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MOORE SOUTH AFRICA

ENVIRONMENTAL, SOCIAL, AND GOVERNANCE GUIDE

2026 / 2027

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1. INTRODUCTION

Since the beginning of 2025, South Africa's climate and sustainability framework has continued to evolve, with important developments in legislation, international commitments, and energy policy that are particularly relevant for businesses navigating environmental, social and governance (ESG) considerations.

A key domestic milestone has been the commencement of the Climate Change Act 22 of 2024 in March 2025, which establishes South Africa's first comprehensive legal framework for climate governance. The Act introduces mechanisms such as sectoral emissions targets and carbon budgets, which will guide emissions reductions across major industries. It also requires climate considerations to be integrated into national, provincial and local planning processes, signalling a more structured regulatory environment for climate mitigation and adaptation.

South Africa has also continued to strengthen its international climate commitments under the Paris Agreement. The country's Nationally Determined Contribution (NDC) maintains a target of limiting greenhouse gas emissions to 398–510 $MtCO_2$-eq by 2025 and 350–420 $MtCO_2$-eq by 2030. The First Biennial Transparency Report (BTR1) provides the most recent assessment of progress toward these targets, reporting emissions of around 394 $MtCO_2$-eq in 2022. The report underscores the importance of accelerating the transition of the electricity system to meet future climate goals.

Energy policy developments have reinforced this direction. The Integrated Resource Plan (IRP) 2025 sets out South Africa's long-term roadmap for electricity supply, projecting the need for over 105 GW of new generation capacity by 2039. The plan envisages a more diversified electricity mix, with substantial growth in wind and solar power, expanded gas capacity, to support grid flexibility, and increased investment in energy storage, alongside the gradual retirement of ageing coal plants.

At the same time, South Africa has entered the second phase of its carbon tax. This phase will increase the carbon tax rate and gradually reduce certain tax-free allowances, strengthening the role of carbon pricing as a policy tool to encourage emissions reductions and low-carbon investment.

International developments have also shaped the policy environment. At COP30 in Belém, Brazil in November 2025, countries advanced negotiations on climate finance, carbon markets and implementation of national climate plans. For South Africa, these global discussions reinforce domestic policy reforms and highlight the country's role in advancing a just energy transition while aligning economic development with long-term climate goals.

2. ENVIRONMENTAL AND SUSTAINABILITY CHALLENGES FACING OUR PLANET

Greenhouse gas emissions

The earth needs naturally occurring greenhouse gases (GHG) to warm the climate, (such as water vapour) otherwise the earth's surface would be too cold to sustain life. Human activity has unnaturally increased the emissions of greenhouse gases into the atmosphere. Globally the primary sources of greenhouse gas emissions are:

- from the energy sector: electricity and heat.
- from the agricultural sector: changes in land use, farming, forestry.
- from the industrial sector: manufacturing and transportation.

The energy sector:

While improvements in renewable generation have been made, the majority of South Africa's electricity continues to be generated from coal. As a consequence, South Africa is the top emitter in Africa, and in the top 15 emitters globally. The responsibility to mitigate is higher, and major changes in energy systems are needed urgently.

The agricultural sector:

- Agriculture, deforestation and land degradation all contribute to the emission of greenhouse gases in the atmosphere.

The industrial sector:

- Industrial processes mainly from transportation and manufacturing processes contribute to greenhouse gases in the atmosphere.

Transport and domestic heating and cooling:

- Home heating and cooling, as well as transportation are major contributors towards the emission of methane, nitrous oxide and hydro fluorocarbons (HFC's).

Waste:

- Greenhouse gas emissions from landfills are mainly due to methane and carbon dioxide.

Effect on the environment, weather patterns, global warming and climate change

- Greenhouse gases greatly affect the temperature on earth. Heat from the sun is trapped by the emissions, causing the earth's atmosphere to warm up, known as global warming, which we have already been observing over the past several decades on our planet.
- South Africa is experiencing the effects of climate change – with ongoing drought and water scarcity currently being experienced over many parts of the country.

Ozone depletion

Ozone depletion describes two distinct but related phenomena observed since the late 1970s:

a) A steady decline of about 4% per decade in the total volume of ozone in Earth's stratosphere (the ozone layer), and

b) A much larger springtime decrease in stratospheric ozone over Earth's polar regions. This phenomenon is referred to as the ozone hole.

The stratosphere of the earth (which extends to about 50km above the earth's surface) protects the atmosphere from damaging ultraviolet (UV) light. Small amounts of UV radiation are healthy for the human being, especially in the production of Vitamin D, however over-exposure may result in detrimental health effects to the immune system, skin and eyes, and widespread cancer. Ozone depletion also results in damage to plants and reduction of plankton populations in the ocean's photic zone. Observed and projected decreases in ozone generated worldwide concern leading to adoption of the Montreal Protocol that banned the production of CFCs, halons, and other ozone-depleting chemicals such as carbon tetrachloride and trichloroethane. Forty-three countries signed on in 1987, agreeing to phase out ozone-depleting substances from 1989 onwards. By the turn of the millennium, 174 parties had signed on. The phase-out that followed was rapid. Within a decade the levels had fallen by almost 80% (far beyond the initial target of the Montreal Protocol of a 50% reduction). The use of ozone-depleting substances is now almost zero, making the Montreal Protocol one of the most successful international agreements to date.

Air pollution and acid rain

- Other human impacts on the atmosphere include air pollution in cities, the pollutants including toxic chemicals like nitrogen oxides, sulphur oxides that produce photochemical smog and acid rain.

Shrinking forests

- Deforestation is the permanent destruction of forests in order to make the land available for other uses. Globally, we deforest around ten million hectares of forest every year. That's an area the size of Portugal every year. Around half of this deforestation is offset by regrowing forests, so overall, we lose around five million hectares each year. Nearly all of this deforestation occurs in the tropics.

- Deforestation means that the carbon sink effect of trees, (ability to take carbon out of the atmosphere) is significantly diminished, and some environmental groups are of the view that even afforestation projects (planting of trees and reducing deforestation) will not have a significant impact (as not all carbon is the same), and that it is not possible to accurately measure the "sink" effect of a forest (trees will take in different amounts of carbon depending on the weather, species of tree and very little is known about the movement of carbon in forest soils). They argue that instead, a move towards low-carbon economics is the only solution.

Water problems and wetlands

- As the population increases and climate change causes more droughts, water scarcity is becoming more of an issue. Wetlands are being destroyed – by being covered over and turned into housing estates, shopping centres, industrial areas, or sewerage farms. The usual wetland function of producing conserved and clean water is diminished (they act as natural filters trapping sediment, nutrients and bacteria). Wetlands are also home to a wide variety of bird and insect life, and their destruction means an interruption in the ecological life-cycle.

Soil erosion, land degradation and desertification

- Land degradation is caused by soil erosion, land clearance and poor agricultural practices. Desertification is the degradation of formerly productive land, primarily due to human activity. Lower agricultural yields result, ultimately in poverty and starvation.

Polar ice and rising sea levels

- Global warming can result in increased melt of polar ice, sea ice and glaciers. Melted sea ice results in increased salt water intrusion into coastal aquifers and it is anticipated that the sea levels will rise by between 50cm and 1.5 metres by 2100.

Endangered species, biodiversity loss and vanishing fisheries

- The term 'biodiversity' is used to describe a concern for the natural environment and nature conservation.
- Man-made carbon dioxide emissions into the atmosphere coupled with the destruction of the natural off-setters (plants, trees, soil) means that the natural checks and balances that nature usually uses to correct the process and adapt to the change, are not able to take place. Statistics show that more fish are hauled out of the sea than can be naturally replenished.

Societal issues

Poverty and inequality

- Climate change is increasingly viewed as a current and future cause of hunger and poverty. Rapid population growth – particularly occurring in developing countries – results in increased demand and usage of resources, threatening our ecosystems. More people equals more food, more water and more energy consumption.

Disease and endocrine disruptors

- Run-off from flooding can cause an increase in water-borne disease such as cholera, diarrhoea, and typhoid. Disease and poverty are closely related. Poorer people succumb to tuberculosis, HIV/AIDS caused by living conditions and lack of access to treatment.
- Humans and wildlife species have suffered adverse health effects after exposure to endocrine-disrupting chemicals, released into the environment by industry. This includes declines in populations, increases in cancers, and reduced reproductive function.

3. WHAT IS SUSTAINABLE DEVELOPMENT?

The sustainability movement is based on the premise that the development of 3 aspects – the economy – the environment – and society – need to be balanced, in order for us to find lasting prosperity for future generations on our planet.

Companies, organisations and the individual need to develop an understanding of sustainability and sustainable development, in order to align their strategies and intentions with global and national programmes and commitments, and in order to modify practices and industry in sustainable ways.

Sustainable development means achieving the outcome whereby the current generation will live on earth under comfortable conditions, and future generations will continue to live under the same conditions, while human needs are supported at the same time.

Economic, social and environmental dimensions

- Sustainable development does not just depend on environmental issues. It encompasses the long-term maintenance of our general well-being – which has environmental, economic and social dimensions, all of which need to be reconciled with each other.

Social dimension (people)

- Implementing change has a social dimension that entails aspects such as:

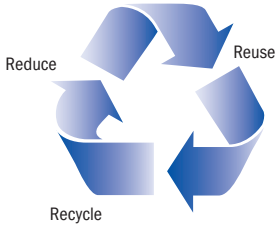
Peace, security and social justice
■ Urban planning and transport, local and individual lifestyles, health ■ Ethical consumerism, improved education ■ Fundamental human rights including racism, gender equality and the political empowerment of women ■ Ensuring the management of resources such as rivers that span political boundaries thus creating environmental security ■ Community outreach, labour relations
Poverty
■ Individuals living in poverty tend to rely heavily on their local ecosystem as a source for their basic needs. It is one source of environmental degradation (Brundtland Report) ■ Alleviation of poverty is a major aspect of change required
Human relationship to nature
■ Nature has, since the industrial revolution, been treated as a commodity ■ So-called "deep ecologists" believe that policies for basic economic, technological and ideological structures that will maintain and improve the **quality of life** rather than the **standard of living** need to be implemented and achieved ■ Individualistic and materialistic societal values and ideologies need to be tackled head-on, strengthening the human relationship to the natural world
Human settlements
■ A concept of the bioregional economy – self sufficiency and eco-villages ■ Altering the built environment to create and preserve sustainable cities which support sustainable transport
Individuals can reduce their personal impact on the environment through a series of small inexpensive steps.

Environmental dimension (planet)

- **Environmental goals** of achieving clean air, water and land emissions, zero waste, zero releases and spills, reduction of carbon emissions and greenhouse gases, a comfortable climate without frequent and extreme weather conditions.
- Maintaining essential ecological processes, preserving biological diversity, sustaining the use of species and ecosystems (some of which support important industries).
- Water efficiency to continually be improved on a local and global scale by increased demand management, improved infrastructures, improved water productivity of agriculture, minimising the water intensity of goods and services, planning for climate change and drought.
- Developing diverse opportunities for non-material use of natural resources (spiritual, recreational, aesthetic).
- Environment Ethics. Ecological integrity is maintained, all of earth's environmental systems are kept in balance while natural resources within them are consumed by humans at a rate where they are able to replenish themselves.
- Sustainable use of materials has included the concept of '**dematerialisation**' whereby the linear path of materials is converted to a circular material flow:

From:

To:



Renewable energy commercialisation

- First generation renewable energy technologies include biomass, hydroelectricity, geothermal power and heat. These technologies are already economically competitive globally.
- Second generation renewable energy technologies include solar heating, photovoltaics, wind power, solar thermal power stations and modern forms of bio-energy. These technologies are currently being deployed globally.
- Third generation renewable energy technologies include advanced biomass gasification, bio-refinery technologies, hot-dry-rock geothermal power and ocean energy. These technologies require further research and development.
- The Integrated Resource Plan 2025 (IRP 2025) is South Africa's central policy framework for long-term electricity planning, setting out how the country will meet future power demand while balancing energy security, affordability and environmental sustainability. The plan outlines the projected electricity generation mix and the scale of new infrastructure required, indicating that more than 105 GW of new generation capacity may be needed by 2039 as older coal plants are retired and demand grows. It also signals a gradual transition toward a more diversified electricity system, with significant expansion of wind and solar generation, increased gas capacity and energy storage to support grid flexibility, and a declining reliance on coal over time.

Economic dimension (profit)

- There is a correlation between economic growth and environmental degradation.
- In economic and environmental fields, the term 'decoupling' is becoming increasingly used in the context of economic production and environmental quality. An economy that is able to sustain Gross Domestic Product (GDP) growth without having a negative impact on the environment is said to be decoupled.

Some further aspects of sustainability in the economic context include:

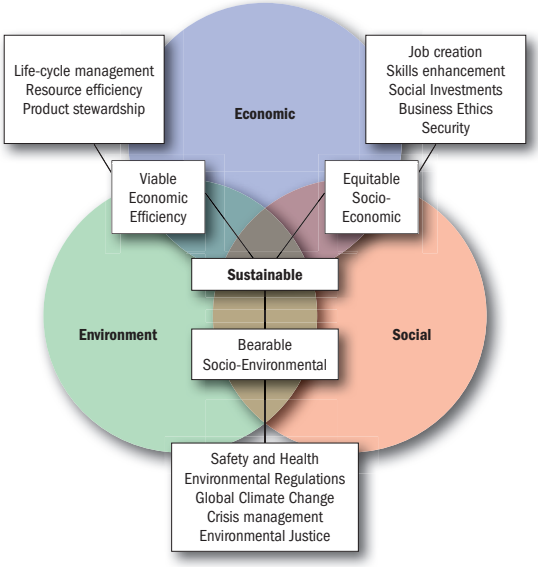
Reducing resource intensity	A goal of 'sustainable scale' rather than 'continual growth'
	Finding ways to reduce resource intensity i.e the amount of the resource needed for production, consumption and disposal of a good or service – either by way of economic management, product design or new technology
Environmental taxes and incentives	Using marketing strategies like eco-taxes and incentives, tradable permits for carbon
	Encouraging the payment for ecosystem services
Economic opportunity	Sustainable business practices integrate social economic and environmental concerns – the "triple bottom line" concept
	The benefits of sustainable business practice and its competitive advantage and profitability – for example, waste reduction results in savings from disposal costs, fewer environmental penalties, and reduced liability insurance, improved public image. Every economic activity produces material that can be classified as waste. Business and industry are now buying into the ideas of eco-design and eco-labelling. Job creation opportunities by the introduction of "green collar" workers
Green Economics	A market-based attempt to address issues of equity and the environment
	A range of government policies, legislation and the implementation of green taxes are likely to bring about a decrease in carbon dioxide emissions

Low carbon economics:

- A low carbon economy (LCE) or low fossil fuel economy (LFFE) is an economy which has minimal output of greenhouse gas emissions, but specifically refers to the greenhouse gas of carbon dioxide.
- The aim of a LCE is to:
  - Implement technologies that produce energy and materials with little greenhouse gas emissions in the manufacturing, agricultural, transportation and power-generation sectors.
  - Dispose of or recycle waste.

- Some other means to achieve LCE would be for retail operations to use high efficiency lighting such as compact fluorescent, halogen and LED light sources, or roof top solar panels.

Scheme of sustainable development: at the confluence of three constituent parts



Integration of the three pillars of sustainability

- Where the social, economic and environmental objectives of sustainable development are integrated into the policy documents and implementation strategies in international treaties, national government and local government policy documents.
- Where the business sector as well as individuals and voluntary groups align themselves with the policies, as all these key players have a major role to play in the transition towards sustainable development.

4. ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG)

ESG is a set of environmental, social, and corporate governance values and practices.

Together, these values and practices within an organisation represent a corporate commitment to making operations more responsible in terms of sustainability, social impact, and corporate management. It is set of values for operating a business that goes beyond the sole focus of shareholder return. In addition, ESG values provide relevant information for investors on an organisation's management and structuring,

ESG represents a fundamental shift to a sustainable mindset in the global marketplace.

ESG has three main indicators:

Environmental

- The focus is on preserving the natural world, and how an organisation acts concerning sustainability goals – i.e the way they approach:
- Climate Change
- Greenhouse Gas (GHG) emissions
- Resource depletion including water
- Waste and pollution
- Deforestation

Social

- The focus is on people and relationships, and how an organisation acts concerning:
- Guaranteeing employees' training
- Supporting gender and diversity
- Equity and inclusion
- Enhancing customer satisfaction
- Employee engagement
- Health and safety
- Labour policies

Governance

- Good governance practices include:
- Ethics and transparency
- Diversity on the board of directors
- Independence of the board
- Structure of tax audit committees
- Cybersecurity practices
- Management structure
- Executive compensation
- The prevention of bribery and corruption

ESG indicators for investors

ESG indicators provide investors with an avenue to obtain more transparent information about how organisations address these complex issues.

It has thus become an important and necessary component in many proposed deals, with enhanced ESG due diligence and disclosure requirements, thereby reducing the risk for investors, and facilitating the decision-making process with precise references on how companies manage their business.

ESG is based on objective criteria and scoring systems

ESG is based on objective criteria and sub-criteria, guided by scoring systems controlled by institutions linked to the financial market, such as the Stock Exchange.

This ranking provides shareholders with complementary information for making investment decisions.

Developing an ESG strategy

An ESG strategy gives businesses a framework for seeing progress toward reaching sustainability goals. Companies get quantitative information that measures the value they're getting back for their efforts, which can benefit them in the following ways:

Keep up with competitors: Having a successful ESG strategy ensures businesses stay in step with competitors, who also have ESG strategies of their own. An ESG strategy can help companies look better to their clients and investors.

Align with stakeholder interests: An ESG strategy gives stakeholders an objective way to measure improvements in each fundamental area of the plan, showing them they're investing their money in the right place.

Prepare for long-term success: An ESG plan is an important part of vision casting and doing the right things now to ensure a long, prosperous future.

How to create an ESG strategy

Consult with stakeholders: Define the beliefs and values of stakeholders to start mapping out objectives with your ESG strategy. Identify those goals applicable to the organisation and incorporate these into developing its sustainable development strategies, corporate social responsibility goals and targets which can be measured – in both the short and the long-term.

Choose the right ESG framework: there are many frameworks to guide the development of an organisation's ESG strategy, such as: the United Nations 17 Sustainable Development Goals and the Global Reporting Initiative Standards.

Conduct a materiality assessment: A materiality assessment will reveal the areas in an ESG plan that the organisation should focus on, and helps businesses prioritise the right actions to take to meet their goals. Conduct baseline assessments – carbon, energy, water, waste, adaption Carbon footprint offsets. Producers, manufacturers responsibility – disposal of products and packaging.

Water resources – the use of scarce water resources to be handled responsibly.

Creation of a strong link in the supply chain – organic raw materials, farming for the future initiative, building intangible assets.

Appoint the right people for management: Appoint the right people to manage ESG efforts – people who devote themselves to the ESG strategy's success. Establish a "Green Team" within the organisation.

Collect data toward key performance indicators (KPIs): Once the ESG plan is up and running, the organisation can begin collecting data. Use the data to track KPIs, measuring success along the way.

Reassess over time: As companies continue gathering data related to ESG efforts and track KPIs, they have the benefit of being able to reassess their strategies over time. Companies should review strategies and policies against standards for good corporate governance, including the SDG's as identified in Agenda 2030, and the King V Report on Corporate Governance for South Africa.

Understand the strategies and policies of government:
The organisation needs to work together with government in order to play its role in ensuring the correct strategies are put into place and implemented and to play its role in achieving same. Business is viewed as an "essential" partner with government in achieving the Sustainable Development Goals (SDGs).

Financial reporting and compliance with legislation

Sustainability assurance reporting – compulsory for listed companies.
Numerous regulations and taxonomies have been released globally in the ESG space, including South Africa's National Green Finance Taxonomy.
Compliance with legislation in South Africa, particularly environmental and employment legislation.

South African green finance taxonomy

The International Finance Corporation (IFC), together with the Treasury Department of South Africa released its 1st Edition of the South African Green Finance Taxonomy during March 2022.

Its main aim is to "develop or adopt a taxonomy for green, social and sustainable finance initiatives, consistent with international developments, to build credibility, foster investment and enable effective monitoring and disclosure of performance".

A green finance taxonomy (GFT) is a classification system or catalogue that defines a minimum set of assets, projects, activities and sectors that are eligible to be defined as "green" in line with international best practice and national priorities. It can be used by investors, issuers, and other financial sector participants to track, monitor, and demonstrate the credentials of their green activities in a more confident and efficient way.

The section on sectors and activities illustrates the environmental objectives that have been developed for each economic activity and further illustrates whether contributions to objectives are recognised as enabling other economic activities or if contributions are to the economic activities own performance.

The Taxonomy is intended to have a range of benefits. Amongst other things, it will

- Help the financial sector with clarity and certainty in selecting green investments in line with international best practice and South Africa's national policies and priorities.
- Reduce financial sector risks through enhanced management of environmental and social performance.
- Reduce the costs associated with labelling and issuing green financial instrument.
- Unlock significant investment opportunities for South Africa in a broad range of green and climate-friendly assets.
- Support regulatory and supervision oversight of the financial sector.
- Provide a basis for regulators to align or reference green financial products.

Sustainability-linked loans in South Africa

The demand for sustainability-linked loans is surging, with banks competing to offer this new form of finance in South Africa. These loans could be used for any purpose, such as making an acquisition. However, the interest rate applicable is informed by the achievement of specific targets by the borrower on key ESG indicators.

Over the next few years, generational shifts and new technologies will be driving forces in the wider adoption of the ESG principles.

5. THE 17 SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development were adopted by 193 world leaders in September 2015 at the United Nations General Assembly: "Transforming our World: the 2030 Agenda for Sustainable Development" [known as Agenda 2030]. They officially came into force on the 1 January 2016. South Africa is one of the member states of the United Nations. The SDGs are significant, as they consist of a call for action for countries to play their part in combating the climate concerns of today and protecting the planet for future generations. These broad and interdependent goals chart a way towards a sustainable future.

The 2030 Agenda consists of four parts:

- Vision and principles
- Goals and Targets
- Means of implementation
- Follow up review mechanism

Vision and principles

Countries that have committed to the 17 SDGs have until 2030 to achieve 3 overarching goals which underpin the Agenda. They are:

- To end extreme poverty.
- To fight inequality and injustice.
- To fix climate change.

The preamble of Agenda 2030 states that the 17 SDGs and 169 targets linked to the goals, seek to build on the 8 Millennium Development Goals (set down in 2000 at the Millennium Summit of the United Nations), and balance the three dimensions of sustainable development: the economic, social and environmental.

In its declaration, Agenda 2030 further states that all previous United Nations summits on the issue have laid the foundation for sustainable development and have "…helped to shape the new Agenda – which will be implemented for the full benefit of all for today's and future generations…"

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

Goals and targets

- Linked to the 17 SDG's are 169 targets, and over 200 indicators – all of which are integrated and indivisible, global in nature and universally applicable.
- The targets are defined as global with each country being required to set its own national targets but guided by the global goals, and taking into account the country's own national circumstances.
- Apart from SDG Goal number 7, which advocates for access to affordable, reliable, sustainable and modern energy, SDG Goal number 13 is particularly significant, as it encourages all nations to take urgent action to combat climate change and its impacts.

The global goals for sustainable development

The 2030 Agenda sets out the 17 SDGs in more detail as follows:

Goal 1. End poverty in all its forms everywhere

There are 5 sub-goals set out – one of which is by 2030 to reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

There are 5 sub-goals set out – one of which is to end hunger by 2030 and ensure access by all people in particular the poor and vulnerable including infants – to safe and nutritious and sufficient food all year round.

Goal 3. Ensure healthy lives and promote well-being for all at all ages

There are 9 sub-goals set out – one of which is by 2030 to reduce the global maternal mortality ratio to less than 70 per 100,000 live births.

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

There are 7 sub-goals set out – one of which is that by 2030 all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.

Goal 5. Achieve gender equality and empower all women and girls

There are 6 sub-goals set out – one of which is to end all forms of discrimination against all women and girls everywhere.

Goal 6. Ensure availability and sustainable management of water and sanitation for all

There are 6 sub-goals set out – one of which is that by 2030 universal and equitable access to safe and affordable drinking water for all will be achieved.

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

There are 3 sub-goals set out – one of which is that by 2030 the share of renewable energy in the global energy mix will be increased.

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

There are 10 sub-goals set out – one of which is to sustain economic growth in accordance with national circumstances and in particular at least 7% gross domestic product growth per annum in the least developed countries.

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

There are 5 sub-goals set out – one of which is to develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

Goal 10. Reduce inequality within and among countries

There are 7 sub-goals set out – one of which is that by 2030 to progressively achieve and sustain income growth of the bottom 40% of the population at a higher than the national average.

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

There are 7 sub-goals set out – one of which is that by 2030 to ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

Goal 12. Ensure sustainable consumption and production patterns

There are 8 sub-goals set out – one of which is to encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information in their reporting cycle.

Goal 13. Take urgent action to combat climate change and its impacts

[acknowledging that the United Nations Framework Convention on Climate Change is the primary international, inter-governmental forum for negotiating the global response to climate change]

There are 3 sub-goals set out – one of which is to integrate climate change measures into national policies, strategies and planning.

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

There are 7 sub-goals set out – one of which is that by 2025 to prevent and significantly reduce marine pollution of all kinds in particular from land based activities, including marine debris and nutrient pollution.

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

There are 9 sub-goals set out – one of which is that by 2030, to ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide benefits which are essential for sustainable development.

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

There are 10 sub-goals set out – one of which is to ensure public access to information and protect fundamental freedoms in accordance with national legislation and international agreements – e.g. promote and enforce non-discriminatory laws and policies for sustainable development.

Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

There are 19 sub-goals set out- under the following headings: Finance, Technology, Capacity-building, Trade, and Systemic issues.

Means of implementation

- Agenda 2030 recognises that each country has primary responsibility for its own economic and social development, and that the new Agenda deals with the means required for implementation of goals and targets.
- Each government will decide on how the global targets set will be incorporated into national planning processes, policies and strategies.
- All countries are expected to work to implement the Agenda at both the regional and global levels, taking into account different national realities, capacities and levels of development and respecting national policies and priorities.

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

- Agenda 2030 states that a "Global partnership" effort is required in order to implement the goals and targets set therein– "... bringing together governments, the private sector, civil society, and the United Nations system...."
- Government, business and civil society need to engage with these goals in a meaningful way in order to address the urgent social, economic and environmental issues facing us globally.

Follow up and review

Some of the principles set out for follow up and review in Agenda 2030 are:

- Each Government will have the primary responsibility for follow up and review at the national, regional and global levels in relation to the progress made in implementing the goals and targets until 2030.
- National ownership is key to achieving sustainable development, the outcome from national-level processes will be the foundation for reviews at the regional and global levels, given that the global review will be primarily based on national official data sources.
- The follow up and review process will maintain a longer-term orientation, identify achievements, challenges, gaps and critical success factors and support countries in making informed policy choices.
- The process will be people-centred, gender-sensitive, respect human rights and have a particular focus on the poorest, most vulnerable and those furthest behind.
- The processes will evolve over time, taking into account emerging issues and the development of new methodologies, and will minimize the reporting burden on national administrations, will be rigorous and based on evidence, informed by country-led evaluations and data which is high-quality, accessible, timely, reliable and disaggregated by income, sex, age, race, ethnicity, migration status, disability and geographic location and other characteristics relevant in national contexts.
- The Goals and targets will be followed up and reviewed using a set of global indicators.

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

- Developing countries, particularly African countries, least developed countries, small island developing States and landlocked developing countries, will be supported – in strengthening the capacity of national statistical offices and data systems to ensure access to high-quality, timely, reliable and disaggregated data.

National level

The 2030 Agenda further states that at the national level, member states will be encouraged to develop, as soon as practicable, ambitious national responses to the overall implementation of the Agenda. These can support the transition to the SDGs and build on existing planning instruments, such as national development and sustainable development strategies, as appropriate. Member States are also encouraged to conduct regular and inclusive reviews of progress at the national and subnational levels which are country-led and country-driven. Such reviews should draw on contributions from indigenous peoples, civil society, the private sector and other stakeholders, in line with national circumstances, policies and priorities. National parliaments as well as other institutions can also support these processes.

Regional level

Follow-up and review at the regional and sub-regional levels can, as appropriate, provide useful opportunities for peer learning, including through voluntary reviews, sharing of best practices and discussion on shared targets.

Global level

The Agenda 2030 states that the high-level political forum will, inter alia, have a central role in overseeing a network of follow-up and review processes at the global level, working coherently with the General Assembly, the Economic and Social Council and other relevant organs and forums, in accordance with existing mandates. It will facilitate sharing of experiences, including successes, challenges and lessons learned, and provide political leadership, guidance and recommendations for follow-up.

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

17 SDGs: Business, NGO's and organisations in South Africa

The preamble to Agenda 2030 states that all countries and all stakeholders, acting in collaborative partnership should implement the plan. It is a collective effort, with the business environment being required to make a contribution to the global effort to make material progress towards meeting the SDGs by 2030.

The 17 SDG's provide a practical framework or "blueprint" for the development of sustainable development strategies within the business environment in South Africa.

In order to incorporate an integrated approach to sustainable development-business, NGO's and other organisations would need to implement the following key steps:

- Plan how the organisation will engage with the SDGs
- Identify which SDGs are important in the sector in which the organisation operates
- Identify targets relating to the SDGs which are relevant in the operation
- Identify the tools needed to assess the organisation's impact against the SDGs (develop relevant indicators of success)
- Identify risks relating to the SDGs specific to their operation
- Implement new processes which would impact on operating procedures and products
- Link the applicable SDG to the value chain of the organisation (where applicable)
- Identify where collaboration with sectors, NGO's or government may be required
- Identify reporting requirements.

Source: United Nations, 2015: Sustainable Development Goals,
URL: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

6. A GREEN ECONOMY IN SOUTH AFRICA

The South African Department of Forestry, Fisheries and the Environment has defined the green economy in South Africa as "a system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks or ecological scarcities. It implies the decoupling of resource use and environmental impacts from economic growth. It is characterized by substantially increased investment in green sectors, supported by enabling policy reforms. The Green Economy refers to two inter-linked developmental outcomes for the South African economy:

- Growing economic activity (which leads to investment, jobs and competitiveness) in the green industry sector.
- A shift in the economy as a whole towards cleaner industries and sectors.

Green economy principles

The most common green economy principles (identified from a review of eight published sets of principles or characteristics) are:

1. The green economy is a means for achieving sustainable development.
2. The green economy should create decent work and green jobs.
3. The green economy is resource and energy efficient.
4. The green economy respects planetary boundaries or ecological limits or scarcity.
5. The green economy uses integrated decision making.
6. The green economy measures progress beyond GDP using appropriate indicators/metrics. The green economy is equitable, fair and just – between and within countries and between generations. The green economy protects biodiversity and ecosystems. The green economy delivers poverty reduction, well-being, livelihoods, social protection and access to essential services. The green economy improves governance and the rule of law. It is inclusive, democratic, participatory, accountable, transparent, and stable. The green economy internalises externalities.

Implementation

The implementation of a green economy in South Africa includes private sector, civil society and all levels of government. The nine key focus areas are identified in the green economy programmes that include:

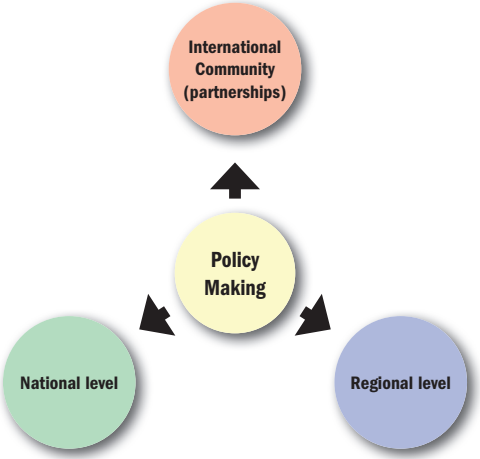
- **Green buildings and the built environment:** promote and enable green building design and green building materials and standards
- **Sustainable transport and infrastructure:** promoting non-motorised transport/low carbon transportation
- **Clean energy and energy efficiency:** expanding off-grid options in rural and urban areas
- **Resource conservation and management:** national payments for ecosystem services, wildlife management
- **Sustainable waste management practices:** measures to improve supply chain efficiency and prevent the production of waste, reduce waste going to land-fill by increasing reuse and recycling
- **Agriculture, food production and forestry:** integrated sustainable agricultural production
- **Water management:** water harvesting, alternative technology for effluent management, reduce water losses in agriculture, municipalities and mining
- **Sustainable consumption and production:** industry specific production methods, industrial production technology changes
- **Environmental sustainability:** research, awareness and skills development and knowledge management.

The South African Green Economy Accord identifies viable changes in the structure and character of the production economy that can generate a more inclusive and greener economy, and set targets based on the opportunities for jobs in the green economy. There are also a range of other policies (Acts, strategies, plans and white papers) that address specific sectors and will serve to enable the transition to a green economy in South Africa. These are outlined in more detail in the next Chapter.

In addition to national and international policy making, the private sector can contribute to steering the country towards a green economy, for example, by investment in green innovation – such as the introduction of a new or significantly improved product, process or method that results in a reduction of environmental impact, and/or optimises the use of resources throughout the lifecycle.

7. SOUTH AFRICAN GOVERNMENT POLICY AND RESPONSE

South Africa has a range of supporting and enabling policy that can help steer the way to a green economy. Policy making takes place on the following levels:



- The primary responsibility for co-ordination and implementation of sustainable development programmes rests with governments.
- Integrating sustainability into national development policies is one of goals of the United Nations Millennium Declaration which South Africa has endorsed.

South African National Framework for Sustainable Development

- The National Framework for Sustainable Development (NFSD) is designed to "initiate a broad framework for sustainable development in South Africa that can serve as a basis from which to develop and consolidate a national strategy and action plan ..."

- The NFSD proposes a national vision, principles, trends, strategic priority areas, and a set of implementation measures that are intended to enable and guide the development of the national strategy and action plan.
- The NFSD discusses the various environmental and social risk areas facing South Africa and maps out five strategic priority areas:
  1. Enhancing systems for integrated planning and implementation.
  2. Sustaining our ecosystems and using resources sustainably.
  3. Investing in sustainable economic development and infrastructure.
  4. Creating sustainable human settlements.
  5. Responding appropriately to emerging human development, economic and environmental challenges.
- The NFSD states that in order to embark on the journey ('to a sustainable, economically prosperous and self-reliant nation') it needs various things – a robust institutional framework, an action plan or roadmap to make sense of the five strategic priority areas, and "to ensure that everyone is on board and stays on board ... for this we need ongoing consultation and communication."

South Africa's Energy Policy

South Africa's energy policy aims to diversify its energy sources, reduce its carbon footprint, and ensure a just transition to a low-carbon economy. It is governed by the following policies:

Integrated Resource Plan (IRP)

The IRP 2025 sets out South Africa's roadmap for electricity supply to 2039, calling for over 105 GW of new capacity, rapid growth in wind and solar, expanded gas and storage for system flexibility, and a gradual reduction in coal's dominance while maintaining energy security.

A core focus is on a diversified future energy mix, balancing energy security, affordability and sustainability. By 2039, the planned generation capacity mix is approximately 27% coal (down from roughly 58% in 2025), 24% wind, 18% solar PV, 11% gas-to-power, 5% nuclear, plus smaller shares from storage, distributed generation and other sources.

Existing coal plants will be decommissioned gradually, and no major new coal plants are planned under the IRP 2025.

The Integrated Energy Plan (IEP)

The Integrated Energy Plan (IEP) is South Africa's overarching long-term strategy for the entire energy system, developed under the National Energy Act 34 of 2008. Unlike the Integrated Resource Plan, which focuses on electricity generation, the IEP considers all energy carriers and sectors, including electricity, liquid fuels, gas, and renewable energy, as well as demand across industry, transport and households. The plan analyses future energy demand, supply options, and infrastructure needs, with the aim of ensuring energy security, affordability and environmental sustainability while supporting economic development.

National Energy Act

This act ensures that energy resources are available at affordable prices and in sustainable quantities. It also encourages the use of renewable energy, contingency energy supplies, and investment in energy infrastructure.

Just Energy Transition Investment Plan (JET IP) 2023–2027

A national investment strategy outlining how South Africa will finance and implement its transition away from coal, particularly in the electricity sector.

Renewable Energy Independent Power Producer Procurement Programme

This program facilitates private-sector investment in renewable energy generation.

Agenda 2063 in South Africa

Agenda 2063 is Africa's blueprint and master plan for transforming Africa into the global powerhouse of the future. It is the continent's strategic framework that aims to deliver on its goal for inclusive and sustainable development and is a concrete manifestation of the pan-African drive for unity, self-determination, freedom, progress and collective prosperity pursued under Pan-Africanism and African Renaissance.

The South African government urged for the development of incentives for investment in programmes geared at creating large number of 'green jobs', i.e. employment in industries and facilities that are designed to mitigate impacts to the environment and natural systems and the protection thereof.

The reimagined industrial strategy

The strategy was launched in 2019 and remains South Africa's current industrial policy framework. The latest update is the 2024 Industrial Policy and Strategy Review, which evaluates progress and guides the next phase of implementation through sector master plans and coordinated industrial policy measures. The strategy also aligns industrial development with the energy transition, promoting new green industries such as renewable energy technologies, green hydrogen and electric vehicles.

International agreements and treaties on sustainability

South Africa is a member state of the United Nations General Assembly, and is party to a number of UN conventions on sustainable development, some of which are:

- Transforming our world: the 2030 Agenda for Sustainable Development
- Future we want: UN Conference on Sustainable Development, Rio+20
- Paris Agreement: 2015
- The 30th Conference of the Parties (COP30)
- The Millennium Declaration and Summit
- World Summit on Sustainable Development (Johannesburg)
- Earth Summit+5 (implementation of Agenda 21)
- The Rio Declaration on Environment and Development
- Agenda 21-Global Programme of Action on Sustainable Development
- G20 Johannesburg Leaders' Declaration
- EU–South Africa Summit

National and provincial government departments and municipalities

- Each Government Department in South Africa has stated a vision, strategic objective and policy on sustainability issues which pertain to it, and all government departments need to work together to form an integrated approach to sustainability.
- The following are some of the aims, objectives and activities in regard to sustainable development as stated by some of the government departments in our country:

1. **Department of Health (DOH):**
   - There is an international recognition that efforts aimed at environmental improvements and protection could have a positive effect on disease prevention.
   - The objectives of environmental health services form the foundation for sustainable development as defined by the United Nations, hence environmental health is seen as a fundamental component of sustainable development.
   - The Department of Health has stated that environmental health services are critical in ensuring the right of every person to live in a healthy environment as entrenched in our Constitution.
   - Our government's national priorities include, amongst others, the creation of employment opportunities, alleviation of poverty and the provision of safe water, proper sanitation and housing.

2. **Department of Trade and Industry (DTI):**
   - The DTI aims to contribute to a tailor-made portfolio of environmental, social and economic policies to meet the country's needs.
   - Based on the principle of 'think globally, act locally' South Africa regularly proposes national positions at multinational conferences.

Provincial Governments and Municipalities

- Have an equally important role in implementing sustainable strategies.
- Local on the ground implementation – housing, waste, environment, health.
- These departments need to integrate sustainable development strategies in their strategy documentation – including aspects relating to poverty reduction and climate change.

Role of government policy going forward

- Government seems to have an understanding of the issues relating to climate change and seems to be playing its part in mitigating emissions, however it is clear that South Africa will be dependent on coal for electricity for some time to come, which will make it difficult to reduce emissions of greenhouse gases significantly.
- Although the National Framework for Sustainable Development (NFSD) is in place, actual implementation of the various strategies across government departments needs to be monitored carefully.
- The Department of Transport has a vital role to play in reducing carbon dioxide emissions arising from transport.
- The responsibility of government departments not just at a national level but at a provincial and municipal level to continue to develop sustainability development strategies, monitor implementation and also to conserve our resources, to account to Parliament and the public as a whole.

8. SOUTH AFRICA AND CLIMATE CHANGE: PLEDGES AND TARGETS

The Paris Agreement

- The "Paris Agreement" was adopted on 12 December 2015 at the 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP21), which was held in Paris from 30 November to 13 December 2015.
- At the conference, parties to the UNFCCC reached a landmark agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future.
- South Africa became a party to the agreement when the Minister of Environmental Affairs, Mrs Edna Molwa signed it during April 2016 on behalf of the South African Government.
- South Africa pledged emissions of between 398 to 614 MtCO2e over 2025 to 2030, and has taken the following steps to try to achieve this, as follows:
  - Passing the country's first Climate Change Act
  - Creating a Presidential Climate Commission
  - Developing a Low Emissions Development Strategy
  - Developing a National Climate Change Adaptation Strategy.

South Africa's Nationally Determined Contribution (NDC)

According to the Paris Agreement, each Party shall prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

South Africa deposited its first NDC with the UNFCCC in October 2016 rather than October 2015, committing to keeping national greenhouse gas emissions within a range between 398 and 614 $MtCO_2e$ between 2025 and 2030. The adaption goals included, inter alia, taking into account climate considerations in national development, sub-national and sector policy frameworks through to 2030.

Some of the mitigation goals include time frames for the implementation of policy instruments under development that include a carbon tax. South Africa submitted a significantly more ambitious update in 2021. The new targets are 398–510 $MtCO_2e$ by 2025, and 350–420 $MtCO_2e$ by 2030. The update also included South Africa's first formal adaptation communication.

Furthermore, ahead of COP30, South Africa introduced a new target range for 2035. Targets include 350–420 $MtCO_2e$ for 2030 (unchanged) and 320–380 $MtCO_2e$ by 2035.

South Africa's First Biennial Transparency Report (BTR1)

South Africa has pledged an emission reduction of 42% by 2025 against a business as usual curve.

South Africa's First Biennial Transparency Report (BTR1) is the country's first report submitted under the Enhanced Transparency Framework of the Paris Agreement to the United Nations Framework Convention on Climate Change. Submitted in December 2024, it reports South Africa's latest greenhouse-gas emissions, outlines policies and measures to reduce emissions, and assesses progress toward the country's Nationally Determined Contribution (NDC) targets.

South Africa's greenhouse gas inventory shows total emissions of approximately 405 $MtCO_2$-eq in 2022 (excluding land use, land-use change and forestry). The energy sector continues to account for the majority of emissions, reflecting the country's coal-based electricity system and energy-intensive industrial structure. This is currently within target.

Key areas of focus to further enhance mitigation include:

- Decarbonising the electricity sector. The BTR identifies the electricity sector as the largest source of emissions, meaning that decarbonising power generation is central to meeting South Africa's NDC targets. This includes reducing reliance on coal-fired generation over time, expanding low-carbon generation capacity, and improving the efficiency and operation of the national power system. Electricity sector reform is therefore expected to play the most significant role in lowering national emissions.
- Accelerating renewable energy deployment

- Scaling up renewable energy – particularly wind and solar – is identified as a key mitigation pathway. Programmes such as the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) have already contributed to diversifying the electricity mix, and the BTR notes that continued expansion of renewable capacity will be necessary to displace higher-emitting generation and meet growing electricity demand.
- Improving energy efficiency across industry, buildings and transport are highlighted as a cost-effective mitigation measure. The BTR points to efficiency programmes and standards aimed at reducing energy consumption per unit of economic output, helping to curb emissions while supporting economic activity.
- Strengthening mitigation policies across industry and transport. The report also emphasises the role of cross-sector policy instruments, including carbon budgets, the carbon tax, and sector-specific mitigation strategies. These policies are intended to encourage emissions reductions in energy-intensive industries and transport systems, while supporting a broader transition toward lower-carbon production and mobility systems.
- Role of finance and implementation capacity. The pace of mitigation will depend on mobilising investment and strengthening institutional capacity to implement these measures effectively, particularly in large infrastructure sectors such as energy and transport.

Together, these measures are expected to drive the emissions reductions required for South Africa to remain within its 2030 NDC target range of 350–420 $MtCO_2$-eq.

9. CONFERENCE OF THE PARTIES (COP30)

The 30th Conference of the Parties (COP30) to the United Nations Framework Convention on Climate Change took place in Belém, Brazil, from 10–21 November 2025. Hosted in the Amazon region, the conference emphasised the role of nature and forests in climate action.

From promises to action

While the Paris Agreement set the goals and pledges, in order to limit global warming to well below 2 degrees, (ideally 1.5), the stated purpose of these conferences is to highlight the need for urgent action and implementation to reduce emissions, so as to achieve the Paris Agreement goals by 2030.

Main areas of negotiation at COP30 were on:

The negotiations focused on strengthening the implementation of existing global climate commitments, particularly in the lead-up to the next round of national climate plans. Key negotiation areas included:

- Climate finance for developing countries
- International carbon markets under Article 6 of the Paris Agreement
- Climate adaptation and resilience
- Strengthening national climate plans (NDCs)
- Transparency and reporting frameworks
- Just transition and equitable decarbonisation

Climate finance

Parties discussed pathways to mobilise at least $1.3 trillion annually in climate finance by 2035 to support mitigation and adaptation in developing countries. The conference reinforced commitments to scale up adaptation finance, recognising the growing costs of climate impacts for vulnerable countries.

Carbon markets

COP30 continued efforts to operationalise Article 6 carbon market mechanisms, which allow countries to trade emissions reductions internationally. Discussions

focused on strengthening rules for carbon credit integrity, accounting standards, and safeguards against double counting. Progress was made toward expanding participation by developing countries and improving oversight of the UN-supervised carbon crediting mechanism.

Transparency

COP30 reinforced efforts to strengthen climate data systems, monitoring and reporting, helping ensure comparability and credibility of national climate commitments.

National climate plans

A central focus of the conference was preparation for the next round of Nationally Determined Contributions (NDCs) due in 2025. Countries were encouraged to submit stronger climate targets aligned with the 1.5°C goal, with greater clarity on implementation pathways.

Other priorities of COP30 included:

- Nature-based solutions, particularly forest protection in the Amazon
- Just transition frameworks to support workers and communities affected by decarbonisation
- Adaptation indicators to track global progress on climate resilience
- Strengthening international cooperation on implementation of the Paris Agreement

COP30 impact on South Africa

Climate finance and the NCQG: South Africa supported calls from developing countries for a more ambitious New Collective Quantified Goal (NCQG) on climate finance, emphasising the need for predictable, grant-based funding to support energy transitions and climate resilience in emerging economies.

Loss and Damage and adaptation: South Africa backed efforts to strengthen the Loss and Damage Fund and supported progress on the Global Goal on Adaptation, including the development of indicators to track climate resilience.

Just transition leadership: Drawing on its experience with the Just Energy Transition Partnership (JETP), South Africa highlighted the importance of a just and equitable energy transition, balancing decarbonisation with economic development, job protection and energy access.

Carbon markets and implementation: South Africa supported progress on Article 6 carbon market mechanisms, which could create opportunities for the country to participate in international carbon trading and attract investment in mitigation projects.

Outcomes of COP30

COP 30 resulted in incremental shifts in the global climate agenda, including:

- Consolidating the just transition agenda: This signals that climate action is now inseparable from jobs, inequality, and political feasibility - meaning policies that ignore distributional impacts are unlikely to succeed.
- Advancing implementation focus: The priority has shifted from pledges to delivery, putting pressure on governments to translate targets into credible, financed, and institutionally grounded plans.
- Elevating adaptation and equity: Climate negotiations are increasingly being driven by the needs of vulnerable countries, making resilience and fairness central, not peripheral, to global climate action.

10. SOUTH AFRICAN ENVIRONMENTAL LEGISLATION

The South African Government has enacted environmental legislation which is underpinned by international agreements, objectives and standards, as well as government policy.

The South African Constitution

The overarching legislative foundation for environmental management in South Africa is the Constitution of the Republic of South Africa Act (no.108 of 1996). Section 24 of this Act provides that everyone has the right to:

- An environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (i) prevent pollution and ecological degradation (ii) promote conservation (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The National Environmental Management Act (no.107 of 1998) (NEMA) is the primary environmental framework Act in South Africa which provides for co-operative environmental governance, and is based on the principle that everyone has the right to an environment that is not harmful to his or her health or well-being. In addition, it enables the administration and enforcement of other environmental management laws. Companies must obtain environmental authorisations for listed activities under Section 24 of NEMA.

Some Other Relevant Environmental Legislation includes:

- National Water Act (no.36 of 1998)
- National Energy Act (no.34 of 2008)
- National Forests Act (no.84 of 1998)
- Marine Living Resources Act (no.18 of 1998)
- National Environmental Management: Biodiversity Act (no.10 of 2004)
- National Environmental Management: Air Quality Act (no.39 of 2004),

- National Environmental Management: Waste Act (no.59 of 2008)
- National Environmental Management: Protected Areas Act (no.57 of 2003), (as amended), and the National Environmental Management: Integrated Coastal Management Act (no.24 of 2008).

The National Environmental Management Laws Amendment Act (no.2 of 2022) or NEMLAA4 finally became an Act on 24 June 2022, and introduces a major shift in South Africa's environmental legislation. The bulk of the provisions contained therein have been proclaimed and came into effect on 30 June 2023.

The Act officially introduces an extensive shift in South Africa's environmental legislative landscape. It amends almost every Environmental Management Act in the country, including Waste, Air, Biodiversity and Water. The changes aim to deter non-compliance with environmental laws, by among other things, introducing new offences, increasing the quantum of fines and administrative penalties where laws or licences have been contravened, and will extend enforcement powers to enable more widespread enforcement of environmental laws.

11. CLIMATE CHANGE ACT, 2024

Background

- The Act is a step towards South Africa meeting its domestic and international commitments, and provides a legislative framework for the implementation of the country's national climate change response policy, and must be read and interpreted and applied in conjunction with the National Environmental Management Act (no. 107 of 1998) as amended by the National Environmental Laws Amendment Act (no.2 of 2022).
- It acknowledges that anthropogenic climate change represents an urgent threat to human societies and the environment, and requires an effective, progressive and well-coordinated response.
- It further highlights that, amongst others, anticipated domestic climate change impacts have the potential to undermine the country's development goals, and that responses to climate change raise unique challenges, thus requiring a legislative framework for the implementation of the country's national climate change response.

Implementation

- The Act commenced in March 2025 through a presidential proclamation.
- The Act allows for phased commencement, meaning some provisions (particularly those requiring detailed regulations, such as carbon budgets and sectoral targets) will come into force later once supporting regulations are finalised.

Objects

The objects of the Act are, inter alia, to:

- provide for the coordinated and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance.

- make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed in a sustainable manner.
- give effect to South Africa's international commitments and obligations in relation to climate change.

Creation of frameworks and plans

- The Act provides an outline for procedures to be developed through the creation of frameworks and plans.
- The framework may provide for the phasing in of its provisions and may be reviewed and amended by the Minister at intervals of not more than 5 years.

Alignment of laws and policies

- Every organ of state that exercises a power or performs a function that is affected by climate change, or is entrusted with powers and duties aimed at the achievement, promotion, and protection of a sustainable environment, must review and co-ordinate their policies, plans, programmes and decisions, in order to ensure that the risks and vulnerabilities of climate change are taken into consideration and to give effect to the principles and objectives set out in the Act.

Presidential Climate Commission

- The President may establish a Presidential Climate Commission and appoint members comprising of representatives of government, organised labour, civil society and business to advise on South Africa's climate change response, the mitigation of climate change impacts and adaption to the effects of climate change towards the attainment of the just transition to a climate resilient and low carbon economy and society.
- The Functional Areas listed in the Schedule are: Agriculture, Forestry and Fisheries, Cooperative Governance and Traditional Affairs, Economic Development, Energy, Environment, Health, Human Settlements, International

Relations, Mineral Resources, National Treasury, Public Enterprises, Public Works, Rural Development and Land Reform, Science and Technology, Trade and Industry, Transport, Water Affairs and Sanitation.

- The Presidential Climate Commission must submit its reports, studies, strategies, recommendations and related information to the National Assembly and to the Ministers whose Portfolios may be affected, for information purposes, within 30 days of the finalisation thereof.

Establishment of provincial and municipal forums

- The Act establishes that every Premier's intergovernmental forum, and every district's intergovernmental form [both of which are established in terms of the Intergovernmental Relations Framework Act (no.13 of 2005)], also serve as a Provincial Forum on Climate Change for each province and each municipality respectively. Each forum must co-ordinate climate change response actions in the relevant province or municipality towards a transition to a climate resilient and lower carbon economy in accordance with the White Paper on National Climate Change Response and South Africa's Nationally Determined Contribution. Each Provincial Forum must recommend any climate change matter and provide progress reports in the relevant province to the Presidential Coordinating Council. Each Municipal Forum must provide a report on climate change response actions taken which are within its operational control of the relevant municipality – to the relevant Provincial Forum.

National adaption to impacts of climate change

- The Minister must, within one year of the coming into operation of the Act, determine by notice in the Gazette– (a) national adaptation objectives which will guide the Republic's adaptation to climate change impacts, the development of resilience and sustainable development; (b) indicators for measuring progress towards achieving the national adaptation objectives; and (c) a date by which the national adaptation objectives must be incorporated into all relevant national planning instruments, policies and programmes which address, or are affected by, the actual and potential impacts of climate change.

- The Minister must also, periodically, review and amend the national adaptation objectives contemplated above.

Sectoral Emission Targets (SETS)

- The Minister of Environmental Affairs must, within one year of the coming into operation of the Act, by notice in the Government Gazette, list the greenhouse gas emitting sectors and sub-sectors that are subject to sectoral emission targets ("SETS") and determine a greenhouse gas emissions threshold for carbon budgets to be allocated at company level for not less than three successive five-year periods, subject to at least five yearly review.

Other provisions

Other provisions included in the Act include:

- setting out and achieving national adaptation objectives.
- determining a national greenhouse gas emissions trajectory.
- determining a greenhouse gas emissions threshold to inform the allocation of carbon budgets.
- listing greenhouse gases and activities

Regulations

- The Minster may make regulations in relation to any matter necessary to give effect to South Africa's international climate change commitments and obligations, in relation to the management of climate change response in general, as well as regulations that will promote the effective monitoring, evaluation and assessment of national progress in relation to climate change matters.
- A regulation made in terms of the Act may provide that any person who contravenes or fails to comply with a provision thereof will be liable to the penalties contemplated in Section 49B(2) of the National Environmental Management Act.

Offences and penalties

- Any person who contravenes or fails to comply with a provision of the Act is guilty of an offence and liable in the case of a first conviction of a fine not exceeding R5 million or to imprisonment for a period not exceeding 5 years and in the case of a second or subsequent conviction, a fine not exceeding R10 million or imprisonment for a period not exceeding 10 years and in both instances to both such a fine and such imprisonment.
- A failure by persons with a carbon budget to prepare, submit and implement an approved greenhouse gas mitigation plan to the Minister in terms of Section 24(5) is liable to penalties also contemplated in Section 49B(2) of the National Environmental Management Laws Amendment Act (no.30 of 2013). Should the greenhouse gas emissions exceed the budget during the applicable period, it is treated as an offence, and will be subjected to a higher carbon tax rate on emissions above the carbon budget as provided for in the Carbon Tax Act.
- Section 49B(2) of the National Environmental Management Laws Amendment Act sets out the penalties to be incurred for a range of transgressions (which transgressions are set out in Section 49A), as follows:
    1. A fine or imprisonment of not more than R10 million or imprisonment of not more than 10 years, or both (for example where a person has unlawfully and intentionally or negligently commits any act or omission which causes significant pollution or degradation of the environment or is likely to cause significant pollution or degradation of the environment.
    2. A fine or imprisonment of not more than R5 million or imprisonment of not more than 5 years, or both (for example where a person fails to comply with or contravenes a compliance notice.
    3. A fine or imprisonment of not more than 1 year, or both (for example where a person fails to comply with a request of an environmental management inspector.

12. GREEN TAXES AND ENVIRONMENTAL ALLOWANCES

Green taxes are one way to reinforce environmental policies, drive sustainable corporate behaviour and achieve green policy goals in South Africa. Some of the "green taxes" in South Africa are as follows:

Carbon tax

Carbon tax was introduced on 1 June 2019 to meet nationally determined contributions under the 2015 Paris Agreement of the United Nations Framework Convention on Climate Change. The Carbon Tax Act (no. 15 of 2019) introduces a carbon levy on fuel and an emissions tax on businesses, and is set out in detail elsewhere in this guide.

Carbon dioxide vehicle emissions tax

This environmental levy is payable on new motor vehicles by manufacturers of these vehicles in South Africa.

Electricity generation levy

Electricity Generation by using non-renewable (fossil) fuels and environmentally hazardous (nuclear) sources are subjected to the payment of an Environmental Levy, and is payable by producers of this form of electricity in South Africa. The current rate of the electricity levy is 3.5c/kWh. This is set to be phased out with the implementation of the carbon tax.

The plastic bag levy

Certain types of plastic carrier and flat bags, the disposal of which is littering the environment, are subjected to the payment of an Environmental Levy, earmarked to establish re-cycling facilities, if used in the RSA. As of April 1, 2024, the Environmental Levy on Plastic Bags in South Africa is ZAR 0.32 per bag.

The incandescent light bulb levy

Electric Filament Lamps (i.e. non energy-saving light bulbs) are subject to the payment of an Environmental Levy if manufactured in the RSA.

The tyre levy

New, used or re-treaded pneumatic tyres, the disposal of which is littering the environment, are subject to the payment of an Environmental Levy, earmarked for re-cycling, if used in the RSA.

The Environmental Levies as listed above are all payable by the manufacturers thereof in the RSA.

"Environmental" deductions/allowances

- Section 12B Deduction in respect of certain machinery, plant, implements, utensils and articles used in farming or production of renewable energy
- Section 37B Deductions in respect of environmental expenditure
- Section 37C Deductions in respect of environmental conservation
- Section 11D Deduction for research and development costs
- Section 12K Exemption for Certified Emission Reductions
- Section 12L Special Allowance for Energy Efficiency Savings
- Section 12U Allowance for renewable energy supporting structures

Regulations for new buildings and energy usage

The Energy Efficiency Regulations for energy usage in buildings provide that all new buildings and building extensions in South Africa must conform to the regulations on energy conservation, including homes, industrial buildings, hotels and schools. The regulations are enforceable in terms of the National Building Regulations and Building Standards Act.

Building plans will not be approved without compliance with the regulations. Buildings Control Officers (inspectors) will be required to ensure that buildings are built in accordance with National Building Regulations and specifically with energy usage requirements. No compliance – no occupancy certificate.

Section 12I: tax allowance for energy-efficiency savings

Regulations on the tax allowance for Energy-efficiency savings stipulate that any company holding a certificate that can prove their energy savings are genuine, can submit the certificate to claim an allowance from SARS. The allowance is

as contemplated in Section 12L (2) of the Income Tax Act, 1962. Section 12L provides that tax incentives are available for savings in all energy forms, and not only electricity. The energy-efficiency savings tax incentive is calculated at a rate of 95c/kWh and also applies to cogeneration projects. It has been extended to expire in December 2030.

13. CARBON TAX

The Carbon Tax Act (no. 15 of 2019) aims provide for the imposition of a tax on the carbon dioxide (CO_2) equivalent of greenhouse gas emissions.

Background

- Carbon tax will play a role in achieving the objectives set out in the National Climate Change Response Policy of 2011 (NCCRP), and will contribute towards meeting South Africa's commitments to reducing greenhouse gas (GHG) emissions.
- In light of the "Paris Agreement", policies, frameworks, financial institutions and indeed legislation is needed to support these commitments for any hope to achieve the anticipated reductions.

Implementation

The Carbon Tax Act came into effect on the 1st June 2019.

Objects of the Act

The preamble states, inter alia, that it has been scientifically confirmed that there is a causal link between the increase in anthropogenic greenhouse gas emissions in the atmosphere and global climate change, and that is has become necessary to:

- manage this impact through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.

- make a contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere.
- impose the "polluter pays principle" – whereby those responsible for harming the environment must be held responsible for the costs of remedying pollution, environmental degradation and the adverse health effects that may result.
- impose a tax on greenhouse gas emissions, and provide tax incentives for rewarding the efficient use of energy – which will have the effect of providing the appropriate price signals to help nudge the economy towards a more sustainable growth path.
- change the behaviour of firms, incentivising them to shift towards cleaner technology when replacing/renewing machinery, technology or processes.
- ensure that South Africa transitions to a low carbon, climate resilient economy in a cost efficient and economically efficient manner.

Phase 2

Phase 2 of the carbon tax started in 2026, which brings in stricter measures.

Key features include:

- Higher carbon tax rates. Rising steadily to around R462/tCO_2e by 2030.
- Reduced tax-free allowances.
- The basic allowance declines to 50% in 2026 and then gradually to 40% by 2030.
- Stronger penalties for exceeding carbon budgets. Emissions exceeding assigned carbon budgets may face a penalty rate of about R640/tCO_2e.

This links the carbon tax more directly to the carbon-budget system under South Africa's climate policy.

Phase 2 will also increase the allowable use of carbon credits to reduce tax liabilities:

- up to 10% of emissions for fugitive/process emissions.
- up to 15% for combustion emissions (higher than current limits).

This aims to stimulate the domestic carbon-offset market.

Administration

- The carbon tax will be administered by the South African Revenue Service.
- It will be administered as if it is an "environmental levy".
- The South African Revenue Service (SARS) will be granted access to the Department of Environmental Affairs' emissions database, such as the South African National Atmospheric Emissions Inventory System (NAEIS).

Persons subject to tax

- A person is a taxpayer for purposes of this Act and is liable to pay an amount of carbon tax calculated as contemplated in Section 6 in respect of a tax period as specified in Section 16 – if that person conducts an activity in South Africa resulting in greenhouse gas emissions above the threshold determined by matching the activity listed in the column "Activity/Sector" in Schedule 2 with the number in the corresponding line of the column "Threshold" of that table.
- Schedule 2 includes the following activities:
  1. the Energy Sector (such as fuel combustion activities, petroleum refining, civil aviation, pipelines etc.).
  2. the Industrial Processes and Product Use Sector (such as cement production, lime production, Nitric acid production, ceramics, Refrigeration and Air Conditioning).
  3. the Agriculture, Forestry and other Land Use Sector (such as cattle, forest land, harvested food products).
  4. the Waste Sector (such as managed waste disposal sites, wastewater treatment and discharge).

Greenhouse gases covered

- The carbon tax covers greenhouse gas emissions including carbon dioxide, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride.

Tax base

- The tax base comprises the sum of the greenhouse gas emissions of a taxpayer in respect of a tax period – expressed as the carbon dioxide equivalent (CO_2-eq) of those greenhouse gas emissions resulting from fossil fuel combustion, emissions from industrial process and product use and fugitive emissions – all of which are determined in accordance with the emissions factors determined in accordance with a reporting methodology approved by the Department of Environmental Affairs.
- Section 4 of the Act sets out various formula's for determining the emission factors where a reporting methodology does not exist.

Section 6 sets out a comprehensive formula for purposes of calculating the carbon tax base, which differs dependant on the specific fuel types used in the different industries.

Rate of tax

- The rate of carbon tax is moving from R236 per tonne CO_2-equivalent (tCO_2e) in 2025 to R308/tCO_2e from 2026.
- The tax must be increased by the amount of the Consumer Price Inflation for the preceding tax year as determined by Statistics South Africa (i.e. adjustments in line with inflation).

Calculation of amount of tax payable

- A taxpayer's carbon tax liability is calculated by reducing the tax base by the tax-free allowances noted below (Sections 7 to 13 of the Act) and then multiplying that amount by the rate of carbon tax.

Tax-free Allowances

Sections 7 to 13 of the Act allows for the following tax-free allowances, which can be summarised as follows:

- A tax free allowance for fossil fuel combustion emissions – for example: 0% allowance for an activity that involves cement production to a 100% allowance for a residential activity, and a 60% allowance for brick manufacturing.

- An allowance for industrical process emissions – for example: 0% allowance for mining and quarrying to a 70% allowance for glass production, to a 100% allowance for poultry farming.
- An allowance for fugitive emissions – for example a 0% allowance for road transport industry, and a 10% allowance for the oil industry.
- Additional and variable tax-free allowance for trade exposed sectors of up to 10%.
- Recognition for early actions and /or efforts to reduce emissions that beat the industry average or performance allowance – in the form of a tax-free allowance of up to 5%.
- A carbon offsets tax-free allowance of 5 to 10%, depending on the sector.
- The combined effect of all of the above tax-free thresholds will be capped at 95%.

Payment of tax

A taxpayer must submit yearly environmental levy accounts and payments for every tax period as per the Customs and Excise Act (no.91 of 1964).

14. KING V™ AND SUSTAINABLE DEVELOPMENT

- The King V Report on Corporate Governance™ for South Africa 2024 (King V) is the fifth and latest version of the King Codes. It is voluntary (unless prescribed by law or by a Stock Exchange listings requirement). Some of the principles have been legislated, and if a conflict occurs, the law prevails.

The code aims to guide organisations in achieving:

- ethical and effective leadership
- long-term value creation
- responsible corporate citizenship
- transparent and accountable governance
- It applies broadly to companies, public entities, non-profits and institutional investors.
- and this 'King V strengthens the sustainability focus of South Africa's corporate governance framework by embedding environmental and social considerations more explicitly into board oversight, strategy, and risk management. It also aligns governance expectations more closely with evolving global standards on climate risk, ESG disclosure, and long-term value creation.

Key sustainability-related provisions emphasised in King V

Sustainable value creation

Organisations should pursue strategies that enable long-term value creation, considering financial, environmental and social impacts.

Responsible corporate citizenship

The governing body should ensure the organisation acts as a responsible corporate citizen, including managing its environmental footprint and contributing positively to society.

Source: Institute of Directors in South Africa (IoDSA). King V Code on Corporate Governance for South Africa. Johannesburg: IoDSA, 2025.

Environmental and climate risk oversight

Boards should oversee environmental risks and opportunities, including climate-related risks that could affect strategy, performance and resilience.

Integration of sustainability into strategy

Sustainability considerations should be embedded in organisational strategy, decision-making and capital allocation, rather than treated as a separate corporate responsibility function.

Stakeholder-inclusive governance

Organisations should consider the legitimate interests and expectations of stakeholders, including communities and the natural environment.

Transparency and disclosure

Companies should provide clear and transparent reporting on sustainability and ESG performance, enabling stakeholders to assess the organisation's long-term sustainability.

Integrated thinking and reporting

Governance structures should promote integrated thinking, recognising the interdependence between financial performance, environmental stewardship and social outcomes.

The 13 King V principles of good governance

Ethical and effective leadership

The governing body should lead ethically and effectively as the focal point of corporate governance in the organisation.

Governing ethics and responsible corporate citizenship

The governing body should ensure that ethics are governed in a way that promotes an ethical culture and responsible corporate citizenship.

Source: Institute of Directors in South Africa (IoDSA). King V Code on Corporate Governance for South Africa. Johannesburg: IoDSA, 2025.

Purpose, strategy and sustainable value creation

The governing body should ensure that the organisation's purpose, strategy and business model are aligned to create sustainable value.

External reporting and stakeholder assessments

The governing body should ensure that external reporting enables stakeholders to assess the organisation's performance and prospects.

Board composition and independence

The governing body should ensure an appropriate balance of skills, experience, diversity and independence in its composition.

Delegation to committees and individuals

The governing body should ensure effective delegation to board committees and other structures while retaining accountability.

Appointment and delegation to management

The governing body should ensure appropriate appointment of executives and clear delegation of authority to management.

Risk governance

The governing body should govern risk in a way that supports organisational strategy and objectives.

Compliance governance

The governing body should ensure the organisation complies with applicable laws, codes and standards.

Data, information and technology governance

The governing body should govern data, information and technology to support the organisation's strategy and performance.

Fair, responsible and transparent remuneration

The governing body should ensure remuneration policies are fair, responsible and aligned with value creation.

Source: Institute of Directors in South Africa (IoDSA). King V Code on Corporate Governance for South Africa. Johannesburg: IoDSA, 2025.

Assurance and internal control

The governing body should ensure effective assurance mechanisms and internal controls.

Stakeholder-inclusive governance

The governing body should ensure a stakeholder-inclusive approach, balancing the interests of stakeholders over the long term.

King V continues to encourage organisations to have a more 'hands-on' approach to principles, so that practices can be clearly linked to outcomes in an "apply and explain" approach. This gives governing bodies more flexibility when implementing the recommended practices, but requires them to be transparent when disclosing how they achieved their goals.

Corporate Governance and the 17 Sustainable Development Goals (UN Agenda 2030)

In order to ensure that the King V™ recommendations and guidelines (relating particularly to corporate governance and sustainable development) are met, directors and business persons should incorporate the 17 SDG's most applicable to the organisation in terms of location, operations, supply chains – and develop their sustainability strategies for the future within this context.

Source: Institute of Directors in South Africa (IoDSA). King V Code on Corporate Governance for South Africa. Johannesburg: IoDSA, 2025.

15. KING V™ AND INTEGRATED REPORTING

- Integrated reporting remains central to governance, enabling organisations to explain how their purpose, strategy, governance, risk and performance contribute to sustainable value creation over time.
- The Code emphasises integrated thinking, requiring organisations to consider the interconnections between financial performance, environmental impacts, social outcomes and governance practices.
- The governing body is responsible for ensuring that external reporting enables stakeholders to assess the organisation's performance, resilience and long-term prospects.
- King V promotes a structured disclosure framework and alignment with global sustainability reporting standards, while maintaining the "apply and explain" approach to encourage meaningful and transparent disclosure.

Recognising the six forms of capital

- The Code recognises the same six forms of capital used in integrated reporting:
- Financial capital – funds available for use in production or investment.
- Manufactured capital – physical infrastructure, equipment and facilities used to produce goods or services.
- Intellectual capital – organisational knowledge, systems, intellectual property and innovation capacity.
- Human capital – employees' skills, experience, wellbeing and leadership capacity.
- Social and relationship capital – relationships with stakeholders, communities and broader society.
- Natural capital – environmental resources and ecosystems that support economic activity.

16. IMPORTANT DEFINITIONS

Carbon Tax Act, 2019:	
"carbon budget"	means an amount of greenhouse gas emissions permitted, against which direct emissions arising from the operations of a person during a defined time period will be accounted for
"carbon tax"	a tax on the carbon dioxide (CO_2) equivalent of greenhouse gas emissions imposed in terms of Section 2 of the Act
"carbon dioxide (CO_2) equivalent"	the concentration of carbon dioxide that would cause the same amount of radiative forcing (the difference of sunlight absorbed by the Earth and energy radiated back to space) as a given mixture of carbon dioxide and other greenhouse gases
"emissions"	the release of greenhouse gases or their precursors; or the release of greenhouse gases and their precursors into the atmosphere, over a specified area and period of time
"emission factor"	the average emission rate of a given greenhouse gas for a given source, relative to the activity data of a source stream assuming complete oxidation for combustion and complete conversion for all other chemical reactions
"fugitive emissions"	emissions that are released into the atmosphere by any other means than through an intentional release through stack or vent, including extraction, processing, delivery and burning for energy production of fossil fuels, including leaks from industrial plant and pipelines
"greenhouse gas"	gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infra-red radiation and includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6)
"industrial process"	a manufacturing process that chemically or physically transforms materials
"Person"	includes a partnership, a trust, a municipal entity and a public entity

Climate Change Act, 2024:	
"carbon sink"	means any process, activity or mechanism which removes a greenhouse gas, an aerosol, or a precursor of a greenhouse gas from the atmosphere
"just transition"	means a shift towards a low carbon, climate resilient economy and society and ecologically sustainable economies and societies which contribute toward the creation of decent work for all, social inclusion and the eradication of poverty
"mitigation"	means a human intervention to reduce the sources or enhance the carbon sinks and greenhouse gases
"sector"	means a collective term for a group of activities with similar characteristics which either emit greenhouse gases or are vulnerable to climate change
"vulnerability"	means the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

General:	
"anthropogenic"	chiefly of environmental pollution and pollutants originating in human activity
"carbon emission"	**Carbon dioxide (CO_2)** is a colourless, odourless and non-poisonous gas formed by combustion of **carbon** and in the respiration of living organisms and is considered a greenhouse gas. **Emissions means** the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time
"carbon footprint"	the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organisation, or community

17. IMPORTANT REFERENCES

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