

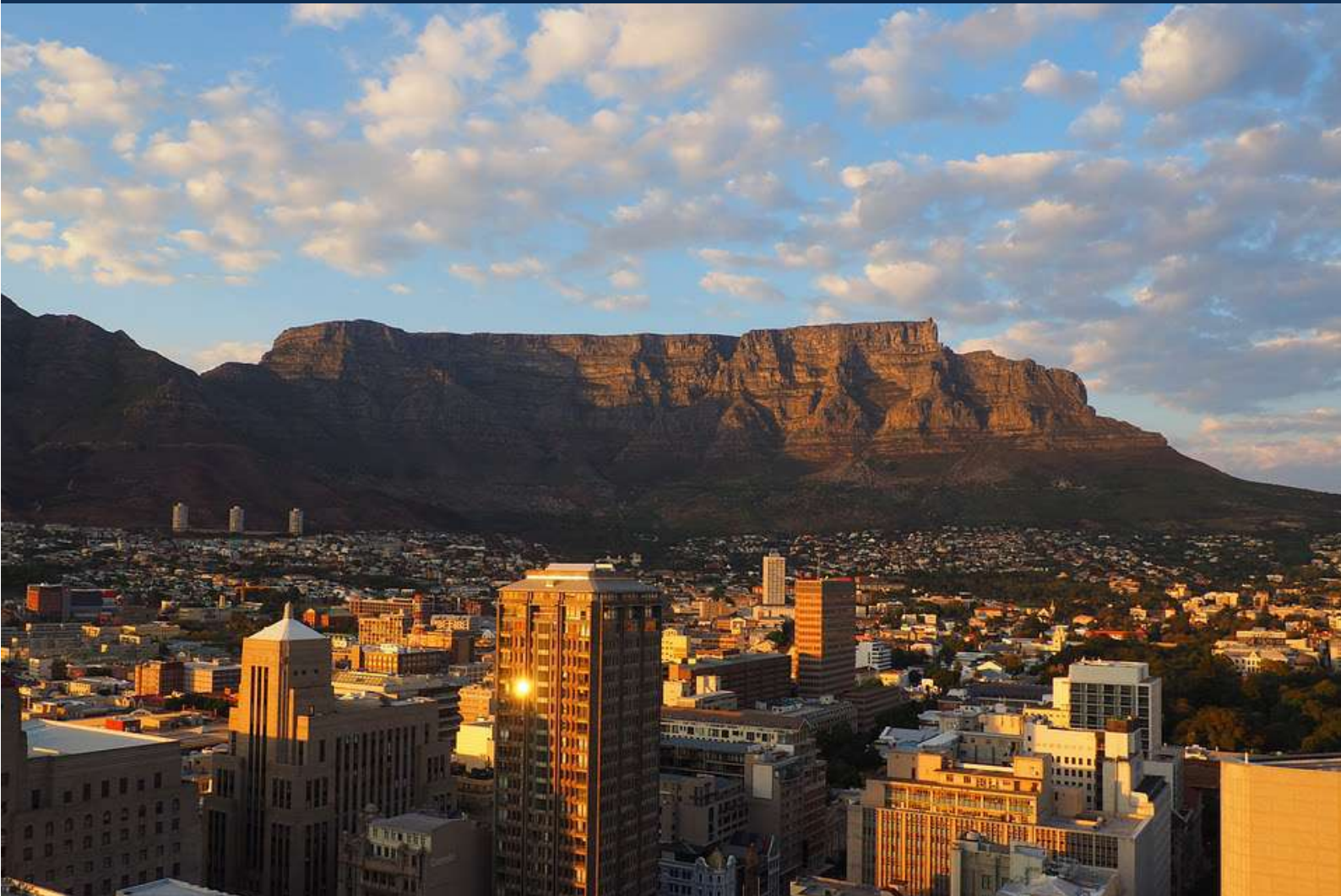


Urban
Pathways

South Africa

POLICY ENVIRONMENT PAPER

BERLIN, 2018



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SOUTH AFRICA

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ABSTRACT

This paper aims to identify policy measures in line with the UN's New Urban Agenda and in the context of the respective Nationally Determined Contributions of the Republic of South Africa (SA). This paper reviews current developments to mitigate and adapt to Greenhouse Gas (GHG) emissions and focuses on national policies and implementation strategies of the South African government in keeping with the Paris Agreement on Climate Change (2015). A brief overview of the City of Cape Town's strategies to accordingly mitigate and adapt is conducted by reviewing the sectors of transport, energy and resource sector.





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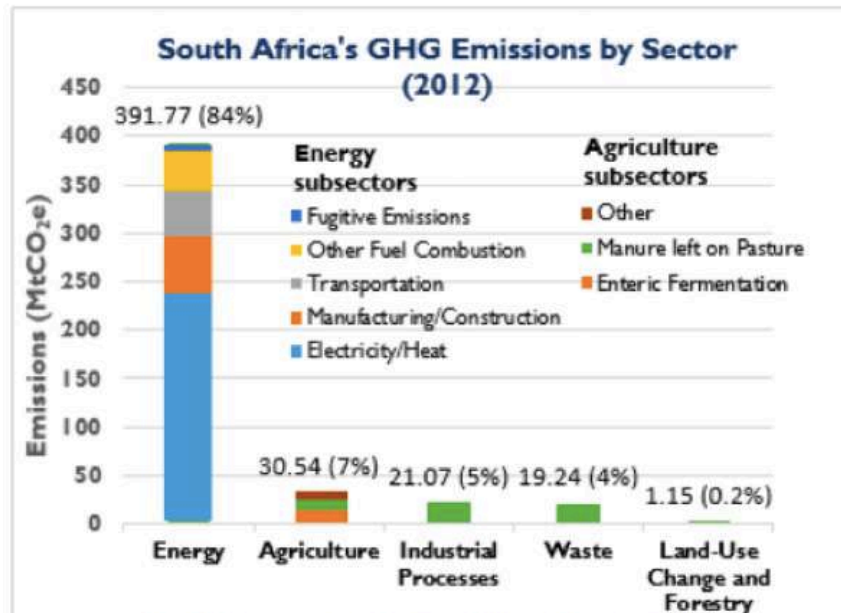
COUNTRY OVERVIEW

The Republic of South Africa is situated on the southernmost tip of the African continent and is Sub-Saharan Africa's second largest economy; an uppermiddle income economy – its GDP amounting to 294.8 billion USD in 2016 (The World Bank, 2018) and accounts for 24% of the African continent's GDP (Jain & Jain, 2017). South Africa (SA) is one of the world's largest producers of platinum, gold and chromium. Its main industries are mining, automobile assembly, textile, iron and steel, chemicals, fertilizers, ship repair, and food production and processing. SA is a water scarce country and is particularly vulnerable to the risks of increases in average temperatures, drought and rainfall associated with climate change. Historically, SA has been heavily dependent on fossil fuels for its energy production, as it has an extensive supply of coal deposits, and faces particularly high challenges to re-orientate its energy matrix towards a low carbon and renewable sources – the 2018 World Economic Forum index scored SA 113 out of 114 countries in terms of its Energy Transition (World Economic Forum, 2018). SA is one of Africa's most urbanised countries and hosts a population of 56.5 million people (Statistics South Af-

rica, 2018), over a surface area 1,221,037 Km² (2015) (United Nations Data, 2018) divided into 9 administrative provinces and is one of the few countries with three political capitals. Tshwane/ Pretoria is the executive capital, the Bloemfontein is the judicial capital, and Cape Town is the legislative capital. The cities of Johannesburg (situated within South Africa's wealthiest province, Gauteng province, hosts a population of 4.5 million people), City of Cape Town (South Africa's oldest city, in the Western Cape province, is home to 4 million people), and eThekweni, within Kwa-Zulu Natal province (accommodates 3.5 million people) are the 3 largest municipalities in South Africa (Statistics South Africa, 2018). South Africa has a high unemployment rate comprising of 27% of the population falling into the unemployed bracket (The World Bank, 2018), and is regarded as one of the most unequal societies in the world. A projected economic growth rate is expected to pick up moderately in 2018-19 on the assumption that business and political confidence increases and policy uncertainty fades (The World Bank, 2018). An estimate 64% of South Africans live in the country's urban centres, and an estimated 39 million of these city dwellers are under the age of 40.



SUMMARY OF SOUTH AFRICA'S NATIONALLY DETERMINED CONTRIBUTION (NDC)



Source: WRI CAIT 2.0, 2015; FAOSTAT, 2016 (USAID, 2017)

MITIGATION PLANS AND ACTIONS

Equitable access to sustainable development

South Africa's GHG emissions accounts for 1.1% of global emissions and is ranked in the worst 20 countries by total emissions of carbon dioxide (Woolard & Davis, 2015). Yet, South Africa maintains that its developmental priorities must be considered in parallel to its obligations to mitigate GHG. In its 2015 INDCs, SA argues that "poor countries and communities are least responsible for the problem of global climate change but are the most vulnerable to its impacts the structural inequity must be resolved in addressing climate change through responses at global, national and local levels with inter-linkages and associated support needs. South Africa's climate change response is that of a developmental state in the context of a sustainable development approach to address climate change" (SA Department of Environment, 2015).

South Africa further believes in the equitable access to sustainable development and those with a greater responsibility for cumulative emissions, which have driven up GHG concentrations, should as a matter of fairness, assist those less responsible (SA Department of Environment, 2015). Contradictory, SA is not classified a poor country but rather as a newly industrialised country (Wokutch & Singal, 2018) which has a sophisticated economic sector, strong institutions and favourable global conditions. The Climate Action Tracker (CAT) rates South Africa "inadequate", indicating that its commitment is not in line with the interpretation of a "fair" approach to reach a 2°C pathway – this analysis indicates that South Africa is not consistent with limiting warming to below 2°C and that if other countries were to follow in SA's ap-

proach, global warming would exceed 3-4°C. South Africa's GHG emissions comprises of 1.1% of global emissions, yet its GDP is only 0.6% of global GDP (Marquard, 2017) and its GHG emission per capita is 10.0t CO₂eq. South Africa's total GHG emissions rose from 390 million tons in 1994 to 433 million tons in 2000 and still further to 563 million tons in 2010. The large reliance on coal by the energy generation sector is a major cause of the carbon-intensive nature of the South African economy. The bulk of these emissions (greater than 80% CO₂eq in 2000) are generated by power generation, metallurgical processes and transportation (Woolard & Davis, 2015).

Mitigation

During the 2009 UN Climate Change Conference in Copenhagen SA committed itself to reduce domestic greenhouse gas (GHG) emissions by 34% in 2020 and 42% by 2025 below the business-as-usual (BAU) trajectory subject to the provision of adequate financial, technological and capacity-building support by developed countries (Woolard & Davis, 2015). According to SA's Peak Plateau and Decline (PPD) pledge, it will peak its national emissions between 2020 and 2025, plateau for approximately a decade, and decline in absolute terms thereafter. South Africa's NDCs target to limit GHG emissions including land use, land use change and forestry (LULUCF) to between 398 and 614 Mt CO₂eq over the period 2025–2030 is equivalent to a 20–82% increase on 1990 levels excluding LULUCF. South Africa's aspiration in the long-term is that total annual GHG emissions will be in the range of 212 to 428 MtCO₂e by 2050, having declined in

absolute terms from 2036 onwards. In response to its identification of mitigation targets South Africa developed a National Climate Change Response White paper (SA Department of Environmental Affairs, 2011). The Key elements of SA's overall approach to mitigation include (SA Department of Environmental Affairs, 2011):

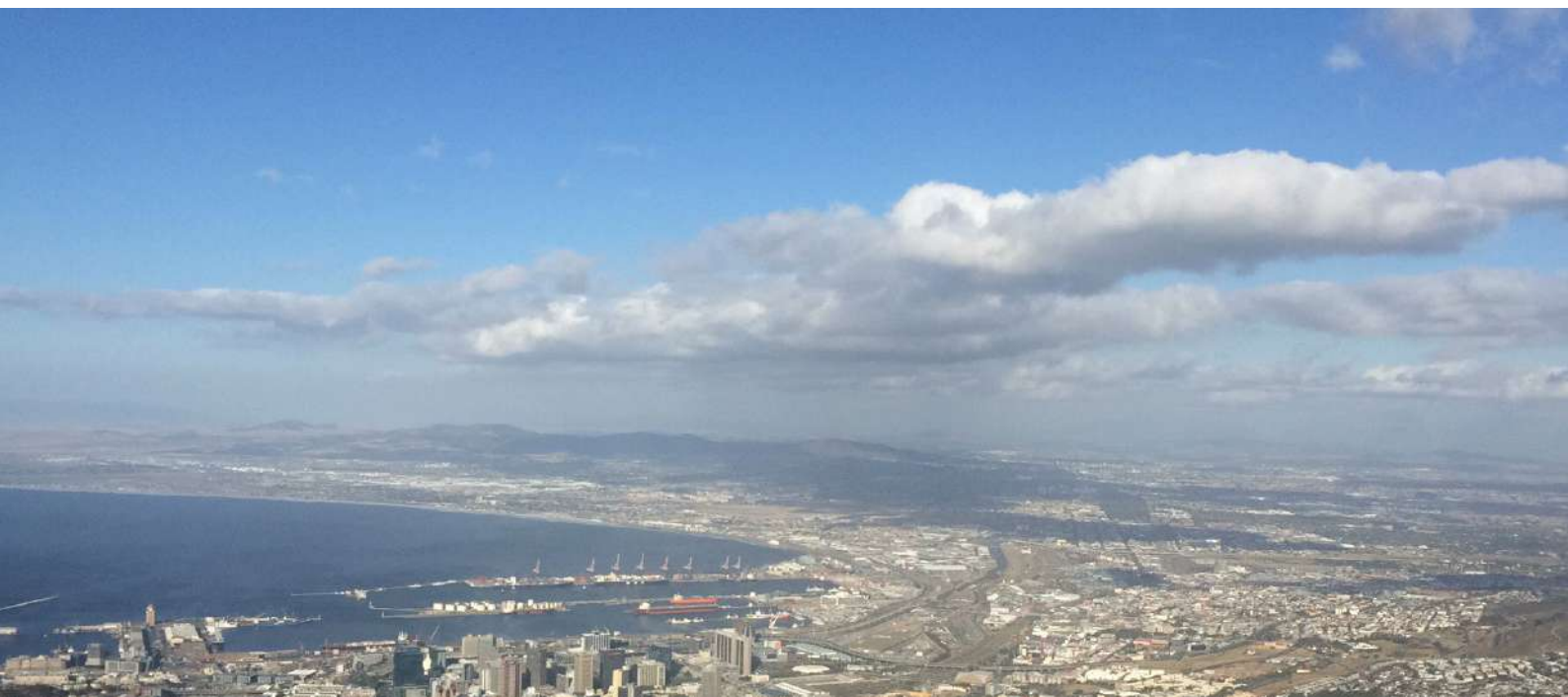
- setting the performance benchmark: using the National GHG emissions trajectory range against which the collective outcome of all mitigation actions will be measured.
- Identifying desired sectoral mitigation contribution: defining desired emission reduction outcomes for each sector and sub-sector of the economy.
- Defining Carbon Budgets for significant GHG emitting sectors and/or sub-set.
- Implementing a requirement that companies and economic sectors or sub-sectors for whom desired emission reduction outcomes have been established to prepare and submit mitigation plans that set out how they intend to achieve the desired emission reduction outcomes.
- Use different types of mitigation approaches, policies, measures and actions that optimise the mitigation outcomes as well as job creation and other sustainable development benefits.
- Using the market: using a range of economic instruments to support the system of desired emissions reduction outcomes, including the appropriate pricing of carbon and economic incentives.
- A national monitoring system of data collection to provide detailed and accurate emission data to support the analysis of the impact of mitigation measures.



Adaptation

SA has stated that its adaptation strategies will encompass ensuring a focus on risk and vulnerability reduction, in collaboration with neighbours and seek to share resources, technology, and learning to coordinate a regional response. SA plans to marry its developmental obligation to those of the GHG adaption responsibilities at as a developing country it is aware that effective adaption could contribute significantly to sustainable development goals, especially by the creation of green jobs. SA's adaption response includes developing adaption through 6 goals (SA Department of Environment, 2015), namely:

1. develop a national adaptation plan as part of implementing the NCRP by 2020,
2. take into account climate consideration, national development, sub-national and sectoral policy framework by 2020/2025,
3. Build the necessary institutional capacity for climate change response planning, by 2025/2030,
4. Develop an early warning system for key climate adaption sectors by 2025/2030, and reporting as part of a national adaption strategy with rolling 5-year implementation periods,
5. Development to a vulnerability assessment and adaption needs framework by 2020 to support a continuous presentation of adaption needs, and
6. Communicate past investments in adaption for international recognition.



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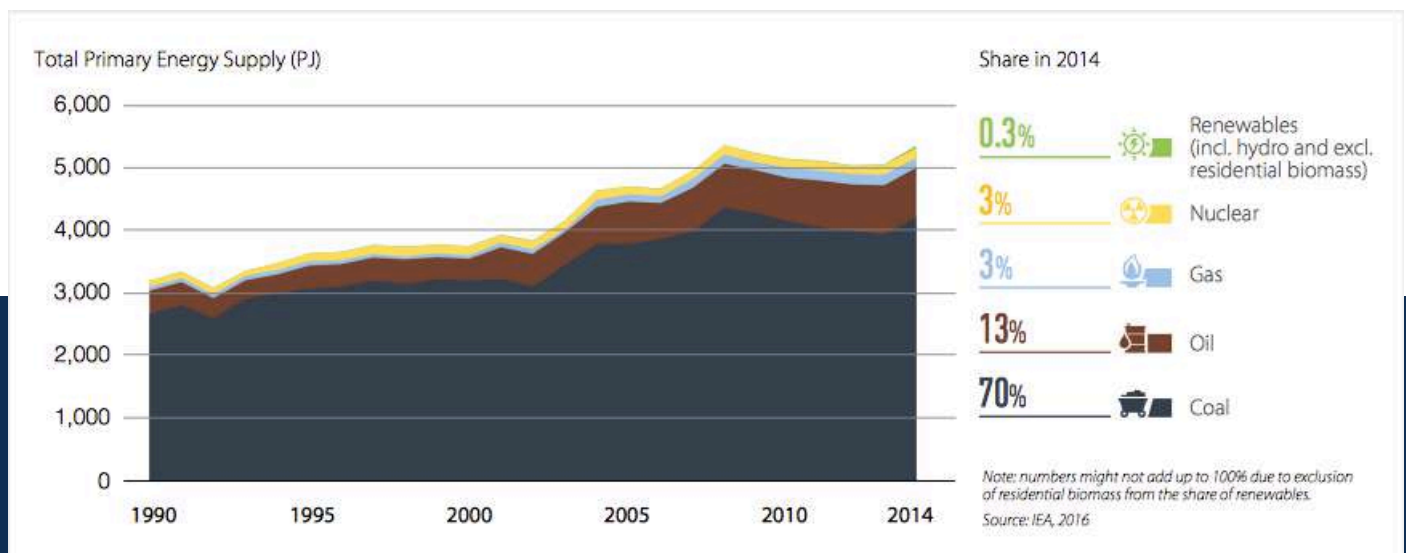
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ENERGY

Transformation of the energy sector

The energy sector is critical to the South African economy because it accounts for a total of 15% in the GDP. Total GHG emissions for the energy sector increased by 27% between 2000 and 2010, and produced a total accumulated GHG estimate of 4,204,640 GgCO₂eq over the 10-year period. The majority of emissions were from energy industries (63.6%), followed by 10.8% from transport and 9.8% from manufacturing industries and construction. The main source of emissions in this sector is CO₂ from fossil fuel combustion. The largest source of emissions for the period 2000 - 2010 was the main activity electricity producer, which accounted for 55.1% (2 316 071 GgCO₂eq) of the total accumulated emissions (Witi & Stevens, 2014). The largest source of energy sector emissions in South Africa is the combustion of fossil fuels. Emission products of the combustion process include CO₂, N₂O, CH₄ and H₂O. The total GHG emissions in the energy sector increased from 337,382 GgCO₂eq in 2000 to 428,368 GgCO₂eq in 2010.

South Africa has embarked on energy and electricity planning actions to begin to transform the energy sector – moving away from its heavy dependence on fossil fuel. Some political hurdles have been present up-until 2017, although a new administration has taken power since the beginning of 2018 – policy programmes are underdevelopment to begin to transform the energy sector moving towards renewable energy, increases in efficiency, and reduction in emissions intensity (SA Department of Environment, 2015). Moreover, SA has begun to rollout the Renewable Energy Independent Power Producer Procurement Programme (REI4P), approving some Renewable Energy Independent Power Producer projects and further projects are in consideration (Khumalo, 2018). The current administration also intends to also create a South African Green Fund, which would include contributions from both domestic and international sources. SA has also been developing policy instruments, including a carbon tax, desired emission reduction outcomes (DEROs) for particular sectors, company-level carbon budgets, and regulatory standards and controls for specific GHG pollutants and emitters (USAID, 2017).



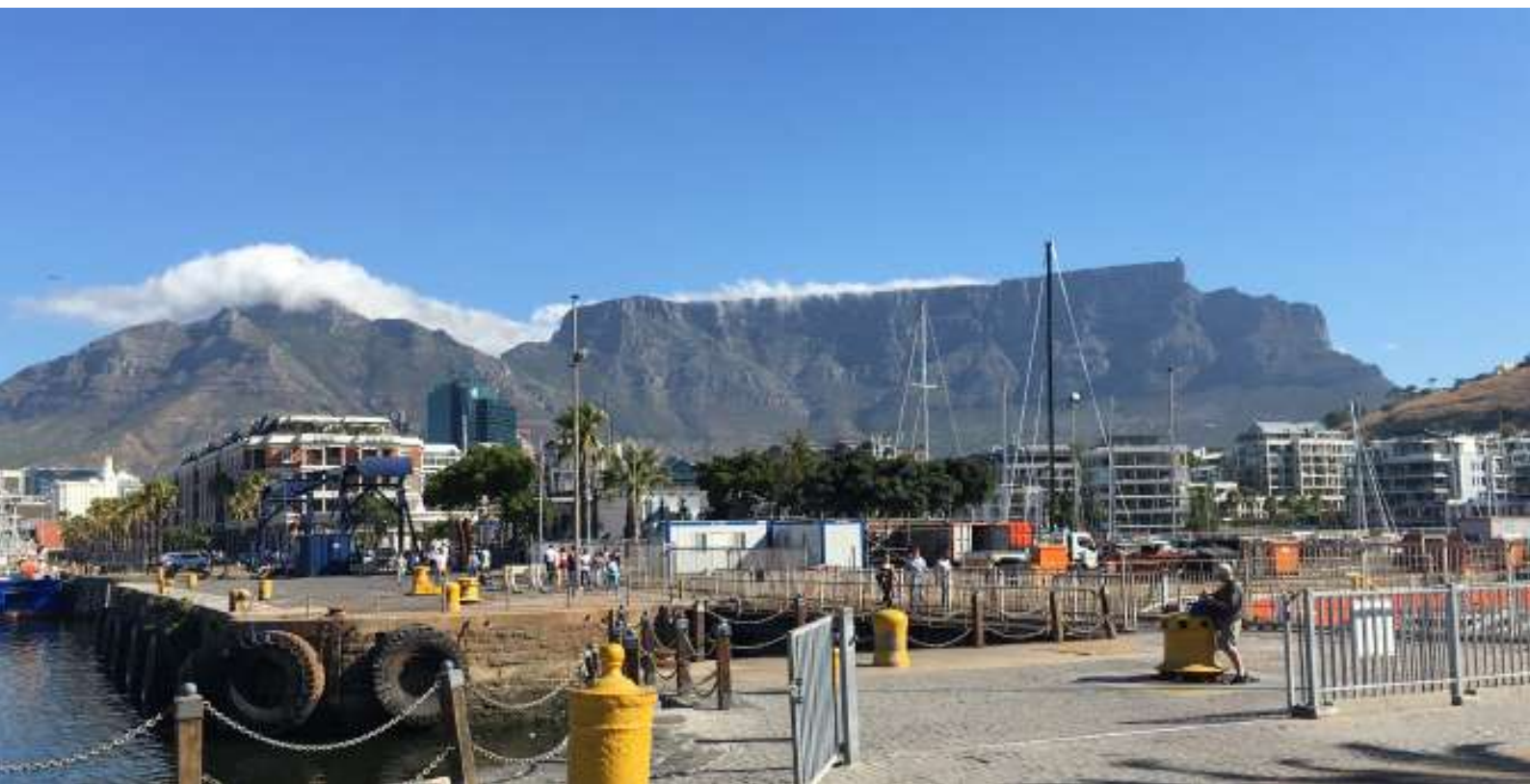
TRANSPORT SECTOR

South Africa's transport subsector is the second-highest contributor to GHG emissions – emitting 61 Mt CO₂ in 2013 (Posada, 2018), accounting for 13% of total emissions and for 453 924 Gg CO₂eq over the period 2000 - 2010. In 2010, road transport was responsible for 91.2% of transport related GHG emissions (SA Department of Transport, 2017), 7.7% was from domestic civil aviation and 1.07% from railways. Emissions in road transport increased because of motor vehicle sales that increased from 4.2% in 2000 to 15.7% in 2010 (Stats SA, 2011) – motor vehicles are closely associated with higher social status in South Africa.

Without mitigation efforts the transport sector is projected to emit a total of 136 Gg CO₂eq by year 2050 (SA Department of Transport, 2017). Motor gas contributed 64.9% towards the road transport fuel consumption in 2010, followed by gas/diesel oil (35%). Between the years 2000 and 2010 there was an increase in the percentage contribution of gas/diesel oil to the road transport consumption (8.2%), and a corresponding decline in the contribution from motor gasoline (SA Department of Transport, 2017). South Africa's railway sector uses electricity as its

main source of energy, with diesel being the only other energy source. GHG emissions from transport subsector activities have increased by 32.2% from 36 016 GgCO₂eq in the year 2000 to 47 607 GgCO₂eq in 2010 (SA Department of Transport, 2017).

In 2012, SA government invested ZAR 5 billion in public transport infrastructure and the in its INDCs indicated, “investment in public transport infrastructure would continue growing at 5% per year” (SA Department of Environment, 2015). SA's white paper on Climate Change Response indicates that more promotion would be invested by the government towards transport-related interventions including transport modal shifts (road to rail, private to public) and switches to alternative vehicles – electric and hybrid vehicles – and lower-carbon fuels. SA has also identified a Transport Flagship Programme. The Transport Flagship Programme, facilitated by the Department of Transport will development of an enhanced public transport programme to promote lower-carbon mobility in five metropolitan areas and in ten smaller cities and create an Efficient Vehicles Programme with interventions that aim towards measurable improvements in the average efficiency of the South African vehicle fleet by 2020.



WASTE MANAGEMENT

SA's INDCs indicates that uncertainties exist in the reporting of emission in agriculture, forestry, and other land use (AFOLU). South Africa is also a water scarce country burdened with a national infrastructure that was not developed to support its total populations (due to the legacy of apartheid and its history of inequality). In addition, investment in waste-water treatment works has not remained in-line with the growth in demand and use. SA has committed to developing a Waste management Flagship programme that will review and implement GHG mitigation potential of the waste management sector by investing in waste-to-energy, within the solid, semi-solid, and liquid-waste management sectors, especially the generation, capture, conversion and/or use of methane emissions.

Reporting on the waste sector reviewed GHG emissions amounting to 19 806 Gg CO₂eq in 2010. The total accumulated GHG emissions from Solid Waste disposal between 2000 and 2010 was estimated at 133 579 Gg CO₂eq, increasing from 9 019 Gg CO₂eq in

2000 to 15 535 Gg CO₂eq in 2010. This equals an increase in contribution from 2.8% in 2000 to 3.7% in 2010. The quantities of solid waste resulting into managed land fills are likely to increase by more than 5% annually in SA (Witi & Stevens, 2014).

SA has enacted the Waste Act and National Waste Management Strategy which places a great emphasis on waste minimisation, re-use, recycling and recovery of waste. Yet, 90% of waste still ends up in local landfills since remains and perception continues that it is a more expedient option. At the local municipal level challenges exist including skills development; lack of resources, i.e. capacity, funding, technologies; inadequate integrated waste management planning, waste data and better infrastructure development using advancements in technology (van Jaarsveldt, 2016). In addition, general societal awareness amongst the general public, consumers, and business owners, is lacking regarding the benefits of waste management and recycling.

NATIONAL POLICIES

South Africa's democratic Constitution (Act 108 of 1996) protects and promotes of all basic human rights, with specific attention to the protection of the environment guaranteed. Section 24 of the constitution enshrines the ethos that all people living in South Africa have "a right to an environment that isn't harmful to their health or well-being, and to have the environment protected for benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development".

The South African national Department of Environmental Affairs (DEA) is the lead authority in all mat

ters pertaining to the environment and in advancing the mandate of the democratic Constitution regarding environmental issues. In October 2017, the DEA published SA's second draft of its National Climate Change adaptation strategy for public comment (SA Department of Environmental Affairs, 2017). Moreover,

SA has aligned its National Development strategies to include the aims and objectives of the Sustainable Development Goals – making advanced progress in the policy process and development yet lacking strategic implementation strategies. SA plays an active role internationally in the development of core multi-lateral policies to enhance climate change mitigation although this activism has not translated adequately within its national context.

NATIONAL POLICIES: TRANSPORT SECTOR

The national Department of Transport has drafted its Green Transport Strategy 2017-2050, which includes a Transport Flagship Programme in response to the call from the National Climate Change Response Policy document. This programme aims to facilitate the development of an enhanced public transport programme to promote low-carbon mobility in the five major metropolitan areas and in ten smaller cities throughout SA – bringing to fruition an efficient vehicles programme by 2020. In 2017, the national Department of Trade and Industry drafted a strategy for policy direction promoting green transport technologies in South Africa – this policy also acknowledges SA's heavy dependence on cars and fossil fuels, and the lack of coherent policy to coordinate efforts in this sector (Climate Transparency, 2017).

Issues within SA's transportation sector

The cost of importing cars and fuel to SA amounts to more than ZAR 200 billion per year (Climate Transparency, 2017). This is a rather startling fact since the automobile assembly industry is one of the largest manufacturing sectors in SA (Report Linker, 2017). While this is a problem, the social psychological association of car ownership usurps the user's cost-be-

nefit analysis. As of April 2017 SA had only 40 electric charging stations, although its NDC states that the country will have more than 2.9 million electric cars on the roads by 2050 (currently only 300 electric cars are in the country) with a ZAR 6.5 trillion investment expected to be spent in the electric energy industry over the next four decades. The additional problem for SA if it makes the radical swop over to electric vehicle in the immediate future is that its energy matrix remains heavily dependent on fossil fuel energy and not clean energy, and that a lack of sufficient electric infrastructure remains a significant hurdle to the adoption of electric cars.

The current fuel tax regime in SA only applies to petrol, diesel, and biodiesel based on volume per litre – electric vehicles are not classified as a fuel stock and hence do not contribute to the general taxes imposed on traditional fuel. Petrol, diesel and biodiesel are classified as fuel levy goods and zero-rated for value added tax purposes in SA. Most of the existing environmentally related taxes in SA were introduced with the intention of raising revenue thus a huge potential exists to using the tax regime to shift behaviour and improve environmental outcomes in redesigning the tax regime in for this industry.



Energy

South Africa's energy mix remains heavily dependent on its coal reserves. In 2015, South Africa's executive Cabinet approved the following key elements in respect of the climate change mitigation system framework (Mitigation System); a carbon tax (currently out for public comment in early 2018), GHG inventory, national emissions trajectory, a carbon budget for each company, pollution prevention plans for companies with carbon budgets and a reporting system to gather information regarding the emissions of users (Gibson, 2018). SA has drafted its Renewable Energy Independent Power Producers Procurement Programme (PEIPPPP), and announced its partial imple-

mentation in March 2018. SA's implementation of a renewable energy policy is yet to be finalised, as its developmental objectives are heavily associated with its high reserves of coal deposits and political instability has had a delaying effect on its rollout of a renewable energy policy process. SA intends on implementing decarbonised electricity – renewable energy and nuclear power sector – by 2050 with an estimated cost of USD 349 billion. The mining sector in SA is also a large labour market and there is heavy resistance to transition towards clean energy/renewable energy from this sector – since SA is the world's 3rd largest exporter of coal (du Plessis, 2018).

THE CITY OF CAPE TOWN

The City of Cape Town has a high carbon footprint compared to other similar cities due to its poor energy security matrix, is rapidly urbanising, with urban sprawl and increase vulnerability to the impacts of climate change. In 2001, the City of Cape Town adopted an integrated Metropolitan Environmental Policy identifying a need to shift from business-as-usual to a targeted sustainable agenda. The city has recognised that its legacy issues of spatial planning and transport does not adhere to its international obligation and the SDGs.

Energy

The City of Cape Town has begun to implement energy efficiency initiatives that aims to reduce its GHG

emissions and contribute to positive climate change mitigation efforts. These include energy efficiency mechanisms for building and facilities, replacing street lighting and traffic lights, smart meters installation, efficiency strategy for similar projects in solid waste, transport and water, engagement with the private sector; rollout of solar water heating and heat pumps through accredited installers and low income energy services (Naidoo, 2017).

Transport

The City of Cape Town is the most congested city in South Africa with 80% of the peak traffic currently

being made up of private car users. The City of Cape Town has begun to focus on spatial transformation that is Transit-Oriented Development – a transit-led development agenda at all levels of the built environment. The City of Cape Town has institutionalised a Transport and Urban Development (TDA) authority which is to be responsible for all transport and urban development issues. In 2018, ten electric busses were integrated into the public bus fleet, a call for tender for a bike sharing system was sent out, a policy change to begin a ticketing system for all public transportation systems into one single ticket system is also under way. The City of Cape Town's e-mobility strategy also includes the development of an EV framework, developing the existing infrastructure further and improving bicycle lands usage and awareness campaigns.

Resources

In its waste-to-energy programme the City has begun to treat sludge waste in bio-digesters, planned installations of CHP plants, key water sites are being assessed to analysis better usage and technological update and solar PV installation feasibility studies have been conducted. A landfill gas infrastructure for flaring was set up in 2017 in the Coast Park, Bellville, Visserhok, and Helderberg facilities. The Rehabilitation of the Atlantis, Vissershok, Waterleaf and Witsand landfill sites are in process and an additional design and development of an integrated management facility in Helderberg is planned (Naidoo, 2017). Severe droughts have affected the City of Cape Town during 2017 signalling a desperate need for policymakers to speedily adjust to the climate change reality.



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