From the TIPS B&M Analyst NEV study for the DTIC White Paper, estimating that ZAR 69 billion will be required by the automotive sector until 2035. The ZAR 26.5 billion is for a five-year period. (P2a) Automotive-related investments are IDC projects and an early-stage estimation for a new assembly plant and supplier park. (P2b) NEV battery mineral and manufacturing-related projects comprised of ZAR19 billion for battery mineral projects and ZAR 4 billion for battery cell development and pilot cell manufacturing plant. ZAR 4 billion is based on similar investments made by the UK Government for their battery programme and establishing British Volt, GBP 166 million. Public transport and mobility emissions programmes are based on existing programmes and projects. Each programme has an additional 20% allocation for associated energy infrastructure. (P2c) The mobility programme has support funding of ZAR 500 million allocated. (P3) The public transport programme has a ZAR 2.0 billion allocation for technical assistance, innovation and capacity development.

	Estimated total investment ZAR 'million		2023	2024	2025	2026	2027	2027/8
	JET IP	JET ImP						
	26 538	26 538	APDP NEV cash incentive under development					
	8 519	5 000	Various projects from pre-feasibility to bankable					
	5 050	23 670	Various projects from pre-feasibility to bankable					
	6 800	5 944		1 266	572	896	1 652	1 562
	6 100	10 463		1 017	1 669	2 336	2 837	2 605
	57 740	**71 616**		**13 324**	**13 282**	**14 274**	**15 528**	**15 208**
		16 408		**2 283**	**2 240**	**3 232**	**4 487**	**4 166**

Table 22: Mobility, automotive supply chain, and battery minerals

Programme owner

On track	IDC Industrial Development Corporation	Funding required **ZAR 34.5 billion**	*Including:* Automotive = ZAR 5 billion Battery VC = ZAR 23.67 billion e-Mobility emission = ZAR 5.8 billion Associated infrastructure = ZAR 545 million

Key stakeholders

Government: DTIC, NT, DMRE, DHET

Industry: NAAMSA, NAACAM, Energy Council

Funders: Partner countries, DFIs, commercial banks

Innovation: uYilo, CSIR

Regulations: NRCS, SABS

Education: DHET, SETAs, universities

Local examples of progress

Mobility
- Pipeline of ZAR 3 billion
- Local SMEs – Green Riders, Mellow Vans, Everlectric, Valternative, ScootHero

Infrastructure
- Investments by RMB and StanLib in charging
- Local SMEs – Zimi Chargers, Aeversa, Gridcars, and Rubicon rolling-out chargers
- Non-Motorised Transport (NMT) projects

Battery minerals
- IDC battery mineral pipeline of ZAR 19 billion

Automotive
- ZAR 4.86 billion component supply investments
- BMW ZAR 4.5 billion NEV investment

Science and Innovation
- uYilo e-mobility programme and fund

Input (challenges)

Supply
- Localisation and production of NEVs and battery cells is critical for regional development and support of our automotive manufacturing transition
- Support for innovation and capacity development

Demand
- Mechanism to support uptake of NEVs
- Charging Infrastructure Support
- Other shared infrastructure, such as EV homologation testing stationsNRCS, SABS

Education
- DHET, SETAs, universities

Funding
- Appropriate funding to support all business models and stages across the NEV segments and value chains

Policy & Regulations
- Incentives for BEVS and FCEVs
- Trade policies between South Africa and the EU/UK and the USA
- Incentives for beneficiation of battery minerals and cell manufacturing

Co-ordination
- Co-ordination across JET will be crucial to the effective implementation of the programmes

Actions to deliver outcomes

- NEV policy finalised by DTIC and NT (Q4 2023)
- Trade measures with the EU and UK which mitigates against unintended consequences of the transition on the automotive sector
- OEMs to develop their business case for NEV production in South Africa, on the back of the NEV policy
- Explore mechanism for a balanced and affordable demand-side support
- IDC to create a funding programme for mobility, infrastructure, and supply chain investment and broader initiatives
- IDC to fund innovation and capacity development
- IDC to secure funding from partner countries and institutions
- Establishment of a JET co-ordination unit at a national level to support programmes and provide oversight
- DTIC to deliver South Africa national battery value chain strategies and game plan, and co-ordinate implementation of the strategy
- Partner countries to facilitate investment and strategic partnership between their OEMs and the IDC
- DTIC, with NT and DMRE, to explore developing a critical minerals beneficiation and cell manufacturing TRIMS incentive policy

Outcomes

- Stable policy framework and roadmap for South Africa's transition to NEVs
- Partner countries commit funds to NEVs Implementation Plan
- Investment by the automotive and battery OEMs
- Funding programmes for public transport and mobility abatement
- Grant and concessional funding provided by partner countries
- Funding partnerships established between IDC, DBSA, and partner country funders
- South Africa to retain export benefit a preferential measure for NEVs
- Increased funding for e-mobility technical assistance and pilots (min ZAR 30 million per annum)
- Increase number of start-ups and SMEs funded
- Capacity and skills development funded by IDC programme
- Demand-side support and incentives for NEVs developed
- Growing pipeline of new transactions and projects
- Established battery mineral and precursor supply chain
- OEM announcement on investment in South Africa for cell manufacturing over the next seven to ten years
- Well-co-ordinated national and programmatic implementation of JET IP

Table 23: Public Transport Programme

Programme owner

On track	DBSA	Funding required **ZAR 10.6 billion**	*Including:* Associated infrastructure = ZAR 833 million Technical assistance = ZAR 2 billion

Key stakeholders

Government
- NT, DoT, local, and provincial government.

Industry
- Transport sector

Funders
- Partner countries, DFIs, commercial banks

Innovation
- uYilo, CSIR

Regulations
- NRCS, SABS

Local examples of progress

Funding
- ZAR 2.3 billion for DBSA public transport programme

Pipeline
- ZAR 4.2 billion; projects including GA, Flex EV, 2 Cities

Infrastructure
- Bus operators, Flex EV

Science and Innovation
- Stellenbosch University and Rham Equipment e-minibus project

Input (challenges)

Supply
- High cost of NEVs for public transport projects (+54% duties and taxes)
- Grid infrastructure and renewables support

Demand
- Need to develop a mechanism to support demand or uptake of NEVs
- Charging Infrastructure Support

Funding
- Appropriate funding to support all business models and stages across the NEV segments and value chains

Policy and Regulations
- Public transport policy incentives are not sufficient for NEVs
- Decentralised procurement for aggregation of supply models

Co-ordination
- Co-ordination across JET will be crucial to the effective implementation of the programmes
- Co-ordination across cities and provinces for public transport projects

Actions to deliver outcomes

- NEV policy finalised by DTIC and NT (Q4 2023)
- Trade measures with the EU and UK which mitigates against unintended consequences of the transition on the automotive sector
- OEMs to develop their business case for NEV production in South Africa, on the back of the NEV policy
- Explore mechanism for a balanced and affordable demand-side support
- IDC to create a funding programme for mobility, infrastructure, and supply chain investment and broader initiatives
- IDC to fund innovation and capacity development
- IDC to secure funding from partner countries and institutions
- Establishment of a JET co-ordination unit at a national level to support programmes and provide oversight
- DTIC to deliver South Africa national battery value chain strategies and game plan, and co-ordinate implementation of the strategy
- Partner countries to facilitate investment and strategic partnership between their OEMs and the IDC
- DTIC, with NT and DMRE, to explore developing a critical minerals beneficiation and cell manufacturing TRIMS incentive policy

Outcomes

- Stable policy framework and roadmap for South Africa's transition to NEVs
- Partner countries commit funds to NEVs implementation plan
- Investment by the automotive and battery OEMs
- Funding programmes for public transport and mobility abatement
- Grant and concessional funding provided by partner countries
- Funding partnerships established between IDC, DBSA and partner country funders
- South Africa to retain export benefit a preferential measure for NEVs
- Increased funding for e-mobility technical assistance and pilots (min ZAR 30 million p.a.)
- Increase number of start-ups and SMEs funded
- Capacity and skills development funded by IDC programme
- Demand-side support and incentives for NEVs developed
- Growing pipeline of new transactions and projects
- Established battery mineral and precursor supply chain
- OEM announcement on investment in South Africa for cell manufacturing over the next seven to ten years
- Well-co-ordinated national and programmatic implementation of JET IP

7.5 NEV JET Governance

Each of the JET Implementation Plan Portfolios will be driven by institutions that have both the capacity and mandate to host and lead multi-faceted investment programmes.

For the NEV sector, the governance and institutional mechanism will be established after further engagement and finalisation with key stakeholders.

There is a well-established automotive industry structure operating under the executive oversight of the Minister of Trade, Industry and Competition, which includes the automotive industry leadership, trade union leadership and government. This structure manages various workstreams, some of which interface with the NEV programmes and the Skills Portfolio set out in this Implementation Plan.

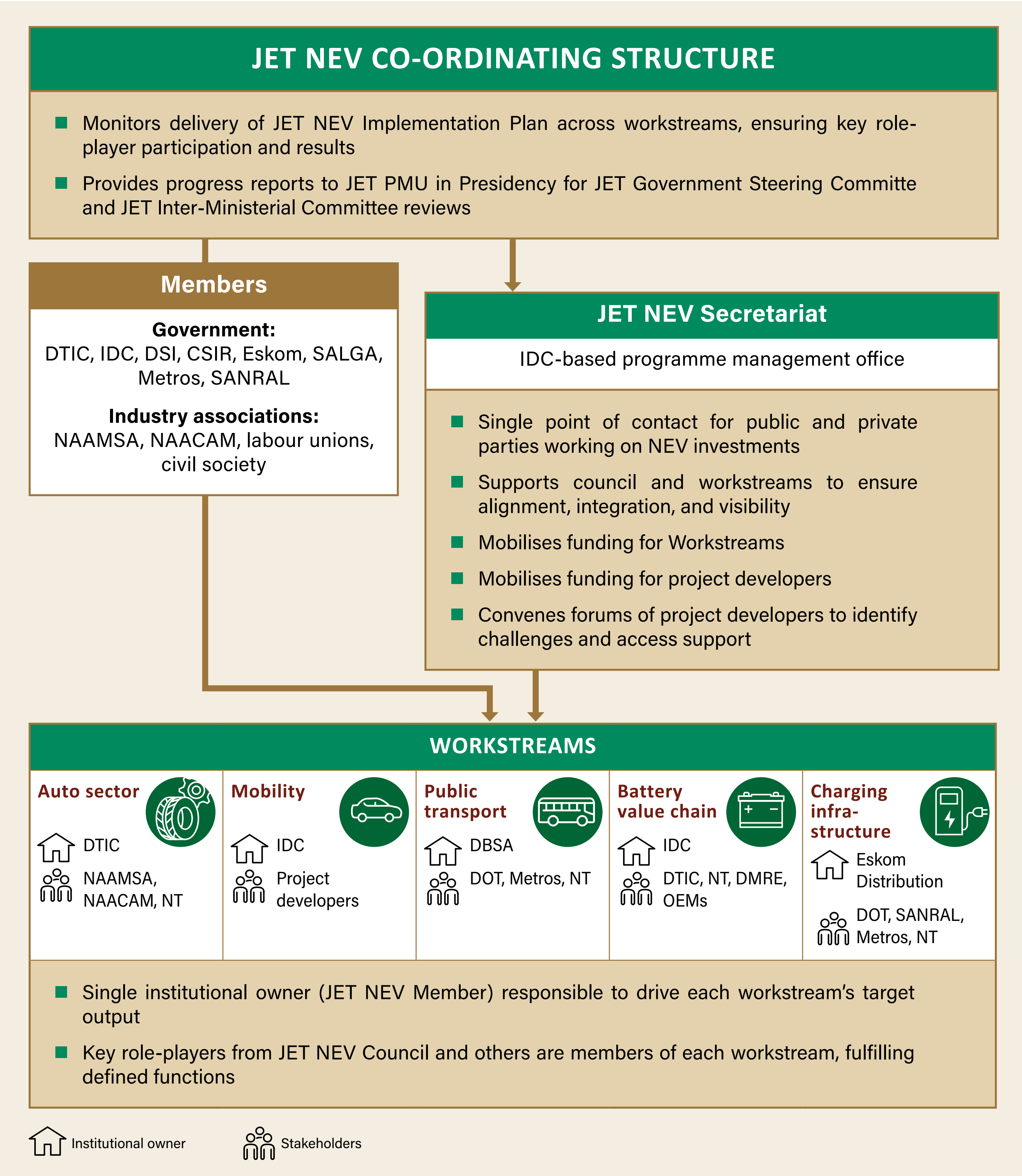
The recommended option for the JET NEV coordination role is, therefore, to expand the existing automotive structure mandates to include the NEV work. A further recommendation is that a dedicated JET NEV Secretariat role be located at the IDC to programme manage the day-to-day NEV Portfolio work.

Regardless of the final governing mechanism, the following need to be in place for the NEV Portfolio to gain traction:

- A NEV coordinating structure comprising representatives from DTIC, DoT, DSI, NT, DBSA, industry associations, organised labour, civil society organisations, amongst others
- Relevant institutions appointed to manage workstreams/programmes, as agreed by the coordinating structure to achieve targeted NEV outputs and outcomes
- Dedicated JET NEV Secretariat support to NEV workstreams/programmes which can also procure technical assistance as needed
- JET NEV Secretariat working with the JET PMU to mobilise financing (grants, concessional loans, commercial loans, guarantees) to support the NEV Portfolio of investment projects
- Monitoring of activities, outputs, outcomes, and impacts of the NEV programmes and providing public reports on results.

The NEV programmes identified in this Implementation Plan should be led by the relevant institutions that are managing the work, as indicated in Figure 13.

Figure 13: Proposed JET NEV Council



Annexure A: Risk Matrix

The table presents the Implementation Plan risks, institutions responsible for mitigating the risk, and the residual risks. Dependencies on other stakeholders are also indicated as this may create barriers to managing risks.

Risk	Institution responsible	Dependencies	Likelihood of occurring	Impact
International grant funding is not provided to support NEV implementation plan	Presidency	IPG, national government	High	Medium
Tax implications for country-to-country grant funding	NT	IPG, National	Likely	Medium
No grant funding provided	Presidency	IDC, NT, DBSA	High	Medium
DTIC NEV policy update does not materialise	DTIC	DTIC, NT	Unlikely	High
Programmes are poorly designed to achieve impact	IDC/DBSA	DTIC Presidency	Unlikely	High
Poor co-ordination between stakeholders	Presidency	PG, PMU, other	Unlikely	High
Funding provided by IPG not aligned with the programme's requirements	Presidency	IPG, DFIs	High	High
High cost of funding provided	IDC	DBSA, NT	Likely	Medium
Eskom loadshedding	Eskom	Eskom, municipalities	High	Medium
Underestimation of the cost of auxiliary infrastructure upgrades	Eskom	Eskom, municipalities	Likely	Medium
Public transport projects hindered by stakeholder issues	DBSA	Municipalities, cities, taxi associations, bus operators	Likely	Medium

	Mitigant (link to institution responsible)	Residual risk (can't mitigate)
	Partner countries commit to supporting NEV plan	Grant funding insufficient for needs
	Bilateral country agreements required and aligned with requirements from NT for development grants	Countries without bilateral agreements won't be able to provide grants
	NT to provide additional cash grant incentives through existing industrial and transport policies	Limited funding for early stage and pilots
	DTIC developed framework for Cabinet consideration by October 2023	New incentives not attractive for NEV localisation; South Africa becomes last outpost for ICEVs
	Programmes to be designed in a collaborative process with stakeholders and mandates clearly defined	Some investments may fall outside of the programmes or may not meet the requirements or criteria
	Presidency to support co-ordination with programme owners (IDC, DBSA, DTIC)	IPG country DFIs undertake own initiatives and programmes
	IPG funders to invest in programme aligned funds	IPG funders to lends NGOs and lenders outside of programme
	IPG funding should have a significant grant component to offset risk pricing and/or provide deep concessionary funding	Given the high interest rate environment, cost of funding will be high
	Eskom interventions and increased RE and grid investment off-sets generation constraints	Load shedding least for another five years but at lower levels (<2 000 MW)
	Eskom are looking at grid upgrades for EVs and development products for customers	Municipalities mainly responsible for grid upgrades and costs; higher CAPEX expense
	DBSA and DoT to ensure that projects and cities are aligned	Secondary cities and small provinces may fall outside of project scope; only main cities align

Risk	Institution responsible	Dependencies	Likelihood of occurring	Impact
Cost of NEVs does not come down and achieve price parity within two to three years	NT	DoT	Unlikely	High
Funds/programmes take more than 12 months to establish and disburse	IDC	DFIs, IPG	Likely	High
South Africa does not secure the funding or IP for manufacturing of battery cells for various markets	IDC	National government, industry, funders	Unlikely	High

	Mitigant (link to institution responsible)	Residual risk (can't mitigate)
	Demand-side policies can be employed by NT and DoT to support adoption	NEV prices reach parity over longer period due to raw material shortages
	IDC fast-track development and implementation of programmes.	Institutions have their own internal processes which will delay implementation of programmes.
	IDC actively pursuing partnership with global battery OEMs; IDC accelerates investment in battery supply value chain and own investments to bring NEVs to South Africa	South Africa's demand not big enough for cell manufacturing; auto OEMs sourcing from different battery OEMs, limiting scale economies

Annexure B: Detailed Implementation Plan

Programmes	Description
NEV supply chain investments	Investments required for the automotive supply chain to transition to NEVs and NEV auto projects include assembly, infrastructure and component manufacturing for both local and export applications
NEV auto-related projects	NEV auto projects include assembly, infrastructure and supplier park projects across scoping, piloting, and commercialisation phases for both local and export applications
NEV battery and critical mineral supply chain	NEV battery mineral projects include investments in battery mineral extraction and beneficiation and the development of precursor materials and components
Battery cell assembly and development	Development of battery cell technology and battery cell plant
Public transport programme	Support investments in public transport, such as buses, taxis, and fleets; funding the charging infrastructure and integrated energy storage (including associated infrastructure); supply chain investments in the local assembly
Public transport	Support investments in public transport, such as buses, taxis, and fleets; funding the charging infrastructure and energy storage (including associated infrastructure); supply chain investments in the local assembly
NEV public transport pipeline	NEV projects for minibus taxis (MBT) and buses, including piloting and assembly of vehicles
Taxi project	EV taxi project (including vehicles and charging facilities)
Bus project	EV bus project in Cape Town
Gauteng	EV bus project with two cities in Gauteng, funded by DBSA
Associated infrastructure	Enabling and auxiliary distribution infrastructure investment required to support the roll-out of adoption projects
Technical assistance	EV bus project with two cities in Gauteng, funded by GEF/DBSA (technical assistance)

Estimated total investment ZAR 'million		2023	2024	2025	2026	2027	2027/8
JET IP	JET ImP						
26 538	26 538	APDP NEV incentive under development					
8 519	5 000			5 000			
5 050	19 670	Various projects from pre-feasibility to bankable					
4 000	4 000	Battery value chain initiatives under development (seed funding)					
6 100	10 463	-	1 017	1 669	2 336	2 837	2 605
6 100	6 976	-	678	1 112	1 558	1 891	1 736
3 750	4 163	-	235	597	968	1 246	1 117
	3 300		120	480	720	960	1 020
	485		97	97	97	97	97
	378		18	20	151	189	
	833		47	119	194	249	223
	1 980		396	396	396	396	396

Programmes	Description
Mobility emissions programme/fund	Decarbonising the NEV market segments for goods and services, logistics, private transport, and government fleets; charging infrastructure; and energy storage (including associated infrastructure)
Mobility emissions abatement requirement	Decarbonising the NEV market segments for goods and services, logistics, private transport, and government fleets; charging infrastructure; and energy storage (including associated infrastructure)
NEV adoption and localisation projects/ pipeline	NEV pilots across the last mile delivery, logistics and other applications incorporating charging infrastructure and assembly and manufacturing of vehicles and batteries
IDC e-mobility study	IDC study on e-mobility including pre-feasibility studies for e-mobility opportunities
e-trucks	Local company assembling e-trucks and supplying chargers; plotting with two corporate companies
Corporate charging services	Business providing charging network for corporate clients; piloting with two corporates
Delivery vans	Delivery and charger service provider to logistics companies for retail and courier delivery services
Delivery cargo vans	Delivery cargo van service provider for retail and delivery services
Delivery bikes project 1	e-bike delivery service with battery swop technology
Delivery bikes project 2	e-bike delivery service with battery swop technology
Delivery e-bicycles	e-bicycle delivery service company based in Cape Town and Gauteng
Game EVs	Manufacturer of electric game drive vehicles
e-mining vehicles	Companies that manufacture electric drive train vehicles for mining applications
EV bakkies	Local manufacturer and assembler of ICEV and NEV LCV (bakkies)
SOE fleet electrification	SOE plans to run pilots to transition minibus, panel vans, etc. and install infrastructure

	Estimated total investment ZAR 'million		2023	2024	2025	2026	2027	2027/8
	JET IP	JET ImP						
	6 800	5 944		1 266	572	896	1 650	1 562
	6 800	3 902	272	777	314	530	1 033	974
		2 999	272	550	212	392	811	762
		7		7				
		50		50				
		200		50		50	50	50
		100		100				
		25	25					
		385	32	96	113	46	98	
		269		9		100	160	
		1 286		40	55	100	395	696
		188	14	24	30	30	90	
		270	200	70				
		54		54				
		26		26				

Programmes	Description
Infrastructure project 1	Charging and enabling infrastructure investment required to support the roll-out of adoption projects
Infrastructure project 2	Charging infrastructure (including soft infrastructure) for e-mobility applications
Public NMT infrastructure	Projects to link townships to urban centres through NMT roads and lanes; create enabling environment for mobility services
Associated infrastructure	Enabling and auxiliary distribution infrastructure investment required to support the roll-out of adoption projects
Early adoption and innovation	Supporting investments in early adoption projects for NEV and the development of a local supply chain and innovation ecosystem – the support will also include the sharing of intellectual property, patents, and technology partnerships between IPG and South African institutions, innovators, and entrepreneurs; charging infrastructure and energy storage (including associated infrastructure)
Innovation fund	Uyilo Kick Start Fund
Feasibility study	Value chain study to investigate the low-carbon manufacturing of NEVs for electro-mobility, logistics, public transport applications and pre-feasibility studies on localisation opportunities
	Feasibility study to investigate the localisation of battery manufacturing in South Africa for various markets
Programme support	Sector research and planning to accurately assess integration and interdependencies; market opportunities and timing; detailed socio-economic and techno-economic studies to support investment planning, JT planning, reskilling programmes; and R&D support
Total funding required	
Total funding required (excl. ind. dev. and supply chain)	

Estimated total investment ZAR 'million		2023	2024	2025	2026	2027	2027/8
JET IP	JET ImP						
	60		10		50		
	15		4	1	5	5	
	64	1	10	13	11	13	16
	545		110	42	78	162	152
1 800	357	-	117	60	60	60	60
360	300		60	60	60	60	60
30	7		7				
	50		50				
1 600	500		100	100	100	100	100
57 740	**71 616**		**13 324**	**13 282**	**14 274**	**15 528**	**15 208**
	16 408		**2 283**	**2 240**	**3 232**	**4 487**	**4 166**

Annexure C: Programme Overview

Public Transport (buses and taxis)

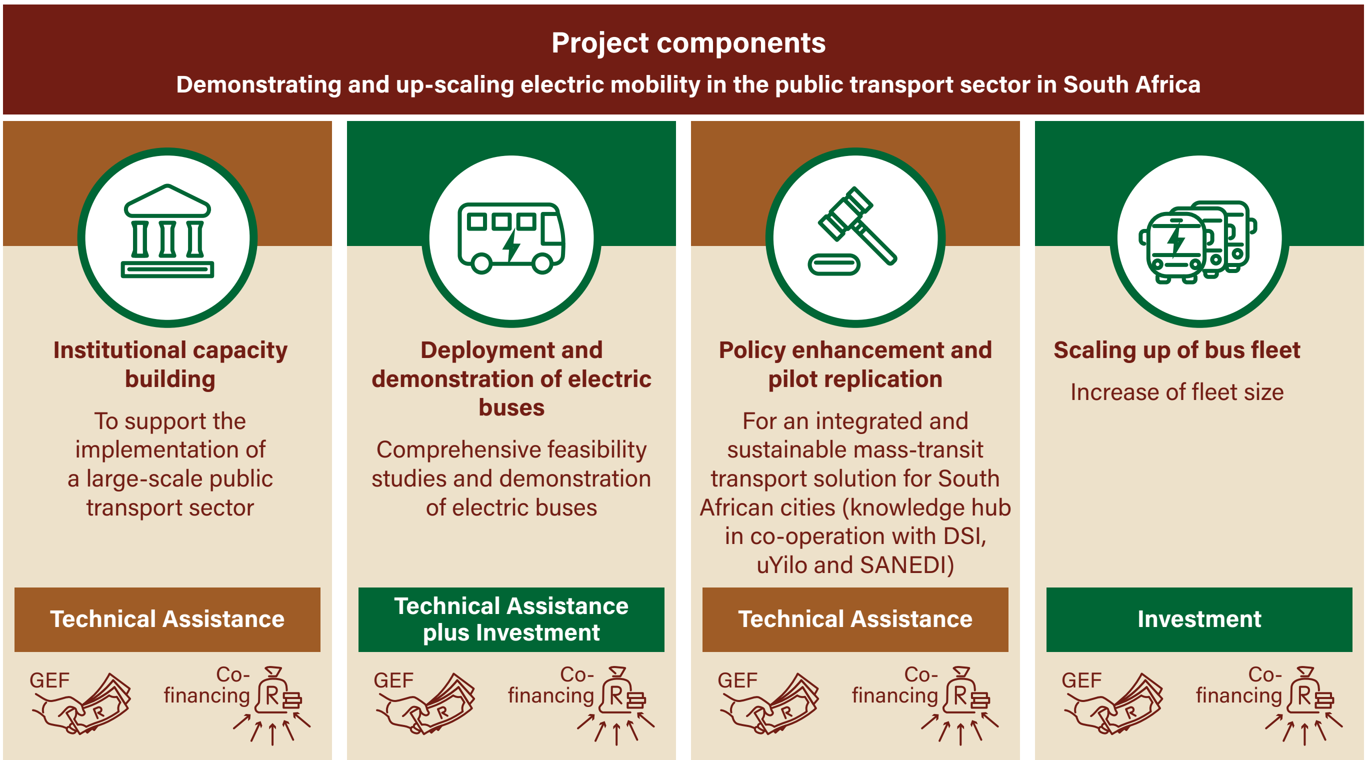
The public transport sector is an area where both the national, local government, cities, and the private sector can advance procurement of electric buses and minibus taxis (MBT). This also includes the private fleets providing passenger services to local government (for example, Golden Arrow and Putco); and MBTs that are a large component of the transport sector and the largest private transport sector in South Africa, serving mainly lower-income households.[44]

Government, through the DoT, has already started looking at the decarbonisation of public transport through the Green Transport Strategy and currently has two incentive programmes running to support both buses and taxis, Public Transport Network Grant (PTNG), and Taxi Recapitalisation Programme.[45] Infrastructure support will be critical and support will be required from multiple stakeholders, such as municipalities, cities, Eskom to effect grid upgrades to support changing infrastructure, and Transnet to support enhancement of rail operations and transition to lower-carbon locomotives.

The public transport programme for JET Implementation Plan requires trusted domestic institutions that have the capability to leverage funding from partner countries, and to administer and implement the programme. The DBSA has partnered with the Global Environment Facility (GEF) to support developing countries to transition to electric mobility. The World Bank (WB) serves as the trustee for GEF, and DBSA has been an accredited national agent since 2014. The DBSA programme under the auspice of 'Accelerating the shift toward electric mobility in South Africa', aims to move towards a low-carbon transport sector and demonstrate the viability of deploying electric buses in various cities that have expressed interest. The programme has received interest from three cities, namely City of Johannesburg, City of Tshwane, and the eThekwini Municipality. The initial pilots will seek to deploy 50 EV buses over the next five years, with the project commencing in 2024.

44 JET IP, 2023–2027.
45 Authors notes, discussions with DoT.

Figure 14: Components of up-scaling e-mobility in SA's public transport sector



Source: DBSA.

The South African National Energy Development Unit (SANEDI) is the approved implementation partner, the executing entity, and project manager, and DBSA is the implementing agency. The programme consists of four key areas:

1. Policy development
2. Pilot development
3. Capacity building
4. Scale up of e-buses

The DBSA programme allows for other funders to participate in the programme, thereby aligning with the JET Implementation Plan to attract funds from partner countries.

The programme supports strategies at a city level to reduce carbon emissions and improve air quality. It demonstrates electric transport working in cities, thus allowing cities to learn and develop capacity. This creates an enabling environment which allows for policy development around e-bus technology and knowledge hubs for cities to share experiences and learnings. The programme will also allow cities and bus operatives access to grant and concessional funding which will reduce the cost of funding and match the tenor of service contracts. Cities will benefit from operating lower-cost fleets and reduced maintenance while providing sustainable and lower operating cost transportation services to the public.

Public Transport Projects

Other notable projects that make up the balance of the public transport programme is the Golden Arrow Bus Service (GABS) electric bus projects and the Flex EV electric taxi project. Both projects are based in Cape Town and will contribute to the City of Cape Town's strategy for the electrification of transport.

GABS (established in 1861) is the major public transport bus service operator in Cape Town, with a current bus fleet of 1 100 buses and a total of 2 500 employees. GABS transport a sizeable number of commuters daily and is an established market player in the public transport industry in Cape Town. In 2021, GABS was the first commuter bus operator to pilot and field test the use of electric buses.[46] The pilot, using two buses built by Busmark which used BYD components, demonstrated the business case for using e-buses. GABS is currently testing a 65-seater BYD bus and has been mandated by their board to commence fleet replacement of 60 e-buses per annum. GABS is looking to assemble these buses locally with an OEM. The project will also require the installation of charging and renewable solar infrastructure (< 100 MW). By replacing its 1 100-bus fleet, GABS will reduce carbon emissions by 67 kilo tonnes of CO_2 per year.[47]

Flex EV is a start-up company focusing on the electrification of the taxi sector. The company plans to roll out two pilot projects in Stellenbosch and Century City in Cape Town and launch approximately 80 e-MBTs and two charging facilities over the next two years. Thereafter, it plans to roll out regional projects in Gauteng, Eastern Cape, and Durban over the next five years, building a fleet of close to 1 500 e-MBT over this period. The project also plans to locally assemble MBT once the volumes and the business case can be proven. It is estimated that the taxi industry emits close to 34 million tonnes of CO_2 per annum and, therefore, it is critical for the JET IP that the taxi sector has the technology and support to decarbonise. The

46 Green Cape. (2023). *Electrification of public transport*.
47 Green Cape. (2023). *Electrification of public transport*. The CO_2 emission factor used was 2 692 kg per litre of diesel fuel consumed (DEA, 2017, as cited in Kornelius et al., 2022).

charging facilities will include renewable solar and energy storage and facilitate the upgrading of the surrounding grid infrastructure.

The estimated investment required for the public transport programme is approximately ZAR 10.46 billion over the next five to six years. The amount is greater than the budget in the JET IP due to the additional DBSA programme and improved data from the other projects. Grant funding required is estimated at ZAR 1.6 billion with the balance of equity, private capital, concessional, or commercial funding. A 20% buffer has been considered for additional related charging infrastructure investments, such as grid upgrades. The investment required has been set at 50% above the project pipeline, to allow for other projects not yet identified to be funded through the JET Implementation Programme.

Mobility Emissions Programme

Mobility emissions abatement refers to NEV segments that cater for B2B and B2G sectors of the economy. Over the past few years, the growth in e-commerce and delivery services has seen significant growth in vehicles on the roads to meet consumer demands. These vehicles range from scooters/motorcycles to lighter delivery vehicles, to three-wheel cargo carriers.

The logistics sector is also facing pressure to decarbonise supply chains that service major local and global companies and covers various categories or transport typologies, such as primary (bulk goods), corridor (national roads), rural and metropolitan.[48] The inefficiencies in South Africa's rail infrastructures have meant that more goods are transported by road than ever before. In terms of CO_2 emissions, metropolitan freight contributes close to 50% of all logistics emissions, followed by rural and road corridor freight. All these typologies will require different solutions and technology offers when transitioning to NEV mobility and will have an impact on emissions reduction over the short- to medium-term. The light delivery vehicle parc in South Africa is estimated at 2 673 783 vehicles in 2021, with heavy delivery vehicles estimates at 388 383.49

Studies undertaken by Green Cape and Bloomberg NEF[50] show that the logistics segment is likely to transition faster due to the TCO savings, which reduces the dilemma of the high purchase price of NEVs faced by passenger car buyers. TCO looks at the purchase price plus the running/ maintenance cost of the vehicles and the revenue/income earned by the vehicle. This makes the mobility abatement attractive for funders, as ROI can be calculated. Companies, such as Uber and Woolworths, have committed to decarbonising their delivery, with Woolworths partnering

48 WWF. (2016). *Greenhouse Gas Emissions from Passenger Transport in Gauteng: an Investigation per Income Group*.
49 Green Cape. (2023). *Sustainable Mobility Market Analysis and Opportunity Report*.
50 Green Cape. (2023). *Sustainable Mobility Market Analysis and Opportunity Report*; *BNEF Global EV Outlook, 2023*.

with local company Everlectric to supply LDVs for its Dash service[51] and Uber committing ZAR 200 million to support businesses in Gauteng using e-mobility solutions on its platform.[52]

The funding approach for mobility and logistics leans towards a phased 'learning as we do' pathway, which allows for investment to be de-risked and the impact of NEV on electricity infrastructure to be phased in over time. Projects typically start with a proof of concept (POC) stage and then graduate to a pilot, demonstration, and commercial stage as businesses increase their fleet volumes, building infrastructure networks and diversifying business/product offerings. Scale economies can be achieved during the demonstration or commercial stages where consideration for localisation of vehicles, chargers, batteries, and infrastructure can be made based on economically viable business case. This is where the power of mobility adoption leads to the creation of factory jobs and wider social economic impacts.

The Mobility Emissions Programme/Fund will be housed at a domestic DFI, such as the IDC, and will support funding for the following areas:

- NEV localisation projects
- Early adoption and proof of concept pilots
- Infrastructure support
- Policy and research development
- Innovation and capacity development.

The programme will fund projects with a focus on two- and three-wheeled vehicles, light delivery vehicles (excluding passenger vehicles), medium and heavy commercial vehicles, mining and agriculture vehicles, and industrial vehicles.

The project pipeline for the programme is approximately ZAR 3 billion, which includes projects and businesses at various levels of maturity with consideration for additional infrastructure at 20% of the project pipeline. The total programme funding is ZAR 5.88 billion. Currently, the IDC is undertaking an e-mobility localisation study which commenced in September 2023. This study will include pre-feasibility undertakings on any viable opportunities to assemble NEVs in the non-passenger vehicles segments in South Africa.

51 (https://businesstech.co.za/news/motoring/593952/woolies-to-ramp-up-rollout-of-electric-delivery-vehicles/).
52 (https://www.dailymaverick.co.za/article/2023-08-10-uber-eats-invests-r200m-to-create-economic-opportunities-for-youth-in-township-economies/).

Mobility Projects

The project pipeline consists of a few notable businesses that provide mobility solutions to various demand-side pathways seeking to decarbonise:

- **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 100 e-bikes and plans to expand to 600 bikes by 2024. Thereafter, they aim to achieve close to 16 000 riders 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.
- **Valternative** is a Durban-based company which intends to roll-out e-bikes and battery swop stations to service food delivery and courier clients using the Uber platform. The company will undertake a POC/pilot project in 2023 and, thereafter, intends expanding its fleet to >200 e-bikes with the goal of reaching 3 000 bikes by 2028. Both these businesses provide services and are supported by Uber South Africa which has a target of net zero by 2040.
- **Mellow Vans**, a three-wheel cargo vehicle manufacturing company based in Stellenbosch, was one of the first e-mobility companies in South Africa and currently supplies several retail, delivery, and e-commerce businesses. They currently assemble locally with up to 70% local content and are looking to export their product to overseas markets.
- **Other projects** include the local manufacturing of e-game drive vehicles for the eco-tourism sector. Logistics projects, including the local assembly of electric trucks and the piloting of DC charging stations with corporates for fleet integration. Eskom is undertaking an e-mobility project to transition their fleet, whereby they will procure about 15 vehicles for five sites, including charging infrastructure and infrastructure upgrading. This will contribute towards their JET commitments. Charging infrastructure projects include the rolling out of charging infrastructure for corporates over the next two years. Mining equipment supplies of scoopers, loaders, and haulers have been providing battery electric vehicles to mining companies and looking to expand local production of these vehicles.
- **Public enabling projects** include the upgrading of public roads for exclusive use by non-motorised transport (NMT) vehicles and creating safe passage for people in urban and informal areas close to major urban hubs. The safe passage initiative allows for private and public partnerships to address the interconnected crisis within urban sprawls. It creates an enabling space for services related to e-mobility to be offered, thus making taxis, e-hailing, micro-mobility, and transformed land use to rapidly reduce GHG emissions related to transport channels. The pilot project is set to launch from Langa to the central business district (CBD) in Cape Town, with other projects planned for Tshwane, Soweto, Sandton, and Johannesburg over the next five years.

Innovation and Technical Assistance Programme

The innovation and technical assistance programme can be linked to, or incorporated in, the programmes for public transport and mobility abatement. The DBSA programme provides for ZAR 2 billion technical assistance. The DSI's uYilo programme is an e-mobility programme which supports technology development and pilot projects for NEVs and has assisted several of the companies, such as Green Riders, Mellow Vans, MMC, and so on. The uYilo Kick Start Fund is an ideal vehicle to channel funding from partner countries to support the innovation and technical assistance requirement for JET. In addition, the fund can support shared technical services, such as testing and homologation stations for NEVs and skills training programmes.

Automotive Value Chain

The Implementation Plan is in line with the NEV roadmap of the DTIC published in 2021, which includes the following phases:

- **Phase 1:** Focus on the assembly of NEVs primarily for export, while preparing for local sales, and finalise the NEV components for local manufacture and pilot projects.
- **Phase 2:** Grow the domestic consumption market by expanding the local NEV component manufacturing sector. This will help facilitate the shift to full electrification.
- **Phase 3:** Focus primarily on the domestic market for NEVs, especially BEVs and fuel cell technologies.

The JET IP is aligned with DTIC's NEV roadmap and provides a holistic support package for the industry (mainstream and infant). The phased approach by government will create an enabling environment for NEV production and address resource mobilisation, focusing on at-risk exports.

The current policy tool (APDP 2) for NEVs is under development by the DTIC and NT, subject to budgetary constraints and additional proposed tax incentives. The new policy incentives will hopefully allow current and new OEMs to demonstrate the business case for attracting NEV production volumes to South Africa and reduce the cost of imported NEVs to stimulate local demand and lower retail prices.

To accelerate this plan and fast-track deployment of locally produced NEVs in the South African market, the country needs additional support.

The automotive supply chain initiatives cover several areas and is supported by a variety of mechanisms, including grant incentive development and commercial finance and private capital. The automotive sector has several supporting mechanisms, such as the APDP 2 and Automotive Industry Transformation Fund (AITF). However, as demonstrated in the JET IP, the requirement for transitioning is significantly higher and more funding support is required.

The JET IP proposed funding support of ZAR 70 billion for end-user incentives (in subsequent phases of implementation) and prioritisation of about ZAR 41 billion for manufacturing support for the automotive and battery minerals value chain.

Manufacturing Supply Chain

Several OEMs are already producing hybrid electric vehicles in South Africa for the domestic and export market, such as Toyota, Mercedes Benz SA, and BMW.

Recent announcements, including from BMW South Africa, indicate that they will invest close to ZAR 4.5 billion to manufacture the new X3 plug-in hybrids in South Africa. Stellantis has also announced its intention to set up a manufacturing facility in South Africa and have signed a memorandum of understanding (MOU) with the DTIC and IDC to undertake a project worth ZAR 3 billion. The South African component industry also recently announced investments worth ZAR 4.85 billion to support current production. Many OEMs, such as BMW, GWM, BYD, and Toyota already have NEV offerings for domestic consumers, and within the next two to three years, it is estimated that NEVs will reach price parity organically with ICE in South Africa.

The IDC will seek to invest close to ZAR 5 billion over the next five years in vehicle assembly and component suppliers.

Battery Value Chain

The pipeline for battery metal and minerals exceeds ZAR 19 billion total project costs, and these projects are mainly from the IDC project development pipeline. Projects are at various stages, from scoping to pre-implementation, and focus on battery minerals, such as nickel, manganese, cobalt, graphite, lithium, rare earths, and other critical minerals, such as copper and vanadium.

The IDC will also partner with a global battery cell OEM to undertake a scoping study for the localisation of cell manufacturing in South Africa. A project cost of ZAR 50 million has been budgeted for this study.

The importance of the battery value chain and manufacturing capability for battery cell manufacturing cannot be overstated enough. The battery makes up more than 50% of the cost of NEVs and value addition from a production perspective. The implications for not localising the battery value chain will mean that local content of 65% by 2035 will not be achieved, and the importation of batteries by OEMs may impact the rules of origin with the EU, which requires local content of up to 60% to export vehicles to the EU duty free. Overall, the Implementation Plan allocates approximately ZAR 4 billion towards battery cell manufacturing development and capacity building.

The strong pipeline of projects is a testament to the country's ability and potential for establishing a battery supply chain for the world, as an alternate sourcing destination for battery manufacturing inputs, such as precursors, foils, contactors, and so on. Many countries, such as the EU and USA, are faced with a either a single source challenge for battery materials or will not meet national targets.[53] This provides an opportunity for battery cell manufacturers to start establishing a supply base for battery cell manufacturing. South Africa has existing legislation, especially the Mineral and Petroleum Resources Development Act (MPRDA), the Royalties Act, and the Income Tax Act (ITA), all of which create the framework for a system of incentives, levies, and rebates that can act as a 'Critical Minerals/Metal TRIMS', like APDP.

Today, mining, automotive, and the transport industry are joined at the hip due to the electrification of transport and the need to decarbonise it. A propagative opportunity, linking two industries, will be pivotal and the support of JET funds and partner countries is vital.

Evidence of progress will include the current flourishing South African battery assembly segment for energy storage and telecoms working with companies, such as Polarium and Blue Nova. Thus, the skills base for battery assembly exists and will grow.

53 The USA, under the IRA and Critical Minerals Act, is forecast to have difficulty achieving its 100% local content requirements for batteries by 2029. Currently the USA sources more than 46%–77% of battery minerals from non-FTTA countries (*S&P Global Market Intelligence Inflation Reduction Act: Impact on North America metals and minerals market*: Final Report, August 2023).

THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Chapter 8:
GREEN HYDROGEN

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- articulate key actions to drive the implementation of South Africa's Green Hydrogen (GH_2)[55] and GH_2-derivative industry and support manufacturing (for example, fuel cells and electrolysers) for the initial five-year period (2023–2027)
- assign owners and targets to these actions to ensure sustainable growth within South Africa's GH_2 industry
- build on existing bodies of work and the latest feedback from project developers and funding partners to develop a well-defined and technically feasible Implementation Plan.

55 All references to GH_2 for purposes of scope of applicability, extend to Power-to-X (PtX) and X-to-Power (XtP) technologies and projects: Power-to-X (PtX): Conversion of renewable electricity (Power) into GH_2-based products (X). This includes technologies and projects for products such as GH_2 itself, Green ammonia (NH3), e-methanol, Sustainable Aviation Fuel (SAF) amongst other Green chemicals and fuels, and beneficiated heavy manufacturing products, such as Green steel. It also includes sustainable carbon sourcing technologies and projects. X-to-Power (XtP): Conversion of PtX products into electricity from hydrogen used as long-term storage to provide seasonal balancing for the power system (both in the form of fuel cell technology or as direct combustion in gas turbines).

8.1 Stakeholder Concerns

During the stakeholder engagements conducted by the Presidential Climate Commission (PCC) in early 2023, GH_2 concerns were highlighted across five core themes. Table 24 outlines how these issues are addressed in the GH_2 implementation plan.

Table 24: Stakeholder concerns and how they are addressed

Theme	Concerns raised	How concerns are addressed
1. **Energy security**	GH_2 should not compete with South Africa's energy crisis Eradicating energy poverty is a more pressing priority	RE dedicated to the production of GH_2 must pass the test of 'additionality' for the GH_2 being produced to be considered certifiably 'Green' - this is a safeguard to ensure that GH_2 production does not compete for RE and conflict with energy security objectives GH_2 can be a key lever in addressing the energy crisis - typically, RE capacity is deliberately 'overbuilt' (2–3X electrolyser capacity) to maximise GH_2 production efficiency which allows the ~20%–40% surplus energy from GH_2 plants to be fed into the grid Substantial scaling of GH_2 projects is anticipated post-2028, which is disconnected from the time horizon to solve the short-term energy crisis South Africa currently faces (e.g. NECOM initiatives aimed at addressing the energy crisis targeted for completion before 2028) GH_2 projects can serve as anchor demand, rationalising critical shared infrastructure projects (for example, grid expansion), especially in remote regions with limited industrial activity, and further increase demand for skills and locally manufactured goods that are integral to other JET IP priorities (e.g. RE value chain)
2. **Funding**	GH_2 should not direct critical grant funding away from the energy crisis and other pressing issues	Grant funding will be sourced from global funds that have ringfenced grants and concessional contributions for supporting GH_2 initiatives - if South Africa does not pursue these grants, they will be allocated to other competing GH_2 producing countries Existing funds dedicated to GH_2 support as part of the JET IP have been sourced from development finance institutions with a dedicated mandate for GH_2 support The GH_2 implementation plan does not seek to obtain grants earmarked for other JET sectors or priorities

Theme	Concerns raised	How concerns are addressed
3. **Workforce skills**	Insufficient local workforce skills to deliver the pipeline of projects	South Africa's high unemployment rate implies that training up a workforce capable of delivering South Africa's GH_2 ambition represents a significant opportunity Investments must be made to build the skills needed to realise this opportunity and this will require a nationally co-ordinated effort The GH_2 economy can serve as anchor demand for these skilled workers and help bridge the unemployment gap GH_2 will primarily require skills and jobs in the RE value chain, aligned with other priority areas in the JET IP, which can help, in the early years, to drive focus on what skills development is required - however, skills to anchor local manufacturing of components in the GH_2 value chain must also be developed in parallel, at a different pace and scale
4. **Execution plan**	Insufficient details on the JET IP's execution plan	This Implementation Plan outlines actions, milestones, and owners to deliver the JET IP
5. **Transparency**	Transparency on progress and fund use is required	A GH_2 implementation dashboard will be developed and made public as part of the JET Implementation Plan

8.2 Context

8.2.1 South Africa's GH_2 Opportunity

South Africa has multiple structural and strategic advantages that underpin its 'right to win' in the global GH_2 market:

- **World-class Renewable Energy (RE) resources** with globally competitive load factors, put South Africa on par with emerging leaders such as Chile, Namibia, Australia, Saudi Arabia, and Morocco.
- **Ample land is available for development**, unlike more developed economies like Germany. South Africa's Renewable Energy Development Zones (REDZ) can alone accommodate up to 370 GW and 550 GW of world-class wind and solar photovoltaics (PV)[56] respectively, enabling the large-scale production of GH_2 at globally competitive prices.
- **Significant Platinum Group Metals (PGM) reserves** exist that can be a source of competitive advantage in the localisation of the manufacturing of key technologies, such as fuel cells

56 NBI. (2021). *Decarbonising South Africa's Power System.*

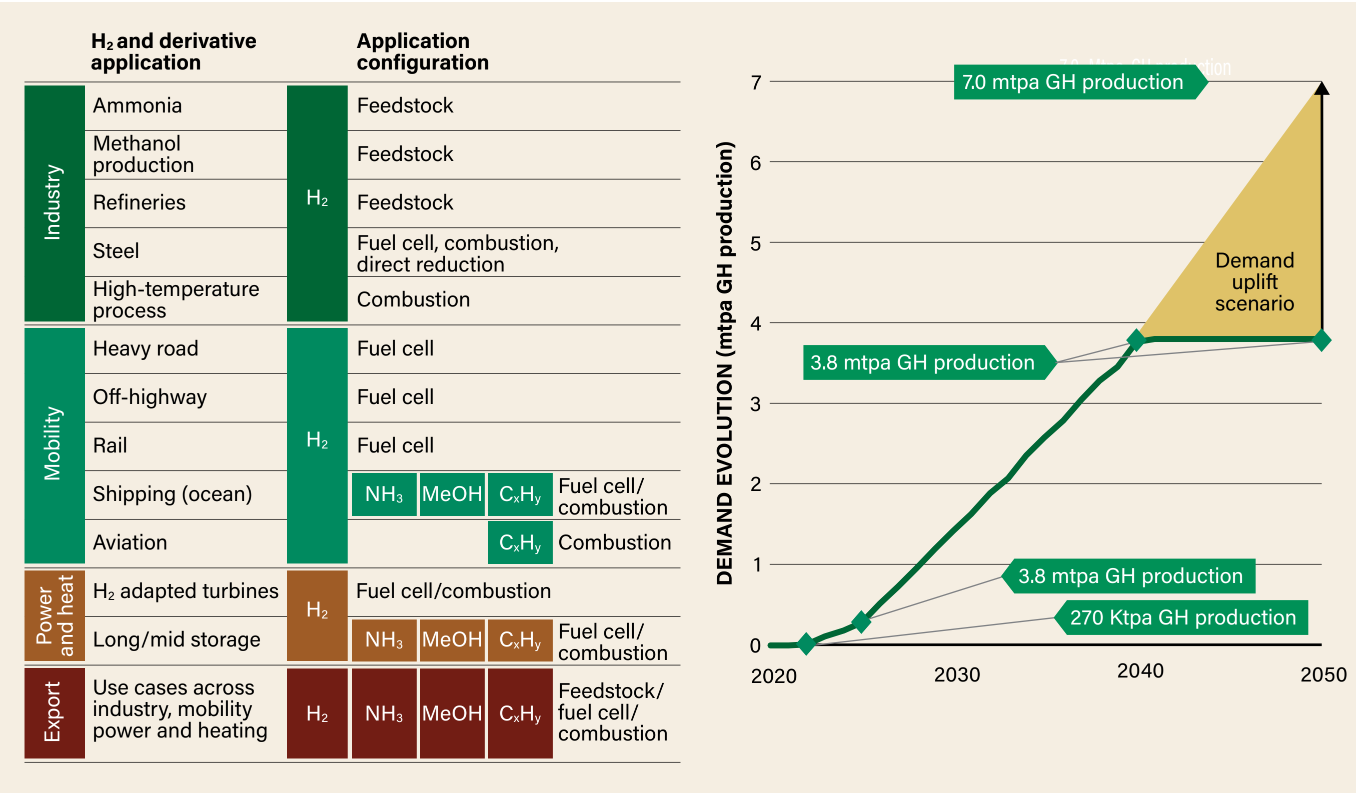
and electrolysers. It must be noted, however, that this specific technology space is nascent and other (non-PGM based) technologies are being explored. South Africa must objectively monitor these key technology signposts in its drive towards localisation to avoid anchoring on a non-competitive technology.

- **Downstream beneficiation technology, capabilities, and existing asset base** (including Fischer-Tropsch and Direct Reduced Iron (DRI)) can enable the production of high-value Green products, such as Sustainable Aviation Fuel (SAF) Green bunker fuels, Green methanol, and Green steel.
- **Strong geo-political and trade relationships with leading GH_2 markets**, such as the European Union (EU), United Kingdom (UK), Japan, and South Korea may allow South Africa to access and collaborate on the development of key technologies, such as fuel cells and electrolysers, and be able to competitively place final GH_2-based products in these markets.
- **Globally advanced Just Energy Transition Partnership (JETP) constructs** have demonstrated pioneering JET partnerships with developed countries, and South Africa is well-positioned to leverage existing JET IP mechanisms for fostering co-ordinated efforts and collaboration in mutually beneficial trade, finance, and decarbonisation agreements that form the foundation of a Just Transition.

By leveraging these structural advantages, South Africa can develop a competitive GH_2 ecosystem in the region that can help preserve and grow a resilient industrial base. In the 'demand uplift' scenario, South Africa could produce ~7 mtpa of GH_2-based products for both local and export markets,[57] as shown in Figure 15. If realised, this could increase the gross domestic product (GDP) by up to ~5.9% (real) or ~ZAR 500 billion[58] by 2050. Moreover, South Africa's globally competitive GH_2 production enables cost-effective decarbonisation of existing downstream industries, such as steel, cement, petrochemicals, and heavy-duty transport by enabling a 10%–15% emissions reduction in these sectors.[59] An affordable decarbonisation pathway that has viable 'last mile' decarbonisation levers (like GH_2) is critical for these sectors and downstream-associated industries to remain resilient as the world transitions to a lower-carbon economy – especially given the context of global regulations such as the EU Carbon Border Adjustment Mechanism (CBAM), which puts ~50% of South Africa's exports at risk.[60] By decarbonising their operations early, these sectors can capture a 'Green premium' in product sales to downstream niche industries. For example, although the production cost of Green steel pre-2030 is expected to be ~2X the current grey alternative, when used in the production of an average light motor vehicle produced in the EU it will add, on average, EUR 500 to the cost of a ~EUR 30 000 car.[61]

57 DTIC and Green Hydrogen Panel. (2022). *Green Hydrogen Commercialisation Strategy; 7 mtpa is GH_2 equivalent*.
58 World Bank Group. (2022). *South Africa Country Climate and Development Report*.
59 NBI. (2022). *It all Hinges on Renewables*.
60 NBI. (2022). *It all Hinges on Renewables*.
61 World Economic Forum and Boston Consulting Group (BCG). (2021). *Net-Zero Challenge: The supply chain opportunity*.

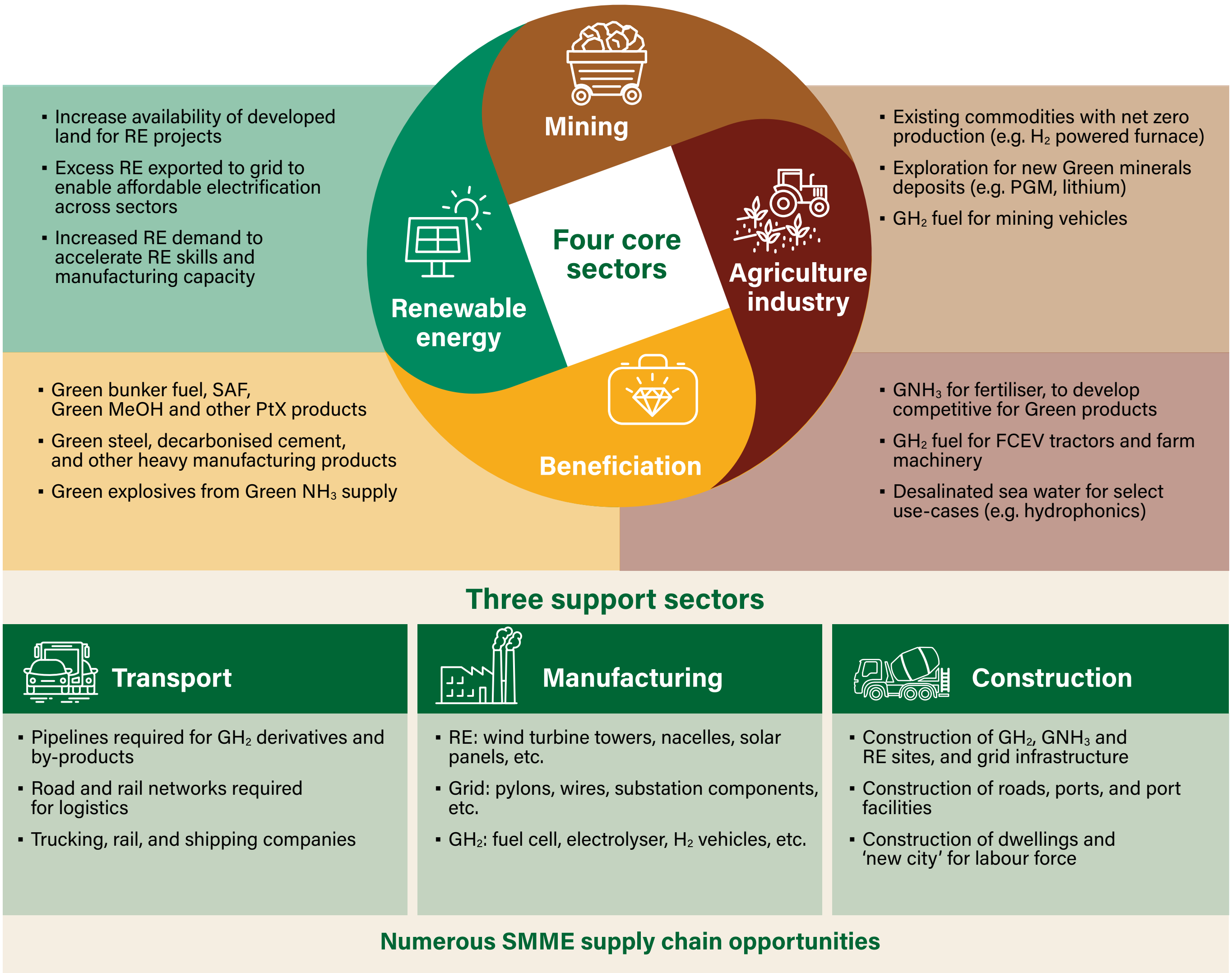
Figure 15: GH_2 application and forecast growth for the South African GH_2 product for local and export consumption



A local GH_2 industry can support the continued industrialisation of South Africa. This can be achieved through the GH_2 industry increasing the roll-out of RE to enable affordable, RE-based electrification across all sectors, driving growth in new Green commodities, for example, PGMs used in membrane electrode assemblies (MEA) for fuel cells and electrolysers, Green agricultural products, and downstream beneficiation to produce Green bunker fuels, SAF, Green methanol, Green steel, and Green explosives, as illustrated in Figure 16. This continued industrialisation due to the growth of the GH_2 industry, will drive further demand and growth in supporting sectors, such as transport, through increased logistics requirements, rail and road development, manufacturing for new RE equipment, and construction through establishing new manufacturing sites, workforce housing, and infrastructure expansion – providing numerous small, medium and micro enterprises (SMMEs) with supply chain opportunities. This can transform underdeveloped regions into industrial hubs. For example, the Coega Green Ammonia Plant is using existing training centres to skill the local community, attracting local manufacturing, amongst other initiatives in the Coega Industrial Development Zone, to create an industrial hub in the Eastern Cape, the province with the highest unemployment in South Africa.[62] Further examples of this industrialisation are provided in Annexure B.

62 Statistics South Africa. (2023)., *Quarterly Labour Force Survey,* 2022: Quarter 4.

Figure 16: GH_2 can drive industrialisation across four core sectors (RE, mining, agriculture, and beneficiation) and three support sectors (transport, manufacturing, and construction)



In scenarios with GH_2 exports and associated industries, up to 1.8 million[63] more jobs could be created economy-wide by 2050 than in scenarios without GH_2 exports and use. This complements and accelerates the ongoing Green job expansion objective within South Africa's JET, with manufacturing and RE value chains the primary job drivers due to the growing demand for locally manufactured components like fuel cells, membranes, solar PV, and wind turbines, and is in line with the vision of the South African Renewable Energy Masterplan (SAREM) to unlock industrial and inclusive development.[64] These high-value industries are pivotal in facilitating a Just Transition, anchoring high-quality, sustainable jobs, and enhancing the value proposition for new entrants to the economy, black-owned local businesses, and those impacted by the

63 Presidency. (2022). *South Africa's JET IP for the initial period 2023–2027.*
64 DMRE, DSI, & DTIC. (2023). *South African Renewable Energy Master Plan, Draft Version for Review 7 July 2023.*

energy transition (for example, individuals within mining value chains). However, this potential remains contingent upon well-structured skills development programmes. Additionally, GH_2 projects serve as a demand anchor for critical infrastructure and initiatives in South Africa's JET by enhancing their viability (business case), for example, by enabling the expansion of the grid to remote regions of the Northern Cape with limited industrial activity, Boegoebaai deepwater port, and Green reskilling initiatives. The GH_2 industry could also enable better utilisation of existing grid infrastructure by absorbing excess RE due to local grid capacity being exceeded if South Africa were to adopt a curtailment operating regime.[65]

To realise these opportunities, in the short term, local developers will have to adhere to export markets' regulations, such as the EU's Delegated Act, to secure the offtake needed to establish the industry. While both local and export markets are essential, securing export offtake in the short term is critical, as these markets will be able to meet the affordability thresholds earlier than the local market due to the large amount of Green stimulus packages being observed, for example, the Green Deal in the EU.

To safeguard against potential conflicts with national energy security and other JET objectives, four guardrails must be adhered to in order to capture the full benefits of a local GH_2 industry:

- Localising value chains, where competitive, must be nationally prioritised, and local content requirements scaled at a pace that balances establishing the industry and maximising socio-economic impact, including the growth of new black-owned local businesses.
- Local demand and export markets must be scaled concurrently, albeit at a different pace, to secure new Green value pools globally and enable the decarbonisation of local downstream industries.
- Local beneficiation of GH_2 into final products, such as Green steel and Green fuels, must be prioritised where viable, to maximise socio-economic impact and contribute to long-term energy security.
- Undue financial strain on the average consumer must be avoided by preventing GH_2-driven cost increases in, for example, electricity or steel costs. GH_2 should instead be targeted where it is already affordable, and at industry segments capable of handling the Green premium during the GH_2 industry's early development stages, that is, the first 10–15 years.

65 Engineering News. (2023). *Eskom mulling new curtailment approach to unlocking grid capacity as it pursues 47 priority projects*. (https://www.engineeringnews.co.za/article/eskom-mulling-new-curtailment-approach-to-unlocking-grid-capacity-as-it-pursues-47-priority-projects-2023-08-25).

Against the backdrop of less than 10% (real) GDP growth between 2012 and 2022,[66] which is less than the 15% population increase over the same period,[67] more of the same will not be enough. South Africa must act quickly to seize the opportunity that GH_2 represents. Other countries with competitive GH_2 prices, such as Australia and Chile, have already completed their GH_2 strategies and made significant progress in establishing an integrated supply base. South Africa must implement policies and regulations to support establishing and growing the local GH_2 industry. If not, it will miss an opportunity to obtain a ~ZAR 500 billion or ~5.9% (real) higher GDP by 2050[68] to help alleviate its triple challenge of unemployment, inequality, and poverty.

8.2.2 Current GH_2 Developments in South Africa

South Africa has made progress in establishing its national GH_2 strategy, supporting policies and regulations in adjacent sectors (for example, RE), securing low-cost funding from international partners, and establishing trade relations with lead GH_2 markets to begin capturing the GH_2 opportunity, as seen in Table 25.

Table 25: Progress made in establishing South Africa's GH_2 industry

Dimension	Progress to date
Strategy	Presidency's JET IP for 2023–2027 (2022) DTIC and Green Hydrogen Panel's Green Hydrogen Commercialisation Strategy (GHCS) (2022) Cabinet approval of the Country Investment Strategy (CIS) (2022) The DSI Hydrogen Society Roadmap (2021)
Policies and regulations	**Renewable Energy Development Zones (REDZ)** defined for RE deployment, creating priority areas for grid investments and accelerated permitting **Special Economic Zones (SEZ)** regulations to accelerate and incentivise local manufacturing through reduced corporate tax, accelerated tax allowance and employment tax incentives, e.g. Namakwa SEZ for GH_2 and GNH_3 for companies in the Northern Cape and Atlantis SEZ for RE manufacturing in the Western Cape **Generation license removal** to move beyond a single buyer electricity model and enable large-scale wheeling

66 StatsSA. (2023). *GDP Time series 2022Q4.*
67 StatsSA. (2023). *Country projection by population group, sex and age (2002–2022).*
68 World Bank Group. (2022). *South Africa Country Climate and Development Report.*

Dimension	Progress to date
Funding	**KfW Development Bank-Industrial Development Corporation (IDC) Programme**: EURO 23 million grant programme for supporting catalytic projects in South Africa's GH_2 economy in the development and construction phase. **International Partners Group (IPG):** ~USD 8.5 billion pledged to the JET IP, with a minimum ~USD 0.7 billion proposed for GH_2 – in addition, the IPG and others have significant funds available for private sector projects **SA-H_2 Fund:** USD 1 billion target fund launched with an initial EURO 50 million seed funding on behalf of the Netherlands government through Invest International, in partnership with IDC, DBSA, Sanlam, and Climate Fund Managers **PtX Development Fund:** EUR 270 million was established by the German Federal Ministry for Economic Co-operation and Development (BMZ), with South Africa on the target country list
Trade relations	**Germany:** South Africa and Germany signed a joint declaration of intent to create a South African-German GH_2 taskforce to formalise GH_2 bilateral agreements - this is on the back of Germany doubling its GH_2 target to 10 GW and a new import strategy to diversify import channels **Netherlands:** Memorandum of understanding (MOU) between South Africa and the Netherlands for co-operation in GH_2, RE and JET **UK:** MOU between South Africa and the UK for co-operation in science, technology, research, and innovation, which includes the hydrogen economy **Japan:** GH_2 relationship through government and business delegation – this is on the back of Japan targeting over USD 100 billion of GH_2 investment, and Tokyo committing to increase GH_2 supply sixfold to 12 mtpa by 2040 **South Korea:** South Africa successfully initiated a GH_2 relationship with South Korea through government and business delegation **United States:** The U.S. Trade and Development Agency (USTDA) will take eligible candidates from South Africa to the United States in the first quarter of 2024 for a Reverse Trade Mission to observe innovative design, manufacture and operations of US GH_2 technology and services to support JET IP GH_2 goals.

South Africa is developing a pipeline of 24 projects worth more than ZAR 300 billion to establish its GH_2 industry (as seen in Table 26), with small-scale projects expected to come online in the next one to two years and larger projects around 2030. Details on the progress of these projects are available in Annexure A. Although South Africa has made good progress on its strategies, funding, trade relations, and projects, challenges still need to be overcome to establish its GH_2 industry. The plan to address these challenges is outlined in the next section.

Table 26: South Africa's pipeline of 24 projects under development for execution in the short- and medium-term, with the first nine projects granted Strategic Integrated Project (SIP) status

Project name	Project description	Developers	COD	Production
Prieska Power Reserve	GH_2 and ammonia from solar and wind energy	Mahlako a Phahla Investments, Central Energy Corporation (Cenec), IDC	2026/7	14 ktpa GH_2 80 ktpa GNH_3
Ubuntu Green Hydrogen: Phase 1	GH_2 and GNH_3 production from solar and wind energy	Ubuntu Green Energy	2026	7 Ktpa GH_2/ 3.5 Ktpa GNH_3
Boegoebaai	Northern Cape GH_2 and ammonia production, and infrastructure programme	Northern Cape Economic Development Trade and Investment Promotion Agency, Sasol	*	*
Atlanthia Green Ammonia/ Hydrogen: Phase 1	GH_2 and GNH_3 production in Freeport Saldanha from solar and wind energy	Atlanthia Green Hydrogen	2027	7.3 Ktpa GH_2 / 36.5 Ktpa GNH_3
Upilanga Solar and Green H_2 Park: Phase 1	GH_2 production from solar energy	Emvelo, Energia, international technical partners in Germany, DBSA		19.8 Ktpa GH_2
Sasolburg	60 MW GH_2 production	Sasol and IDC	*	*
HySHiFT Secunda	SAF production using existing Sasol Secunda assets with new electrolysers and RE	ENERTRAG, Sasol, Linde	Aug 2026	16.4 Ktpa GH_2 / 36.1 Ktpa SAF
Coega Green Ammonia Project: Phase 1	GNH_3 production in Coega Industrial Development Zone	Hive Hydrogen South Africa	2028	237 Ktpa GNH_3
South African Hydrogen Valley	Several GH_2 projects to transform region around Johannesburg, Mogalakwena and Durban into a hydrogen valley	Anglo American, DSI, Bambili Energy, ENGIE	2030	185 Ktpa GH_2 by 2030
Project Rhynbow	Heavy-duty hydrogen fuel cell vehicle corridor between Johannesburg and Durban	Anglo American, Bambili Energy, Engie, Sasol, TotalEnergies	2025	*

Project name	Project description	Developers	COD	Production
Saldanha Bay Green Hydrogen Project	Large-scale GH_2 production with ArcelorMittal South Africa's Saldanha Works steel plant as an anchor offtaker	Mainstream Renewable Power	2027/8	60–80 Ktpa GH_2
Saldanha Hydrogen Direct Reduced Iron	Green Direct Reduced Iron (DRI) using GH_2	ArcelorMittal South Africa	2028	1 200 Ktpa DRI
Enertrag Postmasburg	Green NH_3 production from RE energy near Postmastburg	ENERTRAG	N/A	30 Ktpa GH_2 / 120 Ktpa GNH_3
Renewstable Mpumalanga	H_2 power plants (XtP) for baseload electricity	HDF Energy SA	2025	1 800 GWh p.a. of green electricity
Enertrag Indigen	Zero-carbon methanol production near Gqeberha	ENERTRAG	N/A	22 Ktpa GH_2/ 120 Ktpa e-MeOH
IPM Component manufacturing	Electrolyser and fuel cell catalysts and membrane electrode assembly manufacturing	Isondo Precious Metals (IPM)	2025	3 Mn MEA p.a. from 1 tonne PGM/9 GW p.a. electrolyser equivalent
IPM/NCP Hydrogen Refuelling Stations deployment	Roll-out of Hydrogen Refuelling Stations and 300 fuel cell trucks and buses	Isondo Precious Metals (IPM) NCP	2025	2.5 Ktpa GH_2 300 fuel cell trucks/ buses
Project Phoenix	Fuel cell manufacturing ecosystem (250 kW systems)	Mitochondria Energy Systems	2026	1 000 × 250 kW fuel cell system p.a. (250 MW p.a.)
Cape Stack	*	*	*	*
Green H_2 Mobility: Phase 1 Pilot	GH_2 for long haul transportation	RRS Investment	2026	1 600 000 Nm^3 GH_2
Green H_2 Mobility: N7 Corridor	GH_2 for long haul transportation	RRS Investment	2031	
Phelan Green Hydrogen	GH_2 and GNH_3 production	Phelan Green Hydrogen	2030	85 Ktpa GH_2/480.22 Ktpa GNH_3
Omnia Sasolburg Green Ammonia	GNH_3 production	Omnia, WKN, Windcurrent	2028	18 Ktpa GH_2/100 Ktpa GNH_3

Project name	Project description	Developers	COD	Production
Care-O-Sene	Catalysts for SAF production	Sasol SA and Germany, University of Cape Town (UCT), Fraunhofer Institute for Ceramic Technologies and Systems (Fraunhofer IKTS), HZB, INERATEC, Karlsruher Institute of Technology	*	*

* undisclosed by the project sponsor

8.3 Portfolio Implementation

8.3.1 Theory of Change

South Africa's GH_2 vision is to establish a globally competitive GH_2 industry for local and international consumption to drive socio-economic and economic development through continued industrialisation. Achieving this ambitious, long-term vision requires a systematic action and monitoring plan to ensure continuous progress. The Theory of Change was used to develop an actionable and measurable implementation programme along five dimensions:

- **Challenges**: Challenges that must be overcome to establish a competitive GH_2 industry
- **Outputs**: Completed deliverables by institutional owners to achieve the vision
- **Short-term outcomes**: Measurable changes in capacity and systems within one to two years to achieve the vision
- **Medium-term outcomes**: Measurable changes in performance within three to five years to achieve vision
- **Impact**: Socio-economic, economic, and environmental impact by 2035 that measures the delivery of the vision.

8.3.2 Challenges

South Africa must overcome seven challenges to set up a competitive local GH_2 industry.

8.3.2.1 Funding

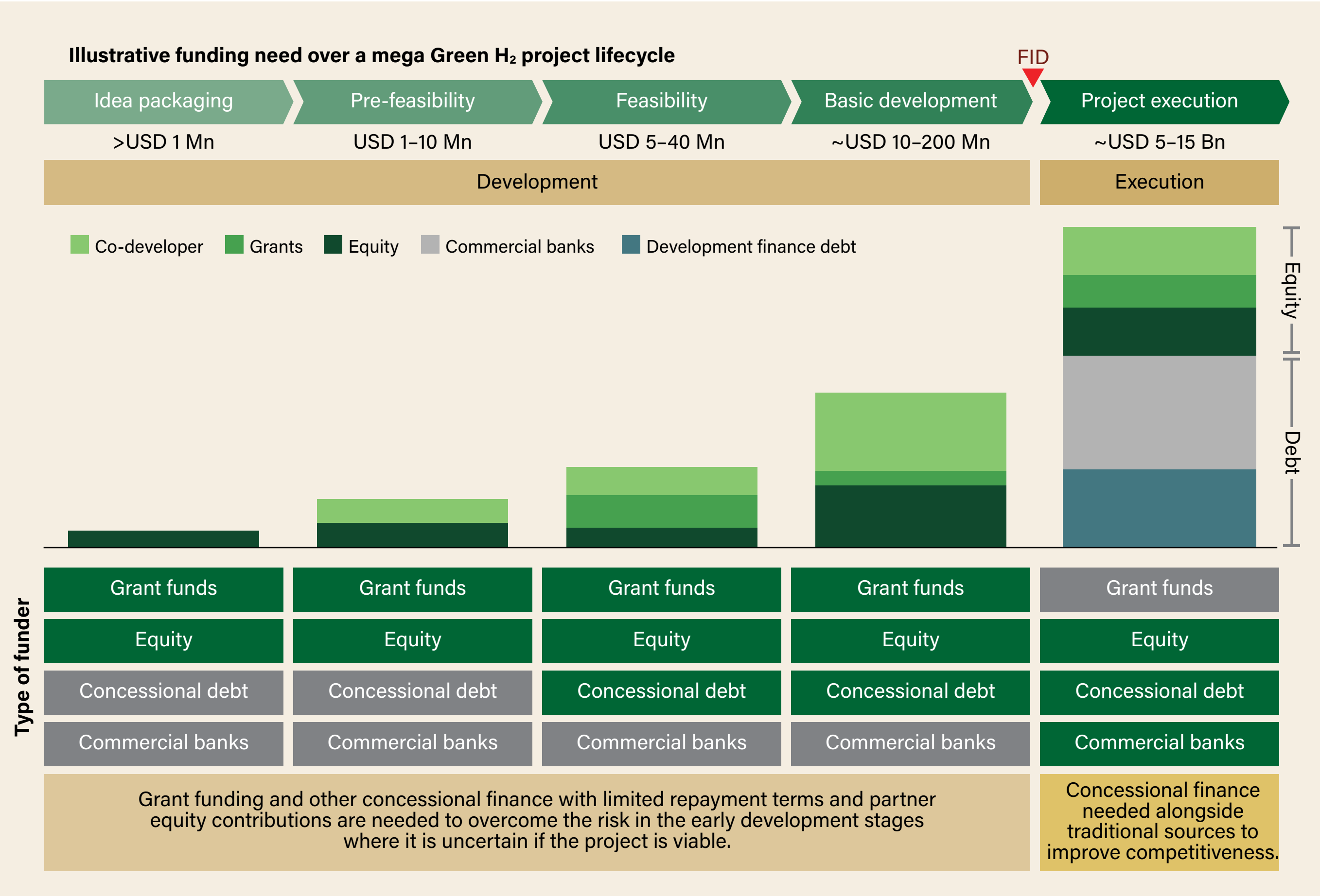
Grant funding shortage: A mega-project typically spends ~10%69 of the total project cost during the development phase. This amounts to ~USD 1 billion for a ~USD 10 billion mega-project. However, GH_2 mega-projects face significant additional challenges due to technology and offtake uncertainty, unclear regulations defining what is 'Green' in key markets, and the project-on-project risk for the substantial supporting grid and port infrastructure required. In this high-risk environment, ~80% of projects globally are typically cancelled in the development phase, at a substantial cost of up to ~USD 1 billion, depending on where in the development lifecycle the project was cancelled. A similar risk-return profile applies to smaller GH_2 projects. This risk-return payoff for GH_2 projects is insufficient for an individual, private institution to invest in GH_2 project development. Grant funding (not concessional debt) or first loss equity with reasonable terms from local or international institutions for individual project studies is needed to reduce the risk of early phase development (as seen in Figure 17), as well as nationally co-ordinated studies to make better use of shared infrastructure and reduce project-on-project risk. This will allow the significant socio-economic and economic impact that a GH_2 industry enables to be realised in South Africa.

Although South Africa has funds from the International Partners Groups (IPGs) for GH_2, this is primarily concessional debt, and more grant funding is needed. South Africa's GH_2 economy needs at least ~USD 100 million of grant funding to catalyse early-stage project development, of which it has already secured ~USD 25 million. Based on benchmarks seen in other industries, this USD 100 million of grant funding will be able to crowd in an additional USD 300–900 million private sector funding[70] (that is, equity) to meet its total development funding needs, as the grant funding de-risks the early-stage development studies, and provides additional, external credibility to the projects. However, South Africa needs to act quickly to secure this additional grant funding from international financiers, as it is competing with other developing nations and GH_2 developers. It is worth noting when driving engagements to secure the ~USD 100 million grant funding, that this is only ~0.03% of South Africa's current ~USD 400 billion GDP[71] and minor compared to the ~USD 25 billion (~ZAR 500 billion)[72] increased GDP the GH_2 industry could enable by 2050.

Required output: *Sourced new grant funding from dedicated GH_2 global funds to increase total grant funding available for GH_2 development studies.*

69 Including Front End Engineering Design (FEED) costs.
70 NBI. (2023). *Financing South Africa's Just Transition* (3x–9x funding multiplier).
71 Stats SA. (2023). *Growth Domestic Product, Fourth Quarter 2022*.
72 World Bank Group. (2022). *South Africa Country Climate and Development Report*.

Figure 17: Illustrative equity, and debt funding sources throughout a GH_2 project lifecycle



High cost of capital: South Africa's cost of capital could be ~7.4%[73] (USD-basis, nominal) with low-cost Green debt. Like-for-like, this is higher than competing GH_2 export countries (for example, ~5.9% of Australia, ~7.0% of Morocco and ~6.4% of Chile[74]). The key driver of South Africa's higher cost of capital is its country risk factor – comprising the localisation factor (labour effectiveness, and so on), sovereign risk (political, macro-economic, and so on), and forex risk. Therefore, despite favourable RE load factors, South Africa's high cost of capital diminishes its global cost competitiveness, given the high capital expenditure (CAPEX) intensity and limited operational expenditure (OPEX) costs of GH_2 projects. To overcome this higher cost of capital, a mix of concessional finance sources (including low-cost concessional debt and credit guarantees) is needed until demand markets mature and technology costs stabilise, allowing the industry to be fully funded by commercial sources.

73 Assuming a 70–30 debt-equity split, a cost of equity of 16% (nominal) and low-cost Green debt of 4.6% (nominal).
74 Assuming the same debt-equity split, cost of equity and cost of debt, with the difference being the country risk factor and corporate tax rate.

Required output: *Increased availability of, and access to low-cost funding instruments (for example, concessional debt, Green bonds, and credit guarantees) and policies and measure (for example, ex-post tax breaks for cost overruns during execution on technologies with highly uncertain cost evolution such as electrolysers, and foreign escrow accounts) to reduce the perceived and actual risk of investment in South African GH_2 projects.*

8.3.2.2 **Supply**

Technology access: To ensure South Africa's GH_2 economy is globally competitive and can contribute to South Africa's continued industrialisation, developers must be able to access and collaborate on the development and manufacturing of key technology components and services in the GH_2 value chain. This is critical to ensure that certain manufacturing process and service elements can be competitively localised to avoid further 'dollarisation' of the economy. This will require collaboration between leading global original equipment manufacturers (OEMs) and South African developers and SMMEs, particularly on fuel cells, electrolysers, RE components,[75] and GH_2 vehicles. Specifically, an enabling environment must be in place for these global OEMs to strike competitive deals with South African developers and SMMEs to do the following:

- Secure access to the production capacity of key technologies (for example, fuel cells and electrolysers)
- Secure IP sharing or co-development rights to key technologies.

Required output: *Established government-to-government relationships and an enabling environment to attract global technology and local manufacturing investments in key elements of the GH_2 and supporting value chains to ensure the long-term security of supply to drive industrialisation of the South African economy.*

Project preparation: The limited visibility on the status of GH_2 projects under development and the lack of standardisation of the project information needed for each stage of development inhibits projects from being evaluated consistently. For example, there is no standard definition of the costing accuracy and requirements for the different phases in a project lifecycle. This lack of standardisation increases the risk of the GH_2 project pipeline, limiting the funding that can be attracted. The socio-economic benefit of projects in the pipeline are also not sufficiently articulated. This limits the funding that can be attracted, as grant or concessional financiers typically want to catalyse or maximise the positive socio-economic impact with their funding. Developing a project preparation template that specifies how the cost, development progress, and socio-economic impact must be determined at each stage of the project lifecycle will reduce the perceived risk and better articulate the benefits of projects to attract greater funding.

75 Localising solar PV and wind energy value chains are a key focus, as highlighted in SAREM.

Required output: *Established world-class and differentiated project preparation standard for GH_2 projects to guide project development in the region, with project information shared on a portal to attract global investors.*

8.3.2.3 **Demand**

Product placement: GH_2 and its derivatives are nascent with high costs relative to grey alternatives. This results in a ~1.2X to 2X+ 'Green premium'[76] for offtakers and downstream value chains. In addition, due to the high uncertainty and potentially high-cost and slow learning rates on the supply side, offtakers are wary of committing too early to long-term contracts. Overcoming this Green premium will require support on both the supply (for example, the lower financing costs, and access to best-in-class technology mentioned above) and demand side. On the demand side, financial innovation is required to lower price uncertainty for offtakers, for example, via Contract for Difference (CfD) instruments between local developers and *both international and local offtakers. Furthermore, trade relations with key export markets are required to create an enabling environment for commercial deals between local developers and international offtakers.*

Required output: *Established government-to-government relationships and an enabling environment with lead markets (that is, markets able to afford Green premium to facilitate export trade deals and developed mechanisms to increase and secure offtake (for example, Germany's H_2 Global scheme and the recently proposed CfD mechanism by Japan[77]).*

Ability to market excess RE: When designing a GH_2 plant, RE plants are typically oversized by a factor of 2–3X the electrolyser capacity, resulting in up to ~20%–40% curtailed energy. Without being able to evacuate and monetise this curtailed energy, the levelized cost of hydrogen (LCOHs) could increase by ~10%–20%.[78] To ensure this power can be evacuated, improving project economics, and contributing to South Africa's energy security without burdening the consumer, a fit-for-purpose market mechanism is required as a temporary solution until a national electricity spot market is available. If projects are not able to evacuate and sell excess RE, South African GH_2 production prices will struggle to be competitive even against markets with much worse load factors (for example, Germany).

Required output: *Established market mechanism that enables trading of excess RE from GH_2 projects.*

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76 Grey ammonia costs ~USD 700/tNH_3 compared to Green NH_3 cost of ~USD 800–1 400/tNH_3 at 2030 at carbon tax of USD 200/tCO_2e.

77 WEF. (2023). *Enabling Measures Roadmap for Low-Emission Hydrogen*.

78 At the breakeven cost of producing the electricity within GH_2 plant. This cost is comparable to current REIPPP costs, and lower than the Eskom Tariff.

8.3.2.4 **Shared infrastructure**

Limited grid, port, and other shared infrastructure to bring projects online: GH_2 and GH_2-derivative plants require critical infrastructure to be in place both for competitive production and final product placement. For example, there is no business case for the first wave of mega-projects without the ability to export to international markets. Clarity and certainty on port infrastructure and access to back-of-port facilities will be critical to build investor and offtaker certainty. Another example relates to the ability to evacuate excess RE from GH_2 plants – critical to ensuring the project's economic viability – where clarity and certainty on specific grid infrastructure investments are critical. However, significant uncertainty exists today on the current development status and timelines of specific critical shared infrastructure projects (for example, the ~400 kV transmission line needed as a first step to connect the Northern Cape-based RE supply with Western Cape demand). This uncertainty drives significant project-on-project risk and can invalidate a project's business case. Project-on-project risk is a global problem faced by GH_2 developers and can be a source of national competitive advantage if effectively and transparently addressed. South Africa would also be able to unlock a competitive advantage if it is able to co-develop and integrate grid and pipeline infrastructure with Namibia, as this increases access to world-class RE resources whilst sharing expensive infrastructure development costs.

Required output: *Created a national infrastructure programme plan to co-ordinate, accelerate and provide visibility on the development of all enabling infrastructure projects (port, grid, pipeline, and rail) across industries and specify how infrastructure development costs will be shared (so that one developer does not take on the risk of the entire infrastructure project).*

Slow permitting and co-ordination (between state-owned enterprises (SOEs) and government bodies): GH_2 projects require many permits from different government bodies and state-owned companies for infrastructure development (for example, Eskom for grid, Transnet for port and pipeline, Department of Forestry, Fisheries and Environment (DFFE) for environmental authorisation, and local and provincial government for construction authorisation, road access, and so on). Streamlining and co-ordinating applications through establishing industrial 'clusters' to pool applications can align infrastructure development across government departments and infrastructure owners (for example, Eskom and Transnet), which limits the need to reapply for permitting, and ensures maximum utilisation of shared infrastructure. This co-ordination can further reduce timeline and cost risks by providing greater clarity on the permitting requirements and allowing permit applications earlier in the project lifecycle, as is currently achieved through requiring lower environmental approval requirements in REDZ regions.

Required output: *Simplified permitting processes to increase co-ordination and speed amongst different government departments and SOEs, stipulating clear requirements for each permit.*

8.3.2.5 Technology incubation and workforce skills

Insufficient local research and development (R&D) and innovation capacity to secure a global competitive advantage: South Africa's R&D expenditure as a percentage of GDP is almost 75% lower[79] than the world average, which limits its ability to drive technology innovation and establish a long-term competitive advantage in the GH_2 value chain. South Africa must prioritise funding both public and private institutions at the front line of R&D and innovation on key GH_2 value chain elements where it can build a competitive advantage (for example, fuel cell and electrolyser component manufacturing, GH_2 beneficiation production applications such as SAF and DRI for Green steel) to anchor demand for a high-skilled workforce of the future and secure South Africa's competitive position in the global GH_2 industry.

Output required: *Increased and fast-tracked R&D funding for public and private research to promote innovation and long-term competitive advantage in the GH_2 value chain.*

Insufficient skills across the value chain to deliver the project pipeline and maximise socio-economic impact: The GH_2 pipeline requires a workforce capable of designing and constructing projects on time, within budget, and at the required quality. It is unclear what skills are required or whether there are sufficient skills across the value chain, particularly in RE development – the largest employment lever in GH_2 projects. It is also unclear what skills are required and available in which regions. Skilling or reskilling the workforce to meet this demand can unlock significant socio-economic benefits through new, decent jobs. The approach to skills planning for JET implementation is set out in Chapter 9.

Output required: *Developed a consolidated national skilling and job transition programme that considers the job requirements for GH_2.*

79 World Bank. (2019). *World Development Indicators Dataset*. The most recent available annual data for South Africa is from 2019.

8.3.2.6 **Policy and regulations**

Transparency on wheeling costs: Feeding excess electricity into the grid and receiving a fair tariff in return is critical for ensuring competitive levelized cost of hydrogen (LCOH) and contributing to energy security. Clarity on the wheeling framework, as the National Energy Crisis Committee (NECOM) is currently driving, is crucial to reducing project risk and moving more projects toward financial viability. In the long term, an ancillary market is needed as GH_2 plants and XtP projects will also be able to provide grid stability.

Required output: *Provided a clear wheeling framework and cost regime for GH_2 producers across the national grid.*

Export market regulations that consider South Africa's starting point: Being able to export GH_2 and GH_2-derivatives is critical for the first wave of South African GH_2 projects. Key export markets – such as the EU through the Delegated Act – are leading in defining regulations determining what can be considered a certifiable 'Green' product. Adhering to this will be critical to securing offtake and project viability. South African developers must have a seat at the table to ensure that their local circumstances and starting point are considered in critical elements of the legislation – this is core to the foundations of a Just Transition. Notably, a viable, clear interpretation of the legislation should be afforded to all South African projects without drifting away from the core principles of what this legislation is trying to achieve. Key elements include the interpretation of the following:

1. Additionality[80] for South Africa-based developers
2. Temporal correlation[81] for South Africa-based developers
3. Proportional allocation principles[82] for South Africa-based GH_2-derivatives producers
4. Sustainable carbon sourcing requirements.[83]

Required output: *Established 'one voice' on South Africa's official position and 'asks' on key international regulations – notably, the EU's Delegated Act.*

80 Electrolysers must be directly connected (cable or PPA) to new RE production sources.
81 RE must be used within a certain period after generation.
82 Process to allocate an individual products emission from that of a facility/process.
83 CO_2 sourcing criteria, including types of feedstock and processes, for producing e-fuels (e.g. SAF).

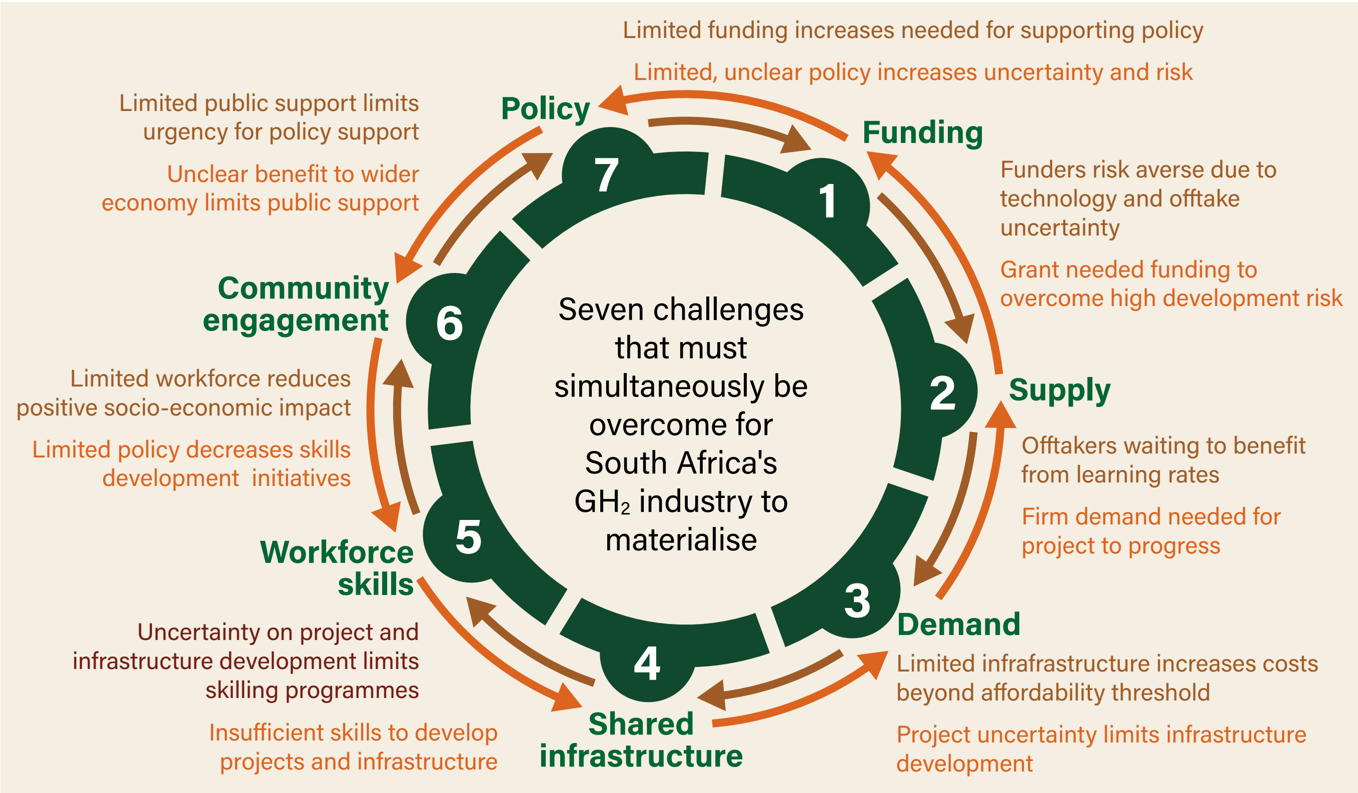
8.3.2.7 Community engagement

Impacted communities and broader society unaware of the socio-economic benefit of GH_2 industry: There is limited understanding within society about the positive socio-economic impacts of the GH_2 economy, including how this industry can create new jobs across skill sets, stimulate local economies, improve infrastructure, and lead to cleaner living environments. Although significant progress has been made in quantifying the socio-economic benefit that the GH_2 industry can unlock amongst private developers and national institutions, there has been limited engagement with communities directly impacted by the GH_2 industry and broader society. Community engagements are important to bridge the GH_2 awareness gap, ensure transparency, address concerns, and highlight the direct and indirect benefits to gain society's support (that is, its social license to operate). Without this support, the South African GH_2 industry will not have the legitimacy needed to scale.

Required output: *Developed an engagement strategy to communicate the socio-economic benefits of establishing a GH_2 industry to impacted communities and broader society, and address their concerns effectively.*

The seven challenges that South Africa's GH_2 industry faces are intrinsically interconnected and must be addressed simultaneously, as illustrated in Figure 18. For example, GH_2 development studies are inherently high-risk due to the industry's nascency (both from a supply/technology perspective and from a demand/'what can the market afford' perspective). This risk, in addition to the project-on-project risk mentioned earlier, makes it difficult for investors to fully commit to providing the scale of low-cost funding required. Without investors behind the project, offtakers are not willing to commit, which means the project does not go ahead, therefore invalidating the need for shared infrastructure, workforce development, community engagement, and policy reform. There are multiple sequences/starting points from which this vicious circle of interdependencies plays out – the key point being that an integrated, collaborative approach is required to ensure the right 'catalytic' actions are taken to overcome these challenges.

Figure 18: The seven interdependent challenges that South Africa's GH_2 industry must overcome



8.3.3 **Outputs**

Outputs, or deliverables, for each of the seven challenges with 18 supporting initiatives and institutional owners have been developed to achieve South Africa's long-term vision of creating a competitive local and global GH_2 industry, as shown in Table 27. The Industrial Development Corporation (IDC) has been proposed as the funding, shared infrastructure, and stakeholder institutional owner due to its success in securing funding and driving South Africa's GH_2 commercialisation strategy. The Department of Trade, Industry and Competition (DTIC), Department of Higher Education and Training (DHET), Department of Science and Innovation (DSI), and the Presidency have been proposed as the institutional owners for the supply and demand, technology incubation and workforce skills, and policies and regulation challenges, respectively, as they are already driving these initiatives.

A single institutional owner has been assigned to each output to ensure clear responsibility and ownership to deliver results at the rapid pace required to ensure that South Africa can capture the GH_2 opportunity. Although a single institutional owner has been assigned, this does not mean that the owner can operate without the key stakeholders. For example, DBSA, the PIC, and National Treasury (NT) are key stakeholders for the funding outputs.

Table 27: Overview of the proposed institutional owners for actions to deliver output to overcome the challenges

Challenge	Proposed institutional owner	Output
Funding	IDC	Sourced new grants from dedicated GH_2 funds to increase total grant funding available for GH_2 development studies
		Increased availability of, and access to, low-cost funding instruments to reduce the perceived and actual risk of investment in South African GH_2 projects
Supply	DTIC	Established government-to-government relationships and an enabling environment to attract global technology and local manufacturing investments in key elements of the GH_2 and supporting value chains to ensure the long-term security of supply drive industrialisation of the South African economy
		Established a project preparation standard for GH_2 projects to guide project development, with project information shared on a portal to attract global investors
Demand	DTIC	Established government-to-government relationships and an enabling environment with lead markets to facilitate export trade deals and developed mechanisms to increase and secure off-take
		Established market mechanism that enables trading of excess RE from GH_2 projects
Shared infrastructure	IDC	Created a national infrastructure programme plan to co-ordinate, accelerate and provide visibility on the development of all enabling infrastructure projects (port, grid, pipeline, and rail) across industries and specify how infrastructure development costs will be shared
		Simplified permitting processes to increase co-ordination and speed amongst different government departments and SOEs, stipulating clear requirements for each permit

	Actions to deliver output (supporting initiatives to achieve output)
	Engage national and international DFIs, donors and partners for a greater mix of development finance, particularly increased grant funding, with reasonable commercial terms to help de-risk development studies, thereby helping attract the low-cost private capital needed to close projects' funding gaps
	Develop blended finance instruments that can leverage concessional debt available to crowd in commercial sources of funding (i.e. equity), as well as financial instruments (e.g. ex-post tax breaks in the event of electrolyser cost overruns) to reduce the perceived risk of business in South Africa and lower the overall cost of capital
	Develop and introduce standards for GH_2 production, storage, refuelling, transportation, and end use Establish government-to-government trade relationships to secure access to technology and IP for electrolysers, fuel cells, and H_2 vehicles (e.g. what South Africa historically achieved with Toyota) Evaluate and address the shortfall of local manufacturing capacity in critical steps of the GH_2 and associated value chains (e.g. electrolyser components, fuel cell manufacturing, H_2 vehicle manufacturing, and so on) with a pipeline of projects to ensure long-term supply security and drive the industrialisation of the South African economy Review and refine SEZ incentives and align interpretation of SEZ rules and guidelines in a manner that enables local GH_2 project development
	Provide a standard template that specifies the type and accuracy of data (e.g. the costing method and accuracy, socio-economic impact) for developers to complete for each stage of development (e.g. feasibility, Front End Engineering Design (FEED)) with this information made publicly available on a portal for potential investors and financiers to access the risk and positive socio-economic impact
	Leverage concessional finance to establish innovative CFD mechanisms to bridge the affordability gap in local offtake and deals between South African developers and global off takers. Establish government-to-government relationships with key offtake markets to secure favourable agreements (e.g. export tariff exemptions, price subsidies, long-term off-take) to place products
	Define and implement a fit-for-purpose temporary market mechanism to trade excess renewables with a willing buyer at a fair price until the national electricity spot market is available
	Co-ordinate infrastructure 'masterplan' with firm government and infrastructure owner (e.g. Eskom and Transnet) commitments for final investment decision (FID) and commercial operation dates, visibility on the proposed funding model and a portal for developers to track the progress of these infrastructure projects to reduce the project-on-project risk
	Simplify and co-ordinate permitting processes to increase speed amongst different government departments and SOEs (that is, create a one-stop hub for infrastructure access and development), through which pooling applications can align infrastructure development across government departments and infrastructure owners to mitigate any timeline delays

Challenge	Proposed institutional owner	Output
Technology incubation and workforce skills	DSI and DHET	Increased and fast-tracked R&D funding for public and private research to promote innovation and long-term competitive advantage in the GH_2 value chain
		Developed a consolidated national skilling and job transition programme considering the job requirements for GH_2 and other JET initiatives
Policies and regulations	Presidency	Provided a clear wheeling framework and cost regime for GH_2 producers across the national grid
		Established 'one voice' on South Africa's official position and 'asks' on key international regulations
Community engagement	IDC	Developed a community engagement strategy to communicate the socio-economic benefits of establishing a GH_2 industry to impacted communities (e.g. GH_2 SEZs) and broader society and address their concerns effectively

8.3.4 Short-Term Dashboard

The short-term dashboard shown in Figure 19 defines metrics to measure progress, capacity, and systems within one to two years, that is, over 2024–2025. These metrics ensure that enablers across all seven challenges are in place to improve competitiveness, reduce risk, and undertake project development at pace. Further, it ensures that pilot projects are delivered to establish the local GH_2 industry. The dashboard primarily targets completing discrete deliverables. However, there are four metrics with quantitative targets:

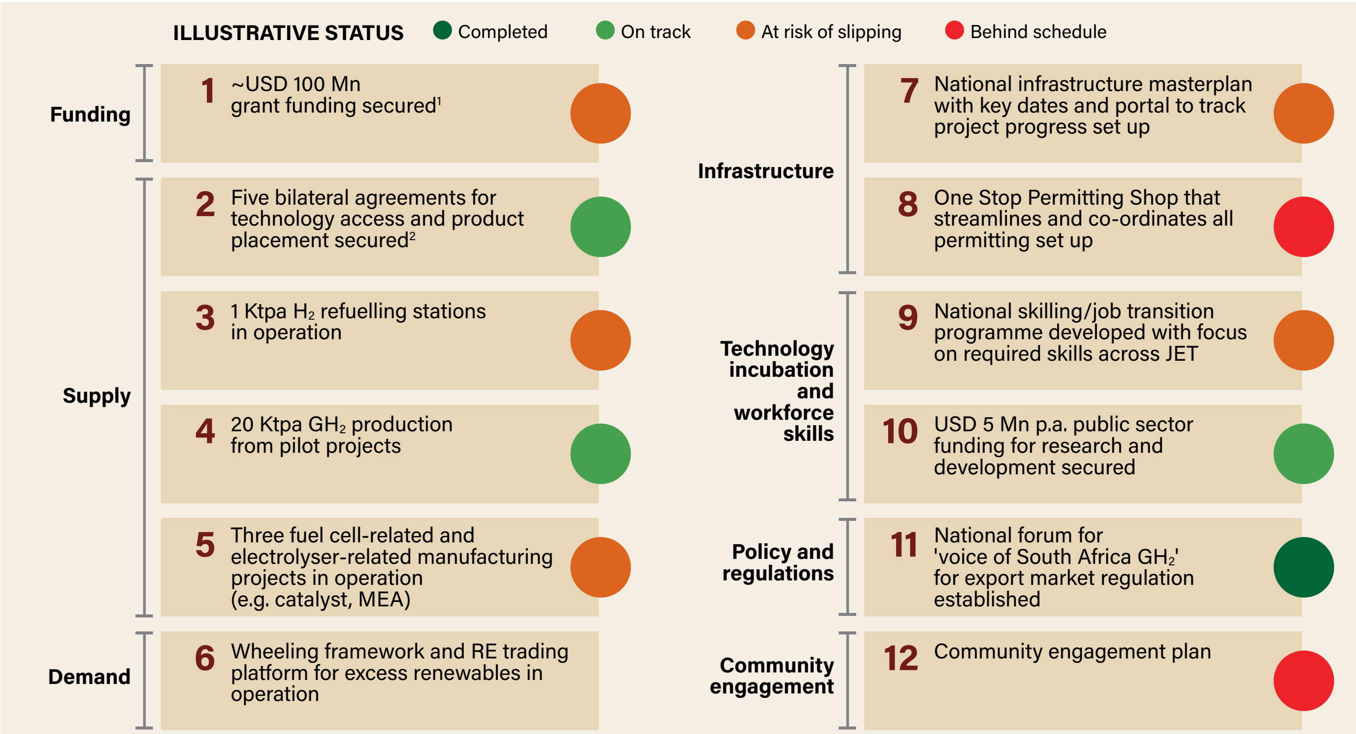
- **USD 100 million grant funding:** This value targeted as grant funding can crowd in 3X–9X private sector funding[84] to meet the total development cost of USD 300 million.
- **Five bilateral agreements:** This is targeted as South Africa has already made substantial progress with five countries (South Korea, Japan, Denmark, Netherlands, and Germany) and should be able to sign bilateral agreements with these countries within one to two years.

84 NBI. (2022). *Financing South Africa's Just Transition*.

	Actions to deliver output (supporting initiatives to achieve output)
	Allow project development expenses to benefit from R&D tax allowances to support innovation of GH_2 processes and development of the first wave of GH_2 projects with highly uncertain return on investment (ROI). Fast-track and increase funding to public and private R&D institutions and technology accelerators, together with required support programmes where South Africa has a clear 'right-to-win' to anchor a globally competitive R&D capability
	Review the skills required across education levels for GH_2 and the broader JET and develop a consolidated national roadmap that outlines the roles of the private and public sectors to deliver and fund skills training to close the skills gap and maximise socio-economic impact
	Develop a wheeling framework with clear conditions for (and costs associated with) wheeling on the transmission and distribution grids to allow the sale of excess RE from GH_2 production and accessing RE in different regions of the country
	Establish a national forum to serve as one voice for the local GH_2 industry and present a coherent business case for fair and favourable interpretations of legislation and regulations in key export markets, in particular the European Union's Delegated Act, that considers South Africa's starting point and challenges
	Undertake community outreach and townhall engagements on the socio-economic benefits of the GH_2 economy and to address concerns

- **1 ktpa GH_2 refuelling, 20 Ktpa GH_2 production and three fuel cell and electrolyser-related projects:** This is the pipeline of pilot or small-scale projects under development.
- **USD 5 million R&D public sector funding:** This is the spending forecast to develop a long-term competitive advantage where South Africa has a competitive advantage, for example, DRI.

Figure 19: Illustrative short-term dashboard (2024-2025) to measure capacity and systems outcomes



1. Grant funding can crowd in 3x–9x private sector funding [NBI, Financing SA's Just Transition. (2022)] to meet the total development cost of USD 300 Mn.
2. SA has made substantial progress with South Korea, Japan, Denmark, Netherlands, and Germany, and should be able to sign bilateral agreements in 1–2 years.
Note: Remaining targets based on pipeline of projects and inputs from stakeholders during engagement sessions.

8.3.5 Medium-Term Dashboard

The medium-term dashboard, shown in Figure 20, defines metrics to measure performance over the next three to five years, that is, 2026–2028. These metrics measure project development and key enablers for projects materialising across demand (offtake), funding, and supply (local fuel cell and electrolyser manufacturing capacity) such that large-scale projects begin to come online towards the end of the decade. The rationale behind the metrics is as follows:

- **Projects in operation:** The 500 Ktpa of GH_2 target is in line with the commercialisation strategy and is required to achieve the 2050 'demand uplift' target of ~7 mtpa. This includes both small- and large-scale[85] projects.
- **Offtake secured:** 100% final product offtake is needed for projects to progress beyond final investment decision (FID), whilst the 30% target in 2025 provides a leading indicator of the quantum of viable projects. This includes both local and export offtake, expressed as GH_2 equivalent.

85 Definition of small and large-scale is to be defined. Small- and large-scale operations can be monitored as separate metrics.

- **Concessional funding:** The USD 5 billion concessional debt target will account for ~50% of the total project debt requirement to improve the cost of capital. Grant funding is not included, as grant funding is primarily needed in the short term to fund development studies and pilot project execution. The priority in the medium term has shifted to funding the execution of projects.
- **Electrolyser manufacturing:** The 100 MW p.a. target will only enable local production of ~10 Ktpa, which is small relative to South Africa's ~7 mtpa target in 2050. Therefore, initial electrolyser sites will serve as pilot projects for proof of concept before setting up multi-GW local manufacturing.
- **Fuel cell manufacturing:** The 250 MW p.a. is in line with the current fuel cell production pipeline.

Figure 20: Illustrative medium-term dashboard (2026–2028) to measure performance outcomes

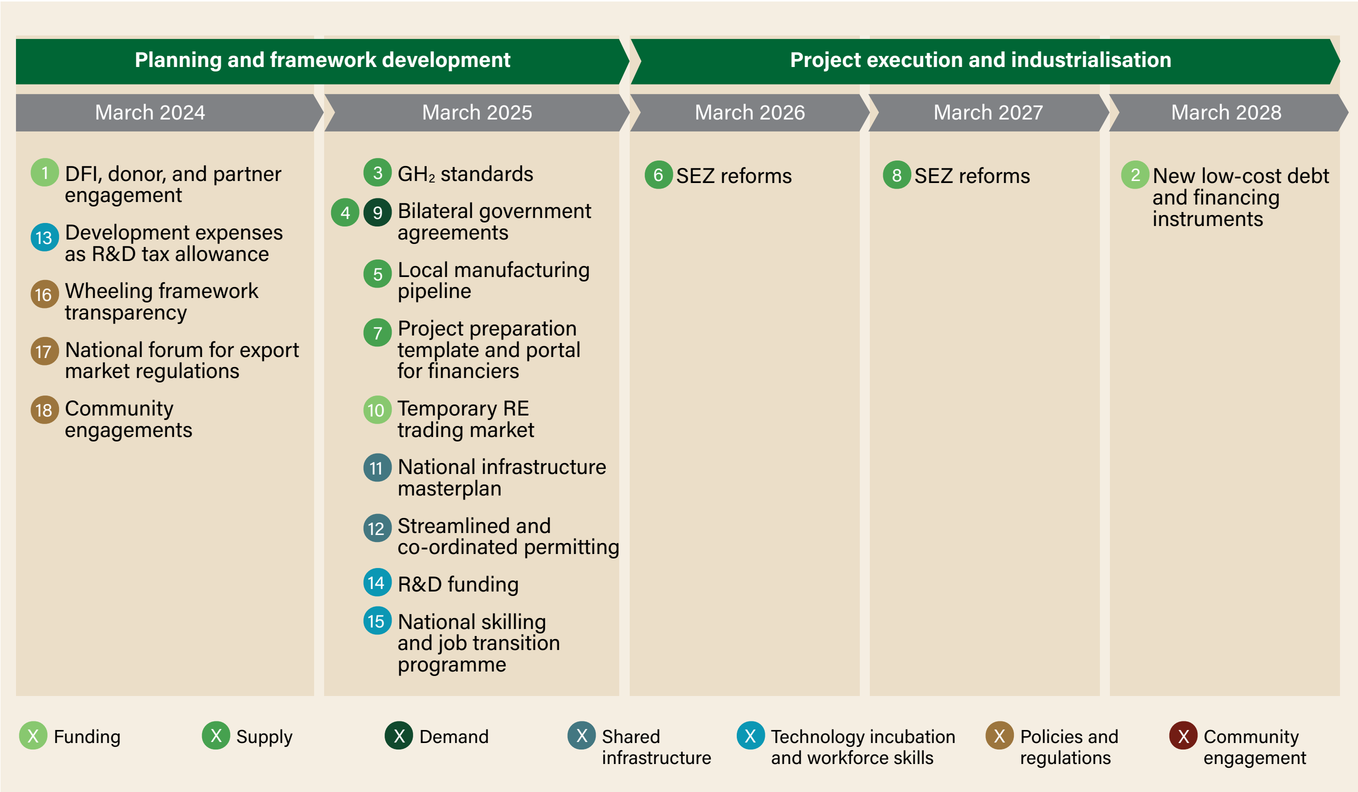
ILLUSTRATIVE STATUS ● Completed ● On track ● At risk of slipping ● Behind schedule

	STATUS	CURRENT	TARGET 2025	TARGET 2027
1 Projects in operation	At risk of slipping	X Ktpa	270 Ktpa	500 Ktpa[1]
2 Total final product offtake secured	On track	X	30%	100%[2]
3 Concessional funding secured	Behind schedule	X Bn	USD 1 Bn	USD 5 Bn[3]
4 Electrolyser manufacturing	At risk of slipping	X MW p.a.	20 MW p.a.	100 MW p.a.[4]
5 Fuel cell manufacturing	At risk of slipping	X MW p.a.	10 MW p.a.	250 MW p.a.[5]

1. In line with GHCS and is required to achieve 2050 target of ~7 mtpa (incl. small- and large-scale projects).
2. Final product off-take of 100% is needed for projects to progress beyond FID, whilst 30% target in 2025 provides leading indicator of the quantum of viable projects.
3. Accounts for ~50% of total project debt requirement to improve cost of capital (grant funding is not included).
4. Only enables local production of ~10 ktpa, hence, will serve as pilot projects for proof of concept before setting up multi-GW local manufacturing.
5. In line with current fuel cell production pipeline.

The roadmap, illustrated in Figure 21, outlines the deadline for the 18 supporting initiatives to meet the short- and medium-term outcomes.

Figure 21: GH_2 implementation roadmap to achieve the short- and medium-term outcomes



8.3.6 Long-Term Dashboard

The long-term impact dashboard, shown in Figure 22, measures progress against the overarching vision for GH_2 and its role within the broader JET IP. Therefore, the impact dashboard includes a range of socio-economic impact metrics such as direct and indirect jobs created, individuals re-skilled/up-skilled and SMME growth, as well as economic indicators such as GDP growth and trade balance impact, and environmental impact through GHG reduction. The rationale behind the metrics is as follows:

- **Direct jobs created:** The 2035 production target is ~2 mtpa, ~30% of the ~7 mtpa production target in 2050.[86] Assuming a direct job multiplier of 2,[87] the full direct job potential from the 1.8 million direct and indirect jobs is ~600 000 in 2050. Scaling this in with the 2035 production gives a direct job target of 180 000.
- **Indirect jobs created:** Applying the same scaling logic as direct jobs on the ~1.2 million 2050 indirect jobs, the 2035 indirect job target is 360 000.

86 DTIC and Green Hydrogen Panel. (2022). *Green Hydrogen Commercialisation Strategy; 7 mtpa is GH_2 equivalent*.
87 World Bank. (2022). Country *Climate and Development Report.*

- **Individuals upskilled/reskilled:** The individuals to be skilled are taken as the sum of the direct and indirect jobs created. This target will be updated after the consolidated national skills roadmap is developed.
- **SMME growth:** SMMEs currently contribute ~40% of GDP in South Africa.[88] The 50% target represents an increase in the current base.
- GDP growth: Applying the same scaling logic as for direct and indirect jobs, the 2035 target is a 1% increase in GDP (ZAR 120 billion).
- **Trade balance:** ZAR 60 billion positive trade balance impact if 30% of GDP impact is export-driven, is in line with the lower bound of the production for export demand from the commercialisation strategy.[89]
- **GHG Impact:** 160 $MtCO_2e$ GHG reduction target also scales with the 2050 target of 541 $MtCO_2e$.

Figure 22: Illustrative impact dashboard to measure the long-term (2035) impact against the overarching vision

ILLUSTRATIVE STATUS ● Completed ● On track ● At risk of slipping ● Behind schedule

		STATUS	CURRENT	TARGET 2035
Socio-economic	1 Direct jobs created	At risk of slipping	XXX	+180 000[1]
	2 Indirect jobs created	On track	XXX	+360 000[2]
	3 Individuals up/reskilled	At risk of slipping	XXX	+500 000[3]
	4 SMME share of GH_2 GDP impact	Behind schedule	XXX	50%[4]
Economic	5 GDP growth	At risk of slipping	XXX	+1%[5]
	6 Trade balance impact	At risk of slipping	XXX	+ZAR 60 Bn[6]
Environmental	7 GHG reduction	At risk of slipping	XXX	-160 Mt CO_2e[7]

1. Scaling in line with ~600 000 2050 direct job potential with 30% of the total 2050 GH_2 production capacity.
2. Applying same scaling logic as direct jobs on ~1.2 million 2050 indirect jobs, 2035 indirect job target is 360 000.
3. Sum of the direct and indirect jobs created, rounded down.
4. SMEs currently contribute ~40% of GDP in South Africa; 50% target represents an increase in the current base.
5. Applying same scaling logic as for direct and indirect jobs, 2035 target is a 1% increase in GDP (ZAR 120 Bn).
6. If 30% of GDP impact is export-driven, in line with lower bound of production for export demand from GHCS.
7. Scales with the 2050 target of 541 Mt CO_2e.

88 OECD. (2022). *Financing SMEs and Entrepreneurs 2022: South Africa.*
89 DTIC and Green Hydrogen Panel. (2022). *Green Hydrogen Commercialisation Strategy; 7 mtpa is GH_2 equivalent.*

8.4 Portfolio Governance and Institutional Arrangements

Due to its mandate, capacity, and established track record in the sector (both nationally and internationally), the IDC will convene a GH_2 JET Advisory Committee of multiple stakeholders, and establish a GH_2 JET Secretariat to enable the rapid delivery needed to capture this industrialisation opportunity, as shown in Figure 23.

The mandate of the GH_2 JET Advisory Committee is to do the following:

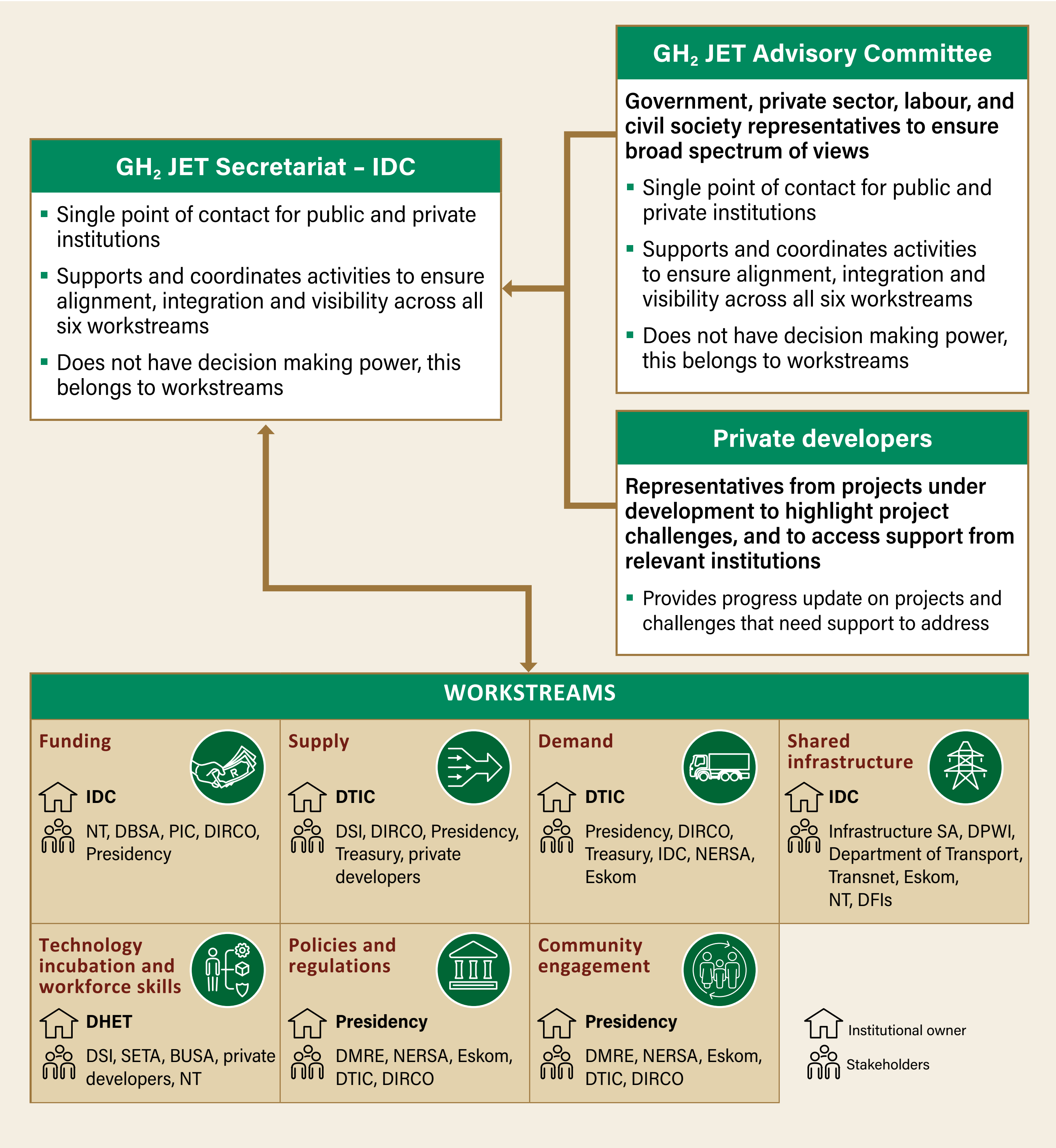
- Provide a central point for all private developers, public sector institutions, and industry bodies to engage on South Africa's GH_2 development progress and challenges
- Enable rapid implementation of the activities by supporting and co-ordinating activities across the seven GH_2 workstreams of the Implementation Plan.
- The body will not have any decision-making power in executing initiatives as it acts as a support function.

The GH_2 JET Secretariat has three functional roles:

- Ensure all seven GH_2 workstreams are driving towards the overall GH_2 vision and targets
- Identify and manage interdependencies across workstreams, for example, local R&D progress that can enable supply security
- Track and provide visibility to stakeholders on the progress across all workstreams.

The GH_2 JET Secretariat will receive and provide feedback to the Advisory Committee of public, private, civil society, and labour institutions to ensure that a wide range of stakeholder comments are considered in establishing South Africa's GH_2 industry and provide a single point of contact for private developers to share their progress and to access support. The GH_2 JET Secretariat will make publish progress on the workstreams and developments to drive accountability and progress, and will report into the JET PMU's national governance arrangements.

Figure 23: GH_2 JET governance and institutional arrangements



Annexure A: Current GH_2-related project progress

Twenty-four GH_2-related projects across various regions and stakeholders represent an estimated value of around USD 300 billion. Among these, nine projects have been granted SIP status and collectively. The projects are making substantial strides towards their progression and realisation.

Project name	Project description	Developer	Capex (ZAR billion)[90]	Devex (ZAR million)[91]	Final product	
Prieska Power Reserve	GH_2 and ammonia from solar and wind energy	Mahlako a Phala Investments, Central Energy Corporation (Cenec), IDC	11–12 (Ph 1)	290–300 (Ph1)	GH_2 and GNH_3	
Ubuntu Green Hydrogen-Phase 1	GH_2 production from solar and wind energy	Ubuntu Green Energy	5.5	6 000	GH_2 and GNH_3	
Boegoebaai						
Atlanthia Green Ammonia/Hydrogen Phase 1	GH_2 and ammonia in Freeport Saldanha from solar and wind energy.	Atlanthia GH_2	6.278	93	GNH_3	
Upilanga Solar & Green H_2 Park (Upilanga Valley) Phase 1	GH_2 production from solar energy	Emvelo, Energia, International technical partners in Germany, DBSA	17–34	120–150	GH_2 and possibly GH_2 – derivatives	
Sasolburg						
HySHiFT Secunda	Sustainable Aviation Fuel (SAF) production using existing Sasol Secunda assets with new electrolysers and RE	ENERTRAG, Sasol, Linde	18.9		SAF (e-Kerosene)	

90 Capital expenditure (estimated) in ZAR billion.
91 Development expenditure (estimated) ZAR million. This may include costs for scoping, concept phase, pre-feasibility and (bankable) feasibility study phases.
92 Final investment decision (planned).
93 Financial close and/or start of construction (planned).
94 Commercial operation date (planned).

FID[92]	FC[93]	COD[94]	Capacity (MW)	GH_2 volume (Ktpa)	Final product volume	CO_2 reduction ($ktCO_2e$ pa)	Progress
2024	2024	2026/7	120	14	80 Ktpa GNH_3	168	
2024	2024	2026	125	7	3.5 Ktpa GNH_3	0	
2024	2025	2027	250	7.3	36.5 Ktpa GNH_3	406.304	
2023	2024	2027	10 (pilot), 100 (Ph 1)	1.8 (pilot), 18 (Ph 1)	19.8 Ktpa GH_2	380–440	
2023	Jun 2024	Aug 2026	200.00	16.40	36.1 Ktpa SAF		Project at feasibility/FID Project received Qualified Bidder Status under the EU H_2 Global Program Received environmental authorisations for 300 MW renewables thus far

Project name	Project description	Developer	Capex (ZAR billion)[90]	Devex (ZAR million)[91]	Final product	
Coega Green Ammonia Project Phase 1	Green ammonia from RE in Coega Industrial Development Zone	Hive Hydrogen South Africa	100	140	GNH_3	
South African Hydrogen Valley	Several GH_2 projects to transform of region around Johannesburg, Mogalakwena and Durban into a hydrogen valley	Anglo American, DSI, Bambili Energy, Engie	22.4 (9 projects)	224	GH_2, fuel cell trucks, fuel cell buses, fuel cell solution for heavy haulage, fuel cells for stationary applications	
Project Rhynbow (part of South African H_2 Valley)	Heavy-duty hydrogen fuel-cell vehicle corridor between Johannesburg and Durban	Anglo American, Bambili Energy, Engie, Sasol, TotalEnergies	0.37 (Ph 1) 0.7 (Ph 2)			
Saldanha Bay Green Hydrogen Project	Large-scale GH_2 production in Saldanha Bay with ArcelorMittal South Africa's Saldanha Works steel plant as an anchor offtaker	Mainstream Renewable Power	51 100–64 700	150	Low-carbon refined iron, e.g. direct reduced iron or hot briquetted iron	
Saldanha Hydrogen Direct Reduced Iron (DRI)	Green direct reduced iron production, using renewable energy-based hydrogen	ArcelorMittal South Africa	4.5	180	Hydrogen Direct Reduced Iron (DRI)	
Enertrag Postmasburg	Green ammonia from RE near Postmastburg	ENERTRAG	65	35	GNH_3	
Renewable Mpumalanga	Hydrogen power plants (24/7 Green baseload electricity)	Hydrogène de France (HDF) Energy SA				

95 Design and construction of H_2 refuelling infrastructure across the Anglo/DSI Hydrogen Valley and Hydrogen mobility corridor.
96 For GNH_3 ships in the Durban/Richards Bay hub.

	FID[92]	FC[93]	COD[94]	Capacity (MW)	GH_2 volume (Ktpa)	Final product volume	CO_2 reduction ($ktCO_2e$ pa)	Progress
	2024	2025	2028	1200		27 tph GNH_3	12 000	
	Projects vary	2034–2045[95]	2030 (pilot)[96]	Projects vary	185 by 2030	Projects vary	Projects vary	
			2025 (Ph 1)					
	2024/5 (Ph 1)	2025/6 (Ph 1)	2027/8 (Ph 1), 2033/4 (Ph 2)	900–1 100	60–80	60–80 Ktpa GH_2	1 400 at final capacity (ArcelorMittal SA)	
	2025	2026	2027	15 (Midrex Plant)	61 (as input)	1 200 Ktpa DRI	2 160	
				300	30	120 Ktpa GNH_3		Project in pre-feasibility Bird and bat monitoring completed RE, hydrogen, and ammonia facilities EIA applications were submitted May 2023 Draft EIA submission October 2023, EA anticipated April 2024
						1 900 GWh p.a.		

Project name	Project description	Developer	Capex (ZAR billion)[90]	Devex (ZAR million)[91]	Final product	
Enertrag Indigen	Zero-carbon methanol production near Gqeberha	ENERTRAG			e-Methanol	
IPM membrane electrode assembly (MEA)/Catalyst Manufacturing	Electrolyser and fuel cell catalysts and MEA	Isondo Precious Metals	0.36	50	Catalysts and MEA for electrolyser and fuel cells	
IPM/NCP Hydrogen Refueling Stations (HRS) deployment	Roll-out HRS and 300 fuel cell trucks and buses	Isondo Precious Metals, NCP	2.3	180	HRS, fuel cell trucks and buses, H_2 purification, compression, and storage plants	
Project Phoenix	Fuel cell manufacturing ecosystem (250 kW systems)	Mitochondria Energy Systems, IDC, DBSA, DTIC	4.463	85.3	250 kW fuel system for combined heat and power applications	
Cape Stack						
Green H_2 Mobility: Phase 1 Pilot	GH_2 production for long haul transportation fuel	RRS Investment	0.0654	9.3	GH_2	
Green H_2 Mobility: N7 Corridor	GH_2 production for long haul transportation Fuel	RRS Investment	TBD	37.4	GH_2	
Phelan Green Hydrogen	Green H_2 and NH_3 production	Phelan GH_2	52.3	TBC	GNH_3	
Omnia Sasolburg Green Ammonia Project	Green Ammonia Pre-Feasibility Study	Omnia, WKN Windcurrent	9	600	GNH_3	
Care-O-Sene	Highly efficient catalysts for SAF production (using GH_2)	Sasol SA, UCT, Sasol Germany, Fraunhofer IKTS, HZB, Ineratec, KIT	0.04 (project budget)			

97 Grid emissions factor.

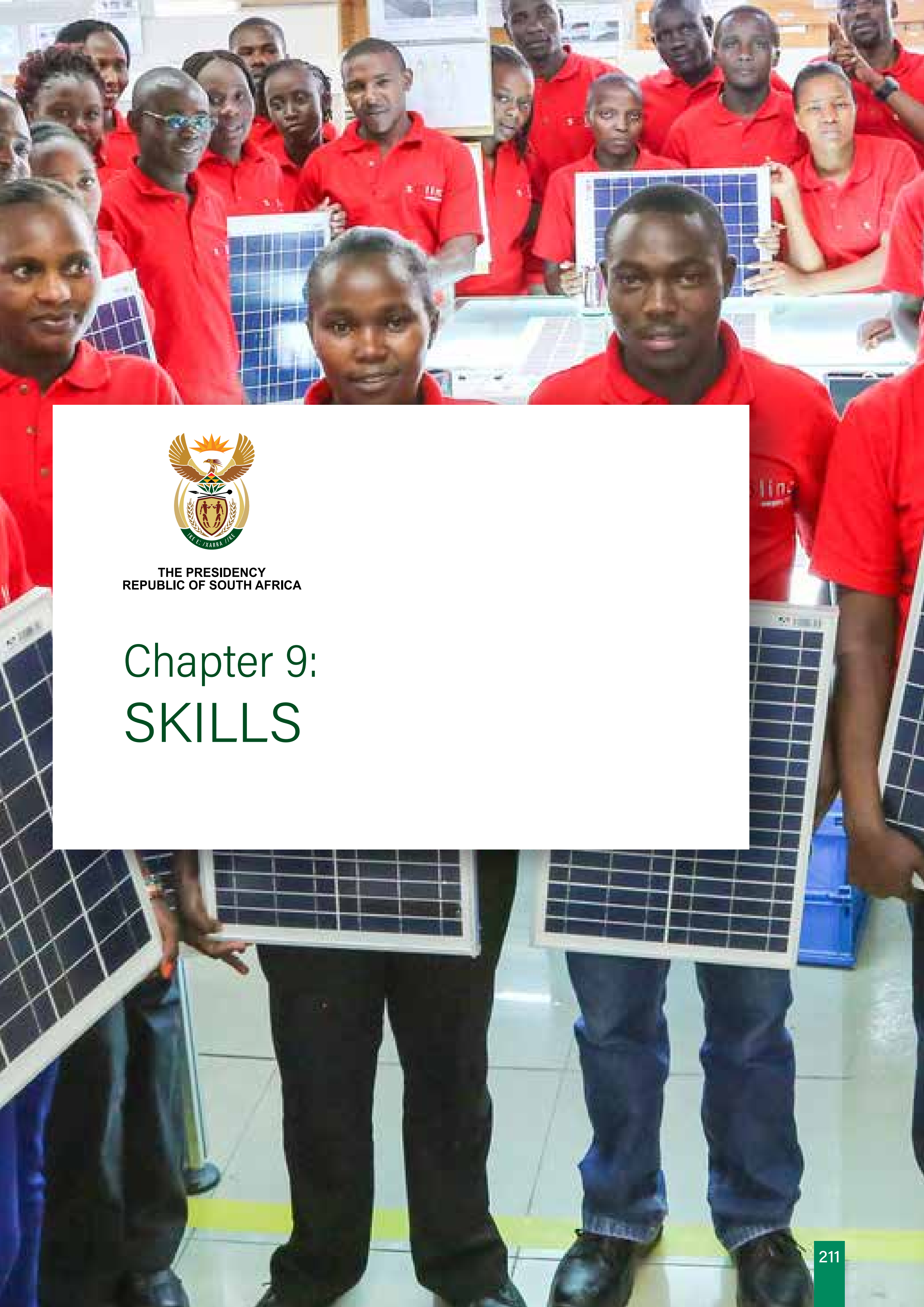
	FID[92]	FC[93]	COD[94]	Capacity (MW)	GH_2 volume (Ktpa)	Final product volume	CO_2 reduction ($ktCO_2e$ pa)	Progress
				185	22	120 Ktpa MeOH		Terms of References for the pre-feasibility have been issued and evaluated
	2023	2024	2025	N/A	660 000 (from one-year MEA supply if only for electrolyser use)	3 Mn MEA p.a. (9 GW electrolyser capacity equivalent), 1 tonne PGM catalysts	10.5 (based on one plant)	In progress: Production start date Q1 2024
	2023	2024	2025	50	2.5	2.5 ktpa GH_2 300 fuel cell trucks/ buses	30	Designed: Start date estimated Q3 2024
	2023	2024	2026	N/A	N/A	1 000 250 kW fuel cell systems pa (250 MW pa)	100 0[97]	
	2024	2025	2026	1.2	1 600 000 Nm^$_3$	1 600 000 Nm^$_3$	2 000	
	2027	2028	2031	TBD	TBD	TBD	TBD	
	2024	2024	2030	2200	85	480.22 ktpa GNH_3	TBC	
	2025	2026	2028	115	18	100 Ktpa	180	

Annexure B: Examples of opportunities and challenges from GH_2 projects currently under development

The Coega Green NH_3 plant selected the Coega Industrial Development Zone (IDZ) site due to the availability of key infrastructure, such as a modern port, grid availability at the Dedisa substation to support the import and export of electricity, availability of shared infrastructure such as piping on servitudes, existing training centres for workforce skilling, and undeveloped land to allow for the development of its facility. This infrastructure availability at the Coega IDZ presents the opportunity to not only develop a Green NH_3 plant, but to also create an industrial cluster around the facility itself. This could include supporting industries, such as electrolyser manufacturing, water processing facilities, and RE equipment manufacturing. This Coega GH_2 industrial cluster will drive significant industrialisation and socio-economic benefit in the Eastern Cape, the province with the highest unemployment, and highlights the benefits a local GH_2 industry can unlock.

Isondo Precious Metals (IPM) is developing key fuel cell and electrolyser components that use PGM metals. These are small-scale proof of concept studies to establish beneficiation and local manufacturing capabilities in the GH_2 value chain, as well as establishing initial GH_2 use cases such as hydrogen refuelling stations (HRS) for fuel cell vehicles. For these and other small-scale projects to materialise, grant funding is critical as long-term offtake needed to provide income certainty to the project cannot be secured since the market is still too nascent – without grant funding these projects cannot progress beyond feasibility studies. However, there is limited clarity on what grant funding is available for proof of concept and local manufacturing projects. This results in all GH_2 projects, including mega-projects, competing for the same pool of grant funding. Further, SMMEs or start-ups developing small-scale, proof of concept studies do not have the same resources as large corporates to meet the grant funders requirements, putting them at a disadvantage to access the grant funding. A fair, transparent process that outlines how much grant funding is available for different GH_2 projects (for example, local manufacturing capabilities, hydrogen refuelling, mega-GH_2 production projects, and so on), and what the requirements are to access this funding is needed. This will allow the South African GH_2 industry to be established in the short term, as well as meet the key long-term targets of SMME growth and local manufacturing capacity to drive job creation.

The on-the-ground experience of the IPM projects also raise concerns with securing PGM supply needed for establishing local fuel cell and electrolyser manufacturing. This is because these small-scale projects are competing in a global commodity market, where existing PGM offtakers have long-term contracts. To overcome this, an integrated strategy between local manufacturers, PGM miners, and key stakeholders such as DTIC, to secure PGMs needs to be created. Finally, a misalignment between the special economic zones (SEZ) intent, and the actual operation of the SEZ is being observed. This misalignment may prevent the initial objective to support the establishment of a local GH_2 industry from being achieved and needs to be reviewed.



THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Chapter 9:
SKILLS

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- outline a plan for how South Africa can build a more co-ordinated approach in supporting skills development, skills utilisation, and skills anticipation for the Just Energy Transition (JET)
- outline the current context and structural challenges within the skills system in South Africa to highlight that building a coherent JET skills response will need good skills intelligence (supply and demand), augmented learning programmes and qualifications, clearer energy learning pathways articulating occupational and educational progression, functioning public and private providers, skilled and capable educators, career and study guidance, institutional development, adequate funding, and quality monitoring mechanisms
- build on existing work to catalyse interventions needed to address JET skills needs in the short term, and that support medium- to long-term skill trajectories
- set out how the JET Skills Plan is designed to strengthen existing skills planning processes and seeks eventually to be anchored into the mainstream skills system targets, such as occupations in high demand, and the National Skills Masterplan and human resource development (HRD) strategy.

9.1 Context

This chapter specifically focuses on the skill formation system for the JET, for without doing so, skills formation remains individualised, fragmented, sporadic, and lacking sustainability or longevity. The chapter is written while the Master Skills Plan (MSP) of South Africa is being developed by government, and this JET Skills Portfolio will form part of the MSP in due course.

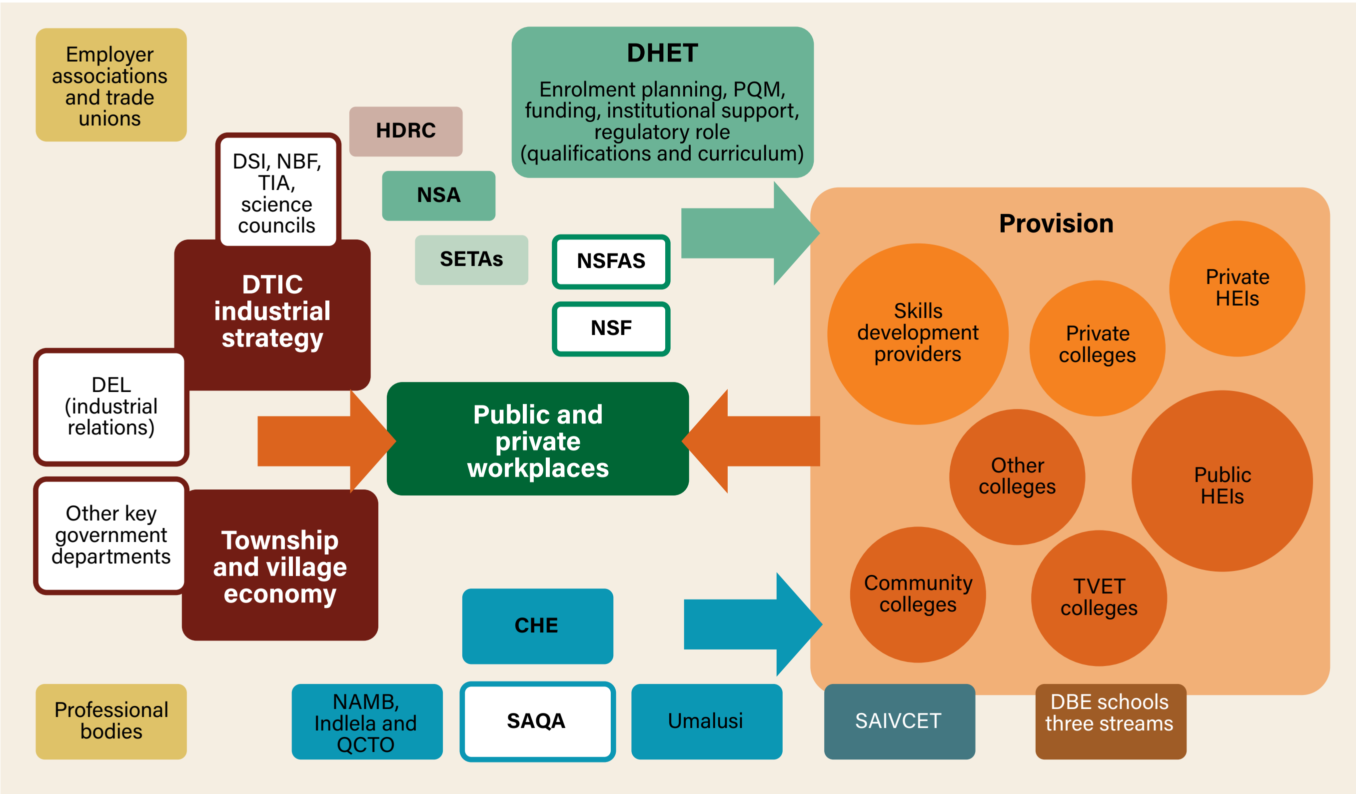
Skill formation is not just an individualised activity. It is a process embedded in a system that enables or constrains it. At a systemic level, skill formation must be understood as a set of systems that are shaped by, and shape, economies, institutions, and social relations. Within the context of 'skill formation systems', the word 'skill' is shorthand for expertise that is used and developed at work, and acquired through schools, formal vocational education institutions, universities, short courses, workplace-training, labour market demand for different types of qualifications and different forms of expertise. The 'skill formation system' is how these fit together.

Skill formation, therefore, refers to an interconnected system that enables skills development. It involves analysing how skills involving expertise, knowledge, and qualifications are produced for work, and how skills development relates to skills demand. It requires looking at a set of moving and inter-related parts that shape and respond to each other.

9.2 Mapping the Skill Formation System in South Africa

The skill formation system in South Africa includes the different institutions that offer education and training, the institutions that support, regulate, and co-ordinate the system, and the institutions where employment happens, as shown in Figure 24, which aims to highlight the complexity of the system and the scope of actors. For a full discussion of the roles of different stakeholders and actors, refer to the National Skills Development Plan (NSDP), 2030.

Figure 24: South Africa's skills formation system



Economic players are both users and producers of skills. The workplace is both a place in which structured training, workplace experience, and ongoing learning about work happen, as well as where demand for expertise and qualifications is shaped. To understand skills systemically, it is necessary to think about institutions, dynamics, and relationships. Institutions include systems, mechanisms, and rules. As shown in Figure 24, the institutional terrain is complex and there is a multiplicity of players with diverse mandates that need to be brought together for advancing new skills interventions, such as those required for the JET.

- From a **contextual and employment drivers' perspective**, *there are various locations where policies are made, and targets are set. These are closely connected to dynamics within the political economy.*
- From a **skills system planning perspective**, there are various sets of 'rules and tools' that stakeholders are often obliged to use – such as the Organising Framework for Occupations (OFO), Workplace Skills Plan (WSP), and the structural requirements for accreditation outlined in the National Qualifications Framework (NQF) and its legislative instruments. The latter are governed and implemented by requirements of quality assurance bodies who fulfil their legislative mandates as outlined in the NQF and skills system legislation. Funding bodies for skills such as the National Skills Fund (NSF), and Sector Education and Training Authorities (SETAs) play a significant role in enabling skills development.

- From a **skills provision perspective**, there are various types of public and private providers, all of which have a particular role to play in relation to the types of skills required for the JET (for example, schooling, occupationally directed training and higher education).

The JET is catalysing the need for fundamental economic change that is regenerative towards achieving greater sustainability and social justice. The envisaged energy transition is an ambitious one and will require a comprehensive policy mix. Simultaneously, this will necessitate transversal engagement across the education and training system, as sustainability and energy practices are located in schooling, higher education, and occupationally directed training. In this rapidly changing context characterised by 'newness' and quick emergence, the education and training system has struggled to be responsive. This has created a landscape of fragmented interventions that do not cohere and maximise impact for JET implementation.

9.2.1 Challenges within the Skills Sector that need to be Considered as Potential Barriers to the Transition

The complex skills system, together with the rules and tools used to understand current and future skills needs, represent numerous contradictions and lock-ins and present barriers to the change that is essential for the transition. There are several challenges within the skills sector that must be overcome for South Africa to deliver on the JET. These include:

- **Lack of centralised, coherently organised co-ordination for skills development for the JET:** Despite the extensive and complex Green/sustainable development mandate in policy, to date no adequate co-ordination mechanism has been established for the national planning and development of sustainability skills in South Africa. At post-schooling education training (PSET) level, there is limited coherent analysis and co-ordination of the skills needs linked to sustainability. For JET specifically, policy, programmes, and training exist in pockets across the country but are not co-ordinated to work together, and so the information from different small studies does not provide a coherent national picture. At all levels of government, non-governmental organisations (NGOs), unions and education centres are all working on their own Green skills programmes leading to a proliferation of Green jobs analyses and human capital development strategies, many of which are overlapping and/or 'double counting.' These are yet to be co-ordinated to work together in a broader context within the wider economic development strategy and policy framework. Thus, we have a paradox of support for sustainability skills seemingly appearing everywhere but being partly invisible in the national skills landscape.
- **No coherent national picture of supply and demand of JET skills:** The fragmentation has resulted in many small studies on skills supply and demand (for example, there are currently at least five different studies on skills for the hydrogen economy), which are methodologically different, often from a positional interest, and do not cohere. It is, therefore, not possible to aggregate information or data to build a clear national picture of supply and demand of JET

skills. These multiple small studies lead to duplications of effort leading to wasteful use of resources, time, and expertise, and planning anomalies. Skills planning from these small studies will also create future planning inconsistencies.

- **Skills anticipation systems and processes:** There are many limitations with current skills anticipation systems. The rules and tools rely on information from employers to indicate labour market needs for the future. However, employers often struggle to analyse their current skills needs, let alone future ones. Most research finds that they specify generic skills. Sometimes what employers perceive as a skills gap is a work organisation problem. Even where employers have clear insight into the gaps in their workforce and the expertise needed by people in those kinds of jobs, this expertise is seldom reducible to a set of tasks, and never gives straightforward insight into what education is therefore required, other than for very specific, very short-term skills needs. The national Labour Market Intelligence (LMI) programme has begun to develop some useful frameworks for skills anticipation. However, these are not yet translated sufficiently into mainstream implementation.
- **Conflation of time horizons:** There is disjunction in terms of the systems for analysing skills gaps, which tend to be focused on current and emerging skills gaps, and the systems for education provision planning, which can only be for long-term planning. Therefore, they misalign, with the ironic effect of keeping the skills development for longer-term JET caught in a short-term 'crisis' trap and short-termism.
- **Factors shaping skill formation systems at a national level:** There is a need for better insight into the factors shaping skill formation systems at a national level – the object of analysis here is education and training at a systemic level, including workplace-based and informal learning, and its interaction with economic and social institutions. Foundation building in the schooling and technical and vocational education and training (TVET) systems are also part of this longer term, more sustainable orientation to JET. Especially urgent is substantive attention to the skills of lecturers, trainers, and curriculum developers to launch and support high-quality training for the JET in TVETs, specialised institutes, and in the general education and training sector, including public and workplace-based education and training settings. Research shows that curriculum development for JET skills tends to be very general and lacks adequate balance of theory and practice, and this relates directly to lecturing and curriculum development skills for JET provisioning. The lack of quality training and curriculum design affects the quality of training and skills development directly.
- **Disconnect between training institutions and communities:** There is a disconnect between training institutions and the specific needs of local communities in the context of clean energy. Tailoring training programmes to address the unique requirements of different communities and industries is essential, but often lacking. Additionally, access to quality skills development remains unequal across regions, with rural and marginalised communities having limited opportunities. Addressing these challenges requires a concerted effort to bridge the gap between training institutions and communities, ensuring that skills development is inclusive, relevant, and accessible to all, thereby fostering a JET in South Africa.

9.2.2 Understanding the Root Causes

The skills system response to the energy transition has been inadequate, ad hoc, fragmented, reactive, and inefficient. *Therefore, these are some of the root causes (of the core problem):*

- New knowledge and skills are needed, and the system is not able to adjust quickly enough:
  - The system is reactive in responding to what is emerging.
- Skills needed for JET are not clear:
  - Poor skills planning, especially in the context where needs are rapidly changing
  - Skills needed for the future are uncertain
  - Tools used to anticipate skills are not effective for uncertain future markets.
- Fragmented and ad hoc educational responses in terms of delivery of required skills:
  - No national co-ordination of JET skills
  - Links between employers and educational institutions are not optimal.
- Some TVETs are sub-optimal and struggling to respond to what is required for JET:
  - Poor link to employers constrains effective apprenticeships, internships, and work-based opportunities for TVET learners
  - Lecturer JET knowledge and educational resources required needs strengthening, as does curriculum development and pedagogy
  - Pedagogy that can bring theory and practice together better
  - Learner literacy levels may not be at the required standard
  - Weak basic education system and foundational skills outdated (not keeping pace with JET directionality).
- Educational institutions disconnected from communities, community colleges, and adult learning centres, and therefore may struggle to respond to local needs
- Some university curricula are not updated rapidly enough to reflect new needs and specialisms:
  - New needs are emerging rapidly, and it takes time for universities to change curricula
  - Investment in new research to guide new knowledge and practice for JET is lacking.
- Inadequate pipeline of skills in JET areas:
  - Insufficient JET knowledge at basic education level.

9.2.3 Stakeholder Perspectives

In consultations conducted by the Presidential Climate Commission (PCC) on the 2022 JET IP, stakeholders agreed that skills development was pivotal but that the approach outlined in the JET IP was insufficient, unclear, and significantly underfunded. There was a strong argument for a more comprehensive understanding of how it is linked to different elements of the value chain, how it will be actualised across the different stakeholder groups (how it will involve communities, youth, and women), and how it will be co-ordinated at different levels and tiers.

The approach adopted for the JET Implementation Plan is therefore to build on the work that has been done, avoiding duplication, and identifying short-term wins while simultaneously addressing the longer-term structural issues. Interventions have been unpacked in more depth to allow funding to be allocated more accurately and for performance measures to be established. Several stakeholders were interviewed as part of the process to determine specific needs and impact areas, as well as to address the concerns that were voiced.

9.3 JET Skills Implementation Plan

9.3.1 Goal

The overall vision is that the JET skills implementation plan will contribute to building a well-co-ordinated, responsive, resourced, and effectively functioning skills ecosystem. This skills ecosystem will involve communities, business, government, and other institutions to ensure that South Africa has an employable, skilled, and capable workforce to implement the JET and support economic growth in the core value chains.

9.3.2 An Approach to Deliver an Effective Skills Implementation Plan

Skills are positioned as critical enablers for the transition of the energy sector. The JET IP identified the following three dimensions of skills development as core, each involving multi-level interventions:

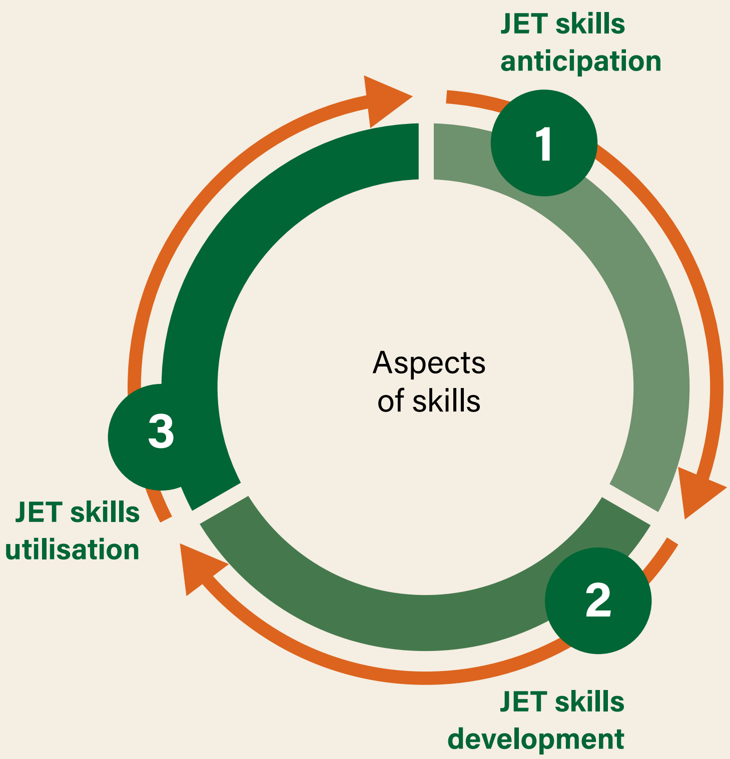
- **Reskilling and upskilling of adult workers:** This will require robust recognition of prior learning (RPL) processes, and diversified labour market information that examines entry and intermediate level pathways. It also requires proactive planning for reskilling, which is not just a short-term technical exercise (for example, via short courses), but also an identity, psycho-social, and community formation process (for example, via skills ecosystem integration into social-economic and social-ecological systems, and new forms of work in already work-scarce contexts).
- **Skills anticipatory systems and processes that support future labour force needs:** This will require strengthening labour market intelligence systems and tools to be more responsive to the needs of industries, communities, youth, women, and vulnerable groups, and to adopt more clearly differentiated lenses to short-termism (that is, crisis skills responses in immediately needed value chains and occupations), and medium-term trajectories.
- **Supporting foundational skills:** To support the adaptive capacity of the broader workforce, and to support educators within schooling and post-school education (training of trainers, curriculum development, and learning programme model development) to develop foundational knowledge, skills, values and approaches to work, learning and living within the JET, and the diversity of types of training that will be needed (for example, vocational, workplace, specialist technical, and reskilling).

This calls for a cross-cutting skills response that bridges the skills system, the skills planning processes, and the transitioning of JET sectors with short-, medium- and longer-term planning approaches.

Furthermore, it will require both national level co-ordination and strategic support and local level alignment to emerging, and at times rapidly changing, needs and demands for skills and/or upskilling or reskilling. Importantly, framing skills systems in a multi-dimensional way goes beyond the traditional approach of seeing skills systems as a means of delivering skills. It also considers the role of a skills system in ensuring a smooth transition from education to work and an appropriate skills match at the workplace in terms of both skills supply and its interaction with demand.

An approach is used to characterise skills systems based on three key aspects, all conceived within a skill formation system (see Figure 25). Resourcing the three identified core value chains for the JET (RE, Green Hydrogen (GH_2), and electric vehicles (EVs)) will need to consider all three aspects. Coherent skills anticipation, where labour market actors identify and prepare to meet future skills needs, will help to avoid potential gaps between skills demand and supply. Skills development, which includes training, education activities, and skills utilisation, also includes how skills are used in workplaces and how employers plan and use the skills of employees.

Figure 25: Aspects of skills



1. Coherent **skills anticipation** where labour market actors identify and prepare to meet future skills needs will help to avoid potential gaps between skills demand and supply
2. **Skills development**, which includes training and education activities
3. **Skills utilisation** includes how skills are used in workplaces and how employers plan and use the skills of employees

9.3.3 Principles to Guide the Design of Skills Interventions

The focus will be on the following interventions:

- Implementable in the short to medium term to fit within the scope of the JET Skills Investment Plan, but that are framed within the ongoing demand for longer-term sustainable development of the energy sector
- Connecting to existing initiatives that can be upscaled or provide a platform for future collaboration and co-creation of solutions (here improved co-ordination and systemic approaches will be encouraged)
- Impacting high numbers of jobs
- Geographically disparate and within different communities (stakeholder groups) but a focus on those areas most impacted
- Focusing on a stream of work (not a single job) where occupational progression can occur
- Strongly focused on women and youth
- Addressing structural challenges that are needed to unlock future energy investment tranches.

The types of skill interventions will also need to be planned from a clear idea on occupational differentiation, such as the following:

- Is there a need for new occupations, or a specialisation in existing occupations, with no existing training in South Africa, and thus needing new qualifications?
- Will the job changes require components of curricula needed to be redone or augmented?
- Are there skill sets with a shortage of existing training in South Africa that will require a short course, and/or more sustained upskilling and/or reskilling programmes? Note that reskilling is more than a 'quick fix' or technical process, especially if reskilling involves a significant change in work type, and/or work identities and communities.
- Will there be changing processes/technology at work that will require on-the-job training – workplace-based training and workplace trainers?
- What are the foundational skills implications of the above?

9.3.4 **Assumptions**

For the framework to address any risks, it is important to identify assumptions being made when developing and implementing interventions. These are the assumptions that are being made:

- There is sufficient funding to implement the interventions and associated activities.
- The JET IP will not change over the five-year period, and should it change, a review of the interventions may be required.
- Relevant government policies and strategies for the power sector, GH_2, and EVs will be implemented as planned.
- Funding and support will be released by Department of Trade, Industry and Competition (DTIC) to support skills development zones (SDZs) and skills ecosystems.
- There is continuity of construction of RE investments.
- The country can retain skills and skills are not lost to emigration.
- Economic growth is occurring, and high investment levels will support demand.

9.3.5 Overview of Desired Outcomes and Impacts

The Theory of Change was used to develop an actionable and measurable implementation plan. The JET Skills Implementation Plan was designed along five dimensions from the Theory of Change. The Theory of Change is summarised in narrative form and presented in Table 28. The JET Skills Implementation Plan is designed as a JET Skills Plan, but achieving this ambitious, long-term vision requires a systematic mainstreaming of these JET priorities into broad strategies overseeing skills development in South Africa.

Improving skills is key to meeting skills needs and for communities to adapt. For this to happen, the skills system must be transformed, and communication and collaboration improved. The key impacts of this portfolio are that there are effective skill formation systems supporting the three core value chains (New Energy Vehicles (NEVs), Green Hydrogen (GH_2), RE, and transmission) (I01), and these have contributed to increased employment and strengthened livelihoods drawing from skills related to the JET (I02) Skills Plan (ST01). The JET Skills Plan will feed into the National Skills Masterplan as developed by the Department of Higher Education and Training (DHET). The SDZs need to be operating and enabling local learning networks with employers, educational institutions, and communities across the three value chains (ST02). TVET colleges have a key role and must be better able to link students with workplaces (ST03), as well as with SETAs (ST09). We need to see improved levels of skilled community members emerging (ST04), as well as skills available to the labour market across the three priority value chains (ST05). To enable this, there must be a good understanding and communication of emerging skills needs/labour market information (ST06). National and provincial government and other stakeholders need to understand JET and JET priorities so that they can apply JET in their work (ST07) and have an enhanced awareness of JET as an important development priority for the country (ST08). JET knowledge must be included in teacher training at universities with curricula modified to include JET (ST010) so that foundational skills are built.

Table 28: Theory of Change

Intervention	Output	
JET Skills Ecosystem and JET Skills Forum focusing on a co-ordinated approach to skills anticipation, development, and utilisation	JET Skills Ecosystem established	
	National JET skills research repository established, and new research commissioned	
JET SDZs focused on three core value chains focused on applied skills anticipation, development, and utilisation for the three value chains (NEV, GH_2, RE, and transmission)	Proposal for JET SDZs to be established and resourced for the three value chains completed	
	Local SDZ actors mapped and lead educational institutions are appointed	
	Technical capacity and development plans for SDZs to support the three core value chains developed	
	Local skills development plan agreed with actors	
	Community development plan with resource requirements identified	
JET skills development needs assessments for three core value chains	Expanded situational analysis across three core value chains completed	
	Key local training priorities established	
	Value chain skills supply and demand baselines completed	
JET skills planning and support for government and key government institutions	Capacity needs assessment for government completed	
	Capacity development and advocacy plan for government developed	
	JET capacity building programme run with SETAs	
Foundational skills development support to teachers and educators	JET teacher education curriculum development materials developed for all teacher training/TVET institutions via the FUNDISA for Change national Professional Learning Community (PLC)	

Short-term outcome	Medium-term outcome	Impact
JET Skills Ecosystem and the National JET Skills Advisory Forum supporting co-ordinated development and implementation of the JET Skills Plan	Effective co-ordination and collaboration of all stakeholders to respond to changing skills needs	Effective skills formation systems supporting the three core value chains (NEV, GH_2, RE, and transmission) Increased employment and strengthened livelihoods drawing from skills related to the JET
	Skills system is effectively adjusting and responding to changing JET skills needs	
	Women and youth participation in JET market activity	
SDZs operating and enabling local learning networks with employers, educational institutions, and communities	SDZs operating effectively supporting skills development, community liaison, and links between institutions	
TVET colleges are better able to link students with workplaces	System is adjusting and responding to changing JET skills needs	
Improved levels of skilled community members	More resilient communities, improved community liaison by education community and business	
	Skills system adjusted to new demand	
Skills across three core value chains available to the market		
Good understanding of emerging skills needs/labour market information		
National/provincial government and other stakeholders	National policy and strategy aligned and co-ordinated	
Enhanced awareness of JET as an important development priority for the country so that they can apply JET in their work		
SETAs able to make the business case with employers and better play their role as intermediaries	JET priorities incorporated into sector skills plans	
JET knowledge included in teacher training at universities and curricula modified to include JET	Teachers are including JET into their lesson planning and teaching	

9.4 Interventions and Outputs

A set of clustered flagship interventions have been identified that map the approach outlined in Figure 26 to support the JET and have a catalytic impact on skills and skills systems in general. It must be noted that although these projects were identified as priorities with broader catalytic implications, additional interventions are also required to address the broader challenges around skills development and other smaller opportunities within JET activities and the JET IP.

9.4.1 Flagship Intervention 1: Establishment of a Three-Tier JET Skills Ecosystem

This intervention is the formation of a national skills co-ordinating structure to catalyse and co-ordinate JET related skills activities. There are many small JET activities that need to be aligned and co-ordinated to increase impact and efficiency, ensure the ecosystem flows are in place, and that supply and demand are matched.

The JET Skills Ecosystem will also co-ordinate research, occupational information, and data, for example, develop an online JET occupational handbook/platform that can link different demand studies, connect different segments of occupational demand information, improve labour market intelligence, and indicate the skills gaps more clearly. This would be a useful quick win and will help to establish cohesion in the JET sector and can eventually be anchored within the OFOs and the National Occupational Pathways Framework (NOPF).

The three tiers of the ecosystem will link macro- and micro-JET skills activity and will work at mainstreaming JET priorities into the post-school system. The complete structure will link to and work with the DHET National Skills Masterplan and strengthen the skills tools used within the system. The three-tier skills ecosystem will be a national co-ordinating structure, and will serve to connect levels of work, both between the SDZs and nationally across the country.

Tier one: JET Desk: The JET Desk is formed at the Human Resource Development Council (HRDC) of South Africa within the DHET, with technical input from the DTIC, the Department of Science and Innovation (DSI), as well as Project Management Units (PMUs), and the PCC. The JET Desk will need to ensure that it is able to work across branches of the DHET, with stakeholders (labour, business, and communities) and have strong mobilising potential. Five technical persons will be appointed to drive the implementation of the JET plan:

- A chief technical advisor who will provide overall insight and management of JET activities, and also ensure that the JET Desk is connected and anchored in core skills planning processes

- Three technical officers, each of whom will be linked to a core value chain and who will be connectors between the SDZs, national JET work, and the national JET Desk
- A person responsible for finance and administration.

The JET Desk will be supported by a higher education institution (HEI) consortium that will advise and provide support in terms of developing research capacity in the country. The JET Desk will do the following:

- Monitor delivery of the JET Skills Implementation Plan across all workstreams, ensuring key role-player participation (DHET, DTIC)
- Set up the national platforms for data and research co-ordination
- Provide progress reports to JET PMU in the Presidency for the JET Government Steering Committee and JET Inter-Ministerial Committee reviews
- Manage the JET Skills Forum
- Establish a link to the SDZs in provinces.

Tier two: National JET Skills Advisory Forum: This will facilitate broader engagement with HEIs, labour, business, and development agencies. This forum will serve to connect the different actors in the JET Skills Ecosystem, facilitate more effective communication and co-ordinate JET activity, and allow sharing of work, research and tools, aggregate data, and skills information. It will function as a single point of contact for public and private parties working on JET skills investments, support national task team and workstreams to ensure alignment, integration, and visibility, mobilise funding for the SDZs and partners, convene working groups to identify challenges, and access support needed for workstreams in the SDZs. The forum will also be the platform to connect work in SDZs with JET work nationally.

Tier three: Three Skills Development Zones (functioning as a learning network): These zones will be established around each core value chain (RE, GH_2, and EVs). The SDZs are conceptualised as a local learning network that will bring together local partners with an aim to support localisation and local economic development. The SDZs will be framed around key local anchor educational institutions (which could be a TVET or centre of specialisation) and will be sites of local implementation, catalytic interventions, and partnerships with business and educational institutions (SDZs are discussed in Intervention 2 and 3).

Figure 26: JET Skills Ecosystem: Co-ordinated approach to JET skills development

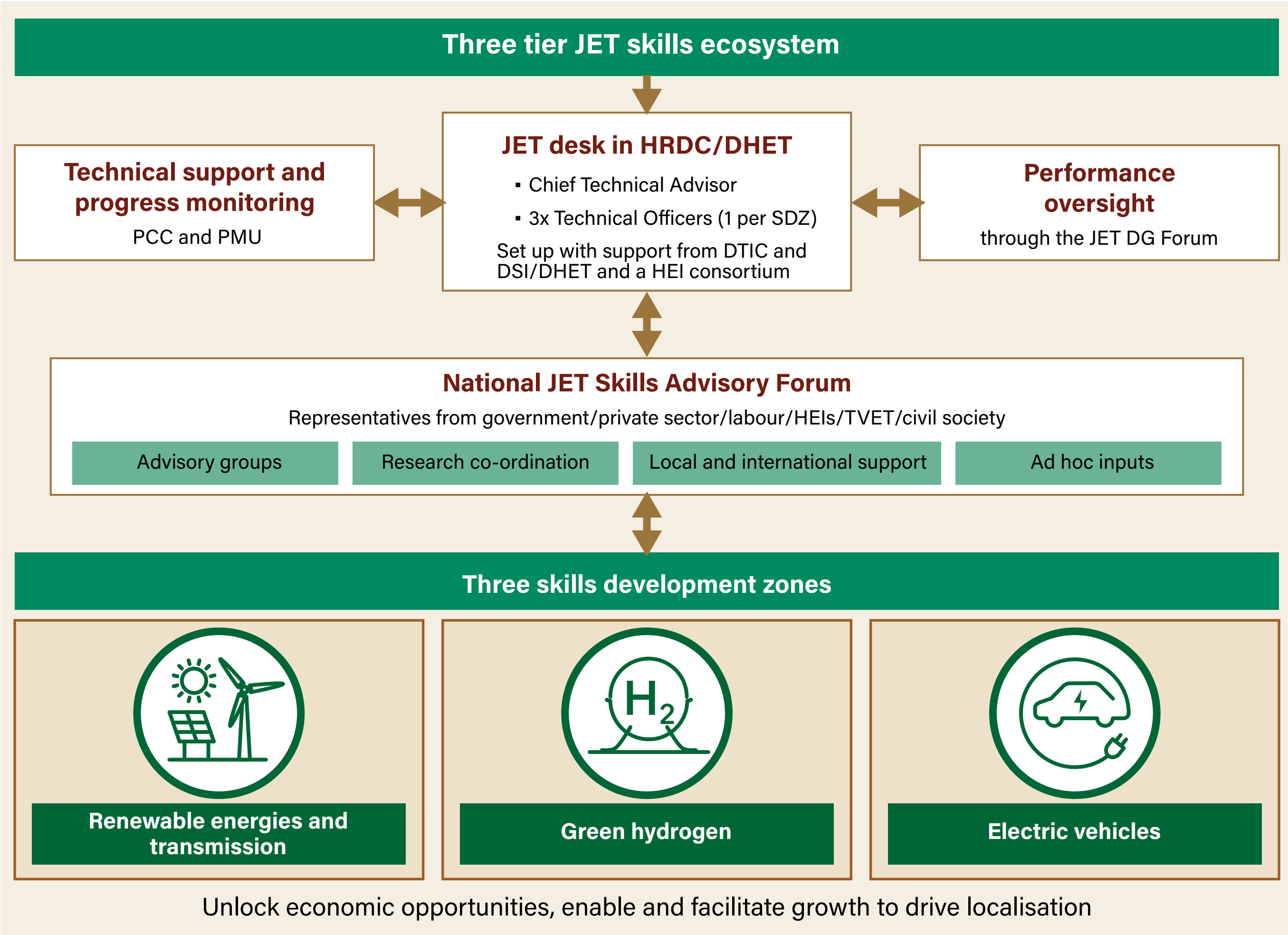


Table 29: Activities needed to establish the three-tier JET skills ecosystem

Activities	Outputs	Lead & key partners
Establish and resource the JET Desk (including technical specialists), to spearhead JET skills planning and co-ordination	JET Skills Ecosystem Forum established	*Lead:* HRDC, DHET *Key partners:* Director General (DG) Forum, JET Desk, SETAs, HEIs, Business, Labour, Funding agencies
Establish a national JET Skills Advisory Forum – comprising government, higher education institutions, development agencies, civil society, and business		
Development of an online JET occupation and skills occupational 'handbook'/platform to standardise and align skills with occupational demand information; improve labour market intelligence and help with planning skills gap analysis	Online occupational intelligence platform/handbook to improve occupational information and skills intelligence	
Establish a national research and co-ordination platform that will aggregate data and commission required research, e.g.: ▪ Situational analysis to identify current provisioning, current workforce, funding, and JET skills interventions (e.g. a JET sector stocktake of who works in the sector and what is happening) ▪ Set up skills supply and demand tools that different organisations can use ▪ Development of robust, dynamic recognition of prior learning (RPL) mechanisms that are not institutionally based	National JET skills online research platform established, and research commissioned	*Lead:* HRDC, DHET *Key partners:* SAQA, Quality Council for Trades & Occupations (QCTO)
Catalytic impact (Duration: 2024-2029)	**Roles and responsibilities**	
This type of co-ordinating structure will be catalytic and will benefit the entire PSET system, as well as industry The online occupational handbook will help to collect more coherent occupational data, so it can be aggregated and provide clearer pictures of demand The RPL process will benefit all sectors and support decisions for reskilling, especially those also transitioning	HRDC/DHET will be responsible for establishing and resourcing a JET Desk (five-year tenure with an option to extend if required) and the functional management of the Ecosystem but reporting into the DG Forum on JET on performance and strategic alignment The JET Skills Ecosystem will be responsible for co-ordination with the National Forum and the SDZs The forum will co-ordinate and align research, data, demand and supply analyses and labour market information linked to JET, and commission new current and future labour market studies either through the JET Skills Ecosystem or SDZs Relevant HEIs will work with the JET Skills Ecosystem to undertake situational analysis and occupational atlas	

9.4.2 Flagship Intervention 2: Establish Skills Development Zones (Local Learning Networks) Focused on Three Core Value Chains

To catalyse, innovate and promote investment, we need to establish and resource three SDZs. These will comprise centres of specialisation at anchor educational institutions, but within a learning network for greater alignment of skills supply and workplace demand in three core value chains. The SDZs will be established in Mpumalanga (RE and Tx), Eastern Cape (EVs) and Northern Cape (GH_2) and will drive local community projects that foster local economic development, as well as skills development in and between core value chains across the country. Figure 27 outlines the key role they will play in each, spearheading local skills relationships and facilitating more effective skills development and utilisation.

The SDZ will feature the following:

- Anchor educational institutions (for example, a centre of specialisation or a TVET college focused on the core value chains)
- Links between these anchor centres of specialisation to community colleges or adult learning centres
- Links with local related businesses
- Links to local community organisations to facilitate community based and youth structures
- Partners working together to develop local demand pictures, identify jobs at risk, and catalyse local skills development.

Figure 27: Skills Development Zones role

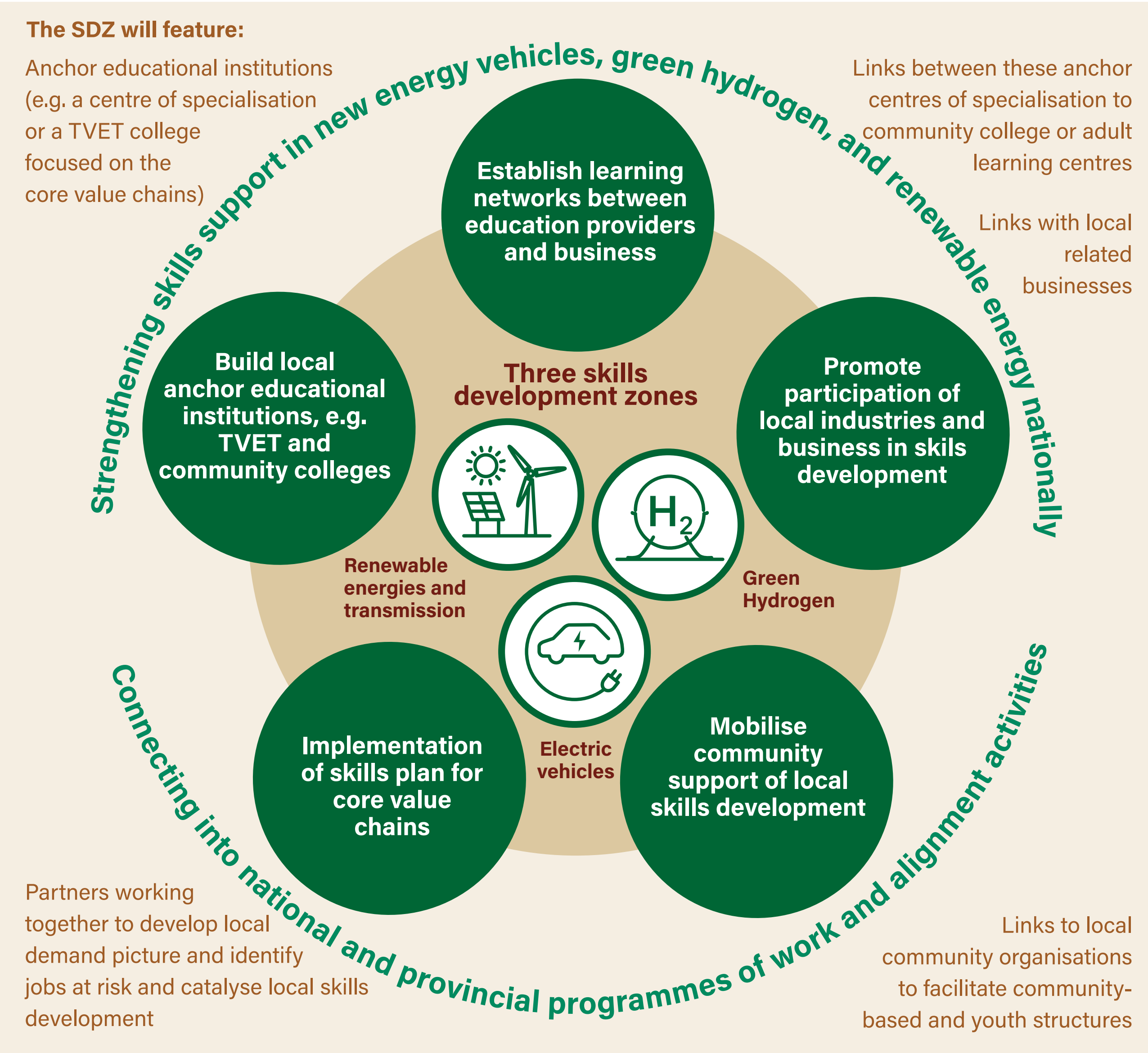


Table 30: Activities needed to establish SDZs

Activities	Outputs	Lead	Key partners
The JET Skills Advisory Forum facilitated by the JET Desk to establish and resource the SDZs as specialised local skills learning networks	Proposal for JET SDZs to be established and resourced for the three core value chains completed	HRDC/DHET JET Desk	DGs JET Forum PCC PMU Funders SETAs TVETs HEIs Business communities, SAQA QCTO CHE
Identify lead funding institutions (potential SETAs) and anchor educational institutions (TVET or centre of specialisation), and potential links to other educational institutions, e.g. adult learning centres, community colleges	Plan for each SDZ with local key partners	SDZ lead educational institution	
Procure studies to map local skills ecosystem actors and identify skills gaps linked to each value chain in context (supply, demand, and transitioning)	Technical capacity, development plans for SDZs to support the three core value chains developed	SDZ lead educational institution	
Within each core value chain build on work done and establish local demand, and link to national demand picture			
In each SDZ, establish jobs at risk, develop a skills plan for persons impacted starting with a RPL analysis of what people know and what experience they have			
Establish learning networks – local educational institutions and business to facilitate better links for Work Integrated Learning (WIL)/Work-based Learning (WBL) apprenticeships			
Work with SETAs, QCTO, and SAQA to fast-track development of new qualifications and courses, and/or recurriculate as required			
Targeted capacity building of TVETs and community colleges (lecturer capacity) linked to identified occupational programmes			
Drive community and local business development through community education, reskilling, and upskilling	Community development plan with resource requirements identified	SDZ lead institutions	

Catalytic impact	Roles and responsibilities	Duration
The SDZs can establish stronger links between education institutions and business at local levels and promote local economic development SDZ will also provide a platform for partners to consolidate inputs, support centres of specialisation, and grow a solid local network that is connected to the national ecosystem	The JET Skills Secretariat, under the leadership of the JET Desk, established in the HDRC for the JET Skills Ecosystem will be responsible for establishing the SDZs and functionally managing them The SDZ will be responsible for rolling-out the defined interventions and activities and establishing partnerships and/or contracting with appropriate bodies to implement the plans Employers and communities will be responsible for providing data and engaging with the SDZ to guide the work SETAs will be responsible for qualification accreditation and funding future programmes as appropriate	2024–2029

9.4.3 Flagship Intervention 3: JET Skills Needs Assessments for Three Core Value Chains

This initiative would further build on work done to consolidate energy skills work that has been conducted across the country and expand it to include all three core value chains in their entirety. This is a critical step to ensure that a comprehensive skills plan is identified and implemented to ensure the required skills are in place nationally. There are skills implications linked to all three priority sectors' supply and demand, for which all need to be planned.

Electricity sector: As the country makes a shift to increased RE, a skilled workforce is necessary to build, operate, and maintain the new renewable technologies efficiently. This creates employment opportunities and reduces inequality, but only if there is a workforce with the necessary skills to fill these new roles. The need to first understand the areas of demand, then enhance reskilling and upskilling efforts for the electricity sector transition is critical, as a skilled workforce is crucial for ensuring that the benefits of the transition are equitably distributed, preventing job losses in the traditional energy sector whilst providing new opportunities.

Potential **quick wins**:

- Support for Grootvlei, the Hendrina Power Station Training Centre, and the artisan training programme at Eskom. There is an existing centre at Komati, which could focus on related skills or support one of the other value chains. Similarly, Eskom's existing artisan training centre for boilermakers, and welders can be scaled up. Both facilities can support a wide variety of skills and can partner with other education institutions, such as TVET and community colleges, as well as local businesses, such as coal mining. Community upskilling and reskilling can also be a focus within this.

- South Africa has the skills to expand the transmission network to accommodate the expansion of RE for electricity and ultimately GH_2. The problem is the volume of skills that will be required, given that there have not been any large-scale transmission expansion programmes for a number of years. An intervention is proposed to address this, using the Transmission Development Plan (TDP) at Eskom, to ensure these skills are developed at the scale required, and ensure that some of these skills are transversal with lower voltages wires programmes so the skills can also support initiatives at municipal and Eskom distribution level.
- Build on the manufacturing opportunities in the RE value chain identified in South African Renewable Energy Masterplan (SAREM) as a quick win for the SDZs to identify ecosystem skills needs.

New Electric Vehicles (NEVs): A skilled labour force can ensure that the adoption of NEVs benefits all communities, preventing job losses in the automotive sector. As a result, the Automotive Industry Development Centre Eastern Cape (AIDC EC) is currently working on an EV skills transition masterplan with the aim of achieving a successful, inclusive, sustainable, and economically beneficial transition for the country. Upskilling and reskilling efforts should be inclusive, taking into consideration the different NEVs (electric cars, plug-in hybrids, and fuel cell vehicles), the potential employees across the three NEVs, and end users as the local market grows.

Potential **quick wins**:

- The University of the Western Cape (UWC) has an Energy Storage Innovation Laboratory based at the South African Institute for Advanced Materials Chemistry (SAIAMC) that has been running for over eight years. This laboratory is focused on battery programmes especially in the field of lithium-ion and sodium-halide batteries, battery modules, and integrated energy storage systems. Given the need for localisation, and the fact that South Africa is a leading producer of lithium, skills in this area should be accelerated together with lean manufacturing skills, and this laboratory can be fast tracked to assist. This initiative would be a cross-cutter for the renewables core area as well as EVs.
- For South Africa to be competitive in the global space and maximise localisation opportunities, lean manufacturing is a critical area of skills development. The Lean Institute Africa is an initiative of the University of Cape Town Graduate School of Business and is a member of the Lean Global Network. Aligning and scaling their programmes for the needs of the JET would develop a necessary and scarce skill.

Green Hydrogen (GH_2): The production and utilisation of GH_2 requires advanced technological knowledge and expertise across the value chain, spanning from electrolysis techniques to infrastructure development. In recognising the need for GH_2 skills, the Energy and Water Sector Education and Training Authority (EWSETA) have developed a Hydrogen Fuel Cell System Practitioner Skills Programme for hydrogen system practitioners to be run by QCTO accredited providers.[98] Additional skills work needs to be conducted to ensure a JET, including the reskilling and upskilling of employees working in areas such as chemical engineering, mechanical engineering, automation, and control systems.

Potential **quick wins**:

- Scale up the current HySA project that supports three research and skills development areas in catalysis, systems, and infrastructure. These 'Centres of Competence' already have established networks throughout South Africa with other researchers and business.
- The National Association Manufacturers of South Africa (NAAMSA) in collaboration with the Trade and Industrial Policy Strategies commissioned by the DTIC has completed a Comprehensive Skills Gap Analysis, the recommendations and the findings of which can be built on and inform potential actions.
- The Chemical Industries Education and Training Authority (CHIETA) has a plan to upskill 1 000 chemical engineers to become hydrogen systems engineers by 2025. This programme can be scaled up to include other critical skills for GH_2 identified by CHIETA.
- CHIETA, Mining Qualifications Authority (MQA), and EWSETA have established a memorandum of understanding (MOU) to work together on supporting the hydrogen economy. This initiative could spearhead the skills work in this workstream.

A cross-cutting **quick win**:

- Support the expansion of the existing research repository of research done to date on JET (compiled as part of the South African National Energy Association (SANEA)/WITS Energy Skills Roadmap) on the EWSETA website to ensure there is no duplication and make the information publicly available to all researchers and investors.

98 EWSETA. (2023). *Hydrogen Fuel Cell System Practitioner skills programme*. (https://ewseta.org.za/wp-content/uploads/2021/02/Hydrogen-Fuel-Cell-System.pdf).

Table 31: Activities needed for the expansion of skills for all three core value chains

<table>
<tr><th>Activities</th><th>Outputs</th><th>Lead</th><th>Key partners</th></tr>
<tr><td>Update the database of current JET studies, collate, and aggregate to organise</td><td>Expanded situational analysis across three core value chains completed</td><td rowspan="6">JET Desk</td><td rowspan="6">Skills Forum
SETAs
QCTO</td></tr>
<tr><td>Conduct a skills supply and demand assessment across the skills ecosystem of each value chain, by further consolidating and verifying the work done to date, e.g.:
SANEA – Energy Skills Roadmap
NAAMSA has completed a Comprehensive Skills Gap Analysis of the EV sector
HySA work on skills and work done by CSIR/ DHET</td><td>Key local training priorities established</td></tr>
<tr><td>Linked to each core VC, conduct a comprehensive supply analysis to assess the provisioning ability and provider capacity of the current PSET system to provide the required skills for the energy transition.
Highlight gaps in the current qualification mix and provider capacity</td><td rowspan="4">Active labour market absorption of JET graduates</td></tr>
<tr><td>Develop, resource, and identify delivery mechanisms for a skills training plan per core value chain (upskilling, reskilling, artisan programmes, apprenticeships)</td></tr>
<tr><td>Identify priorities for provider development and engage QCTO, e.g. workplace trainers</td></tr>
<tr><td>Develop reskilling plans for jobs at risk</td></tr>
<tr><th>Catalytic impact</th><th colspan="2">Roles and responsibilities</th><th>Duration</th></tr>
<tr><td>These baselines will have spill-over impacts on a number of other sectors that are part of the JET Skills Ecosystem and ensure skills needed to resource the key skills that are required across the value chains (VCs), and the skills needed to resource activity across the VCs</td><td colspan="2">The JET Skills Ecosystem will be responsible for co-ordination with the Forum and the SDZs
The local SDZ will co-ordinate and align research, data, demand and supply analyses, and labour market information linked to JET, and commission new current and future labour market studies either through the JET Skills Ecosystem or SDZs</td><td>2024–2025</td></tr>
</table>

9.4.4 Flagship Intervention 4: JET Capacity Development for Government and Key Government Institutions

This intervention is aimed at ensuring that there is an enabling environment for skills development in JET across government, by building the capacity of the national and provincial government to support JET implementation. This will foster aligned and responsive policy development, ensure that capacity is built to work systemically, that synergies are identified, and that awareness of best practice globally is in place.

A **quick win:**

- Expand on work done by the National Environmental Skills Planning Forum and the WITS-Rhodes Green Skills Research Programme, an enabling document to guide SETAs with skills planning, and sourcebook of skills tools to help SETAs build a business case with employers. These were developed around Green skills broadly but can be adapted to a focus on JET.

Table 32: Activities needed for JET capacity development for government and key government institutions

Activities	Outputs	Lead	Key Partners
Mapping of current government interventions to determine current level of JET activities	Capacity needs assessment for government completed	DHET PSETA HRDC	SETAs Relevant government, and provincial departments National School of Government WITS-Rhodes
Develop a matrix aligning government programmes and projects to foster synergy			
JET capacity building training plan developed and implemented for government officials	Capacity development and advocacy plan for government developed		
SETA JET skills needs assessment completed Enabling document developed to guide SETAs in JET skills planning, with tools to assist skills planning SETA training/capacity building programme planned and conducted	JET enabling document developed SETA capacity building programme	DHET ILO	

Catalytic impact	Roles and responsibilities	Duration
Better integration and co-ordination of policy implementation and collaboration in key areas. Maximising scale of effort by pooling resources and working across geographical and functional boundaries	Working with HRDC, PSETA would be responsible for leading this work - they would sub-contract the research and the accountability for roll-out to other organisations The government departments would be responsible for completing the learning needs assessment - this will include the identification of the need for deep dives into key areas such as for technologies or climate financing and sending the right people for training They would also be responsible for using the learnings across other spheres of work and government initiatives Government departments would also need to identify areas of synergy where they could pool funding or effort	2023–2025

9.4.5 Flagship Intervention 5: Support Foundational Skills Development

This intervention would aid in building foundational skills by empowering and upskilling teacher educators, and pre-service and in-service teachers to integrate sustainable energy concepts into the curriculum.

A **quick win**:

- This would entail building on the established FUNDISA for Change network, which was initiated by Rhodes University and is currently funded by the South African National Biodiversity Institute (SANBI) across all teacher training universities and is endorsed by the National Department of Basic Education (DBE). All learning materials developed are copyright free as the network operates as a knowledge commons. The JET Implementation Plan can leverage off the network, and this will ensure that teacher training within all South African universities is capacitated for JET-related knowledge streams using copyright free materials developed for teacher educator training.

Table 33: Activities needed to build foundational skills development

<table>
<tr><th>Activities</th><th>Outputs</th><th>Lead</th><th>Key partners</th></tr>
<tr><td>Engage FUNDISA for Change and fund a study to identify JET knowledge progression and where JET skills could be included, and develop materials used by universities</td><td rowspan="3">JET materials developed by FUNDISA for Change for all teacher training/TVET in the country</td><td rowspan="3">FUNDISA for Change Programme
DBE</td><td rowspan="3">DBE
DMRE
PCC
HEIs with teacher education units
SANBI
Rhodes University
SETAs</td></tr>
<tr><td>Work with different HEIs to support their teacher training</td></tr>
<tr><td>Identify gaps and fast track development of new content and/or recurriculate as required – must cover ECD, Foundation, Intermediate, Senior, Phases, TVET, programmes for community colleges and adult learning centres</td></tr>
<tr><th>Catalytic impact</th><th colspan="2">Roles and responsibilities</th><th>Duration</th></tr>
<tr><td>This model can be used for the co-ordination of other skills-building initiatives over time and be expanded to include other transition pathways</td><td colspan="2">FUNDISA for Change will be responsible for reviewing their programmes and identifying gaps in collaboration with the universities, the JET Skills Ecosystem and the SDZs
They will also be responsible for rolling-out the changes to curricula with the universities
The universities will be responsible for the adaption and design of local training programmes
The DBE will be responsible for reviewing basic education curricula to include additional JET material</td><td>2025</td></tr>
</table>

9.5 Indicators

Table 34 articulates the various objectives and indicators that will be used to measure progress.

Table 34: Indicators for JET skills

Narrative summary	Objective	Indicator
JET impact		
Effective skills formation system supporting the three core value chains (NEV, GH_2, RE, and transmission)	PSET system aligned and key areas co-operating	Skills master plan includes JET
		HRD strategy includes JET
		Included in SETA SSPs
Increased employment and strengthened livelihoods drawing from skills related to the JET	New jobs created from JET IP investments	Nationally (disaggregated by gender, age, employment status, race/ethnicity, disability, and other vulnerability status)
Resilient communities	Communities that can adapt to changes and generated economic growth	Percentage change in unemployment in defined communities

Narrative summary	Objective	Indicator
Medium-term outcomes[99]		
Effective co-ordination and collaboration of all stakeholders to respond to changing skills needs	Stakeholders collaborating effectively and aligning relevant programmes	JET Skills Forum constituted and meeting regularly
		Number of collaboration opportunities identified
Skills System is effectively adjusting and responding to changing JET skills needs	To develop a JET Skills Plan	JET Skills Plan developed and agreed by end 2024
		JET Skills Plan integrated into National Skills Masterplan
Women and youth participation in JET market activity	Increase number of women and youth participating in skills programmes	Percentage increase in number of women and youth trained/ employed
SDZs operating effectively, supporting skills development, community liaison, and links between institutions	SDZs set up and resourced by end 2024	Number of SDZs set up and operating by 2024
Improved community liaison by education community and business	To understand community needs and assist communities with the transition	Percentage increase in number of community interactions
Skills system adjusted to new demand	More responsive skills system that can change to include new technological developments	Number of students absorbed
National skills policy and strategy aligned and co-ordinated	To ensure that policy and legislation supports the JET	JET integrated into NSDP, Skills Masterplan, HRD strategy, DTIC and DMRE masterplans
JET priorities incorporated into sector skills plans	To ensure that all SETAs capacitated and aligned on JET requirements and priorities	Number of SSPs and ATRs that reflect JET priorities
Teachers are including JET into their lesson planning and teaching	To build foundational skills by capacitating teacher education institutions and pre-service teachers	Number of preservice teachers trained

99 Changes in behaviour and performance.

Narrative summary	Objective	Indicator
Short-term outcomes[100]		
JET Skills Ecosystem and the National JET Skills Planning Forum supporting co-ordinated development and implementation of the JET Skills Plan	Identification of key role-players and current programmes of work	Technical task team appointed. Forum members identified and invited to participate
SDZs operating and enabling local learning networks with employers, educational institutions, and communities	SDZs anchor institutions are identified and learning network established	Number of key partners identified
TVET colleges are better able to link students with workplaces	TVET colleges to understand workplace needs and match students with appropriate workplaces	Number of new opportunities for work-based learning and apprenticeships created
Improved levels of skilled community members	Understand community needs and match them with reskilling or upskilling programmes	Number of trained community members
Skills across three core value chains available to the market	To develop the right skills in the right volume at the right time	Number of students employed in three core value chains
Good understanding of emerging skills needs/labour market information	Good understanding of where business and other stakeholders require current and future emerging skills	JET represented in WSPs and occupations in high demand lists
Government JET learning needs requirements understood	Understand baselines of JET skills in government and where there are gaps	Learning needs assessment completed by end 2024
Enhanced awareness of JET as an important development priority	Government departments understand where they can apply JET in their work	Number of policies strategies aligned to JET priorities
SETAs able to make the business case with employers and play their role as intermediaries better	SETAs able to understand the key leverage points for JET implementation within their sector and engage with stakeholders	Number of SETA staff trained/ aware
		Number of stakeholders awareness programmes
		Number of new JET related partnerships
JET knowledge included in teacher training at universities and curricula modified to include JET	To adjust curricular to include JET material	Number of curricular adjusted

100 Changes in capacity and systems.

9.6 Managing Risks

Table 35 details what risks might materialise in the execution of the JET skills interventions, ranks them in terms of impacts and probability, and details mitigation plans.

9.6.1 Managing Risks and Dependencies

Table 35: Risk identification and management for JET skills

Risk description	Inherent impact[101]	Inherent probability	Inherent risk rating	Mitigation plans (ways to improve controls)	Residual risk rating
Funding is insufficient to implement all the interventions and associated activities	2	2	4	Prioritise interventions to ensure that the interventions with the biggest impact are funded first; source supplementary funding	Low
The JET IP changes over the five-year period, and a review of the interventions are required	3	1	3	Agree plan with key role players for the five-year period and manage changes based on impact	Low
Relevant government policies and strategies for the power sector, GH_2, and electric vehicles are not implemented as planned	3	2	6	Understand key decision points and put an early warning system in place through the JET Skills Forum to notify the forum of impending changes so that proactive action can be taken	Medium
Funding and support are not released by DTIC to support SDZs and the Skills Ecosystem in longer-term (>five years)	3	2	6	Negotiate with DTIC in advance of setting up SDZs so that agreement is obtained prior to any commitments being made	Medium
Construction of RE investments is not continuous, inhibiting investment	3	3	9	Align government policy to ensure investment and unblock transmission constraints	High
Severe loss of skills to emigration	3	3	9	Ensure an adequate pipeline and encourage companies to put retention schemes in place	High
Economic growth is low and investment levels do not support demand	3	3	9	Monitor impact of GDP on the energy sector and have it as a standing item on the Forum's agenda so that plans can be adjusted as required	High

101 3 = high, 2 = medium, 1 = low.

Figure 28: Theory of Change – Skills

INTERVENTION	OUTPUTS (O)
JET Skills Ecosystem and JET Skills Forum focusing on a co-ordinated approach to skills anticipation, development, and utilisation	**O01** JET Skills Ecosystem established **O02** National JET skills platform established, and research commissioned
SDZs focused on three value chains focused on applied skills anticipation, development, and utilisation for the three value chains (NEV, GH_2, RE and transmission)	**O03** Proposal for JET SDZs to be established and resourced for the three value chains **O04** Local actors mapped and lead institutions appointed **O05** Technical capacity development plans for SDZs to support the three core value chains developed **O06** Local skills development plan agreed with actors
JET skills development needs assessments for three core value chains	**O07** Community development plan with resource requirements identified **O08** Expanded situation analysis across three value chains completed **O09** Key local training priorities established **O10** Value Chain Skills Supply and Demand baselines completed
JET skills planning and support for government and key government institutions	**O11** Community development plan with resource requirements identified **O12** Expanded situation analysis across three value chains completed **O13** Key local training priorities established
Foundational skills development support	**O14** Value chain skills supply and demand baselines completed

SHORT-TERM (ST) OUTCOMES Changes in system and capacity	**MEDIUM-TERM (MT) OUTCOMES** Changes in behaviour and performance
ST01: JET Skills Ecosystem and the National JET Skills Planning Forum supporting co-ordinated development and implementation of the JT Skills Plan	**MT01:** Effective co-ordination and collaboration of all stakeholders to respond to changing skills needs **MT02:** Skills system is adjusting and responding to changing JET skills needs **MT03:** Women and youth participation in JET market activity
ST02: SDZs operating and enabling learning networks with employers, educational institutions, and communities **ST03:** TVET colleges are better able to link students with workplaces	**MT04:** SDZs operating effectively supporting, skills development, community liaison, and links between institutions
ST04: Improved levels of skilled community members **ST05:** Skills across three value chains available to the market **ST06:** Good understanding of emerging skills needs/labour market information	**MT05:** Improved community liaison by education, community, and business **MT06:** Skills system adjusting to new demand
ST07: Government JET learning needs requirements understood **ST08:** Enhanced awareness of JET as an important development priority for the country so that they can apply it in their work **ST09:** SETAs able to make the business case with employers and better able to play their role as intermediaries	**MT07:** National policy and strategy aligned and co-ordinated **MT08:** JET priorities integrated into sector skills plans
ST10: JET knowledge included in teacher training at 14 universities and curricula modified to include JET	**MT09:** Teachers are including JET in their lesson planning and teaching

JET IP IMPACT (I)

I01
Reliable, secure electricity supply, with access for low-income households

I02
Jobs created in renewable energy, industrialisation, tourism, agriculture, etc.

I03
Sustainable livelihoods secured/strengthened for SMMEs/communities at risk from climate and transition impacts

I04
GHG emissions reduced

I05
Social, economic, and environmental development co-benefits, e.g. improved air quality and regeneration

WIDER IMPACT

Transition to a low-carbon economy and a just, climate-resilient society by mid-century

THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Chapter 10:
MUNICIPALITIES

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- articulate actions that will contribute to a significant improvement in the ability of the municipal electricity distribution grid to absorb higher levels of Renewable Energy (RE) and to make a stronger contribution to reducing energy poverty
- assign institutional owners and targets to these actions to ensure the co-ordinated mobilisation of both effort and finance by relevant role-players in the public and private sectors
- build on existing initiatives in respect of municipal capability development and support, review of the local government electricity pricing model, and the implementation of free basic electricity.

10.1 Context

Local government owns and operates approximately half of South Africa's electricity distribution grid. A total of 165[102] (of 257[103] – 205 local, 44 district, and eight metros) municipalities are electricity service providers, through the allocation of distribution licenses by the National Energy Regulator of South Africa (NERSA) (Annexure A). However, most of the electricity distribution is located in relatively few municipalities: five metros account for 63% of municipal electricity sales, and the next 11 largest municipalities account for an additional 19% of sales. Approximately 20 municipalities account for close to 90% of the municipal electricity market.[104]

102 In terms of the Constitution, all municipalities are electricity service authorities, but there is a clear separation between authority and provider in terms of the legislation. Provider status is determined by the holding of a distribution license and, by implication, of meeting the requirements of that license. This chapter covers interventions to support the 165 authorised electricity service providers.

103 In the balance of municipalities, all electricity services are provided by Eskom. It should be noted, however, that even in the 165 municipalities, Eskom is responsible for at least some of the electricity distribution.

104 Source: SALGA. (2023).

Municipalities have a critical role to play in a successful energy transition, in improving South Africa's energy security, and in ensuring that the country has sufficient reliable and affordable electricity to support expanded socio-economic development. Given the widely varying complexities that confront local government, the municipal energy transition needs a focussed and collaborative approach across national, provincial, and municipal spheres of government to manage the significant financial, technical, and managerial challenges and risks of the transition. This established inter-governmental relations approach is spearheaded by the Department of Cooperative Government and Traditional Affairs (COGTA) and National Treasury (NT), along with organised local government structures, and will be key to finding sustainable electricity system solutions for municipalities of all sizes and capabilities.

The main roles through which municipalities will contribute to these outcomes are as follows:

- Recent changes in legislation allow municipalities to purchase power directly from Independent Power Producers (IPPs) and/or to establish their own power-producing entities.[105]
- Municipalities can potentially play a significant role in both the rapid decarbonisation of the electricity sector and addressing national electricity supply constraints, supporting the energy transition, and increased economic growth.

The ability of regulatory innovation – such as that allowing for increased embedded generation and wheeling across the grid – to make a meaningful contribution to South Africa's energy transition and security of supply, will be determined, in large part, by the functionality and robustness of municipal grids and system operation, including appropriate tariff structures. The municipal electricity distribution grid in many places has deteriorated significantly over the past 20 years and is now a major contributor to power outages (over and above scheduled loadshedding). In 2017, the South African Institution of Civil Engineering (SAICE) gave municipal electricity distribution infrastructure in aggregate an 'at risk of failure' score.[106] In their current state, the distribution grids in most municipalities are a barrier to embedded Renewable Energy (RE) generation, security of supply, as well as adequate equitable sustainable energy access.

The successful uptake of electric vehicles (EVs) – particularly at large-scale for public transport – will be supported by the functionality of municipal distribution grids.

Municipalities play a leading role in facilitating universal access to electricity. Together with Eskom, they are responsible for reducing the electrification backlog, funded through the Integrated National Electrification Programme (INEP) grant. Affordability is a barrier to ensuring that all households and small businesses have access to sufficient electricity. Municipalities

105 Prior to these changes, municipalities were almost entirely limited to purchasing power from Eskom, with very few and small exceptions.
106 Meaning: "Infrastructure is not coping with demand and is poorly maintained. It is likely that the public will be subjected to severe inconvenience and even danger without prompt action."

contribute to affordability in two ways: firstly, municipal electricity tariffs directly determine affordability; and secondly, municipalities are mandated to oversee and implement the national free basic services policy, including the Free Basic Electricity (FBE) subsidy.[107] Increased access to the FBE subsidy by low-income households (that is, better implementation of the existing policy) will contribute directly to reducing the cost of electricity for these households.

The future energy generation system will require a municipal electricity system that is fundamentally different in design, capability, and operation from the current system, and significant investment is required to deliver this. A successful energy transition requires functional distribution grids (which includes new forms of demand-side metering (DSM), such as smart metering) that can accommodate an increasing penetration of RE generation at different scales, and facilitate new generation modes, such as wheeling and feed-in by Small-Scale Embedded Generation (SSEG) systems. Grid investments and smart upgrades are required to enable grid stability, optimal grid control, safety, feed-in, and appropriate storage.

The desired outcomes for municipalities in respect of the JET IP are as follows:

- An increased share of renewables (from IPPs or own generation) in the municipal electricity supply mix
- Functional distribution grids that will support greater levels of renewables penetration, a higher level of electricity supply, multiple generation models, and universal access to electricity
- Municipal tariff structures that support the goals of the JET, notably financially sustainable electricity utilities, increased uptake of renewables on the municipal grid, and affordable access to electricity
- High capability municipalities able to plan, implement, and manage the electricity generation and distribution function envisaged in the JET.

The JET IP 2023–2027 identifies key activities and investments required to deliver the energy transition at municipal level, as shown in Table 36.

107 Even where a municipality does not distribute electricity, it still oversees the FBE and is responsible for determining which households qualify to receive the subsidy, and transfers the funds to the entity that supplies those households.

Table 36: Key activities and investments required to deliver energy transitions at municipal level

Category	ZAR billion
Infrastructure: Distribution maintenance	200
Infrastructure: Distribution modernisation for NEVs[108]	73
Infrastructure: Electrification backlog	45
DSM	0.5
Energy access design	0.1
Capability and capacity	0.23
Knowledge generation (collective planning to support JET)	0.03
Knowledge management (municipal revenue)	0.2

A close reading of the JET IP makes it clear that the category 'Infrastructure: Distribution Maintenance' is intended to include all grid upgrading required for a successful energy transition. In addition, in the interests of achieving economies of scale in capacity, integrated planning and expenditure, and aligned outputs, it is also recommended to include the grid modernisation required for EVs into one combined category (together with grid modernisation and reducing the maintenance backlog) of municipal distribution grid upgrading. This represents by far the most significant investment requirements in municipalities – a total of ZAR 273 billion. It should be noted that, although the JET IP states that this is a five-year (2023–2027) investment requirement, this sum represents the total investment required; and capacity limitations within municipalities, together with fiscal constraints, imply that only a small part of that funding is likely to be spent by 2027. The actual level of expenditure will be determined by several factors, such as the pace at which municipal capability increases, access to additional concessional climate investment funds, and the ability to leverage private sector investment.

The remaining investment categories are the following:

- **Addressing the remaining electrification backlog (achieving the goal of 100% household electrification rate, from the current 86%):** This item also includes alternative solutions (such as investments in micro-grids) for areas where main grid connections present technical and/or financial obstacles.

108 Electric vehicles. This is particularly relevant for urban areas and municipalities located on long-distance road routes.

- **Demand-side management:** Smart metering and complex billing solutions are likely to be a significant component of the new grid requirements, and thus require much more significant investment than current (basic) metering and billing systems. In addition, municipalities should identify and implement energy efficiency strategies to reduce demand.
- **Energy access design:** This investment is intended to address current problems with household access to the FBE subsidy. There is a considerable discrepancy between the number of households funded for FBE in the national budget, and the number that actually receive it.
- **Capability development and support:** This includes the 'capability and capacity' item above, together with knowledge generation in respect of collective planning to support the JET.
- **Research:** This is needed to inform the optimisation of the municipal electricity tariff and revenue system so that it is aligned with and supports the goals of the energy transition.

10.2 Stakeholders' Concerns and Feedback

During consultations held by the Presidential Climate Commission (PCC), stakeholders raised a number of issues and concerns, which have been addressed in this Implementation Plan.

Table 37: Stakeholder concerns and how these are addressed

Theme	Stakeholder concerns	
Defining the role of municipalities in the JET	Although there is a chapter on municipalities in the JET IP, many municipalities are unaware of all the details of this chapter, and very little work has been done to date in respect of most of the issues (apart from proposals in respect of the FBE).	
Sustainability of the current model of municipal electricity distribution	Municipalities highlighted the structural challenges of the current operating model of municipal electricity distribution. These include the difficulties of providing electricity at sufficiently affordable rates, while simultaneously funding infrastructure maintenance and upgrading. The sentiment was expressed that the operating model needs to be significantly overhauled to become more sustainable.	
Collaborative and context-specific planning	Most municipalities are clear that they want to be more involved in the development of locally specific strategies that reflect the particular circumstances in their own municipalities. There is clear opposition to top-down developed and one-size-fits-all models, as well as a JET Implementation Plan institutional structure that does not give a strong voice to municipalities. Higher-capability/readiness municipalities do not wish to be held back by rigid oversight/funding/support structures that have been designed for the lowest capability/governance municipalities.	

	How the concerns are addressed
	There is more preparatory work that still needs to be done in respect of municipalities to ensure that programmes match all requirements. This is the focus of the first six months of the Implementation Plan.
	Most initiatives proposed in the Implementation Plan are designed to improve the sustainability of municipal electricity distribution. Initiatives in respect of the local government revenue and electricity pricing model are particularly relevant in this regard.
	One of the guiding principles of the Implementation Plan is a commitment to co-creation of local-context specific strategies for individual municipalities, and a differentiated approach to implementation. It is recommended that the JET Municipal Council (JET MC) contains a majority of local government representatives (from South African Local Government Association (SALGA), Association of Municipal Electricity Utilities (AMEU), and the metro municipalities).

Theme	Stakeholder concerns	
Fragmented and complex institutional (oversight) arrangements in respect of municipalities	The Project Management Unit (PMU) is the central institution in developing the roadmap and overseeing its implementation. A key role of the PMU is to ensure clarity of institutional roles and clear mandates, which are essential for the effective implementation of the JET IP. However, this is a congested space in respect of the municipal energy transition. National government oversight of local government is largely a split function between National Treasury (NT) and Department of Cooperative Governance and Traditional Affairs (COGTA), with overlap in a number of areas. Provincial Treasuries and COGTA departments also play a significant role in local municipalities. The Department of Mineral Resources and Energy (DMRE) has an indirect oversight role, through the regulatory function of NERSA, and line responsibility for legislation that facilitates direct purchases of and/or own generation of electricity. Clarity and co-ordination of all these roles will be necessary to ensure the successful implementation of the JET IP.	
Access to funding	Current expenditure on infrastructure maintenance falls very far short of what is required to address the backlog: the annual national repairs, maintenance, renewal and upgrading budget across all relevant municipalities is less than ZAR 10 billion (Annexure B). In addition to addressing the maintenance backlog, additional investments in grid modernisation are needed to expand, reinforce, and enhance the distribution grid and integrated equipment and systems (such as smart metering and billing systems). These upgrades are critical for enabling the rapid increase in RE generation and ensuring offtake, given the greater share of this generation embedded in distribution networks nationally over time, as well as wheeling agreements involving generation connected to Eskom or municipal grids. There are currently no conditional grants available to local government for this purpose. The entire maintenance backlog as well as the significant investments required in new infrastructure cannot reasonably be expected to be fully self-funded in full without significant support. While municipalities do have other options – in addition to direct transfers via conditional grants – in respect of raising funds for new infrastructure investments (through various borrowing options, blended finance, pooled financing arrangements, and others), consultations with stakeholders indicate that the majority of municipalities require support in order to take maximum advantage of these options. The majority of municipalities are in financial distress. Only a very small number have the ability to raise funds based on their own balance sheets. The JET cannot be limited to just these municipalities. To date, the main funding source for distribution infrastructure maintenance and certain categories of upgrades in municipalities has been own revenue (derived from property rates and taxes, and the sale of services). There are no national conditional capital grants that can be used on general electricity infrastructure maintenance: the INEP conditional grant is intended for new infrastructure in previously unserviced areas, and although a portion of the Integrated Urban Development Grant (IUDG) may be used for electricity infrastructure upgrades, this is subject to location limits and is not available to all municipalities. The national fiscus is extremely constrained, and there is general reluctance to make additional funding available to municipalities from this source.	

	How the concerns are addressed
	The Implementation Plan proposes a JET MC to oversee activities. This structure will play a key role in bringing together and co-ordinating the activities of the various entities responsible for municipal regulation and oversight.
	The Implementation Plan proposes a number of strategies to support municipalities to improve the financial viability of electricity distribution operations, and increase their ability to raise additional funding themselves, including options for smaller municipalities unable to leverage their own balance sheets. It also proposes that the possibility of a new conditional grant specifically for municipal infrastructure be investigated.

Theme	Stakeholder concerns	
Municipal capability	There are significant capability gaps across municipalities in multiple areas required for a successful energy transition, including in the following areas: ▪ Planning for new renewable generation capacity and/or purchases thereof ▪ Structuring optimum financing arrangements for a wide range of investments ▪ Smart grid design ▪ Infrastructure planning and project implementation ▪ Technical skills to implement significantly increased maintenance to address the backlog ▪ System operation, including system governance ▪ Financial governance and oversight. Although all municipalities require capability development and support across all these areas, there are significant differences in existing capability levels across the JET target areas and among municipalities. In respect of new generation capacity, a small number of municipalities are at a relatively high level of readiness with respect to increasing supply of renewable power onto their grids (either through direct purchases or own generation), while the majority are at much lower levels of readiness. Many do not have access to any of the detailed information required to make effective decisions in this regard, such as accurate cost-of-supply studies. Much the same situation applies in respect of grid upgrading and eradicating the maintenance backlog. While some municipalities have a grid that is in a relatively good state of repair and a good capability base, a significant number of municipalities do not have even the most basic foundation in place required to successfully develop smart grids. Many have never undertaken detailed cost-of-supply studies, nor do they have in place basic grid operation frameworks (such as those required to facilitate wheeling of power through their grids). Most municipalities struggle to find and retain specialist artisan and engineering skills (of which there is a general shortage in South Africa) and the demand for these is likely to increase significantly as infrastructure investment accelerates. Municipalities report that they routinely lose specialist engineering and artisan skills to the private sector. Legacy in-house artisan training programmes in municipalities have mostly disappeared. As a result, there is no longer a pipeline of younger artisans entering the system to replace those that retire (or leave the municipal sector). Specialist electricity engineering skills present a particularly high barrier for smaller municipalities, which do not have the resources to employ these skills on a permanent basis, and also find consulting fees in this space prohibitively expensive. It is thus a considerable challenge for them to obtain skilled and impartial advice on how to design and implement new energy generation and grid upgrading strategies. Municipalities have indicated that they require capability development and support in areas related to fund raising:	

	How the concerns are addressed
	The Implementation Plan contains wide-ranging proposals for increasing the level and range of support to improve the capability of municipalities in a large number of areas.

Theme	Stakeholder concerns
(continued) **Municipal capability**	*(continued)* ▪ They will require sophisticated advice in respect of exploring various financing options (including the possibility of pooled funding for smaller municipalities that do not have robust-enough balance sheets), project finance preparation, and support to go to capital markets. Although the Policy Framework for Municipal Borrowing (Annexure C) creates significant regulatory space for innovation in funding, municipalities require specialist support to take optimum advantage of this. ▪ Support and advice in terms of negotiating with IPPs for long-term power purchases agreements (most of which will require a formal PPP in order to be compliant). This advice includes that required to determine the optimum supply mix for a municipality to optimise the cost and reliability of supply. At a technical level significant capability development is required. Technical support is needed in terms of designing, implementing, and managing the new smart grids that the future energy system requires, including designing and implementing new forms of grid governance (including new tariff structures and frameworks). There is a need for integrated planning support to direct and institutionalise progressive transformation and shape local transitions. Significant spending on capital investments in a new grid must be based on a good planning foundation and requires appropriate skills to be implemented correctly. Grid redesign and upgrading for the future electricity system – and implementing plans in this regard – is a specialist skill in relatively low supply. All municipalities have a capacity deficit in this area, which must be addressed in order for grid plans to be implemented. Technical capability for basic maintenance planning and implementation must be significantly increased in order to reduce the maintenance backlog. Most municipalities do not have the resources to provide all these multiple skills in-house at the appropriate level. Even the most advanced and well-resourced municipalities will still require some level of external support. In addition to these (externally provided) specialist skills directly related to increasing renewables penetration and implementing new grid design, municipalities have indicated the need to significantly expand and develop their in-house technical capability in respect of basic artisan skills – electricians and similar, maintenance management systems and processes in order to be able to scale-up maintenance expenditure, and system operation and governance. Finally, municipalities need to develop skill retention policies to ensure that investments in increased capability are sustainable.

	How the concerns are addressed
	The Implementation Plan contains wide-ranging proposals for increasing the level and range of support to improve the capability of municipalities in a large number of areas.

Theme	Stakeholder concerns	
Fragmentation and duplication of municipal capability development efforts	There is considerable fragmentation and duplication in the municipal capability development space.[109] A large number of organisations – inside and out of the State – are currently engaged in providing capability development support to municipalities in respect of many of the areas described above.[110] While many of these programmes have been successful in specific areas, better co-ordination across them will improve economies of scale, improve coverage, and ensure that all aspects of required capability are delivered. In addition, identification of particularly successful programmes will facilitate targeted allocation of resources and encourage up-scaling.	
The need to improve household affordability of electricity and access to FBE	Civil society organisations and community representatives have been critical of the poor level of implementation of the current FBE system by municipalities (fewer than 30% of households funded in the national budget actually receive the benefit). Additionally, the current level of the allowance (50 kWh per household per month) has been criticised as being too low, and proposals were made that this is increased to 350 kWh. Most low-income households can only afford electrical appliances that are energy inefficient (and often dangerous). This is particularly the case with cooking appliances. If households can access more efficient appliances, they will reduce usage and cost (and thus effectively increase access to electricity). Stakeholders indicated that they were very supportive of such an initiative.	

109 (https://www.treasury.gov.za/publications/other/National%20Treasury%202022%20System%20of%20Capacity%20Building%20for%20Local%20Government%20Diagnostic%20Review.pdf).
110 It is estimated that approximately ZAR 10 billion is spent annually on local government capacity building initiatives.

	How the concerns are addressed
	The Implementation Plan proposes that a review of current capability development mandates relevant to the JET is undertaken, to: ▪ identify high-impact programmes ▪ ascertain the most appropriate institutional location for capability development support ▪ consolidate relevant capability building initiatives across the State under that entity. Capability development programmes outside of the State (i.e. managed by non-State entities) will be encouraged to consolidate their efforts with the State-driven initiatives under various areas of support.
	While there is general agreement on the long-term goal of 350 kWh per household per month (and this has been included in the proposed electricity plan) current fiscal limits prevent short-term implementation. Proposals to improve the implementation of the existing benefit will be part of the NT review described below, and so do not form part of this Implementation Plan. The Implementation Plan recommends a programme to subsidise the cost of low-income household access to energy efficient appliances. Such a programme could be linked to a local manufacturing development initiative.

Theme	Stakeholder concerns	
The current municipal revenue and electricity tariff-setting model	There are several challenges to be addressed in this regard. The current local government electricity revenue (i.e. tariff) model has been designed to support municipal revenue (to ensure fully funded municipal budgets), and not specifically to meet the requirements of universal energy access, energy diversification, distributed generation, and smart grids. Electricity tariffs do not currently support municipalities' accommodation of SSEG or other embedded renewable electricity and associated off-take agreements, nor do they enable equitable service delivery. The reality is that these are often competing goals, and there is no clear methodology in place for how these are to be resolved. The redesign of municipal electricity financial models is required to incentivise optimal actions for different grid users, support more progressive system outcomes, and adequately resource the system over the long-term. Most municipalities have not undertaken detailed cost-of-supply studies. Lack of accurate information as to the real cost to deliver the service, and consequent inappropriate tariffs and subsidies lead to insufficient funding for electricity and sub-optimal financial incentives for all actors – municipalities and electricity users. In addition, there are effectively multiple electricity tariff setting authorities in local government. While NERSA has considerable regulatory authority in this space, the Municipal Finance Management Act (MFMA) also regulates tariff setting by municipalities and allows for the levying of charges (which effectively form part of the tariff structure) that are not regulated by NERSA. This fragmented regulatory authority is not desirable. Finally, many municipalities are struggling to collect revenue for electricity and other services. More than ZAR 200 billion is currently owed to municipalities for rates and taxes and services. This directly impacts their ability to pay bulk service providers (including Eskom) and to fund infrastructure maintenance and upgrades.	
Lack of co-ordination in planning for new generation capacity	Several municipalities are planning new generation capacity projects (both own investment and purchases from IPPs), with little reference to what is being planned in other municipalities, or the broader national electricity landscape. In the interests of co-ordinated national infrastructure planning and the optimum allocation of JET IP resources, it is desirable that there is better communication and co-ordination among municipalities, so that one national strategy is in place, rather than multiple, fragmented, and incoherent energy generation investments.	
Inefficiencies in implementation of INEP (electrification)	Electrification (including solutions for remote areas where grid connection is not feasible) is currently funded by the INEP grant. However, expenditure and implementation of the grant needs to be improved before additional funding can be allocated to this output.	

	How the concerns are addressed
	NT is currently in progress with a comprehensive review of all aspects of the municipal fiscal framework (including electricity pricing). This review is due to be finalised in mid-2025. An important part of the mandate of the proposed JET Municipal Council will be to provide input to the NT process, and to ensure that there is close collaboration between NT and NERSA in respect of resolving the contradictions in municipal tariff setting. Support to municipalities to complete detailed and accurate cost-of-supply studies is included in the first 12 months of the Implementation Plan.
	The Implementation Plan proposes the establishment of a platform across municipalities to improve co-ordination and co-operation.
	NT is currently in process of reviewing all of the conditional grants. This is due to be completed by mid-2024. Recommendations in respect of increasing efforts around electrification will be based on the findings of that review.

The Implementation Plan roadmap is focused on delivering the goals of the municipal chapter of the JET IP, taking into account the concerns of stakeholders summarised in Table 37. The roadmap is based on the following five **guiding principles**:

1. An **agile and flexible approach** is required to ensure that municipalities at different stages of transition readiness can be accommodated. Those with a high state of readiness should be allowed to progress as swiftly as they can, while those with a lower level of readiness will proceed at a more measured pace, commensurate with capability. In addition, smaller (and less wealthy) municipalities will generally require different funding solutions from larger municipalities. A 'one-size-fits-all' rigid approach – to both funding and capability development – is thus to be avoided, since the details of what is required in one municipality will vary considerably from what is required in another. The most appropriate municipal energy transition implementation plan, therefore, is one that best fits the specific details of the local context of a particular municipality.
2. Given the necessity of local-context specific solutions, and the importance of incorporating the justice components of the national JET Framework (notably procedural justice which requires significant community/stakeholder participation in solution design), **co-creation**[111] **of local context-reflective municipal energy transition strategies** will be encouraged. Co-creation as an approach to policy and programme design has multiple operational benefits, including better problem scoping and broad-based support for implementation of programmes, both of which increase the likelihood of success.[112] A co-creation approach to programme design also reflects the new approach towards capability development in municipalities supported by NT.[113]
3. **An initial focus on the 20 largest municipalities** in the sector, which account for close to 90% of municipal electricity distribution.
4. The adoption of a **sequenced approach in implementation**, to ensure that a solid capability and governance foundation is in place for each municipality prior to the allocation of funding, and the progressive increase of funding. For the majority of municipalities, **capability deficits must be addressed prior to the allocation of significant amounts of new funding for infrastructure investment**. If this is not done, there is a significant risk that funds will not be applied in the most productive manner. Additionally, infrastructure development plans should be based on detailed energy scenario plans, which in turn reflect long-term socio-economic development goals, as well as detailed quantifications of current maintenance backlogs.

111 In this context 'co-creation' is intended to mean deeply collaborative approaches towards policy and programme design that include a wide range of communities and stakeholders from the very beginning of the process. That is, co-creation implies that a wide range of impacted groups participate directly in all aspects of policy and programme design and implementation. This is a very different approach from current models of 'community participation', where policies are generally written within the State, by a small team/department, and then selected stakeholders have the opportunity to make comments.

112 McGann, M., Wells, T., & Blomkamp, E. (2021). Innovation labs and co-production in public problem solving. *Public Management Review*, 23(2): 297–316.

113 (https://www.treasury.gov.za/publications/other/National%20Treasury%202022%20System%20of%20Capacity%20Building%20for%20Local%20Government%20Diagnostic%20Review.pdf).

5. **Avoid duplication and fragmentation.** There is currently work underway across the State in several areas directly related to the delivery of the municipal component of the JET IP. The most important of these current initiatives are the following:
   - A comprehensive review of the Local Government Fiscal Framework (including revenue models and electricity pricing strategies) is in progress by NT. This review includes an assessment of how to improve the implementation of all the free basic services, including the FBE. The review is scheduled to be completed in mid-2025 (although some recommendations may be released prior to that date).
   - NT is also in the process of a comprehensive review of the entire conditional grant structure. This review includes all grants across both provincial and municipal spheres. As proposed below, one possibility for funding the municipal JET is a new conditional grant in respect of electricity distribution infrastructure. Additionally, addressing the electrification backlog (one component of the municipal JET IP) is currently funded from a conditional grant – the INEP grant. The implication is that the details of these parts of the funding strategy for municipalities (that is, changes to INEP and/or a new capital expenditure conditional grant) should be informed by and incorporated into the recommendations of this review, which is due for completion in mid-2024.
   - Work is being undertaken by the Cities Support Programme (CSP) in respect of supporting metros to develop long-term energy scenarios, which should be detailed enough to support the development of comprehensive infrastructure investment plans.

10.3 Implementation Plan

The main components of the Implementation Plan are the following:

10.3.1 Establishment of Institutional Arrangements for Implementation

It is proposed that a JET MC is established to oversee the implementation of the JET roadmap for municipalities, to provide leadership in an institutionally fragmented environment, and to consolidate capability development efforts so as to maximise the efficiency of funding for this purpose. The JET MC will also be responsible for liaison with and input into current government initiatives that directly impact municipalities (such as the reviews currently in process by NT).

The details of the composition of the JET MC, are to be finalised, but the following is proposed:

- JET MC representation to be from the three main national departments responsible for oversight of energy and related matters in local government (NT, Department of Cooperative Governance and Traditional Affairs (COGTA), and Department of Mineral Resources and Energy (DMRE)), with municipalities represented by the South African Local Government Association (SALGA), the Association of Municipal Electricity Utilities (AMEU), and direct municipal delegates. Other stakeholders to be part of the JET MC will be identified during the process of establishing and defining the mandate of the Council. There is a strong preference within local government for the majority representation on this Council to be from local government.
- A Secretariat that is responsible for ensuring alignment and integration of workstreams. The Secretariat will also have primary responsibility for mobilising funding for the various workstreams.
- A number of workstreams be created, linked to the main categories of activities listed in the Implementation Plan. These workstreams will be responsible for overseeing the delivery of relevant activities but will appoint implementing organisations to deliver particular outputs. (It is envisaged that most of these implementing organisations will be existing entities within the State that are currently engaged in relevant activities.)

The JET PMU in the Presidency will facilitate an initial conference of the abovementioned role-players to co-create the JET MC, the Secretariat, and the workstreams; and will assist in mobilising funds to support work of these structures.

10.3.2 Capability Development and Support

As indicated above, capability deficit must be addressed simultaneously with/prior to the allocation of significant amounts of funding.

The starting point for all capability development initiatives will be to prepare a **detailed assessment of municipal readiness** in respect of all aspects of the energy transition – including new generation capacity readiness, the details of current maintenance backlogs, future grid planning, existing organisational capacity, governance and oversight, basic regulatory frameworks, depth of cost-of-supply study, and a wide range of other factors. This assessment will culminate in a readiness score for each municipality and will be the basis on which detailed capability development strategies for each municipality will be developed.

It is further recommended that, as part of this readiness assessment, a delivery model review in terms of Section 77 of the Municipal Systems Act (MSA) is undertaken. This will determine the most appropriate service delivery model to be implemented, and funding and capability development support will be directed at supporting that final delivery model.

One of the priority focus areas in 2024 (under the proposed capability development initiatives outlined above) will be to ensure that all municipalities are assisted to develop detailed and accurate cost-of-supply studies. However, the longer-term goal is to ensure that these studies are merely the first step in a process to optimise the cost-of-supply.[114]

114 Reducing cost-of-supply will also contribute towards lower tariffs, which in turn will improve affordability.

10.3.3 Financing

A significant amount of financing is required to meet the ambitious JET IP targets in respect of new infrastructure investment in municipalities. Many municipalities are highly indebted, have poor audit records, and low levels of capability to successfully finance, design, and implement ambitious infrastructure projects. No new infrastructure financing will be available to municipalities which do not overcome these challenges or have this capability, either internally or through an external agency model.

These challenges imply that a multi-pronged approach towards financing is adopted, based on leveraging funds from multiple sources, with an important role for private sector investment. Municipalities should be positioned to take maximum advantage of the regulatory space available to leverage private sector investment enabled by the municipal borrowing framework. Strategies to ensure that smaller municipalities are able to access funding (such as via pooled arrangements) will contribute to spatial equity in infrastructure. Funding vehicles will be designed to provide incentives to municipalities to improve capability and governance, and to allow high capability municipalities access to finance relatively quickly to proceed with investments. It is particularly important that municipalities aim to maximise their own investment contributions from their electricity operations, through enhanced revenue collection and reducing their cost-of-supply.

The possibility of utilising the conditional grant system to increase electricity distribution infrastructure funding to municipalities will be assessed: a comprehensive exercise to evaluate the entire conditional grant system is currently underway by NT. Any proposals in respect of using conditional grants as one source of municipal infrastructure funding should incorporate the findings and recommendations of that work.

The financing of the broader JET IP is expected to result in financial innovations as different forms of capital are structurally blended to meet the investment need. These innovations will be expanded and applied to address the municipal requirement.

From the JET IP concessional loan pledges made to South Africa, there has been limited appetite to date to fund municipal infrastructure. Nevertheless, results-based financing models merit further investigation for municipal infrastructure, and there is willingness by concessional lenders to explore these options. Further work is needed with NT, municipalities, and Development Finance Institutions (DFIs) to optimise blended financing on a case-by-case basis, using public sector grants, concessional loans, and private capital. Consideration should also be given to using donor grants in de-risking blended finance structures. A substantial proportion of JET IP grants is allocated to municipal capacity building and technical assistance.

10.4 Theory of Change

The municipalities portfolio focuses on ensuring the distribution side of the energy transition, that municipalities are well-positioned to increase the share of renewables in their generation mix, and that poor households have improved access to electricity. The impacts sought are improved economic opportunities facilitated by higher levels of RE (I01), improved access to affordable electricity (I03), with a reduction in GHG emissions (I02), and co-benefits in improved air pollution (I04).

The outcomes in terms of changes in performance needed over the medium-term (three to five years) include sustained improvement in municipal capability to plan, design, implement, and manage effective distribution grids (MT01), and an increased share of renewable electricity in municipal electricity supply (MT02). This results in the reliability and security of electricity supply in municipalities (MT03), and increased affordability of electricity (MT04). Municipalities also need regulatory certainty in tariff setting (MT05).

Certain institutional arrangements and municipal capability need to be established in the short term (one to two years). These short-term outcomes include a co-ordination structure which is driving the process, such as a JET MC and workstreams functioning (ST01). Funding for distribution infrastructure must be secured (ST02), the national electrification plan accelerated (ST05), with municipal capability development plans being implemented (ST03). To ensure viability, municipalities need to undertake a cost-of-supply study (ST04) and establish one regulatory authority to oversee all municipal electricity pricing and tariff setting (ST07). To ensure access for the poor, plans for improving the delivery of FBE needs to be implemented (ST06), with poorer households having greater access to energy efficient appliances (ST07).

Figure 29: Theory of Change – Municipalities

INPUTS

Public finance

Grants/ Philanthropic/ CSI/ESD finance

OUTPUTS (O)

O01
Proposal for JET MC and operational mechanisms agreed

O02
Workstreams established and are operational; outputs and targets for each agreed

O02b
Workstreams developed a stakeholder engagement model with communities included

O03
Funders identified for infrastrucure and capacity development

O04
Mandates, roles and funding needs for capability development agreed

O05
Readiness assessment conducted on each municipality

O06
Capability support implementation plans developed for each municipality

O07
Short-term assistance provided to all municipalites on cost of supply

O08
Funding secured for infrastructure investments and delivery mechanisms designed

O09
Programme agreed to subsidise low-income household access to energy efficient appliances

O10
New generation co-ordination platform established

O11
Municipal revenue and electricity pricing model that supports the goals of JET established

O12
Plan to improve the implementation of FBE developed

Assumptions

- Review of municipal revenue by NT completed on time
- Review of INEP conducted by NT as part of review of conditional grants
- Recommendations on improving FBE completed by NT
- Sufficient funding obtained

SHORT-TERM (ST) OUTCOMES
Changes in system and capacity

ST01
JET MC and all workstreams functioning

ST02
Funding for municipal distribution infrastructure available

ST03
Municipal capability development plans are being implemented

ST04
All municipalities have accurate and detailed cost-of-supply studies

ST05
Implementation of national electrification programme is accelerated

ST06
Plans for improving FBE being implemented

ST07
Low-income households have access to energy efficient appliances

ST08
One regulatory authority established to oversee all municipal electricity pricing and tariff setting

Assumptions:
Municipalities implement required programmes

MEDIUM-TERM (MT) OUTCOMES
Changes in behaviour and performance

MT01
Sustainable improvement in municipal capability to plan, design, implement, and manage effective distribution grids

MT02
Increased % of renewable electricity in municipal electricty supply

MT03
Reliability and security of electricity supply in municipalities

MT04
Increased affordable access to electricity

MT05
Regulatory certainty in tariff setting

JET IP IMPACT (I)

I01
Improved economic opportunities facilitated by higher levels of renewable electricity

I02
GHG emissions reductions

I03
Improved access to affordable electricity

I04
Social, economic, and environmental development co-benefits, e.g. improved air quality and regeneration

WIDER IMPACT

Transition to a low-carbon economy and a just, climate-resilient society by mid-century

10.5 Summary of Activities and Timeframes

Table 38 sets out a summary of the initial proposed activities under the Municipal Implementation Plan together with the proposed institutional owner of each, with the PMU having overarching responsibility for managing progress towards the JET goals.

Table 38: Summary of proposed activities under the Municipal Implementation Plan

Area of work	Key outputs	Proposed institutional owner (participating organisations)	Timeframes
Institutional arrangements	Establishment of the JET MC mandate, membership and goals, identification of workstreams, and allocations of responsible persons to each workstream	PMU in broad consultation with stakeholders	February 2024
Capability development	Identification of institutional location ('implementing organisation') for each component of capability development and agreement of mandates	JET MC Capability Workstream	February 2024
	Collation of all existing and previous (past five years) research and initiatives related to capability development and support in local government electricity sector (mapping of the sector)	JET MC Capability Workstream/ implementation organisation	January–May 2024
	Detailed 'readiness' assessment conducted for each municipality, including capability around new generation procurement, infrastructure planning and management, governance frameworks, and details of existing maintenance backlogs and organisational capacity (including MSA Section 77 reviews)	JET MC Capability Workstream/ implementation organisation	Largest 20 municipalities: January–September 2024 Balance: December 2025
	Preparation of detailed capability support/ development plans for each municipality (commencing with the top 20)	JET MC Capability Workstream/ implementation organisation	December 2024
	Preparation of detailed funding requirements for capability development programmes	JET MC Capability Workstream	December 2024
	Short-term assistance to all municipalities in respect of the development of cost-of-supply studies	JET MC Capability Workstream/ implementation organisation	January–December 2024

Area of work	Key outputs	Proposed institutional owner (participating organisations)	Timeframes
Municipal revenue/role of electricity tariffs in municipal revenue	This work is currently in progress within NT	JET MC Financing Workstream/NT	Mid-2025
Address electrification backlog	There is an existing INEP grant to fund this outcome, although expenditure has not been at full grant levels; a review of grant performance forms part of the NT review of all conditional grants, and they will include INEP in this	DMRE NT (Conditional Grant Review)	September 2024 (proposals to improve expenditure under the existing grant)
Improve implementation of FBE	This is part of the review of the Local Government Fiscal Framework currently underway; recommendations in respect of improving the implementation of the FBE are likely to be released prior to the completion of the review	NT	Mid-2024
Improve affordability of electricity for low-income households through a targeted energy efficiency programme	Programme to subsidise low-income household access to energy efficient appliances (particularly for cooking) and to recommend how this can be linked to supporting local manufacturing	JET MC Energy Access Workstream	Initial proposal mid-2024
Funding	Detailed quantification of individual municipal infrastructure financing requirements	JET MC Financing Workstream/DBSA	Top 20: June 2024 Balance: June 2025
	Development of financing strategies to leverage concessional finance into products for municipalities	JET MC Financing Workstream/DBSA	September 2024
	Access donor funding for capability development programme	JET MC Financing Workstream	March 2024
	Investigate the possibilities of the conditional grant mechanism as a funding option	JET MC Financing Workstream/NT	December 2024

Area of work	Key outputs	Proposed institutional owner (participating organisations)	Timeframes
Co-ordinated planning for and development of new generation purchases/ investments	Set up a shared database of planned municipal investments in and/or purchases of electricity and encourage co-ordination in planning through regular discussions among municipalities	JET MC Capability Workstream/AMEU	June 2024

10.6 Indicators

Table 39: Municipal JET IP impact, objectives, and indicators

Municipal JET impact	Objectives	Indicators
I1: Improved economic activities facilitated by higher levels of renewable electricity	Increased municipal GDP	GDP growth
	Increased employment	Employment rate (full-time equivalent)
I2: GHG emissions reduced or avoided from tCO_2eq	Emissions reduced or avoided by use of RE	tCO_2eq per annum
I3: Improved access to affordable electricity	Poor households have access to a minimum FBE allowance of 50 kWh per household per month	Number of households below the upper-bound poverty line that have access to FBE
I4: Socio-economic benefits, such as improved air quality	Air quality improves	Air quality
Medium-term outcomes	**Objectives**	**Indicators**
MT01: Sustainable improvement in municipal capability to plan, design, implement, and manage effective distribution grids	Municipalities can plan and manage effective distribution grids	Number of unplanned electricity outages (annual)
MT02: Increased percentage of renewable electricity in municipal electricity supply	Municipalities derive the majority of electricity from renewables	Percentage of renewables in municipal electricity mix by 2027
MT03: Reliability and security of electricity supply in municipalities	Municipal electricity supply is reliable	Number of unplanned electricity outages (annual)

MT04: Increased affordable access to electricity	All poor households (below the upper-bound poverty line) have access to FBE	Number of households below the upper-bound poverty line with access to FBE
MT05: Regulatory certainty in municipal tariff setting	All municipal tariffs and fees are set by NERSA	NERSA is the only regulatory authority authorised to approve all tariffs and fees charged by municipalities
Outputs	**Objectives**	**Indicators**
O1 & O2: JET MC and all workstreams are functioning and effective	JET MC is driver of sector reform	Council is established
	Workstreams are able to implement the goals of the Implementation Plan	Workstreams are operating according to mandate
	Workstreams develop a stakeholder engagement model that includes communities	Broad-based support
O3: Financing identified for infrastructure and capability development	Financing requirements are met	Amount of funding secured
O4: Mandates, roles, and funding for capability development agreed	Clarity on delivery of and funding for capability development programmes	Detailed activity plans
O5: Readiness assessment conducted for each municipality	The status quo for each municipality is clear and can inform future support	Readiness assessments completed
O6: Capability development support plans developed for each municipality	Each municipality has a relevant and detailed capability development plan	Capability development plans completed
O7: Short-term assistance provided to all municipalities on cost-of-supply	All municipalities have cost-of-supply studies that comply with regulatory requirements	Number of compliant cost-of-supply studies
O8: Financing secured for infrastructure investment and delivery mechanisms designed	Financing requirements for infrastructure investments for the period to 2027 are met	Amount of funding secured
	Clear mechanisms for delivering financing requirements to municipalities are in place	Delivery mechanisms operating
O9: Programme agreed to subsidise low-income household access to energy efficient appliances	Low-income households have access to affordable energy-efficient appliances	Number of beneficiary low-income households

O10: New generation co-ordination platform established	Municipalities co-ordinate planning for increasing the share of renewables in their energy mix	Platform established and operating
O11: Municipal revenue and electricity pricing model that supports the goals of the JET	A municipal revenue and electricity pricing model that is compatible with the goals of the JET	Revenue and pricing reforms
O12: Plan to improve the delivery of FBE	All households below the upper-bound poverty line receive FBE	Clear plan to improve delivery

10.7 Risks and Dependencies

Table 40: Risk description, impacts, and mitigation plans

Risk description	Inherent impact	Inherent rating	Inherent risk rating	Mitigation plan	Residual risk rating
Review of municipal revenue framework by NT completed on time	3	1	3	JET MC works closely with NT to provide support as required	Low
Critical review of INEP performance conducted by NT	2	1	2	JET MC works with NT to ensure that all analysis of the INEP grant is undertaken as part of the overall conditional grant review	Low
Recommendations on improving implementation of FBE completed by NT	3	1	3	JET MC works with NT to ensure that the plan contains workable recommendations most likely to succeed	Low
Sufficient funding obtained	3	3	9	Prioritise interventions to ensure that the biggest impact interventions are funded first, while supplementary funding is sourced	High
Municipalities implement required programmes	3	3	9	The greater the involvement of municipalities in all aspects of designing the mandates and programmes of the workstreams and the details of implementation, the greater the likelihood of buy-in that will support successful implementation. Support through the framework set out in the Intergovernmental Relations Framework Act (2005), and a collaborative approach across different spheres of government	High

*Key: 3=high, 2=medium, 1=low

Annexure A: Municipalities with NERSA distribution license

- Abaqulusi LM
- Albert Luthuli LM
- Amahlati LM
- Ba-Phalaborwa LM
- Beaufort West LM
- Bela-Bela LM
- Bergrivier LM
- Bitou LM
- Blouberg LM
- Blue Crane Route LM
- Breede Rivierwinelands LM
- Breede Valley LM
- Buffalo City Metro
- Cape Agulhas LM
- Cederberg LM
- Centlec (Mangaung Metro)
- City Power (Johannesburg Metro)
- City of Cape Town Metro
- City of Tshwane Metro
- Dawid Kruiper LM
- Dihlabeng LM
- Dikgatlong LM
- Dipaleseng LM
- Ditsobotla LM
- Dr Beyers Naude LM
- Drakenstein LM
- eDumbe LM
- Ekurhuleni Metro
- Elias Motsoaledi LM
- Elundini LM
- eMadlangeni LM
- Emakhazeni LM
- Emalahleni LM (EC)
- Emalahleni LM (MPU)
- Emfuleni LM
- Emthanjeni LM
- Endumeni LM
- Enoch Mgijima LM
- Ephraim Mogale LM
- eThekwini Metro
- Gamagara LM
- Gariep LM
- Ga-Segonyana LM
- George LM
- Govan Mbeki LM
- Great Kei LM
- Greater Kokstad LM
- Greater Letaba LM
- Greater Taung LM
- Greater Tzaneen LM
- Hantam LM
- Hessequa LM
- Hibiscus Coast LM
- Inxuba Yethemba LM
- JB Marks LM
- Joe Morolong LM
- Kai Garib LM
- Kamiesberg LM
- Kannaland LM
- Kareeberg LM
- Karoo Hoogland LM
- Kgatelopele LM
- Kgetleng Rivier LM
- Khai Ma LM
- King Sabata Dalindyebo LM
- Knysna LM
- Kou-Kamma LM
- Kouga LM
- KwaDukuza LM
- Laingsburg LM
- Lekwa LM
- Lekwa Teemane LM
- Lephalale LM
- Lesedi LM
- Letsemeng LM
- Madibeng LM
- Mafube LM
- Mamusa LM
- Magareng LM
- Makana LM
- Makhado LM
- Maluti-a-phofung LM
- Mandeni LM
- Mantsopa LM
- Maquassi Hill LM
- Masilonyana LM
- Matatiele LM
- Matjhabeng LM
- Matzikamma LM
- Mbizana LM
- Mbombela LM
- Merafong LM
- Metsimaholo LM
- Midvaal LM
- Mkhondo LM
- Modimolle-Mokgopong LM
- Mogalakwena LM
- Mogale City LM
- Molemole LM
- Moqhaka LM
- Mosselbay LM
- Mpofana LM
- Msukaligwa LM
- Mthonjaneni LM
- Musina LM
- Nala LM
- Naledi LM
- Nama Khoi LM
- Ndlambe LM
- Nelson Mandela Bay Metro
- Newcastle LM
- Ngwathe LM
- Nkandla LM
- Nketoana LM
- Nkomazi LM
- Nquthu LM
- Oudtshoorn LM
- Overstrand LM
- Phokwane LM
- uPhongolo LM
- Phumelela LM
- Pixley Ka Seme
- Polokwane LM
- Prince Albert LM
- Ramotshere Moiloa LM
- RandWest City LM
- Raymond Mhlaba LM
- Renosterberg LM
- Richtersveld LM
- Rustenburg LM
- Sakhisizwe LM
- Saldanha Bay LM
- Senqu LM
- Setsoto LM
- Siyacuma LM
- Siyathemba LM
- Stellenbosch LM
- Steve Tshwete LM
- Sundays River Valley
- Swartland LM
- Swellendam LM
- Thaba Chweu LM
- Thabazimbi LM
- Theewaterskloof LM
- Thembelihle LM
- Tsantsabane LM
- Tokologo LM
- Tswaing LM
- Tswelopele LM
- Ubuntu LM
- Ulundi LM
- UMgeni LM
- Umhlatuze LM

Annexure B: Current levels of municipal expenditure on infrastructure maintenance, repairs, upgrading, and renewal

METRO	RENEWAL	UPGRADING	R&M	TOTAL
Buffalo City	88 581	10 000	39 906	**138 487**
Nelson Mandela Bay	55 896	34 449	57 375	**147 720**
Mangaung	15 480	16 219	4 204	**35 903**
Ekurhuleni	346 596	0	957 039	**1 303 635**
Johannesburg	244 624	143 755	1 037 510	**1 425 889**
Tshwane	59 200	105 589	329 147	**493 936**
eThekwini	34 886	201 325	661 843	**898 054**
Cape Town	432 102	68 049	545 727	**1 045 878**
Total metros	1 277 365	579 386	3 632 751	**5 489 502**
NATIONAL	**1 695 600**	**1 012 842**	**6 347 799**	**9 056 241**

Source: National Treasury Municipal Finance Management Act No. 56 of 2003 (MFMA) data (2022, *Medium-Term Revenue and Expenditure Framework* (MTREF).

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Chapter 11:
MONITORING AND EVALUATION SYSTEM AND RISK MANAGEMENT FRAMEWORK

PURPOSE

The purpose of this chapter of the JET Implementation Plan is to:

- describe the approach and process which has been adopted for the monitoring, evaluation, and learning (MEL) of JET IP implementation
- summarise the components of JET IP implementation that make up the MEL system
- tabulate the overall indicators that will be tracked to measure JET IP implementation impacts and outcomes
- set out key risks for the implementation of the JET IP and confirm the process for risk management.

11.1 Monitoring, Evaluation, and Learning System Approach and Process

The monitoring, learning, and evaluation (MEL) system for the JET Implementation Plan provides the mechanism for accountability, external and internal tracking of progress, problem-solving, and learning. The purpose of the MEL system is the following:

- Enhance **transparency** and accountability on progress with the JET, and how resources are spent
- Track the **outcomes and impacts** achieved from the programmes and projects implemented and use this to provide useful feedback to **improve policy and decision-making**.

The following approach has been adopted for the JET Implementation Plan MEL system:

- It is a sub-system of a broader **Just Transition** MEL system which is under development.
- It is based on a **Theory of Change** of how the JET would be achieved.
- It is developed in **collaboration with key stakeholders**, so that the higher levels of the framework are shared across the State.
- It **complements** and builds on existing/related tracking efforts in government.
- It **decentralises responsibility** for monitoring portfolios to the relevant lead institutions.
- It focuses on maximising **impact and continual improvement**.
- It is accessible and transparent to the public.
- Given the importance of procedural justice to South Africa's JET, it includes systems of **participatory** monitoring, evaluation, and learning.

Each Portfolio of the JET Implementation Plan, will have its own MEL process, led by the relevant institution. Each Portfolio involves co-ordination structures with a number of key role-players, with workstreams involving multiple programmes and projects. Based on engagements with stakeholders, the JET Implementation Plan includes a Theory of Change for each Portfolio, and a draft set of indicators for impact, outcomes, and outputs. The lead institution of each Portfolio will need to use this groundwork to design and manage the MEL system for the Portfolio, reporting quarterly to its co-ordination structure and to the JET PMU to track overall progress. To this end, each Portfolio will:

- Confirm that reliable data is available for each indicator
- Agree annual milestones
- Track outputs and short-term outcomes quarterly

- Track medium-term outcomes annually
- Report on impacts for the JET IP overall.

The JET PMU will convene a MEL working group with representatives from each Portfolio to co-ordinate the work and problem-solve.

The process of developing the JET IP MEL system, as a sub-system within a wider Just Transition MEL system, involves ongoing collaboration with others to ensure integration. The PMU is part of a monitoring and evaluation (M&E) working group convened by the Presidential Climate Commission (PCC), including the Department of Forestry, Fisheries and Environment (DFFE) and Department of Planning, Monitoring and Evaluation (DPME), which is developing a shared approach to monitoring and evaluating the JET. This includes developing an overall Theory of Change for the Just Transition by early 2024, in which the roles of various institutions are specified, each having a related Theory of Change, but with shared indicators wherever possible. The PMU is also working with government and development partners to confirm data sources and reporting requirements. This collaborative process will be ongoing to develop a shared learning and evaluation agenda across the state and with development partners.

11.2 Components of the Monitoring, Evaluation, and Learning System

There are four key components of the overall MEL system: The Theory of Change; the M&E framework; the projects register; and the learning and evaluation system.

11.2.1 Theory of Change

Figure 30 shows an overall Theory of Change that has been developed for the work of the PMU. This is being tested with the PCC, DFFE, DPME, and Department of Mineral Resources and Energy (DMRE). The PMU is working with these institutions to establish commonality across systems, and on the higher-level outcomes and impacts targeted for the Just Transition, to which different institutions contribute parts. The PMU component focuses on climate change mitigation. The narrative summary of the Theory of Change is provided in Chapter 4 (section 4.2).

A Theory of Change has, in turn, been developed for each Portfolio of the JET Implementation Plan, as presented in the preceding chapters. This lays the groundwork for the lead institution of each Portfolio to further develop the portfolio-specific M&E process with their respective stakeholders.

Figure 30: Theory of Change – PMU

INPUTS

- Public and grant finance
- PMU team
- Presidency mandate

OUTPUTS (O)

- **O01:** Financing options and flows provided
- **O02:** Financing agreements formulated
- **O03:** Criteria and governance systems for JT project developed, including addressing possible rent seeking
- **O04:** Proposal for FF agreed and implementation elements defined
- **O05:** Project pipeline compiled
- **O06:** Co-ordination systems in government and with stakeholders established
- **O07:** JET plans developed with engagement of stakeholders
- **O08:** Problem-solving interventions to mobilise, deploy funds, and speed up implementation
- **O09:** Proposals for changes to policy, regulation, and legislation
- **O10:** M&E system operating, supporting transparency, learning, and decision-making
- **O11:** Knowledge management and communication on successes/lessons

Assumptions

- Divergent views do not paralyse decision-making
- Changes in South Africa and international partners do not create uncertainty and undermine partner support
- Sufficient skills to analyse, coordinate, facilitate
- Fiscal deterioration does not undermine JET IP progress

SHORT-TERM (ST) OUTCOMES

Changes in system and capacity

- **ST01** Agreed transparent funding flows for identified JET projects
- **ST02** Co-ordination mechanisms supporting the JET Implementation Plan' effectively
- **ST03** Confirmed portfolio of JT interventions agreed
- **ST04** JET FF helping development of viable projects, and pipeline being supported actively
- **ST05** Demonstrated problem-solving approaches to overcome bottlenecks
- **ST06** Sufficient compliant programmes being implemented to demonstrate this way of working

Assumptions:

- Insufficient absorptive capacity does not stop investment
- Unbundling of Eskom is effective
- No major policy change that undermines JET IP
- Corruption does not derail the programme
- Capacity of organs of state improves
- Sufficient institutions to mediate the transition

MEDIUM-TERM (MT) OUTCOMES

Changes in behaviour and performance

MT01

Finance for JET IP being mobilised, deployed, and implemented rapidly and effectively

MT02

Widespread endorsement by South Africa and international stakeholders of the JET IP and the JET Implementation Plan

MT03

Government and other stakeholders increasingly able to manage and deliver Just Transition

MT04

Enhance skills system working effectively to support the energy transition and economic diversification

Assumptions:

- Unbundling of Eskom is effective
- Grid capacity does not undermine RE roll-out
- Trade barriers do not undermine supply of equipment and materials
- Ongoing social risks do not affect implementation
- No major policy change that undermines JET IP and the JET Implementation Plan
- Corruption does not derail the programme
- Skills shortages in the economy do not undermine ability to implement
- Sufficient institutions to mediate the transition

JET IP IMPACT (I)

I01

New RE generation/ transmission/distribution implemented (GW)

I02

JT interventions implemented, demonstrating spread of benefit

I03

GHG emissions reductions

I04

Increased economic diversification and inclusive growth

I05

Social, economic, and environmental co-benefits

WIDER IMPACT

Transition to a low-carbon economy and a just, climate-resilient society by mid-century

11.2.2 **Monitoring, Evaluation, and Learning Framework and Indicators**

A MEL framework has been drafted from the Theory of Change with the logic chain and indicators as shown in Table 41. Indicators are being refined with stakeholders for the higher-level outcomes and impacts to ensure, where appropriate, these are common, and to establish who is supplying this data. Consistent indicators are needed for wider system integration. There will be a dashboard using selected indicators from this framework and tracking of progress will be public. The source/means of verification for each indicator is being established and agreed milestones will be confirmed with the relevant parties thereafter.

Table 41: Indicators to be tracked for JET IP overall

Narrative summary	Objective	
Wider impact		
Transition to a low-carbon economy and a just, climate-resilient society by mid-century	Reduced carbon emissions	
	Reduced energy use (not electricity)	
	High levels of employment/self-employment in Mpumalanga	
	Jobs in RE as a share of employment in the energy sector	
	Improved human health	
	Improved community livelihoods[116] and reduced vulnerabilities	

115 Not installed capacity but actual generation.
116 Bearing in mind the human, social, natural, physical, and financial capital, so a wider perception of well-being than an income lens.

	Indicator
	NDC targets for GHG emissions GHG emissions per capita CO_2 intensity of national energy consumption compared to national gross domestic product GDP Share of RE generation (GWh)[115] in South Africa's power system (%)
	Energy use for sectors Energy consumption saved by energy efficiency measures (GWh/year)
	Levels of unemployment in Mpumalanga stabilised and dropping compared to national average
	Jobs in the renewable RE sub-sector as a percentage of total jobs in the energy sector
	Levels of respiratory illness (asthma, etc.)
	Multi-dimensional poverty levels improving in Mpumalanga

Narrative summary	Objective
JET IP impact	
New RE generation, transmission, distribution infrastructure constructed or upgraded	Total installed capacity of RE plants
	Total installed capacity of small-scale RE plants
	Transmission line upgraded or extended
	Grid-support infrastructure projects developed (transformers and sub-stations)
	Distribution infrastructure upgraded or extended
	Energy storage installed
	EV charging stations installed
JT interventions implemented demonstrating spread of benefits	Jobs created or maintained from JET IP investments
	Households benefitting from livelihoods support in Mpumalanga's coal districts
	Coal workers have sustained income and livelihoods
	Population in transition areas benefitting from JET IP investments
	Effective government services in affected communities, notably in Mpumalanga
	Level of engagement and participation of local communities affected by the transition interventions

117 Note: Can also measure actual generation (PSPV IEI1).
118 ACT IP indicator and target.

	Indicator
	Total installed capacity of RE plants under the RE IPP programme (MW) Total installed capacity of embedded RE generation (MW)
	Total installed capacity of solar photovoltaics (PV)[117]
	km
	Number
	km
	Energy rating (MWh) and power rating (MW) of installed energy storage
	Number
	Number of non-permanent direct full-time equivalent (FTE) jobs created or maintained during construction Number of direct FTE jobs created or maintained after construction Number of FTE staff employed to implement residential solar projects Number of FTE staff employed in supply chains for RE Number of new FTE staff employed in tourism, transport, and agriculture
	Number of households benefitting from livelihoods support in Mpumalanga's coal districts
	Number and percentage of coal workers transitioned (retired, job numbers, and job types) Number and percentage of employees of retired coal plants that have access to sustained income (gender disaggregated)[118]
	Percentage of Mpumalanga population benefitting from JET IP investments
	Percentage of households in Mpumalanga with working water services Percentage of households in Mpumalanga accessing reliable electricity Percentage of people qualified for FBE actually receiving
	Public feel engaged in policy and collective action to implement JT

Narrative summary	Objective
GHG emissions reduced or avoided from (tCO_2eq)[119]	Emissions reduced or avoided by coal power plant closures
	Emissions reduced or avoided by sector interventions (tCO_2eq p.a.)
	Electricity saved Energy Efficiency and Demand-side Management Programme
Increased economic diversification and inclusive growth	Economic diversification and development of new economy value chains in the country, stimulated by JET IP investment
	Growth in the number and contribution of SMEs to the Mpumalanga economy
Social, economic, and environmental co-benefits[120]	Reduction in air pollution, water pollution, land degradation, improved ecosystems, and biodiversity
Medium-term outcomes[121]	
Finance for JET IP being mobilised, unlocked, and spent rapidly and effectively	Funds spent on JET IP-related investments/activities
Widespread endorsement by South Africa and international stakeholders of the JET Implementation Plan	Endorsement of the JET Implementation Plan across the South African government
	Endorsement by a wide range of South African stakeholders
	Endorsement from international partners

119 JET IP mentions energy, industrial, and transport sectors.
120 Consider policies which impact on co-benefits.
121 Changes in behaviour and performance.
122 Substantially more favourable than what NT can borrow on the capital markets.

	Indicator
	tCO_2eq p.a.
	Emissions reduced or avoided from RE electricity generation Emissions reduced/avoided by New Electric Vehicles (NEVs) (public and private) Emissions reduced through Transnet road-to-rail programme Emissions reduced or avoided from more sustainable agriculture
	Emissions reduced or avoided through the Municipal Energy Efficiency and Demand-side Management Programme
	Value of manufacturing in South Africa of solar PV systems (PV cells, batteries, and inverters) Number of electric vehicles (EVs) manufactured in South Africa (buses, taxis, cars)
	Numbers of SMMEs Employment in SMMEs (FTE)
	Hectares of land affected by coal mining rehabilitated Land redistributed for economic diversification (hectares) Air pollution (PM2.5 concentrations, SO2 levels) Water made available from coal plant closures (million litres)
	Grant funds spent (Rand) Public sector budgets allocated (Rand) Concessional loans deployed[122] (Rand) Development Finance Institutions (DFIs) commercial loans (Rand) Commercial finance deployed (Rand)
	All key government stakeholders endorse the JET Implementation Plan
	Public expressions of support for the JET Implementation Plan by the PCC, business, labour and civil society organisations
	Additional partners joining the IPG and supporting the JET Implementation Plan

Narrative summary	Objective	
Government increasingly able to manage and deliver JT	Coherent plans being implemented for JET Portfolios	
	Government institutions proactively leading JET IP initiatives	
	Mpumalanga Province leading a coherent programme to support JT effectively	
Enhanced skills system working effectively to support the energy transition and economic diversification	Skills system is effectively adjusting and responding to changing JET skills needs	
	Skills Development Zones (SDZs) operating effectively, supporting skills development, community liaison, and links between institutions	
Short-term outcomes[124]		
Agreed transparent funding flows for identified JET portfolio	Instrument, disbursement channel, and receiving programme within focal areas agreed	
Co-ordination mechanisms supporting the JET Implementation Plan effectively	Co-ordination mechanisms are working effectively	

123 ACT IP has numbers of people trained in the RE sector, medium- and high-skilled Green jobs, STEM education, and relevant vocational training through JET IP (gender disaggregated).
124 Changes in capacity and systems.

	Indicator
	All portfolio plans being implemented
	Government institutions initiate, drive, and oversee key programmes or projects that directly align with the goals and principles of the JET IP
	Mpumalanga JET Action Forum and Secretariat operating effectively to lead JT work in the province Pipeline of interventions in Mpumalanga being driven effectively
	Number of workers in all the priority sectors (energy, supply chains, tourism, agriculture) reskilled, upskilled, and/or retrained*[123]
	Number of people trained absorbed into employment
	Agreed for electricity infrastructure Agreed for ACT IP Agreed for Mpumalanga Agreed for NEVs Agreed for GH_2 Agreed for Skills Agreed for Municipalities Agreed for Energy efficiency Agreed for RE industrialisation Agreed for Road-to-rail
	IMC and Steering Committee meeting and endorsing the work National JET Skills Planning Forum operating SDZs operating NEV JET Coordinating Structure operating Municipal JET Council operating Green Hydrogen JET Council operating Mpumalanga JET Action Forum operating ACT IP steering mechanism operating Eskom/NTCSA is implementing the Transmission Development Plan

Narrative summary	Objective	
Confirmed portfolio of JT interventions for Mpumalanga agreed	Confirmed portfolio of JT interventions agreed which empower local stakeholders (procedural justice)	
Financing Facility helping development of viable projects and pipeline being supported actively	Financing Facility operating to support project development and identification of funders	
	Potential projects are progressed as fast as possible while maintaining quality	
Demonstrated problem-solving approaches to overcome bottlenecks	Problems resolved to which PMU have contributed	
Sufficient compliant projects/ programmes being implemented to demonstrate this way of working	JET IP interventions underway in each Portfolio	

11.2.3 JET Projects' Register

The JET PMU is establishing a JET Projects' Register to make visible what projects are being financed through the JET IP investments, and to track and analyse their progress and outcomes. The register work has started by compiling the grants component of the JET IP financing.

The JET Projects' Register is intended to show the status of JET project implementation by delivery institutions, and their development of the JET projects' pipelines in each Portfolio. The register records categories of information for each programme/project including purpose, priority area, type of activity, stage, amounts, implementing institution, and so on. This enables analysis across the interventions. A set of core MEL requirements will also be defined for all projects, providing a set of key data for projects to report on and making these available in a publicly accessible database.

11.2.4 Evaluation and Learning Framework

An evaluation and learning framework is in development. It will identify the learning systems needed as part of basic monitoring, and the deeper JET learning systems required. This involves

	Indicator
	Emergent models of viable JT interventions being tested Number and value of JT interventions underway (repurposing of power stations, economic diversification, establishment of Mpumalanga SDZ, land and water regeneration) Extent of community involvement and ownership of community-based JT interventions
	Number and value of projects supported to project approval stage Disaggregated numbers of beneficiaries from projects supported (gender, age, race)
	Trends on planned/approved/ disbursed JET projects
	Model of funding of transmission agreed Viable approach agreed to implementing ACT IP Model agreed for funding distribution infrastructure Local DFI support agreed for electrifying public transport and logistics Viable approach agreed to address integration of skills anticipation, skills development, and utilisation Viable set of impactful programmes agreed with stakeholders for Mpumalanga
	Key catalytic projects underway in each portfolio (projects to be defined)

establishing mechanisms for feedback from different spheres and stakeholders, including the communities affected. The evaluation plan will focus on significant outcome/impact evaluations after three to five years (and any baselines) and provide for responsive rapid evaluations for in-depth analysis of bottlenecks and opportunities, rapid feedback on what is working/not working and changes needed for decision-making. This evaluation plan will be developed in collaboration with key stakeholders (notably, the PCC, DFFE, DPME, DMRE, NT) so that a coherent set of evaluations are conducted to inform policy, planning, and budgeting. The JET IP evaluation and learning framework will be an important driver of evaluation demand within the wider Just Transition MEL System.

11.3 Risk Management Framework

Key risks have been identified which affect the Theory of Change and could thus undermine the JET Implementation Plan. The following are the key risks related to the overall medium-term outcomes and impacts:

- Unbundling of Eskom is not effective
- Delays in decommissioning of coal power plants changes the decarbonisation trajectory
- Transmission and distribution grid capacity constraints undermine RE roll-out
- Insufficient absorptive capacity leads to bilateral concessional loans not being approved
- Insufficient grant funding to address the scale of need for this instrument
- Tangible community-level benefits are not achieved
- Skills shortages undermine the ability to implement
- Policy changes undermine the JET IP
- Corruption damages the JET Implementation Plan
- Capacity of organs of state does not improve.

Key risks to achieving the PMU short-term outcomes are as follows:

- Fiscal deterioration undermines the state's capacity to support Just Transition investments
- Divergent views paralyse decision-making
- Insufficient skills in key institutions to plan, manage, analyse, co-ordinate, regulate, and unblock
- Political changes in South Africa and international partners create uncertainty and undermine partner support.

The JET PMU has rated the inherent impact and probability for these risks and allocated an inherent risk rating to each. Mitigation measures for each risk have been identified, and residual risk ratings have been applied. This work thus establishes that the JET Implementation Plan Risk Register which is a living management tool of the JET PMU. Updates to the Risk Register will be reported regularly to the JET Government Steering Committee.

Mitigation measures that are being actively managed by the PMU include:

- Unblocking financing for transmission
- Unblocking financing for the Accelerated Coal Transition Investment Plan (ACT IP)
- Identifying and building institutional capacity for the management of each Portfolio
- Identifying delivery mechanisms which are less dependent on state capacity
- Building the relationships and communication mechanisms to strengthen coherence and reassure financing partners.

Risk registers will be developed for each Portfolio and managed by the responsible lead institutions.

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