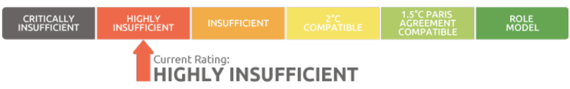
CLIMATE ACTION TRACKER

South Africa

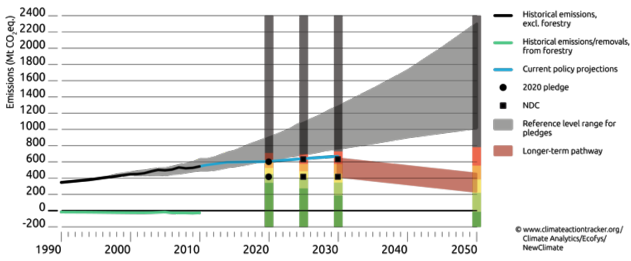
History: 2017 2015 2014 2013 2012 2011

Page last updated: 6th November 2017

Rating



Basic Intermediate



Assessment

While South Africa may come close to meeting its 2030 target, it's a target the CAT rates as "Highly insufficient." While it has a strong renewable energy target for 2030, South Africa's coal-fired generation, which supplies 93% of electricity, is still expected to grow, with new coal plants either planned or under construction. Meanwhile the state-owned grid operator Eskom (and owner of the majority of the coal plants in South Africa) is stalling on signing power purchase agreements with renewables companies, delaying progress. The start date for South Africa's planned carbon tax remains uncertain.

South Africa's Nationally Determined Contribution (NDC) contains a target to limit greenhouse gas (GHG) emissions including land use, land use change and forestry (LULUCF) to between 398 and 614 $MtCO_2e$ over the period 2025–2030. This target is equivalent to a 20–82% increase on 1990 levels excl. LULUCF. Although South Africa is one of the few countries that has put forward absolute emission reduction targets in their NDC, we still rate this target "Highly insufficient."

With currently implemented policies and continuing low economic growth, South Africa gets close to its mitigation target: emission projections are 32 MtCO2e higher than the upper end of the target for 2030. If South Africa's economy were to grow again, emission levels up to 2030 may be expected to increase.

One of South Africa's key policies to reduce emissions is the Integrated Resource Electricity Plan (IRP) 2010–2030, which sets a renewable capacity target of total 17.8 GW for 2030. However, the plan foresees coal generation growing at a similar rate. By 2030, the IRP base case expects South Africa to have 21% of energy generation from renewable energy and 48% from coal.

Renewables deployment is also being hampered because Eskom, South Africa's state-owned grid operator and owner of the majority of coal plants, is stalling on signing power purchase agreements with renewable energy companies, putting the financial future of those companies at risk, along with the renewable energy capacity target, and reducing the country's renewable energy investment attractiveness. A carbon tax has been planned since 2015, but the start date has been postponed several times and remains uncertain.

South Africa's NDC is consistent with its pledge under the Copenhagen Accord, which proposed emissions reduction below business-as-usual (BAU) levels, incl. LULUCF, by 34% in 2020 and 42% in 2025. This represents a 20–73% increase in emissions excl. LULUCF in 2020 and a 20–82% increase in 2025 on 1990 levels, excl. LULUCF.

According to our analysis, South Africa reaches the higher end of its emission reduction targets in 2020 and 2025 under the current policy projections. However, as emissions are still projected to keep rising post-2025, whereas the NDC pledge requires a flattening of emissions, South Africa would not achieve its proposed target by 2030. The CAT's projection for South Africa's emissions trajectory under its implemented policies in 2020 and 2030 are expected to increase by 75% and 93%, respectively, on 1990 levels excl. LULUCF.

The significant reduction in projected emission levels compared to last year's analysis is primarily due to downward adjustment of assumptions on economic growth rates until 2030 in the external scenario used (see 'Assumptions' for more details). If South Africa were to experience stronger economic growth rates leading up to 2030, emissions levels in its current policy trajectory are likely to increase.

Pledges and targets

Paris Agreement target

South Africa's NDC, 2020 pledge and long-term target pledge are consistent with its long-term goal to constrain its emissions to follow a peak-plateau-decline (PPD) trajectory. Based on this, South Africa's emissions should peak between 2020 and 2025 (as targeted by the Copenhagen and NDC pledge), plateau for approximately a decade and then decline in absolute terms, as shown in the red shaded range in the figure above.

South Africa's NDC targets an absolute emissions level in the range of 398–614 $MtCO_2e$ incl. LULUCF over the period 2025–2030 (Government of South Africa, 2016). Assuming LULUCF remains at the average level over 2000–2010 (-19 $MtCO_2e$), this NDC translates to an emissions level of between 417–633 $MtCO_2e$ excl. LULUCF, equivalent to a 20–82% increase above 1990 levels excl. LULUCF.

South Africa's NDC is "premised on the adoption of a comprehensive, ambitious, fair, effective and binding multilateral rules-based agreement under the UNFCCC at the 21st conference of the Parties (COP21)" (Government of South Africa, 2016). It also highlights that equity, economic and social development and poverty eradication are South Africa's top priorities. To date, it is unknown how the government of South Africa interprets the Paris Agreement—which is the outcome of COP21—in terms of its ambition, fairness and effectiveness. As South Africa has signed and ratified the Paris Agreement, CAT thus interprets the South African NDC as an unconditional target.

2020 pledge

Under the Copenhagen Accord, South Africa committed to reduce emissions below BAU by 34% in 2020, and by 42% in 2025, incl. LULUCF. The emissions level (excl. LULUCF) derived from South Africa's pledge is 417–602 $MtCO_2e$ in 2020 and 417–633 $MtCO_2e$ by 2025. South Africa's Copenhagen pledge is conditional on a fair, ambitious and effective agreement in the international climate change negotiations under the Climate Change Convention and the Kyoto Protocol and the provision of support from the international community.

Copenhagen pledge	
2020 target	34% below BAU by 2020 incl. LULUCF [20–73% above 1990 levels excl. LULUCF]
2025 target	42% below BAU by 2025 incl. LULUCF [20–82% above 1990 levels excl. LULUCF]
Conditions	A fair, ambitious and effective agreement under the Climate Change convention and the Kyoto Protocol and the provision of support from the international community.
Paris Agreement target	
Ratified	Yes
2030 target	Emissions incl. LULUCF of between 398–614 $MtCO_2e$ over 2025–2030 (20–82% above 1990 levels excl. LULUCF).
Conditions	The finalisation of an ambitious, fair, effective and binding multilateral agreement under the UNFCCC at COP21.
Coverage	Economy-wide, all sectors (including AFOLU), six GHGs
Long term goal	
Long-term goal	Stable emissions over 2025–2035, followed by a decline in emissions to between 212–428 $MtCO_2e$ incl. LULUCF by 2050 (-34% to 29% of 1990 levels, excl. LULUCF).

Long-term goal

South Africa aims to reduce GHG emissions to 212–428 $MtCO_2e$ by 2050 (incl. LULUCF). Excluding LULUCF, this long-term target is equivalent to 231–447 $MtCO_2e$.

Fair share

Depending on whether the low or high level of emissions range for 2025–2030 is analysed, South Africa's NDC is categorised as "Highly insufficient" or "2°C compatible." We rate it "Highly insufficient" based on the upper end of the NDC range, because South Africa would reach its NDC target if its emissions in 2030 were below this limit.

The "Highly insufficient" rating indicates that South Africa's climate commitment in 2030 is not consistent with holding warming to below 2°C, let alone limiting it to 1.5°C as required under the Paris Agreement, and is instead consistent with warming between 3°C and 4°C: if all countries were to follow South Africa's approach, warming could reach over 3°C and up to 4°C. This means South Africa's climate commitment is not in line with any interpretation of a "fair" approach to the former 2°C goal, let alone the Paris Agreement's 1.5°C limit.

If the CAT were to rate South Africa's projected emissions levels in 2030 under current policies, South Africa would also be rated "Highly insufficient."

For further information about the risks and impacts associated with the temperature levels of each of the categories click here.

Current policy projections

Current policy-based projections are estimated to reach at an emissions level of 606 $MtCO_2e$ in 2020 excl. LULUCF. This is equivalent to a 75% increase in emissions from 1990 levels excl. LULUCF. For 2030, the current policy analysis suggests a further increase in emissions to 670 $MtCO_2e$, excluding LULUCF, representing a 93% increase in emissions compared to 1990 levels excl. LULUCF.

South Africa's emissions have steadily increased historically. South Africa's economy relies heavily on mining and heavy industry. Energy consumption in the industrial and buildings sectors relies largely on electricity as an energy source, which is produced with high carbon intensity using domestic coal: 93% of South Africa's electricity is generated from coal (IEA, 2016b). Large amounts of coal are also liquefied: over 30% of South African gasoline and diesel needs are covered by liquefied coal (World Coal Association, 2015). Additional emissions come from industrial-process emissions, especially steel and cement production.

The National Development Plan (NDP) of the Republic of South Africa provides a 2030 vision on sustainable development, eliminating poverty and reducing inequalities. The National Climate Change Response Policy (NCCRP) of 2011 further elaborates this 2030 vision. Various sectoral plans exist, of which the Integrated Resource Plan (IRP) for electricity is South Africa's main policy affecting greenhouse gas emissions (see 'Energy supply' section below).

South Africa is planning on introducing a carbon tax covering fossil fuel combustion emissions, industrial processes and product use emissions, and fugitive emissions (e.g. fugitive emissions from coal mining). Under current planning, the waste and land use sectors will be exempted from taxation. While the full carbon tax rate is proposed to be R120/tCO_2e (US\$8/tCO_2e), after exemptions, the effective tax rate will be between R6–48/tCO_2e (US\$0.4–3/tCO_2e) (World Bank, 2016). The implementation of the carbon tax has faced several setbacks and opposition from industry (Trollip & Boulle, 2017). Originally, the 1st of January 2015 was set to be the start date, but since then, it has suffered repeated delays (The Carbon Report, 2015). The latest draft bill indicated a start date of 1 January 2017, but implementation has been yet further delayed due to the busy legislative programme of the parliament. The 2017 Budget Review states that a revised Carbon Tax Bill will be published for public consultation and tabled in parliament by mid-2017 (National Treasury Republic of South Afrcia, 2017). As of October 2017, the start date of the carbon tax remains unclear (World Bank Group and Ecofys, 2017).

Energy supply

One of South Africa's key policies to reduce emissions is through increased deployment of renewable energy. At the end of 2015, installed renewable capacity totalled 4.1 GW (IRENA, 2017). Introduced in 2010, the Integrated Resource Electricity Plan (IRP) 2010–2030 is the government's capacity expansion plan for the electricity sector until 2050 (Department of Energy, 2011), which contains targets for all technologies, including renewable energy technologies.

The IRP sets an overall emissions constraint of 275 $MtCO_2/a$ for electricity generation after 2024, meaning that the total emissions from electricity generation should not be higher than this threshold, which has been relevant for supporting the inclusion of RE capacity targets. The IRP 2010–2030 aims to more than triple the installed renewable capacity to 17.8 GW by 2030. This figure is about a third of the electricity generation capacity from all sources (fossil fuel, nuclear and renewable) in 2015 (Department of Energy, 2011).

As part of regular updates and revisions laid down in the 2010 IRP, the Department of Energy proposed updates of the IRP in 2013 and 2016. The 2016 IRP update was released in October 2016 and was made available for public comment until the end of March 2017 (Department of Energy, 2016b). Updating key assumptions such as technology costs, macroeconomic assumptions and policy constraints, both updates propose downward adjustments of additional renewable generation capacity to be installed by 2030 as compared to the original 2010 IRP policy. As of 20 July 2017, none of the proposed IRP updates have been formally adopted. For this reason, the IRP 2010 remains the official government plan for new generation capacity in the CAT's current policy projections.

In 2012, the government replaced its feed-in-tariff scheme with the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). This was originally intended to fund the procurement of 3.7 GW of renewable capacity up to 2016 through a bidding process. At the end of 2012, the REIPPPP was extended to fund a further 3.2 GW of capacity (Department of Energy, 2013). As of August 2017, 6.4 GW of renewable projects have been procured under the REIPPPP (Independent Power Producers Office, 2017).

Despite the success of the REIPPPP in generating interest in renewable energy project development—with all bidding rounds significantly over-subscribed—there have been considerable delays in connecting the procured renewable projects to the grid. Eskom—South Africa's grid operator and its largest utility company, which also owns most of the country's coal-fired power plants—has stalled on signing power purchase agreements, which guarantee grid access for renewable energy projects (Groenewald, 2017).

Despite President Zuma expressing the government's commitment to the REIPPPP and stating that Eskom would sign the outstanding PPAs, Eskom has continued to further delay the process. (CleanTechnica, 2017). As of October 2017, Eskom had not yet signed such agreements with renewable energy projects procured under the fourth bidding window of the REIPPPP in 2015. This delay reduces the attractiveness of investments in renewable energy and may put the achievement of the renewable capacity target at risk.

Even if the growth in renewable energy proceeds as planned, it will not displace coal generation, as South Africa's coal generation capacity is likely to grow at a similar rate to renewable energy. At the beginning of 2017, 7.94 GW of coal plants were under construction, with a further 6.29 GW in the pipeline (permitted, in the pre-permit development phase or announced) (Global Coal Plant Tracker, 2017). Under the IRP's base case for 2030, coal generation will still account for 48% of capacity, while renewable generation will contribute to 21% (Republic of South Africa, 2013).

Finally, a post-2015 National Energy Efficiency Strategy (NEES) is under consideration to replace the first NEES adopted in 2005 (Department of Energy, 2016a). This strategy aims to build on the achievements of the first NEES, which saw higher than targeted improvements in energy intensity, by stimulating further energy efficiency improvements through a combination of financial incentives, legal and regulatory frameworks and enabling measures. It is expected to reduce economy-wide final energy consumption by 29% below 2015 levels by 2030.

Transport

Due to the lack of enforcement as of July 2017, the mandatory blending of biofuels has not been included in our current policy projections. The Biofuels Industrial Strategy mandates a biofuel blending of 2%-10% for bio-ethanol and minimum 5% for biodiesel from 2015 onwards, which falls under the Petroleum Products Act. Even though this policy on the mandatory blending of biofuels has been legally put into force, it has not been enforced as of July 2017, mainly due to concerns over the impact of large-scale biofuels production on food security and the biofuels financial support or subsidy mechanisms (Fundira & Henley, 2017). If the policy targets are met, this would lower emissions by up to 2.0 $MtCO_2e/a$ in 2020 and 2.6 Mt CO_2e/a in 2030.

Assumptions

Historical data

For historical data, GHG inventory data submitted to the UNFCCC accessed via the UNFCCC data portal was used for 1990 and 1994 (UNFCCC, 2017) and DEA's GHG Inventory for Republic of South Africa for 2000–2010 (Department of Environmental Affairs South Africa, 2014) with linear interpolation between 1990–1994 and 1994–2000.

Pledge

In its 2020 emission reduction pledge, South Africa aims for a 34% reduction below BAU by 2020 and 42% below BAU by 2025 including LULUCF (Department of Environmental Affairs Republic of South Africa, 2011). The emission levels included under both the upper and lower bound of the targeted reductions are provided by the explanatory note.

These targets are read directly off the peak, plateau and decline (PPD) emission trajectory graph (Department of Environmental Affairs Republic of South Africa, 2011). LULUCF sector emissions are assumed to be included in the targets because the 1997 data point in the graph matches the historical emissions including LULUCF. To obtain the emissions level excluding LULUCF, it was assumed that the LULUCF sector continues to represent a small net carbon sink with the emission level in 2030 equivalent to the average emissions from this sector over 2000–2010 (annual emissions of -24 $MtCO_2e$). The same approach was used for the quantification of the NDC target and long-term target below.

In its NDC, South Africa provides the peak, plateau and decline (PPD) emission trajectory range of 398 $MtCO_2e$ to 614 $MtCO_2e$ including LULUCF by 2025 and 2030 (Government of South Africa, 2016).

South Africa further specified a long-term target until 2050. After PPD emission targets are set to remain stable until 2035, the PPD emission targets decrease to 212–428 $MtCO_2e$ by 2050 (Department of Environmental Affairs Republic of South Africa, 2011).

Current policy projections

The current policies projections is based on a combination of the World Energy Outlook 2016 for CO_2 emissions from fuel combustion (IEA, 2016a), non-CO_2 emissions from US EPA (2012), and a linear continuation of historical trends for CO_2 process emissions. The WEO2016 Current Policies Scenario for CO_2 emissions from fuel combustion assumes a slightly different energy mix for the electricity supply sector and the transport sector compared to target levels of policies considered under implementation, which has been adjusted to fully reflect these policies. In general, neither the WEO2016 main report nor its annexes specify which of the policies have been included in the current policies scenario.

As for the energy supply sector, the renewable energy capacity assumed to be installed in the WEO2016 was adjusted to reflect the 2010 IRP policy. The biofuels mandate has been furthermore quantified for informative purposes, however, it has not been included in the current policy projections as it is still not enforced as of August 2017. For non-CO_2 emissions, US EPA (2012) projections until 2030 were used. For the non-energy CO_2 emissions, historical non-energy CO_2 emissions data from EDGAR (JRC/PBL 2012) was used for projections. A continuation of historical growth between 2000 and 2010 was assumed for future years.

Compared to last year's analysis, projections of emission levels under currently implemented policies in 2020 and 2030 are significantly lower, by 123 MtCO2e and 273 MtCO2e respectively. Last year's analysis was based on the 'with existing measures' (WEM) scenario developed for South Africa's Greenhouse Gas Mitigation Potential Analysis Report (Department of Environmental Affairs 2014b). The difference in absolute emissions levels mainly stems from different underlying assumptions between the external emissions scenarios used for the South Africa's country analyses. Most prominently, economic growth is 3.6% between 2015 and 2022 and 3.9% between 2023 and 2032 in the outdated Greenhouse Gas Mitigation Potential Analysis Report of the Department of Environmental Affairs, whereas it is 1.7% between 2014 and 2020 and 2.8% between 2020 and 2030 in the WEO2016. Even though these growth rates assumed in the WEO2016 might still seem be too optimistic in light of an economic recession in early 2017 (Rossouw, 2017), they better reflect current and future economic development and corresponding electricity consumption.

Sources

CleanTechnica. (2017). South Africa's renewable energy future at crossroads again.

Department of Energy. (2011). Integrated Resource Plan for Electricity 2010-2030.

Department of Energy. (2013). Bid Window 3 Preferred Bidders' announcement.

Department of Energy. (2016a). Draft Post-2015 National Energy Efficiency Strategy. Government Gazette.

Department of Energy. (2016b). Integrated Resource Plan Update.

Department of Environmental Affairs. (2014). South Africa's Greenhouse Gas (GHG) Mitigation Potential Analysis.

Department of Environmental Affairs Republic of South Africa. (2011). Explanatory note: Defining South Africa's Peak, Plateau and Decline Greenhouse Gas Emission Trajectory. SA Government Position on Climate Change.

Department of Environmental Affairs South Africa. (2014). GHG Inventory for South Africa.

Fundira, T., & Henley, G. (2017). Biofuels in Southern Africa: Political economy, trade, and policy environment (WIDER Working Paper)

Global Coal Plant Tracker. (2017). Coal Plants by Country (MW) - January 2017.

Government of South Africa. (2016). Nationally Determined Contribution (NDC).

Groenewald, Y. (2017). Dilly-dallying endangering SA's renewable programme.

IEA. (2016a). World Energy Outlook 2016. Paris, France: International Energy Agency.

IEA. (2016b). World Energy Statistics and Balances. 2016 Edition. Paris, France: International Energy Agency.

Independent Power Producers Office. (2017). Independent Power Producer Procurement Programme.

IRENA. (2016). Renewable Energy Capacity Statistics 2016.

National Treasury Republic of South Afrcia. (2017). Budget Review 2017 National Treasury Republic of South Africa.

Republic of South Africa. (2013). Integrated Resource Plan for Electricity (IRP) 2010 - 2030. Update Report 2013., (November), 2010–2030.

Rossouw, J. (2017). SA's in a recession. Here's what that means.

The Carbon Report. (2015). How will the draft carbon tax bill affect your business?

Trollip, H., & Boulle, M. (2017). Challenges associated with implementing climate change mitigation policy in South Africa. Cape Town, South Africa.

UNFCCC. (2017). UNFCCC GHG Emission Data Portal.

US EPA. (2012). Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990 - 2030.

World Bank. (2016). State and Trends of Carbon Pricing 2016. Washington D.C.; USA

World Bank Group and Ecofys. (2017). Carbon Pricing Watch 2017. Washington, DC; USA.

World Coal Association. (2015). Uses of coal.

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