sanedi

South African National Energy Development Institute

ANNUAL PERFORMANCE PLAN

2023 - 2024

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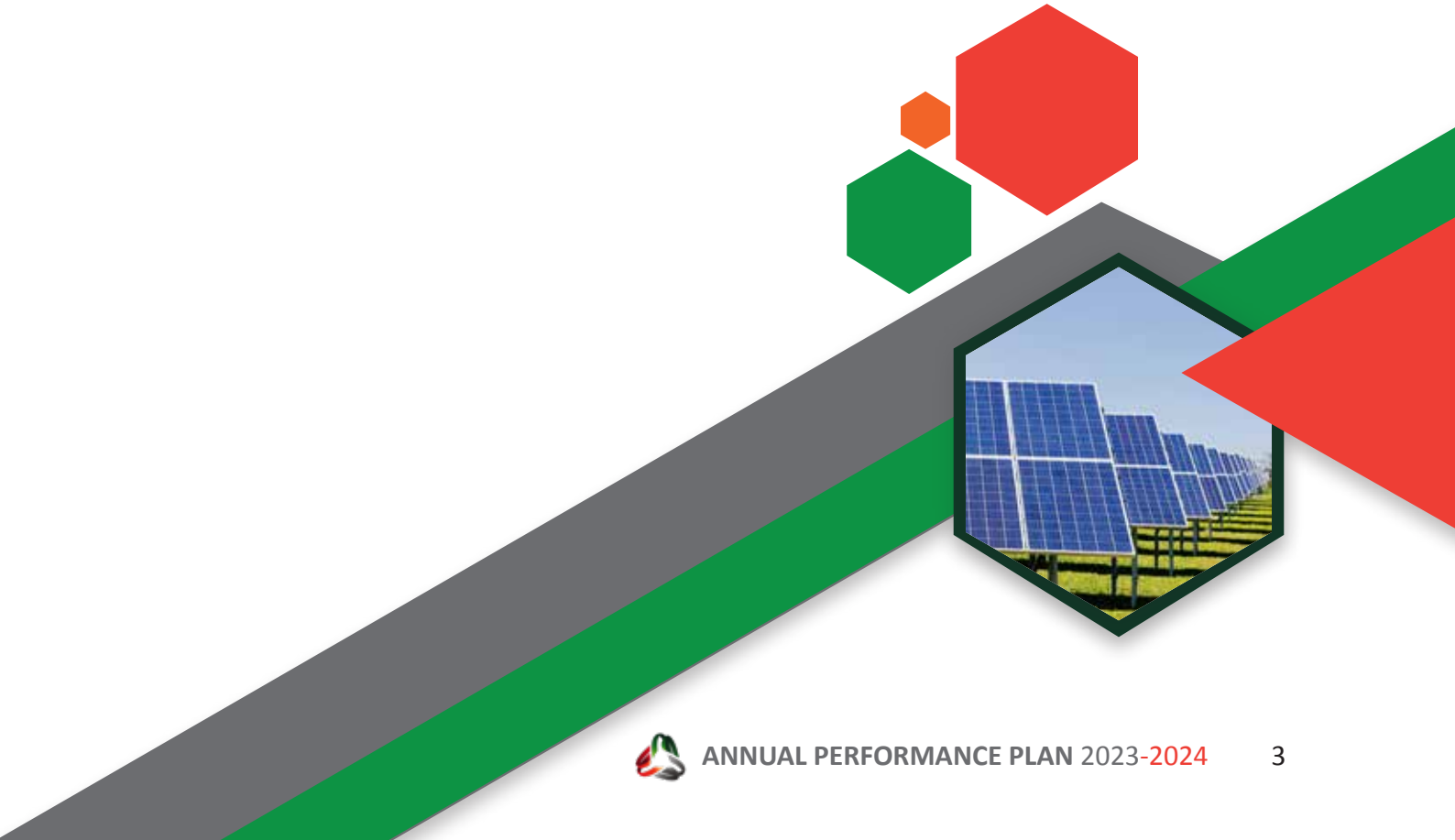

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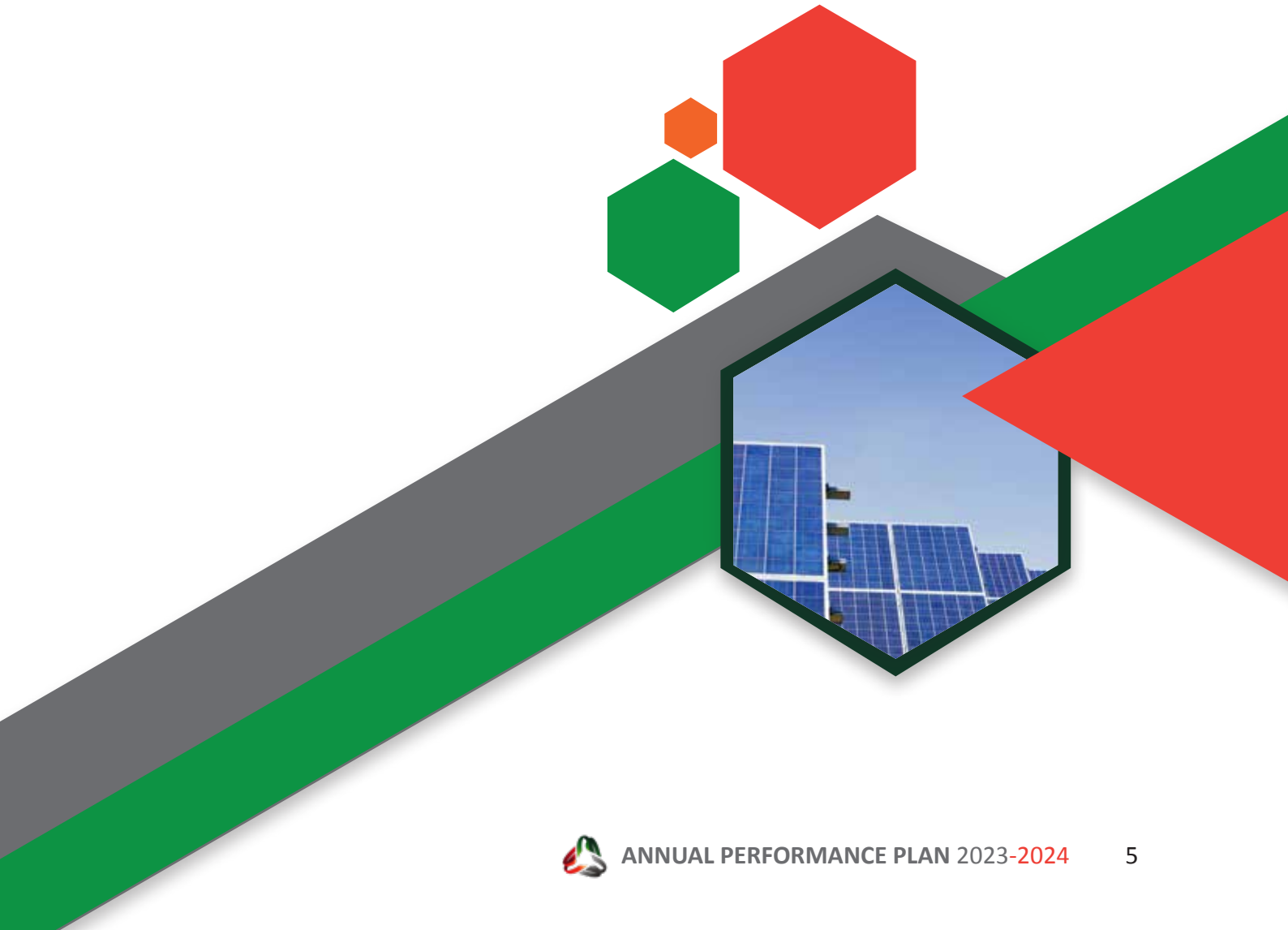


ABOUT SANEDI

The South African National Energy Development Institute (SANEDI) was established in 2011 under the National Energy Act, 2008 (Act No. 34 of 2008) (NEA). The Act provides for SANEDI to direct, monitor and conduct energy research and development, promote energy research and technology innovation as well as undertake measures to promote Energy Efficiency (EE) throughout the economy.

SANEDI's energy development agenda is a key part of our country's energy journey, and its portfolio of initiatives is closely attuned to technology advancements, declining technology costs and continued innovation in the energy sector. These can enable South Africa to take full advantage of our energy resources and the associated infrastructure development as a vehicle for economic growth, industrialisation, employment creation, and sustainable development.

SANEDI is committed to fulfilling the objectives of South Africa regarding energy security and universal access. The entity is fully behind the Integrated Resource Plan (IRP) 2019 which updates the energy forecast from the current period to the year 2030. IRP 2019 considers the energy security as well as energy demand-supply balance. We are equally concerned that most of the communities that lack access to energy are in the rural areas where "energy poverty" is more prevalent. Whereas the provision of universal access to energy requires scaling up of capital investment, the country is likely to experience budget constraints because of COVID-19. In the context of the post-COVID-19 recovery, SANEDI will strengthen its obligation to energy transformation pathways in line with its mandate.

SANEDI considers itself as an integral part of the National System for Innovation (NSI), as defined by the Draft White Paper on Science, Technology, and Innovation, published under the custodianship of the Department of Science and Technology (DST now DSI) on 10 September 2018. This White Paper builds on the previous version adopted in 2006, and sets out the medium to long term policy direction for Government to ensure a growing role for Science, Technology, and Innovation in a prosperous, and inclusive society in which the potential of all South Africans is realised. SANEDI will continue its commitment to the policy statements in this White Paper, and the decadal plans that will follow detailing implementation of the policy. Additionally, as an innovation body, SANEDI will continue its long-standing collaboration with the Department of Science & Innovation (DSI), Department of Mineral Resources & Energy (DMRE), and other role players within the innovation value chain, to see to it that there is a realisation of our National objectives.

ACCOUNTING AUTHORITY STATEMENT

The energy sector is facing several challenges, interrupted energy supply being top of the agenda. The capacity constraints that ESKOM continues to experience are having a negative impact on the economic recovery plans and will continue to do so until we find sustainable solutions to the challenge at hand. In our Strategic Plan (SP) 2020-2025, we adopted the following themes that would underpin the work that SANEDI will focus on. These themes are:

- Energy Security, the universal access to affordable energy and balancing energy demand and supply;
- Climate change response, the need to decarbonise the economy through embracing the fundamentals of the Just Energy Transition (JET) and enabling the achievement of the Nationally Determined Contributions (NDC 2030);
- Convergence, the integration of information systems, energy & engineering technologies to improve service delivery;
- People Management and Energy Skills, attract, develop & retain exceptional talent; and
- Policies Processes and Systems, develop processes, policies, systems, best practices & standards for operational excellence.

As SANEDI, we are concerned about Energy Security and our revised strategy is a response thereto, as well as addressing the emerging energy dynamics. We have made some changes in our Strategic Plan (SP) 2020-2025 as we revised our strategic outcomes, the mission and vision statements. We are fully committed to address Clean Coal and loadshedding in the country. We are also strengthening our strategic partnership with DMRE and DSI. The Energy Secretariat that was assigned to SANEDI by DSI is now allocated as a fourth programme in our proposed programme structure. We have also introduced Special Projects as a fifth programme.

At the beginning of the Medium-Term Strategic Framework (MTSF) period and as described in our Strategic Plan (SP) 2020/2025, SANEDI was dealing with a global context shaped by several megatrends including climate change, urbanisation, demographic shifts, Fourth Industrial Revolution (4IR) and growing inequalities. Programmes of action were shaped taking these trends, local context, and National Priorities into account. SANEDI, as mentioned in our SP 2020/2025, has

previously adopted three themes that would strengthen and drive our mandate. SANEDI believes that the repositioning of its focus around these new themes which play to our existing strengths and expertise in the areas of sustainable energy, Renewable Energy Technologies and Smart Grids continues to be the appropriate focus. This is enabling us to evolve and harness the changing global and local environment.

SANEDI understands that it is uniquely positioned and is required to carefully balance the short-term needs of the country as far as energy solutions are concerned, while considering where the country wants to be in decades to come, and therefore develop energy solutions and technologies ahead of time. Our SP 2020/25 and this APP aim to maintain this careful balance of focus. SANEDI is building even closer collaboration and alignment with the DMRE to ensure that the key priorities of the Department, in line with National Priorities, are delivered effectively. SANEDI is a key part of the country's innovation system and can contribute to the elevation of innovation in the country by increasing its alignment with the White Paper on Innovation.

MR SICELO XULU
BOARD CHAIRPERSON: SANEDI

CHIEF EXECUTIVE OFFICER'S STATEMENT

The South African energy sector is complex and is changing dynamically over multiple periods of time. The sector is faced with a short term crisis of energy security wherein the generation supply more often cannot meet the demand for electricity. In the midst of this short term crisis, there are significant expectations of transition in the energy sector to invest in sources of generation that would meet climate change goals through a process of a just energy transition for the country and its people. This dynamic changes in the energy landscape has been driven by seismic technology shifts as well as technological disruptors. The triple challenges of unemployment, poverty and inequality must be addressed. We see an opportunity to utilize the short and medium term challenges in the sector as an opportunity for the country, the community and its citizens to take advantage of the opportunities presented by technological changes. These changes address the contribution of skills and employment of SMMEs, youth and women through these changes.

This Annual Performance Plan (APP) is derived from the recently revised SANEDI Strategic Plan which will continue to contribute to areas in:

i. Applied Energy Research (Renewables, Clean Coal, Clean Mobility, Smart Grids and Data & Knowledge Management);

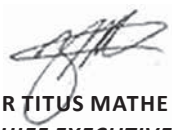
ii. Energy Efficiency (Energy Performance Certification, 12L Tax Incentive, Energy Services Market Development, Cool Surfaces, Standards & Labelling); and

iii. DSI Energy Secretariat (Coal CO_2-X, Energy Storage, Hydrogen South Africa (HySA), and Renewable Sustainable Energy (RSE) Hub and Spokes).

However, this APP will introduce Energy Balancing which will address the revised Strategic Plan with proof of concepts in both the supply and demand side.

SANEDI as an agency of the Department of Mineral Resources and Energy (DMRE), is mandated to direct, monitor and conduct energy research and development, promote applied energy research and technology innovation, as well as undertake measures to promote the uptake of green energy and energy efficiency throughout the economy. It's mission is to expediently conduct policy relevant research and implement innovative energy research, development and energy efficiency solutions to catalyse South Africa's socio-economic growth and climate resilience. It's mission is to expediently conduct policy relevant research and implement innovative energy research, development and Energy Efficiency solutions to catalyse South Africa's socio-economic growth and climate resilience.

In conclusion, the 2023/24 APP will be a bold new step in addressing the short to medium term energy challenges faced by South Africa. It operationalises the revised Strategic Plan in its mid-term, building up to the delivery of the 5 year strategic plan in 2025. To achieve this, it would require a renewed sense of urgency, commitment, high performance culture and a well capacitated organization. Lastly, it is exciting to be a part SANEDI at a time where history requires us to dig deep down and find sustainable solutions that supports South Africa's energy transition and addresses its critical pain points.



DR TITUS MATHE
CHIEF EXECUTIVE OFFICER (CEO)
SANEDI

OFFICIAL SIGN-OFF

It is hereby certified that this Annual Performance Plan:

- Was developed by the Management of the SANEDI under the guidance of the Board.
- Takes into account all the relevant policies, Legislation and other Mandates for which the SANEDI is responsible, and.
- Accurately reflects the Impact, Outcomes and Outputs which the SANEDI will endeavour to achieve over the period 2023/24.

Mr. Mthetheleli Baqwa
Corporate Planner
Date: 31 January 2023

Ms. Lethabo Manamela CA (SA)
Chief Financial Officer (CFO)
Date: 31 January 2023

Dr. Titus Mathe
Chief Executive Officer (CEO)
Date: 31 January 2023

Mr. Sicelo Xulu
SANEDI Board Chairperson
Date: 31 January 2023

LIST OF ACRONYMS

ACRONYM	DESCRIPTION
4IR	4th Industrial Revolution
ADA	Austrian Development Agency
AG	Auditor-General
AGSA	Auditor-General of South Africa
AMI	Advanced Metering Infrastructure
AOP	Annual Operating Plans
APP	Annual Performance Plan
ADA	Austrian Development Agency
AV	Autonomous Vehicles
BARC	Board Audit and Risk Committee
CO_2	Carbon Dioxide
CCTs	Clean Coal Technologies
CCS	Carbon Capture & Storage
CCUS	Carbon Capture Utilisation and Storage
CEO	Chief Executive Officer
CFF	Cleaner Fossil Fuel
CFO	Chief Financial Officer
CGS	Council for Geoscience
CM	Cleaner Mobility
COGTA	Department of Cooperative Governance and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
DBSA	Development Bank of Southern Africa
DDM	District Development Model
DKM	Data & Knowledge Management
DMRE	Department of Mineral Resources and Energy
DoE	Department of Energy
DoD	Department of Defence
DoT	Department of Transport
DSI	Department of Science and Innovation
DSM	Demand Side Management
DTU	Technical University of Denmark
EA	Executive Authority
EC	European Commission
EE	Energy Efficiency
EEDSM	Energy Efficiency and Demand Side Management
EEPBIP	Energy Efficiency in Public Buildings and Infrastructure Programme
EPC	Energy Performance Certificate
EMS	Energy Management Systems
ERD	Energy Research and Development
ESCo	Energy Services Company
Eskom	Electricity Supply Commission
ETPSG	European Technology Platform Smart Grid
EU	European Union
EV	Electric Vehicles
ExCo	Executive Committee
FFC	Funding and Finance Committee
FGD	Flue Gas Desulphurisation
GDA	German Development Agency

ACRONYM	DESCRIPTION
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GGE	Greenhouse Gas Emissions
HFCT	Hydrogen and Fuel Cell Technologies
HR	Human Resources
HSRM	South African Hydrogen Society Roadmap
IAF	Impact Assessment Framework
ICT	Information Communications and Technology
IEA	International Energy Agency
IPPPP	Independent Power Producers Procurement Programme
IRP	Integrated Resource Plan
IT	Information Technology
JET	Just Energy Transition
IPAP	Industrial Policy Action Plan
IPPs	Independent Power Producers
IRP	Integrated Resource Plan
KPA	Key Performance Area
KPI	Key Performance Indicator
kWh	Kilowatt hour
LCOE	Levelized Cost of Electricity
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation, Learning
MEPS	Minimum Energy Performance Standards
MoA	Memorandum of Agreement
MoU	Memorandum of Understanding
MTEF	Medium Term Expenditure Framework
MTSF	Medium Term Strategic Framework
MW	Mega-Watts
NBEPR	National Building Energy Performance Register
NCPC	National Cleaner Production Centre
NDC	Nationally Determined Contributions
NDP	National Development Plan
NEA	National Energy Act
NECSA	South African Nuclear Energy Corporation
NEES	South Africa National Energy Efficiency Strategy's
NEPBR	National Energy Performance Building Register
NERSA	National Energy Regulator of South Africa
NOx	Nitreous Oxide
NPF	National Planning Framework
NRCS	National Regulator for Compulsory Specifications
NRF	National Research Foundation
NSDP	National Spatial Development Plan
NSI	National System of Innovation
NT	National Treasury
PBWTP	Public Buildings & Wastewater Treatment Plants
PC	Projects Committee
PCSP	Pilot Carbon Dioxide Storage Pilot Project
PGM	Platinum Group Metal
PMO	Project Management Office
PtH	Power to Heat
PV	Photovoltaic
PwD's	People Living with Disabilities

ACRONYM	DESCRIPTION
R&D	Research and Development
R&I	Research and Innovation
RC	Remuneration Committee
RDI	Research and Development Initiatives
RE	Renewable Energy
RET	Renewable Energy Technologies
RSE	Renewable Sustainable Energy
S&L	Standards & Labelling
SA	South Africa
SACCS	South African Centre for Carbon Capture and Storage
SADC	Southern African Development Community
SALGA	South African Local Government Association
SANAS	South African National Accreditation System
SANEDI	South African National Energy Development Institute
SARETEC	South African Renewable Energy Technology Centre
SARS	South African Revenue Service
SASGI	South African Smart Grids Initiative
SAWS	South African Weather Service
SCM	Supply Chain Management
SDA	Swiss Development Agency
SDBIP	Service Delivery and Budget Implementation Plan
SEP	Stakeholder Engagement Plan
SETA's	Sector Education and Training Authority
SG	Smart Grids
SJEC	Social Justice & Ethics Committee
SLA	Service Level Agreement
SMMEs	Small, Medium Micro Enterprises
SoE	State-owned Entity
SOLTRAIN	Solar Thermal Training and Demonstration Initiative
SSEG	Small-scale Embedded Generation
SP	Strategic Plan
SWH	Solar Water Heating
SWOT	Strengths Weaknesses Opportunities and Threats
TES	Thermal Energy Storage
the dtic	Department Trade, Industry and Competition
TFEC	Total Final Energy Consumption
ToC	Theory of Change
TUT	Tshwane University of Technology
TVET	Technical Vocational Education and Training
UCG	Underground Coal Gasification
UNIDO	United Nations Industrial Development Organisation
UoT	University of Technology
UP	University Pretoria
VVISDP	Viability and Validation Innovation Service Delivery Programme
WASA	Wind Atlas for South Africa
WHR	Waste Heat Recovery
WSP	Workplace Skills Plan
WWTPs	Waste Water Treatment Plants

1. EXECUTIVE SUMMARY

Under the guidance of the Executive Authority (EA). the SANEDI 2023/24 APP, was developed with the aim of operationalising the strategic priorities identified in the revised (2020/25) SP and the attainment of the set performance targets related to each programme.

A review of SANEDI's operating environment was conducted to adapt the APP to the global socio-economic and climatic conditions, as well as the South African political, economic, socio-cultural, technological, environmental, and legal contexts at the time of reporting. Highlights included a decline in the real Gross Domestic Product (GDP) by 0,7% after two consecutive quarters of positive growth, in the second quarter of 2022 (Q2: 2022). The devastating floods in KwaZulu-Natal, and loadshedding contributed to the decline, weakening an already fragile National economy that had just recovered to pre-pandemic levels. Furthermore, the impact of Russia's invasion of Ukraine on the South African economy has been felt in terms of rising fuel, oil wheat, and maize prices.

In addition, the plan was informed and aligned to key Government Policy Frameworks that guide the work of SANEDI such as the National Development Plan (NDP), Medium Term Strategic Framework (MTSF) and DMRE priorities.

SANEDI's strategy draws from the contextual environment within which it sees itself, including primarily a global shift, driven by (1) Decarbonisation through technological advancements towards convergence and sector coupling, (2) Energy Security, (3) Changing demographic patterns and increases in urbanisation, and (4) Increased environmental sensitivity and awareness driving socio-political and economic discourse.

Within this global context, the South African environment is characterised by an unsustainable economic trajectory, with stagnating economic growth, rising unemployment and income inequality. It is in this environment, both with significant opportunities and threats, that SANEDI must discharge its Mandate of delivering EE and Energy Research and Development (ERD).

In the analysis of SANEDI's Mandate for energy research and EE as well as the broader environment directly impacting SANEDI, six strategic themes emerged, underpinning the strategy that SANEDI has adopted.

Strategic themes are the main, high level business strategies that form the basis for SANEDI's business model.

2. STRATEGIC THEMES

The following themes were used to underpin the strategy:

1. Energy security	The universal access to affordable energy and balancing energy demand and supply (e.g. loadshedding & liquid fuel shortage).
2. Climate change response	The need to decarbonise the economy through embracing the fundamentals of the Just Energy Transition(JET) and enabling the achievement of the Nationally Determined Contributions(NDC 2030).
3. Convergence	Integration of information systems, energy & engineering technologies to improve service delivery.
4. People Management and Energy Skills	Attract, develop & retain exceptional talent whilst fostering employee wellbeing and respect.
5. Policies, Processes and Systems	Develop processes, policies, systems, best practices & standards for operational excellence.

SANEDI's priority programmes may be summarised as:

- Energy Efficiency,
- Smart Grid Technology,
- Energy Secretariat,
- Cleaner Mobility,
- Renewable Energy,
- Data and Knowledge Management,
- Balance Energy Supply and Demand in order to address loadshedding, grid stability, liquid fuels shortage and gas,
- Cleaner Fuels and Related Technologies, and
- Collaboration with Local, Regional and International energy partners.

PART A:
OUR MANDATE

3. OUR MANDATE

In order to drive optimal resource allocation through the various layers of State, consistency in strategic and budgetary planning is required. The relationship between the Mandate, policy priorities and entities of the State is highlighted in the image below, and was considered as a critical feature in the development of the strategy.

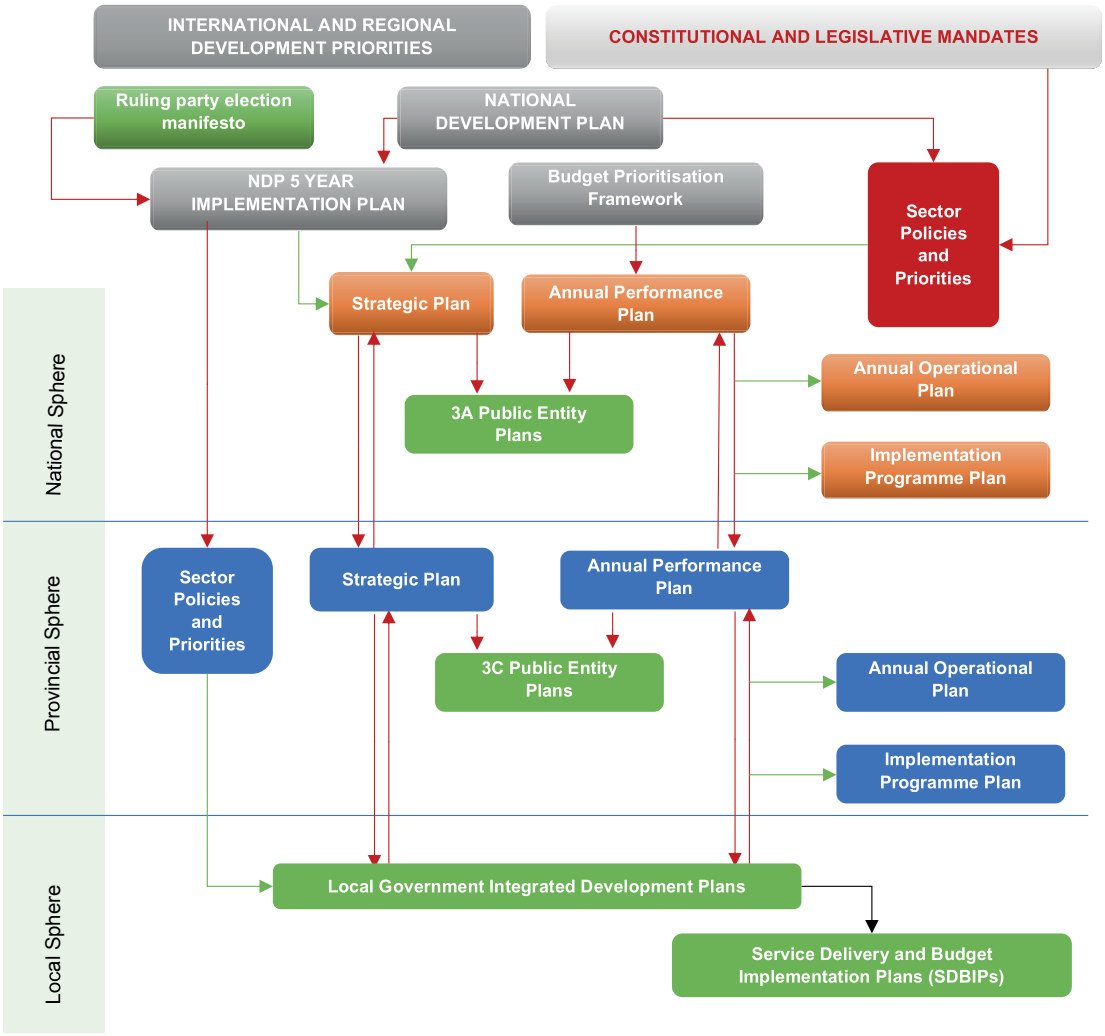


Figure 1: Context for Strategic Alignment[1]

1 **Source: Department of Planning, Monitoring and Evaluation**

3.1 CONSTITUTIONAL MANDATE

SANEDI, as an entity of the State, derives its Mandate from the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) and relevant Legislative and Policy Frameworks. SANEDI has a functional responsibility towards the technological development and Energy Efficiency (EE) in the field of energy (other than nuclear energy) – thereby improving the overall energy landscape within the country.

The strategy developed by SANEDI seeks to ensure alignment with two critical components of the Constitution, namely:

1. Chapter 2, The Bill of Rights, where: Everyone has the right:

    i. To prevent pollution and ecological degradation,
    ii. To promote conservation, and
    iii. To secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

2. Schedule 4, The Functional Areas of Concurrent National and Provincial Legislative, specifically with respect to Municipalities and the issue of Local Government matters related to:

    i. Electricity (and gas reticulation).

SANEDI has a clear role to play, contributing towards an environment that is sustainably utilised for the socio-economic development of the country, as well as municipal development for the distribution of electricity (and potentially other energy sources) to the residents of the country.

3.2 LEGISLATIVE AND POLICY MANDATES

As a Schedule 3A State-owned Entity (SoE), SANEDI's authority is derived from Section 7 (2) of the National Energy Act, 2008 (Act No. 34 of 2008) (NEA). Section 7 (2) of the NEA gives effect to SANEDI's powers and functions and provides for its responsibilities as stated below:

SANEDI's Legislative Mandate		
	Energy Research and Development	
	Direct, monitor, conduct and implement energy research and technology development in all fields of energy, other than nuclear energy, and **Promote energy research** and technology innovation. **Provide for**: Training and development in the field of energy research and technology development, Establishment and expansion of industries in the field of energy, and The commercialisation of energy technologies resulting from ERD programmes. **Register patents** and intellectual property in its name resulting from its activities, **Issue licences** to other persons for the use of its patents and intellectual property, **Publish information** concerning its objects and functions, **Establish facilities** for the collection and dissemination of information in connection with Research & Development Initiatives (RDI)	Undertake any other energy **technology development** related activity as directed by the Minister, with the concurrence of the Minister of Science and Technology, Promote relevant energy research through **cooperation with any entity, institution or person** equipped with the appropriate skills and expertise within and outside the Republic, **Make grants to educational and scientific institutions** in aid of research by their staff or for the establishment of facilities for such research, Promote **the training of research workers** by granting bursaries or grants-in-aid for research, Undertake **the investigations or research** that the Minister, after consultation with the Minister of Science and Technology, may assign to it, and **Advise the Minister** and the Minister of Science and Technology on research in the field of energy technology.
	Energy Efficiency	
	Undertake EE measures as directed by the Minister, and Increase EE throughout the economy.	Increase the Gross Domestic Product (GDP) per unit of energy consumed, and Optimise the utilisation of finite energy resources.

Figure 2: Primary Legislative Mandate

SANEDI's operational mandate is also influenced by the following Legislation and Policies:

Legislative Framework	Policy Framework
• Electricity Regulation Act, 2006 (Act No. 4 of 2006), as amended. • White Paper on Energy Policy, 1998. • Petroleum Products Act, 1977 (Act No. 120 of 1977), as amended. • Central Energy Fund Act, 1977 (Act No. 38 of 1977), as amended. • Petroleum Pipelines Act, 2003 (Act No. 60 of 2003). • Petroleum Pipelines Levies Act, 2004 (Act No. 28 of 2004). • Gas Act, 2001 (Act No. 48 of 2001). • Gas Regulator Levies Act, 2002 (Act No. 75 of 2002). • National Energy Regulator Act, 2004 (Act No. 40 of 2004). • Abolition of the National Energy Council Act, 1991 (Act 95 of 1991). • The National Environmental Management Act, 1999 (Act No. 107 of 1999). • The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). • South African Revenue Service Act, 1997 (Act 34 of 1997).	• SANEDI Business Case. • National Development Plan Vision 2030. • Medium-Term Strategic Framework. • National Energy Efficiency Strategy of the RSA, 2008. • Energy Security Master Plan for Liquid Fuels, 2007. • Energy Security Master Plan, 2007. • Integrated Resource Plan for Energy, 2010. • Department of Science and Technology 10- year Innovation Plan. • Measurement and Verification Guideline for Energy Efficiency Certificates (EEC) (DRAFT). • Industrial Policy Action Plan (IPAP) 2010/11 – 2012/13, published Feb 2010. • Carbon Capture and Storage Road Map. • Climate Change Response White Paper. • Draft White Paper on Science, Technology and Innovation, and Intellectual Property Law. • The Science, Technology and Innovation Decadal Plan.

Figure 3: SANEDI Legislative and Policy Mandate

INSTITUTIONAL POLICIES AND STRATEGIES OVER THE FIVE-YEAR PLANNING PERIOD

As highlighted, the National Planning Framework (NPF) must align with the National Development Plan (NDP) policy priorities, as well as the Executive focus of the National Government, including the seven key priorities of Government.

In driving towards strategic alignment, the five-year NDP implementation plan was considered, with a focus on the three pillars that describe the strategic priorities of the National Government for the following five years, namely:

i. Pillar 1: Inclusive Economic Growth,
ii. Pillar 2: Capabilities of South Africans, and
iii. Pillar 3: A capable State.

With the following themes cutting across all three pillars:

i. Youth empowerment,
ii. Gender equity,
iii. 4th Industrial Revolution (4IR),
iv. Environmental sustainability (climate change), and
v. National Spatial Development Plan (NSDP).

Furthermore, the seven key priorities for Government were considered and are as follows:

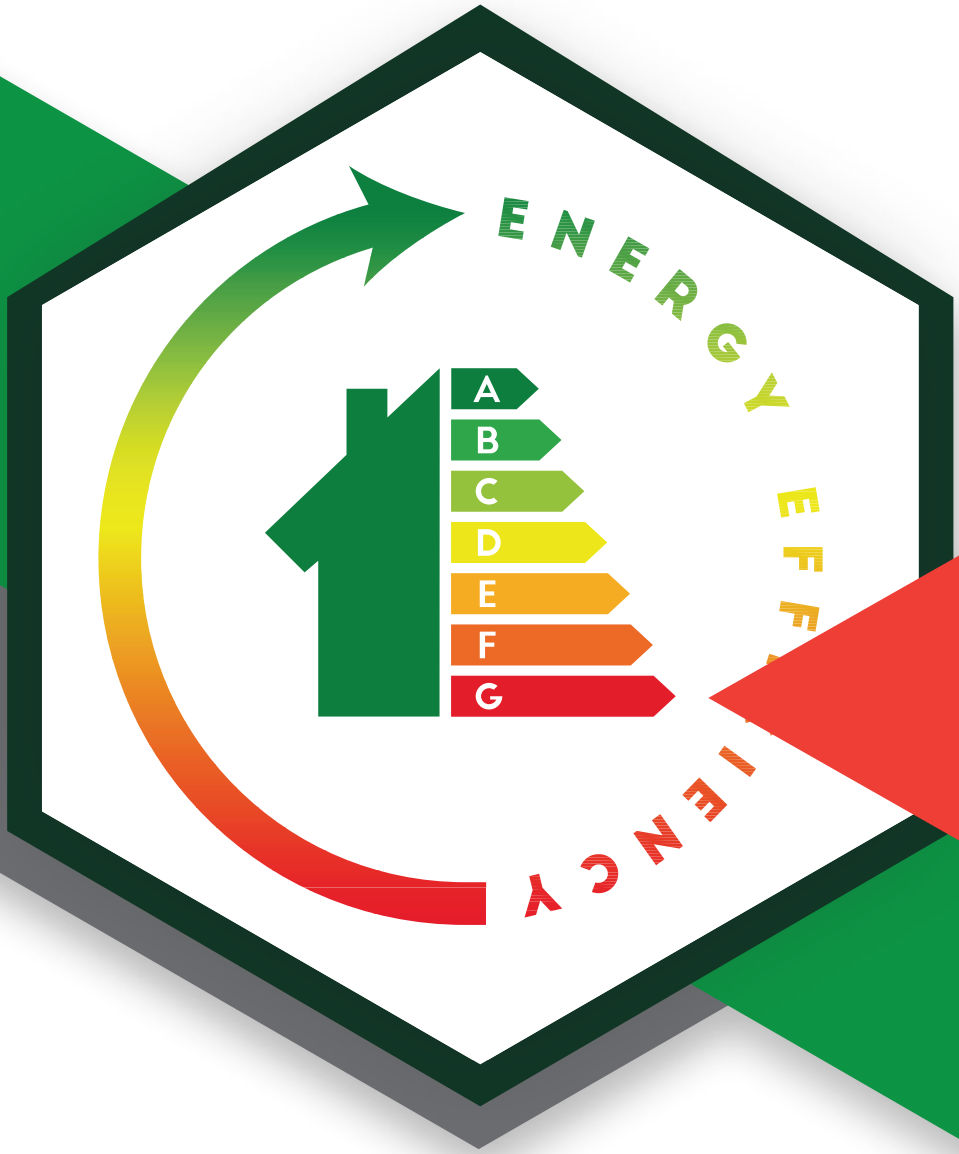
i. Economic transformation and job creation,
ii. Education, skills and health,
iii. Consolidating the social wage through reliable and quality basic services,
iv. Spatial integration, Human Settlements and Local Government,
v. Social cohesion and safe communities,
vi. A capable, ethical and developmental State, and
vii. A better Africa and World.

As energy is central to socio-economic development and the growth of a country, SANEDI has a defined and clear role in assisting in the achievement of the National Priorities.

RELEVANT COURT RULINGS

There were no court rulings that impacted SANEDI's strategic context.

PART B:
OUR STRATEGIC FOCUS



3.1 VISION

To be a leading research & innovation organisation for sustainable and inclusive energy development that influences energy policy goals in South Africa and beyond.

3.2 MISSION

Expediently conduct policy relevant research and implement innovative energy research, development and Energy Efficiency (EE) solutions to catalyse South Africa's socio-economic growth and climate resilience.

3.3 VALUES

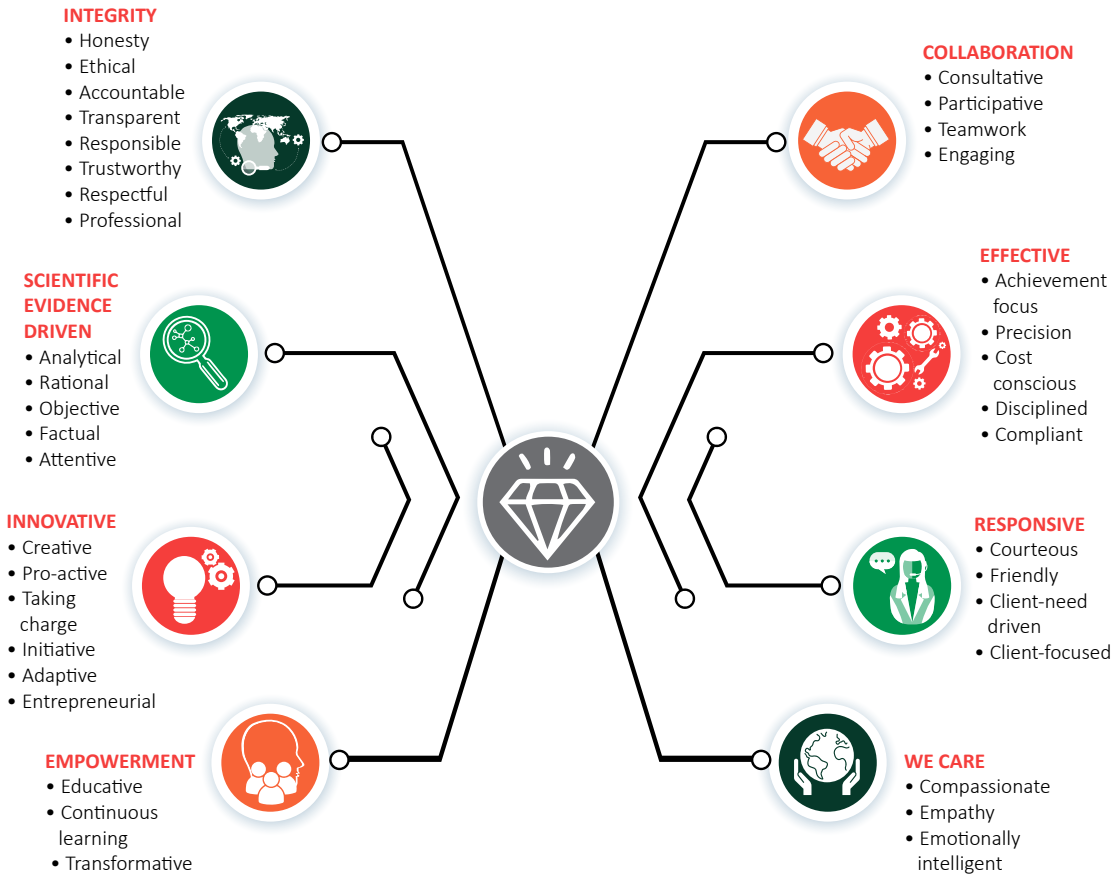


Figure 4: Organisational Values

3.4 STRATEGIC THEMES

The following themes underpin SANEDI's 2020/25 strategy:

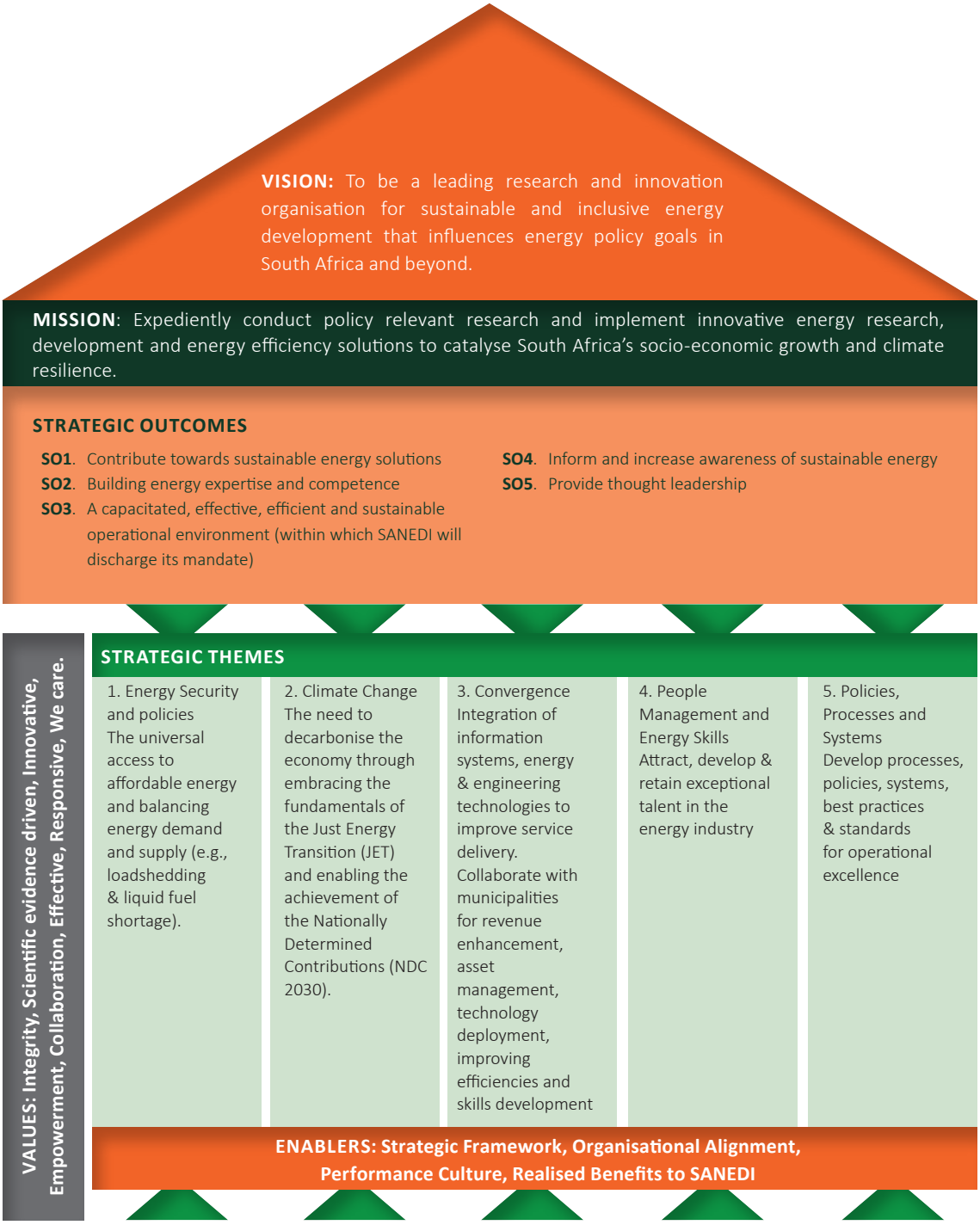


Figure 5: Strategic Themes

3.5 OUR SERVICES

SANEDI provides the following services as guided by the functions stipulated in the National Energy Act.

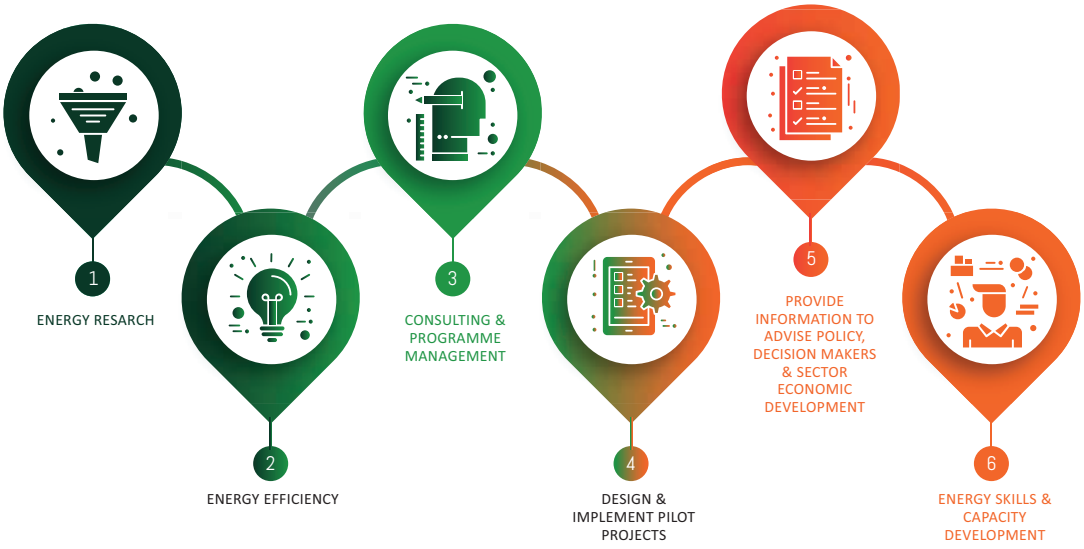


Figure 6: SANEDI Service offering

1. **Energy Research**

   SANEDI is a centre for information on innovation, research, development and demonstration in the areas of energy, the optimal use of energy resources, analysis and optimisation of energy systems, climate change and sustainable energy systems.

2. **Energy Efficiency Services**

   SANEDI is a strategic research organisation focusing on EE technologies that are accelerating the shift to a low-carbon economy.

3. **Consulting, Programme and Project Management**

   SANEDI provides advisory and programme management services and employs established methodologies and cutting-edge concepts and techniques.

4. **Design and implement pilot projects**

   We assist in the planning and execution of pilot projects aimed at encouraging the adoption of cutting-edge energy supply and EE technologies.

5. **Policy Advice, decision makers and sector economic development**

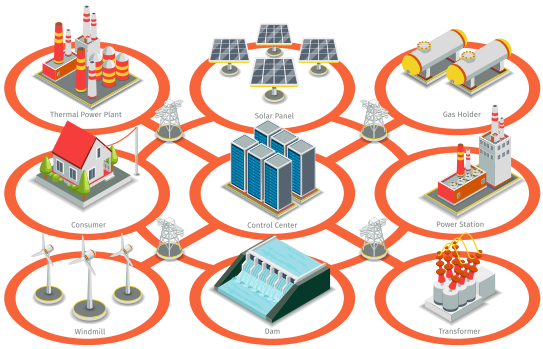
   Our in-depth analysis evaluates policy pathways for the power, transport, industry, and building sectors to adapt to the energy transition.

6. **Energy skills and capacity development**

   We contribute to South Africa's energy skills and capacity development, and equip policy professionals with the requisite skills needed to navigate change and generate opportunities.

3.5.1 SMART GRIDS

A Smart Grid (SG) is an electricity network that can intelligently integrate the actions of all users connected to it – generators, consumers, and those that do both, in order to efficiently deliver sustainable, economic, and secure electricity supplies[2].



Our Smart Grid programme would realise Smart Cities in South Africa and assist in solving the Municipality energy debt crisis through relevant technology and data that solve both energy measurement concerns and shortfalls in financial management capacity.

SANEDI, in collaboration with the Department of Mineral Resources & Energy (DMRE), developed and piloted the concept of SGs in South Africa. The programme mainly focused on "Technology as an Enabler for Change" in the municipal environment. Municipalities are currently under huge financial pressure, largely because of poor revenue collection and incorrect tariff designs. The Enhanced Revenue Management project, piloted in nine municipalities, was designed to assist Municipalities in collecting the electricity revenues. For projects that were properly designed and implemented, results have shown that technology can be used to improve revenue collection while also enhancing the effectiveness and efficiency of the Municipalities, thereby returning them to sustainability. Lessons learnt from this collaboration have highlighted the role of SG's and the importance of Advanced Metering Infrastructure (AMI) in solving the Electricity Supply Commission (Eskom) debt crisis.

Additionally, SANEDI, through the South African Smart Grids Initiative (SASGI), supports the South African Local Government Association (SALGA) and the Department of Cooperative Governance and Traditional Affairs (COGTA) with the development and institutionalisation of the SGs programme as an approach to enable municipal revenue management, the introduction of Renewable Energy (RE) and effective service delivery. Through SG's projects, we have designed research projects that aim to enable:

- Implementation of a communication system that supports municipal revenue management, and
- A solid asset management policy, strategy, framework, and Governance structure will guide Municipalities on how to manage their electricity distribution assets.

PlasWen Pyrolysis Concept

- With plasma gasification, an electric arc heats a gas stream (air or nitrogen), at extremely high temperatures typically 5000^{0}C, and supplies energy to the process. Due to the temperature, ash, metals and glass in the waste stream are melted, organic components volatilised, and complex molecules dissociated. Organic materials, containing mostly chemically bound carbon, hydrogen, and oxygen, are decomposed into syngas which can produce electricity.

3.5.2 RENEWABLE ENERGY

Renewable Energy (RE), often referred to as clean energy, comes from natural sources or processes that are constantly replenished. South Africa has abundant natural and RE resources that can be harnessed for energy production:

- One of the best solar regimes in the world, measured at 4.5 to 6.6 kWh/m2, at one of the most abundant RE resources in the country.
- A reasonable wind energy resource (an average of 8 m/s measured at 80 m) is available in geographically dispersed locations, allowing for security of supply.
- Biomass for energy use is restricted due to water availability in South Africa, but energy from waste, utilising the estimated 60 – 70 million m^3 of waste generated annually, is more readily available and exploitable.
- Despite limited water availability, 1400 MW of pump storage is currently utilised by Eskom from two sites in South Africa, while micro-hydro applications at specific sites offer further opportunities.
- A world-class wave energy (10 – 50 kW/m crest length) and ocean current (70 – 85 Sv peaking at 2 m/s) resource, is potentially exploitable upon the availability of commercially viable technologies.

2 This is the definition within the South African Smart Grids Vision document. SANEDI adopted this definition from The European Technology Platform Smart Grid (ETPSG).

Through Renewable Energy, we will continue to undertake Biogas, Solar and Wind projects to demonstrate GHG emissions mitigation potential in support of National commitments. The market and the industry will be promoted, and technology that is fit for purpose will be tested.

Our RE programme entails facilitating RE technology pilot and demonstration, as well as research and co-ordination, collaboration and dissemination of National and International RE knowledge, contributing towards a sustainable low carbon energy future. Initiatives that are being carried out by the Renewables programme include:

- **Pilot and demonstration of Renewable Energy Technologies that are fit for purpose in SA**
  - The Renewables programme co-ordinates multiple projects designed to prove that RE can offer a reliable, sustainable, secure, energy solution designed to fit the needs of the consumer/user who is employing this intervention. These technologies include the harnessing of solar energy in the form of heat and light, biogas, energy storage, energy innovation towards sustainable energy supply and security.
- **Sector and policy support studies**
  - Sector and policy support studies are produced to promote technology development and uptake, industry expansion and boost the National economy, using knowledge gained from pilot and demonstration projects, skills development and training, awareness and understanding as well as scientific data proving energy savings, Greenhouse Gas (GHG) emissions savings, and technology performance towards creating business cases around viable investment in RE.
- **The SOLTRAIN project**
  - A Southern African Development Community (SADC) regional programme, that has been in existence since 2009, focusses on capacity building and demonstration of solar thermal energy systems in the SADC region, and is funded by the Austrian Development Agency (ADA). Through the programme, Solar Thermal Roadmaps have been developed for all partner countries, and capacity building and training programmes have been implemented. The Solar Thermal Training and Demonstration Initiative (SOLTRAIN) project aims to tackle thermal needs at domestic and commercial sector levels, and create opportunities through catalysing growth of the Solar Water Heating (SWH) sector.
- **The WASA project**
  - The main objective of the Wind Atlas for South Africa (WASA) project is to develop, verify and employ numerical Wind Atlas methods ,and to develop capacity to enable large scale exploitation of wind energy in South Africa. This includes dedicated wind resource assessment, and siting tools for planning purposes that can be used for feasibility studies in support of projects.

3.5.3 CLEANER FUELS AND RELATED TECHNOLOGIES

Cleaner Fuels and Related Technologies is a concept that implies using Fossil Fuels as an energy source, but with reduced GHG emissions. Due to its high dependency on fossil fuel for its energy supply, SA wishes to leverage this concept in its journey to meeting its Nationally Determined Contributions (NDC) targets.

SANEDI retains the CFF and rename into Cleaner Fuels & Related Technologies subprogramme we are also exploring other applied energy research including clean coal pilots and biofuels. Through demonstrated clean energy initiatives, SANEDI will support the Sector Education and Training Authorities (SETAs) and Incubators, to enable the development of skilled Small, Medium Micro Enterprises (SMMEs) in the clean energy sector.

During 2012, the South African Carbon Capture Storage (CCS) Roadmap was endorsed by Cabinet. Recently, delays and the incorporation of capture, utilisation and mineralisation saw the phylogeny of a refreshed Roadmap. The Pilot Carbon Dioxide ($CO_{2)}$ Storage Project and the Pilot CO_2 Capture Project conflate in the integrated CCS Demonstration Project circa 2026. The consummation of the overall Carbon Capture, Utilisation and Storage (CCUS) programme is anticipated during 2030.

There are changes in Cleaner Fossil Fuel (CFF), and as from 1 September 2020 certain sub-programmes under CFF were transferred to the Council for Geoscience (CGS) as per the Minister's approval. To this end, the Pilot Carbon Dioxide Storage Pilot Project (PCSP), the CCUS project, and the team have been transferred to the Council for Geosciences (CGS) for further implementation and custodianship. The transfer of CCUS to CGS is a logical step as SANEDI had been working with the CGS throughout the CCS programme. The move has resulted in extra staff being available to work on the programme. Moreover, it has resulted in two major revisions to the CCUS Programme: -

- Since the launch of the original Atlas, the CGS has undertaken further geological analyses indicating further possible geological storage sites. Consequently, the PCSP has been moved from the KZN Province to the Mpumalanga Province, closer to the source of point CO_2 emissions, and
- Technologies, enhanced coal-bed methane, underground coal gasification and enhanced geothermal energy extraction, have been added to the scope of utilisation under investigation.

SANEDI believes that exploration of solutions in CFF is important, and that there is scope outside of CCUS that should be explored. We are now moving from CFF to Cleaner Fuels & Related Technologies, and through demonstrated clean energy initiatives, SANEDI will support the SETAs and Incubators, to enable the development of skilled Small, Medium Micro Enterprises (SMMEs) in the clean energy sector.

Going forward, SANEDI Cleaner Fuels & Related Technologies portfolio will focus on clean coal technologies such as sulphur emissions reduction technologies like Flue Gas Desulphurisation (FGD), particulates emissions reduction technologies like high-frequency transformers combined with chemical injection, Nitrous Oxide (NOx) reduction technologies and coal combustion product utilisation and beneficiation.

3.5.4 CLEANER MOBILITY

The Cleaner Mobility Programme will continue to investigate and demonstrate alternative ways of mobility that will lead to the improvement of the environmental, social, and economic conditions.

Cleaner Mobility (CM) creates a favourable environment for the broader use of cleaner alternative fuels and technology for public and private transport modes.

SANEDI's CM programme, with support from United Nations Industrial Development Organisation (UNIDO), has been actively engaging with the Department of Transport (DoT) as well as various cities to explore and introduce cleaner mobility options. SANEDI has been instrumental in doing applied research and demonstration regarding the use of Electric Vehicles (EV's) and charging batteries using solar Photovoltaics (PV) with good success. Going forward, the CM sub-programme will continue solving key challenges including energy security, EE in transportation, urban air pollution, traffic congestions, local industry development and climate change.

Although we have had great success in attracting funding from external partners, there has been a significant decline in third-party funds available towards renewable technologies because of policy changes by some International Governments and donors, who are beginning to focus on countries less developed than South Africa. This significant decline poses a tremendous threat to the funding requirements of SANEDI, given its already constrained budget. We are also aware that the fiscal challenges faced by the fiscus have led to a general decline in Research and Development (R&D) funding. Therefore, we shall be exploring various funding sources to supplement or compensate for the shortfall in funding.

Research projects to be undertaken through CM would: -

- Serve as a tool for guiding decision-making process for Municipalities and public decision makers,
- Identify, contrast, and recommend appropriate policies and support instruments for the South African EV market, and
- Contribute to knowledge dissemination and awareness on technology developments.

3.5.5 DATA AND KNOWLEDGE MANAGEMENT

The Data and Knowledge Management programme will provide a mechanism for energy modelling and planning in support of the alignment of National and local Government energy data objectives. The Data and Knowledge Managment programme completed projects that supported residential energy assumption, pulp & paper and automotive sectors.

The Data and Knowledge Management programme provides a mechanism for energy modelling and planning, to support the alignment of National and local Government energy objectives. The aim is to develop an energy data repository and technical capacity to support National and local energy planning and policy.

SANEDI plans to be a data repository for energy data in South Africa, and is in the process of establishing a data centre that will house reliable, accurate and up-to-date energy datasets that will be made available to Stakeholders. SANEDI at present is responsible for maintaining the following datasets that are annually maintained and available at no cost to Stakeholders: WASA database, Energy Services Company (ESCo) register, 12L Tax Incentives database, Big EE database, Transport database and Residential database. For the Medium-Term Strategic Framework (MTSF) period, SANEDI will continue to maintain the above datasets, and create and maintain these to the following datasets: Commercial database, Industrial database, Agricultural database, Standards & Labelling database and Public Infrastructure database (Public Buildings & Wastewater Treatment Plants (PBWTP)).

3.5.6 ENERGY EFFICIENCY

Through Energy Efficiency (EE) we will continue to undertake Cool Roof Surface and projects to demonstrate GHG emissions mitigation potential in support of National commitments. The market and industry will be promoted and technology that is fit for purpose will be tested.

Energy Efficiency refers to the use of less energy to achieve the same goal. Energy-efficient systems and buildings use less energy to heat, cool, and operate appliances and electronics. One of the simplest and most affordable ways to slow climate change, lower consumer energy costs, and boost the competitiveness of South Africa businesses is through EE. EE is also a vital component in achieving net-zero emissions of Carbon Dioxide ($CO_{2)}$ through decarbonisation.

SANEDI's co-ordination and implementation of the EE tax incentives (Section 12L and 12I), has produced phenomenal results, both in terms of energy savings and reduction in Greenhouse Gas Emissions (GGE). Through the 12L and 12I programmes, SANEDI will continue to support the industry to reduce their energy and carbon intensity through the verifiable deployment of RE and EE initiatives. Over 19 TWh have been saved, and the emission of 18 730 Mega-tonnes of CO_2 has been avoided. Based on the success of this activity over the last five years, National Treasury (NT) has decided to extend the Section 12L incentive from January 2020 to January 2022. This also saw the development of various (secure) online tools and databases for the processing of these applications, which over the last few years, has resulted in the establishment of a significant repository of EE data, for use in modelling impacts of these interventions.

Furthermore, the Cool Surfaces programme, which initially started out as a small activity within the international Clean Energy Ministerial series of activities, has gained traction in South Africa with impressive

results achieved in a Northern Cape pilot programme managed by SANEDI. This resulted in SANEDI being chosen as one of 10 countries globally to win an award of USD100 000 in 2019, for accelerated implementation of the initiative in South Africa.

SANEDI will continue to roll out Cool Surfaces on roof surface area in households and selected buildings in selected Municipalities, as an inexpensive way of improving ambient air quality in buildings, especially low-income housing, develop the Cool Surfaces industry and thereby creating jobs in the clean energy space.

Every company and building owner has a role to play in South Africa's drive to curb carbon emissions. Climate change is a threat, and EE measures must be adopted. Absa Bank has been a pioneer in this regard, being the first bank to achieve compliance with the country's new building energy performance regulations. Over the 2022/23 financial year, we will continue to partner with more Stakeholders to confront the climate change battle. Our new strategic vision towards a more sustainable and efficient energy sector, is primed to equip and support South Africa's economic transformation, growth, and social development. The EE initiated projects are aiming to: -

- Support businesses with tax incentives to promote and instil, a culture of cleaner production and EE in all sectors of the economy through participating applicants from which the projects are derived,
- Achieve the National carbon emissions reduction targets, and
- Maintain a repository of EE data, readily available to the key Stakeholder (DMRE) for policy formulation and evidence-based decision making.

3.5.7 THE ENERGY SECRETARIAT

Energy Secretariat is responsible for ensuring effective monitoring of energy policy specific to the energy landscape and DSI flagship programmes. The four flagship programmes comprise the Coal CO2-X, Energy Storage, Hydrogen South Africa (HySA), and Renewable Sustainable Energy (RSE) Hub and Spokes. Flagship programmes are housed and implemented with local Universities and Science Councils where centres of excellence have been established.

The strategic role of the Energy Secretariat objective is to ensure effective implementation, monitoring and evaluation of innovation policies relevant to the energy landscape and the four Department Science & Technology (DSI) flagship programmes.

SANEDI is proud to have been awarded the privilege by the DSI to host on its behalf, the DSI Energy Secretariat. The Secretariat is an administrative office which carries out the substantive and administrative work as directed by the Chief Director Hydrogen Energy. The objective of establishing the Energy Secretariat is to support the successful commercialisation, and up scaling of knowledge outputs from the broader energy Research and Development Initiatives (RDI) portfolio and ensuring systemic impact in the National System of Innovation (NSI). The SANEDI-DSI collaboration is Initially a 3-year programme with an estimated budget of R150 million per annum. SANEDI made readiness preparations towards the end of the last financial year, and this year will see the Secretariat tackling substantive work towards its objectives.

3.5.8 COLLABORATION WITH LOCAL, REGIONAL & INTERNATIONAL ENERGY PARTNERS

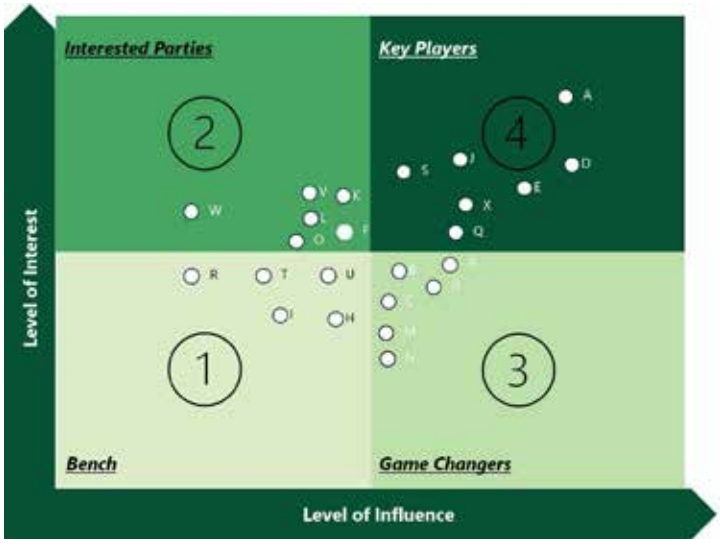
SANEDI is viewed as a strategic partner because our mission aligns with the goals of many partners, including advancing EE and RE initiatives to combat climate change and providing South Africa access to a skills pipeline in the RE industry.

In South Africa and the SADC region, we hope to be a driving force behind opportunities in the large-scale demand-side EE market. Scaling-up EE interventions in South Africa and the SADC region is considered one of the most promising solutions to ensure energy security in the country and region, and achieve rapid, ambitious and cost-effective emission reductions.

SANEDI represents South Africa in energy research and EE through its collaboration with local, Regional and International energy partners. Below is a list of priority partners as identified in the Stakeholder map:

STAKEHOLDER MAP

Tier 1: Detractor	Tier 2: Neutral	Tier 3: Supporter	Tier 4: Champion
Is obstructive toward the achivement of the organisation's goals.	Is ambivalent towards the organisation and its goals, and could assist but is not activated.	Is engaged in the organisation's activitises. Provides abstract support but not concrete.	Is a champion for the organisation's goals, and provides support in the form of funding and enablment.



Quadrant 3 - 4: Key Players/ Game Changers
- (A) Department of Mineral Resources and Energy
- (D) Department of Science and Innovation
- (E) National Treasury
- (S) Universities and Research Institutes
- (J) IEA, UNIDO, UNDP etc
- (Q) Media
- (X) Broader Public

Quadrant 2-3: Interested Parties/Game Changers
- (B) Department of Transport
- (C) Department of Defence
- (F) Department of Environment, Forestry and Fisheries
- (G) Department of Trade, Industry and Competition
- (K) SALGA & COGTA
- (I) Local Municipalities
- (M) Eskom
- (N) IPPs
- (O) NERSA
- (P) Development Finance Institutions
- (V) Energy Associations/Memberships
- (W) Communities

Quadrant 1-2: Bench/ Interested Parties
- (I) NGOs
- (H) International Government Development Agencies
- (R) Commercial Banks
- (T) Industry Chambers
- (U) Other International Organisations

Figure 7: Stakeholder map

3.5.9 BALANCING ENERGY DEMAND AND SUPPLY

3.5.9.1 LOADSHEDDING AND GRID STABILITY

With the threat of loadshedding an ever-constant reality for South Africans, unpacking the stability of the National grid is an important exercise. It has become fundamentally critical to conduct research geared towards reducing or eliminating rotational power cuts. Loadshedding is poised to rise to extreme levels unless unprecedented interventions are taken urgently to introduce about 10 GW by 2024.

Loadshedding and grid stability have thus become key focus areas for SANEDI in the coming years. This focus is key given the opportunities presented by renewable and embedded energy generation in the country. The incorporation of energy storage, EE, renewable and embedded power sources with the electric utilities has been a promising solution towards ensuring uninterrupted power supply and lessening the negative economic effects of loadshedding on the economy as a whole.

Below are the co-ordinated programmes SANEDI is implementing which contribute to a reduction in loadshedding and grid stability in South Africa.

SMART GRIDS PROGRAMME

The SGs programme has indirectly contributed to addressing a reduction of increased levels of loadshedding in the past few years, with the pilot project deployment of over 12,000 smart meters across 10 Municipalities between 2014 to 2018. These smart meters provide customers direct visibility of their electricity usage, thereby, keeping customers cautious of electricity usage and indirectly reducing their usage of electricity.

For the utility (Municipalities), smart meters have improved their ability to do bi-directional metering, where they are able to accommodate feed-in tariffs should a customer have a grid-tie PV roof-top system. Such metering and RE systems allow for a reduce on grid demand, thereby, promoting grid stability.

In 2021, the SGs programme undertook a research study on "Advanced Distribution Management Systems for Municipalities with Distributed Generation Penetration" This study was shared with Municipalities to enable them to understand the implications of grid automation and increased RE penetration. Traditionally, distribution network design does not need to consider issues of stability, as the network is passive and remained stable under most circumstances provided the transmission network is itself stable. However, this is likely to change as the penetration of RE increases and their contribution to network security becomes greater. This study contributes in the long-term to the areas that need to be considered, like transient first swing stability as well as long term dynamic stability and voltage collapse.

DATA & KNOWLEDGE MANAGEMENT

The Data and Knowledge Management (DKM) programme addresses loadshedding and grid stability by adhering to the targets stipulated in the post – 2015 National Energy Efficiency Strategy. This strategy, amongst other things, states that end-use energy consumption within the public building sector is expected to increase to 125.13PJ in 2030, from 62.4PJ in 2012 levels. These increases can be curtailed by 19.7PJ, which is a decrease of roughly 16%, by conducting refurbishments and interventions in space heating, lighting and improved building practices based on the current version of the SANS10400-XA. Future tightening of the standards and enforcement would achieve greater savings, provided they are enforced. Despite being the most cost-effective method, new stock of office buildings and renovations to existing stock offer the greatest potential for savings.

Within municipal services, based on interventions, energy savings of 47% for bulk-water supply and water treatment, 32% for the municipal vehicle fleet, 25% for street lighting and 16% for buildings and facilities could be achieved. Making reference to the post 2015 South Africa National Energy Efficiency Strategy's (NEES) implementation plan and in collaboration with the DMRE, the DKM programmes addresses grid stability implementing Demand Side Management measures like EE interventions in:

- Electricity reduction in Wastewater Treatment Plants (WWTPs) with a potential of **10,224 MWh/a,**
- EE retrofits in public buildings **81,936 MWh/a**, and
- Deployment of PV systems in 14 WWTP's **15,366 MWh/a.**

The figures stated below are potential savings that can be realised if the EE interventions are carried out within plants and buildings assessed. The first phase of the project was focused on assessing the potential for energy savings. The next phase if granted an extension of the GBS programme, will focus on implementing EE retrofits through a shared savings performance contracting model.

Programmes / Projects	Activities	Potential Savings Per Annum	CO_2 Off-set
EU GBS Wastewater Treatment Plants (WWTPs)	14 WWTP assessed	10,224 MWh	11,042 tonnes
Solar PV System within WWTP	14 – 250 kW – 800kW Grid-tie PV Systems	15,366 MWh	16,595 tonnes
EU GBS Buildings	18 Public Buildings assessed	81,936 MWh	88,491 tonnes
Pulp & Paper	11 Paper Mills assessed	579,616 MWh	625,985 tonnes
Automotive Industry	7 Light Duty Vehicles	87,763 MWh	94,784 tonnes
Totals per annum saving potential and CO_2 off-set		TBD	2 957 200 t

TABLE 1

CLEANER MOBILITY

The CM programme has the potential to contribute towards grid stability. The programme will contribute towards research aimed at using EVs as an energy storage and energy generator using a municipal distribution network. EVs have the potential to store energy during the off-peak period and feedback energy into the distribution network during the peak period, thus contributing towards the stabilisation of the grid at municipal level.

Historically, the CM programme focused on research aimed at policy development (e.g., green transport), economic impact analysis and demonstration (e.g., deployment of 4 EV charging stations). The programme did not specifically assess the contribution towards grid stability, The programme will now assess the potential of EVs on grid stabilisation using the work done at International level in this area.

As of March 2022, we are pleased to announce collaboration with the Development Bank of Southern Africa (DBSA) on the implementation of a Global Environment Facility (GEF) funded project, on accelerating the shift towards electric mobility in South Africa. This partnership resulted from an ongoing DBSA Stakeholder consultation process, which indicated that SANEDI is better positioned to play the role of an executing agency, implementing the day-to-day activities of the project.

Programmes / Projects	Activities	Potential Savings Per Annum	CO_2 Off-set
Converting 30% of fleet to cleaner mobility of Municipality buses e.g. Metro Bus, Golden Arrow, and PUTCO.	The CM programme in collaboration with the DBSA, the City of Johannesburg, City of Tshwane and eThekwini Municipality is planning to procure 40 Electric buses to be deployed in the three Metropolitan areas. The objective of the project is to demonstrate the benefits of converting the municipal fleet from ICE to an Electric Drive train. Application for funding has been submitted to the GEF and Municipalities are following their respective internal processes for budget allocation for the project.	Potential cost savings to be determined during demonstration stage of the project.	1 366 000 t
Converting 30% of the fleet to CM taxis.	The concept of converting taxis to CM has been considered by Municipalities and taxi associations. There has been engagement with several Municipalities and taxi associations. Further research and scoping for the large-scale project will be undertaken in the current financial year.	Detailed cost savings for converting of taxis from ICE to CM to be investigated in the scoping phase of the project.	1 591 200 t
Totals per annum saving potential and CO_2 off-set		TBD	2 957 200 t

TABLE 2

CLEANER FUELS AND RELATED TECHNOLOGIES

Cleaner fuels [3]are fuels that produce much lower GHG emissions than traditional fuels on a life-cycle basis. Growing South Africa's cleaner fuels market will help reduce our carbon footprint cutting emissions from hard to abate sectors, create jobs and stimulate private sector investments.

South Africa is committed to reducing its carbon emissions in line with its International commitments to mitigate climate change. To meet its carbon emission goals, the economy will need to be powered by clean power and cleaner fuels. Cleaner fuels provide a near-term pathway for emissions reductions, and are expected to play a critical role in 'hard-to-decarbonisesectors such as industry and medium- and heavy-duty freight.

Also recognising the essential role for hydrogen in the country's energy mix, South Africa's broad economic policies on gas includes the Gas Master Plan 2022 which aims to increase the proportion natural in the country's total energy mix, and the recently launched South African Hydrogen Society Roadmap (HSRM).

SANEDI is well-positioned to expand its scope to conduct applied research, and promote the production and usage of cleaner fuels production in the country.

a. Cleaner Coal

The Minister of Minerals and Energy on the occasion of the Coal Colloquium in 01 February 2022 expressed that:-

- Coal will remain the mainstay of South Africa's energy basket for the next 10 to 20 years, and a strategic sector as well as a job provider,
- The new Eskom build and the coal Independent Power Producers (IPPs) will sustain the coal industry,
- South Africa is highly depended on coal for its base load and energy security, and
- Coal mining and energy generation industries do not only bring massive revenue, but also employs thousands of employees.

Given our strong reliance on coal and the necessity to maintain compliance with the Just Energy Transition (JET) requirements, it is widely acknowledged that SANEDI needs to expand its research on Cleaner Coal Technologies (CCTs). CCTs are one option South Africa has that will help ensure that the country maintains its reliance on coal-based power generation, while maintaining compliance with its obligations to mitigating climate change.

In order to increase the effectiveness and acceptability of coal extraction, preparation, and use from an environmental standpoint, a new generation of advanced coal utilisation methods known as CCTs have been developed over the years. The use of CCTs, in particular carbon capture and storage, and flue gas separation, has expanded in several nations, including South Africa.

Going forward, SANEDI's Cleaner Fuels & Related Technologies portfolio will focus on CCTs such as sulphur emissions reduction technologies like Flue Gas Desulphurisation (FGD), particulates emissions reduction technologies like high-frequency transformers combined with chemical injection, Nitreous Oxide (NOx) reduction technologies and ash utilisation and beneficiation.

SPECIAL PROJECTS

Special Projects will focus on the following aspects:

- Intellectual Property & Commercialisation,
- Collaboration with Local, Regional & International Energy Partners,
- SMMEs & Enterprise Development,
- Energy Skills Development, and
- Any other project as requested by Government.

3 Types of cleaner fuels include biofuels such as cellulosic ethanol, renewable diesel, synthetic fuels and sustainable aviation fuel, as well as gaseous fuels, such as clean hydrogen and renewable natural gas.

4. SITUATIONAL ANALYSIS

An important information source for SANEDI is environmental analysis, both internal and external. At the institutional level, SANEDI's mission can be viewed as that of a subject matter expert (SME) in applied energy research as well as the promotion and adoption of EE throughout the country. This in itself requires a highly qualified and competent staff complement, which not only comes at a high cost to the organisation, but is also difficult to secure in the job market. A crucial pre-requisite for economic productivity and social well-being on a Regional and global scale is sustainable hybrid energy.

4.1 INTERNAL ENVIRONMENTAL ANALYSIS

SANEDI is influenced by the conditions and forces that exist within the organisation. An extensive review of SANEDI's vision, mission and values, programmes (operations) and processes, as well as internal capacity and capabilities (width and depth of resources) was conducted, and this uncovered an array of aspects that were interpreted as strengths or weaknesses.

4.1.1 SANEDI: AN ENTITY OF MINERAL RESOURCES AND ENERGY (DMRE)

SANEDI is an implementation agency of Government, specifically the Department of Mineral Resources and Energy (DMRE), previously Department of Energy (DoE), established under the National Energy Act, 2008 (Act No. 34 of 2008) (NEA), with a focus on EE, Energy Research, Development and Innovation. SANEDI has commitments on Skills Development through our programs on RE, CM and SGs. These include training and development on EE technologies and related datasets, Clean Mobility Technology systems with a purpose to enable energy transition expertise and competence building.

4.1.2 OPERATING MODEL (PEOPLE, PROCESS, TECHNOLOGY)

SANEDI's operating model compromises three converging components that speak to People, Process, and Technology, which determines the organisation's capacity to action its business processes, thereby achieving its strategy. Aligned to SANEDI's Strategic Themes 4, 5 and 6, robust and well-defined business processes create a well-functioning organisation.

Significant effort has been placed on process standardisation, driving towards well-defined business principles. Clear lines of accountability must be established to re-enforce current systems and procedures. Change Management becomes a key component in terms of embedding the change the organisation is undertaking.

In the past financial year, a few key milestones were achieved, in an effort to ensure that the organisation is well resourced in implementing the recommendation from the 2018/19 organisational review which also shaped the strategy for the 2020/25 period. The milestones as follows:

- Implementation of the organisational review and section 189 without any litigation,
- Implemented a new operational structure for the organisation with a remuneration system that is aligned to the market,
- Significantly improved visibility and influence of the organisation through the development, adoption and implementation of the Stakeholder Engagement Plan (SEP).
- Secured project funding exceeding the MTSF allocation on a multi-year ensuring sustainability,
- SANEDI is under the stewardship of a new Board, which came into effect in December 2021, with a new Chief Executive Officer (CEO) appointed 1st October 2022,
- A significant number of Senior Managers are currently appointed in acting capacities,
- During 2020/21 and 2021/22, SANEDI was operating on a Hybrid model of working from home and in the office, and
- Due to COVID-19. The Hybrid model proved to be effective as the organisation achieved 97% of its target during 2020/21 and 2021/2022.

SANEDI continues to engage with key Stakeholders to ensure that operational activities are aligned with those of key Stakeholders, and in turn, will have the desired impact.

4.2 EXTERNAL ENVIRONMENTAL ANALYSIS

4.2.1 INCREASED FOCUS ON SPEED OF GLOBAL DECARBONISATION TO 2030

There has been increasing attention over the past few years on achieving a significant fall in global emissions by 2030 to conserve the world's remaining carbon budget. Analysis contained in the 2018 IPCC Special Report (SR15) suggested that, under some scenarios, to be consistent with a 1.5ºC climate goal, global net anthropogenic CO_2 emissions would need to decline by about 45% by 2030 (relative to 2010 levels).

This fall in CO_2 emissions in the SR15 analysis, included reduced emissions from both the energy and industry sectors and the AFOLU (Agriculture, Forestry and Other Land Use) sector. The fall in CO_2 emissions from 'Fossil Fuels and industry' was around 37% (relative to 2010). The corresponding fall in CO_2 emissions in Net Zero is around 20%. The smaller fall in CO_2 emissions assumed in Net Zero partly reflects the higher level of CO_2 emissions in 2019 than assumed in the SR15 analysis, together with the assumption that emissions rise over the next year or so, as the global economy continues to recover from the pandemic. It also reflects an assessment of the likely lead times associated with financing, and implementing the required changes to the global energy system that are necessary to support a rapid decarbonisation.

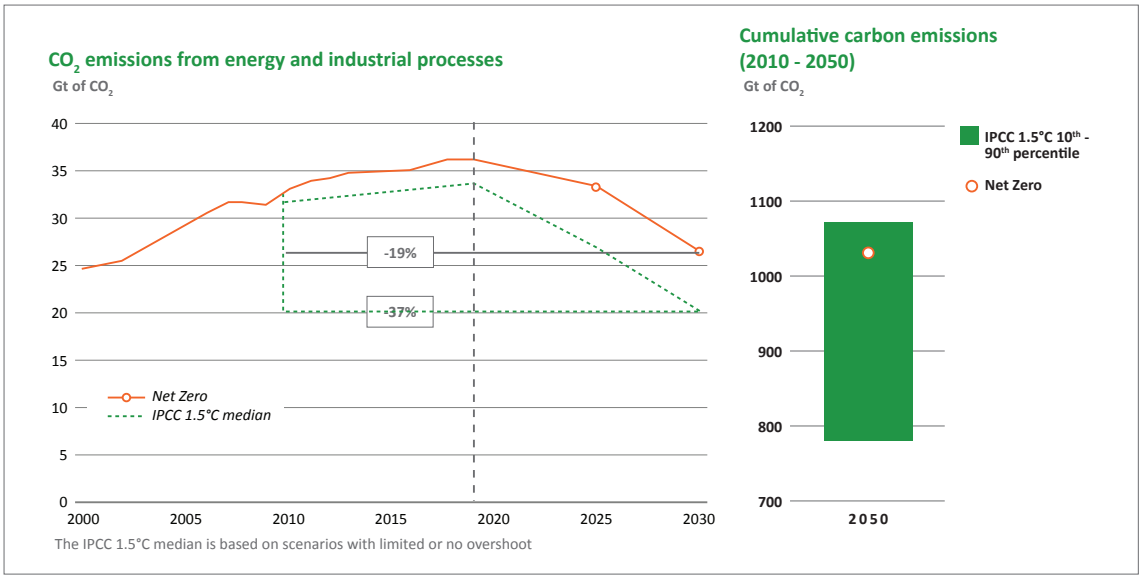


Figure 8: Global CO_2 Emissions[4]

The pace of decarbonisation in Net Zero in the second half of this decade is broadly similar to that assumed in the SR15 analysis, albeit from a higher level.

Bloomberg New Energy Finance (2022) estimates that in order to achieve net-zero emissions by the year 2050, global energy-related emissions must decrease by 75% by 2040, and 30% below 2019 levels by 2030, respectively. This 1.75-degree budget calls for a 3.2% annual reduction until 2030, and a quick reversal of current trends, emissions increased by 0.9% annually from 2015 to 2020. The power sector needs to make the most reductions over the following ten years, reducing emissions by 57% from 2019 levels by 2030 and then 89% by 2040. Emissions from the transportation sector must decrease by 11% by 2030, and by 80% by 2040 compared to 2019 levels. For industry and buildings, it's 16% and 12% down by 2030 and 58% and 55% by 2040. Transitions in fuels and energy-intensive sectors such as construction materials, chemicals and long-distance transport are therefore particularly important.

4.2.2 PEOPLE CENTERED TRANSITIONS

Enhancing lives and means of livelihood is the goal of the energy sector's transformation. This entails giving citizens the tools they need to take advantage of the opportunities, and navigate the disruptions brought on by the switch to clean energy technologies, in addition to the advantages of avoiding the worst effects of climate change. It entails eliminating energy poverty because no system can be maintained if significant portions

4 **Source:** *bp Energy Outlook 2022*.

of the world's population are still denied access to modern energy sources. Additionally, it entails placing employment, equity, inclusion, affordability, access, and sustainable economic development at the forefront of the process.

According to the International Energy Agency (IEA), energy sector transformation also comes with dislocation, as new jobs are not necessarily created in the same places where jobs are lost. Skill sets are not automatically transferable, and new skills are needed. This is true both within specific countries and internationally. Governments need to manage the impacts in a co-ordinated way, seek transition pathways that maximise opportunities for decent, high-quality work and for workers to make use of existing skills, and mobilising long-term support for workers and communities where jobs are lost.

Changes in the energy sector must support social and economic development and improve quality of life. A starting point is to bring modern energy to those that lack access. The IEA estimates that providing universal access to electricity and clean cooking by 2030, would require investments of USD43 billion per year, closing an important gap in the global energy system at a fraction of the overall cost of transitions. The affordability and security of energy supply are also vital considerations when it comes to quality of life.

4.2.3 GENDER MAINSTREAMING

The energy sector is one of the worst performing sectors of the global economy when it comes to gender balance, despite overwhelming evidence of the social, and economic benefits of diversity and equal opportunities in the workforce. Few women hold senior positions, and only a small percentage of the labour force is female. Only one in five jobs worldwide in the oil and gas industry, and one in three jobs worldwide in the RE industry, are held by women. Aside from that, data from nearly 2 500 publicly traded energy companies show that women make up just under 14% of Senior Managers (representation is strongest in utilities), compared to 16% in 30 000 non-energy companies.

Energy transitions offer a chance to integrate policies and actions, that address gender equality issues in the energy and related sectors. This will necessitate tailored policy support, with solutions created to take into account the unique dynamics of the various sectors and sub-sectors, as well as the ways that gender equality can be improved as energy transitions advance.

4.2.4 ENERGY SECURITY

Energy transitions can be chaotic and tumultuous affairs, marked by conflicting interests and stop-go strategies. There is a constant risk of energy supply and demand mismatches, as the world moves toward net zero emissions because of a dearth of appropriate investment signals, a lack of sufficient technological advancement, inadequately designed policies, or bottlenecks resulting from a lack of infrastructure.

Physical risks to the world's energy infrastructure are growing because of climate change. According to the IEA estimates, over 10% of dispatchable generation fleets, coastal refineries, and freshwater-cooled thermal power plants are vulnerable to severe coastal flooding, and about a quarter of the world's electricity networks are at high risk of destructive cyclone winds. Additionally, a third of these facilities are situated in high water stress regions. These risks are predicted to rise over time, highlighting the urgent need to improve the climate change resilience of energy systems.

4.2.5 SHORTAGES IN LIQUID FUEL

A shortage of oil refineries across sub-Saharan Africa, coupled with soaring crude prices because of the war in Ukraine, has left countries dangerously short of fuel supplies and disrupting airlines. The impact of liquid fuel shortage is expected to be longer lasting in South Africa, as the Government and private sector companies are less able come up with the funding needed to get refineries running at full capacity.

4.2.6 ENERGY DEMAND

Global energy demand measured at the final point of energy use decarbonises in all three scenarios, as the world electrifies and makes increasing use of hydrogen. The share of Fossil Fuels in Total Final Energy Consumption (TFEC) declines from around 65% in 2019 to 30-50% by 2050 in the three scenarios. Within hydrocarbons, the largest falls occur in the share of coal as the world increasingly shifts towards lower carbon fuels in industry and buildings, and in the share of oil, driven primarily by falling use of oil in road transport. The role of electricity increases substantially, with electricity consumption increasing by 75- 85% over the outlook in all three scenarios. The share of electricity at the final point of use increases from 20% in 2019, to around 30% in New Momentum, and 45-50% in Accelerated and Net Zero. The growth in electrification in all three scenarios is met mostly by the rapid growth in wind and solar power.

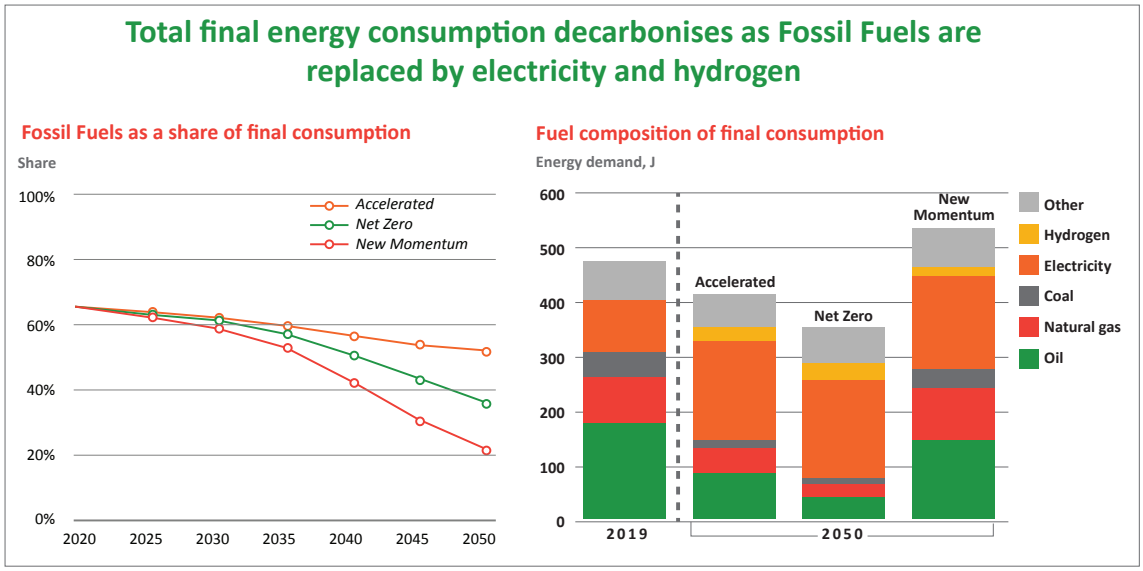


Figure 9: Fossil Fuels as a share of final consumption vs fuel composition of final consumption[5]

4.2.6.1 ENERGY EFFICIENCY

In clean energy transitions, EE is referred to as the "first fuel" because it offers some of the quickest, and most affordable CO_2 mitigation options while lowering energy costs and enhancing energy security. The most effective way to reduce energy demand is through EE, which is also closely related to electrification, behavioural modification, digitalization, and material efficiency. Together, these metrics influence global energy intensity, which is a crucial indicator of the economy's EE. Global energy intensity is the amount of energy needed to produce one unit of GDP. The rate of improvement in global energy intensity must be two to three times greater than historical rates, and rise to just over 4% per year between 2020 and 2030 in order to stay on track with the 2050 Net Zero targets.

Energy-efficient technologies help to reduce emissions and fossil fuel use across the board, by slowing the growth of energy demand. For instance, more fuel-efficient steel, cement, and chemical production reduces the use of Fossil Fuels in industry, better insulation and more efficient appliances reduce the electricity and direct use of Fossil Fuels in buildings, and more energy-efficient cars, trucks, and aircraft reduce the demand for oil in the transportation sector.

To get back on track, a massive and unprecedented shift toward more EE buildings, transportation, and industry is required, adopting the full range of EE-related measures to prevent increased energy demand. The importance of EE in addressing issues like energy security, affordability, and climate change is greater than ever, as the world grapples with one of the biggest and most serious energy crises of modern times.

4.2.7 ENERGY POLICY DISCOURSE

Major energy policy developments in the country are a response to the growing sense of urgency in ensuring access to affordable, clean, and modern sources of energy by the Government. However, the results of a review of the policies indicate that the current suite of Government policies and programmes aimed at fighting energy access, and energy poverty have produced sub-optimal solutions.

It appears that many policies and programmes appear to be failing to address the many problems at hand, as the country still grapples with loadshedding and high levels of energy poverty. Thus, if the country is to achieve a reduction in energy poverty and reach its goal of universal access to energy, then policy and regulatory frameworks and resources to support energy service delivery need to be urgently and constructively reviewed. Anchored on the District Development Model (DDM), this can be and can be achieved by close collaboration between the DMRE, the DSI, civil society and the many energy Stakeholders in the country.

The role of coal in South Africa's energy mix is far from over. Eskom is still planning to bring more coal-fired generating capacity online, while the DMRE plans to keep it as part of its energy mix.

5 **SOURCE:** *bp Energy Outlook 2022*.

4.2.8 PESTEL ANALYSIS

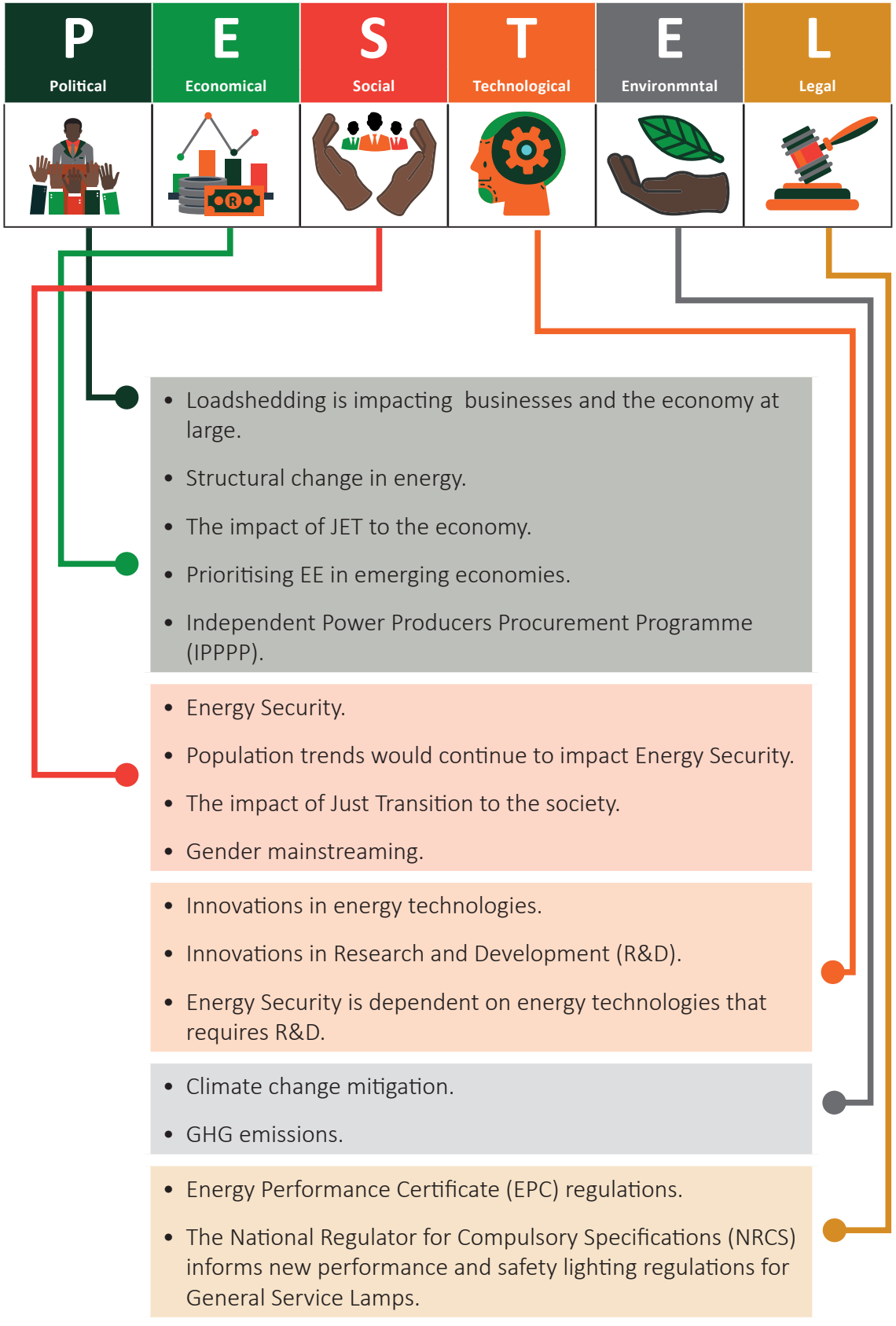


Figure 10: PESTEL Analysis

4.3 SWOT ANALYSIS

STRENGTHS	WEAKNESSES
• Collaboration stock: We have established and maintained relationships and partnerships with both internal and external Stakeholders. • Organisational capability: Great organisational capability to deliver and implement programmes and projects. • Recognised brand – Built and maintained a strong brand locally and Internationally. • High quality work output – We have consistently produced high quality work output over the years. • Management team: Management has extensive experience in energy, research and development. • Resilient and committed workforce.	• Human Capital constraints – High labour turnover, as SANEDI is losing experienced and skilled employees being replaced by young graduate engineers leaving many positions vacant. Skill set built around certain projects might not work in the future. • Financial constraints / funding model – The organisation does not collect any form of revenue, and is heavily reliant on the Shareholder and largely the donor community for funding. • Prioritisation of programmes: SANEDI manipulates donors to support its priorities. • Stakeholder engagement – SANEDI needs to improve on Stakeholder programmes.
OPPORTUNITIES	**THREATS**
• New collaborations and partnerships – There is a growing community of partners and organisations working on various energy development initiatives including the Decadal Plan[6]. • Research- There is a growing demand for theoretical and empirical investigations on energy policy and development. • Financial self-sufficiency- There are avenues (consulting fees, royalties, data sales) available for SANEDI to generate revenue and ensure financial self-sufficiency. • Government policy and programmes - Promotion of programmes and policies designed to solve the nation's and the world's energy issues.	• Evolving mandate- Technology changes and new energy problems are driving policy shifts. • Local and geopolitical instability- Escalating International and internal political tensions affecting the economy, energy policies and SANEDI Mandate. • Funding risks- The ability of SANEDI to carry out its Mandate is put at risk by a limited budget, and less funding commitments from the Shareholder. • Skills shortage- South Africa has a big shortage of critical engineering skills. The shortage of engineering professionals means that we don't have enough practitioners available for ongoing programmes and projects.

Figure 11: SANEDI SWOT Analysis

6 **Driven by the DSI, the decadal plan is focused on growing South Africa by finding sources of new economic growth for a re-industrialised, modern economy.**

4.4 STRATEGIC OUTCOMES

In making its desired impact of enabling decarbonisation and a just transition from a fossil fuel-based economy to a cleaner energy economy for sustainable development, SANEDI strives to achieve the following outcomes within the 2020/25 planning period:

TABLE OF STRATEGIC OUTCOMES (SOs) AND KEY PERFORMANCE AREAS (KPAs)	
SO1. Contribute towards sustainable energy solutions	
KPA 1.	Digitalised energy systems
KPA 2.	Green House Gas (GHG) reduction through sustainable energy interventions
KPA 3	Energy policy support
KPA 4.	Catalyse balanced Just Energy Transition
KPA 5.	Energy Research, Development and Innovation
KPA 6.	Balancing Energy Supply and Demand
KPA 7.	ICT
KPA 8.	Intellectual Property
KPA 9.	Energy Secretariat
KPA 10.	Special Projects
SO2. Building energy expertise and competence	
KPA 11.	Collaboration with industry, tertiary education bodies and SETAs
KPA 12.	Implement skills development interventions
KPA 13.	SMMEs and enterprise development
SO3. A capacitated, effective, efficient and sustainable operational environment (within which SANEDI will discharge its mandate)	
KPA 14.	HR – Recruitment
KPA 15.	Supply Chain Management (SCM)
KPA 16.	Governance Risk and Compliance
KPA 17.	Local, Regional and International Partnerships
KPA 18.	Financial Management
SO4. Inform and increase awareness of sustainable energy	
KPA 19.	Developing and implementing communications strategy
KPA 20.	Public Relations Management
KPA 21.	Internal and External Communications
KPA 22.	Events Management
KPA 23.	Publications
SO5. Provide thought leadership	
KPA 24.	Technical and Research Publications

5. FUNDING AND RESOURCE ALLOCATION

SANEDI derives its revenue through transfers from the Department and limited donor funding. From a funding perspective, historically about 5% to 7% of SANEDI's actual income has been from donor-funded projects, thus ensuring appropriate selection and delivery of projects becomes an underlying strategic enabler. However, funding levels have declined in recent years. Revenue is expected to be at R125 million and declined over the Medium-Term Expenditure Framework (MTEF) period to approximately R91million.

Programme 2 has historically been allocated approximately 70% of the overall funding because of its volume of sub-programmes. In 2022/23, we are expecting the Management Fee from the DSI, resulting in the additional funding. Budgeted donor funding is expected to be 30% of revenue for 2022/23 due to mainly the Energy Secretariat Management Fee and other donor fees secured. This is expected to be below 5% onwards in the subsequent years, as most projects are funder over a period of 2 to 3 years and new funds can only be secured for the next phase once the current phase is completed. Interest is expected to grow in line with the prevailing repo and prime rates. Cost containment measures will continue to be implemented to contain expenditure especially in Programme 1 relating to operational expenditure, which constitutes less than 20% of the total budget.

Expenditure is expected to be in-line with actuals from 2020/21, and increase by an average of 4% in line with inflation. This is due to a combination of rising staff costs and a reduction of 5% of spending on goods and services.

SANEDI shows a trend that when funding is reduced, projects spend is reduced disproportionately. Staff costs are projected to increase by 4% per annum over the MTEF period in line with inflation. At present, employee costs are currently 40% of total revenue. SANEDI, in-line with the NT measures on spending, could potentially see the employee costs being plugged in the future in line with inflation. The budget for goods and services administration strategic objectives has traditionally increased by 6% annually, and is expected to increase by 4% to 6% annually in the future.

The lack of adequate funding remains a risk that faces the organisation, and can materially impact on the organisation's ability to fully implement is Mandate. By leveraging available climate funds, SANEDI plans to augment its funding in response to the risks posed by inadequate funding.

Partnerships and funding agreements have been reached with key Stakeholders for funding of initiatives that are included in the contract with Stakeholders, and engagements continue to leverage the available funding.

Management will continue with the implementation of the recommendations of the organisational review conducted in 2018/19, which also proposed measures that would need to be undertaken to improve funding for SANEDI programmes. As part of the plan, SANEDI continues with its plans of leveraging on commercialisation opportunities when funding technology innovation projects, and in deriving a financial benefit from the technologies that it will support in their development.

5.1 EXPENDITURE SUMMARY

Rand thousand	2019/20		2020/21		2021/22		2022/23			2023/24			2024/25				2025/26
	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Budget estimate	Approved budget	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Planning budget estimate	Planning budget estimate
Objective/Activity																	
Administration	40,202	57,438	40,694	52,494	46,564	36,072	50,012	50,012	-	50,522	50,522	-	52,748	52,748	-	56,277	56,277
Cleaner fossil fuels	106,969	3,621	101,233	91,640	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Efficiency programme	61,200	1,367	61,733	1,958	22,562	21,736	26,563	26,563	-	15,021	15,021	-	12,703	12,703	-	12,637	12,637
Smart Grids	5,788	2,938	6,163	4,565	6,366	5,926	9,455	9,455	-	8,184	8,184	-	8,522	8,522	-	8,205	8,205
Working for Energy (WfE)	5,929	1,728	5,736	9,206	-	-	-	-	-	-	-	-	-	-	-	-	-
Clean energy solutions	5,203	6,573	5,421	4,410	9,710	15,910	33,032	33,032	-	11,109	11,109	-	11,594	11,594	-	12,290	12,290
Centre for energy systems analysis and research [7]	4,618	654	5,984	740	4,212	3,220	3,224	3,224	-	3,224	3,224	-	3,369	3,369	-	3,571	3,571
Cleaner Mobility	2,505	320	2,677	13	2,491	2,548	2,895	2,895	-	2,755	2,755	-	2,879	2,879	-	3,052	3,052
Total	232,414	74,639	229,641	165,026	91,905	85,412	125,181	125,181	-	90,815	90,815	-	91,815	91,815	-	96,032	96,032
Economic classification																	
Current payments	**232,414**	**74,639**	**229,641**	**74,052**	**91,905**	**91,905**	**125,181**	**125,181**	**-**	**90,815**	**90,815**	**-**	**91,815**	**91,815**	**-**	**96,032**	**96,032**
Compensation of employees	50,735	38,203	51,625	36,792	43,139	32,962	45,001	45,001	-	46,881	46,881	-	49,000	49,000	-	51,940	51,940
Salaries and wages	50,735	38,203	51,625	36,792	43,139	32,962	45,001	45,001	-	46,881	46,881	-	49,000	49,000	-	51,940	51,940
Social contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Goods and services	179,020	32,626	175,211	34,912	45,792	52,040	76,153	76,153	-	39,728	39,728	-	38,423	38,423	-	39,436	39,436
Of which	-		-		-												
Administrative fees	-	-	-	465	-	518	426	426	-	443	443	-	461	461	-	489	489
Advertising	-	1,422	-	463	-	669	589	589	-	589	589	-	589	589	-	624	624
Audit costs: External	-	1,087	-	898	-	1,997	1,400	1,400	-	1,400	1,400	-	1,400	1,400	-	1,484	1,484
Catering: Internal activities	-	194	-	18	-	28	46	46	-	46	46	-	46	46	-	49	49
Communication (G&S)	850	-	879	-	862	-	909	909	-	950	950	-	1,000	1,000	-	1,060	1,060
Computer services	2,172	3,431	2,274	3,119	932	2,954	3,987	3,987	-	4,147	4,147	-	4,314	4,314	-	4,573	4,573
Consultants: Business and advisory services	15,016	3,889	16,662	5,778	8,780	12,174	6,439	6,439	-	6,211	6,211	-	6,485	6,485	-	6,875	6,875
Legal services (G&S)	-	-	-	1,085	-	-	1,100	1,100	-	1,200	1,200	-	1,300	1,300	-	1,742	1,742
Science and technological services	147,845	13,408	139,838	18,152	18,719	21,272	47,671	47,671	-	12,271	12,271	-	9,784	9,784	-	9,043	9,043
Contractors	1,089	968	1,135	451	666	-	150	150	-	156	156	-	162	162	-	172	172
Maintenance and repairs of other fixed structures	1,089	205	1,135	170	666	-	150	150	-	156	156	-	162	162	-	172	172
Maintenance and repairs of other machinery and equipment	-	763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

7 This is now referred to Data and Knowledge Management

5.1 EXPENDITURE SUMMARY (CONTINUED)

Rand thousand	2019/20		2020/21		2021/22	2022/23				2023/24			2024/25				2025/26
	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Budget estimate	Approved budget	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Planning budget estimate	Planning budget estimate
Other	-	-	-	281	-	-	-	-	-	-	-	-	-	-	-	-	-
Agency and support/outsourced services	5,365	-	5,548	-	5,359	-	3,997	3,997	-	3,204	3,204	-	3,681	3,681	-	3,574	3,574
Consumables: Stationery, printing and office supplies	370	-	-	376	-	112	390	390	-	400	400	-	400	400	-	424	424
Operating leases	1,894	1,301	1,957	1,185	2,074	1,259	2,188	2,188	-	2,287	2,287	-	2,287	2,287	-	2,424	2,424
Travel and subsistence	5,466	2,610	4,168	367	3,556	455	2,361	2,361	-	2,091	2,091	-	2,153	2,153	-	2,282	2,282
Training and development	1,176	499	1,228	832	1,292	654	751	751	-	785	785	-	796	796	-	844	844
Operating payments	(2,672)	3,434	1,112	1,662	3,243	9,948	3,421	3,421	-	3,256	3,256	-	3,259	3,259	-	3,455	3,455
Venues and facilities	450	383	410	61	310	-	327	327	-	292	292	-	305	305	-	323	323
Depreciation	2,659	3,810	2,805	2,348	2,974	410	4,026	4,026	-	4,207	4,207	-	4,392	4,392	-	4,656	4,656
Transfers and subsidies	**-**	**-**	**-**	**90,974**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Other government units	-	-	-	90,974	-	-	-	-	-	-	-	-	-	-	-	-	-
National Government	-	-	-	90,974	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**232,414**	**74,639**	**229,641**	**165,026**	**91,905**	**85,412**	**125,181**	**125,181**	**-**	**90,815**	**90,815**	**-**	**91,815**	**91,815**	**-**	**96,032**	**96,032**

TABLE 3:

5.1.1 PROGRAMME 1: BUDGET - ADMINISTRATION

	2019/20	2020/21	2021/22	2022/23			2023/24			2024/25			2025/26
Expenses Rand thousand	Audited outcome	Audited outcome	Audited outcome	Budget estimate	Approved budget	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Planning budget estimate
Objective/Activity													
Administration	57,438	52,494	46,564	50,012	50,012	-	50,522	50,522	-	52,748	52,748	-	55,913
Economic classification													
Current payments	57,438	52,494	36,072	50,012	50,012	-	50,521	50,521	-	52,748	52,748	-	56,277
Compensation of employees	38,203	36,792	12,139	24,409	24,409	-	25,507	25,507	-	26,666	26,666	-	28,266
Salaries and wages	38,203	36,792	12,139	24,409	24,409	-	25,507	25,507	-	26,666	26,666	-	28,266
Goods and services	15,425	13,354	23,523	21,577	21,577	-	20,807	20,807	-	21,690	21,690	-	23,355
Of which													
Administrative fees	-	264	518	426	426	-	443	443	-	461	461	-	489
Advertising	1,407	454	669	589	589	-	589	589	-	589	589	-	624
Audit costs: External	1,067	898	1,997	1,400	1,400	-	1,400	1,400	-	1,400	1,400	-	1,484
Catering: Internal activities	194	14	28	46	46	-	46	46	-	46	46	-	49
Communication (G&S)	-	-	862	909	909	-	950	950	-	1,000	1,000	-	1,060
Computer services	3,285	3,119	2,954	3,987	3,987	-	4,147	4,147	-	4,314	4,314	-	4,573
Consultants: Business and advisory services	3,319	3,492	5,589	4,739	4,739	-	4,511	4,511	-	4,709	4,709	-	4,992
Legal services (G&S)	-	1,085	-	1,100	1,100	-	1,200	1,200	-	1,300	1,300	-	1,742
Contractors	205	451	666	150	150	-	156	156	-	162	162	-	172
Maintenance and repairs of other fixed structures	205	170	-	150	150	-	156	156	-	162	162	-	172
Other	-	281	-	-	-	-	-	-	-	-	-	-	
Agency and support/outsourced services	-	-	-	852	852	-	277	277	-	621	621	-	658
Consumables: Stationery, printing and office supplies	-	374	112	390	390	-	400	400	-	400	400	-	424
Operating leases	1,301	1,185	1,259	2,188	2,188	-	2,287	2,287	-	2,287	2,287	-	2,424
Travel and subsistence	982	174	228	1,000	1,000	-	700	700	-	700	700	-	742
Training and development	484	377	245	664	664	-	693	693	-	700	700	-	742
Operating payments	3,181	1,450	9,924	3,137	3,137	-	3,008	3,008	-	3,000	3,000	-	3,180
Venues and facilities	-	17	-	-	-	-	-	-	-	-	-	-	-
Depreciation	3,810	2,348	410	4,026	4,026	-	4,207	4,207	-	4,392	4,392	-	4,656
Total	**57,438**	**52,494**	**46,564**	**50,012**	**50,012**	**-**	**50,522**	**50,522**	**-**	**52,748**	**52,748**	**-**	**55,913**

TABLE 4

5.1.2 PROGRAMME 2: BUDGET – APPLIED ENERGY RESEARCH, DEVELOPMENT AND INNOVATION

	2019/20	2020/21	2021/22	2022/23			2023/24			2024/25			2025/26
Expenses Rand thousand	Audited outcome	Audited outcome	Audited outcome	Budget estimate	Approved budget	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Planning budget estimate
Objective/Activity													
Programme 2 Applied Energy and Research	15,834	110,574	27,604	48,606	48,606	-	25,272	25,272	-	26,364	26,364	-	27,118
Economic classification													
Current payments	15,834	19,600	27,604	48,606	48,606	-	25,272	25,272	-	26,364	26,364	-	27,118
Compensation of employees			13,088	15,164	15,164	-	15,701	15,701	-	16,406	16,406	-	17,391
Salaries and wages			13,088	15,164	15,164	-	15,701	15,701	-	16,406	16,406	-	17,391
Goods and services	15,834	19,600	14,516	33,442	33,442	-	9,574	9,574	-	9,958	9,958	-	9,727
Of which [1]	-	-	-	-	-	-	-	-	-	-	-	-	-
Administrative fees	-	197	-	-	-	-	-	-	-	-	-	-	-
Advertising	15	-	-	-	-	-	-	-	-	-	-	-	-
Audit costs: External	20	-	-	-	-	-	-	-	-	-	-	-	-
Computer services	16	-	-	-	-	-	-	-	-	-	-	-	-
Consultants: Business and advisory services	570	736	669	-	-	-	-	-	-	-	-	-	-
Science and technological services	13.399	17,965	47,875	30,952	30,952	-	7,110	7,110	-	7,384	7,384	-	6,999
Agency and support/outsourced services	-	-	811	1,348	1,348	-	1,300	1,300	-	1,360	1,360	-	1,442
Consumables: Stationery, printing and office supplies	-	1	-		-	-		-	-	-	-	-	
Travel and subsistence	1,304	172	82	1,146	1,146	-	1,163	1,163	-	1,214	1,214	-	1,286
Training and development	15	415	37		-	-		-	-		-	-	
Operating payments	209	80	102	-	-	-	-	-	-	-	-	-	-
Venues and facilities	368	29	-	-	-	-	-	-	-	-	-	-	-
Transfers and subsidies	-	90,974	-	-	-	-	-	-	-	-	-	-	-
Other government units	-	90,974	-	-	-	-	-	-	-	-	-	-	-
National government	-	90,974	-	-	-	-	-	-	-	-	-	-	-
Total	**15,834**	**110,574**	**27,604**	**48,606**	**48,606**	**-**	**25,272**	**25,272**	**-**	**26,364**	**26,364**	**-**	**27,118**

TABLE 5

5.1.3 PROGRAMME 3: BUDGET – ENERGY EFFICIENCY

	2019/20	2020/21	2021/22	2022/23			2023/24			2024/25			2025/26
Expenses Rand thousand	Audited outcome	Audited outcome	Audited outcome	Budget estimate	Approved budget	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Budget estimate	Revised budget estimate	Changes from budget estimate	Planning budget estimate
Energy efficiency programme	1,367	1,958	21,736	26,563	26,563	-	15,021	15,021	-	12,703	12,703	-	12,637
Economic classification													
Current payments	1,367	1,958	21,736	26,563	26,563	-	15,021	15,021	-	12,703	12,703	-	12,637
Compensation of employees	-	-	7,735	5,429	5,429	-	5,673	5,673	-	5,928	5,928	-	6,284
Salaries and wages	-	-	7,735	5,429	5,429	-	5,673	5,673	-	5,928	5,928	-	6,284
Goods and services	1,367	1,958	14,001	21,134	21,134	-	9,347	9,347	-	6,775	6,775	-	7,182
Of which [1]													
Administrative fees	-	4	-	-	-	-	-	-	-	-	-	-	
Advertising	-	9	-	-	-	-	-	-	-	-	-	-	
Catering: Internal activities	-	4	-	-	-	-	-	-	-	-	-	-	
Computer services	130	-	-	-	-	-	-	-	-	-	-	-	
Consultants: Business and advisory services	-	1,550	5,916	1,700	1,700	-	1,700	1,700	-	1,776	1,776	-	1,883
Science and technological services	190	187	7,646	16,719	16,719	-	5,161	5,161	-	2,400	2,400	-	2,044
Contractors	763	-	-	-	-	-	-	-	-	-	-	-	-
Maintenance and repairs of other machinery and equipment	763	-	-	-	-	-	-	-	-	-	-	-	
Agency and support/outsourced services	-	-	-	1,797	1,797	-	1,627	1,627	-	1,700	1,700	-	1,474
Travel and subsistence	274	18	145	219	219	-	229	229	-	239	239	-	253
Training and development	-	40	294	88	88	-	92	92	-	96	96	-	102
Operating payments	10	132	-	285	285	-	248	248	-	259	259	-	275
Venues and facilities	-	14	-	327	327	-	292	292	-	305	305	-	323
Energy efficiency programme	**1,367**	**1,958**	**21,736**	**26,563**	**26,563**	**-**	**15,021**	**15,021**	**-**	**12,703**	**12,703**	**-**	**12,637**

TABLE 6

5.1.3.1 PROGRAMME 4: BUDGET – ENERGY SECRETARIAT

SANEDI has been hosting the Energy Secretariat since its appointment by the DSI in 2020. There is however no alignment between the National budget process and the budget process of the Energy Secretariat and as such funds available for the Energy Secretariat are only confirmed during the year. It expected that the funding allocation would be in line with previous financial year, at about R181 million. The allocation for 2022/2023 is R 181 million (which was only confirmed in November 2022) and we do expect the allocation for the 2023/2024 to be +/- 5% of the allocation for 2022/2023. The administrative structure of the Energy Secretariat is also yet to be confirmed, pending the finalisation of the completion of the Theory of change mapping process currently under way for the programme structure development process. This process is expected to be completed during the 23/24 financial year and once completed, funding towards the establishment of the energy secretariat will be made available by the DSI. In the past an amount of R10 million had been budgeted for by the DSI for the Energy Secretariat. According to the DSI funding allocation cycle, SANEDI is not able to provide with a detailed budget for the 2023/2024 as the DSI is expected to confirm such a budget in or around September 2023. This is the way the Energy Secretariat has been operating for the past 2 years.

5.1.3.2 PROGRAMME 5: BUDGET – SPECIAL PROJECTS

This is a new proposed programme from SANEDI that is not funded. The development of the APP was finalised when the National Treasury process to align budget and the APP closed during October 2022 and this makes it impossible to fund the programme from 2023/2024 fiscal. An estimated budget of R20 million is required for the programme and funds will be raised through partnerships.

6. PLANNING TOOLS

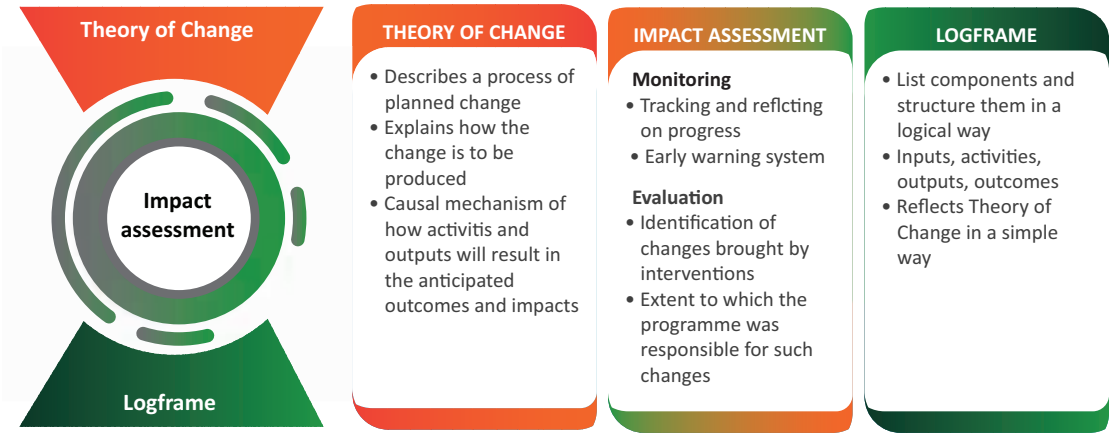


Figure 12: Theory of change as a planning tool

6.1 THEORY OF CHANGE

SANEDI's Theory of Change (TOC) allows mapping the change that SANEDI is pursuing. and illustrates how the activities of the organisation are envisaged to contribute to the change. By institutionalising TOC, SANEDI will be able to monitor and track its contributions to the energy sector and the country, considering the pursued outcomes and impacts. By conducting regular implementation evaluations and making use of the recreated TOC, it will also be able to identify the areas of success and challenges, which will assist the organisation in informing and refining future planning and efforts, so SANEDI's contribution can be increasingly targeted and effective.

SANEDI's TOC is in line with SANEDI's Strategic Plan (SP) for the period between 2020/25. It reflects vision, mission and objectives for the 2020/25 period, to ensure that the assessment of the organisation's performance is fair and is done in light of the activities that are pursued during the analysis period. The Mandate of the organisation is expected to remain the same in the foreseeable future and demand the organisation to deliver EE, and Energy Research and Development (ERD). However, the ever-changing technology landscape, the macro-economic challenges, and the resource constraints, has forced the organisation to prioritise the needs for the 2020/25 period. As outlined in the SP 2020/25, the organisation re-positioned itself to focus on three areas of delivery: -

- Service delivery through the Smart Cities programmes, particularly as it relates to transport, energy, revenue and asset management,
- Decarbonisation through technological programmes, compliance monitoring and awareness campaigns, and
- Information and Knowledge Management to increase the National dataset on energy-related information, thereby facilitating improvements in public sector policy making and private sector investment decisions.

- **LOGFRAME**

The Logframe, or Logical Framework tool was used for improving the planning, implementation, management, monitoring and evaluation of SANEDI's programmes. It provided a As a results chain, it described impact, outcomes, outputs, activities, and inputs, and showed the logical linkages between them.

Indicators, baselines and targets at each level of the results chain are developed to measure progress towards achieving the desired results. Assumptions and risks form the basis of the Logframe. Indicators and targets developed through the Logframe are reflected in SANEDI's SP, Annual Performance Plans (APP) and Annual Operating Plans (AOP).

6.2 SWOT

In revising the APP, SANEDI's internal characteristics, strengths and weaknesses were assessed with a SWOT (strengths, weaknesses, opportunities, and threats) assessment in order to build on its strengths and overcome or work around its weaknesses in the action plan.

The SWOT assessment assessed the external environmental conditions, or opportunities and threats, that favour or threaten SANEDI's strategy. The progress made in responding to SWOT analysis was emphasised in the planning process.

6.3 IMPACT ASSESSMENT FRAMEWORK (IAF)

IAF is envisaged to enable SANEDI to track and assess the impact of its work going forward. The IAF framework aims to assist SANEDI in:-

- Conducting comparative assessments of SANEDI's contributions to similar developmentalorganisations,
- Monitoring and tracking SANEDI's contributions to the energy sector and the country,
- Showcasing SANEDI's contribution and building the organisation's reputation,
- Inspiring innovation and interest in the energy sector among South Africa's youth, and
- Informing and refining future planning and efforts so SANEDI's contribution can be increasingly targeted and effective.

The above scope for the IAF is wide-ranging and cannot be responded to by a single tool. Therefore, SANEDI comprises of three elements that would allow it to measure the aspects outlined above, namely:

- A benchmarking tool for comparing the organisation's performance against other similar institutions in other countries, or organisations in South Africa that are also meant to contribute to the desired impacts pursued by SANEDI, and
- A reputational framework to measure and showcase SANEDI's reputation.

6.4 BALANCED SCORE CARD

The Balanced Score Card was used by SANEDI as a strategic planning and management tool that aligned the entity's functions with its vision and strategy. It is envisioned that SANEDI's Balanced Score Card would be used to improve the entity's internal and external communications, as well as to act as a tool for the Board to measure Management's performance against pre-determined results.

Using the SANEDI's Balanced Score Card approach suggests that the organisation could be viewed from six perspectives i.e.:

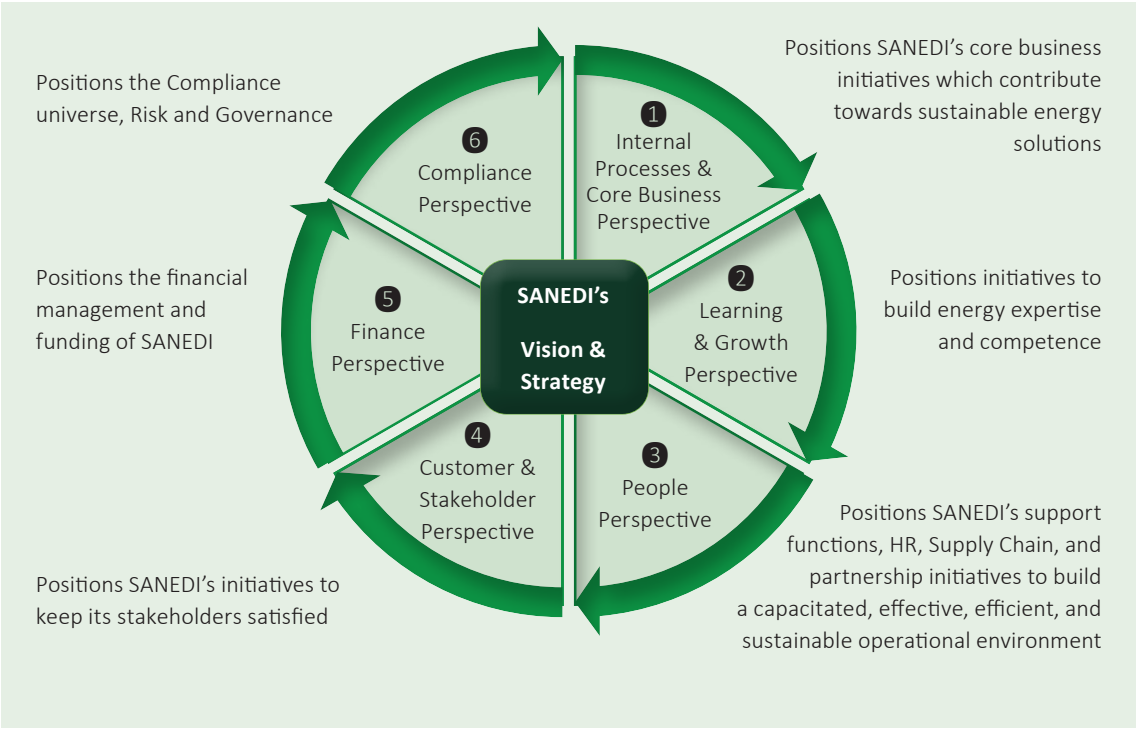


Figure 13: SANEDI's Balanced Score Card

7. ORGANISATIONAL STRUCTURE

The organogram includes the SANEDI Board directly overseeing the Board Committees: Board Audit and Risk Committee (BARC), Remuneration Committee (RC), Projects Committee (PC), Funding and Finance Committee (FFC), and Social Justice and Ethics Committee (SJEC). The SANEDI CEO reports to the Board and oversees three programmes: Administration IP Management and Commercialisation, Applied Energy Research, Development and Innovation, and Energy Efficiency. Within those programmes are several sub-programmes as shown in the figure below:

7.1 BOARD STRUCTURE

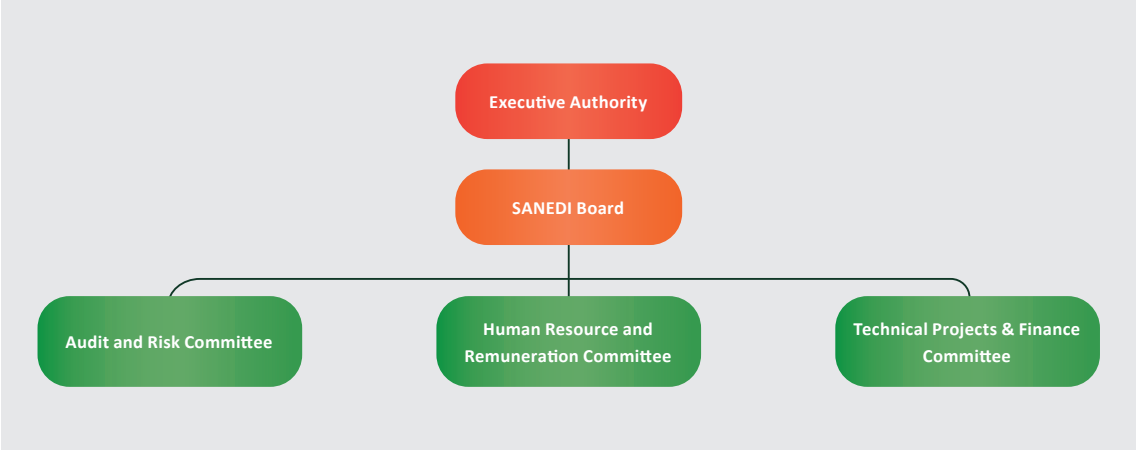


Figure 14: Board Structure

7.2 MANAGEMENT ORGANOGRAM

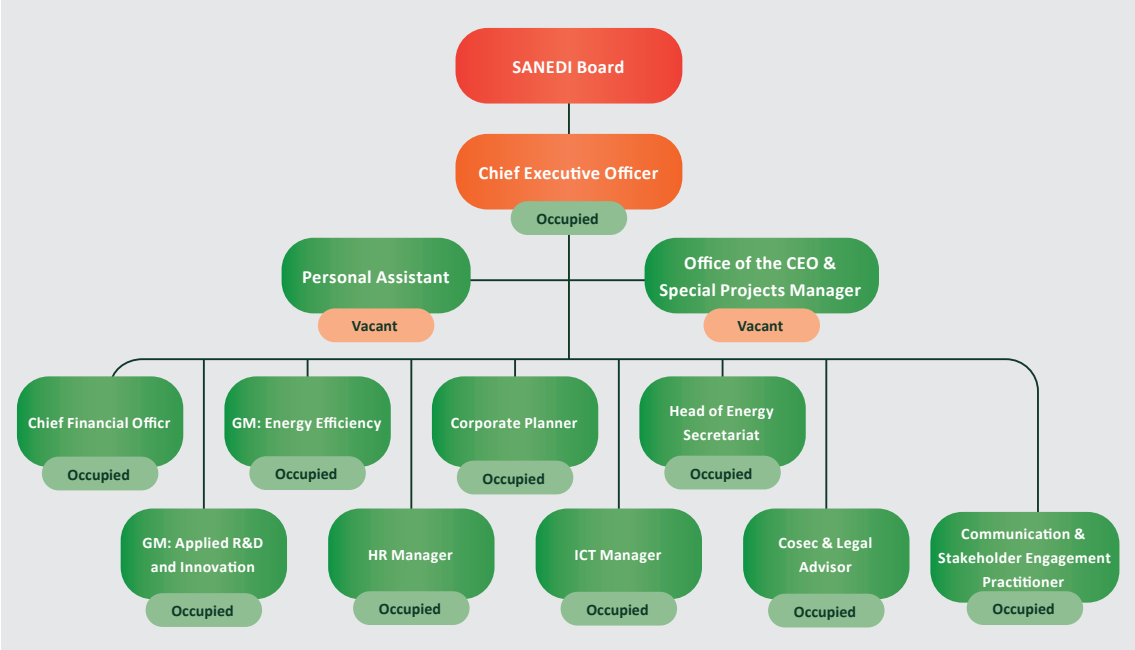


Figure 15: Organogram

7.3 PROGRAMMES

SANEDI has undergone an organizational restructuring and benchmarking exercise to ensure efficient utilization resources in delivering the mandate. Implementation of the new organizational structure will likely occur during the strategic cycle presented. Due to the broad mandate, and limited funds available, resource effectiveness and efficiency by focusing on real value creation is key to the long-term sustainability of SANEDI. The programmes and sub-programmes highlighted in red are new as shown in Figure 16 below

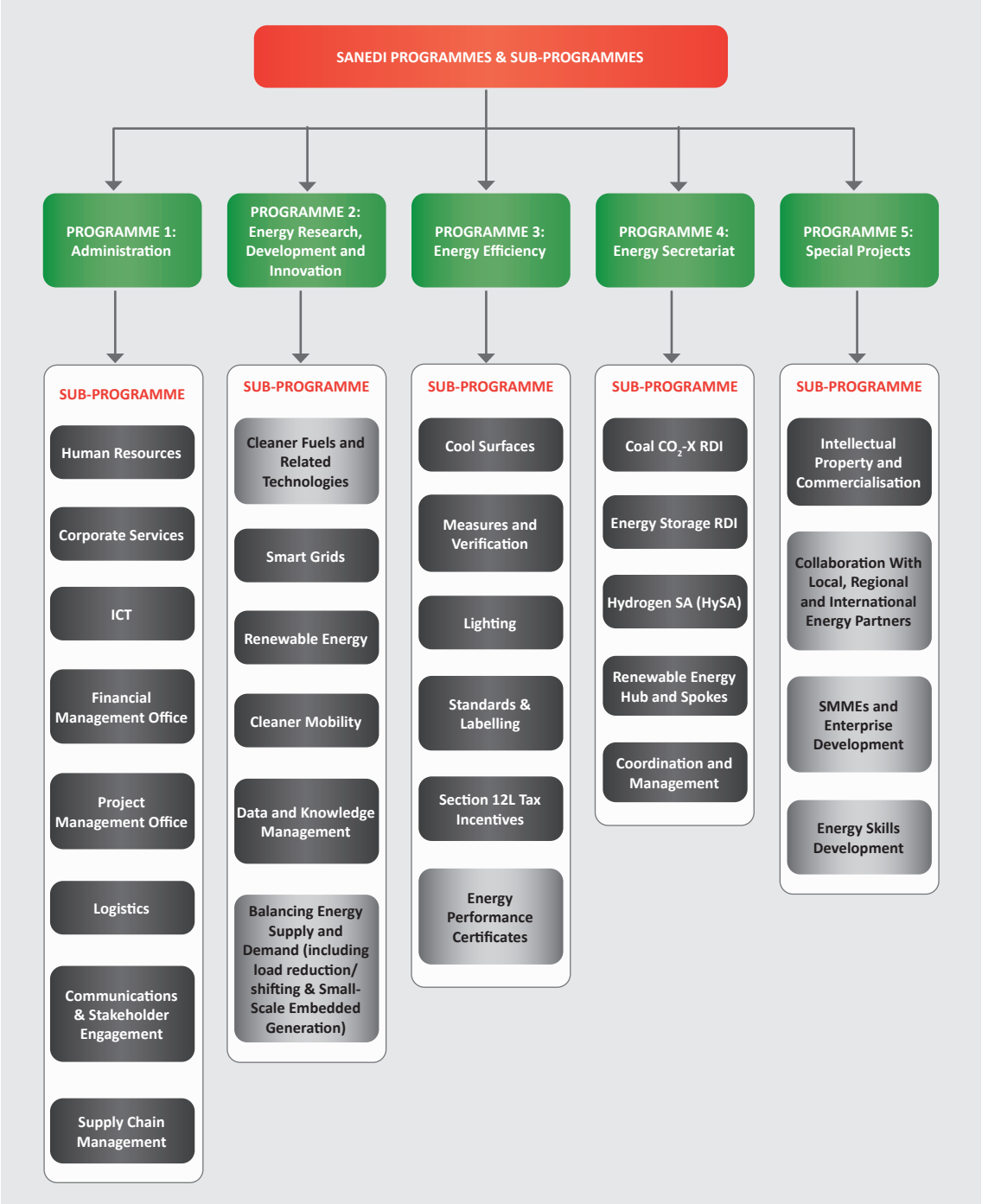


Figure 16: Programmes and Sub-Programmes

PART C:
MEASURING OUR PERFORMANCE

8. MEASURING OUR PERFORMANCE

8.1 PROGRAMME 1 : ADMINISTRATION

The following is a list of programmes and associated sub-programmes conducted by SANEDI.

The purpose of Programme 1 is to create an effectual delivery environment for SANEDI that is fully compliant with all statutory requirements.

SUB-PROGRAMMES

14.1.1. Human Resources

Managing employee related processes and affairs, as well as administration of employee benefits in an efficient manner to ensure that SANEDI has an adequately capacitated, motivated staff complement.

14.1.2. Information and Communications Technology (ICT)

Support efficient operations and ensuring data processing, integrity and availability.

14.1.3. Corporate Services

Facilitate transparency and compliance from a Legislative and Governance perspective. Incorporating all lines of business and support activities relating to the Board and Board Committees.

14.1.4. Financial Management

Delivery of business and support activities relating to the effectual financial management, financial reporting and auditing practices.

14.1.5. Supply Chain Management

To ensure efficient and effective Supply Chain Management (SCM) processes, that are compliant procurement regulations.

14.1.6. Communications & Stakeholder Engagement

To ensure effective communications with all Stakeholders through robust Stakeholder engagement, client satisfaction surveys, public awareness campaigns in collaboration with the Department of Mineral Resources & Energy (DMRE) and media intelligence support services.

14.1.7. Shared Logistics

To ensure compliant health and safety shared facilities, resources for a conducive and productive working environment.

14.1.8. Project Management Office

Ensure adequate project selection resource allocation, Project Management and performance monitoring.

8.1.1 SUB-PROGRAMME 1: HUMAN RESOURCES

To make this possible, the previously approved Human Resources (HR) strategy that was formulated a few years ago and does not align with the current organisational strategy, will have to be changed to align with the recent changes within the organisation. The focus in the 2022/23FY is to review the strategy, prioritise the Balance Score Card, Talent Management, Performance Management and start introducing an integrated people management system.

To improve reporting and monitoring, SANEDI needs to have a SMART (specific, measurable, attainable, realistic, and timeous) Performance Management system that can be improved by a Balanced Score Card whereby the Key Performance Areas (KPA) across the organisation are the same and only differ in internal processes. All Executives and Management will be measured on the same dimension in their respective areas of work. The Score Card will also assist in aligning the KPA to the Annual Performance Plan (APP) and organisational strategy.

In addition, HR will conduct a culture survey to gauge the impact of the country's lockdown on SANEDI's working culture. On completion of the survey, and depending on the outcomes, interventions to resolve the challenges will be sought and implemented , or promote SANEDI's culture to a more desirable state.

8.1.2 SUB-PROGRAMME 2: INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

SANEDI has made significant investment in Information Systems infrastructure which enabled the organisation to continue to operate during the period of hard lockdowns. Information Technology (IT) is a crucial part of the business, and a key enabler in our ability to effectively deliver on our Mandate and maintain an effective and efficient control environment.

Several strategic IT projects are planned which should further improve efficiencies:

- **Installation of a Project server solution for the organisation** – SANEDI has implemented a Project Management Office (PMO) to assist with the implementation of projects across all Departments. Currently, these projects operate using different kinds of software which includes Microsoft Excel and Microsoft Wor ady procured some hardware, however, additional software and hardware must be procured to house these databases and ensure that the data is backed up and safely stored. Furthermore, an internet connection is required to facilitate the hosting and the safety of the data.

The current systems stated below are required to be hosted by SANEDI on behalf of the (DMRE) as we pursue the vision of establishing a data centre at SANEDI:

- 12L database,
- GIS system,
- SEEL system,
- Additional WASA databases,
- MDMS system, and
- Standards and Labelling system.

8.1.3 SUB-PROGRAMME 3: FINANCE

SANEDI has consistently managed to obtain an unqualified audit opinion from the Auditor-General of South Africa (AGSA) indicative of a sound control environment that exists within the organisation. For the year under review, increased focus will be made on improving reporting for decision making, and maintenance of a sound control environment, to ensure that the entity retains an unqualified audit from the Auditor – General (AG).

The Internal Control environment will undergo continuous reviews with the audit action plans developed and implemented by the Internal Audit Department within a reasonable period of time, to avoid material weaknesses in the control environment. AGSAs audit findings will continue to be addressed within the financial year that they are raised, focusing on addressing root causes to avoid repeat findings and material findings that may have an impact on that audit outcomes of the organisation.

Finance Department working with the programmes, will continue to drive the implementation of funding plans that will ensure that the organisation's Mandate is adequately funded through the leveraging of Climate funds as available. This is a continuous process which will ensure that SANEDI takes advantage of available opportunities. Cost containment measures will continue to be implemented for operational costs to be kept within inflationary increase. Any increases of employee related costs will continue to be made based on market related surveys, and will endeavour to be as competitive as possible in order to attract, and retain the right calibre of employees into the organisation. This being implemented in partnership with HR.

SANEDI will continue to monitor the costs associated with the use of consultants to ensure that they stay within a reasonable range, with use of consultants only, when necessary, e.g., where capacity constraints exist, where skills are not readily available within the organisation, and where funding arrangements for the use of consultants require it.

8.1.4 SUB-PROGRAMME 4: RISK MANAGEMENT

We continue through our Risk Management system to monitor the risks associated with the implementation of the SP and APP. Historical performance indicates that current systems are appropriate, and have not resulted in the materialisation of any of the identified risks.

For the current financial year, we will focus on maintaining the status quo in relation to Risk Management, although we will conduct reviews of our current Risk Management systems to identify areas for improvement. The function is also significantly under resourced, and measures to ensure that there is adequate capacity with Risk Management will be pursued. The focus of Risk Management is to ensure that Business and Operational Risks are mitigated by various risk owners. The impact of Risk Management is to monitor and reduce the impact of risks that are threatening the organisation and improve on the action plans to mitigate risks.

8.1.5 SUB-PROGRAMME 5: COMMUNICATIONS & STAKEHOLDER ENGAGEMENT

Stakeholder engagement is the process utilised by SANEDI to understand and involve Stakeholders in its activities and decisions. For identifying, understanding, and responding to sustainability issues and concerns, as well as for reporting and performance, the institute uses the process to engage relevant Stakeholders.

Stakeholder engagement helps SANEDI to meet its strategic needs ranging from gathering information and trends that may impact our activities, improving transparency, building the trust of the Stakeholders whose support is critical for our long-term success, to sparking the innovation and organisational change needed to meet new challenges and opportunities.

By getting to understand our Stakeholders, SANEDI is able to better understand what they want, when they want it, how engaged they are, and how the entity's plans and actions will affect their expectations and goals.

8.1.6 PROGRAMME 1: ADMINISTRATION - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

8.1.6.1 SUB-PROGRAMMES: 1. HUMAN RESOURCES, 2. ICT AND 4. RISK MANAGEMENT - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output Indicators	Annual Targets						
			Audited Performance			Estimated Performance	MTEF Targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
A capacitated, effective and efficient operational environment (within which SANEDI will discharge its mandate)	Critical business risk factors identified, managed as per Risk Management Plan.	Quarterly review of strategic risks and operational risks	>90%	>90%	100%	>95%	4	4	4
	Implementation of Corporate ICT Plan in relation to the IT Strategy	ICT vulnerability assessment and penetration test.	New Output Indicator				2	2	2
		ICT Governance maturity assessment.	New Output Indicator				70 %	70 %	70 %
	HR- Talent Management.	Percentage of training undertaken as per EXCO approved Annual Training Plan.	80%	100%	85 %	90%	80%	100%	100%
	HR- Recruitment	Vacancy rate of funded positions	5%	<5%	4,25 %	<5%	<5%	<5%	<5%
	HR- Employment Equity	Percentage deviation from employment equity targets.	>5%	<5%	2.04 %	<5%	<10%	<10%	<10%
	Supply Chain Management	Procurement as per the Procurement Plan.	New Output Indicator				60 %	60 %	60 %
	Governance Risk and Compliance	Compliance Universe report	New Output Indicator				4	4	4

TABLE 7

8.1.6.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: HUMAN RESOURCES, ICT AND RISK MANAGEMENT

Output indicators	Annual Targets	Q1	Q2	Q3	Q4
Quarterly review of strategic and operational risks	4	1	1	1	1
ICT vulnerability assessment and penetration test	2	-	1 internal	-	1 external
ICT Governance maturity assessment.	70 %	20 %	40 %	60 %	70 %
Percentage of training undertaken as per EXCO approved Annual Training Plan	80 %	20 %	40 %	60 %	80 %
Vacancy rate of funded positions.	<5 %	<5 %	<5 %	<5 %	<5 %
Percentage deviation from employment equity targets.	<10 %	<10%	<10%	<10%	<10%
Procurement as per the Procurement Plan.	60 %	10 %	20 %	40 %	60 %
Compliance Universe report	4	1	1	1	1

TABLE 8

8.1.7 SUB-PROGRAMME 3: FINANCIAL MANAGEMENT - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

8.1.7.1 OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS: FINANCIAL MANAGEMENT

Outcome	Outputs	Output indicators	Annual Targets						
			Audited performance		Estimated Performance		MTEF targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
A capacitated, effective, efficient and sustainable operational environment (within which SANEDI will discharge its mandate)	Financial management	Approved Sustainable Funding	New Output Indicator		New Output Indicator		1	1	1
		External Audit outcome	New Output Indicator		New Output Indicator		Unqualified audit	Unqualified audit	Unqualified audit
		Percentage % of Internal Audit findings resolved	New Output Indicator		New Output Indicator		80 %	80 %	80 %
		Ratio of project costs to admin expenditure	New Output Indicator		New Output Indicator		30/70	30/70	30/70
		Percentage (%) Capex budget spent	New Output Indicator		New Output Indicator		95%	95%	95%
		Funding leveraged as percentage (%) of received allocation	New Output Indicator		New Output Indicator		20% of allocated budget	20% of allocated budget	20% of allocated budget
		Percentage % of expenditure in relation to approved Budget	New Output Indicator		New Output Indicator		90%	90%	90%
		Percentage (%) of funded Budget overspent	New Output Indicator		New Output Indicator		0%	0%	0%

TABLE 9

8.1.7.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGET: FINANCIAL MANAGEMENT

Output Indicators	Annual Targets	Q1	Q2	Q3	Q4
Approved Sustainable Funding Model	1		1		
External Audit outcome	Unqualified Audit		Unqualified Audit		
Percentage % of Internal Audit findings resolved	80 %	20 %	40 %	60 %	80 %
Ratio of project costs to admin expenditure	30/70	10/90	15/85	20/80	30/70
Percentage (%) Capex budget spent	95 %	0 %	5 %	10 %	95 %
Funding leveraged as percentage (%) of received allocation	20 %	5 %	10 %	15 %	20 %
Percentage % of expenditure in relation to approved Budget	90 %	25 %	50 %	75 %	90 %
Percentage (%) funded Budget overspent	0 %	0 %	0 %	0 %	0 %

TABLE 10

8.1.8 SUB-PROGRAMME 5: COMMUNICATIONS AND STAKEHOLDER MANAGEMENT - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

8.1.8.1 OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS: COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT

Outcome	Outputs	Output indicators	Annual Targets						
			Audited performance			Estimated Performance	MTEF targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Inform and increase awareness of sustainable energy	Developing and implementing communications strategy	Communications and stakeholder engagement strategy and Plan reviewed and approved	New Output Indicator				1	1	1
		Report on implementation of communications and stakeholder engagement strategy and plan					4	4	4
	Public relations management	Number of media engagements (media releases)					12	12	12
		Number of Strategic Energy Dialogue					1	1	1
		Outreach programmes (Community consultations to obtain buy-in)					1	1	1
		Number of Stakeholder perception surveys					1	1	1
	Social / Digital media / Radio and Television	An interactive website maintained annually	New Output Indicator				2	2	2
		Social Media Perception Index Report	New Output Indicator				1	1	1
		Radio and Television engagements					8	8	8
	External Events	Number of industry knowledge sharing events and marketing platforms hosted to promote energy related market/industry developments.	New Output Indicator				1	1	1
		SANEDI Annual Conference	New Output Indicator				1	1	1

TABLE 11

8.1.8.2 OUTPUT INDICATORS AND TARGETS: COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT

OUTPUT INDICATORS	Annual Target	Q1	Q2	Q3	Q4
Communications and stakeholder engagement strategy and plan reviewed and approved	1	1	-	-	-
Report on implementation of Communications and Stakeholder Engagement	4	1	2	3	4
Number of media engagements (media releases)	12	3	6	9	12
Number of Strategic Energy Dialogue	1	-	-	1	-
Outreach programmes (Community consultations to obtain buy-in)	1	-	-	-	1
Number of stakeholder perception surveys	1	-	-	1	-
An interactive website maintained annually	2	-	1	-	2
Social media perception index report	1	-	-	1	-
Radio and Television engagements	8	2	4	6	8
Number of industry knowledge sharing events and marketing platforms hosted to promote energy related market/industry developments.	1	-	-	-	1
SANEDI Annual Conference	1	-	-	1	-

TABLE 12

8.2 PROGRAMME 2: APPLIED ENERGY RESEARCH, DEVELOPMENT & INNOVATION

Purpose: The purpose of Programme 2 is to facilitate knowledge creation that can support energy-related planning and decision-making, and accelerating the transformation of the energy market and landscape in the country.

Sub-Programme 1	Cleaner Fuels and Related Technologies
Purpose	Alternative low carbon energy and mitigation options to limit serious, negative and environmental impacts from conventional energy sources.

Sub-Programme 2	Renewable Energy
Purpose	Support the accelerated and informed development of South Africa's clean energy portfolio and RE sector.

Sub-Programme 3	Smart Grids
Purpose	Demonstrate and assess intelligent energy systems infrastructure, as an enabler for municipal sustainability.

Sub-Programme 4	Data and Knowledge Management
Purpose	Collation, development and utilisation of credible, objective and high-quality data and information relating to the areas of SANEDI's responsibility.

Sub-Programme 5	Cleaner Mobility
Purpose	Developing Cleaner Mobility solutions for public transportation.

Sub-Programme 6	Balancing Energy Supply & Demand
Purpose	Contribute towards alleviating the negative impact of loadshedding and shortage of liquid fuel and gas.

During October 2019, Cabinet approved the Integrated Resource Plan (IRP) 2019, which recognises the challenges that South Africa faces as a country within the National and Global energy landscape, and proposes solutions to address them. In the report, opportunities are also highlighted that could significantly improve infrastructure planning and development, allowing for progress towards achieving each goal of the 2030 National Development Plan (NDP).

The IRP recognises socio-economic challenges of increasing electricity tariffs, shortages of generation capacity emanating from the challenges that Eskom is faced with, as well as the over-reliance on coal as the primary source of energy. These have a significant negative impact on the economic growth of the country.

The IRP also recognises opportunities that are brought about, by emerging technological advancements and the concomitant decreasing costs of production. These developments, make global access to energy through renewable and off-grid technologies such as solar PV, bioenergy, and wind through microgrids and battery storage much more possible for both rural and urban applications.

Reliance on coal for electricity or liquid fuels generation is starting to become less viable, as the banking sector moves away from financing coal-based energy generation. This constraint is making it imperative for the country to start aggressively investing in cleaner coal technologies, and ensuring that the country begins to adhere to minimum global emission standards. South Africa, as a Party to the Paris Agreement, has obligations towards reducing its Green House

Gas (GHG) emissions as set out in the 2016 Nationally Determined Contributions (NDC). As disruptive technologies are developed and applied across the world, it becomes crucial that these technologies are assessed for their potential adoption and deployment within the South African energy landscape, to ensure their appropriateness for the country in support of the advancement of the country's development goals. Where it becomes evident that transition is required from one technology to the next, attention should also be given to issues of the impact of such a transition. In this regard, a just transition is required to minimise the adverse impacts on affected fossil energy sectors and communities who depend on them for socio-economic development. The development of concomitant policies also needs to be supported by accurate, reliable, and timeous data and research information.

SANEDI's contribution then becomes crucial in supporting policy formulation, as well as piloting and demonstrating new technologies to inform policy and to support the adoption of new technologies.

For the (2020/25) Medium Term Strategic Framework (MTSF) period, SANEDI will be mainly focusing on the provision of information, developing and maintaining datasets, and implementing pilot and demonstration projects that will enable, strengthen, and support the ability of Government and all sectors of the economy, to collectively ensure that there is the security of energy supply through several targeted initiatives.

8.2.1 SUB-PROGRAMME 1: CLEANER FUELS AND RELATED TECHNOLOGIES

During 2012, the South African Carbon Capture and Storage (CCS) Roadmap was endorsed by Cabinet. Recently, delays and the incorporation of capture, utilisation and mineralisation saw the phylogeny of a refreshed Roadmap. The Pilot CO_2 Storage Project and the Pilot CO_2 Capture project conflate in the integrated CCS Demonstration Project circa 2026. The consummation of the overall Carbon Capture, Utilisation and Storage (CCUS) programme is anticipated during 2030.

Through demonstrated clean energy initiatives, SANEDI will support among others, the Sector Education and Training Authorities (SETAs) and Incubators, towards enabling the development of technology, skills, and energy economy within not only the industrial and commercial space, but also Small, Medium Micro Enterprises (SMMEs) in the clean energy sector. We are now changing Cleaner Fossil Fuels to Cleaner Fuels and Related Technologies.

8.2.1.1 SUB-PROGRAMME 1: CLEANER FUELS & RELATED TECHNOLOGIES - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output indicators	Annual Targets						
			Audited performance			Estimated Performance	MTEF targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Contribute to sustainable energy solutions.	Roadmap and Business Case for Cleaner Fuels and Related Technologies approved.	Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies, or technology roadmaps and demonstration projects/facilities.	3	-	1	1	1	1	1
		Approved report on Cleaner Coal Technologies collaborations.	New indicator				1	1	1

TABLE 13

8.2.1.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: CLEANER FUELS & RELATED TECHNOLOGIES

Output Indicators	Annual Targets	Q1	Q2	Q3	Q4
Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies, or technology roadmaps and demonstration projects/facilities.	1	-	-	-	1
Approved report on Cleaner Coal Technologies collaborations	1	-	-	-	1

TABLE 14

8.2.2 SUB-PROGRAMME 2: RENEWABLE ENERGY

The Clean Energy sub-programme will focus on developing pilot and demonstrate Sustainable Hybrid Energy Technologies in different applications with the aim of providing research, to showcase potential, create data, develop policy recommendations, and insights for decision-makers and industry to inform potential uptake of such technologies in the commercial and industrial sectors.

JUST TRANSITION

As the country transitions its power generation infrastructure from fossil-based to a cleaner, environmentally sustainable energy infrastructure, there is a need to ensure that the transition happens in a manner that is equitably and socially just, focusing on local communities and people. The decommissioning of power stations that are coming to their end of life, as well as the transition of Fossil Fuels, presents a challenge of ensuring that communities and people stand to be negatively affected.

SANEDI has been involved through several partnerships in up skilling, and training artisans and professionals in an effort to ensure that people are capacitated and prepared for future jobs that will be brought about by this transition. The transition to new technologies will create opportunities for dialogue and engagement with Stakeholders to bring about an understanding of the transition and the need thereof, and the need to understand the new technologies as we move away from the traditional methods of energy supply.

SANEDI will focus on the engagements with Stakeholders with the objective of ensuring that there is understanding, buy-in, and adoption of new technologies by communities in general, opportunities for new industries, jobs are harnessed, and there is the commercialisation of these technologies.

WIND RESOURCE MAP

The Wind Atlas for South Africa (WASA) project is is a renewable resource measurement project, for wind potential in South Africa, that has seen 18 wind measurement masts built across five Provinces. Providing reliable high-resolution data on the wind energy resource for South Africa, has the ultimate benefit of being able to level the playing field for wind energy developers, and provide a much-needed boost in Renewable Energy (RE) site development. Data generated from these masts will continue to be a useful tool to inform policy decision-makers, investors, researchers, and other Stakeholders in providing reliable and accurate wind data at the five different Provinces to enable the continuous assessment of wind potential in South Africa. The project is currently in its third phase and is being undertaken in partnership with the Department of Mineral Resources & Energy (DMRE), South African Weather Services (SAWS), Council for Scientific and Industrial Research (CSIR), and the Technical University of Denmark (DTU).

From the IRP, wind has been identified as one of the least costs' options for electricity generation in the country, and is expected to contribute 1600MW of electricity by 2030. SANEDI will continue its partnership with South African Renewable Energy Technology Centre (SARETEC) with regards to the training of wind technicians as we support the industry, by ensuring that there will be appropriate skills available in the country. We will also pursue pilot studies, that will show the potential of locally developed wind technologies for commercialisation and mass rollout. The new policy of Government allowing their own generation by business and Municipalities, creates an opportunity to create sustainable businesses and jobs in the wind energy space.

PV AND ENERGY STORAGE PILOTS

In partnership with various Stakeholders and collaborators, SANEDI will explore opportunities for Photovoltaics' (PV) and battery storage as options for ensuring energy security in South Africa.

SANEDI will furthermore explore, map, with thorough modelling of scenarios, identify opportunities for consolidating environmental rehabilitation initiatives with power generation opportunities, and exploring the potential for repurposing sites from retired power plants as sites for RE power plants. Feasibility studies supporting this concept will, as far as funding allow, be conducted with the aim of developing viable business cases should they be a pursuable option.

Through its partnership with the Department of Defense (DoD), SANEDI is exploring the possibility of piloting fit-for-purpose micro, small and medium scale PV with battery storage for energy security to meet National priority demand within the Defence Force Mandate.

SOLTRAIN

The Solar Thermal Training and Demonstration Initiative (SOLTRAIN), funded by the Austrian Development Agency (ADA) has been active within South Africa since 2009. SANEDI has collaborated with this initiative since its inception, and since 2016 is the official implementation partner of this project in the country. To date, it has achieved over 600 demonstration systems, over 4000 persons trained, awareness generation, industry capacitation and boost, as well as developing business cases and roadmaps for solar thermal implementation across six South African Development Community (SADC)

country partners. Through this project, South Africa has been able to place the largest district heating system in Saharan Africa, marking the country in the top 20 in 2019.

PLASWEN

SANEDI commissioned the South African Nuclear Energy Corporation (NECSA) to design, build and demonstrate a proof-of-concept waste pyrolysis machine. The unit can treat between 0,2 and 0,5 tonnes of municipal green waste per day, while able to produce between 10 and 25 kW. The unit can further treat COVID-19 material waste, mixed solid waste, and tyres. It is scalable and can treat larger waste volumes and produce more electricity over time.

SANEDI CSIR THERMAL LAB

South African industry has historically developed into an environment of low coal and electricity prices. This has resulted in a wide range of industrial processes that are inefficient and carbon intensive. Rapidly increasing energy costs, coupled with the need to reduce GHG emissions, requires industrial consumers to optimise, and in some cases redesign their thermal generation and distribution systems. Waste Heat Recovery (WHR), Power-to-Heat (PtH) and Thermal Energy Storage (TES) technologies have the potential for concurrent cost savings and decarbonisation, but the development of these technologies requires innovative Research and Development (R&D) solutions for the South African market.

Initial objectives of this lab are to conduct modelling and technology development into WHR, PtH and TES systems to support industrial competitiveness. Simulation and analysis will guide the optimisation of thermal energy systems, and in cases where off-the-shelf solutions are not readily available in the market, targeted R&D will be conducted in partnership with industry to develop novel solutions.

SANEDI DoD PARTNERSHIP

SANEDI and the DoD are currently engaged in an energy collaboration that allows them to essentially pilot and demonstrate technologies that are fit for purpose on DoD facilities. These technologies stretch across the EE and RE space and are designed to be able to prove that RE technologies can be adapted to deliver according to requirements across the variety of sectors. Currently SANEDI has 17 active projects at different scales with the National Defence Force, demonstrating technologies such as Cool Surfaces, Photovoltaics', biogas, storage, energy efficient lighting, energy efficiency, energy security, water treatment using EE and RE. Included in all of these is skills development, technology proof and transfer, ultimately leading to an economic boost through industry support during project duration and subsequent business case and return on investment development based on in situ technology performance.

DSI SOLAR RDI PROGRAMME

This programme is designed to accelerate solar technologies in the market, create industry and skills in the sector in South Africa, and advance new and innovative technologies to pilot and potential commercial stage. The mainstream component of this project has yielded three primary outputs, an innovative inverter technology, waste to energy technology and a portable solar energy device that can be scaled up to container size for small and micro business use. This programme is currently winding down, though further offshoots will be showcased under the Energy Secretary within SANEDI.

INTERNATIONAL RELATIONS

SANEDI represents South Africa and the DMRE in several International fora. At least three of these are within specific technologies of the International Energy Agency (IEA) task projects, which focusses on solar heating and cooling technologies, bioenergy and GHG. The renewables program also collaborates closely with the German Development Agency (GIZ), the Austrian Development Agency (ADA) and the Swiss Development Agency (SDC), towards clean energy technologies and a sustainable future.

VIABILITY AND VALIDATION INNOVATION SERVICE DELIVERY PROGRAMME (VVISDP)

The Department Science and Innovation (DSI) submitted a proposal and successfully secured European Funding. The programme management comprises a consortium from the Department of Cooperative Governance and Traditional Affairs (CoGTA), DSI, Technology Innovation Agency (TIA) and South African Local Government Association (SALGA). TIA appointed SANEDI to manage the Energy Management component of the VVISDP. The programme is divided into four work streams and six projects. Viable Energy Management technologies will be demonstrated at selected Municipalities whose submitted proposals were approved. These Municipalities include City of Cape Town, Drakenstein, City of Mbombela, and Rustenburg. SANEDI will earn an 8% Management Fee from the overall Energy Management sub-programme budget of an estimated R50 million.

8.2.3 SUB-PROGRAMME 2: RENEWABLE ENERGY - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

8.2.3.1 OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS: RENEWABLE ENERGY

Outcomes	Outputs	Output Indicators	Annual Targets						
			Audited Performance			Estimated Performance	MTEF Targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Contribute towards sustainable energy solutions	Smart public facilities Pilots and studies (Renewable Energy SANEDI driven initiative contributing towards GHG reduction). Information and data made available for policy development.	Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies or technology roadmaps demonstration projects/ facilities.	1	4	4	4	4	4	4
Inform and increase awareness of sustainable energy	Clean energy technologies training in the sector (including municipalities, training programmes with trained, skilled participants).	Number of recipients of energy-related training facilitated (excluding SANEDI staff).	85	120	161	120	120	120	120
	Research publications reflecting clean energy insights.	Number of annual Energy industry status reports	1	1	4	1	1	1	1
	Accessible and high-quality data: maintain energy-related datasets.	Minimum number of energy-related datasets maintained per annum.	1	3	2	2	2	2	2
		Number of policy support instruments either industry roadmaps or sector development plans or industry support tools,).	1	1	1	1	1	1	1
Building energy expertise and competence	Energy Research students and researchers supported.	Number of energy-related research students / contracted researchers supported either bursaries or non-bursaries.	1	1	1	N/A	N/A	N/A	N/A
Catalyse balanced Just Energy Transition	Research study providing insights on how South Africa may implement Just Energy Transition	Approved research study providing insights on technology options or benchmarks and lessons learnt or employment vulnerability and sector jobs resilience plans for JET to enable policy development.	New Output Indicator	New Output Indicator	New Output Indicator	New Output Indicator	1	1	1
	Training of stakeholder in provinces in Just Energy Transition value chain.	Number of stakeholders trained on Just Energy Transition in various interventions.	New Output Indicator	New Output Indicator	New Output Indicator	New Output Indicator	50	50	50
Inform and increase awareness of sustainable energy	Reports from energy-related knowledge sharing events / platforms.	Number of energy-related knowledge sharing events / platforms engaged in either hosted by SANEDI or attended by SANEDI staff or knowledge presented by SANEDI staff	3	6	15	4	4	4	4

TABLE 15

***Targets in the above tables are outlined according to known funding available and committed to these outputs, however this does not negate overachieving these targets once more projects are confirmed. There are some expected out puts that could be delivered from projects waiting for the new financial year to confirm funding, and thus be able to add into expected/ projected outputs. These projects are linked into collaborative agreements where mutual resources are pooled in order to achieve outcomes/demonstrations, several such collaborative Memoranda of Agreements (MoA) overarch collaborations with project partners and separate project agreements are pending in the new financial year.**

**** Output indicators are defined concisely in the table above for ease and conciseness in target measuring, however please refer to the Annual Report (AR) for complete breakdowns of the intricate and detailed deliverables leading to answering SANEDI's Mandate towards job and skills creation, business support/development, technology demonstration, business case development, return on investment understanding, economic and industrial advancement, National and International collaboration, policy information, as well as knowledge and networking exchange.**

8.2.3.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: RENEWABLE ENERGY

Output Indicators	Annual Targets	Q1	Q2	Q3	Q4
Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies or technology roadmaps demonstration projects/facilities.	4	-	-	2	4
Number of recipients of energy-related training facilitated (excluding SANEDI staff).	120	20	40	60	120
Number of annual Energy industry status reports	1	-	-	-	1
Minimum number of energy-related datasets maintained per annum.	2	-	-		2
Number of policy support instruments either industry roadmaps or sector development plans or industry support tools,).	1	-	-	-	1
Approved research study providing insights on technology options or benchmarks and lessons learnt or employment vulnerability and sector jobs resilience plans for JET to enable policy development.	1	-	-	-	1
Number of stakeholders trained on Just Energy Transition in various interventions.	50		30		50
Number of energy-related knowledge sharing events / platforms engaged in either hosted by SANEDI or attended by SANEDI staff or knowledge presented by SANEDI staff	4	1	1	1	1

TABLE 16

8.2.4 SUB-PROGRAMME 3: SMART GRIDS

Electricity service delivery within the municipal environment has been a challenge over the years. Municipal electric distribution departments struggle to maintain their networks and to provide their customers with the level of service they need. This has resulted in additional revenue losses and the difficulty of introducing new technologies and customers are migrating to alternative energy sources, ''small-scale-renewables technologies". Through the deployment of smart distribution networks, also referred to as Advanced Metering Infrastructure (AMI), revenue and asset management initiatives can be driven as a sustainable business model that guarantees visibility and control of local networks.

SANEDI's Smart Grids (SG) sub-programme focuses on the introduction of smart distribution networks to support the deployment of distributed generation, revenue enhancement, asset management, and the deployment of various SG technologies. SGs are a driver for positive change and therefore, strategic roadmaps that guide the industry "distribution segment" aligned to the strategic objectives of the DMRE Electricity Directorate and SANEDI's Applied Research and Innovation Mandate are required to guide municipal electricity distribution asset management interventions, industry insights and case studies that emanate from piloting SG technologies using system thinking.

Previous AMI projects supported by the DMRE's Electricity Directorate for policy making decisions, have successfully piloted these concepts, carefully considering the risk of the age and state of distribution assets. Now after lessons learnt from doing and not just conceptualising, a better understanding of how to deploy AMI to address sustainability is now championed by the National Treasury (NT) in collaboration with other National entities through projects that aim to generate blueprints for success.

These projects will further support case studies and research publications that allow other municipal electricity distribution departments, and industry Stakeholders to replicate successes and avoid similar pitfalls during their implementation of AMI projects. The aim of improving the knowledge base, constituting of public officials and technical experts is crucial to driving better service delivery, thereby, guaranteeing sustainable Municipal Electricity Distribution departments.

In the last financial year, SANEDI, in collaboration with Municipalities, developed the Smart Grid Roadmap. The Roadmap serves as a guideline to Municipalities in their SGs journey, and allows SANEDI to use SGs technologies as an enabler to solve pressing municipal related problems. In this financial year, SANEDI will support NT and COGTA in the "Smart and financially sustainable Municipality" pilot and demonstration project. Several research projects are also proposed in collaboration with the University of Pretoria (UP).

For 2022/23, the SGs will deliver activities that aim pilot SGs systems for cities. These include Enterprise service business requirements for SGs applications, and The Development of an Asset Management Policy, Strategy and Governance Framework for Municipalities.

8.2.4.1 SUB-PROGRAMME 3: SMART GRIDS - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output Indicators	Annual Targets						
			Audited Performance			Estimated Performance	MTEF Targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Contribute towards sustainable energy solutions.	Energy solutions assessed evidenced by reports.	Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies, or technology roadmaps and demonstration projects/ facilities.	5	3	4	2	2	2	2
		Number of approved annual Energy industry status reports.	1	1	1	1	1	1	1
		Number of industry roadmaps or sector development plans and industry support tools developed, to promote energy related market/industry development.	N/A		1	1	1	1	1

TABLE 17

*** We have reduced our SGs pilots over the years as the concept has been proven in past pilot demonstrations. Municipal electricity distribution departments have the evidence that supports SGs work and enables business sustainability. The new approach is to direct our focus around solving existing problems, rather than piloting concepts, hence, the reduction in targets. Such applied projects must be limited and targeted at addressing the most burning issues for participating municipal distribution departments.**

8.2.4.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: SMART GRIDS

Output Indicators	Annual Targets	Q1	Q2	Q3	Q4
Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies, or technology roadmaps and demonstration projects/facilities.	2	-	-	1	1
Number of approved Aannual Energy industry status reports.	1	-	-	-	1
Number of industry roadmaps or sector development plans and industry support tools developed to promote energy related market/ industry development.	1	-	-	-	1

TABLE 18

8.2.5 SUB-PROGRAMME 4: DATA AND KNOWLEDGE MANAGEMENT

Working in collaboration with the Energy Efficiency Directorate of the DMRE to fulfil the EE sectorial targets as stated within the National Energy Efficiency Strategy (post NEES 2015), the Data and Knowledge Management sub-programme focuses on utilising energy data for evidence-based planning to support EE as the primary fuel to South Africa's drive for electricity consumption demand-side management, through scaling up the use of EE intervention technologies, and the development of building standards to drive the adoption of such technologies.

The development of Sector Reports that focus on the adoption of Energy Management Systems (EMS) in addition to International Organisation for Standardisation (ISO) standards within the Pulp and Paper and Automotive Industrial sub-sectors are driven by SANEDI and the Energy Efficiency Directorate. These Sector Reports are supported by working with the International Energy Agency (IEA), United Nations Industrial Development Organisation (UNIDO), the Department of Trade Industry and Competition (the dtic) and the National Cleaner Production Centre (NCPC) to support the transition process to a less energy intense economy.

Furthermore, strengthening the technical capacity for Public Officials, and creating opportunities for skills development within the energy sectors addressing inclusive growth, is driven by SANEDI and the Energy Efficiency Directorate's General Budget Support Programme. This programme is expected to reach fruition in 2023. Over 100 Public Officials are targeted in extensive training through a collaboration with the UP. The training areas cover EE in its broad term, it also addresses EE interventions within Wastewater Treatment Plants (WWTP) and certain classifications of buildings for public or commercial use, based upon the recently issued mandatory Energy Performance Certificates (EPC) by the DMRE.

For the 2023/24 APP, SANEDI will undertake research that would realise evidence-based planning, resource allocation and decision-making enabled by accurate and timely information, datasets, and data analytics.

8.2.5.1 SUB-PROGRAMME 4: DATA KNOWLEDGE MANAGEMENT - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output Indicators	Annual Targets						
			Audited Performance			Estimated Performance	MTEF Targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Provide thought leadership.	Detailed analytical reports containing data and insights of priority sector or sub-sectors.	Number of approved Sectorial reports produced.	N/A		3	3	2	2	2
Inform and increase awareness of sustainable energy.	Research publications reflecting clean energy insights.	Number of approved Aannual Energy industry status reports.	1	1	1	1	1	1	1
Building energy expertise and competence.	Energy Data Research support and development.	Number of energy-related research students / contracted researchers supported either bursaries or, non-bursaries.	N/A		2	20	5	5	5
	Training provided to recipients.	Number of recipients of energy data related training facilitated (excluding SANEDI).	N/A	32	60	5	40	40	40

TABLE 19

8.2.5.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: DATA AND KNOWLEDGE MANAGEMENT

Output Indicators	Annual Targets	Q1	Q2	Q3	Q4
Number of approved sectorial reports produced.	2	-	1	-	1
Number of approved Annual Energy Industry Status reports.	1	-	-	-	1
Number of energy-related research students / contracted researchers supported either bursaries or, non-bursaries.	5	-	-	5	-
Number of recipients of energy data related training facilitated (excluding SANEDI).	40	-	20	20	-

TABLE 20

8.2.6 SUB-PROGRAMME 5: CLEANER MOBILITY

By 2050, about 70% of the world's population will live, commute and work in urban areas[8]. Between now and then, cities and suburbs will undergo significant transformations to create sustainable living conditions for their residents. Mobility and energy are the twin pillars of these transformations, and both will require radical adaptation to meet demographic and economic growth without increasing congestion and pollution. Cities will require mobility and energy solutions that are sustainable, affordable, secure, and inclusive, and integrated with customer-centric infrastructure and services. Thus, the convergence of energy and mobility is critical.

These are exciting times in which new technologies allow people to rethink the way they live more sustainably and efficiently. Smart Mobility, Smart Water, Smart Grid, and Smart Integration. These are the foundations of tomorrow's cities, which are being realised today.

Mobility is going to change rapidly in the coming years as Electric Vehicles (EV's) proliferate, ride sharing continues to grow, and eventually Autonomous Vehicles (AV) enter urban fleets. This is especially true in cities where new forms of mobility are concentrated, and where investment in supporting infrastructure needs to accommodate this growth. These changes coincide with the evolution towards a cleaner, more decentralised, and digitalised energy systems and services, and increasing electrification.

The Cleaner Mobility (CM) programme within SANEDI in collaboration with the Development Bank of Southern Africa (DBSA) and key Stakeholders, will conduct a study to assess the feasibility of rolling out electric busses for public transport in the next three years. The project objective is to advance and accelerate large scale roll out of EV's for public transport systems in major Metropolitan areas, and will initially comprise two phases, namely feasibility study and demonstration. The feasibility study is funded through the Global Environment Facility (GEF) whilst the demonstration phase with an estimated budget of R 1,7 billion will be funded to a large extent (83%) by Metropolitan Municipalities, with GEF expected to provide 17% of the project funding.

The CM programme has relied on collaboration with key partners in financial, technical and Government sectors to undertake large scale, and high impact projects in the CM sector. Such collaborations will still be critical for the programme's success in the short to medium term. The programme will intensify efforts to secure more partnerships, particularly in key areas such as financial and technical assistance. The partnerships with entities such as the DBSA, Department of Transport (DoT), Municipalities and GEF, to name a few, will be strengthened as part of the objective to unlock additional resources towards infrastructure development projects, for both public transport and private use electric vehicles.

There is an opportunity to design a different future, and reap both environmental and economic benefits with a call to action around the following three principles to be acted upon: -

- **Take a multi-Stakeholder and market-specific approach**: First and foremost, a market-specific approach that considers all relevant Stakeholders should be applied to new mobility patterns with smarter and cleaner energy systems. Energy, mobility, and infrastructure enterprises, along with policymakers, regulators, and urban planners, can collectively define a new paradigm for cities. The paradigm would go beyond today's industry divisions

8 WEF, 2018

in search of complementary municipal, Regional and National policies. The investment and infrastructure to support electric mobility will vary significantly from one place to another, thus, any approach needs to be market specific. Local Stakeholders should plan for electrification while considering local characteristics, especially urban infrastructure and design, the energy system and the culture and patterns of mobility.

- **Prioritise high-use vehicles**. The focus should be on electrifying fleets, taxis, mobility-as-a-service vehicles, and public transport, which will have a greater impact, as these represent a higher volume of kilometres travelled. Although personal-use vehicles will likely remain a significant portion of the vehicle stock for many years, they are on the road less than 5% of the time, representing a low volume of overall kilometres driven.
- **Deploy critical charging and refuelling infrastructure today while anticipating the transformation of mobility**. To keep pace with growing demand and to address range-anxiety issues, charging infrastructure is needed, especially along highways, at destination points, and close to public transport hubs. To minimise the risk of stranded investments, future mobility and vehicle ownership patterns should be considered, as some current charging locations (i.e., in apartment buildings, at parking meters along city streets) may not be needed in the future. The infrastructure should be deployed in combination with grid edge technologies, such as decentralised generation, storage, microgrids and Smart buildings and integrated into SGs, to fully exploit the flexibility of EVs while enabling the stability of the energy system. Digitalisation would help simplify and enhance the customer experience, support efficient infrastructure deployment and management as well as enable new services associated with electric, shared, and autonomous mobility. Charging stations can become hubs for Smart City services.

8.2.6.1 SUB-PROGRAMME 5 CLEANER MOBILITY - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output Indicators	Annual Targets						
			Audited Performance			Estimated Performance	MTEF Targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Contribute towards sustainable energy solutions.	Cleaner Mobility: Greening municipal fleet and cleaner transport massification plans.	Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies, or technology roadmaps and demonstration projects/ facilities.	3	1	1	1	1	1	1
		Annual energy industry insight (Trends) publications reflecting insights from extensive International and National collaboration, interfacing and forums.	0	1	1	1	1	1	1
		Number of industry roadmaps or sector development plans and industry support tools developed to promote energy related market/ industry development.	N/A		1	1	1	1	1
		Number of energy-related knowledge sharing events / platforms engaged in either hosted by SANEDI or attended by SANEDI staff or knowledge presented by SANEDI staff.	N/A		1	1	1	1	1
		Number of recipients of energy-related training facilitated (excluding SANEDI staff).	N/A		11	5	5	10	15

TABLE 21

8.2.6.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: CLEANER MOBILITY

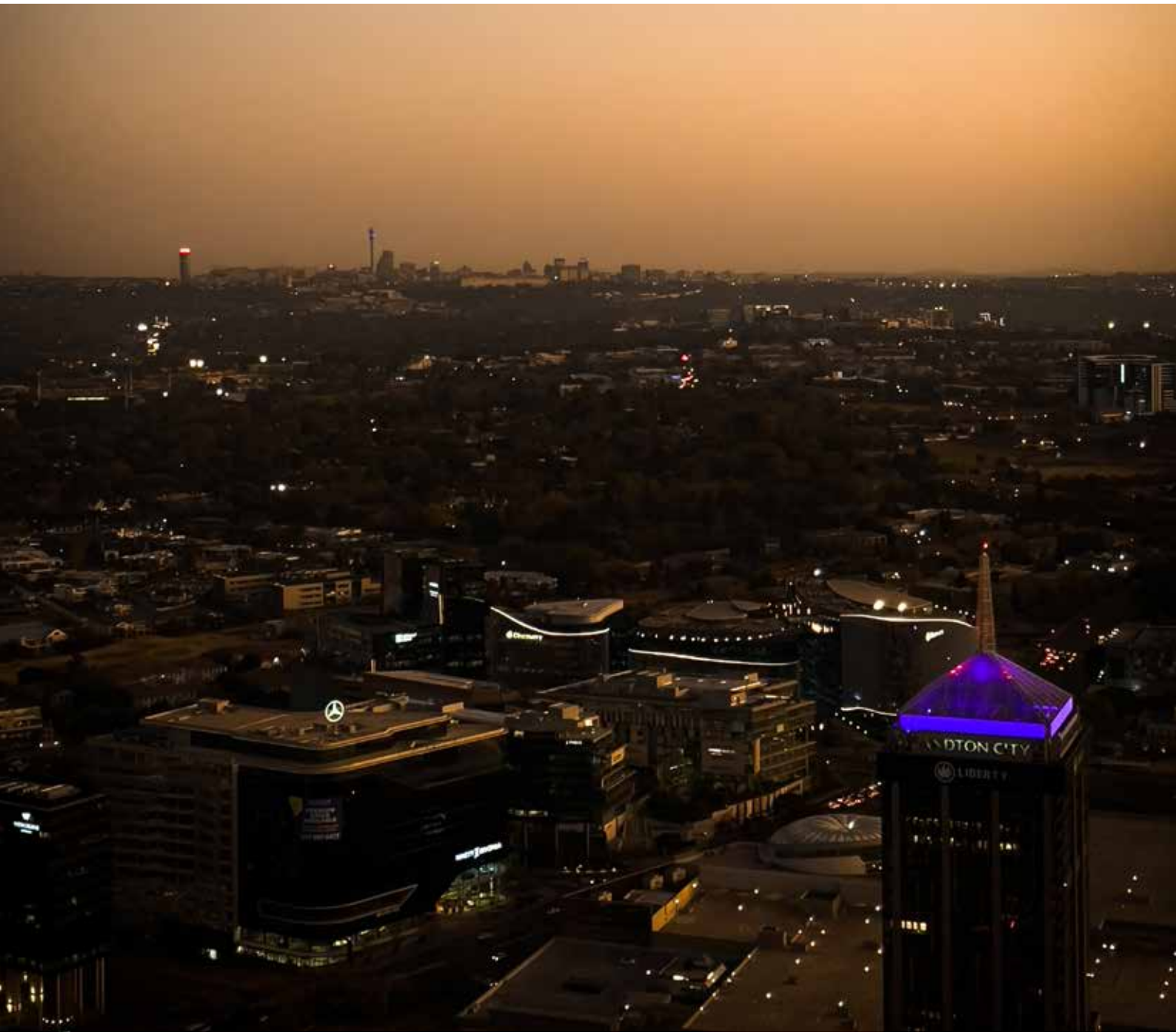
Output indicators	ANNUAL TARGETS	Q1	Q2	Q3	Q4
Number of energy solutions assessed either advisory notes or feasibility reports or study reports or case studies, or technology roadmaps and demonstration projects/facilities.	1	-	-	-	1
Annual energy industry insight (Trends) publications reflecting insights from extensive International and National collaboration, interfacing and forums.	1	-	-	-	1
Number of industry roadmaps or sector development plans and industry support tools developed to promote energy related market/ industry development.	1	-	-	-	1
Number of energy-related knowledge sharing events / platforms engaged in either hosted by SANEDI or attended by SANEDI staff or knowledge presented by SANEDI staff.	1	-	-	-	1
Number of recipients of energy-related training facilitated (excluding SANEDI staff).	5	-	-	2	3

TABLE 22

8.2.7 SUB-PROGRAMME 6: BALANCING ENERGY SUPPLY & DEMAND

With the threat of loadshedding an ever-constant reality for South Africans, unpacking the stability of the National grid is an important exercise. It has become fundamentally critical to conduct research geared towards reducing or eliminating rotational power cuts. Loadshedding is poised to rise to extreme levels unless unprecedented interventions are taken urgently to introduce about 10 GW by 2024.

Loadshedding and grid stability have thus become key focus areas for SANEDI in the coming years. This focus is key given the opportunities presented by renewable and embedded energy generation in the country. The incorporation of energy storage, EE, renewable and embedded power sources with the electric utilities has been a promising solution towards ensuring uninterrupted power supply, and lessening the negative economic effects of loadshedding on the economy as a whole.



8.2.7.1 SUB-PROGRAMME 6: BALANCING ENERGY SUPPLY & DEMAND - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output indicators	Annual Targets						
			Audited performance			Estimated Performance	MTEF targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Contribute towards sustainable energy solutions	Demonstrating load control and reduction of significant capacity from demand side management and self-generation	Approved report on proof of concept to demonstrate load shifting and/ or reduction of up to 1000MW	New Output Indicator			New Output Indicator	1	1	1
		Approved report on Project definition (scoping and basic design) of Small-Scale Embedded Generation (SSEG) contribution to load shifting and / or reduction 10MW	New Output Indicator	New Output Indicator	New Output Indicator	New Output Indicator	1	1	1

TABLE 23

8.2.7.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: BALANCING ENERGY SUPPLY & DEMAND

Output indicators	ANNUAL TARGETS	Q1	Q2	Q3	Q4
Approved report on proof of concept to demonstrate load shifting and/ or reduction of up to 1000MW	1	-	-	-	1
Approved report on project definition (scoping and basic design) of Small-Scale Embedded Generation (SSEG) contribution to load shifting and / or reduction 10MW	1	-	-	-	1

TABLE 24

8.3 PROGRAMME 3: ENERGY EFFICIENCY

PURPOSE: THE PURPOSE OF PROGRAMME 3 IS TO ACCELERATE A SHIFT TOWARDS A RESOURCE AND PARTICULARLY, AN ENERGY (INCLUDING GAS, LIQUID FUELS, ELECTRICITY, AND WATER) EFFICIENT SOCIETY.

Since 2008, South Africa has been experiencing intermittent bouts of loadshedding across the country, largely brought about by the demand for energy exceeding the available supply from Eskom at various points in time. Notwithstanding, this serious challenge to the country's economic development, South Africa remains within the top 15 countries with the highest GHG per capita, as a result of the country's dependence on coal for power generation.

To address these two serious National challenges, the EE division at SANEDI plans on undertaking a range of solutions-based activities, which are guided by various Legislative commitments, guidance from the Shareholder, the DMRE and defined in a formal Memorandum of Understanding (MoU) between SANEDI and the Department, as well as activities identified through SANEDI's own research and strategic planning.

Amongst the key activities planned for the 2022/23 financial year and which are included in this APP, are highlighted as follows: -

- The administration of the Section 12L Energy Efficiency tax incentives on behalf of the DMRE, NT and the South African Revenue Services (SARS), where registered companies can claim a rebate for every unit of energy saved. Although still very significant in the size of rebates claimed (and associated GHG savings), we are expecting a slight decline in the number of applications received, because of companies shifting their focus from EE interventions more towards the installation of SSEG technologies, due to the recent increase in licensing threshold to 100MW by the DMRE and The National Energy Regulator of South Africa (NERSA).

- Within the activities around SMART public facilities, SANEDI will be hosting and maintaining the National Building Energy Performance Register (NBEPR), as mandated by the EPC Regulations promulgated by the DMRE Minister on 8 December 2019, as well as facilitating the market through several sub-initiatives, such as the re-skilling of 20 unemployed electricians to be able to enter this market and conduct EPC-assessments in commercial buildings. SANEDI is also co-funding the collection of data, analysis of results and the issuing of 20 EPCs in public facilities across all three tiers of Government. SANEDI have also been earmarked to provide a fully funded Monitoring and Evaluation (M & E) facility for an international (V-NAMA) funded 'Energy Efficiency in Public Buildings and Infrastructure Programme (EEPBIP)', also covering facilities in all three tiers of Government, as well as State-owned Entities (SoE's).
- Furthermore, through the Energy Efficiency Standards and Labelling programme that SANEDI are administering on behalf of the DMRE, it is anticipated that at least one additional technology will be added to the current basket of 12 domestic appliances for which mandatory Minimum Energy Performance Standards (MEPS) already exist. SANEDI is working very closely with multiple public and private sector Stakeholders in this activity, which includes the dtic, DMRE, South African Bureau of Standards (SABS), National Regulator for Compulsory Specifications (NRCS), manufacturers, retailers, end-users of these technologies, as well as International partners and donor funders.
- However, all successful EE programmes worldwide, are reliant on the existence of a robust Energy Service Company (ESCo) market, i.e., companies that focus on and specialise in EE audits and the implementation and financing of EE interventions. In this area, we will be finalising two extensive World Bank funded studies in the coming financial year, one titled: 'Sustainable Energy Efficiency Sectoral Financing Mechanisms' and an 'ESCo Market Development Strategy for South Africa'. Both these SANEDI-initiated reports are expected to provide a clear strategy to accelerate the uptake of EE in South Africa, whilst potentially creating a platform for significant job creation opportunities for women, youth, and PwDs. This will also increase the number of requisite skills to assist in activities relating to the envisaged Just Energy Transition (JET) in South Africa in the coming years.
- Digitalisation has been identified by the International Energy Agency (IEA) as one of the key enablers towards a low carbon and EE world and SANEDI has embraced this by securing funding for the Tshwane University of Technology (TUT) to conduct the first-ever Digitalisation Impact Assessment for EE in South Africa, due for completion in the 2022/23 financial year, and in support of this on a practical level, SANEDI is administering and maintaining datasets that can underpin a transition towards a Digital Energy Efficiency industry in South Africa.
- SANEDI will furthermore continue to support the establishment of a Cool Roof industry in South Africa, through a transition from pilot and demonstration projects (to increase the number of square meters coated), towards an increase in local economic development by supporting local manufacturing of the coatings, job creation through skills development, and capacity building and product quality control through the development of local product standards and testing facilities.
- Lastly, the Section 12L Energy Efficiency tax incentives, the EPCs for buildings, and phase 2 of the Carbon Tax, all require the Inspection Bodies involved in these activities to be accredited by the South African National Accreditation System (SANAS). In leading by example and because of our key role in the successful implementation of the first two Legislated activities, SANEDI has initiated a formal process to become SANAS-accredited in these two disciplines within the 2022/23 financial year. The initial aim is to assist the DMRE with the assessment of internal projects such as the Energy Efficiency and Demand Side Management (EEDSM) projects within municipalities and some Government building EPC projects, but this accreditation could assist in potential revenue generation activities by participating in these markets at a future stage.

To address climate change, we will partner with more stakeholders in the 2022/23 financial year. Our new strategic vision towards a more sustainable and efficient energy sector is primed to equip, and support South Africa's economic transformation, growth, and social development. The EE initiated projects are aiming to: -

- Support businesses with tax incentives to promote, and instil a culture of cleaner production and EE in all sectors of the economy, through participating applicants from which the projects are derived,
- Achieving the National carbon emissions reduction targets, and
- Maintaining a repository of EE data, readily available to the key Stakeholder (DMRE) for policy formulation and evidence-based decision making.

8.3.1 SUB-PROGRAMME 1: COOL SURFACES

COOL SURFACES PILOT

Looking forward to the upcoming MTSF period, SANEDI will extend the scope of the Cool Surfaces project utilising funds received for the demonstration of the technology. Several demonstration projects are planned for the MTSF period, and are expected to be completed during the first two years. Ultimately, SANEDI intends to develop business cases for appropriate Stakeholders such as the COGTA, Municipalities, and businesses for a mass roll-out of Cool Surfaces.

This innovative paint technology not only has the potential of reducing the energy demand for space cooling purposes, but also has the potential to create a new industry, local manufacturing and to create new jobs. To date, several people have been trained as applicators for this new paint technology, and it is expected that in the two years that pilot projects will be running, a greater number of people will be trained. Pilot projects have already demonstrated and increased skills capacity, as well as creating small and micro businesses particularly within the Limpopo Province to date. As SANEDI rolls out this technology, we are expecting to see even more skills creation and small/micro businesses capacitated and empowered. This is expected to be supported through the SANEDI collaboration with the Cool Surface Associations in establishing an accreditation laboratory for South African manufactured Cool Surface products. Training will focus on mainly the youth and women, to create opportunities for these groups to alleviate poverty and unemployment.

SANEDI will be engaging with the SETAs to formalise the training provided under the Cool Surfaces programme, and also to assess the potential of this and be included as part of the curriculum at Technical Vocational Education and Training (TVET) colleges involved in the construction industry.

8.3.1.1 PROGRAMME 3: ENERGY EFFICIENCY - OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output indicators	Annual Targets						
			Audited performance			Audited performance	MTEF targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/2026
Contribute towards sustainable energy solutions.	Processed 12L tax applications.	12L EE tax certificates issued.	56	2	39	11	25	25	25
		GHG emissions reduced (Mega tonnes CO2).	N/A		N/A	1.0 tonnes	0,5 Mega tonnes	0,5 Mega tonnes	0,5 Mega tonnes
	Smart public facilities (and any other SANEDI driven initiative contributing towards GHG reduction).	Number of EE solutions assessed.	1	1	2	3	3	3	3
Provide thought leadership.	EE data sets and information for policy decision making.	Number of EE energy-related datasets maintained per annum.	6	6	2	3	3	3	3
	Minimum energy Performance Standards, regulations and related impact assessments developed.	Number of EE solutions implemented (Standards and Labelling).	New Output Indicator		1	1	4	4	4
Building energy expertise and competence.	EE capacity created through training.	Number of recipients of energy-related training facilitated (excluding SANEDI staff).	New Output Indicator			20	20	20	20
	SANAS accreditation.	Application for full SANAS accreditation for Measurement & Verification, and Energy Performance Certificates works.	New Output Indicator			3	N/A	N/A	N/A

TABLE 25

8.3.1.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: ENERGY EFFICIENCY

Output indicators	ANNUAL TARGETS	Q1	Q2	Q3	Q4
12L EE tax certificates issued	25	5	10	5	5
GHG emissions reduced (Mega tonnes CO_2).	0,5 Mega tonnes (cumulative)	0.03 Mega tonnes (cumulative)	0,1 Mega tonnes (cumulative)	0,2 Mega tonnes (cumulative)	0,5 Mega tonnes (cumulative)
Number of EE solutions assessed	3	-	-	-	3
Number of EE energy-related datasets maintained per annum.	3	-	-	-	3
Number of EE solutions implemented (Standards and Labelling).	4	1	1	1	1
Number of recipients of energy-related training facilitated (excluding SANEDI staff).	20	-	20	-	-

TABLE 26

8.4 PROGRAMME 4: THE ENERGY SECRETARIAT

PURPOSE: TO COMMERCIALISE AND UPSCALE KNOWLEDGE OUTPUTS FROM THE RDI PORTFOLIO.

The DSI commissioned the National Research Foundation (NRF) to conduct a review of the Renewable Sustainable Energy (RSE) Hub and Spokes programme. Recommendations proposed the establishment of an Energy Secretariat. The DSI contracted SANEDI to establish an Energy Secretariat in the 2019-20FY. The Secretariat would promote the 10-Year Innovation Plan and leverage the Energy Grand Challenge. The Grand Challenge stimulates and advances a knowledge-based economy and advances increased knowledge generation and exploitation, human capital development, knowledge infrastructure, and enablers to addressing the "innovation chasm." These efforts will seamlessly address the energy trilemma which encompasses energy access, environmental sustainability, and energy security.

The role of the Secretariat is to commercialise and upscale knowledge outputs from the RDI portfolio. The outputs will systematically ensure impact in the National System of Innovation (NSI). The Secretariat will monitor and evaluate implementation of the Energy Science, Technology, and Innovation Plan. Monitor implementation of innovative, alternative, and emerging technology policies influencing the energy landscape. Co-ordinate and monitor the training of Technical Vocational Education and Training (TVET) and University of Technology (UoT) graduates. Deploy scalable technologies with the public and private sector, as well as academia. Align deployments with the Presidential District Development Model. The Science and Innovation flagship programmes are summarised here.

The **Coal CO_2-X Programme** demonstrates CO_2 captured from the flue gas emitted from coal-fired power stations, along with green hydrogen produced from RE sources by way of the electrolysis of water, to green, clean burning 0% sulphur diesel. This is a RE carrier for local demand and developing global renewables trade. The programme seeks to reduce CO_2 emissions, while honouring our National obligations under the Paris Agreement.

The **Energy Storage Programme** advances energy storage technology research. Lithium-ion battery development supports stationary and mobile applications. Lithium, nickel, and cobalt minerals can be supplied by neighbouring countries. Research focal areas include value-added precursor materials like lithium manganese oxide and lithium nickel manganese cobalt. Universities and science councils undertake computational modelling, precursor material development, cell manufacturing, and battery testing research. The research programme consortium comprises Universities and Science Councils alike.

The **Hydrogen South Africa (HySA) Programme** originated from the National Hydrogen and Fuel Cell Technologies (HFCT) RDI strategy approved by cabinet in May 2007. The programme consortium comprises local Universities and Science Councils researching the beneficiation of Platinum Group Metal (PGM) resources. The research contributes actively towards energy security and RE. It further supports Government's ambition to supply green hydrogen into Africa. It also exploits component manufacture throughout the HFCT value chain.

The **rse Hub and Spokes Programme** advances research and technology innovation in the RE landscape, postgraduate skills development, and increases the knowledge base. It stimulates new science, technology, and innovation industries supporting Government policies and plans. The hub and spokes model involves administrative support at the hub, while computational modelling, photovoltaic, solar thermal, and wind technology research and demonstrations are undertaken by the hubs.

SANEDI on boarded a new DSI programme, the VVISDP. DSI applied and secured European Union (EU) funding. Strategic programme management is undertaken by a consortium comprising CoGTA, DSI, TIA and SALGA. TIA recently appointed SANEDI to implement the energy management component of the programme. The City of Cape Town, Drakenstein, City of Mbombela, and Rustenburg submitted successful proposals that were approved.

The Energy Secretariat have not compiled Key Performance Indicators (KPIs) and targets in the 2022-23FY APP. Work currently underway by the UK Partnering for Accelerated Climate Transitions (UK-PACT) are investigating a model for improved operational efficiency and Governance. A Theory of Change - Monitoring, Evaluation, Learning (MEL) framework also forms part of the project outputs. The UK PACT project outputs will enable SANEDI to formulate appropriate and relevant KPIs and targets in support of the 2022-23FY APP.

LEAP-RE

The Europe-Africa Partnership for Renewable Energy (LEAP-RE) is a 5-year programme co-funded by the European Commission (EC) under Horizon 2020. It aims to develop long-term partnerships between Europe and Africa on Research and Innovation (R&I) in RE. The consortia comprise 83 partners from European and African countries. The overall budget is €32m, including €15m from the EC. There are three pillars, Pillar 1 is a joint call for RE research proposals, Pillar 2 focuses on the management of R&I and capacity building projects, and Pillar 3 fosters long-term RE partnerships between African and European countries. SANEDI has secured R5 million from the DSI, and expects an additional R15 million, to implement projects approved by Leap-Re International.

8.4.1 PROGRAMME 4: THE ENERGY SECRETARIAT: OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

8.4.1.1 THE ENERGY SECRETARIAT: OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS

Outcome	Outputs	Output indicators	Annual Targets						
			Audited performance			Estimated Performance	MTEF targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Contribute to sustainable energy solutions.	Effective management of Strategic programmes and projects.	Approved report detailing number of postgraduate students (masters and doctoral) supported in designated energy areas	New output indicators				4	4	4
		Approved report detailing number of commercial outputs in designated energy areas.					1	1	1
		Approved report detailing number of artisans and/or technicians trained in the energy sector of the economy.					4	4	4
		Approved report detailing number of University of Technology/TVET graduates offered experiential learning opportunities in the energy sector.					4	4	4
		Approved report detailing number of intellectual property rights (IPRs) filed based on energy RDI.					1	1	1
		Approved report detailing number of stationary fuel cells/clean energy technologies deployed in partnership with Municipalities/District Municipalities.					4	4	4
		Approved report detailing number of SMMEs assisted/supported with business development and commercialisation					2	2	2

TABLE 27

8.4.1.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: THE ENERGY SECRETARIAT

Output indicators	ANNUAL TARGETS	Q1	Q2	Q3	Q4
Approved report detailing number of postgraduate students (masters and doctoral) supported in designated energy areas	4	1	1	1	1
Approved report detailing number of commercial outputs in designated energy areas.	1	-	-	-	1
Approved report detailing number of artisans and/or technicians trained in the energy sector of the economy.	4	1	1	1	1
Approved report detailing number of University of Technology/TVET graduates offered experiential learning opportunities in the energy sector.	4	1	1	1	1
Approved report detailing number of intellectual property rights (IPRs) filed based on energy RDI.	1	-	-	-	1
Approved report detailing number of stationary fuel cells/clean energy technologies deployed in partnership with Municipalities/ District Municipalities.	4	1	1	1	1
Approved report detailing number of SMMEs assisted/supported with business development and commercialisation	2	-	1	-	1

TABLE 28

8.5 PROGRAMME 5: SPECIAL PROJECTS

The purpose of Special Projects is to manage Intellectual Property and coordinate SMMEs and Enterprise Development initiatives. Special Projects will focus on the following aspects:-

- Intellectual Property & Commercialization,
- Collaboration with Local, Regional & International Energy Partners,
- SMMEs & Enterprise Development,
- Energy Skills Development, and
- Any other project as requested by Government.

8.5.1.1 OUTCOMES, OUTPUTS, OUTPUT INDICATORS AND TARGETS: SPECIAL PROJECTS

Outcome	Outputs	Output indicators	Annual Targets						
			Audited performance			Estimated Performance	MTEF targets		
			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Contribute towards sustainable energy solutions	Intellectual Property	IP Audit conducted	New Output Indicator				1	1	1
		Approved Intellectual Property (IP) Management Policy	New Output Indicator				1	1	1
		Number of internal trainings on IP management	New Output Indicator				2	2	2
	Special Projects	Setting up a governance structure for ring-fenced projects	New Output Indicator				1	1	1
	SMMEs and enterprise development	Number of localised technologies	New Output Indicator				2	2	2
		Number of SMMEs supported	New Output Indicator				2	2	2
	Local, Regional and International Partnerships	Local- Maintaining representation/ partnership/ agreements on: Councils, Boards, Reference groups, Steering Committees, NATJOINTS, NACI, IPP office, State Owned Entities	New Output Indicator				8	8	8
		Regional- Maintaining representation/ partnership/ agreements on: memberships, Councils, Boards	New Output Indicator				2	2	2
		International - Maintaining representation/ partnership/ agreements on: IEA memberships, Councils, Boards, Reference groups, Steering Committees,	New Output Indicator				4	4	4

TABLE 29

8.5.1.2 OUTPUT INDICATORS: ANNUAL AND QUARTERLY TARGETS: SPECIAL PROJECTS

Output indicators	ANNUAL TARGETS	Q1	Q2	Q3	Q4
IP Audit conducted.	1	1	-	-	-
Approved IP Management Policy.	1	-	1	-	-
Number of internal trainings on IP management.	2	-	-	1	1
Setting up a Governance structure for ring-fenced projects.	1	-	1	-	-
Number of localised technologies.	2	-	-	1	1
Number of SMMEs supported.	2	-	-	1	1
Local- Maintaining representation/partnership/ agreements on: Councils, Boards, Reference groups, Steering Committees, NATJOINTS, NACI, IPP office, SoEs.	8	-	-	-	8
Regional- Maintaining representation/partnership/ agreements on: memberships, Councils, Boards.	2	-	-	-	2
International- Maintaining representation/partnership/ agreements on: IEA memberships, Councils, Boards, Reference groups, Steering Committees.	4	-	-	-	4

TABLE 30

9. EXPLANATION OF PLANNED PERFORMANCE OVER THE MEDIUM-TERM PERIOD

In developing its strategy, SANEDI must align with key National Priorities and DMRE focus areas. Its strategy thus seeks to add value and contribute towards specific areas of these priorities. The table below details the alignment of the strategic outcomes to the NDP, MTSF and DMRE priorities.

OUTCOME	LINK TO NDP	LINK TO MTSF	LINK TO DMRE PRIORITIES
SO1. Contribute towards sustainable energy solutions.	**Chapter 4: Economic Infrastructure.** At least 20 000 MW of this additional generated capacity should come from renewable sources. The proportion of people who use public transport for regular commutes will expand significantly. By 2030, public transport will be user friendly, less environmentally damaging, cheaper and integrated or seamless.	**Priority 5: Spatial integration, Human Settlements and Local Government.** Smart Cities are equipped with SGs systems using the Smart Cities framework to enhance municipal revenue management, energy asset management and improved demand-response.	**Policy, Planning and Clean Energy.** Smart Cities aim to utilise a cleaner and more efficient energy system with less detriment to the environment.
	The concept of Smart Cities is based on cleaner and more efficient energy technologies, offering cleaner and more efficient buildings and transportation.	**Priority 2: Economic transformation and job creation.** The move towards Smart Cities will have an impact on the economic outlook of the country through increased access and uptake of Information and Communications Technology (ICT), creating new opportunities and improved competitiveness for the country. Transport massification in the municipal environment will result in a greener municipal fleet. The massification will also result in the introduction of new technologies, creating opportunities for new jobs and business opportunities and innovation in the sector.	**Policy, Planning and Clean Energy.** Smart Cities aim to utilise a cleaner and more efficient energy system with less detriment to the environment.
	Chapter 5: Environmental sustainability and resilience - Zero-emission building standards by 2030. The drive towards zero emissions starts with identifying, and reducing current sources of GHG emissions in our energy systems. **Priority 7: A better Africa and World.** In reducing GHG emissions, South Africa would be aligning itself with goals towards the mitigation of climate change, hence contributing to a better world. This will entail developing strategic policy and regulatory frameworks and programmes to promote a low carbon economy.	**Policy, Planning and Clean Energy.** Smart Cities aim to utilise a cleaner and more efficient energy system with less detriment to the environment.	**Policy, Planning and Clean Energy.** Petroleum and Petroleum Products Regulation: The focus will be on strengthening the role of the regional offices in the licensing process, by improving the capabilities in the regional offices and delegating certain functions to these offices. The DMRE also aims to diversify the country's energy sources and reducing GHG emissions.

OUTCOME	LINK TO NDP	LINK TO MTSF	LINK TO DMRE PRIORITIES
SO1. Contribute towards sustainable energy solutions. (continued)	**Chapter 4: Economic infrastructure – The foundation of social and economic development.** Aims to promote: (i) Economic growth and development through adequate investment in energy infrastructure and the provision of quality energy services that are competitively priced, reliable and efficient, and (ii) Environmentally sustainable through efforts to reduce pollution and mitigate the effects of climate change.	**Priority 2: Economic transformation and job creation.** Promote a just transition to an environmentally sustainable economy. High impact environmental sustainability research, evidence gathering, and systematic review commissioned. **Priority 7: A better Africa and World.** Transition towards an environmentally sustainable economy.	**Policy, Planning and Clean Energy.** The DMRE aims to foresee the implementation of energy policy interventions, mapping out future power generation technologies. Top of their priorities are diversifying energy sources and reducing GHG emissions.
	Chapter 13: Building a capable and developmental State. Clear Governance structures and stable leadership enable SOEs to achieve their developmental potential.	**Priority 2: Economic transformation and job creation.** Awareness creation to enable investments for inclusive growth, industrialisation, localisation, exports and as well as innovation.	
SO2. Building energy expertise and competence.	**Chapter 9: Improving education, training and innovation.** Expand science, technology and innovation outputs by increasing R&D spending by the Government, and through encouraging industry to do so.	**Priority 2: Economic transformation and job creation.** Awareness creation to enable investments for inclusive growth, industrialisation, localisation, exports, and as well as innovation. **Priority 3: Education, skills and Health.** Address the challenge of poverty across society through providing skills and creating economic opportunities, especially for vulnerable groups. An awareness of clean technologies opens up an opportunity for South Africans to acquire new skills.	
SO3. A capacitated, effective, efficient and sustainable operational environment (within which SANEDI will discharge its Mandate).	**Chapter 13: Building a capable and developmental State.** A public service immersed in the development agenda but insulated from undue political interference. Clear Governance structures and stable leadership enable SOEs to achieve their developmental potential.	**Priority 1: A capable, ethical, and developmental State.** Clean administration, accurate and reliable reporting. Strengthening Internal capacity and collaboration with other organs of State.	**The Implementation of Best Management Practices.** In support of Government's cost-cutting measures, outlined by the Minister of Finance in his medium-term budget policy statement in 2013, the DMRE has begun and will continue to review and implement internal policies aimed at containing operational costs.
SO4. Inform and increase awareness of sustainable energy.	**Chapter 13: Building a capable and developmental State** Clear Governance structures and stable leadership enable SOEs to achieve their developmental potential.	**Priority 2: Economic transformation and job creation.** Awareness creation to enable investments for inclusive growth, industrialisation, localisation, exports and as well as innovation.	

OUTCOME	LINK TO NDP	LINK TO MTSF	LINK TO DMRE PRIORITIES
SO5. Provide thought leadership.	**Chapter 3: Economy and Employment.** Public employment programmes should reach 1- million people by 2015 and 2-million people by 2030. **Chapter 13: Building a capable and developmental State.** Staff at all levels have the authority, experience, competence and support they need to do their jobs.	**Priority 3: Education, skills and health.** Expanding the high-tech industry by ensuring that the legal and regulatory framework promotes innovation, scaling up skills development for young people in new technologies, and reducing data costs. **Priority 1: A capable, ethical and developmental State.** Scaling up skills development for young people, women and Government officials in new technologies.	**Electrification and Energy Programme and Project Management.** Through economic development initiatives, such as Education Project & Partnerships (EP&Ps), the programme will: • Create job possibilities through EP&Ps, • Create opportunities for skills development within the energy sector, • Re-establish electrical engineering training programmes that support the Municipalities' capacity building and poverty alleviation, and • Develop small businesses in rural areas that support the mission of rural development.

10. PROGRAMME RESOURCE CONSIDERATIONS

10.1 STATEMENTS OF HISTORICAL FINANCIAL PERFORMANCE AND POSITION

10.1.1 STATEMENTS OF HISTORICAL FINANCIAL PERFORMANCE AND POSITION.

Statement of Financial Performance	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Budget estimate	Approved budget	Outcome/ Budget Average %	Average growth rate (%)	Expenditure/ total: Average (%)	Medium-term estimate			Average growth rate (%)	Expenditure/ total: Average (%)
R thousand	2018/19		2019/20		2020/21		2021/22		2018/19-2021/22			2022/23	2023/24	2024/25	2021/22 - 2024/25	
Revenue																
Tax revenue	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Non-tax revenue	6 000	20 341	6 330	17 391	6 678	8 571	1 000	1 000	236,4%	-63,4%	11,5%	6 369	6 582	6 777	89,2%	5,2%
Other non-tax revenue	6 000	20 341	6 330	17 391	6 678	8 571	1 000	1 000	236,4%	-63,4%	11,5%	6 369	6 582	6 777	89,2%	5,2%
Transfers received	168 031	97 099	226 084	78 942	222 963	80 471	90 905	90 905	49,1%	-2,2%	88,5%	118 812	84 233	85 038	-2,2%	94,8%
Total revenue	174 031	117 440	232 414	96 333	229 641	89 042	91 905	91 905	54,2%	-7,8%	100,0%	125 181	90 815	91 815	-0,0%	100,0%
Expenses															–	
Current expenses	174 031	90 066	232 414	74 639	229 641	74 052	91 905	91 905	45,4%	0,7%	86,2%	125 181	90 815	91 815	-0,0%	100,0%
Compensation of employees	50 233	36 404	50 735	38 203	51 625	36 792	43 139	43 139	79,0%	5,8%	40,2%	45 001	46 881	49 000	4,3%	47,0%
Goods and services	121 278	50 044	179 020	32 626	175 211	34 912	45 792	45 792	31,3%	-2,9%	42,6%	76 153	39 728	38 423	-5,7%	49,1%
Depreciation	2 520	3 617	2 659	3 810	2 805	2 348	2 974	2 974	116,3%	-6,3%	3,4%	4 026	4 207	4 392	13,9%	4,0%
Transfers and subsidies	–	–	–	–	–	90 974	–	–	–	–	13,8%	–	–	–	–	–
Total expenses	174 031	90 066	232 414	74 639	229 641	165 026	91 905	91 905	57,9%	0,7%	100,0%	125 181	90 815	91 815	-0,0%	100,0%
Surplus/(Deficit)	–	27 374	–	21 694	–	(75 984)	–	–		-100,0%		–	–	–	–	

TABLE 31

10.2 GOODS AND SERVICES DETAILED BREAKDOWN

10.2.1 GOODS AND SERVICES DETAILED BREAKDOWN.

	2018/19		2019/20	2020/21			2021/22	2022/23	2023/24	2024/25
	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Approved budget	Revised budget estimate	Revised budget estimate	Planning budget estimate
Rand thousand										
Economic classification										
Goods and services	121 278	50 044	179 020	32 626	175 211	34 912	45 792	76 153	39 728	38 423
Administrative fees	-	103	-	-	-	465	-	426	443	461
Advertising	-	82	-	1 422	-	463	-	589	589	589
Audit costs: External	-	1 340	-	1 087	-	898	-	1 400	1 400	1 400
Bursaries: Employees	-	142	-	-	-	-	-	-	-	-
Catering: Internal activities	-	137	-	194	-	18	-	46	46	46
Communication (G&S)	787	2 404	850	-	879	-	862	909	950	1 000
Computer services	1 660	2 721	2 172	3 431	2 274	3 119	932	3 987	4 147	4 314
Consultants: Business and advisory services	4 798	4 607	15 016	3 889	16 662	5 778	8 780	6 439	6 211	6 485
Legal services (G&S)	-	-	-	-	-	1 085	-	1 100	1 200	1 300
Science and technological services	97 776	27 484	147 845	13 408	139 838	18 152	18 719	47 671	12 271	9 784
Maintenance and repairs of other fixed structures	886	879	1 089	205	1 135	451	666	150	156	162
Maintenance and repairs of other machinery and equipment				763						
Agency and support/outsourced services	5 278	-	5 365	-	5 548	-	5 359	3 997	3 204	3 681

10.2 GOODS AND SERVICES DETAILED BREAKDOWN (CONTINUED)

	2018/19		2019/20		2020/21		2021/22	2022/23	2023/24	2024/25
	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Approved budget	Revised budget estimate	Revised budget estimate	Planning budget estimate
Entertainment	-	71	-	-	-	-	-	-	-	-
Consumables: Stationery, printing and office supplies	-	-	370	-	-	376	-	390	400	400
Operating leases	1 796	1 438	1 894	1 301	1 957	1 185	2 074	2 188	2 287	2 287
Travel and subsistence	4 663	4 082	5 466	2 610	4 168	367	3 556	2 361	2 091	2 153
Training and development	1 114	366	1 176	499	1 228	832	1 292	751	785	796
Operating payments	2 520	4 049	(2 672)	3 434	1 112	1 662	3 243	3 421	3 256	3 259
Venues and facilities	-	139	450	383	410	61	310	327	292	305

TABLE 32

10.3 STATEMENTS OF ESTIMATES OF FINANCIAL PERFORMANCE AND POSITION

10.3.1 STATEMENTS OF ESTIMATES OF FINANCIAL PERFORMANCE AND POSITION

Financial Position	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Budget estimate	Approved budget	Outcome/ Budget Average %	Average growth rate (%)	Net change/ total: Average (%)	Medium-term estimate			Average growth rate (%)	Net change/ total: Average (%)
	2018/19		2019/20		2020/21		2021/22			2018/19 - 2021/22		2022/23	2023/24	2024/25	2021/22 - 2024/25	
Carrying value of assets	6 828	8 523	8 628	8 954	9 428	6 764	9 947	9 947	98,2%	5,3%	4,8%	10 494	10 966	10 966	3,3%	8,0%
of which:																
Acquisition of assets	(1 300)	(5 189)	(1 300)	(4 250)	(1 300)	(1 209)	(527)	(527)	252,4%	-53,3%	-1,2%	(10 331)	(10 796)	(11 283)	177,7%	-5,7%
Receivables and pre-payments	1 500	9 023	1 584	4 481	1 673	4 744	1 765	1 765	306,9%	-42,0%	2,2%	1 862	1 946	1 946	3,3%	1,4%
Cash and cash equivalents	76 440	229 519	80 721	249 029	85 241	260 613	89 929	89 929	249,5%	-26,8%	93,0%	364 875	99 145	99 145	3,3%	90,5%
Derivatives financial instruments	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total assets	84 768	247 065	90 933	262 464	96 342	272 121	101 640	101 640	236,4%	-25,6%	100,0%	377 231	112 056	112 057	3,3%	100,0%
Accumulated surplus/ (deficit)	6 828	210 179	8 628	231 873	9 428	155 890	9 947	9 947	1 745,3%	-63,8%	60,1%	180 493	10 965	10 966	3,3%	19,3%
Capital and reserves	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Capital reserve fund	64 816	15 872	68 445	15 513	72 279	103 411	76 254	76 254	74,9%	68,7%	31,3%	180 448	84 068	84 068	3,3%	68,2%
Borrowings	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Trade and other payables	5 000	12 529	5 280	4 956	5 576	7 227	5 882	5 882	140,7%	-22,3%	3,9%	6 206	6 485	6 485	3,3%	4,8%
Provisions	8 124	8 485	8 579	10 122	9 059	5 593	9 558	9 558	95,6%	4,0%	4,7%	10 083	10 537	10 537	3,3%	7,7%
Total Equity and Liabilities	84 768	247 065	90 932	262 464	96 342	272 121	101 641	101 641	236,4%	-25,6%	100,0%	377 230	112 056	112 056	3,3%	100,0%

TABLE 33

Expenditure for the organisation is linked to the total amount of income the entity can secure for implementation of various projects. As a result, significant fluctuations occur year-on-year. Over the previous medium-term period, SANEDI's actual revenue declined versus the budget, mainly due to a reduction in donor funding secured for new projects. Most projects are funded over a period of two to three years, and new funds can only be secured for the next phase once the current phase is completed.

Future projections indicate, and based on our strategy, suggest that in the medium term there will be average increases in expenditure and revenues because of new projects that will be undertaken, as the entity moves into new phases on some of the existing projects. Specifically, the following projects will have a significant impact on the expenditure estimates:

- The Smart Grids projects,
- Data knowledge Management,
- Energy Efficiency 12 L project,
- Energy Efficient Wastewater treatment,
- Energy Efficiency in Government buildings, and
- Energy Secretariat.

Cost containment measures will continue to be implemented to contain expenditure. Administrative expenditure related to Programme 1: Governance and Administration will be expected to increase with inflationary adjustments over the remainder of the medium term as we focus on improving control efficiencies, and automation of data management processes. Administration will account for under 20% of the total expenditure, not considering the compensation of employees. The expectation in the future years will be that compensation of employees will account for over 50% of the total budget at most, around 50% will be for goods and services, apart from the 2022/23 year as we anticipate increased expenditure from the Energy Secretariat, and this stabilising subsequently to around 50%. We will also be continuing to implement the organisational review recommendations. Core mandate expenditure relating to Programmes 2 and 3, that is Applied Energy Research and Energy Efficiency, will increase especially under the Energy Secretariat programme.

10.4 PERSONNEL INFORMATION

10.4.1 PERSONNEL INFORMATION

	Post status estimated for 31 March 2022		Number and cost1 of personnel posts filled / planned for on funded establishment														Number	
	Number of posts on approved establishment	Number of funded posts	Actual			Revised estimates					Medium-term expenditure estimate						Average growth rate (%)	Salary level/ total: Average (%)
			2020/21			2021/22			2022/23			2023/24			2024/25				
Salary level			Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	2021/22 - 2024/25	
Salary level	47	47	71	36 792	518	47	43 139	918	47	45 001	957	47	46 880	997	47	49 000	1 043	4,3%	100,0%
1 – 6	12	12	25	2 808	112	12	2 843	237	12	2 965	247	12	3 080	257	12	3 219	268	4,2%	25,5%
7 – 10	14	14	22	10 077	458	14	9 814	701	14	10 238	731	14	10 608	758	14	11 088	792	4,2%	29,8%
11 – 12	8	8	10	6 775	677	8	7 869	984	8	8 209	1 026	8	8 569	1 071	8	8 956	1 119	4,4%	17,0%
13 – 16	12	12	13	15 312	1 178	12	19 963	1 664	12	20 825	1 735	12	21 739	1 812	12	22 721	1 893	4,4%	25,5%
17 – 22	1	1	1	1 819	1 819	1	2 649	2 649	1	2 764	2 764	1	2 885	2 885	1	3 015	3 015	4,4%	2,1%

TABLE 34

10.5 COMPENSATION OF EMPLOYEES

Employee compensation costs have historically increased by 6%-7%, inflationary increases of around 4% are expected in future. Actual costs amounted to R37 million for the 2020/21 period, as vacancies were filled in both the administrative and technical functions of the entity to cater for new projects. The expectation in future years will be that they will increase to R49 million, mainly because of proposed amendments to SANEDI's operating model following the organisational review that was carried out in 2018. In terms of cost pressures, salaries account for over 50% of the baseline, as SANEDI aims to attract top talent and a highly skilled workforce. The current allocation is underfunded as these resources cannot be recruited given the current base line.

10.5.1 DETAILED BREAKDOWN FOR EMPLOYEE COSTS

Salary level	Actual	Approved budget	Revised estimates		
	2020/21	2021/22	2022/23	2023/24	2024/25
	Cost	Cost	Cost	Cost	Cost
Basic	31 041	31 578	32 925	34 412	35 984
Performance bonus	3 844	6 661	6 981	7 168	7 504
Medical Aid cc	761	1 400	1 456	1 514	1 575
Provident & Pension	1 146	3 500	3 640	3 786	3 937
Total	36 792	43 139	45 001	46 880	49 000

TABLE 35:

11. KEY RISKS

Risk Management provides enabling environment in support of the identification, management and oversight of risks across strategic risks. This role includes ensuring that countering fraud and/or corruption is made an integral part of the organisations strategy.

RISK #	STRATEGIC OUTCOME	KEY RISK	RISK DEFINITION	RISK MITIGATION
1.	A capacitated, effective, and efficient sustainable operational environment.	Major business interruption.	Inability to adapt to new operating environment, resulting in a weak internal control environment and inefficiencies in operations. Inability to operate from the office / project sites.	• Business Continuity Plan . • Remote working capabilities (HS Committee and working from home protocols). • Project funding strategies to supplement fiscal funds. • Project planning and monitoring. • Health and Safety Protocols. • Performance management system. • Insurance over assets. • Site visits for external stakeholders and stakeholder engagement.
2.	A capacitated, effective, and efficient operational environment (within which SANEDI will discharge its Mandate).	Loss of specialised skills within SANEDI.	Lack of expertise to meet the needs of the changing environment (JET). Inability to attract and retain scarce and specialised skills.	Retention and succession plan linked to training and development. Collaborations with other research institutions (CSIR, GIZ, Universities etc.).
3.	A capacitated, effective, and efficient operational environment (within which SANEDI will discharge its Mandate). Evidence-based planning, resource allocation and decision-making enabled by accurate and timely information, datasets and data analytics.	Disruption to operational Information Technology systems.	Inability to react timeously to disruptions.	• ICT Continuity Plan. • Off-site Disaster Recovery Plan. • Service Level Agreements (SLAs) in place with Information Technology (IT) service providers (MTN, hardware providers & Software providers). • Insurance over hardware assets. • End point security for cyber attacks. • System documentation and operational architectural designs.

KEY RISKS (CONTINUED)

RISK #	STRATEGIC OUTCOME	KEY RISK	RISK DEFINITION	RISK MITIGATION
4.	A capacitated, effective, and efficient operational environment (within which SANEDI will discharge its Mandate) – internal compliance.	Non-adherence to good Corporate Governance.	Key Governance structures are not in place.	Charters reviewed annually. Governance Policy. Exco recommends all relevant aspects to the Board and Board Committees.
5.	A capacitated, effective, and efficient operational environment (within which SANEDI will discharge its Mandate). Internal operational effectiveness and efficiency.	Fraud and corruption.	Illegal or improper acts by employees.	• Loss of assets and resources. • Reputational damage. • Possible litigation. • Non- achievement of SANEDI Mandate. • Disruption of day-to-day business. • Low staff morale. • Irregular, fruitless and wasteful expenditure. • Adverse impact on the external audit opinion.
6.	All outcomes.	Insufficient funding from the fiscus.	The current trends demonstrate insufficient funding from the fiscus to accommodate growth of SANEDI in terms of building capacity and requisite expertise Multi Stakeholder interdependencies. Unavoidable reliance on external parties for the implementation of strategy.	• Leveraging external funds (donor funds). • Budgetary controls (planning based on available funds, cost containment etc.). • Oversight monitoring over budget utilisation. Board Audit and Risk Committee (BARC) and Board. • Stakeholder Engagement Plan. • Contracts, Memorandum of Agreements (MoAs) and SLAs with all Third Parties. • Legal function reviews all contracts. • Monitoring of contracts at project level.
7.	All outcomes.	Inadequate implementation of Stakeholder management.	Inadequate financial resources to implement effectively Stakeholder Management. Evolving Stakeholders groupings in the energy sector.	Stakeholder Engagement Plan.

12. PUBLIC-PRIVATE PARTNERSHIPS

SANEDI is not currently part of any formal public-private partnerships as defined by South African law. SANEDI does, however, intend pursuing the establishment of such partnerships, particularly with Metropolitan councils and Municipality involvement. In such a case, a public-private partnership model will be explored to allow the Local Government institution to provide a concession to SANEDI to develop key projects in their jurisdiction. In the case where a private management company is required to operate a facility allocated to SANEDI on a concessional basis, it intends establishing a public-private partnership to manage such a relationship.

PART D:
TECHNICAL INDICATOR DESCRIPTIONS (TIDs)

13. TECHNICAL INDICATOR DESCRIPTIONS (TIDs)

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS

INDICATOR TITLE	**Quarterly review of strategic and operational risks.**
DEFINITION	This indicator monitors risk environment and tracks mitigated risks.
SOURCE OF DATA	Quarterly review of strategic risks and operational risks.
METHOD OF CALCULATION / ASSESSMENT	Number of risks mitigated as per strategic risks register and operational risk register ÷ Number risks in strategic risks register and operational risk register x 100
MEANS OF VERIFICATION	Quarterly review of strategic risks and operational risks.
ASSUMPTIONS	Not applicable.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in the APP.
INDICATOR RESPONSIBILITY	Corporate Planner.

INDICATOR TITLE	**ICT vulnerability assessment and penetration test.**
DEFINITION	Conduct an ICT Vulnerability and Penetration test with the SANEDI ICT head office environment.
SOURCE OF DATA	Vulnerability and Penetration Report.
METHOD OF CALCULATION / ASSESSMENT	One internal report and 1 external report/plan.
METHOD OF VERIFICATION	One internal report and 1 external report/plan.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in the APP.
INDICATOR RESPONSIBILITY	IT Manager.

INDICATOR TITLE	**ICT Governance maturity assessment.**
DEFINITION	Conduct an ICT Governance Maturity assessment with SANEDI.
SOURCE OF DATA	Maturity assessment report.
METHOD OF CALCULATION / ASSESSMENT	Level 3: Full Conformance ÷ Total Practices x 100.
METHOD OF VERIFICATION	Quarterly.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-to-date).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in the APP.
INDICATOR RESPONSIBILITY	IT Manager.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Percentage of training undertaken as per EXCO approved Annual Training Plan.**
DEFINITION	This indicator tracks development of skills and competencies against Annual Training Plan.
SOURCE OF DATA	HR records of staff training.
METHOD OF CALCULATION / ASSESSMENT	The number of training interventions executed ÷ by the number of planned interventions (internally or externally funded) x 100.
MEANS OF VERIFICATION	Training records, attendance records for physical and virtual training.
ASSUMPTIONS	Every employee in the organisation is scheduled for at least a training intervention.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-to-date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Human Resources (HR) Manager.

INDICATOR TITLE	**Vacancy rate of funded positions.**
DEFINITION	To monitor vacancy rate of funded positions prioritized by EXCO in a stipulated period
SOURCE OF DATA	Organization structure, HR records on vacant positions.
METHOD OF CALCULATION / ASSESSMENT	Number of funded vacancies prioritized by EXCO in a stipulated period ÷ number of funded positions in the organization x 100.
MEANS OF VERIFICATION	Proof of funded positions, vacant positions prioritized by EXCO per reporting period.
ASSUMPTIONS	The assessment will take into account vacancies that are older than three months.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Non-cumulative
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP.
INDICATOR RESPONSIBILITY	HR Manager.

INDICATOR TITLE	**Percentage deviation from Employment Equity Targets.**
DEFINITION	To track/monitor achievement against SANEDI improved Employment Equity Plan.
SOURCE OF DATA	Employment Equity reports.
METHOD OF CALCULATION / ASSESSMENT	Total white males on staff establishment-planned recruitments of white males)/ planned recruitments x 100
MEANS OF VERIFICATION	Employment Equity reports.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Non-cumulative
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in the APP.
INDICATOR RESPONSIBILITY	HR Manager.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Procurement as per the Procurement Plan.**
DEFINITION	It measures the extent to which procurement is done as per the Procurement Plans and deviations by measuring the percentage of procurements that were completed within the planned
SOURCE OF DATA	Procurement documents/records.
METHOD OF CALCULATION / ASSESSMENT	Number of awards completed within procurement cycle ÷ total number of requests made within procurement cycle x 100.
MEANS OF VERIFICATION	SCM tracking sheet.
ASSUMPTIONS	The procurement cycle time is measured for contracts and purchase orders using historical data. It measures the number of days required to complete the procurement cycle, beginning with the date a requisition is submitted until the date the contract or letter of award is issued to a selected bidder.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-to-date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Chief Financial Officer (CFO).

INDICATOR TITLE	**Compliance Universe Report.**
DEFINITION	This indicator refers to the extent to which the SANEDI complies with laws and regulation and compliance action plans to ensure good governance, and clean audit ultimately.
SOURCE OF DATA	Compliance Reports.
METHOD OF CALCULATION / ASSESSMENT	Number of laws or regulations complied with ÷ Number of laws or regulations identified for compliance x 100
METHOD OF VERIFICATION	Compliance Reports.
ASSUMPTIONS	There is a strong culture of compliance within the organisation.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Company Secretary.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Approved Sustainable Funding Model.**
DEFINITION	A comprehensive plan that focuses the funding approach of SANEDI on the identification of funding sources, the raising of revenue.
SOURCE OF DATA	Funding Model report.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of approved Funding Model.
METHOD OF VERIFICATION	Proof of approved Sustainable Funding Model.
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	CFO.

INDICATOR TITLE	**External Audit Outcome.**
DEFINITION	Strengthening of Governance to ensure the organisation achieves an unqualified audit.
SOURCE OF DATA	Auditor General (AG) report.
METHOD OF CALCULATION / ASSESSMENT	Simple count of "Unqualified audit opinion obtained.
MEANS OF VERIFICATION	Audit opinion from external auditors.
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not Applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not Applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annually.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	CFO.

INDICATOR TITLE	**Percentage % of Internal Audit findings resolved.**
DEFINITION	Internal audit tracker containing a tracker on audit findings raised in the last raised in the Q4 of the previous financial year and IA findings raised in the CY, excluding IA findings raised in Q4 of current financial year.
SOURCE OF DATA	Financial reports and financial records maintained by the organisations.
METHOD OF CALCULATION / ASSESSMENT	Number of audit findings closed ÷ number of audit findings raised x 100.
MEANS OF VERIFICATION	Issued audit reports as per the approved Internal Audit Plan.
ASSUMPTIONS	Availability of information or records / audit scope is not limited.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year- to date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Improved effectiveness of Risk Management, Control and Governance processes.
INDICATOR RESPONSIBILITY	CFO.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Ratio of project costs to admin expenditure.**
DEFINITION	This indicator monitors the project costs against administration expenditure.
SOURCE OF DATA	Financial reports and financial records maintained by the organisations.
METHOD OF CALCULATION / ASSESSMENT	Total projects costs in comparison to administrative costs to be equal to administrative costs or exceed project costs with a 30/70 split being the best case scenario.
MEANS OF VERIFICATION	Records/financial statements on projects costs.
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year to date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	CFO.

INDICATOR TITLE	**Percentage (%) Capital Expenditure (CapEx) budget spent.**
DEFINITION	This indicator measures the percentage of funds spent on CapEx as a percentage of allocated to the organisation by National Treasury (NT).
SOURCE OF DATA	Financial reports and financial records maintained by the organisations.
METHOD OF CALCULATION / ASSESSMENT	The amount spent on CapEx ÷ by the total CapEx budget x 100.
MEANS OF VERIFICATION	Monthly financial reports.
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-to-date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	CFO.

INDICATOR TITLE	**Funding leveraged as percentage % of received allocation.**
DEFINITION	This indicator measures the percentage of grant funds leveraged as a percentage of allocated to the organisation by NT.
SOURCE OF DATA	Financial reports and financial records maintained by the organisations.
METHOD OF CALCULATION / ASSESSMENT	Total funds received from other sources ÷ by the total amount allocated to the organisation x 100.
MEANS OF VERIFICATION	
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	CFO.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Percentage % of expenditure in relation to approved budget.**
DEFINITION	This indicator measures the percentage of funds spent that were allocated to the organisation by NT.
SOURCE OF DATA	Financial reports and financial records maintained by the organisations.
METHOD OF CALCULATION / ASSESSMENT	The amount spent ÷ by the total amount budget x 100.
MEANS OF VERIFICATION	Expenditure records.
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-to-date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	CFO.

INDICATOR TITLE	**Percentage (%) of funded Budget overspent.**
DEFINITION	Measurement of the extent to which the approved budget has not been exceeded without additional funding.
SOURCE OF DATA	Financial reports and financial records maintained by the organisation.
METHOD OF CALCULATION / ASSESSMENT	Total spent per quarter ÷ budgeted amount per quarter (approved) x 100.
MEANS OF VERIFICATION	Budget allocation and expenditure records.
ASSUMPTIONS	Deficit will not be considered as a deficit if the deficit is achieved as a result of the utilization of surplus funds/ accummulated surpluses.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Non-cumulative.
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	CFO.

COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT

INDICATOR TITLE	**Communications and stakeholder engagement strategy and plan reviewed and approved**
DEFINITION	This indicator tracks the availability of an approved Communications and Stakeholder Engagement Strategy.
SOURCE OF DATA	Communications and Stakeholder Engagement Strategy.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of approved strategies.
MEANS OF VERIFICATION	Proof of submissions of reviewed Communications and Stakeholder Engagement Strategy and plan.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Target to be achieved as set in the APP.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Report on implementation of Communications and Stakeholder Engagement**
DEFINITION	This indicator details implementation of Communications and Stakeholder Engagement
SOURCE OF DATA	Report on implementation of Communications and Stakeholder Engagement
METHOD OF CALCULATION / ASSESSMENT	Count of reports
MEANS OF VERIFICATION	Report detailing implementation of Communications and Stakeholder Engagement
ASSUMPTIONS	Sufficient funding provided
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable
CALCULATION TYPE	Cumulative (year to date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP or more.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager

INDICATOR TITLE	**Number of media engagements (media releases).**
DEFINITION	Media engagements activities such as releases and briefings are designed to disseminate information to the general public, where SANEDI is a thought leader in energy research and Energy Efficiency (EE).
SOURCE OF DATA	Media releases and briefing statements.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of media releases and briefings.
MEANS OF VERIFICATION	Proof of media release and briefing i.e., Briefing video or audio output and releases statements.
ASSUMPTIONS	The indicator is used to measure the rate at which SANEDI is disseminating information to the general public.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

INDICATOR TITLE	**Number of Strategic Energy Dialogue.**
DEFINITION	This indicator tracks the number of Strategic Energy dialogues that are conducted by SANEDI in the year.
SOURCE OF DATA	Communications reports.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of Strategic Energy dialogues conducted.
MEANS OF VERIFICATION	Proof of hosting Strategic Energy dialogue.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Outreach programmes (Community consultations to obtain buy-in).**
DEFINITION	It is important for SANEDI to make its presence known in the energy industry as well as the communities that it implements its projects. Outreach programmes and Stakeholder consultations will assist in creating awareness as well as a buy-in.
SOURCE OF DATA	Internal reporting against the indicators.
METHOD OF CALCULATION / ASSESSMENT	Simple count.
MEANS OF VERIFICATION	Outreach attendance registers.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

INDICATOR TITLE	**Number of Stakeholder Perception surveys.**
DEFINITION	This indicator tracks the number of Stakeholder perception surveys conducted as an attempt to get feedback from Stakeholder.
SOURCE OF DATA	Communications reports.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of perception surveys conducted.
MEANS OF VERIFICATION	Proof of conducting perception survey; Stakeholder Perception report.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

INDICATOR TITLE	**An interactive website maintained annually.**
DEFINITION	This indicator tracks the number of times the SANEDI website is reviewed for content layout and structure.
SOURCE OF DATA	Website review report.
METHOD OF CALCULATION / ASSESSMENT	Simple count of website review report.
MEANS OF VERIFICATION	Proof of updated website.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year to date).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Social Media Perception Index Report.**
DEFINITION	This measures the positive or negative client reviews in the form of likes and comments received on SANEDI social media accounts.
SOURCE OF DATA	SANEDI's social media platforms.
METHOD OF CALCULATION / ASSESSMENT	Simple count of reports.
MEANS OF VERIFICATION	Social media index report incorporating social media analytics, comments, likes, dislikes and shares.
ASSUMPTIONS	Percentage positive / negative client reviews or Social Media Perception on SANEDI.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

INDICATOR TITLE	**Radio and Television engagements.**
DEFINITION	This indicator tracks the number of times SANEDI provides feedback to the public via radio and television.
SOURCE OF DATA	Communications reports.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of radio and television activities undertaken.
MEANS OF VERIFICATION	Proof of radio and television activities undertaken.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year to date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

INDICATOR TITLE	**Number of industry knowledge sharing events and marketing platforms hosted to promote energy related market/industry developments.**
DEFINITION	The number of industry knowledge sharing events and marketing platforms hosted to promote energy related market/industry developments that have been conducted.
SOURCE OF DATA	Communication reports.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of events or platforms hosted.
MEANS OF VERIFICATION	Proof of knowledge sharing events and marketing platforms hosted i.e., briefing, video or audio output, photos and statements.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Target to be achieved as set in the APP.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

13.1 PROGRAMME 1: ADMINISTRATION - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**SANEDI Annual Conference.**
DEFINITION	The number of SANEDI Annual Conferences that have been conducted.
SOURCE OF DATA	The Key Performance Indicators (KPIs) will reflect the number of SANEDI Annual Conferences that have been conducted in the year order to educate the public on energy issues and commemorate World Energy Day.
METHOD OF CALCULATION / ASSESSMENT	Simple count of the number of conferences conducted.
MEANS OF VERIFICATION	SANEDI Annual Conference report.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieving targets as set in APP for the relevant period.
INDICATOR RESPONSIBILITY	Communications and Stakeholder Engagement Manager.

13.2 PROGRAMME 2: APPLIED ENERGY RESEARCH, DEVELOPMENT & INNOVATION - PERFORMANCE INDICATORS

PROGRAMME PERFORMANCE INDICATORS – CLEANER FUELS & RELATED TECHNOLOGIES

INDICATOR TITLE	**Number of energy solutions assessed either Advisory notes or Feasibility Reports or Study reports or Case studies, or Technology Roadmaps and Demonstration projects/ facilities.**
DEFINITION	Assess and/or demonstrate energy solutions for relevance in South Africa.
SOURCE OF DATA	As confirmed by (i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, (vi) Operational demonstration facilities/ projects, pilot studies among others, (vii) Business cases, and (viii) Proof of concepts.
METHOD OF CALCULATION / ASSESSMENT	Count of either Advisory notes or Feasibility Reports or Study reports or Case studies, or Technology Roadmaps and Demonstration projects/facilities..
MEANS OF VERIFICATION	i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, (vi) Operational demonstration facilities/ projects, pilot studies among others, (vii) Business cases, and (viii) Proof of concepts.
ASSUMPTIONS	Sufficient funding provided.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP or more.
INDICATOR RESPONSIBILITY	General Manager (GM) of EE.

INDICATOR TITLE	**Approved report on Cleaner Coal Technologies collaborations**
DEFINITION	A report on Clean Coal Technologies collaborations.
SOURCE OF DATA	Report.
METHOD OF CALCULATION / ASSESSMENT	Count of a report.
MEANS OF VERIFICATION	Report on Clean Coal Technologies collaborations.
ASSUMPTIONS	Sufficient data and information is available, accessible and provided.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP or more.
INDICATOR RESPONSIBILITY	GM.

PROGRAMME PERFORMANCE INDICATORS – RENEWABLE ENERGY

INDICATOR TITLE	**Number of energy solutions assessed either Advisory notes or Feasibility Reports or Study Reports or Case studies, or Technology Roadmaps and Demonstration projects/ facilities.**
DEFINITION	Assess and/or demonstrate energy solutions for relevance in South Africa.
SOURCE OF DATA	As confirmed by (i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, (vi) Operational demonstration facilities/ projects, pilot studies among others, (vii) Business cases, and (viii) Proof of concepts.
METHOD OF CALCULATION / ASSESSMENT	Count of outputs collated across projects within the sub-programme.
MEANS OF VERIFICATION	i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, (vi) Operational demonstration facilities/ projects, pilot studies among others, (vii) Business cases, and (viii) Proof of concepts.
ASSUMPTIONS	Sufficient funding provided.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP or more.
INDICATOR RESPONSIBILITY	GM of EE.

INDICATOR TITLE	**Number of energy-related knowledge sharing events / platforms engaged in either hosted by SANEDI or attended by SANEDI staff or knowledge presented by SANEDI staff.**
DEFINITION	This indicator tracks the hosting of industry knowledge sharing events and platforms to promote energy-related market/industry development.
SOURCE OF DATA	Knowledge sharing events records (registers, recordings, pictures, etc.).
METHOD OF CALCULATION / ASSESSMENT	Count of knowledge sharing events hosted.
MEANS OF VERIFICATION	Knowledge sharing events records (registers, recordings, pictures, etc.).
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP or better.
INDICATOR RESPONSIBILITY	GM of EE.

PROGRAMME PERFORMANCE INDICATORS – RENEWABLE ENERGY (CONTINUED)

INDICATOR TITLE	**Number of recipients of energy-related training facilitated (excluding SANEDI staff).**
DEFINITION	This indicator tracks training offered or facilitated by SANEDI to recipients.
SOURCE OF DATA	Training records, attendance register, training report, virtual recordings of attendance.
METHOD OF CALCULATION / ASSESSMENT	Count the number of trainees.
MEANS OF VERIFICATION	Training records, attendance register, training report, virtual recordings of attendance.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year to date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs.

INDICATOR TITLE	**Number of annual Energy industry Status Reports**
DEFINITION	Annual energy sector insight (Trends) publication reflecting insights from extensive International and National collaboration, interfacing and forums produced annually.
SOURCE OF DATA	Published industry insight publications.
METHOD OF CALCULATION / ASSESSMENT	Simple count of reports.
MEANS OF VERIFICATION	Proof of published industry insight publications.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GM of EE.

INDICATOR TITLE	**Minimum number of energy-related datasets maintained per annum**
DEFINITION	This indicator tracks maintenance (update and expand) of energy-related datasets.
SOURCE OF DATA	Datasets.
METHOD OF CALCULATION / ASSESSMENT	Count of data sets.
MEANS OF VERIFICATION	Energy-related data sets.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GM of EE.

PROGRAMME PERFORMANCE INDICATORS – RENEWABLE ENERGY (CONTINUED)

INDICATOR TITLE	**Number of policy support instruments either industry roadmaps or sector development plans or industry support tools.**
DEFINITION	This indicator tracks the development of industry roadmaps, sector development plans, and industry support tools to promote energy-related market/industry development including tools, that enable sector skills development and training for future capacity development in line with policy.
SOURCE OF DATA	Industry roadmaps, Sector Development plans and Industry Development / support tools, project records.
METHOD OF CALCULATION / ASSESSMENT	Count of outputs across this sub-programme.
MEANS OF VERIFICATION	Proof of Industry Roadmaps, Sector Development plans and Industry Development / support tools, project records.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GM of EE.

INDICATOR TITLE	**Approved research study providing insights on technology options or benchmarks and lessons learnt or employment vulnerability and sector jobs resilience plans for JET to enable policy development.**
DEFINITION	A research study providing insights on technology options, benchmarks and lessons learnt, employment vulnerability and sector jobs resilience plans for JET to enable Policy development
SOURCE OF DATA	Research Report register.
METHOD OF CALCULATION / ASSESSMENT	Count of reports produced.
MEANS OF VERIFICATION	Approved research report.
ASSUMPTIONS	Research report to be published during the period under review.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-to date).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP or better.
INDICATOR RESPONSIBILITY	Respective GMs.

INDICATOR TITLE	**Number of Stakeholders trained on JET in various interventions.**
DEFINITION	This measures community members in the provinces affected by JET and the decommissioning of coal fired thermal power stations and that would be trained on other interventions.
SOURCE OF DATA	Training records, attendance records for physical and virtual training.
METHOD OF CALCULATION / ASSESSMENT	Count the number of trainees.
MEANS OF VERIFICATION	Proof of training records, attendance records for physical and virtual training
ASSUMPTIONS	Ongoing training throughout the review period.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs.

PROGRAMME PERFORMANCE INDICATORS – SMART GRIDS

INDICATOR TITLE	**Number of energy solutions assessed either Advisory notes or Feasibility Reports or Study Reports or Case studies, or Technology Roadmaps and Demonstration projects/ facilities.**
DEFINITION	To track the number of energy solutions assessed for relevance to local applications.
SOURCE OF DATA	(i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, and (vi) Operational demonstration facilities/projects or pilots that document an assessed EE solution.
METHOD OF CALCULATION / ASSESSMENT	Count of EE solutions assessed.
MEANS OF VERIFICATION	Proof of (i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, and (vi) Operational demonstration facilities/projects or pilots that document an assessed EE solution.
ASSUMPTIONS	Outputs not published or released to the public or intended recipients because of Government moratorium, preference, or sensitivity of content.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GMs for EE.

INDICATOR TITLE	**Number of annual Energy Industry Status Reports.**
DEFINITION	Annual energy sector insight (trends) publication reflecting insights from extensive International and National collaboration, interfacing and forums produced annually.
SOURCE OF DATA	Published industry insights publication.
METHOD OF CALCULATION / ASSESSMENT	Simple count of outputs.
MEANS OF VERIFICATION	Published industry insights.
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs; responsibility for final publication resides with the CEO of SANEDI.

PROGRAMME PERFORMANCE INDICATORS – DATA AND KNOWLEDGE MANAGEMENT (CONTINUED)

INDICATOR TITLE	**Number of industry Roadmaps or Sector Development plans and Industry support tools developed to promote energy related market/industry development.**
DEFINITION	This indicator tracks the development of Industry Roadmaps, Sector development plans, and Industry support tools to promote energy-related market/industry development including tools, that enable sector skills development and training for future capacity development in line with policy.
SOURCE OF DATA	Industry Roadmaps, Sector development plans and Industry development/ support tools developed.
METHOD OF CALCULATION / ASSESSMENT	Count of outputs across this sub-programme.
MEANS OF VERIFICATION	Proof of Industry Roadmaps, Sector development plans and Industry development/ support tools
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead sub-programmes.

PROGRAMME PERFORMANCE INDICATORS – DATA AND KNOWLEDGE MANAGEMENT

INDICATOR TITLE	**Number of approved sectorial Reports produced.**
SHORT DEFINITION	This indicator tracks the production of detailed analytical reports containing data and insights for priority energy-related sectors and/or sub-sectors.
SOURCE/COLLECTION OF DATA	Industrial EE project records, Relevant Economic Classification study articles.
METHOD OF CALCULATION	Simple counting of approved sectorial reports.
MEANS OF VERIFICATION	Sector reports.
ASSUMPTIONS	None.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs / Project Managers.

INDICATOR TITLE	**Number of annual Energy Industry Status Reports.**
SHORT DEFINITION	This indicator tracks annual energy industry insight (trends) publication reflecting insights from extensive International and National collaboration, interfacing and forums produced annually.
SOURCE/COLLECTION OF DATA	Published industry insights
METHOD OF CALCULATION	Simple count of reports.
MEANS OF VERIFICATION	Published industry insights.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annually.
DESIRED PERFORMANCE	Achieve the stated target in APP.
INDICATOR RESPONSIBILITY	Respective GMs / Project Managers.

PROGRAMME PERFORMANCE INDICATORS – CLEANER MOBILITY (CONTINUED)

INDICATOR TITLE	**Number of energy-related research students / contracted researchers supported either bursaries or, non-bursaries.**
SHORT DEFINITION	This indicator tracks support for full time energy data research studies through bursaries or non-bursary support.
SOURCE/COLLECTION OF DATA	Bursary records, non-bursary support records.
METHOD OF CALCULATION	Simple count of records of energy-related researchers support or bursary records.
MEANS OF VERIFICATION	Proof of energy-related researchers support records or bursary records.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve the stated target in APP.
INDICATOR RESPONSIBILITY	Respective GMs / Project Managers.

INDICATOR TITLE	**Number of recipients of energy data related training facilitated (excluding SANEDI)**
SHORT DEFINITION	This indicator tracks energy data-related training offered or facilitated by SANEDI to recipients.
SOURCE/COLLECTION OF DATA	Training records, attendance records for physical and virtual training.
METHOD OF CALCULATION	Count of the trainees excluding SANEDI employees
MEANS OF VERIFICATION	Training records, attendance records for physical and virtual training.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective General Managers / project managers.

PROGRAMME PERFORMANCE INDICATORS – CLEANER MOBILITY

INDICATOR TITLE	**Number of energy solutions assessed either Advisory notes or Feasibility Reports or Study Reports or Case studies, or Technology Roadmaps and Demonstration projects/ facilities.**
DEFINITION	Assess and/or demonstrate energy solutions for relevance in South Africa.
SOURCE OF DATA	(i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, (vi) Operational demonstration facilities/ projects, pilot studies among others, (vii) Business cases, and (viii) Proof of concepts.
METHOD OF CALCULATION / ASSESSMENT	Count of outputs collated across this sub-programme.
MEANS OF VERIFICATION	(i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, (vi) Operational demonstration facilities/ projects, pilot studies among others, (vii) Business cases, and (viii) Proof of concepts.
ASSUMPTIONS	Outputs not published or released to the public or intended recipients because of Government moratorium, preference or sensitivity of content.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs of this sub-programme.

PROGRAMME PERFORMANCE INDICATORS – CLEANER MOBILITY (CONTINUED)

INDICATOR TITLE	**Annual energy industry insight (Trends) publications reflecting insights from extensive International and National collaboration, interfacing and forums.**
DEFINITION	Annual energy industry insight (trends) publication reflecting insights from extensive International and National collaboration, interfacing and forums produced annually.
SOURCE OF DATA	Published industry insights.
METHOD OF CALCULATION / ASSESSMENT	Count of outputs.
MEANS OF VERIFICATION	Published industry insights.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs, responsibility for final publication resides with the CEO of SANEDI.

INDICATOR TITLE	**Number of Industry Roadmaps or Sector development plans and Industry support tools developed to promote energy related market/industry development.**
DEFINITION	This indicator tracks the development of Industry Roadmaps, Sector development plans, and Industry support tools to promote energy-related market/industry development including tools, that enable sector skills development and training for future capacity development in line with policy.
SOURCE OF DATA	Count of Industry Roadmaps, Sector development plans, and Industry development/ support tools, developed.
METHOD OF CALCULATION / ASSESSMENT	Count of outputs collated across this sub-programme.
MEANS OF VERIFICATION	Proof of developed industry roadmaps, sector development plans and industry development/ support tools.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme.

INDICATOR TITLE	**Number of energy-related knowledge sharing events / platforms engaged in either hosted by SANEDI or attended by SANEDI staff or knowledge presented by SANEDI staff.**
DEFINITION	This indicator tracks the hosting of industry knowledge sharing events and platforms to promote energy-related market/industry development.
SOURCE OF DATA	Knowledge sharing events records. (Registers, recordings, pictures, etc.).
METHOD OF CALCULATION / ASSESSMENT	Count of knowledge sharing events hosted.
MEANS OF VERIFICATION	Registers, recordings, pictures of Knowledge sharing events records.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme.

PROGRAMME PERFORMANCE INDICATORS – CLEANER MOBILITY (CONTINUED)

INDICATOR TITLE	**Number of recipients of energy-related training facilitated (excluding SANEDI staff).**
DEFINITION	This indicator tracks the training offered or facilitated by SANEDI.
SOURCE OF DATA	Training records, attendance records for physical and virtual training.
METHOD OF CALCULATION / ASSESSMENT	Count of trainees.
MEANS OF VERIFICATION	Proof of training records, attendance records for physical and virtual training.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GMs that lead this sub-programme and/or programmes.

PROGRAMME PERFORMANCE INDICATORS – BALANCING ENERGY SUPPLY & DEMAND

INDICATOR TITLE	**Approved report on proof of concept to demonstrate load shifting and/ or reduction of up to 1000MW**
DEFINITION	A report detailing a proof of concept to demonstrate load shifting and/ or reduction of up to 1000MW.
SOURCE OF DATA	Completed report on proof of concept published internally.
METHOD OF CALCULATION / ASSESSMENT	Simple count of a report.
MEANS OF VERIFICATION	Approved report on proof of concept.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Yearly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GMs that lead this sub-programme and/or programmes.

INDICATOR TITLE	**Approved report on Project definition (scoping and basic design) of Small-Scale Embedded Generation (SSEG) contribution to load shifting and / or reduction 10MW**
DEFINITION	Project definition report (scoping and basic design) detailing SSEG contribution to load shifting and / or reduction 10MW.
SOURCE OF DATA	Completed report on proof of concept published internally.
METHOD OF CALCULATION / ASSESSMENT	Simple count of a report.
MEANS OF VERIFICATION	Approved report on proof of concept.
ASSUMPTIONS	Impact measured during the period under review. Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GMs that lead this sub-programme and/or programmes.

13.3 PROGRAMME 3: ENERGY EFFICIENCY - PERFORMANCE INDICATORS

INDICATOR TITLE	**12L EE Tax Certificates issued.**
DEFINITION	Assess EE solutions for relevance to local applications.
SOURCE OF DATA	Section 12L projects fully approved and Tax Certificates issued.
METHOD OF CALCULATION / ASSESSMENT	Count of EE solutions implemented including Section 12L projects fully approved and Tax Certificates issued.
MEANS OF VERIFICATION	Proof of approved 12L projects and issued Tax Certificates.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GM for EE.

INDICATOR TITLE	**GHG emissions reduced (Mega tonnes CO2).**
DEFINITION	To track the reduction of GHG emissions as a result of Section 12L projects and Cool Surface product application.
SOURCE OF DATA	Online data repository dedicated for Section 12L tax incentives applications and procurement documents for Cool Surface.
METHOD OF CALCULATION / ASSESSMENT	Database automatically calculates, using a standard formula and published Emission Factors. - Count area coated for Cool Surface.
MEANS OF VERIFICATION	Online data repository for Section 12L tax incentives applications and procurement documents for Cool Surface.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-to-date).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GMs for EE.

INDICATOR TITLE	**Number of Energy Solutions assessed.**
DEFINITION	To track the number of energy solutions assessed for relevance to local applications.
SOURCE OF DATA	Completed reports with recommendations published.
METHOD OF CALCULATION / ASSESSMENT	Count of EE solutions assessed.
MEANS OF VERIFICATION	Publication date of reports.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GM for EE.

13.3 PROGRAMME 3: ENERGY EFFICIENCY - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Number of EE energy-related datasets maintained per annum.**
DEFINITION	This a collection of related sets of information on an Excel sheet relevant to particular project/research work or topic or area.
SOURCE OF DATA	Datasets developed and maintained. Databases must reflect the reported outputs Quarterly, Annual and performance from Programme/ Project Inspection. The Database can be manual (Excel spreadsheet) or from an automated system
METHOD OF CALCULATION / ASSESSMENT	Simple count of datasets maintained.
MEANS OF VERIFICATION	Proof of maintained data sets.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GMs / Project Manager that leads this sub-programme and/or programme.

INDICATOR TITLE	**Number of EE solutions implemented (Standards & Labelling).**
DEFINITION	Assess EE solutions for relevance to local applications.
SOURCE OF DATA	Energy performance standards on Standards & Labelling.
METHOD OF CALCULATION / ASSESSMENT	Count on Minimum Energy performance standards developed on Standards & Labelling.
MEANS OF VERIFICATION	Energy performance standards on Standards & Labelling
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	GMs for EE.

INDICATOR TITLE	**Number of recipients of energy-related training facilitated (excluding SANEDI staff).**
DEFINITION	This indicator tracks the training offered or facilitated by SANEDI.
SOURCE OF DATA	Training records, attendance records for physical and virtual training.
METHOD OF CALCULATION / ASSESSMENT	Count trainees excluding SANEDI employees.
MEANS OF VERIFICATION	Proof of training records, attendance records for physical and virtual training.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

13.4 PROGRAMME 4: THE ENERGY SECRETARIAT - PERFORMANCE INDICATORS

INDICATOR TITLE	**Approved report detailing number of postgraduate students (masters and doctoral) supported in designated energy areas.**
DEFINITION	This indicator tracks the number of postgraduate students (masters and doctoral students supported through the Energy Secretariat.
SOURCE OF DATA	Student records/database.
METHOD OF CALCULATION / ASSESSMENT	Simple count of records of postgraduate students (masters and doctoral students supported.
MEANS OF VERIFICATION	Proof of postgraduate students support records or bursary records.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP/Energy Secretariat Memorandum of Understanding (MoU).
INDICATOR RESPONSIBILITY	GM for ES.

INDICATOR TITLE	**Approved report detailing number of commercial outputs in designated energy areas.**
DEFINITION	Assess commercial outputs in designated energy areas as stipulated.
SOURCE OF DATA	Performance standards developed.
METHOD OF CALCULATION / ASSESSMENT	Simple count.
MEANS OF VERIFICATION	Proof of commercial outputs completed.
ASSUMPTIONS	Achievable in Q4. Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP/Energy Secretariat MoU.
INDICATOR RESPONSIBILITY	GMs for ES.

INDICATOR TITLE	**Approved report detailing number of artisans and/or technicians trained in the energy sector of the economy.**
DEFINITION	This indicator tracks the number of artisans and/or technicians trained in the energy sector of the economy through the Energy Secretariat.
SOURCE OF DATA	Student records/database.
METHOD OF CALCULATION / ASSESSMENT	Simple count of records of the number of artisans and/or technicians trained in the energy sector of the economy through the Energy Secretariat.
MEANS OF VERIFICATION	Proof of postgraduate students support training records or attendance register and/or certificates.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP/Energy Secretariat MoU.
INDICATOR RESPONSIBILITY	GM of ES.

13.4 PROGRAMME 4: THE ENERGY SECRETARIAT - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Approved report detailing number of University of Technology (UoT)/ Technical Vocational Education and Training (TVET) graduates offered experiential learning opportunities in the energy sector.**
DEFINITION	This indicator tracks the number UoT/TVET graduates offered experiential learning opportunities in the energy sector through the Energy Secretariat.
SOURCE OF DATA	Student records/database.
METHOD OF CALCULATION / ASSESSMENT	Simple count of records of UoT/TVET graduates supported.
MEANS OF VERIFICATION	Proof of UoT/TVET students support records or training records.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP/Energy Secretariat MoU.
INDICATOR RESPONSIBILITY	GM of ES.

INDICATOR TITLE	**Approved report detailing number of Intellectual Property Rights (IPRs) filed based on energy RDI.**
DEFINITION	This indicator tracks the number of IPRs filed based on energy RDI under the auspices of the Energy Secretariat.
SOURCE OF DATA	Intellectual property rights records/database.
METHOD OF CALCULATION / ASSESSMENT	Simple count of records of intellectual property rights filed.
MEANS OF VERIFICATION	Records of or proof of intellectual property rights filed.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP/Energy Secretariat MoU.
INDICATOR RESPONSIBILITY	GM of ES.

13.4 PROGRAMME 4: THE ENERGY SECRETARIAT - PERFORMANCE INDICATORS (CONTINUED)

INDICATOR TITLE	**Approved report detailing number of stationary fuel cells/clean energy technologies deployed in partnership with Municipalities/District Municipalities.**
DEFINITION	Assess and/or demonstrate the number of stationary fuel cells and clean energy technologies deployed at the sub-national level, particularly in Municipalities.
SOURCE OF DATA	As confirmed by (i) Advisory notes, (ii) Feasibility Reports, (iii) Complete Study Reports, (iv) Case studies, (v) Technology Roadmaps, (vi) Operational demonstration facilities/ projects, pilot studies among others, (vii) Business cases, and (viii) Proof of concepts.
METHOD OF CALCULATION / ASSESSMENT	Count of outputs collated.
MEANS OF VERIFICATION	Reports on stationary fuel cells/clean energy technologies deployed.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP/Energy Secretariat MoU.
INDICATOR RESPONSIBILITY	GM of EE.

INDICATOR TITLE	**Approved report detailing number of Small, Medium and Micro Enterprises (SMMEs) assisted/supported with business development and commercialisation.**
DEFINITION	This indicator tracks the number of SMMES supported by the Energy Secretariat.
SOURCE OF DATA	SMMEs programme reports/records.
METHOD OF CALCULATION / ASSESSMENT	Count supported SMMEs.
MEANS OF VERIFICATION	Proof of supported SMMEs. Progress/closeout reports.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in the APP/Energy Secretariat MoU.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

13.5 PROGRAMME 5: SPECIAL PROJECTS - PERFORMANCE INDICATORS

PROGRAMME PERFORMANCE INDICATORS – COLLABORATION WITH LOCAL, REGIONAL & INTERNATIONAL ENERGY PARTNERS

INDICATOR TITLE	**IP Audit conducted**
DEFINITION	IP protection and strengthening of IP Governance to reduce IP theft.
SOURCE OF DATA	IP audit report.
METHOD OF CALCULATION / ASSESSMENT	Simple count of number of internal trainings on IP Management.
MEANS OF VERIFICATION	Approved IP Audit Reports.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve targets as set in the APP.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

INDICATOR TITLE	**Approved IP Management Policy**
DEFINITION	Drafting and production of an IP Management Policy.
SOURCE OF DATA	IP Policy.
METHOD OF CALCULATION / ASSESSMENT	Count of IP Policies produced.
MEANS OF VERIFICATION	Approved IP Policy.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end)
REPORTING CYCLE	Annual.
DESIRED PERFORMANCE	Achieve as per target set in the APP.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

INDICATOR TITLE	**Number of internal trainings on IP management.**
DEFINITION	This indicator tracks the IP Management training provided or facilitated.
SOURCE OF DATA	Training records, attendance records for physical and virtual training.
METHOD OF CALCULATION / ASSESSMENT	Simple count of number of internal trainings on IP Management.
MEANS OF VERIFICATION	Proof of training records, attendance records for physical and virtual training.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the disaggregation will be provided where applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	This information is not possible to determine currently. However, during reporting the spatial transformation will be provided where applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

PROGRAMME PERFORMANCE INDICATORS – COLLABORATION WITH LOCAL, REGIONAL & INTERNATIONAL ENERGY PARTNERS (CONTINUED)

INDICATOR TITLE	**Setting up a governance structure for ring-fenced projects.**
DEFINITION	Assesses the evidence of the existence of a governance structure for ring-fenced programmes.
SOURCE OF DATA	Governance structure report.
METHOD OF CALCULATION / ASSESSMENT	Governance structure.
MEANS OF VERIFICATION	Approved governance structure for ring-fenced programmes.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve as per target set in the APP.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

INDICATOR TITLE	**Number of localised technologies.**
DEFINITION	This metric tracks the number of localised technologies.
SOURCE OF DATA	Technology reports/records.
METHOD OF CALCULATION / ASSESSMENT	Count localised technologies.
MEANS OF VERIFICATION	Proof of localised technologies.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

INDICATOR TITLE	**Number of SMMEs supported.**
DEFINITION	This indicator tracks the number of SMMEs supported by Special Projects.
SOURCE OF DATA	SMMEs programme reports/records.
METHOD OF CALCULATION / ASSESSMENT	Count supported SMMEs.
MEANS OF VERIFICATION	Resources are available.
ASSUMPTIONS	SMMEs supported are in addition to those supported by the Energy Secretariat.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

PROGRAMME PERFORMANCE INDICATORS – COLLABORATION WITH LOCAL, REGIONAL & INTERNATIONAL ENERGY PARTNERS (CONTINUED)

INDICATOR TITLE	**Local- Maintaining representation/partnership/ agreements including: Councils, Boards, Reference groups, Steering Committees, NATJOINTS, NACI, IPP office, SoEs.**
DEFINITION	This indicator tracks the number of local partnerships entered into and maintained by Special Projects.
SOURCE OF DATA	Local Partnerships reports/records.
METHOD OF CALCULATION / ASSESSMENT	Count local partnerships entered into and/or maintained.
MEANS OF VERIFICATION	Proof of local partnerships.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

INDICATOR TITLE	**Regional: Maintaining representation/partnership/ agreements on memberships, Councils, Boards.**
DEFINITION	This indicator tracks the number of regional partnerships entered into and maintained by Special Projects.
SOURCE OF DATA	Regional Partnerships reports/records.
METHOD OF CALCULATION / ASSESSMENT	Count of Regional partnerships entered into and/or maintained.
MEANS OF VERIFICATION	Proof of Regional partnerships.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

INDICATOR TITLE	**International: Maintaining representation/partnership/ agreements on: IEA memberships, Councils, Boards, Reference groups, Steering Committees.**
DEFINITION	This indicator tracks the number of international partnerships entered into and maintained by Special Programmes.
SOURCE OF DATA	International partnerships reports/records.
METHOD OF CALCULATION / ASSESSMENT	Count of International partnerships entered into and/or maintained.
MEANS OF VERIFICATION	Proof of International partnerships.
ASSUMPTIONS	Resources are available.
DISAGGREGATION OF BENEFICIARIES (WHERE APPLICABLE)	Not applicable.
SPATIAL TRANSFORMATION (WHERE APPLICABLE)	Not applicable.
CALCULATION TYPE	Cumulative (year-end).
REPORTING CYCLE	Quarterly.
DESIRED PERFORMANCE	Achieve at least the stated target in APP or better.
INDICATOR RESPONSIBILITY	Respective GMs that lead this sub-programme and/or programme.

A State-owned entity established under Section 7 (2) of the National Energy Act 2008|Act No. 34 of 2008 |

Physical Address: CEF House, Block C, Upper Grayston Office Park, 152 Ann Crescent, Strathavon, Sandton.
Postal Address: PO Box 9935, Sandton, 2146
Telephone: 011 038 4300
Email: information@sanedi.org.za
Website: www.sanedi.org.za

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