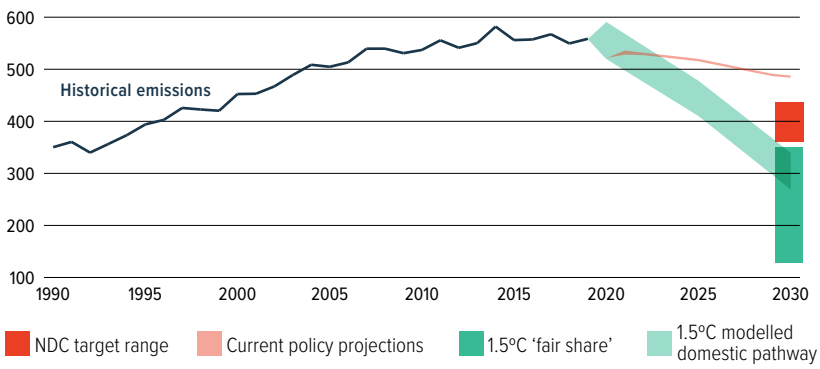
SOUTH AFRICA

Climate Transparency

CLIMATE TRANSPARENCY REPORT: COMPARING G20 CLIMATE ACTION **2022**

NOT ON TRACK FOR A 1.5°C WORLD

1.5°C compatible emissions pathway ($MtCO_2e$/year)[1]

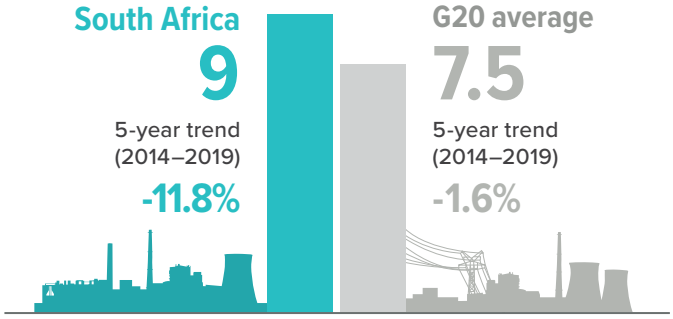


South Africa's updated NDC target would reduce emissions 22–34% below 1990 levels, or to approximately 366–436 $MtCO_2e$ (excl. LULUCF). To keep below the 1.5°C temperature limit, analysis by the 1.5°C Pathways Explorer shows that South Africa's 2030 emissions would need to be around 304 $MtCO_2e$, leaving an ambition gap of about 62 $MtCO_2e$. When compared with its 1.5°C 'fair share' contribution, South Africa would need to achieve reductions in line with the bottom of its 2030 NDC range.

Climate Action Tracker, 2022a, 2022b; Climate Analytics, 2022; Gütschow et al., 2021

PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS ABOVE G20 AVERAGE

tCO_2e/capita[2] in 2019



South Africa's per capita emissions are 1.2 times the G20 average. Total per capita emissions have decreased by 11.8% from 2014 to 2019.

Gütschow et al., 2021; World Bank, 2022

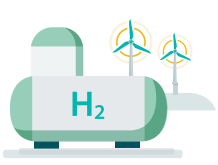
RECENT DEVELOPMENTS

- One of the largest solar PV projects (with battery storage) in the world was approved through the Risk Mitigation Independent Power Procurement Programme, with solar capacity of 540 MW and battery capacity of 225 MWh–1,140 MWh.
- Some large fossil gas projects have been delayed by court rulings; however, substantial gas developments are still underway, with plans to import fossil gas from Mozambique's new gas field.
- President Ramaphosa's plan to end the electricity crisis currently crippling the country's economy includes several measures for boosting the scale and pace of renewable energy deployment.

KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION

Finalise the passage of the Climate Change Bill, submitted to Parliament in February 2022, which would establish the framework for setting carbon budgets, sectoral emissions targets and update the national greenhouse gas emissions trajectory.

Once funds have been mobilised, implement the Just Energy Transition Partnership to accelerate phase-out of coal power while ensuring resources are used to support communities and job creation in the transition away from fossil fuels.



Prioritise green hydrogen in the implementation of the South African Hydrogen Society Roadmap. Developing green hydrogen markets in South Africa can promote low-carbon industries and create jobs.

Contents

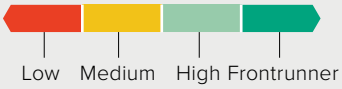
We unpack South Africa's progress and highlight key opportunities to enhance climate action across:

Legend

Trends show developments over the past five years for which data are available. A red exclamation mark indicates negative trends from a climate protection perspective.

Decarbonisation Ratings[3] assess a country's performance compared to other G20 Members. A high score reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.

Policy Ratings[4] evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.



SOCIO-ECONOMIC CONTEXT

Human Development Index

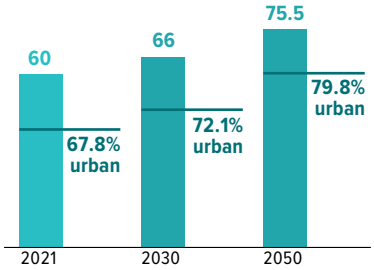
The Human Development Index (HDI) reflects life expectancy, level of education, and per capita income. South Africa ranks high.

0.70 high

Data for 2019. UNDP, 2020

Population and urbanisation projections

(in millions)

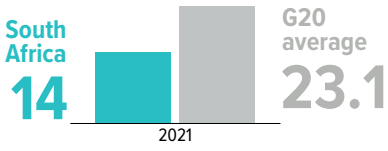


South Africa's population is projected to increase by 26% by 2050, and become more urbanised. Impacts of climate change are already placing significant stress on urban water services in South African cities and threatening biodiversity.

Cullis et al., 2019; Gannon et al., 2018; United Nations, 2018; World Bank, 2022

Gross Domestic Product (GDP) per capita

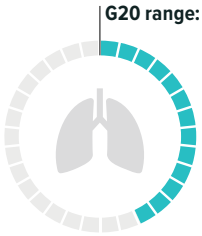
(thousand PPP constant 2015 international $ per person) in 2021



World Bank, 2021

Death rate attributable to ambient air pollution

(death rate per 1,000 population per year, age standardised) in 2019



0.73
per 1,000 people per year

Over 29,800 people die in South Africa every year due to stroke, heart disease, lung cancer and chronic respiratory diseases as a result of outdoor air pollution. This is one of the higher levels in the G20.

Institute for Health Metrics and Evaluation, 2020

A JUST TRANSITION

Recognising South Africa's fossil fuel dependence and the need to address climate and development in an integrated manner, Just Transition is high on the policy agenda. In 2020, a Presidential Climate Commission (PCC) was launched, comprising stakeholders from labour, civil society, business and youth. At COP26 in 2021, South Africa and international partners agreed to the Just Energy Transition Partnership (JETP), a first of its kind financing deal to support the transition to a low-carbon economy and society. A country-led process to develop the JETP Investment Plan is underway and will target key sectors. In July 2022, the PCC released a National Just Transition Framework (JTF) that centres the critical principles of procedural, distributive, and restorative justice, to achieve a quality life for all South Africans, including decent work for all, social inclusion, poverty eradication, enhanced resilience, and an environment not harmful to health and well-being. The JTF identifies major policy interventions to meet these goals: (i) social protection, (ii) human resource and skills development, and (iii) industrial development, economic diversification and innovation.

Minerals Council South Africa, 2022; Presidential Climate Commission, 2022; The Presidency of the Republic of South Africa, 2021; Republic of South Africa, 2021

ADAPTATION

Paris Agreement: Increase the ability to adapt to the adverse effects of climate change and foster climate resilience and low-GHG development.

Climate change poses a severe threat to water quality and availability in South Africa, with both extreme floods and droughts resulting in reduced crop production, livestock deaths and water scarcity.

Demand for water by people, industry and agriculture is expected to rise by 17.7 billion cubic metres by 2030, while water supply is projected to reach 15 billion cubic metres, a deficit of 17%.

Without policy intervention, the impacts of climate change are expected to exacerbate poverty and inequality as lower income communities are disproportionately impacted due to their higher vulnerability and lower resilience.

ADAPTATION NEEDS

Impacts of a changing climate

Exposure to warming

0.3°C
Higher

Between 2017 to 2021, the average summer temperatures experienced by people in South Africa were 0.3°C higher than the 1986–2005 average global mean temperature increase of 0.3°C.

Changes in the ability to work due to exposure to excessive heat

791,200 **Labour hours lost**
1% **increase**

In 2021, heat exposure in South Africa led to the loss of 791,200 potential hours of labour, a 1% increase from 1990–1999.

Loss of earnings from heat-related labour capacity reduction

205m **Loss in labour capacity (USD)**
0.05% **of GDP**

Extreme heat can make it unbearable or even dangerous to work in a range of economically important sectors. The potential income loss – in the service industry, manufacturing, agriculture, and construction sectors – from labour capacity reduction due to extreme heat was USD 205m in 2021 in South Africa, or 0.05% of its GDP.

Romanello et al., 2022; World Meteorological Organization, 2022

Exposure to future impacts at 1.5°C warming and higher

Different levels of global warming are projected to have a wide range of impacts of varying severity across the world. The percentages at 1.5°C are calculated as an increase/decrease from the reference period of 1986–2006. Using the projected impacts at 1.5°C of warming as a reference, we compare impacts that may occur at higher levels of warming.

Climatic	**At 2°C**	**At 2.5°C**	**At 3°C**
Local **precipitation**: -0.3% at 1.5°C warming	5.4 times	1 time	-5.1 times

In South Africa, local precipitation is projected to decrease by 0.3% if global temperature rises by up to 1.5°C above the average over the period 1986–2006. The extent of warming beyond this is expected to have variable effects on local precipitation. Under a 2.5°C warming scenario, this decrease in precipitation is projected to decrease by 5.4 times what is expected under a 1.5°C scenario. Under a 3°C warming scenario, precipitation is expected to dramatically increase, rather than decrease.

Fresh water	**At 2°C**	**At 2.5°C**	**At 3°C**
Surface run-off: +15.7% at 1.5°C warming	0.6 times	1.1 times	1.5 times
River discharge: +9.8% at 1.5°C warming	0.4 times	0.8 times	1.2 times
Total **soil moisture content:** -0.3% at 1.5°C warming	5.5 times	5.1 times	3.6 times

Surface run-off and river discharge are projected to increase by almost 16% and 10% above the average for 1986–2006, if global temperature rises by up to 1.5°C. These would be 1.5 times and 1.2 times greater, respectively, at 3°C of warming. In addition, total soil moisture content would decrease by 0.3% under 1.5°C warming; a decrease that would be magnified by 3.6 times under 3°C warming conditions.

Hazards	At 2°C	At 2.5°C	At 3°C
Number of people annually exposed to **heatwaves:** 305,436 at 1.5°C warming	2 times	4.3 times	5.4 times
Number of people annually exposed to **wildfires:** 99,894 at 1.5°C warming	0.6 times	1.4 times	1.1 times

The number of people annually exposed to hazards is expected to rise as the temperature increases. For example, the number of people annually exposed to heatwaves in South Africa is projected to be approximately 305,000 more than those affected annually during the reference period, at 1.5°C of warming, 2 times that if warming increases to 2°C, and over 5 times that if warming increases to 3°C. Almost 100,000 more people than in the reference period are projected to be exposed to wildfires at 1.5°C of warming, and 1.4 times that number of people at warming of 2.5°C.

Economic	At 2°C	At 2.5°C	At 3°C
Annual expected damage from **river flood:** +48.2% at 1.5°C warming	0.1 times	0.9 times	0.6 times
Labour productivity due to heat stress: -2% at 1.5°C warming	1.7 times	2.4 times	3 times

At 1.5°C, damages from flooding are anticipated to be 48% greater than the damages over the period 1986–2006; and at 3°C the damages are projected to be 0.6 times the increase in damage under a 1.5°C warming scenario. Labour productivity is projected to drop by 2% under 1.5°C of warming, and this decrease would be 2.4 times larger at 2.5°C of warming.

For further assessments of impacts under different warming scenarios, and a detailed explanation of the methodology, go to https://climate-impact-explorer.climateanalytics.org

Climate Analytics, 2021

ADAPTATION POLICIES

National Adaptation Strategies

Document name	Publication year	Fields of action (sectors)												Monitoring & evaluation process
		Agriculture	Biodiversity	Coastal areas and fishing	Education and research	Energy and industry	Finance and insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism	Water	
National Climate Change Adaptation Strategy	2020	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	Annual reporting and update of strategy every 5 years
First Adaptation Communication	2021	✓	✓	✓	✓		✓		✓	✓			✓	✓	Not specified

Nationally Determined Contribution (NDC): Adaptation

TARGETS

Goals listed in proposed NDC:

- Enhance adaptation governance and legal frameworks
- Develop understanding of climate impacts
- Implement NCCAS adaptation interventions
- Mobilise funding through multilateral mechanisms
- Quantify adaptation efforts

ACTIONS

"Efforts" to achieve the above goals listed

MITIGATION

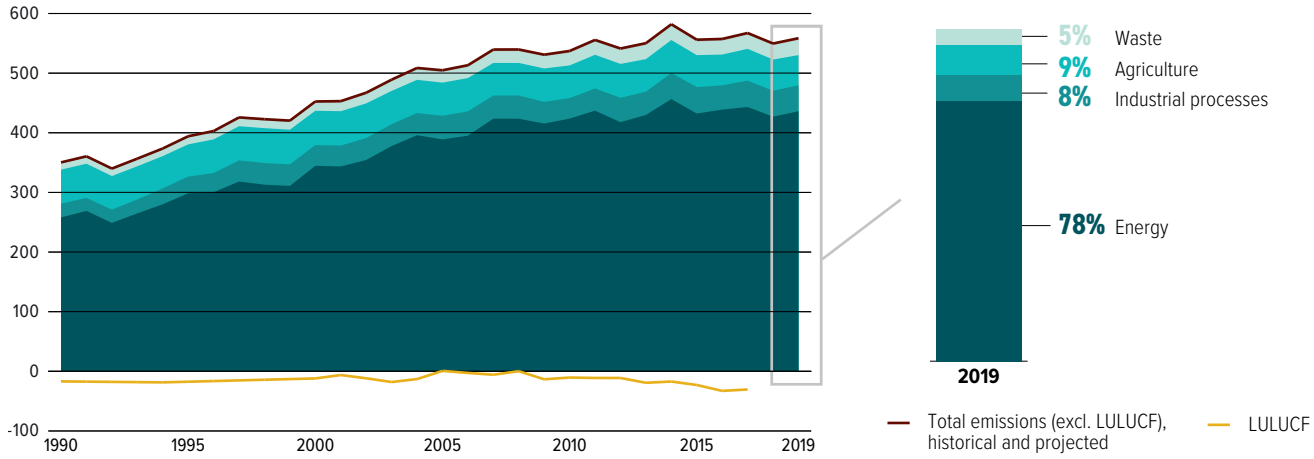
Paris Agreement: Hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.

EMISSIONS OVERVIEW

South Africa's total greenhouse gas emissions (excl. LULUCF) have increased by 59% (1990–2019). In the same period, its total methane emissions (excl. LULUCF) increased by 30%.

GHG emissions across sectors[5]

Total sectoral GHG emissions ($MtCO_2e$/year)

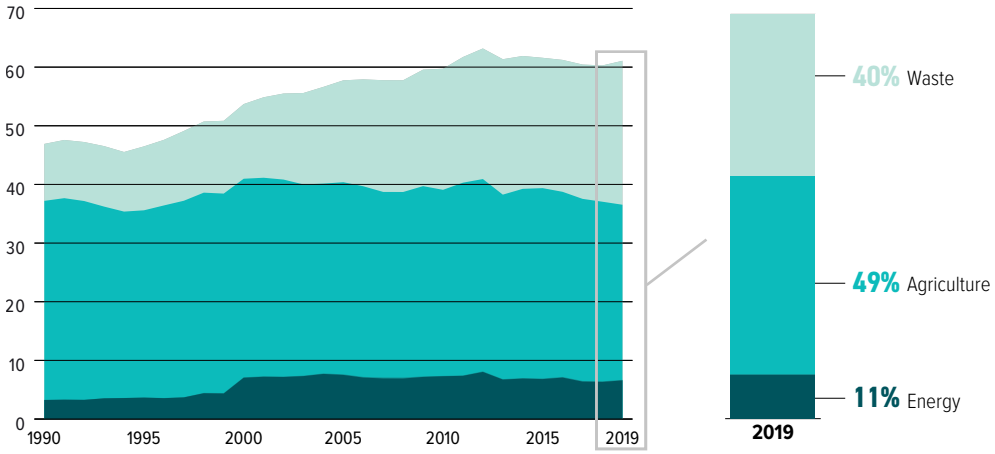


South Africa's GHG emissions (excl. LULUCF) increased by 59% between 1990–2019 to 558 $MtCO_2e$/yr. Emissions from all sectors, except agriculture, have increased dramatically: from a sustained increase of 69% in energy-related emissions, an 88% increase from industrial processes, and a 149% increase from the waste sector (albeit from a minimal initial amount).

Gütschow et al., 2021

Methane emissions by sector

Total CH_4 emissions ($MtCO_2e$/year)



South Africa did not sign the Global Methane Pledge at COP26 in November 2021.

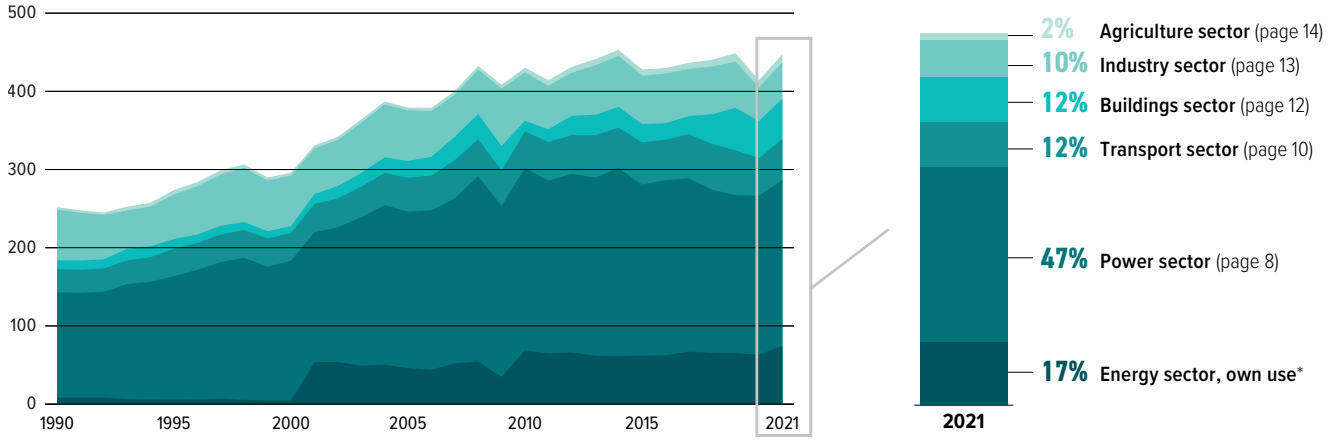
Participating countries pledged to undertake voluntary actions to contribute to a collective reduction of global methane emissions by at least 30% from 2020 levels by 2030. Further scrutiny of plans and implementation will be required.

Methane is a potent, though short-lived, greenhouse gas, accounting for an estimated third of global warming. South Africa's methane emissions (excl. LULUCF) increased by 30% between 1990–2019 to 61 $MtCO_2e$/yr. The majority of 2019 methane emissions came from the agriculture sector, which has been, and remains, the largest emitter of methane; however, as a proportion of the total, it has declined 23%, from 72% in 1990 to 49% in 2019. Both energy and waste sector emissions have increased by 4% between 1990–2019, but waste emissions were higher (40%) than those from energy (11%) in 2019.

Climate and Clean Air Coalition, 2021; Gütschow et al., 2021

Energy-related CO_2 emissions by sector

Annual CO_2 emissions ($MtCO_2$/year)



The largest driver of overall greenhouse gas emissions are CO_2 emissions from fuel combustion. In South Africa, the emissions have been increasing since 1990, reaching a relative plateau in the 2010s and stagnating from 2017 onwards. While emissions dipped in 2020, largely due to responses to the COVID-19 pandemic, they rebounded in 2021. The power sector is the largest contributor at 47%, followed by the energy sector's own use and transport sectors, with 16.7% and 11.7%, respectively.

Enerdata, 2022

**Includes energy-related CO_2 emissions from extracting and processing fossil fuels.*

ENERGY OVERVIEW

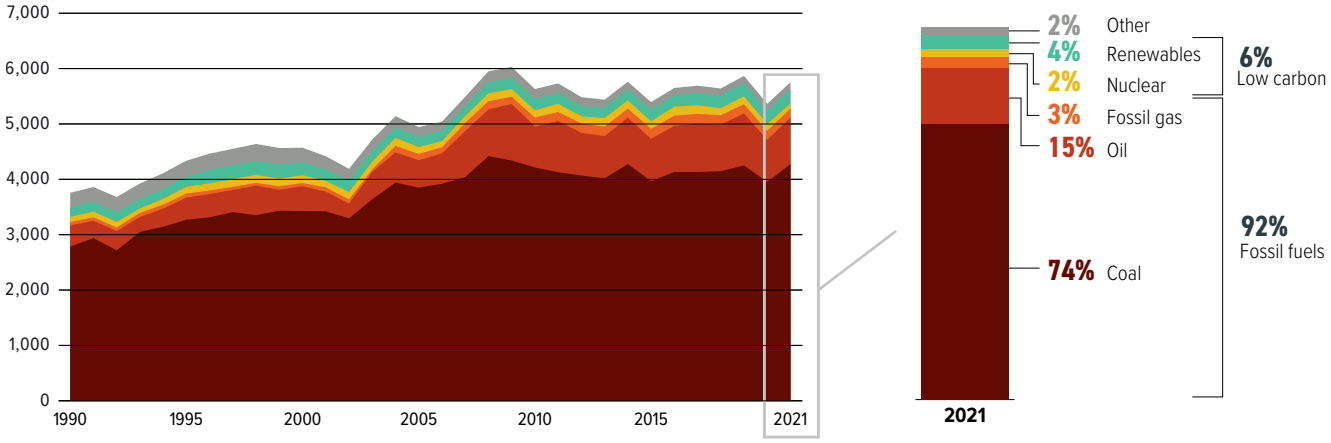
Fossil fuels make up about 92% of the South African energy mix, mostly coal. Total energy supply dipped during 2020, largely due to the COVID-19 pandemic, but this rebounded in 2021. Oil saw the largest dip in 2020, while renewable energy was the only source that increased, though only marginally.

The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050, and to substantially lower levels without carbon capture and storage.

Rogelj et al., 2018

Energy mix

Total primary energy supply (PJ)

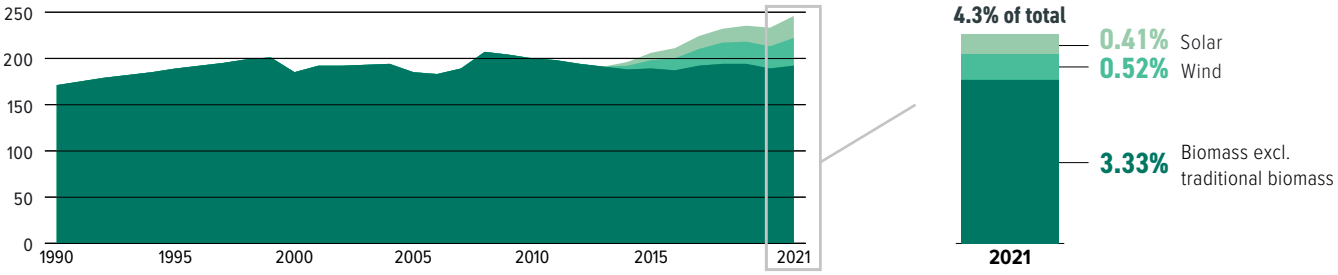


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating and cooking, but also for transport fuels. Fossil fuels (oil, coal, and gas) make up 92% of the South African energy mix, which is higher than the G20 average (81%). Coal has provided a relatively consistent proportion of the energy mix between 1990 and 2021 (between 72% and 78%), whereas the proportion of oil increased from 6% in 2002 to 15% in 2021. Since 2010, energy supply has stagnated. Despite growing generation from renewables, they still play a small role in energy supply.

Enerdata, 2022

Solar, wind, geothermal and biomass development

As a share of total primary energy supply (TPES) (PJ)

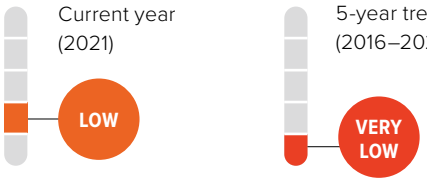


Solar, wind, geothermal and biomass excluding traditional biomass account for 4.3% of South Africa's energy supply – the G20 average is 7.5%. The share in total energy supply has increased by around 14.2% in the last 5 years in South Africa (2016–2021). Biomass (for electricity and heat) makes up the largest share, but the majority of new renewable supply is from wind and solar, albeit still a minimal contribution.

Enerdata, 2022

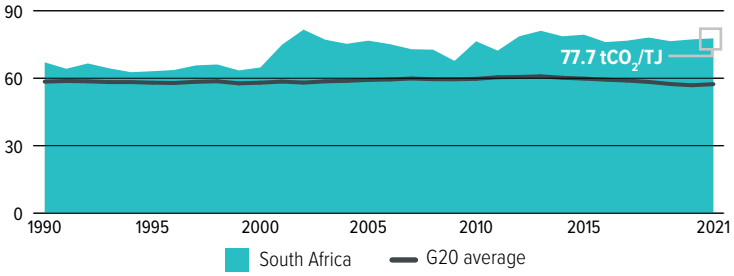
Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.

Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Carbon intensity of the energy sector

Tonnes of CO_2 per unit of TPES (tCO_2/TJ)



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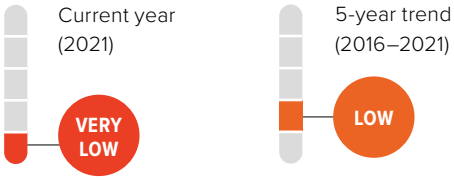


Carbon intensity is a measure of how much CO_2 is emitted per unit of energy supply. Carbon intensity of the energy sector was 77.7 tCO_2/TJ in 2021, the highest in the G20, which averages 57.4 tCO_2/TJ, and is mainly due to the high share of coal in South Africa's energy mix. Over the last 5 years, the carbon intensity of South Africa's energy mix has increased slightly, while the G20 average has declined.

Enerdata, 2022

Energy supply per capita

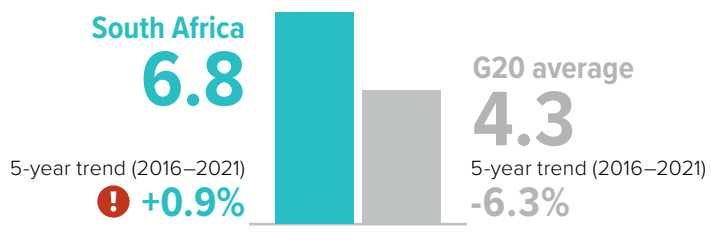
TPES per capita (GJ/capita) in 2021

The level of energy supply per capita is closely related to economic development, climatic conditions and the price of energy. In 2021, energy supply per capita in South Africa was 95.8 GJ, just below the G20 average of 99.4 GJ. Supply per capita between 2016–2021 has decreased at 7%, in contrast to the increasing G20 average of 1.6% over the same period.

Enerdata, 2022; World Bank, 2022

Energy intensity of the economy

(TJ/million US$2015 GDP) in 2021



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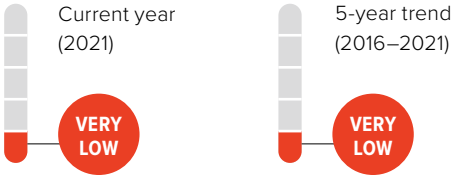


This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of decarbonisation, efficiency achievements, climatic conditions or geography. South Africa's energy intensity is higher than the G20 average and has increased by 0.9% (between 2016–2021), in contrast to the 6.3% decrease of the G20 average.

Enerdata, 2022; World Bank, 2021

POWER SECTOR

Emissions from energy used to make electricity and heat

South Africa produced **87% of its electricity from coal in 2021 resulting in the G20's most emissions-intensive power sector.** The pipeline of power projects indicates a shift towards renewables and fossil gas.

Power generation's share of energy-related CO_2 emissions in 2021:

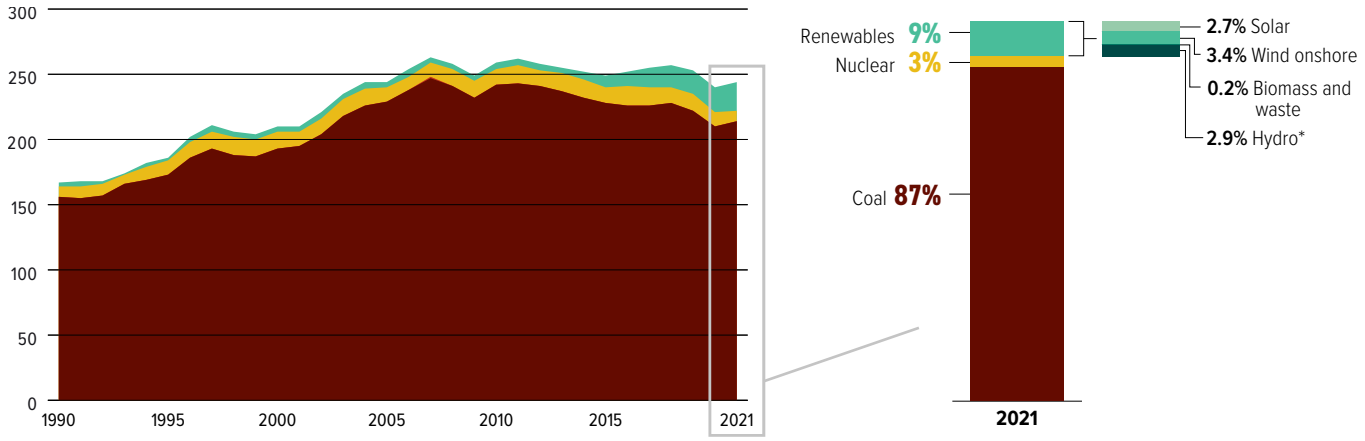
47% Direct

Worldwide, coal use for power generation needs to peak by 2020, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal reduced to zero.

Climate Action Tracker, 2020a; Rogelj et al., 2018

Electricity generation mix

Gross power generation (TWh)



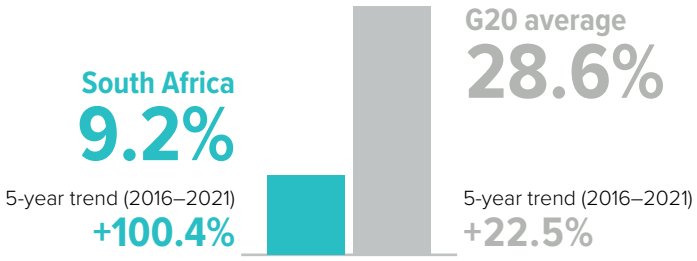
South Africa generated 87% of its electricity from fossil fuels in 2021, overwhelmingly from coal. The share of renewable energy in the power sector has been increasing, accounting for approximately 9% of the power mix in 2021. Onshore wind and solar are the leading sources of renewable energy, with wind power growing slightly faster than solar PV.

Enerdata, 2022

**Pumped hydropower used for storage makes up the majority of hydro reflected in this figure. It is important to note that the majority of pumped hydropower in South Africa is charged by coal-fired power plants, usually at night, and during times of low demand. As such, it is not a true renewable source of power generation.*

Share of renewables in power generation

(incl. large hydro) in 2021



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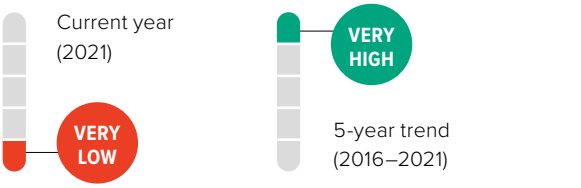
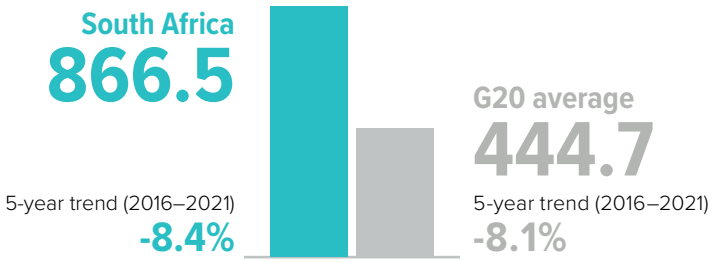


Enerdata, 2022

Emissions intensity of the power sector

(gCO_2/kWh) in 2021



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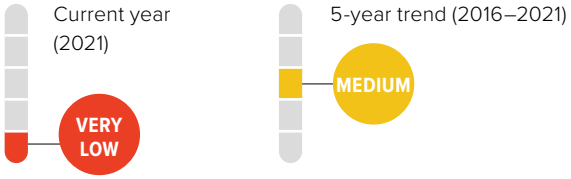
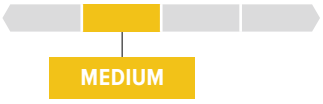


For each kWh of electricity, 866.5 g of CO_2 are emitted in South Africa. The emissions intensity is declining as renewable generation increases; however, South Africa's power sector has the G20's highest emissions intensity due to continued reliance on coal.

Enerdata, 2022

POLICY ASSESSMENT

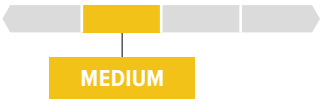
Renewable energy in the power sector



South Africa's IRP2019 proposes an expansion of renewable energy capacity from about 6,600 MW (excluding large hydro) to 26,700 MW (plus a projected 6,000 MW in distributed PV) in 2030. As part of the President's energy crisis plan, the capacity of wind and solar procured in bid rounds of the REIPPPP will double from 2,600 MW to 5,200 MW. The licensing threshold for embedded generation, previously increased from 1 MW to 100 MW, will also be removed under the plan, which is expected to lead to increased private investment in renewables. There is no 2050 renewables target.

Department of Energy, 2019; The Presidency of the Republic of South Africa, 2022

Coal phase-out in the power sector



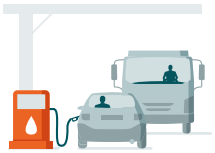
South Africa's IRP2019 outlines the decommissioning of 12 GW of older coal plants by 2030, but also includes 1.5 GW of new coal capacity by 2030, in addition to the mostly completed 8.5 GW coal capacity. Much of the coal fleet will be retired in the 2030s and 2040s, with a few plants potentially still operational in 2050 or later.

While the JETP envisions an "accelerated decarbonisation" of the power system with a focus on coal, there is still no detailed phase-out plan – although work is ongoing in consultation with Eskom and other relevant stakeholders.

Department of Energy, 2019; The Presidency of the Republic of South Africa, 2021

TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Emissions from transport have begun to rebound after a dip in emissions driven by the pandemic. In 2020, 43.5% of work-related transport was by private road transport, and 85% of freight transport was by road in 2014. Both sectors are still dominated by fossil fuels, and electric vehicles (EVs) make up only 0.09% of new car sales. In order to stay within a 1.5°C temperature limit, passenger and freight transport need to be decarbonised.

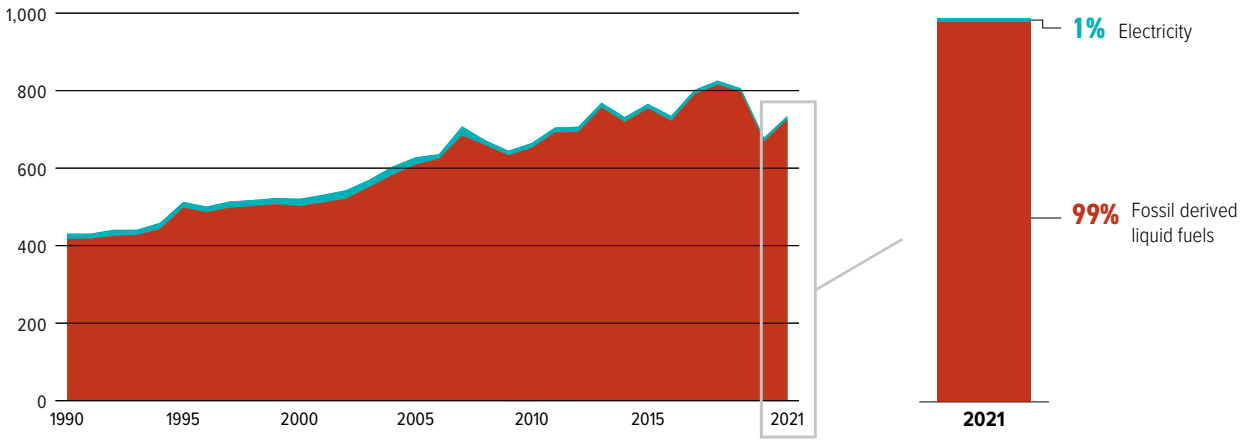
The share of low-carbon fuels in the transport fuel mix must increase to between 40% and 60% by 2040 and 70% to 95% by 2050.

Climate Action Tracker, 2020a; Rogelj et al., 2018

Transport's share of energy-related CO_2 emissions in 2021: **11.7%** Direct **0.6%** Indirect

Transport energy mix

Final energy consumption by source (PJ/year)

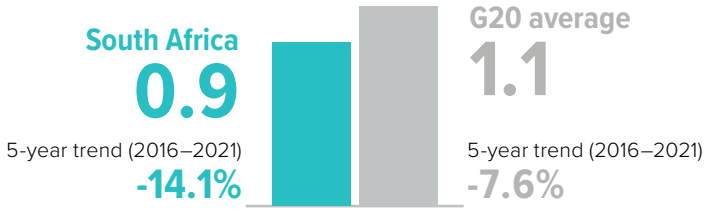


Electricity and biofuels make up only 1% of the energy mix in transport.

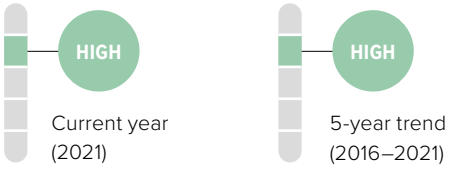
Enerdata, 2022

Transport emissions per capita

(excl. aviation) (tCO_2/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



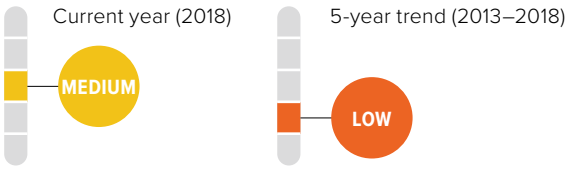
Per capita emissions in 2021 and the 5-year trend have been impacted by COVID-19 pandemic response measures and resulting economic slowdowns. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2022, please see the Highlights Report at www.climate-transparency.org

Enerdata, 2022; World Bank, 2022

Aviation emissions per capita[6]

(tCO_2/capita) in 2018

Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



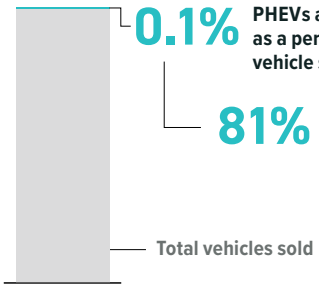
Enerdata, 2022; IEA, 2021; World Bank, 2022

Motorisation rate

128
vehicles per 1,000 inhabitants in 2019

Enerdata, 2022

Market share of electric vehicles in new car sales (%)

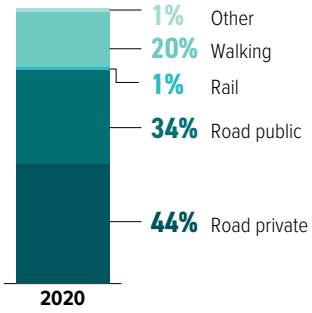


Battery-Electric Vehicles (BEVS) have greater emissions mitigation potential when they are powered by electricity produced by renewables because they have no internal combustion engine (ICE), whereas plug-in hybrids (PHEVs) still produce emissions when using the ICE.

IEA, 2022

Modal split passenger transport*

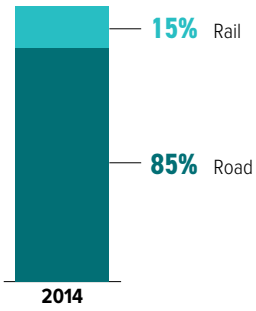
(% of passenger-trips): road, rail and air for work related travel



Statistics South Africa, 2020

Freight transport*

(modal split in % of tonne-km)



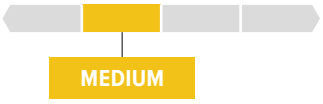
Due to data availability, only road and rail transport are included in the freight transport category. Other freight modes, e.g. waterways, are excluded due to lack of data for all countries.

Havenga, J. H. et al., 2016

**Owing to the variety of sources and data years available, these data are not comparable across G20 Members.*

POLICY ASSESSMENT

Phase out fossil fuel cars



South Africa has no plan to phase out fossil fuel vehicles, and no energy nor emissions standards for vehicles, apart from an emissions-related tax on vehicle purchases and a carbon tax. The 2018 Green Transport Strategy proposes a range of measures to promote shifting to low-emission vehicles and introduce vehicle emissions standards; however, as of August 2022 these strategies have had little to no implementation. The political declaration on the JETP indicates an intention to invest in EVs.

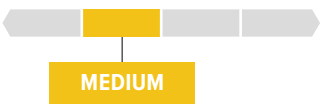
Ahjum et al., 2021; Department of Trade, Industry and Competition, 2021; Department of Transport, 2018; The Presidency of the Republic of South Africa, 2021

Phase out fossil fuel heavy-duty vehicles

South Africa has not adopted a target to phase out emissions from freight transport, nor are there energy or carbon emission standards for heavy-duty vehicles. However, it has passed the Biofuels Regulatory Framework, which aims to increase the penetration of biofuels in the national fuel pool. The Framework has been criticised for not providing adequate protections for food security and biodiversity, among other shortcomings.

Department of Mineral Resources and Energy, 2019; WWF, 2020

Modal shift in (ground) transport

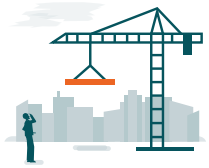


South Africa's Green Transport Strategy (2018–2050) targets a 5% reduction of transport emissions by 2050, shifting 30% of freight transport from road to rail, and 20% of passenger transport from private cars to public transport and eco-mobility transport within seven years of implementation. However, there are no detailed programmes for implementation. The 2020 Economic Reconstruction and Recovery Plan includes some measures for passenger rail and mentions a "road to rail" strategy for freight. Despite targets, rail conditions have worsened, with the amount of freight tonnage transported by rail decreasing every year since 2017.

Daniel, 2022; Department of Transport, 2018; The Presidency of the Republic of South Africa, 2020

BUILDINGS SECTOR

Emissions from energy used to build, heat and cool buildings



Direct emissions and indirect emissions from the buildings sector in South Africa account for 11.1% and 15.8% of total energy-related CO_2 emissions, respectively. Per capita emissions from the buildings sector are 1.4 times the G20 average.

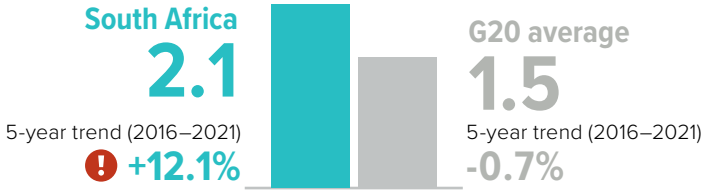
Buildings sector's share of energy-related CO_2 emissions in 2021: **11.1%** Direct **15.8%** Indirect

By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95–100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

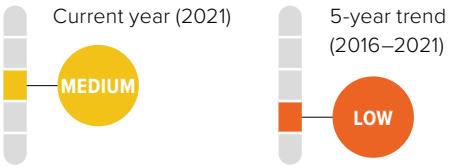
Climate Action Tracker, 2020a; Rogelj et al., 2018

Buildings sector emissions per capita

incl. indirect emissions (tCO_2/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Buildings emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (from grid-electricity for air conditioning, appliances, etc.) Buildings-related emissions per capita are 1.4 times the G20 average as of 2021. This reflects the high fossil fuel share of the electricity mix. In contrast to the decrease of the G20 average, South Africa has increased the level by 12% (2016–2021).

Enerdata, 2022; World Bank, 2022

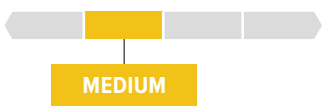
POLICY ASSESSMENT

Near zero energy new buildings

South Africa's National Development Plan sets a goal for zero emission buildings by 2030. The draft National Energy Efficiency Strategy foresees a 54% improvement in average energy performance of new commercial buildings by 2030, compared to the 2015 baseline. There are ambitious mandatory energy building codes for new residential and non-residential buildings. However, to be successfully implemented, these also require government to put enforcement measures in place to ensure compliance.

Department of Energy, 2016; National Planning Commission, 2012

Renovation of existing buildings



There are no mandatory building retrofit policies but, in 2020, the government adopted regulations requiring the submission and display of energy performance certificates in buildings of particular classes. Certificates would need to be renewed every 5 years. The draft National Energy Efficiency Strategy foresees a 20% improvement in energy performance of the residential building stock.

Department of Energy, 2016; Department of Mineral Resources and Energy, 2020

INDUSTRY SECTOR

Emissions from energy use in industry

Direct emissions and indirect emissions from industry in South Africa make up 10.4% and 24.8% of energy-related CO_2 emissions, respectively. South Africa lacks the enforcement of policies to increase the energy efficiency of the industry sector and has no effective policies to reduce emissions or decarbonise the sector.

Industrial emissions need to be reduced by 65–90% from 2010 levels by 2050.

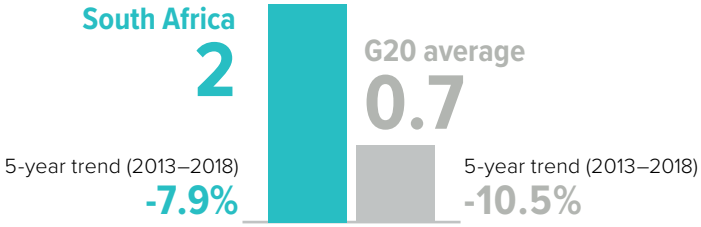
Rogelj et al., 2018

Industry sector's share of energy-related CO_2 emissions in 2021:

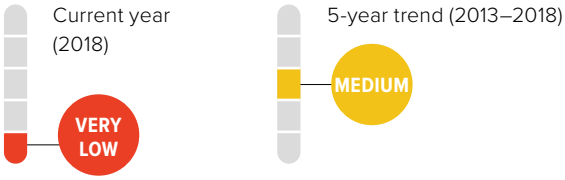
10.4% Direct **24.8%** Indirect

Industry emissions intensity[7]

($kgCO_2e$/USD2015 GVA) in 2018



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Enerdata, 2021; World Bank, 2022

Carbon intensity of steel production[8]

($kgCO_2$/tonne product) in 2016

Steel production and steelmaking are significant GHG emissions sources, and challenging to decarbonise.

Climate Action Tracker, 2020b; World Steel Association, 2018

POLICY ASSESSMENT

Energy efficiency

The draft Energy Efficiency Strategy envisages reducing the energy consumption of manufacturing by 16% by 2030 below 2015 levels. The second phase of the Green Environment Facility-funded (GEF) Industrial Energy Efficiency Programme that operated between 2016 and December 2021 was successful in reducing industrial energy demand, but this programme has officially ended. However, the 12L tax incentive that was promulgated in 2013 and provides an allowance for businesses to implement energy-efficiency savings was extended in the 2022 Budget Speech from 2023 to the end of 2025.

Department of Energy, 2016; IEEP, 2020; KPMG, 2022

LAND USE SECTOR

Emissions from land use change and forestry

South Africa's land sector is currently a net carbon sink, despite decreasing forest cover, partly due to the growing importance of the timber industry. To stay within the 1.5°C limit, South Africa will need to further enhance its current land sector sink by increasing afforestation and promoting soil carbon enhancement on grasslands and on savannah.

Global deforestation needs to be halted and changed to net CO_2 removals by around 2030.

Rogelj et al., 2018

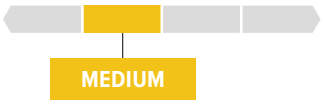
Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year

No data available for South Africa

POLICY ASSESSMENT

Target for net zero deforestation



South Africa's land sector is currently a carbon sink. There is significant scope to enhance the sink, which could play an important role in a future net zero emissions target.

AGRICULTURE SECTOR

Emissions from agriculture

South Africa's agricultural emissions are mainly from enteric fermentation (predominantly the digestive processes of cattle) and livestock manure. A 1.5°C compatible pathway requires behavioural and dietary shifts for humans and animals.

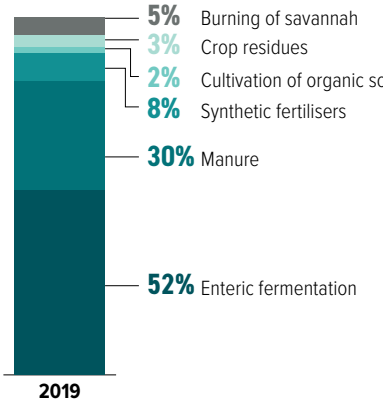
Methane emissions need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Rogelj et al., 2018

Emissions from agriculture

excluding energy emissions, in 2019

29.58
$MtCO_2e$ in 2019



In South Africa, the largest sources of GHG emissions in the agriculture sector are enteric fermentation (mainly from cattle) and manure from livestock. For crop production, the largest source of emissions is the use of synthetic fertilisers.

Improving and adapting the diets of cattle, making (human) dietary changes in favour of vegetables and fruits, improving storage and handling of manure, and reducing or more efficiently using synthetic fertilisers could all help reduce emissions from this sector.

FAO, 2022

MITIGATION: TARGETS AND AMBITION

The science from the IPCC on the risks of exceeding 1.5°C warming is clear. The UN science body has projected that to keep the 1.5°C goal alive, the world needs to roughly halve emissions by 2030.

However, despite the Glasgow Climate Pact (1/CMA.3) agreement to "revisit and strengthen" 2030 targets this year, progress on more ambitious targets has stalled. Without far more ambitious government action, the world is heading to a warming of **2.4°C with the current 2030 targets** and even higher warming **of 2.7°C with current policies**.

Climate Action Tracker, 2021a, 2022c; IPCC, 2022; UNFCCC, 2021

AMBITION: 2030 TARGETS

Nationally Determined Contribution: Mitigation

TARGETS

The Updated NDC, submitted to the UNFCCC on 27 September 2021, includes a 2030 GHG emission target range of 350–420 $MtCO_2e$, incl. LULUCF (as submitted) or 366–436 $MtCO_2e$, excl. LULUCF.

ACTIONS

Implementing the 2019 Integrated Resource Plan, Green Transport Strategy, enhanced energy efficiency programmes, and carbon tax.

Climate Action Tracker (CAT) evaluation of targets and actions

Critically insufficient	Highly insufficient	**Insufficient**	Almost sufficient	1.5°C Paris Agreement compatible

The CAT evaluates and rates several elements of climate action: policies and actions, targets and a country's contribution to climate finance (where relevant) and combines these into an overall rating.

The "insufficient" rating indicates that South Africa's climate policies and commitments need substantial improvement to be consistent with the Paris Agreement's 1.5°C temperature goal. South Africa's 2030 emissions reduction target is rated as "almost sufficient" when compared to modelled domestic pathways, and "insufficient" when compared with its 'fair share' contribution to climate action. South Africa's targets and policies are not stringent enough to limit warming to 1.5°C, based on the CAT analysis. If fully implemented, South Africa's current policies would result in emissions reductions only in line with 3°C warming.

This CAT analysis was updated in September 2022.
For the full assessment of the country's targets and actions, and the explication of the methodology, see www.climateactiontracker.org

Climate Action Tracker, 2022a

AMBITION: LONG-TERM STRATEGIES

The Paris Agreement invites countries to communicate mid-century, long-term, and low-GHG emissions development strategies. Long-term strategies are an essential component of the transition toward net zero emissions and climate-resilient economies.

Status	Submitted to UNFCCC in 2020
Net zero target	Net zero CO_2 emissions by 2050
Interim steps	No
Sectoral targets	The proposed legislation (the Climate Change Bill) establishes a process to set "Sectoral Emissions Targets"

FINANCE

Paris Agreement: Make finance flows consistent with a pathway towards low-GHG emissions and climate-resilient development.

Fossil fuel subsidies reached USD 4.4bn in 2020, a steady increase over the past decade. South Africa introduced a carbon tax in 2019, covering 80% of domestic emissions, but the first phase of tax-free allowances and revenue recycling measures has been extended to 2025, undermining the benefits of pricing carbon.

Investment in green energy and infrastructure needs to outweigh fossil fuel investments by 2025.

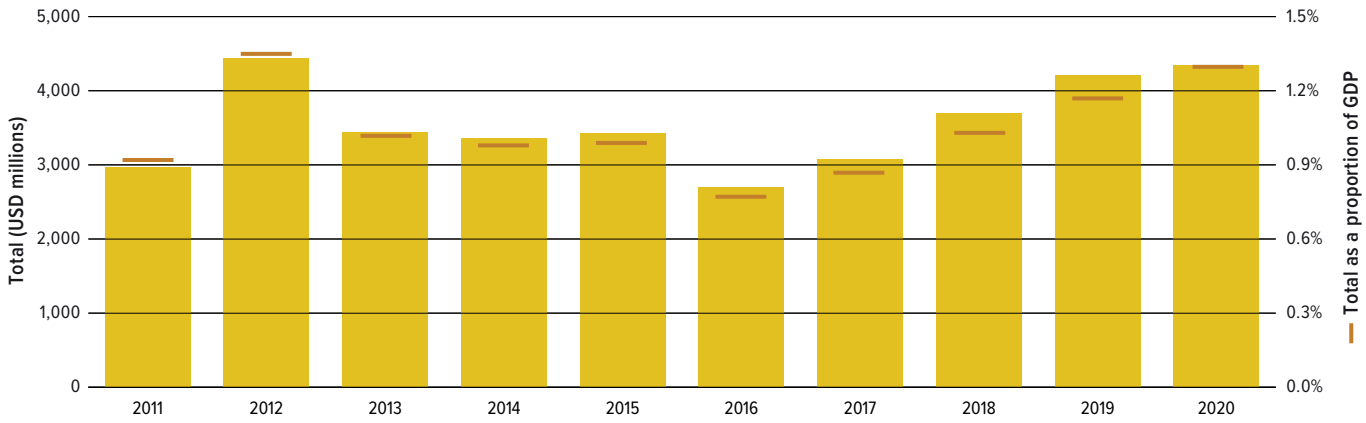
Rogelj et al., 2018

FISCAL POLICY LEVERS

Fiscal policy levers raise public revenues and direct public resources. Critically, they can shift investment decisions and consumer behaviour towards low-carbon, climate-resilient activities by reflecting externalities in the price.

Fossil fuel subsidies relative to national budgets

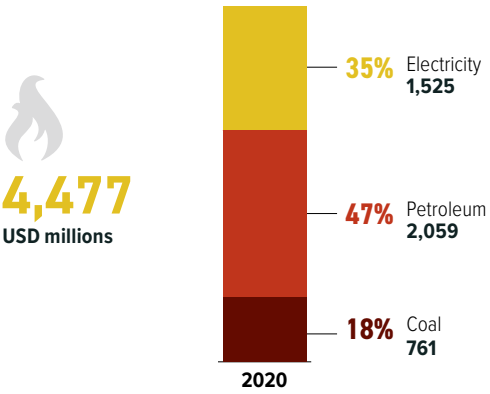
(USD millions)



OECD-IEA Fossil Fuel Support Database, 2022

Fossil fuel subsidies by fuel type

(USD millions) in 2020



South Africa's fossil fuel subsidies have increased over the past decade to reach USD 4.4bn in 2020. Roughly half of this support has gone to petroleum, and 35% to electricity generation. Production accounts for almost twice as much as consumption subsidies. Fossil fuel subsidies in South Africa made up 2.9% of public spending in 2020, the highest proportion of the decade.

Two support measures account for more than half of all fossil fuel subsidies in 2020. The first, new in 2019, was provisional support to service the debt of the state-owned electricity utility Eskom, which was in financial crisis. The second supports petroleum consumption by exempting motor gas, diesel and kerosene from VAT. Low consumption and oil prices due to the COVID-19 pandemic led to a dip in 2020, interrupting an otherwise increasing trend in support. South Africa also provides free basic electricity to low-income households. Of the total amount of electricity in South Africa, 88% is generated by coal, effectively making this a fossil fuel subsidy.

Energy Policy Tracker, 2022; OECD-IEA Fossil Fuel Support Database, 2022

Carbon pricing and revenue

In June 2019, South Africa became the first African nation to launch a carbon tax, generating USD 94m in revenue in 2021. It covers 80% of domestic emissions, including all types of fossil fuels across industry, power, buildings and transport sectors. Emissions are charged at around USD 10/tCO_2e. During its first phase, the carbon tax rate was to increase until 2022 by the amount of consumer price inflation, plus 2% annually, with inflationary adjustments from 2023. The 2022 National Budget Speech extended this first phase by three years, to 2025, including tax-free allowances and revenue recycling measures. This means significant emissions sources will remain outside the scope of the tax, such as those from the agriculture sector and state-owned power utility Eskom.

I4CE, 2022

FINANCIAL POLICY AND REGULATION

Through policy and regulation, governments can overcome challenges to mobilising green finance, including real and perceived risks, insufficient returns on investment, capacity and information gaps.

South Africa has made considerable strides in greening its financial system and is working on more. In November 2021, the South African Reserve Bank (SARB) completed the second edition of its Financial Stability Review, which included a climate change stress test of climate risks to the banking sector.

In April 2022, the South Africa Sustainable Finance Initiative (SASFI) launched South Africa's first Green Finance Taxonomy, to identify and track sustainable activities for investors. A Green Bond Framework was built in January 2021 by the Development Bank of Southern Africa (DBSA), in line with Green Bond Principles.

The National Treasury is considering mandatory reporting of climate risks in financial disclosures, in line with the recommendations of the Task Force on Climate-Related Financial Disclosure, established in 2015 by the Financial Stability Board. A report published in December 2021 by the Disclosure Working Group sets out minimum expectations for disclosure.

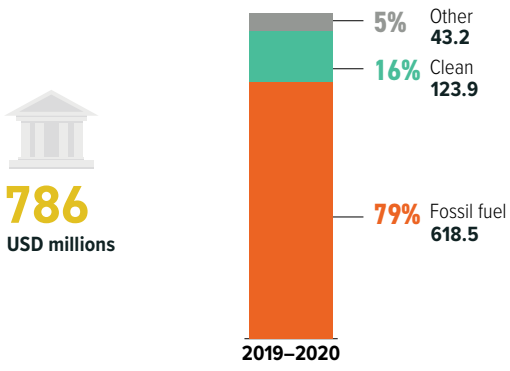
Climate Risk Forum Disclosure Working Group, 2021; Development Bank of Southern Africa, 2021; National Treasury Republic of South Africa et al., 2022; South African Reserve Bank, 2021; Task Force on Climate-Related Financial Disclosures, 2022

PUBLIC FINANCE

Governments steer investments through their public finance institutions, including via development banks both at home and overseas, and green investment banks. Developed G20 countries also have an obligation to provide finance to developing countries, and public sources are a key aspect of these obligations under the UNFCCC.

Public finance for energy

USD millions (2019–2020 average)



Between 2019 and 2020 South Africa provided an average of USD 786m in public finance per year to energy projects. Of this amount, 79% went to fossil fuels, almost exclusively to fossil gas. The largest single support measure, of USD 800m provided in 2020, financed the development of a LNG terminal in Mozambique. Further smaller loans were also provided for this project. Other significant investments include a loan of USD 150m to a concentrated solar power plant in South Africa.

Oil Change International, 2022

Provision of international public support

South Africa is not listed in Annex II of the UNFCCC and is not formally obliged to provide climate finance and, therefore, while it may channel international public finance towards climate change via multilateral and other development banks, it has not been included in this report.

Endnotes

For more detail about sources and methodologies, please download the CTR Technical Note at: www.climate-transparency.org/g20-climate-performance/g20report2022

Where referenced, "Enerdata, 2022" refers to data provided in July 2022 and, due to rounding, graphs may sum to slightly above or below 100%.

1 The '1.5°C compatible pathway' is derived from global cost-effective pathways assessed by the IPCC's SR15, selected based on sustainability criteria, and defined by the 5th–50th percentiles of the distributions of such pathways achieving the long-term temperature goal of the Paris Agreement. Negative emissions from the land sector and novel negative emissions technologies are not included in the assessed models, which consider one primary negative emission technology (BECCS). In addition to domestic 1.5°C compatible emissions pathways, the 'fair share' emissions reduction range would almost always require a developed country to provide enough support through climate finance, or other means of implementation, to bring the total emissions reduction contribution of that country down to the required 'fair share' level.

2 'Land use' emissions is used here to refer to land use, land use change and forestry (LULUCF). The Climate Action Tracker (CAT) derives historical LULUCF emissions from the UNFCCC Common Reporting Format (CRF) data tables, converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from LULUCF, which under the IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).

3 The Decarbonisation Ratings assess the current year and average of the most recent 5 years (where available) to take account of the different starting points of different G20 Members.

4 The selection of policies rated and the assessment of 1.5°C compatibility are primarily informed by the Paris Agreement and the IPCC's 2018 SR15. The Policy Assessment Criteria table below displays the criteria used to assess a country's policy performance.

5 In order to maintain comparability across all countries, this report harmonises all data with PRIMAP 2021 dataset to 2018. However, note that CRF data is available for countries which have recently updated GHG inventories.

6 This indicator adds up emissions from domestic aviation and international aviation bunkers in the respective country. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.

7 This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.

8 This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

Policy Assessment Criteria

	LOW	MEDIUM	HIGH	FRONTRUNNER
Renewable energy in power sector	No policies to increase the share of renewables	Some policies	Policies and longer-term strategy/ target to significantly increase the share of renewables	Short-term policies + long-term strategy for 100% renewables in the power sector by 2050 in place
Coal phase-out in power sector	No targets and policies in place for reducing coal	Some policies	Policies + coal phase-out decided	Policies + coal phase-out date before 2030 (OECD and EU28) or 2040 (rest of the world)
Phase out fossil fuel cars	No policies for reducing emissions from light-duty vehicles	Some policies (e.g. energy/emissions performance standards or bonus/ malus support)	Policies + national target to phase out fossil fuel light-duty vehicles	Policies + ban on new fossil fuel-based light-duty vehicles by 2035 worldwide
Phase out fossil fuel heavy-duty vehicles	No policies	Some policies (e.g. energy/emissions performance standards or support)	Policies + strategy to reduce absolute emissions from freight transport	Policies + innovation + strategy to phase out emissions from freight transport by 2050
Modal shift in (ground) transport	No policies	Some policies (e.g. support programmes to shift to rail or non-motorised transport)	Policies + longer-term strategy	Policies + longer-term strategy consistent with 1.5°C pathway
Near zero energy new buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + national strategy for near zero energy new buildings	Policies + national strategy for all new buildings to be near zero energy by 2020 (OECD countries) or 2025 (non-OECD countries)
Energy efficiency in industry	No policies	Mandatory energy efficiency policies cover more than 26–50% of industrial energy use	Mandatory energy efficiency policies cover 51–100% of industrial energy use	Policies + strategy to reduce industrial emissions by 75–90% from 2010 levels by 2050
Retrofitting existing buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + retrofitting strategy	Policies + strategy to achieve deep renovation rates of 5% annually (OECD) or 3% (non-OECD) by 2020
Net zero deforestation	No policies or incentives to reduce deforestation in place	Some policies (e.g. incentives to reduce deforestation or support schemes for afforestation/ reforestation in place)	Policies + national target for reaching net zero deforestation	Policies + national target for reaching zero deforestation by 2020s or for increasing forest coverage

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For more information on this country profile, please contact:

Energy Systems Research Group – University of Cape Town.
Dr. Andrew Marquard, andrew.marquard@uct.ac.za
Bryce McCall, bryce.mccall@uct.ac.za