



# South Africa's Energy Fiscal Policies:

An inventory of subsidies,  
taxes, and policies impacting  
the energy transition

**GSI REPORT**



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## South Africa's Energy Fiscal Policies: An inventory of subsidies, taxes, and policies impacting the energy transition

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## Executive Summary

Energy fiscal policies (of which fossil fuel subsidies are a subset) in South Africa have historically been framed around distributive aims, particularly in the post-Apartheid state. Broadly speaking, and depending on the type of energy fiscal policy, these policies can be linked to promoting domestic energy production and increasing energy security and access to affordable energy. Subsequently, this may drive economic development, which in turn positively impacts sectors such as education and health.

This report aims to assist the South African government by identifying whether or not its energy fiscal policies are aligned with its stated objectives for the energy sector. Fiscal policies denote broad government spending, including subsidies, taxes, and grants. As such, the report is a tool to support government and foster informed discussion among national stakeholders.

Understanding energy subsidies is important for several reasons. First, subsidies are one of the key economic policy levers that governments can use to influence energy production and consumption. If subsidies are in place that act against stated policy objectives for political or legacy reasons, transparency and debate can hold governments to account to align subsidies with stated government policy. Second, subsidies come at a high cost to the public budget and are often linked to health and environmental public objectives, so it is essential that the impacts of subsidy policy are monitored and debated. Third, fossil fuel subsidies increase the consumption of fossil fuels, worsening local air pollution and greenhouse gas (GHG) emissions. Monitoring and reporting of fossil fuel subsidies are included in the Sustainable Development Goals indicators, and International Institute for Sustainable Development modelling has shown that fossil subsidy reform could reduce South Africa's carbon emissions by nearly 3% by 2030 (Kuehl et al., 2021; United Nations, 2021).

The extent to which fossil fuel subsidies still exist in South Africa is, however, disputed. The South African government, under its G20 commitments, had claimed that it has no inefficient fossil fuel subsidies that encourage wasteful consumption (Schmidt, 2010). Reports state that its stance has not changed since then (Asmelash, 2017). This report aims to shine a light on the current status of energy subsidies and present a basis for debate about their role in the energy sector.

A few key sector-specific subsidy trends include the following:

- Our subsidy inventory found ZAR 172 billion (USD 10.4 billion) of energy subsidies in total in FY 2020/21.<sup>1</sup>
- Government bailouts—including the ZAR 56 billion (USD 3 billion) bailout for South Africa's state-owned utility Eskom in FY 2020/21—have placed a strain on the government budget. In this context, bailouts were provided to Eskom due to the utility's increasing debt sheet. Bailouts to other state-backed and energy intensive enterprises included South African Airways and South African Express, worth ZAR 5.5 billion (USD 333 million) and ZAR 300 million (USD 18 million), respectively.

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<sup>1</sup> Largely fossil fuels and related energy.



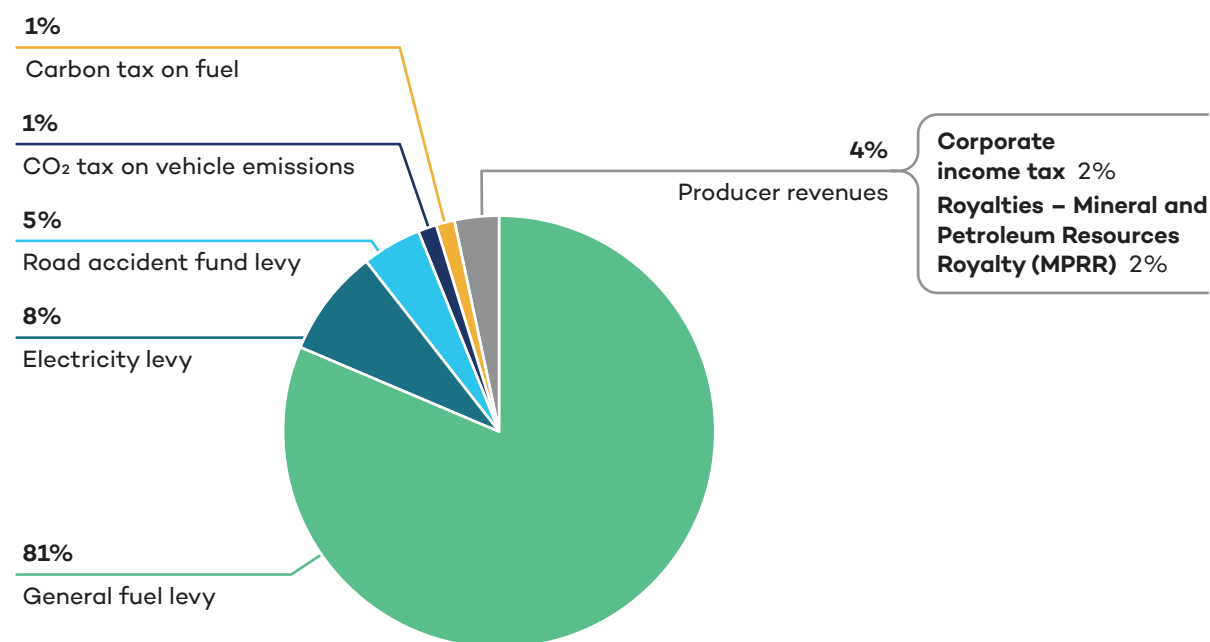
- Oil and gas: There remain subsidies for the consumption of fossil fuels. The highest-value oil and gas subsidy that has been quantified in this report was on value-added tax (VAT) exemptions provided for the sale of gasoline, diesel, and illuminating paraffin. This subsidy has increased from ZAR 23.89 billion (USD 1.79 billion) in FY 2017/18 to ZAR 34.67 billion (USD 2.4 billion) in FY 2019/20.
- The Free Basic Electricity access program and the national electrification program, which have increased by 10% and 3.3%, respectively, from FY 2018/19, are the two most significant electricity subsidies, costing ZAR 11.65 billion (USD 707 million) and ZAR 4.57 billion (USD 280 million) in FY 2020/21.
- Nuclear energy: Support for the nuclear industry continues. Significant questions remain over the future role of nuclear power. South Africa's existing nuclear reactor, which is owned and operated by Eskom, provides 5% of South Africa's electricity generation (International Energy Agency [IEA], 2020). In its 2021 expenditure estimates, the Department of Energy estimated that 11.9% (ZAR 3.4 billion, or USD 0.2 billion) of its budget over the medium term would go toward funding entities such as the South African Nuclear Energy Corporation under the Nuclear Energy Regulation and Management program (National Treasury Department, South Africa, 2021).
- Renewables: Renewable energy subsidies are difficult to estimate, but subsidies will fall as technology costs decline. Our estimates for renewable energy only quantify a government subsidy for a solar water heating project for which support was provided in FY 2018. However, the cost of power purchase agreements for renewable energy projects will have created subsidies to renewable energy generation.

Fossil fuels are an important source of government revenue. South Africa imposes taxes on fossil fuel consumption, production, and incomes, as well as charges for some externalities and fuel-related costs (such as transport). In 2019–2020, total revenue from fossil fuels was ZAR 100.5 billion (USD 6.95 billion), constituting 2% of GDP and 7.4% of general revenue. Among large emerging economies, South Africa's revenue from fossil fuels as a proportion of total revenue is similar to Brazil's, higher than China's, and lower than India's and Russia's (based on 2017 data).

The South African government is aware of the merits of environmental taxation. In 2006, the government developed a framework for market-based instruments for implementing Environmental Fiscal Reform (EFR) (National Treasury, 2006). Environmental taxes are in place for carbon and nitrogen oxide emissions (albeit with many exemptions), air travel, passenger vehicle purchases based on emissions, electricity generated from coal, and incandescent light bulbs (National Treasury & SARS, 2020). However, current environmental taxation does not match the social costs associated with the combustion of fossil fuels. Societal costs associated with air pollution and GHG emissions from fossil fuels in South Africa are estimated to be a minimum of ZAR 550 billion (USD 33 billion) per year.



**Figure ES1.** Key fossil fuel revenue sources, consumer (left) and producer (right) 2019–2020



Source: Authors' diagram using data from National Treasury & South African Revenue Service (SARS), 2020.

Comparing fossil fuel subsidies, tax and non-tax revenues (from Sections 4 and 5), and externalities (Section 7.1) reveals that social costs are five times higher than revenues, with an annual net cost to society of ZAR 550 billion (USD 33 billion). The social costs estimated were climate change and air pollution related deaths and lost working days from fossil fuel combustion. While there is uncertainty about these estimates, the overall finding that social costs far exceed revenues is likely to be correct or even understated. Externalities would be higher if the scope of externalities had been more comprehensive, such as to include more external costs (e.g., medical expenses, partial lost working days, or productivity) or more of the fossil fuel supply chain (e.g., extraction and transport of fuels).

In order to achieve its clean energy transition goals, South Africa has implemented some support policies and subsidies for renewable energy. The growth in renewables (mostly wind and solar) in South Africa is mostly due to a series of independent power producer (IPP) procurement rounds launched in 2011 under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

The key findings and recommendations from this work are summarized below:

*Finding 1: Fossil fuel subsidies are too high.*

Recommendations:

- **Reforming/reducing bailouts provided to Eskom.** Bailouts distort the price of electricity generated from coal, failing to account for its true cost (externalities) and



similarly making the price of electricity generated from coal seem cheaper than it actually is.

- **Ending the exemptions to the carbon tax.** Such a tax should be applied across the economy and at a level that is proportional to the external cost of the emissions.
- **Transparency on energy fiscal policies is important to understand the signals that government is sending, ensure effective reporting, and increase accountability.** Improved transparency on subsidy and tax data allows ministries to accurately monitor, evaluate, and revise fiscal policies to better meet policy objectives. Transparency on data and reporting is also a key enabler in equipping civil society and government watchdogs to monitor decision making and hold ministries accountable.

### *Finding 2: Social costs of fossil fuels exceed subsidies and revenues.*

Recommendations:

- **There is a need for a review of current energy fiscal policies.** Government should review energy fiscal policies and align them with the requisite action needed to align with the country's Paris Agreement commitments. It is crucial that the prices of fossil fuels reflect social and environmental costs.
- **The revenue generated by the efficient pricing of fossil fuels could be used as targeted support for vulnerable households.** Efficiently targeting subsidies and taxes to fossil fuels creates an additional revenue source that can be used to support lower- and middle-income households facing higher energy prices.
- **Increasing fossil fuel taxes is an important stage in the energy transition.** Revenue generated from fossil fuel subsidies and taxation can be invested into the energy transition in ways that stimulate jobs and economic growth while funding a just transition for fossil fuel sector workers and communities.

### *Finding 3: Renewables can deliver cheap electricity under the right policy settings.*

Recommendations:

- **A key factor in the current power shortages is stalled investment in renewable energy.** Maintaining a predictable and effective renewable energy procurement process based on the IPP model will help the industry grow. The REIPPPP process alone is not sufficient to transform the electricity system. Any coherent plan for reform must also include a transformation of Eskom. Only through the combination of public and private investment in renewable energy can the electricity sector be transformed.
- **Explore alternative business models for utility-scale renewable energy.**
- **Maintain policy certainty through regular Integrated Resource Plan (IRP) and Integrated Energy Plan (IEP) updates.** The government departments should focus on ensuring that the IRP and IEP are kept up to date with emerging technology and reflect the external costs of technologies to meet environmental and economic goals and spur the growth of South Africa's clean energy transition.



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# 1.0 Introduction

The Government of South Africa has intervened in the energy market to achieve a range of objectives: to ensure affordable access to energy, encourage decarbonization of the energy system, improve energy security, and boost economic development (Republic of South Africa, 2021). Intervention usually involves a combination of regulation and fiscal policies, such as government spending, subsidies, and revenue collection.<sup>2</sup>

Energy fiscal policies shape a country's energy landscape and influence its future development. However, objectives can conflict. For example, improving energy security through subsidies for domestic coal production will undermine efforts to reduce carbon emissions.

This report explores the extent to which South Africa's current energy fiscal policies are aligned with goals relating to the development of a robust domestic energy system that can provide low-carbon energy to all at a fair cost. The report is intended to support government and foster informed discussion among national stakeholders by

- Identifying current energy fiscal policies, specifically subsidies and revenue.
- Assessing the social cost of fossil fuels compared with subsidies and revenue and analyzing whether these policies are aligned with stated government objectives for the energy sector.
- Providing an overview of renewable energy policies and whether they are sufficient to achieve the Government of South Africa's targets for renewable capacity and net-zero carbon emissions by 2050.
- Recommending reforms that would lead to a more coherent and effective approach to energy fiscal policies aligned with key energy policy objectives.

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<sup>2</sup> Fiscal policy, as defined by the International Monetary Fund (IMF), "is the use of government spending and taxation to influence the economy" and includes tools such as broad government spending, subsidies, taxes, and grants (Horton & El-Ganainy, 2020, p. 1).



## 2.0 Approach and Scope

This report presents a database of fiscal measures for energy in South Africa, discussion of associated externalities of the energy system, and a deep dive into renewable energy policies. The report is structured as follows:

- Section 3—Context on South Africa's energy sector
- Section 4—Energy subsidies
- Section 5—Tax mapping
- Section 6—The social cost of energy
- Section 7—Deep dive into renewable energy
- Section 8—Recommendations

### 2.1 Scope

The energy subsidy assessment encompassed all types of commercial modern energy: electricity; fossil fuels including coal, natural gas, and petroleum (crude oil and its products); nuclear energy; and large-scale hydroelectricity and renewable energy. Biomass, small-scale renewables (including rooftop solar photovoltaic [PV] and non-grid-connected renewable energy) and biofuels were not included. The section on renewable energy policies covers only large grid-scale solar PV and wind.

The revenue section includes electricity and fossil fuels. Analysis of the social cost of energy was limited to the combustion of fossil fuels. Assessment of the full life cycle of energy extraction, production, and retirement for all energy types was beyond the scope of this report.

The fiscal measures were categorized according to the energy type that receives benefits: a) coal; b) oil and gas; c) renewable energy and hydropower; and d) nuclear. In addition, we single out the several other categories that are not energy specific but that predominantly benefit one type of energy. This includes a) electricity transmission and distribution, which mostly benefit coal because of its dominance in South Africa's electricity mix; and b) bailout packages for airlines and the state-owned electricity utility, Eskom, which mainly provide benefits, respectively, to the oil and gas sector and the coal sector. All categories include the full value chain of production and consumption: for example, oil and gas includes upstream subsidies for refineries and downstream subsidies for retail consumers. The subsidy database attempts to capture all subsidies and taxes provided by the national government to these sectors, and it covers three financial years: FY 2018, FY 2019, and FY 2020.<sup>3</sup> The revenue database covers revenue for FY 2019/20. Social costs are estimated based on 2019–2020 data, where available, but where this was not possible, data has been sourced from the most recent year available.

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<sup>3</sup> FY 2020 refers to the year beginning in April 2019 and ending in March 2020, and likewise for other fiscal years.



## 2.2 Definition of Subsidy and Revenues

Our definition of subsidies is based on Article 1 of the Agreement on Subsidies and Countervailing Measures of the World Trade Organization (WTO) (1994). This agreement defines the following four types of subsidies:

1. Direct and indirect transfers of funds and liabilities (budget outlays)
2. Government revenue foregone (reduced tax rates and tax exemptions)
3. Provision of goods or services below market value (such as land or water)
4. Income and price support through market regulations (including non-enforcement).

The United Nations Sustainable Development Goals (SDGs) also use the Agreement on Subsidies and Countervailing Measure of the WTO as the basis of its definition of subsidies under SDG 12.c.1, which includes a commitment to “rationalize inefficient fossil fuel subsidies that encourage wasteful consumption” (Wooders et al., 2019, p. 2). The SDG methodology unites the approaches adopted by the majority of intergovernmental organizations in defining fossil fuel subsidies and identifies the following sub-indicators (Wooders et al., 2019):

1. Direct transfer of government funds
2. Induced transfers (price support)
3. As an optional sub-indicator, tax expenditure, other revenue foregone, and underpricing of goods and services.

In this publication, the terms “subsidy” and “government support” are used as synonyms.

Our definition of revenues includes taxes and non-tax revenues. Taxes follow the South African National Treasury and Organisation for Economic Co-operation and Development (OECD) definition, which are unrequited payments to the general government budget, enforced through legislation (National Treasury, 2006; OECD, 2020a). “Unrequited” means that the benefits provided by the government to taxpayers are not normally in proportion to their tax payments (OECD, 2020a). Duties and statutory levies are compulsory payments and therefore also considered a tax.

Non-tax revenues are all other government revenues that are not classified as taxes, such as royalties and rents from fossil fuel extraction. Administrative fees and user charges are required (and therefore not taxes) and are included in this report where relevant to energy revenues. The database encompasses revenues from the consumption and production of fossil fuels, as well as income and profits derived from fossil fuel industries.

The definitions of subsidies, revenues, and social cost can and do overlap. For example, exemptions from energy taxation—such as carbon taxes—are government revenue foregone and therefore subsidies, but also clearly a feature of the tax system. In this report, the sections on subsidies provide a description of the subsidies identified with, where possible, estimates of their value. For more general descriptions of the broader system of energy and environmental taxation, refer to the sections on taxation. Some organizations, notably the International Monetary Fund (IMF), consider the failure to price the social costs of fossil fuels as a subsidy



(see Parry et al., 2021). In this report, we recommend that taxation should be increased to reflect social costs, but we do not classify the social costs as subsidies. This is consistent with the approach taken by the SDG 12.c.1 indicator reporting (Wooders et al., 2019).

## 2.3 Subsidy and Revenue Quantification and Sources of Information

The preferred method of the database was drawing information from official government sources, such as documentation pertaining to the process of budget drafting and execution.

### 2.3.1 Subsidies

Detailed information on each of the subsidies is provided in Appendix 1. The details include the name of the subsidy, its intended policy objective, end recipients, a brief description and quantification, as well as sources of information.

In cases where official sources lack reporting on energy subsidies and their values, different methods of subsidy quantification have been applied in accordance with internationally recognized approaches. Descriptions of quantification methods are provided in relevant parts of the appendices. All subsidies in the review are national government policies.

All reported values are nominal and calculated for the fiscal year. Values are in ZAR and converted to USD at annually average exchange rates as per the OECD-notified rates for each year.

### 2.3.2 Taxes

Taxes and non-tax measures were identified by systematically searching national government publications, including budget papers (National Treasury, 2021a), South African Revenue Service (SARS) tax statistics reports (National Treasury and SARS, 2020), and the SARS website (SARS, 2021c). Publications by international organizations active on tax issues in South Africa were also reviewed. These organizations included IISD (Gerasimchuk et al., 2019), the IMF (Davis et al., 2015), and the OECD (OECD, 2019a), as well as major tax companies including Deloitte (n.d.), KPMG (Kotze & de Jager, 2021), and PwC (PwC, 2021).

The majority of revenue data were derived from National Treasury and SARS (2020), with 2019–20 being the most recent financial year available. Revenue was not included in the database where these data were not publicly available, such as the smaller taxes and levies, or where data were not disaggregated by sector. The database does not attempt to estimate tax revenues that have not been quantified in published sources. Where revenues are derived from multiple fuels (such as the “coal and petroleum sector”), the database does not estimate allocations to specific fuels.



### 2.3.3 Social Cost of Fossil Fuels

To estimate the social costs of fossil fuels (or “externalities”), we first reviewed literature for estimates of total deaths (mortality), working days lost (WDLs) (morbidity), and greenhouse gas (GHG) emissions caused by air pollution resulting from the combustion of fossil fuels. More conservative estimates and midpoint values were taken when a range of estimates was available, with a preference for more recent data. Second, a cost for each unit was identified, again by reviewing literature and taking a midpoint or more conservative estimate where possible.

The two data points in each category were then multiplied and summed to estimate a total financial cost. Key findings are summarized in Section 7, with an overview of key variables and literature review results in Appendix 1.

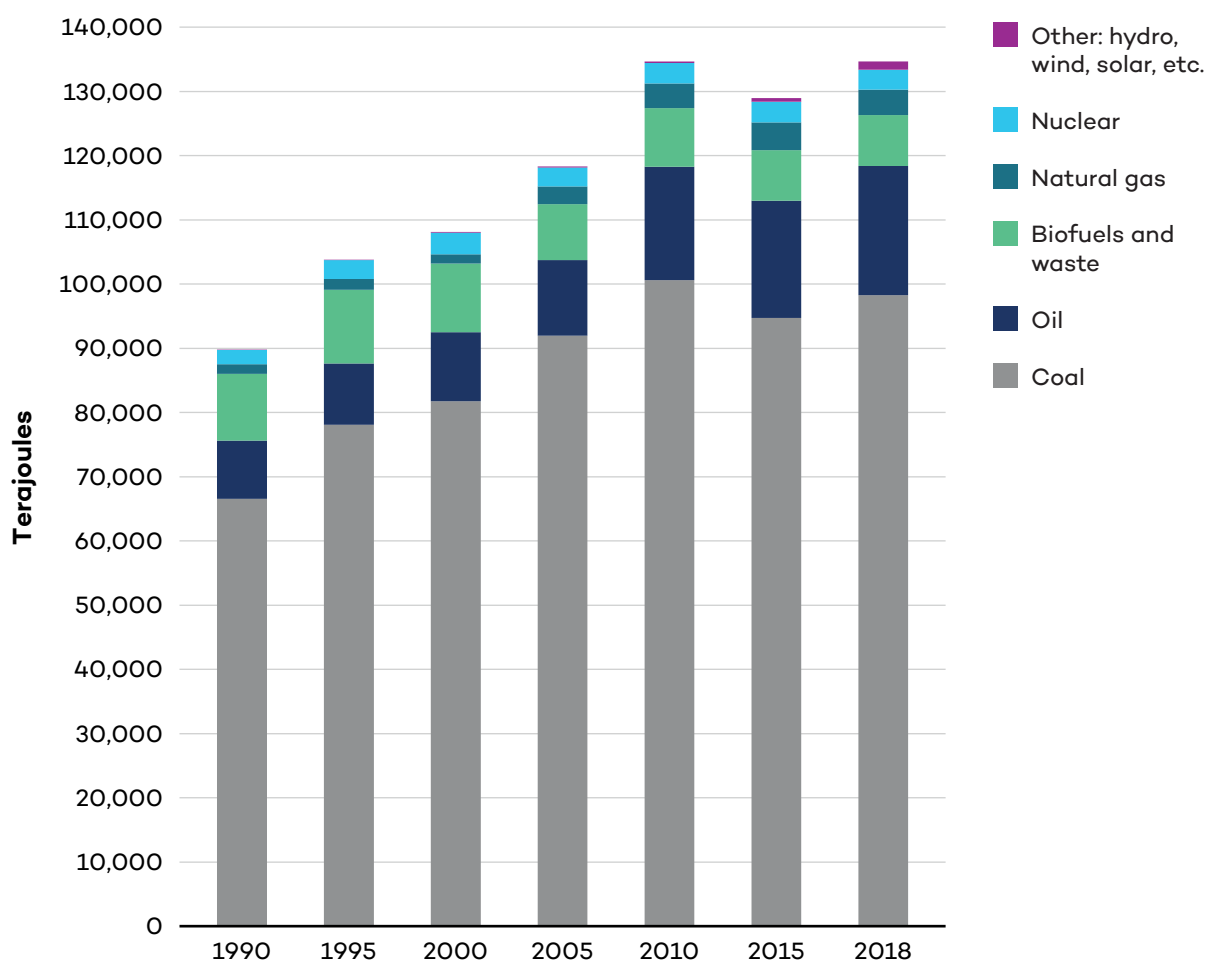


## 3.0 Context

### 3.1 Energy Mix

South Africa's energy supply is dominated by coal, followed by crude oil, renewables, and nuclear. Figure 1 provides an overview of the country's energy mix.

**Figure 1.** Total primary energy supply in South Africa



Source: Authors' diagram, with data from International Energy Agency (IEA), 2019.

Coal is a key component in the energy mix—contributing 80% of the country's total primary energy requirements—and is used to generate 92% of South Africa's electricity supply. Coal is also used to generate liquid fuels in the coal-to-liquid fuel sector, managed by Sasol.

The second largest energy source, crude oil, is largely imported from the Middle East and other African countries. Crude oil is mostly used in the production of liquid fuels, which power the country's automotive industry. Oil is also used to generate electricity through open-cycle gas turbines typically used for peaking demand. Nuclear accounts for about



5% of South Africa's total energy supply, provided by the Koeberg nuclear power station. Natural gas plays a very small role in South Africa's energy mix, accounting for less than 3%. The share of renewables is slowly increasing, primarily through the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), and as of 2018, accounted for 6% of the total primary energy supply (IEA, 2019; International Renewable Energy Agency [IRENA], 2021a).

## 3.2 Energy Objectives and Targets

The 2016 draft Integrated Energy Plan (IEP) highlighted eight main objectives for South Africa's energy sector, namely:

1. "Ensure security of supply
2. Minimise cost of energy
3. Promote job creation and localization
4. Minimise environmental impacts
5. Minimise water consumption
6. Diversify supply sources
7. Promote energy efficiency
8. Promote energy access" (Department of Mineral Resources and Energy, 2016, p. 41).

The first objective, ensuring security of supply, mirrors the language used in SDG 7, particularly around ensuring "adequate, sustainable and reliable forms of energy" (Department of Mineral Resources and Energy, 2016, p. 41). The plan outlines this tenet as the underpinning goal of the IEP.

Globally speaking, South Africa has ratified the Paris Agreement and updated its Nationally Determined Contribution in September 2021. The updated Nationally Determined Contribution increases the country's climate ambition, is a step toward keeping warming below 2°C, and "is found to be consistent with a 1.5°C pathway" (Climate Action Tracker, 2021; Steyn & Tyler, 2021, p. 3).





## 4.0 Subsidy Mapping

Understanding energy subsidies is important for several reasons. First, subsidies are one of the key economic policy levers that governments can use to influence energy production and consumption. If subsidies are in place that act against stated policy objectives for political or legacy reasons, transparency and debate can hold governments to account to align subsidies with stated government policy. Second, subsidies come at a high cost to the public budget and are often linked to health and environmental public objectives, so it is essential that the impacts of subsidy policy are monitored and debated. Third, fossil fuel subsidies increase the consumption of fossil fuels, worsening local air pollution and GHG emissions. Monitoring and reporting of fossil fuel subsidies are included in the SDG indicators, and IISD modelling has shown that fossil fuel subsidy reform could reduce South Africa's carbon emissions by nearly 3% by 2030 (Kuehl et al., 2021; United Nations, 2021).

The extent to which fossil fuel subsidies still exist in South Africa is, however, disputed. The South African government, under its G20 commitments, had claimed that it has no inefficient fossil fuel subsidies that encourage wasteful consumption (Schmidt, 2010). Reports state that its stance has not changed since then (Asmelash, 2017). While this stance may be due to a variation in defining subsidies, this report aims to shine a light on the current status of energy subsidies by estimating them based on definitions highlighted in Section 2.2 above and to present a basis for debate about their role in the energy sector.

### 4.1 Subsidies

In FY 2020/21, the South African energy subsidies quantified in this study totalled ZAR 172 billion (USD 10.4 billion) (Table 1; see Appendix 1 for a description of subsidies). This included subsidies to fossil fuels, electricity, hydroelectricity, nuclear, as well as carbon tax exemptions, and bailouts for several carbon-intensive industries. The largest subsidies were for fossil fuels and coal-fired electricity (Figure 2). A significant number of subsidies for renewables were identified but cannot be quantified due to a lack of data (see Section 5 for a description of these policies). The total subsidy estimates should be viewed as conservative given the number of unquantified subsidies.

**Table 1.** Major quantified energy subsidies in South Africa, FY 2017/18–FY 2020/21

Subsidy number	Energy fiscal policy	(million ZAR)			
		FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
1	VAT exemption for sales of gasoline, diesel, and illuminating paraffin	23,892	29,279	34,667	29,273
2	Refund of Fuel Levy and Road Accident Fund (RAF) Levy for diesel consumed in specific sectors	2,165	4,623	5,103	13,639
3	Free Basic Electricity access	8,725	9,604	10,612	11,645
4	Government grants for PetroSA training on projects	12	4	4	0
5	Fiscal funding for multiproduct pipeline project by Transnet	1	1	0	2
6	Funding for water transportation projects	615	534	761	0
7	Cleaner Fossil Fuels Programme	100	81	99	0
8	Integrated National Electrification Programme	5,519	4,817	4,674	4,569
9	Provisional allocation for Eskom restructuring	0	0	49,000	56,000
10	Recapitalization and bailouts of South African Airways	10,000	5,000	5,500	10,300
11	Recapitalization and bailouts of South African Express	0	1,200	300	200
12	Petroleum Agency South Africa: Subsidies on products and production	87	98	127	135
13	Petroleum Agency South Africa: Ring-fenced grant income from the Central Energy Fund (CEF) for shale gas exploration and training and development	0	0	0	1
14	Market price support for synthetic fuels (i.e., coal-to-liquid gasoline)	1,600	1,550	1,550	0
15	Exemption from carbon tax	0	0	24,700	44,630
16	Three months-deferral of first carbon tax payment	0	0	0	0

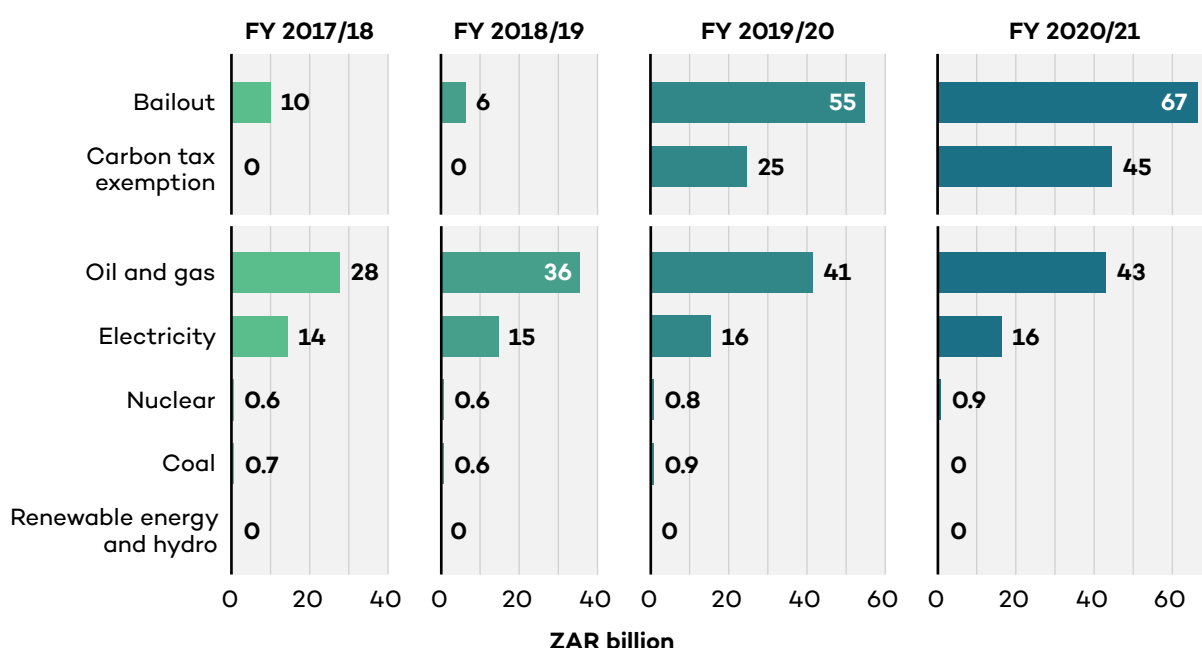


Subsidy number	Energy fiscal policy	(million ZAR)			
		FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
17	CEF: Grant from the Department of Mineral Resources and Energy (DMRE) for feasibility studies for Vaal Dam projects	1	1	1	0
18	Various institutions: Solar water heater project	0	0	0	0
19	South African Nuclear Energy Corporation: Other transfers to public corporations	574	587	790	923
20	Energy-efficiency and demand-side management grant for selected municipalities	203	215	227	218
<b>TOTAL (million ZAR)</b>		<b>53,495</b>	<b>57,594</b>	<b>138,116</b>	<b>171,534</b>
<b>TOTAL (million USD)</b>		<b>4,015</b>	<b>4,323</b>	<b>9,560</b>	<b>10,413</b>

Notes: Non-exhaustive list of identified energy subsidies. Zero values may indicate absence of data, not necessarily the absence of subsidies.

Sources: Authors' calculations and Government of South Africa, 2020; Minister of Finance, 2019; National Treasury, 2020; OECD, 2020b; Pant et al., 2020.

**Figure 2.** Subsidies by energy and subsidy type, FY 2017/18 to FY 2020/21



Source: Authors' calculations. Note that a significant number of subsidy policies for renewables have been identified but cannot be quantified due to a lack of transparently available data. See subsequent discussion and accompanying spreadsheets for more details.



## 4.2 Key Trends

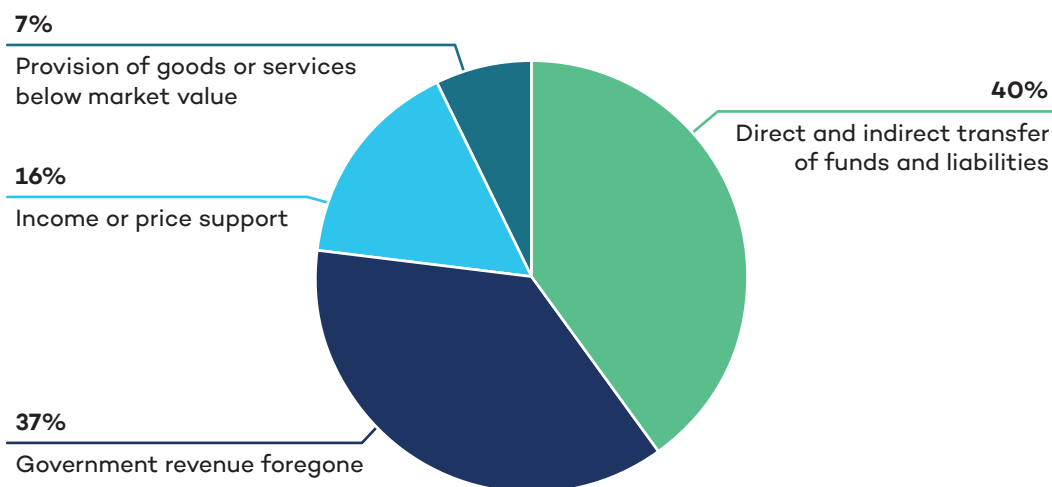
**Energy subsidies more than tripled between FY 2017/18 and FY 2020/21**, from ZAR 58 billion (USD 4 billion) in FY 2018/2019 to ZAR 172 billion (USD 10.4 billion) in FY 2021). The main reasons for the increases were:

- The bailout of Eskom at ZAR 56 billion (USD 3.4 billion) in 2020–2021: the single largest quantified subsidy for that year and equivalent to 10% of Eskom's total accumulated debt of ZAR 488 billion (USD 29.6 billion) (African News Agency, 2020). This effectively supported the ongoing combustion of coal in South Africa, which made up 88% of the electricity mix in 2018, with Eskom producing more than 90% of total power supply (Curran & Ahmed, 2020; IEA, 2020).
- Tax-free emission allowances for energy productions under the carbon tax regime were estimated to result in ZAR 47 billion (USD 2.9 billion) of foregone revenue in FY 2020/21. The carbon tax was introduced in June 2019; therefore, exemptions were included for part of FY 2019/20 and the full year for FY 2020/21. Box 1 presents a summary of the system of carbon tax thresholds, allowances, and exemptions, and Appendix 1 provides an explanation of how this subsidy was calculated.
- Electricity subsidies increased by 8% to ZAR 16 billion (USD 960 million) and oil and gas subsidies by 18% to ZAR 35 billion (USD 2.1 billion).
- Support for nuclear energy increased from ZAR 590 million in FY 2017/18 to ZAR 920 million in FY 2020/21 (USD 60 million). This largely consisted of direct transfers to the South African Nuclear Energy Corporation.

The majority (77%) of subsidies were delivered as transfers of funds and liabilities (notably the bailouts) or foregone revenue (such as the carbon and VAT tax exemptions) (Figure 3). The remainder comprised income or price support (16%) and the provision of goods or services at below market value (7%).



**Figure 3.** Subsidy mechanisms employed in FY 2020



Source: Authors' calculations.<sup>4</sup>

**There was insufficient data publicly available** to quantify the value of renewable energy subsidies for FY 2020/21, despite the existence of several national policies, including the REIPPPP, and tax benefits for renewable energy projects. Under the applied definition of subsidies, any excess paid to renewable energy generators over a nominal “market price” for electricity would be considered a subsidy. In the absence of a wholesale electricity market or an available proxy for this market price for electricity, it was not possible to determine what proportion of REIPPPP prices should be considered a subsidy. The lack of transparency meant that there was no clear government reporting on expenditure associated with these policies nor was it possible to estimate the subsidies independently.

**Despite recent price rises, the electricity sector is still unable to cover costs, necessitating large bailouts.** Subsidies to the electricity sector have resulted in some of the lowest electricity prices in the world despite recent price rises, leading to an energy-intensive economy that depends on cheap power (Matsuo & Schmidt, 2016). This below-cost pricing is a key factor in the poor financial position of Eskom, among other problems. While it is vital for electricity to remain affordable for the poor and vulnerable, it should be possible to reduce losses by better targeting of subsidies—see Box 2 for more detail. Bailouts for Eskom will continue to increase in the next few years: the South African National Treasury provided ZAR 49 billion (USD 3 billion) in FY 2019/20 and ZAR 56 billion (USD 3.8 billion) for FY 2020/21 (Eskom, 2021), and demarcated ZAR 33 billion (USD 2.3 billion) for FY 2021/22 (Curran & Ahmed, 2020).

<sup>4</sup> Note that a significant number of subsidy policies for renewables have been identified but cannot be quantified due to a lack of transparently available data. See subsequent discussion and accompanying spreadsheets for more details.



### **Box 1. South Africa's carbon tax: Thresholds, allowances, and exemptions**

Carbon tax exemptions fall into the subsidy category of government revenue foregone. The Carbon Tax Act 2019 sets a tax rate to apply to carbon emissions (Republic of South Africa, 2019). This is a clear benchmark tax rate. The exemptions for specific industries and activities are a discount on the full carbon tax rate, and therefore result in foregone revenue (subsidies) when contrasted with a situation where the carbon tax was applied indiscriminately.

The carbon tax threshold, where the government decides when an emitter should start paying carbon tax, varies by activity: no threshold for many process and fugitive emissions (meaning that all emissions are taxed); 10 megawatt (MW) installed thermal input capacity for combustion activities; unique thresholds for some activities, such as domestic aviation; and complete exemptions for others (i.e., not subject to the tax) (Deloitte, n.d.).

In addition, there are large tax-free emissions allowances (Deloitte, n.d.; South African National Treasury, 2018):

- A basic tax-free allowance of 60%
- An additional tax-free allowance of 10% for process emissions
- An additional tax-free allowance of 10% for fugitive emissions
- A variable tax-free allowance for trade-exposed sectors (up to a maximum of 10%)
- A maximum tax-free allowance of 5% if a given company's processes are less emission intensive than a benchmark set by the Treasury
- A 5% tax-free allowance for companies with a carbon budget with the Department of Environment, Forestry, and Fisheries
- A carbon offset allowance of either 5% or 10% for those that invest in emission-reducing projects
- The total tax-free allowances during the first phase (up to 2020) can be as high as 95%.

Together, these allowances result in 60% to 100% of emissions being tax free (Republic of South Africa, 2019). Emissions from electricity are tax free in the first phase of the tax. The result is a modest net carbon tax rate ranging from ZAR 6 to ZAR 48 (USD 0.36 to 2.91) per tonne carbon dioxide equivalent (CO<sub>2</sub>e) (South African National Treasury, 2018). The low tax rate is intended to give significant emitters time to transition their operations.

A review of the carbon tax will take place after at least 3 years of its implementation. The review is likely to begin in 2022 and is expected to consider progress made to reduce GHG emissions, future rates, and tax-free thresholds (IEA/IRENA, 2020). Phase 2 will run from 2023 to 2030.



## 4.3 Sector-Specific Findings

### Government Bailouts for Carbon-Intensive Industries

In addition to the large transfers to Eskom, bailouts were also provided to other state-backed enterprises, including South African Airways and South African Express, worth ZAR 10.3 billion and ZAR 200 million, respectively. COVID-19 created a challenging fiscal climate that resulted in costs for these businesses exceeding revenues.

From a fiscal perspective, bailouts will continue and become an established part of the electricity system if they are not linked to reforms. The government has recognized the need for financial and institutional restructuring of Eskom to return the utility back to a sustainable financial position (Department of Public Enterprises, 2019).

### Oil and Gas

**Subsidies remain for the consumption of fossil fuels.** The highest-value oil and gas subsidy quantified in this report was the VAT exemption on the sale of gasoline, diesel, and illuminating paraffin. This subsidy increased from ZAR 24 billion in FY 2017/18 to ZAR 29 billion (USD 1.78 billion) in FY 2020/21. The reason for this rising trend is the increased consumption of liquid fuels, including imported refined petroleum products, specifically diesel, which constitutes 70% of total refined product imports (Department of Energy, South Africa, 2020). Most of the diesel consumed in the country was in the commercial sector for transportation, heavy machinery, and electricity generation (Department of Energy, South Africa, 2016). Paraffin continues to be used for lighting in households that remain without grid electricity services (Statistics South Africa, 2019, 2021).

### Coal and Electricity

**Coal production subsidies are low, but carbon tax exemptions constitute a large subsidy.** South Africa's indigenous energy resource base is dominated by coal, which is being mined at favourable costs domestically (DMRE, n.d.-a). Low coal costs account for the prominence of coal in South Africa's energy sector. In absolute terms, there are relatively low levels of government support provided by way of subsidies to coal. The coal subsidies are primarily provided for the "cleaner" fossil fuel program and for water transportation projects required for the functioning of thermal power plants. While producers of coal power did not receive budget transfers to support their operations, carbon tax exemptions allowed them to pay very little for extremely high levels of carbon emissions, creating significant subsidies to the sector.

The two largest electricity subsidies were the Free Basic Electricity access program and the national electrification program, which increased by 10% and 3.3%, respectively, from FY 2018/19 and cost ZAR 11.7 billion (USD 707 million) and ZAR 4.6 billion (USD 280 million) in FY 2020/21. These programs are designed to fulfill social objectives (see Box 2 on targeted subsidies). However, due to the inextricable links between the electricity sector and coal use, they also help to lock in the current coal-based energy system.



## Box 2. Targeted subsidies and electricity access

Governments need to remove fossil fuel consumer subsidies, but this can have a big impact on the cost of living and doing business. Untargeted fossil fuel consumption subsidies are an inefficient and unjust tool for improving energy access. Many fossil fuel consumer subsidies end up mostly benefiting richer consumers, who can afford to pay more (Coady et al., 2015).

Governments must ensure they implement targeted and well-designed subsidies that allow the poor and vulnerable to access energy. Subsidy reform policies can be introduced in ways that protect poor and vulnerable consumers and allow for better equity (Laderchi, 2014; Yemtsov & Moubarak, 2018).

IISD's Global Subsidies Initiative (GSI) notes that "some fossil fuel subsidies are used to incentivize the use of energy technologies for which there is no short-term sustainable alternative. If these subsidies are deemed necessary, governments should improve the effectiveness and efficiency of these subsidies through targeted subsidies aimed at poor households. Facilitating new connections should be a major focus in this respect" (Sharma et al., 2019, p. 5).

The Free Basic Electricity access program in South Africa was designed to be one such subsidy and is intended to support indigent and low-income households. Although this subsidy locks in coal-based electricity, due to the current energy mix in South Africa—coupled with the need to provide affordable and reliable energy to low-income households—there is still a need for this support. The focus, however, should be on evaluating the households that receive the support in a step to ensure that it is targeted appropriately and, where possible, subsidies are swapped to promote more sustainable energy sources.

## Nuclear Energy

**Support for the nuclear industry continues.** South Africa's existing nuclear reactor, owned and operated by Eskom, provides 5% of South Africa's electricity generation (IEA, 2020). In its 2021 expenditure estimates, the Department of Energy estimated that 11.9% (ZAR 3.4 billion/USD 0.2 billion) of its budget over the medium term would go toward funding entities such as the South African Nuclear Energy Corporation under the Nuclear Energy Regulation and Management program (National Treasury, 2021).

Nuclear energy often receives implicit subsidies. In addition to the budgetary spending linked to the nuclear industry, which has been quantified, nuclear sectors are often provided with other subsidies, including support for waste disposal, decommissioning costs, and government-backed insurance against nuclear accidents (Bridle & Sanchez, 2016). None of these potential subsidies have been identified or evaluated in this report. Further research is needed to estimate the true level of nuclear subsidies in South Africa.





## Renewables

**Renewable energy subsidies are difficult to estimate, but subsidies will fall as technology costs reduce.**

The cost of power purchase agreements for renewable energy projects will have created subsidies to renewable energy generation. The cost of subsidies to renewable energy generation is a function of the gap between the agreed price for renewable power and a “reference price” that represents unsubsidized generation. It was not possible to accurately estimate these subsidies due to the lack of publicly available data. Determining the reference price in the absence of transparent wholesale electricity price data is challenging.

However, what can be noted is that, due to cost reductions in renewable energy, the subsidies required for new generation capacity are likely to fall over time, as renewable energy has become the cheapest source of electricity, as evidenced through the recent REIPPP bidding round, which is the case in many power markets. Further discussion of the renewable energy industry is presented in Section 7.

**Most current subsidy spending is directed to propping up existing energy industries rather than promoting the transition to clean energy.**

The South African government has committed to reducing carbon emissions under both domestic policy and international treaties. While South Africa's climate policies and commitments are almost sufficient to be consistent with the Paris Agreement's less than 2°C temperature limit, implementation of these policies will be a key factor in meeting these commitments (Climate Action Tracker, 2021). In conflict with these commitments, the government continues to support the production and consumption of fossil fuels indirectly through:

- Tax exemptions for the use of oil, gas, and coal, including substantial or total carbon tax exemptions
- Enabling Eskom's continued dependence on coal-based electricity generation
- Providing infrastructure to support the ongoing consumption and production of fossil fuels (Burton et al., 2018).



## 5.0 Renewable Energy Policies

The Government of South Africa has ambitious plans to accelerate the adoption of renewable energy. But are current policy settings sufficient to achieve these objectives? Our ability to answer this question was hindered by the lack of transparency on government expenditure and renewable energy contracts, which prevented the quantification of support for the sector (as noted in Section 4). However, qualitative information was available on subsidies, targets, the regulatory environment, and investment. This section presents this information in relation to large-scale renewable energy<sup>5</sup> and assesses the key challenges and risks for the government in achieving its objectives for the sector.

### 5.1 Current State of the Industry

The renewable energy sector currently contributes only a small share of total electricity generation in South Africa: in 2019 wind and solar accounted for 3% and 1% of total generation, respectively (IEA, 2020). Installed capacity increased tenfold in as many years, from 0.9 gigawatts (GW) in 2011 to 9.6 GW in 2020 (IRENA, 2021b).

### 5.2 Targets

South Africa's Integrated Resource Plan (IRP) aims to guide future energy infrastructure investments and determine the country's generation mix. The 2010 IRP set a target of 17.8 GW of renewable energy by 2030. After a delay of 8.5 years between updates, the 2019 IPR substantially increased the renewable energy target to 31.2 GW installed capacity (39.7% of the energy mix) by 2030, comprising:

- 17.7 GW of wind
- 8.3 GW of solar PV
- 4.6 GW of hydropower
- 0.6 GW of concentrating solar power (KfW et al., 2021; Power Futures South Africa, n.d.).

South Africa has also stated its intention of achieving a net-zero economy by 2050 through its Low Emission Development Strategy, released in February 2020 (South African Government, 2020).

### 5.3 Support Policies

We identified six support policies for renewable energy in South Africa (Table 2; measures descriptions in Appendix 1). The only two that could be quantified were funding for institutions to support research and development (R&D).

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<sup>5</sup> This section examines subsidies and support policies for large, grid-scale renewables and does not investigate distributed, smaller-scale (residential) or municipal-level renewable policies.

**Table 2.** Identified renewable energy support policies in South Africa, FY 2017/18–FY 2019/20

	<b>Energy fiscal policy</b>	<b>Energy type</b>	<b>Cumulative value</b> (million ZAR)	<b>FY 2017/18</b>	<b>FY 2018/19</b>	<b>FY 2019/20</b>
1	South African National Energy Development Institute (SANEDI) (national R&D organization) <sup>6</sup>	Multiple fossil fuels; renewables and hydro	200	60	70	70
2	IRENA (international R&D organization)	Renewables and hydro	3.53	1.015	1.177	1.336
3	REIPPPP	Renewables and hydro; wind and solar PV only	N/A <sup>7</sup>	N/A	N/A	N/A
4	Accelerated depreciation under Section 12B of the Income Tax Act (ITA) Any plant or machinery used in a process of manufacture or any other process of a similar nature, for the production of renewable energy (original tax act expanded to include renewables in 2006)	Renewables and hydro	N/A	N/A	N/A	N/A
5	Section 12U of ITA Deduction for expenditure for supporting infrastructure such as roads and fences (introduced April 1, 2016)	Renewables and hydro	N/A	N/A	N/A	N/A
6	Section 12N of ITA Deductions allowed for improvements with regard to property under procurement plans, like the REIPPPP (introduced Jan. 1, 2013)	Renewables and hydro; wind and solar PV only	N/A	N/A	N/A	N/A

Sources: National Treasury, 2019a, 2019b; South African Government, 1962.

<sup>6</sup> SANEDI performs R&D work on both renewables and “clean” fossil fuel technology, so it is difficult to allocate this subsidy to renewables or fossil fuels individually.

<sup>7</sup> N/A: data not available



The key driver in bringing in private investment to deploy renewable energy projects in South Africa has been REIPPPP, launched in 2011. The REIPPPP is a competitive tender process that awards long-term contracts to private investors for grid-connected renewable energy projects (see Box 3 for further details on the policy and Section 5.4 for a discussion of its effectiveness).

The South African Renewables Initiative was launched in 2011 to develop and implement financing arrangements needed to help kickstart renewable energy in South Africa (Ward, 2012). The South African Renewables Initiative, no longer in operation, was a government project funded through the Department of Public Enterprises, the Employment Creation Fund, and the European Climate Foundation Fund. The initiative sought to secure low-cost loans, financial risk mitigation instruments, international grants, along with a “modest domestic contribution” (Parliamentary Monitoring Group, 2011).

### Box 3. REIPPPP

REIPPPP, launched in 2011, consists of a series of energy auctions that award long-term power purchase agreements (PPAs) to independent power producers (IPPs). It allows developers to submit bids to supply power at long-term prices, giving long-term certainty to projects, ensuring they can source investment and be deployed. In addition to promoting the supply of clean energy through private sector investment, the REIPPPP program is designed to contribute to various developmental objectives, such as job creation, social upliftment, and economic transformation, primarily through broader economic ownership (Nomjana, 2020). Four bidding rounds were completed between 2011 and 2015 (IRENA, 2018). REIPPPP has resulted in the procurement of 6.3 GW from 92 IPPs in the first four bidding rounds (Del Rio, 2016).

REIPPPP was structured to enable the quick rollout of new renewable energy capacity. The size and structure of the bidding process meant that there would be multiple bid winners, which was an important incentive for the private sector to participate (Eberhard et al., 2014). The competitive tendering process associated with the REIPPPP model also helped renewable energy prices drop sharply (Eberhard et al., 2014). As of bid window 4, the cost of renewable energy in South Africa had decreased by more than 67%, to ZAR 0.62 per kilowatt hour (kWh) for wind and solar and attracted ZAR 201.8 billion of investment (Radebe, 2018). The IPPs also benefited from sovereign guarantees provided by the Government of South Africa, which backed Eskom's purchase of power from the renewable energy projects.

The fifth round of the REIPPPP program was originally planned for 2018 but was delayed several years until 2021 due to the different financial situation of the country's state-owned utility Eskom and the renegotiation of the PPAs awarded in the previous REIPPPP rounds (Bellini, 2021). The recently held fifth round of bids has attracted diverse renewable developers and low prices. Solar PV average prices have come in at ZAR 0.429 per kWh, a 45% drop from 2015 prices and a 75% drop from the 2011 auction prices. New wind prices came in at ZAR 0.495 per kWh, a 36% reduction on 2015 prices and a 90% reduction on 2011 prices. Finally, concentrated solar power has bid prices at ZAR 2.547 per kWh, showing a reduction of 43% on 2011 prices.



Several tax exemptions have also been made available to renewable energy project developers, including accelerated depreciation on plants and equipment along with deductions for expenditure on supporting infrastructure such as roads and fences.

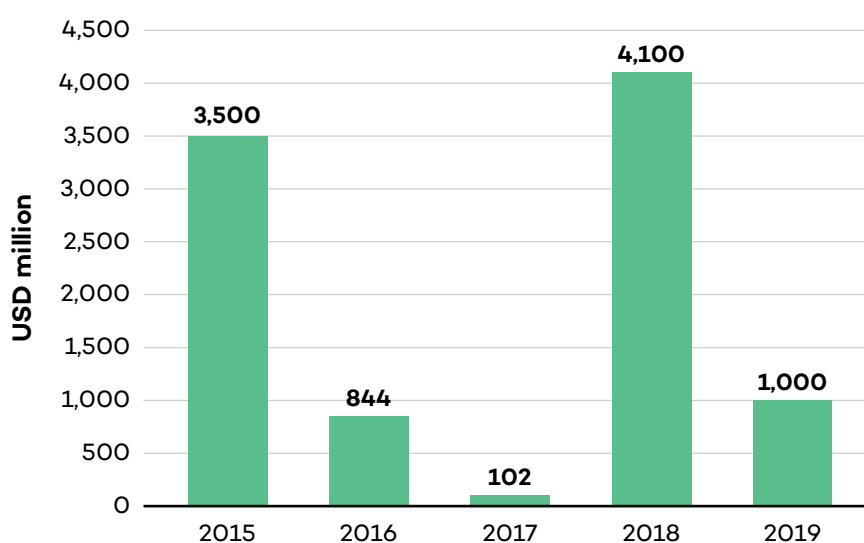
Other strategies that aim to accelerate South Africa's adoption of renewable energy and the energy transition more broadly include the carbon tax (discussed in Section 4), the Green Transport Strategy, and the enhanced energy-efficiency program (Climate Action Tracker, 2021). The South African presidency also recently announced an amendment to the Electricity Regulation Act around the licensing threshold, increasing it from 1 MW to 100 MW, in order to promote the rapid deployment of distributed generation projects. This measure aligns well with the IRP 2019 targets (Richards et al., 2021).

## 5.4 Impact of Policies on Investment

While the REIPPPP was instrumental in the deployment of renewable energy, investments in new projects came to a halt in 2016 and 2017, reflecting a reluctance by Eskom to sign new PPAs under the REIPPPP (Figure 4) (Frankfurt School–United Nations Environment Programme [UNEP] Centre/BloombergNEF [BNEF], 2018; Global Climatescope, 2016). In 2018, under new political leadership, Eskom eventually signed new PPAs and investments in renewable energy rebounded rapidly (Frankfurt School–UNEP Centre/BNEF, 2019). This spike in investments could not be sustained in 2019, as the fifth round of auctions was delayed until 2021 (Frankfurt School–UNEP Centre/BNEF, 2020).

Eskom's financial situation, its reluctance to sign PPAs, and the delay of the REIPPPP are primarily attributed to political reasons (Tyler & Hochstetler, 2021). The coal lobby has been active in the African National Congress and pushed back against the development of a renewable energy sector in South Africa. Eskom has also been used as a vehicle for state capture and corruption (Tyler & Hochstetler, 2021).

**Figure 4.** Renewable energy investment trend in South Africa from 2015 to 2019



Sources: Authors' diagram, based on Frankfurt School–UNEP Centre/BNEF, 2017, 2018, 2019, 2020; Southern African Alternative Energy Association, 2021.



The recently held fifth round of IPP auctions attracted 102 bids from diverse project developers and saw record low tariffs (Mantashe, 2021). Solar PV tariffs averaged 0.429 ZAR/kWh (0.032 USD/kWh), a 45% drop from 2015 tariffs. New wind tariffs averaged 0.495 ZAR/kWh (0.037 USD/kWh), a 36% reduction on 2015 tariffs (Creamer, 2021; Mantashe, 2021). The latest outcome of the fifth round of auctions indicates that the REIPPPP continues to have an impact in attracting investment in renewables in South Africa.

Renewable energy developers interviewed by the authors for this report indicated that the tax exemptions that are available to them were not influential in helping them to mobilize investment for renewables.

## 5.5 Barriers and Risks for Renewable Energy in South Africa

Despite the success of the REIPPPP, there remain barriers and risks to the mobilization of finance for renewable energy project deployment in South Africa. We highlight the key barriers below.

### 5.5.1 Eskom

Eskom's monopoly in the electricity sector means that if Eskom lacks the ability, willingness, or political support to procure renewable energy, this creates a major barrier to renewable energy investment. Eskom's financial situation and previous reluctance to sign PPAs have been clear factors in the rate of renewable energy investment. Two possible approaches have been proposed that could reduce this risk.

1. A process of unbundling and legal separation of Eskom to improve the governance and financial position of some parts of the restructured entity, enabling renewable energy procurement and reducing institutional incentives that favour existing coal-based generation over new renewable energy. Various risk-reducing mechanisms have also been proposed in parallel to the unbundling to address the financial issues and reduce the credit status risks that Eskom exposes the power sector to (Steyn et al., 2021)
2. A program of transformation, enabling a rejuvenated Eskom to participate in renewable energy investment and eventually reduce its reliance on high-carbon energy (Muzondo et al., 2020).

Measures designed to achieve both goals are being taken. The legal separation of Eskom's transmission division is expected to be completed by December 2021, and the separation of the generation and distribution divisions will be completed by December 2022 (Parliamentary Monitoring Group, 2021). Eskom is seeking finance for a major clean energy investment program (Sguazzin, 2021).



## 5.5.2 Inconsistent Subsidies and Policies for Low-Carbon Transition

The DMRE continues to propose policies relating to new coal investment, including clean coal technologies, underground coal gasification, and carbon capture and storage, demonstrating a continuing commitment to coal as a source of primary energy (DMRE, 2019).

A current push for gas, indicated through government plans and announcements, is also inconsistent with a low-carbon transition. The IRP gives a significant future role to gas, and South Africa is investing in gas fields in Mozambique and Namibia, as well as exploring two significant recent gas condensate discoveries off its coast (Yelland, 2020). The Risk Mitigation IPP request for proposals is a 2 GW tender to deal with the issue of load shedding in the coming years. The tender aims at diversification of the energy supply: any distributed generation power plant can participate except for diesel and coal (Colthorpe, 2020). However, it is widely thought that the tender has been designed to favour gas projects and will result in renewable technologies needing to make more expensive bids in these auctions (amaBhungane, 2021a, 2021b).

## 5.5.3 Transmission and Distribution Infrastructure

Generation potential and transmission capacity are significantly mismatched in South Africa. More transmission infrastructure needs to be built—especially in Northern Cape and in areas where the highest wind speeds and best solar resources are located. Some of these are far from existing coal fields and the associated electricity transmission infrastructure. To enable renewables deployment in the long term, this transmission infrastructure also needs to allow for greater movement of energy across the country to smooth local and national peaks and troughs in demand and supply and allow for increasing levels of intermittent renewables and storage (Aggarwal & Chawla, 2019).

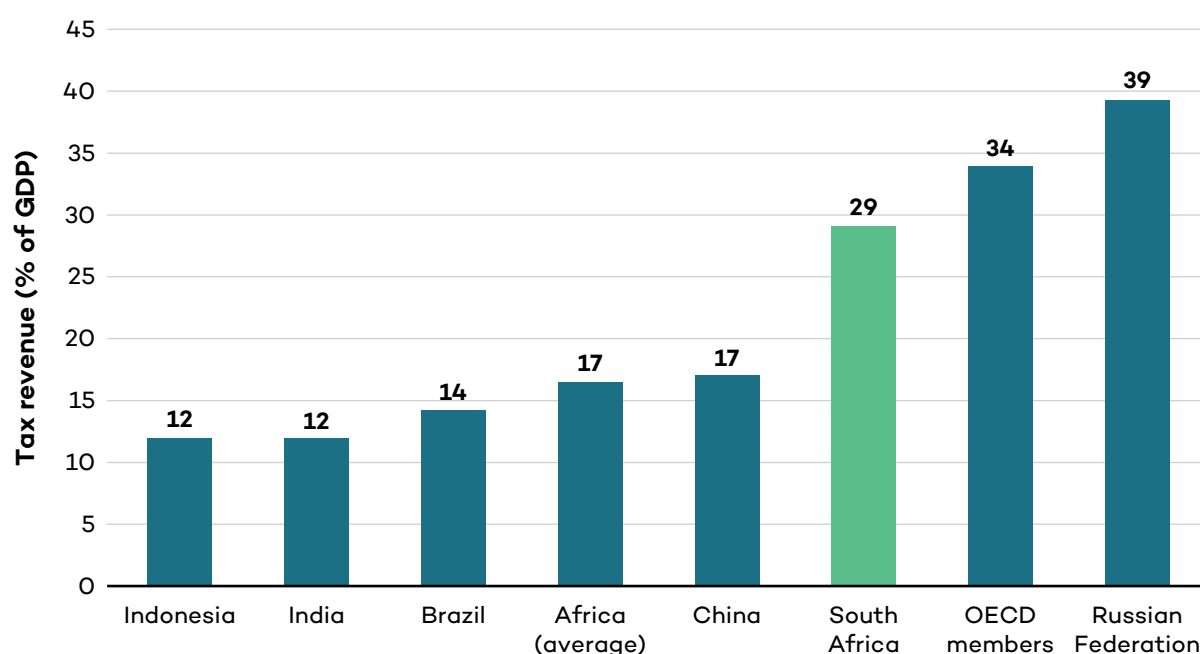


## 6.0 Fossil Fuel Revenues

### 6.1 Context

South Africa is a relatively high-tax country: tax revenue as a proportion of GDP was 25.5% in 2021–2022 (National Treasury, 2021a). This was higher than the African average and most other large emerging economies in 2018 (the most recent data year available for these comparator countries and groups; see Figure 5).

**Figure 5.** Tax revenue as a percentage of GDP in South Africa and comparator countries or groups of countries, 2018



Sources: OECD, 2021a, except India and Russia, which were from World Bank, 2021b, and OECD, 2021b, respectively.

South Africa's tax base is reasonably broad: it has the highest personal income tax share (% GDP) among upper-middle-income countries and one of the highest top personal income tax rates (National Treasury, 2021). In 2021/22, personal income tax was the largest single source of tax revenue (37% of GDP) followed by value-added taxes (27%) and corporate income tax (15%) (National Treasury, 2021b). Non-tax revenues are relatively less significant, contributing 0.6% of GDP in 2021/22, with rents and royalties representing the largest component at 0.2% of GDP (OECD, 2020a).

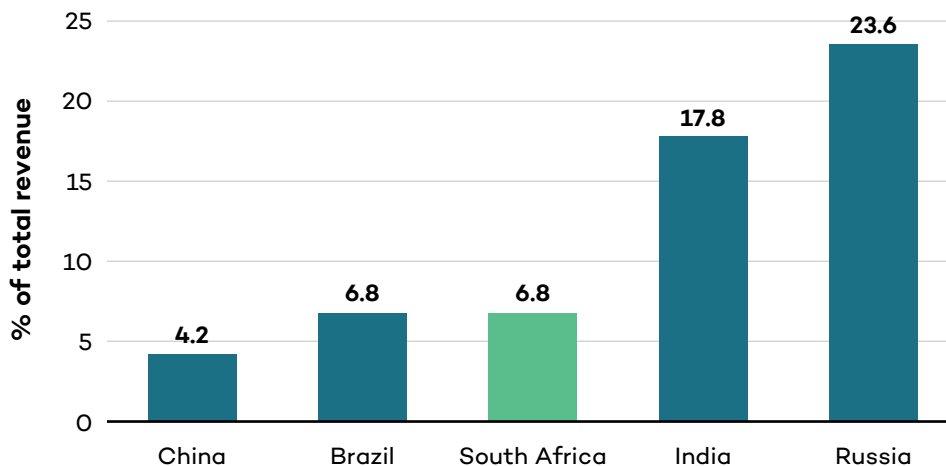
Fossil fuels are an important source of revenue. South Africa imposes taxes on fossil fuel consumption, production, and incomes, as well as charging for some externalities and fuel-related costs (such as transport). In 2019/20, total revenue from fossil fuels was ZAR 100.5 billion (USD 6.95 billion), constituting 2% of GDP and 7.4% of general revenue. Among





large emerging economies, South Africa's revenue from fossil fuels as a proportion of total revenue is similar to Brazil's, higher than China's, and lower than India's and Russia's (based on 2017 data).

**Figure 6.** Fossil fuel revenue in large emerging economies as a percentage of total revenue in 2017



Source: Authors' diagram with data from National Treasury and SARS, 2020.

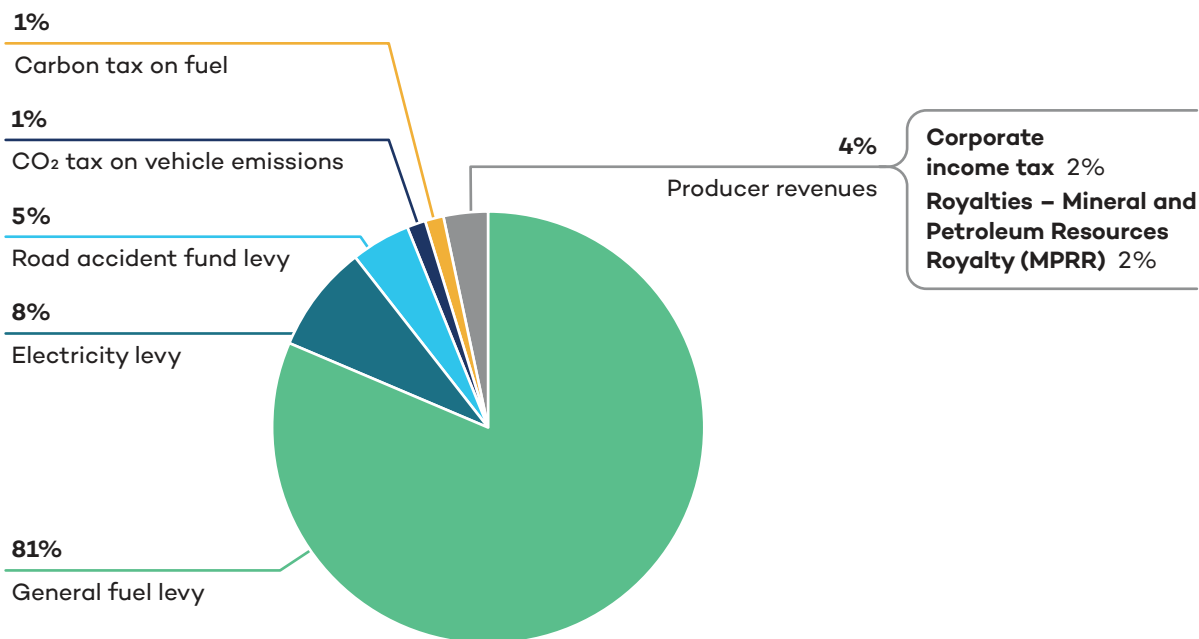
## 6.2 Consumption Tax Revenue

Consumer energy taxes are a key source of revenue in many countries because they are relatively simple to administer and difficult to evade (Coady et al., 2019; OECD, 2019b), have low price elasticity in the short term, and can be designed to be progressive (Chancel, 2020).

The vast majority (93%) of the fossil fuel and carbon taxes quantified in this section are derived from transport fuel consumption. The single largest source of tax revenue is the General Fuel Levy, which generated almost ZAR 83 billion (USD 5.7 billion) in 2019/20: 5.9% of all government revenue and 1.6% of GDP (Figure 7). Revenue from the General Fuel Levy is reduced by around 10% once the Diesel Fuel Refunds (ZAR 8.8 billion in 2019/20 (USD 609 million)) are taken into account. The rebates are foregone tax revenues and therefore represent subsidies.



**Figure 7.** Key fossil fuel revenue sources, consumer (left) and producer (right), 2019/20



Source: Authors' diagram with data from National Treasury and SARS, 2020.

The RAF levy, at ZAR 2.18 (USD 0.13) per litre for both petrol and diesel (around 13% of the final fuel price), is paid into a fund that compensates victims of traffic accidents. The RAF levy generated ZAR 4,768 million (USD 289 million) in 2019/20 (Table 3). However, the funds received from the RAF fuel levy on an annual basis are not sufficient to pay all annual liabilities, and debt has been accumulating for several decades (Road Accident Fund, 2020). As a result, the RAF Levy has been raised regularly over recent years. As of FY 2019/20, the RAF had an unfunded claims liability of ZAR 331 billion (USD 20 billion), resulting in long delays in the payment of claims (Road Accident Fund, 2020).

There are also fuel levies on aviation fuel (ZAR 0.0164 per litre, or USD 0.001 per litre); to discourage high octane use in inland areas; and to recoup fuel transport expenses and the cost of injecting an illuminating dye into paraffin to trace illegal adulteration with diesel. Customs and excise are also applied to fossil fuels (ZAR 0.04 [USD 0.0002] per litre for petrol and diesel), but disaggregated revenue data were not available. The fuel price buildup also includes wholesale and retail margins, several minor levies, and distribution and transport costs (DMRE, n.d.-b).

**Table 3.** Revenue from fossil fuel consumption, 2019/20

	ZAR million	USD million	% of general revenue
General Fuel Levy	82,886	5,737	6.10%
Electricity levy	8,141	563	0.60%
RAF levy	4,768	330	0.35%
CO <sub>2</sub> tax on vehicle emissions	1,327	92	0.10%
Carbon tax on fuel	1,287	89	0.09%
<b>Total</b>	<b>97,122</b>	<b>6,722</b>	<b>7.2%</b>

Notes: Based on total government revenue of ZAR 1,355 billion (USD 94 billion).

Source: Authors' diagram based on data from National Treasury and SARS, 2020.

Carbon emissions on transport fuels are taxed in two ways in South Africa: variable taxes on new passenger vehicles and a fuel levy. Since 2010, passenger and light commercial vehicles have attracted a CO<sub>2</sub> tax for emissions above a certain threshold. The tax is a one-off payment by the manufacturer or importer (see Table 4 for current rates). The aim of the policy is to encourage more energy-efficient and environmentally friendly vehicle purchases. For example, the CO<sub>2</sub> tax on a Toyota Hilux (South Africa's best-selling double cab) represents around 0.7% of its purchase price.

**Table 4.** CO<sub>2</sub> emissions tax on new vehicles

Vehicle type	Threshold	Tax for each gram of CO <sub>2</sub> emissions per km above the threshold
Passenger vehicles	95 gCO <sub>2</sub> /km	ZAR 120 (USD 8)
Double cabs	120 gCO <sub>2</sub> /km	ZAR 160 (USD 11)

South Africa's carbon tax on gasoline and diesel is applied through the fuel levy system rather than as a direct carbon tax on motorists' emissions. The Carbon Tax Fuel Levy was applied at a rate of ZAR 0.08 per litre on petrol and ZAR 0.09 per litre on diesel in 2021/22 (~USD 0.005), generating ZAR 1,287 million (USD 78 million) in 2019/20 (National Treasury & SARS, 2020). Diesel refunds cannot be claimed against this tax (National Treasury & SARS, 2017). However, COVID-19 resulted in the government issuing a 3-month deferral for filing and first payment of carbon tax to October 31, 2020 (SARS, 2021c).

In 2021, the official carbon price was ZAR 134 (USD 9.2)/tCO<sub>2</sub>-e on entities generating emissions above specified thresholds, but the applied rate was between ZAR 6 and 48 (USD 0.4 and 2.9)/tCO<sub>2</sub>-e (Republic of South Africa, 2019). The official rate increased by inflation plus 2% each year to 2022 (the first phase of the tax) and by inflation after that. The first phase of the tax includes high thresholds and generous allowances, resulting in many sectors paying low or no carbon taxes. Total carbon tax revenue, not including the Carbon Tax Fuel



Levy, was projected to be ZAR 1,750 million (USD 106 million) in 2020/21, but further disaggregation on the revenue gained from specific fuels was not provided (National Treasury & SARS, 2020).

The Environmental Levy on Electricity Generation from non-renewable resources was the second highest single source of energy tax revenue (after the General Fuel Levy). The electricity levy is imposed at ZAR 0.035 (USD 0.0002) per kWh on electricity generated from fossil fuels and nuclear energy as of 2020. The levy raised ZAR 8,141 million (USD 484 million) in 2019/20, 95% of which was from coal-fired power.

Gasoline, diesel, and electricity are currently exempt from VAT. The coal and petroleum sector claimed more in VAT refunds on inputs than gained from the sector from VAT on outputs. As a result, the sector's contribution to VAT revenues was negative ZAR 6,253 billion (USD 380 million) in 2019/20 (National Treasury & SARS, 2020).

### 6.3 Production Tax Revenue

The two quantifiable sources of revenues from fossil fuel production were corporate income tax and the Mineral and Petroleum Resources Royalties (MPRR) (Table 5). The MPRR is a resource rent or royalty rather than a tax, as it compensates the state for the permanent loss of non-renewable resources. MPRR payments are paid into consolidated revenue (SARS, 2021b). The rates for the MPRR are determined by a formula based on whether the resources are refined (e.g., oil and gas products) or unrefined (e.g., coal). The rate varies between 0.5% and 5% for refined resources and 0.5% and 7% for unrefined. In 2019/20, coal generated ZAR 1,741 million (USD 121 million) or 15% of MPRR revenues (National Treasury & SARS, 2020). The amount generated by oil and gas was not publicly available but is likely to be low: South Africa's domestic crude oil resources are small, producing around 1,800 barrels per day (OECD, 2019a).

Corporate income tax revenues for the coal and petroleum sector were ZAR 1,593 million (USD 110 million) in 2019/20. In addition, personal income tax from individual taxpayers with business income from the coal and petroleum sector was reported as ZAR 82 million (USD 5 million) for 333 taxpayers in 2019 (National Treasury & SARS, 2020). The full amount of income tax paid from those employed in the fossil fuel sector would be significantly higher, but disaggregated data is not available for individuals without business income.

**Table 5.** Revenue from fossil fuel production, 2019/20

	ZAR million	USD million	% of general revenue
MPRR	1,741	121	0.13%
Corporate income tax	1,593	110	0.12%
<b>Total revenue</b>	<b>3,334</b>	<b>231</b>	<b>0.25%</b>

Source: Authors' diagram based on data from National Treasury and SARS, 2020.



## 6.4 Comparison of Carbon Taxes

Comparing energy and carbon taxation across jurisdictions is challenging because standard tax rates are not the only variable. Energy taxes and explicit carbon taxes act together to create an effective carbon price, while tax exemptions and other policies (notably emissions trading systems) can increase or decrease applied average tax rates. Several organizations provide useful summary data for energy and carbon taxes (Table 6). These show that

- Like many jurisdictions, South Africa taxes transport fuels at much higher rates than non-transport fuel (coal, gas, and electricity).
- While South Africa's standard carbon tax rate of ZAR 134 (USD 9) is lower than the average of all jurisdictions with a carbon price (including an emissions trading system), its effective carbon tax price for transport fuels (i.e., including excise) is similar to the average of the OECD and partner economies.
- South Africa's taxation of non-transport fossil fuels is very low.

The OECD has developed a “Carbon Pricing Score” to assess effective carbon taxation rates (explicit carbon taxes plus excise) (OECD, 2021c). Using a benchmark of EUR 60 (USD 68.6) per tonne of CO<sub>2</sub>, a low-end rate needed by 2030 to achieve slow decarbonization by 2050, South Africa achieved a score of 13% in 2018 (6.4). This means that, in theory, South Africa's taxes across the energy sector amounted to 13% of a EUR 60/tCO<sub>2</sub> carbon price. This compares to 19% for the OECD and G20 average, 13% in India, 9% in China, 7% in Russia, and 1% in Brazil (although noting both China and South Africa have since imposed new carbon pricing regimes). However, it is important to note that the analysis was based on South Africa's official rate of USD 9.15/tCO<sub>2</sub>e, not the much lower applied rates. If based on the applied rates, South Africa's carbon pricing score would be far lower.

**Table 6.** Comparison of South Africa's carbon and energy tax levels with averages from other jurisdictions

Database and year of data	South Africa	Average (jurisdictions)
OECD Taxing Energy Use—effective carbon price (2018)		
Non-road excise	USD 2.56 per tonne CO <sub>2</sub>	USD 7.48 per tonne CO <sub>2</sub> (OECD plus partner economies)
Road excise	USD 159 per tonne CO <sub>2</sub>	USD 166 per tonne CO <sub>2</sub> (OECD plus partner economies)
OECD Carbon Pricing Score (2018)	13% (using USD 68.5 per tonne benchmark)	19% (OECD plus partner economies)
World Bank Carbon Pricing Dashboard—official carbon prices (2021)	USD 9.15 (official rate)	USD 23.33 (average official rates for all jurisdictions with an implemented carbon tax or emissions trading system, including subnational)

Sources: OECD, n.d., 2019c; World Bank, 2021a.



## 6.5 Recent Changes and Future Trends

The 2021/22 Budget included several reforms relevant to fossil fuel revenues (National Treasury, 2021a):

- An inflation-linked General Fuel Levy increase of ZAR 0.15 per litre for petrol and diesel
- An above-inflation increase of ZAR 0.11 (USD 0.007) per litre in the RAF levy
- A 1% decrease in the corporate income tax rate
- A government review of environmental taxes, including the fuel levy and VAT exemption for fossil fuels
- An increase in the carbon tax rate from ZAR 127 (USD 7.7) per tonne of CO<sub>2e</sub> to ZAR 134 (USD 8.13) per tonne of CO<sub>2e</sub>
- Changes to the thresholds, reportable emissions, and deductions under the carbon tax for several sectors.

The government's strategy is to gradually reduce corporate and personal income taxes as a means to stimulate economic growth and investment competitiveness (National Treasury, 2021a). The tax cuts will be funded by broadening the tax base and reducing distortions such as tax incentives, deductions, and loss offsets (National Treasury, 2021a). These reforms are intended to increase the equity of the tax system. To support economic recovery, the government did not raise additional tax revenue during the 2021/22 Budget.

As mentioned in Box 1, the review of the carbon tax is scheduled to take place in 2022. Future carbon tax thresholds, rates, and exemptions are likely to be determined following the review (KPMG, 2021).

South Africa may face higher import duties for some of its carbon-intensive goods if countries implement border carbon adjustment mechanisms (CBAMs). The European Union (EU) has signalled its intention to apply a CBAM. The first phase, to be implemented as early as 2023, would apply to a limited number of carbon-intensive sectors: cement, iron and steel, aluminum, fertilizer, and electricity (European Commission, 2021). However, a 3-year penalty-free period would apply until 2026. Initially, only direct emissions linked to production processes would be covered (therefore not indirect emissions, such as emissions embedded in products arising from electricity inputs) (Montmasson-Clair, 2021). From 2026, EU importers will have to declare the amount of embedded emissions in the total goods they imported into the EU in the preceding year and surrender the corresponding amount of CBAM certificates (European Commission, 2021).

A 2011 study of the potential impacts of border carbon adjustment on South Africa found that 71 carbon-intensive product categories, or some EUR 5.4 billion (USD 6.2 billion) in trade, would potentially be covered by an EU border carbon adjustment (Cosbey & Wooders, 2011). Assuming prices do not affect demand (which they would), the total amount payable annually on these product categories would be about EUR 380 million (USD 434 million), equivalent to a tax of over 10% on the value of iron, steel, and non-ferrous metals exports.

Border carbon adjustment will create an effective carbon tax on relevant exports, but South Africa will not gain the revenue. Applying a domestic carbon tax to these sectors early would make sense because it would allow South Africa to harness revenues that could be used to assist impacted industries in reducing emissions.



## 7.0 The Social Cost of Energy

Governments traditionally intervene in energy pricing to raise revenue or to encourage domestic production or affordability through subsidies. However, rising consciousness of the negative impacts of fossil fuels on society has changed the motivation behind these interventions. Adopting the principles of the “polluter pays” and Pigouvian taxation (Box 4), governments are increasingly using fiscal policy instruments to ensure prices more accurately reflect costs to society (OECD, 2017).

### Box 4. Key economic principles in EFR

Pollution that imposes no direct costs on the producer or consumer of a pollution-causing product is an example of a market failure. The polluter and consumer make decisions based only on their direct costs and profits, without considering the indirect costs to those harmed by the pollution (Helbling, 2020).

The “polluter pays principle” indicates that polluters should be charged with the cost of preventing and controlling pollution (OECD, 1975). This can be achieved through a Pigouvian tax, one that is levied on a transaction that creates an additional cost borne by individuals not involved in the transaction (a negative externality) (OECD, n.d.). Pricing the externality incentivizes producers and consumers to change their behaviour to avert or lessen such damage. Similarly, subsidies can be provided for products with positive externalities.

Based on these principles, EFR is the alignment of taxes, subsidies, and similar measures with the costs of environmental damage, implemented alongside socially or environmentally productive spending of the revenues (OECD, 2017). The valuation of externalities is necessary to determine the right level of intervention to correct prices (Havenga, 2015).

Fossil fuels have well-known negative impacts on society: their combustion is the leading cause of ambient (outdoor) air pollution and climate change (Bruckner et al., 2016; IEA, 2016). Transport fuel use is also closely correlated with road accidents, road damage, and vehicle congestion (Burke & Nishitateno, 2015; Parry et al., 2014; Zhang & Burke, 2020). Together, these negative externalities were estimated to cost the world's governments around USD 5.5 trillion in 2020 (Parry et al., 2021). Other externalities associated with fossil fuels include biodiversity loss as well as land and water contamination (Bielecki et al., 2020; Nkambule & Blignaut, 2017). Section 7.2.1 contains estimates of the costs of fossil fuel externalities in South Africa.

Renewable energy can also have externalities, such as life-cycle GHG emissions (from sourcing of materials, and the manufacture and disposal of equipment), visual impacts, and biodiversity loss (Bielecki et al., 2020). However, these are relatively minor compared with fossil fuels: one study concluded that 98% of energy-related externalities, including from renewables, arise from fossil fuel emissions (Bielecki et al., 2020). Renewable energy also has external costs that are created by variability in production (Vivid Economics, 2016). This



variability causes balancing challenges for the grid operator. The presence of these external costs without an adequate system to recover them has been one of reasons that vertically integrated utilities have historically been reluctant to procure renewable energy (Ueckerdt et al., 2013).

## 7.1 Environmental Taxation in South Africa

The South African government is clearly aware of the merits of environmental taxation. In 2006, the government developed a framework for market-based instruments for implementing EFR (National Treasury, 2006). Environmental taxes are in place for carbon and nitrogen oxide emissions (albeit with many exemptions), air travel, passenger vehicle purchases based on emissions, electricity generated from coal, and incandescent light bulbs (National Treasury & SARS, 2020). The pricing formula for diesel and gasoline includes explicit levies for carbon emissions and traffic accidents. Environmental taxation is also embedded into the budget process, with regular reporting and a review foreshadowed in the 2021/22 budget (National Treasury, 2021a).

However, South Africa's approach to environmental taxation in the energy sector is inconsistent. Fossil fuel prices are too low to reflect their costs on society (OECD, 2019a; Parry et al., 2021). The effective tax rate on coal is zero, despite its having the highest emissions among fossil fuels (OECD, 2019b). According to the IMF, the price increases needed to reflect societal costs in South Africa were around

- USD 8 per gigajoule (GJ) for coal (double the average 2020 retail coal price)
- USD 0.77 per litre for gasoline (equal to the average 2020 retail price)
- USD 1.07 per litre for diesel (75% of the average 2020 retail price).

For fossil gas, average retail prices in South Africa for 2020 (USD 8.95 per GJ) were found to be higher than climate change and air pollution externality costs (USD 2.94 per GJ) (Parry et al., 2021).

### 7.1.1 Estimating the Social Costs of Air Pollution and GHG Emissions

This section estimates key externalities for the combustion of fossil fuels in South Africa based on data obtained from a literature review (see methodology section and Annex 1 for details). Quantifying externalities is challenging because it involves assigning financial value to non-financial impacts. Even where market prices are available, such as a carbon price, the "correct" price can be contentious (WWF-SA, 2020).

Due to the complexity of estimation, we have limited quantification to three costs, although, as noted in the preceding section, there are many other negative externalities that contribute to the true negative external cost of fossil fuels. As such, the following factors should be considered a conservative estimate of the actual value:

- Mortality due to air pollution
- Morbidity (disease) due to air pollution
- Climate change impacts of GHGs.





For morbidity, we only accounted for work-loss days due to the challenges of costing the health and productivity costs associated with hospital admissions due to air pollution-related cardiovascular diseases.

**Societal costs associated with air pollution and GHG emissions by fossil fuels in South Africa were estimated to be a minimum of ZAR 550 billion (USD 33 billion) per year** (Table 7). The results cannot be attributed to a single year, given the fact that input data were derived from multiple years. The results were considered a proxy for 2020. The estimate was conservative since only fossil fuel combustion was included and conservative or mid-range values from the literature were used. For example, the mortality cost component was based on 13,000 premature deaths per year, the midpoint of the range provided, whereas the IMF assumed 34,900 premature deaths per year (Farrow et al., 2020; Parry et al., 2021). The “value of a statistical life” was based on gross national income and other factors; it was not intended to reflect the true value of a life (which of course cannot be monetized) but only a reference point for assessing the benefits of risk-reduction efforts (Viscusi & Masterman, 2017). Also, the figure for WDLs related only to coal combustion, as a figure for all fossil fuel combustion was not available.

**Table 7.** Social costs of fossil fuel combustion for air pollution and GHG emissions in South Africa, per year<sup>a</sup>

Externality	Unit	Estimated cost per unit	Cost (ZAR million)	Cost (USD million) <sup>b</sup>
Mortality	13,000 deaths	Value of statistical life (VSL): USD 1.046 million	224,000	13,598
Morbidity	996,628 Working Days Lost (WDL)—from coal combustion only	Value WDL (RSA minimum wage 2021): ZAR 43,035	42,890	131
Climate change	429.9 million tonnes CO <sub>2</sub> e (2015)	USD 40/tCO <sub>2</sub> e	283,270	17,196
<b>Total</b>			<b>550,160</b>	<b>33,398</b>

Notes: <sup>a</sup> The results cannot be attributed to a single year given input data were derived from multiple years. The results are considered a proxy for 2020.

<sup>b</sup> Exchange rate conversions based on 2020 average from (OECD, 2021a): ZAR 16.43 per USD 1.

Sources: Mortality: deaths—Farrow et al., 2020; VSL—Viscusi & Masterman, 2017; Morbidity: WDL—Holland 2017; minimum wage: Department of Employment and Labour, 2021; Climate change: GHG emissions, Republic of South Africa, 2017; carbon price—Stiglitz & Stern, 2017.

The CO<sub>2</sub> price chosen for climate change cost in Table 7, USD 40 (ZAR 657)/tCO<sub>2</sub>e, was also conservative. This is the lower-bound estimate of the carbon price needed to implement the Paris Agreement as provided by the High Level Commission on Carbon Prices: USD 40–



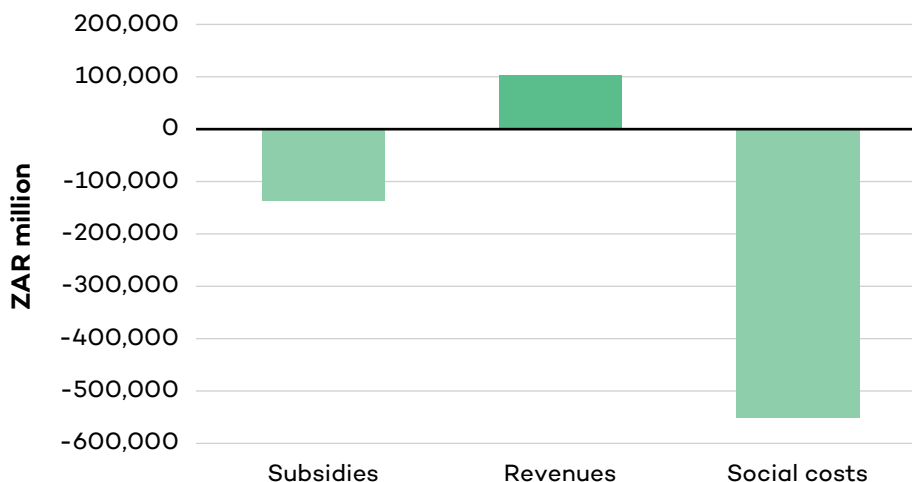
USD 80/tCO<sub>2</sub>e by 2020 (Stiglitz & Stern, 2017).<sup>8</sup> Choosing the lower end of the range reflects South Africa’s developing country status and the “differentiated responsibilities and respective capabilities” of the Paris Agreement (WWF–SA, 2020). It was a deliberately conservative carbon price and was lower than:

- The IMF’s assumed carbon price of USD 60/tCO<sub>2</sub>e in 2020 (Parry et al., 2021)
- That recommended in the Intergovernmental Panel on Climate Change for a 1.5°C target of USD 135–USD 550 USD/tCO<sub>2</sub>e in 2030 (Intergovernmental Panel on Climate Change, 2018)
- USD 100/tCO<sub>2</sub> recommended by Stiglitz and Stern (2021) to achieve a 1.5°C target.

## 7.2 Comparison of Fossil Fuel Subsidies, Taxes, Charges, and Social Costs

Comparing fossil fuel subsidies, tax and non-tax revenues (from Sections 4 and 5), and externalities (Section 7.1) reveals that social costs are five times higher than revenues (Figure 8). While there is uncertainty about these estimates, the overall finding that social costs far exceed revenues is likely to be correct or even understated. Externalities would be higher if their scope had been more comprehensive, such as to include more external costs (e.g., medical expenses, partially lost working days, or productivity) or more of the fossil fuel supply chain (e.g., extraction and transport of fuels).

**Figure 8.** Comparison of South Africa’s fossil fuels subsidies, tax and non-tax government revenues, and social costs (climate change and air pollution only), 2019/20



Source: Source: Authors’ diagram with data from Department of Employment and Labour, 2021; Farrow et al., 2020; Holland, 2017; Republic of South Africa, 2017; Stiglitz & Stern, 2017; Viscusi & Masterman, 2017.

<sup>8</sup> Three main approaches have been used to value CO<sub>2</sub> emissions in the economic literature: 1) the social cost of carbon, 2) the price on global CO<sub>2</sub> emissions consistent with achieving global temperature stabilization goals, and 3) prices implicit in national mitigation pledges (Parry et al., 2021). We follow the approach of Parry et al. (2021) and use a conservative CO<sub>2</sub> price needed to limit global warming.



### 7.3 The Way Forward: Reconciling prices with pollution

**Coal is the most underpriced fossil fuel in South Africa.** It is estimated that the retail price would need to double to internalize its social costs (Parry et al., 2021). The exemption of coal from the carbon tax is particularly problematic given that the combustion of coal has the highest CO<sub>2</sub> emissions of any fossil fuel. In addition, Eskom's power plants do not comply with emission standards, resulting in significant amounts of toxic air pollutants and increasing social costs (Myllyvirta, 2019). Coal taxes (ideally based on carbon and air pollutant content) need to increase not only to incorporate externalities related to emissions but also to raise the funds needed for a just transition for workers, pension funds, and mine site remediation as the industry inevitably declines as low-cost low-carbon renewable energy replaces coal. In India, a tax on coal called the GST Compensation Cess raised USD 3.7 billion in 2019. Using economic modelling, (Parry et al., 2017) estimated that raising the Indian tax annually by USD 2.5 per tonne of coal from 2017 to 2030 was projected to avoid over 270,000 air pollution deaths, raise the equivalent of 1% of GDP in revenue in 2030, reduce CO<sub>2</sub> emissions by 12%, and generate net economic benefits of approximately 1% of GDP. This example shows the potential of coal taxes to not only save lives but also to raise significant sums that could be used to pay for the transition away from coal (Sumarno & Laan, 2021).

**Coal-based electricity is also underpriced, but taxes should target coal rather than electricity.** Externalities for air pollution and GHG emissions were estimated by WWF-SA (2020) to be around one third of current electricity tariffs: ZAR 0.48 per kWh compared to a common electricity tariff of ZAR 1.67 per kWh (see Appendix 1 for details). However, electricity in itself does not have significant externalities: externalities arise from how the electricity is generated (Parry et al., 2021). In addition, electricity has the lowest social cost of residential fuels, so switching households from biomass or kerosene to electricity has positive externalities, particularly for health (Vivid Economics, 2016). In addition, a substantial increase in electricity supply and use will be needed to improve energy access in South Africa and to supply electrification in transport, industry, and other sectors in order to reduce emissions. Taxes on coal will impact electricity prices, but these can be mitigated through targeted assistance to vulnerable consumers using coal tax revenues.

**Even relatively highly taxed gasoline and diesel are significantly underpriced.** Havenga (2015) estimated that total transport externalities add an additional 18% to total transport costs in South Africa, while Parry et al. (2021) found that gasoline and diesel prices need to increase in price by 100% and 75%, respectively, to reflect major social costs.

**Opposition to energy price increases, driven by legitimate concerns, is blocking fiscal measures that enable transition.** The South African government is understandably reluctant to increase energy prices during the global COVID-19 pandemic, as evidenced by the delay of first payments of the carbon tax. However, this approach fails to capitalize on the potential of EFR as a tool for economic recovery and development. Opposition to energy price increases is driven by concerns about the need for energy access and the risks of energy poverty and cost-of-living increases. To reduce opposition, policies that increase the costs of polluting activities must explicitly demonstrate how they can reduce costs overall for consumers, particularly those on low incomes. For example, in the 1970s in Kentucky in the United States the introduction of the "Coal Severance Tax" was coupled with the removal of



sales tax on food and prescription drugs, additional funds raised from the tax were spent on economic development, and job creation initiatives, including the construction of business parks (IISD, 2017). The overall presentation of the impacts was such that it was able to garner support from a wide range of stakeholders.

Nordic countries successfully used EFR in response to economic crises in the 1990s as a way to raise revenue for economic stimulus (Laan et al., 2021). The Nordics implemented carbon and pollution taxes alongside reductions in labour and capital taxes. This had the benefit of improving purchasing power for consumers (offsetting higher energy prices), removing disincentives for employment (stimulating economic growth) while reducing the cost of externalities on the government and society (Laan et al., 2021). Most Nordics now generate significant revenue from environmental taxes: between USD 7 billion and USD 13 billion in 2018 (OECD, 2021a). South Africa could use such revenues for social safety nets and poverty-eradication programs to ensure progressive outcomes from EFR (Pigato & Black, 2018).

By reducing externalities, higher fossil fuel prices would boost productivity and reduce costs to the government such as those for pollution-related health care costs. Air pollution is an important cofactor that increases morbidity from COVID-19, providing further motivation to encourage a switch away from fossil fuels as soon as possible (Wu et al., 2020).



## 8.0 Key Findings and Recommendations

This report provides an overview of the current status of energy fiscal policies and the signals these policies are sending to actors in the energy system. This has been done in an attempt to consider what changes could be made to fiscal policies to support decarbonization while providing affordable energy to consumers in South Africa. The key findings and recommendations from this work are summarized below.

### Finding 1: Fossil Fuel Subsidies Are Too High

Fossil fuel subsidies in South Africa amounted to ZAR 172 billion (USD 10.4 billion) in FY 2020/21. South Africa currently collects approximately ZAR 100 billion (USD 7 billion) in tax receipts from both consumption and production activities. Fossil fuels receive more subsidies than they contribute to revenue.

#### RECOMMENDATIONS

- **Bailouts should be tied to the energy transition: currently, they are a major expense and effectively provide an untargeted subsidy for electricity consumers.** To date, the government has provided substantial financial support in the form of bailouts to the heavily indebted utility Eskom. Although it is acknowledged that these bailouts may have been necessary to keep Eskom afloat, they also indirectly contribute to the lock-in of fossil fuel production and provide untargeted consumer electricity subsidies. This is an example of wasteful consumer subsidies that do not provide support to the most vulnerable consumers. Additionally, bailouts distort the price of electricity generated from coal, failing to account for its true cost (both in terms of supply costs and externalities), making coal-fired electricity appear cheaper than it actually is. Future bailouts must be designed to support, not inhibit, the energy transition. This could be achieved by attaching conditions to bailouts that require Eskom to undergo reforms that facilitate renewable energy capacity.
- **The carbon tax is creating a mechanism to price externalities, but exemptions are weakening the strength of this signal.** Placing a price on carbon is a very positive development. Should such a tax be applied across the economy and at a level that is proportional to the external cost of the emissions, it would generate considerable revenues that could allow for increased spending or reductions in taxation on other priority areas. In its current form, the 60% to 95% emissions allowances reduce the impact of the tax.
  - The scheduled 2022 review of carbon tax implementation before the second phase of the tax is due to start in 2023 will be a critical moment to determine the extent to which this carbon pricing scheme will create an effective signal. A move toward phasing out exemptions under the carbon tax would remove one of the largest subsidies to fossil fuels and be in line with EFR principles. More practically, it would immediately improve the economics of renewable energy compared to gas and coal use.



- **Transparency on energy fiscal policies is important to understand the signals that government is sending, ensure effective reporting, and increase accountability.** Improved transparency on subsidy and tax data allows ministries to accurately monitor, evaluate, and revise fiscal policies to better meet policy objectives. Transparency on data and reporting is also a key enabler in equipping civil society and government watchdogs to monitor decision making and hold ministries accountable. Subsidy reporting can be conducted using methods consistent with guidelines for SDG 12.c.1 and contribute to peer review of fossil fuel subsidies as part of G20 commitments (Viswanathan et al., 2021; Wooders et al., 2019).

## Finding 2: Social Costs of Fossil Fuels Exceed Subsidies and Revenues

The external costs of fossil fuel use are far greater than the cost of subsidies (ZAR 172 billion [USD 10.4 billion] in 2020) or the value of tax revenues (ZAR 100 billion [USD 7 billion]).

### RECOMMENDATIONS

- **There is a need for a review of current energy fiscal policies.** The South African government should use the upcoming review of environmental taxation (foreshadowed in the 2021/22 budget) to review energy fiscal policies and align them with the requisite action needed to achieve the country's Paris Agreement commitments. It is crucial that the prices of fossil fuels reflect social and environmental costs. To meet social objectives, it remains reasonable to subsidize electricity for vulnerable consumers, but most consumers should pay for the energy they use. Additionally, there is an urgent need to remove the existing carbon tax exemptions, particularly for coal, and potentially introduce taxation on specific pollutants.
- **The revenue generated by efficient pricing of fossil fuels could be used as targeted support for vulnerable households.** As has already been discussed, the bailouts to Eskom act as untargeted electricity subsidies to consumers. By efficiently targeting subsidies and taxes to fossil fuels, government can create an additional revenue source that can be used to support lower- and middle-income households facing higher energy prices.
- **Increasing fossil fuel taxes is an important stage in the energy transition.** Revenue generated from fossil fuel subsidy reform and taxation can be invested into the energy transition in ways that stimulate jobs and economic growth while funding a just transition for coal workers and communities. This revenue could also be used in the short term for COVID-19 recovery. However, the government should not become reliant on these revenues, which will inevitably decline as fossil fuels are phased out. The government should, as part of its budget process, initiate a fiscal transition strategy that ensures revenues are maintained as fossil fuel use declines.



### Finding 3: Renewables Can Deliver Cheap Electricity Under the Right Policy Settings

Renewable energy is now the cheapest form of electricity on a levelized cost basis, but South Africa is missing out on this opportunity because investment has not kept up with government targets or demand for electricity.

#### RECOMMENDATIONS

- **A key factor in the current power shortages is the stalled renewable energy investments.** The stop-start procurement process for renewable energy while PPAs went unsigned between 2016 and 2018 and the suspension of round 5 of the REIPPPP to 2021 have exacerbated the power crisis. In addition, this has increased uncertainty for investors in projects and renewable energy manufacturing capacity. Maintaining a predictable and effective renewable energy procurement process based on the IPP model will help the industry to grow and reduce the risks of power shortages. The REIPPPP process alone is not sufficient to transform the electricity system. Any coherent plan for reform must also include a transformation of Eskom. The electricity sector can only be transformed through a combination of public and private investment in renewable energy.
- **Explore alternative business models for utility-scale renewable energy.** At present, in addition to practical and financial barriers, increased renewable energy development faces continued opposition from powerful trade unions, political parties, and government officials who favour other energy types (Muzondo et al., 2020). To address these challenges, public and community-owned project models can be considered, as described in Muzondo et al. (2020).
- **Maintain policy certainty through regular IRP and IEP updates.** The government departments should focus on ensuring that the IRP and IEP are kept up to date with emerging technology and reflect the external costs of technologies to meet environmental and economic goals while spurring the growth of South Africa's clean energy transition.



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# Appendix 1: Descriptions of Identified Subsidies

## Bailouts

### *A. Provisional Allocation for Eskom Restructuring*

The state-owned electricity utility Eskom has repeatedly received recapitalizations and was bailed out multiple times (National Treasury, 2020). This is intended to allow Eskom to service debt, meet redemption requirements, and fund urgent operational improvements. Additionally, the funds will be used to support Eskom's restructuring: it will be split into three operating entities under a single state-owned holding company (OECD, 2020a). Overall, Eskom accounts for 82% of fiscal support to South African state-owned enterprises since 2008 (National Treasury, 2020). Besides its latest bailout package in 2019 (ZAR 49 billion) Eskom's restructuring has also been supported with ZAR 56 billion in 2020 and will be allocated another ZAR 56 billion spread over 2021 and 2022 (National Treasury, 2020; OECD, 2020a; Republic of South Africa, 2019).

### *B. Recapitalization and Bailouts of South African Airways and South African Express*

South African Airways (SAA) has repeatedly received recapitalizations and was bailed out. The same holds true, though on a much smaller scale, for the South African Express airline (National Treasury, 2020). Both are listed as energy subsidies because of the aviation industry's overwhelming reliance on fossil fuels.

## Coal Subsidies

### *A. Free Basic Electricity Access*

Since 2003, the government has been providing a free basic electricity allowance of at least 50 kWh to indigent households with a connection to the national electricity grid. Deemed sufficient to provide basic services, this measure is funded through the so-called "local government equitable share" that is transferred to municipalities by the government to support, amongst other things, their provision of "free basic services," such as water, sanitation, electrification, and waste removal. Its fossil fuel support is calculated as follows: The share of electricity on "local government equitable share" spending is multiplied by the number of households receiving free basic electricity across South Africa and the share of electricity produced from coal (OECD, 2020a).

### *B. Funding for Water Transportation Projects*

The Trans-Caledon Tunnel Authority has been receiving direct transfers from the Department of Water and Sanitation to support projects supplying water to power stations and coal mines. Among others, Eskom's thermal power stations and Sasol's petrochemical installations are the strategic users of the water from one of the supported projects (OECD, 2020a).



### *C. Cleaner Fossil Fuels Programme*

Since 2014, the SANEDI has provided financial support to two projects that are reliant on anthracite, coking coal, and other bituminous coal (OECD, 2020a). The research institute is tasked with coordinating public interest energy research, development, and distribution. Deriving most of its revenue from transfers from the Department of Energy, SANEDI's Cleaner Fossil Fuels Programme currently consists of a carbon capture and storage project as well as a feasibility study of shale gas in South Africa. The expenditure was ZAR 99 million (USD 6.85 million) in FY 2019/20, mostly for the carbon capture and storage project (OECD, 2020a).

## **Electricity Subsidies**

### *A. Integrated National Electrification Programme*

In 1999, South Africa put in place the Integrated National Electrification Programme (INEP). The national budget separates INEP payments into grants to municipalities and transfers to Eskom, of which the latter were roughly twice those to municipalities. However, the 2019 Budget reduced the INEP by ZAR 58.4 million in 2019/20 and as much as ZAR 558.8 million in 2020/21. In both cases, the funds were reallocated to the urban settlements development grant in the Department of Human Settlements (OECD, 2020a).

### *B. Energy-Efficiency and Demand-Side Management Grant for Selected Municipalities*

The grant funds selected municipalities to implement projects with a focus on public lighting and energy-efficient municipal infrastructure. It continues to make provision for municipalities to use funding from the energy-efficiency and demand-side management grant for planning and preparing for the Energy Efficiency in Public Infrastructure and Building Programme. Ultimately, the program aims to create a market for private companies to invest in the large-scale retrofitting of municipal infrastructure, paid back through the savings on energy costs achieved (National Treasury, 2020).

## **Nuclear Subsidies**

### *A. South African Nuclear Energy Corporation: Other transfers to public corporations*

South Africa's Nuclear Energy Corporation has been receiving additional funding for many years. Explicitly named as a subsidy in the 2019 budget review (National Treasury, 2019), the same amounts were renamed as "indirect transfers" in the 2020 budget review (National Treasury, 2020). The nomenclatural change of these transfers was not accompanied by greater transparency regarding exactly what these amounts go to.



## Carbon Tax Exemptions

### A. Exemption From Carbon Tax

Revenue foregone from the carbon tax for 2019 can be calculated via the following components: (1) The fixed price of ZAR 120/t CO<sub>2</sub>e in 2019 and ZAR 127/t in 2020, (2) 411 Mt CO<sub>2</sub>e as South Africa's carbon taxable industrial emissions in 2017,<sup>9</sup> (3) the exemptions for Eskom (100%) and Sasol (over 90% of total emissions), and (4) a conservative minimum carbon tax rate of 60% on the total industrial emissions minus Eskom's and Sasol's exempt emissions. Two aspects shall be highlighted: 2017 has been chosen as the reference year, as no more recent data exist that allow for greater precision. The calculated figure for 2019 is a lower limit, and the carbon tax revenue foregone could be much higher, given the technicalities and transparency of exemptions to producers of industrial emissions.

The value for the three-month deferral of carbon tax payment in 2020 has not been calculated. Technically the deferral confers a subsidy equivalent to the value of the interest payments that would otherwise have been due on an equivalent-sized loan.

Lastly, the carbon tax revenue foregone from Eskom alone (2019–2023) is based on its total emissions as of 2019, multiplied by each year's respective carbon tax price (2019: ZAR 120/t CO<sub>2</sub>e, 2020: ZAR 127/t CO<sub>2</sub>e, 2021: ZAR 134/t CO<sub>2</sub>e, 2022: ZAR 141/t CO<sub>2</sub>e [assumed, based on the price increase of previous years]) and then added.

## Oil and Gas Subsidies

### A. VAT Exemption for Sales of Gasoline, Diesel, and Illuminating Paraffin

According to the VAT Act of 1991, gasoline, diesel fuel, and illuminating paraffin (kerosene) are exempt from the VAT normally levied on sales of most products in South Africa (in the case of energy products: 15% from April 1, 2018, 14% previously). Considered a tax expenditure in South Africa's budget since FY 2005/6, this measure "is calculated by estimating the value for sales and making assumptions about the estimated volumes used by final consumers" (OECD, 2020a, cited in National Treasury, 2018). According to the OECD (2020a), since FY 2006/7 it has been assumed that 20% of gasoline sales and 90% of diesel sales in South Africa are used for business purposes, thus those purchases are exempt from VAT. These exemptions were reported to be ZAR 16.15 billion, ZAR 1.84 billion and ZAR 569 million in FY 2016/17. In FY 2017/18, VAT exemption amounted to ZAR 17.08 billion, ZAR 2.05 billion and ZAR R665 million for petrol, diesel, and illuminating paraffin respectively (OECD, 2020a).

<sup>9</sup> No recent CO<sub>2</sub>e-figure exists. The 7th National Greenhouse Gas Inventory report (Department of Forestry, Fisheries and the Environment, 2021) provides data for 2017. This data has been used for calculations effectively making the assumption that emissions have been constant since that time.



### *B. Refund of Fuel Levy and Road Accident Fund Levy for Diesel Consumed in Specific Sectors*

The fuel levy is directed to the National Revenue Fund, while the RAF levy goes to the RAF, compensating those injured in road traffic accidents. For the past 30 years, the RAF has been insolvent. In 2016, it was announced that it would be replaced by a Road Accident Benefit System based on social security principles, succeeding the current liability insurance system. As of November 2020, RAF remained in place, as the Road Accident Benefit System was formally rejected in Parliament in September (Maqhina, 2020).

Consumers of diesel fuel in specific primary production sectors have been refunded a certain percentage of the fuel levy and RAF levy since 2000. These sectors include land (agriculture, forestry, mining), offshore (commercial fishing, coastwise shipping, offshore mining, coastal patrol, marine research and rescue), rail freight transport and harbour vessels and large peak electricity-generating plants with a capacity exceeding 200 MW per plant (since 2006). According to the OECD (2020a), as of January 2020, the refunded amounts for eligible groups were as follows:

- On land: 40% of the General Fuel Levy plus 100% of the RAF levy on 80% of the qualifying diesel consumption
- Offshore: 100% of General Fuel Levy plus 100% of the RAF levy
- Electricity generation plants: 50% of the General Fuel Levy plus 100% of the RAF levy
- Rail and harbour services: 100% of the RAF levy.

Importantly, diesel refunds cannot be claimed against the carbon tax (7 cents per litre for petrol and 8 cents per litre for distillate fuel since June 2019). Up to 2019, the General Fuel Levy was set to ZAR 3.52 per litre for 93 octane petrol, ZAR 3.37 per litre for diesel and certain types of biodiesel. Qualifying biodiesel received a reduced rate of ZAR 1.69 per litre up to June 4, 2019. From June 5, 2019, when the carbon tax came into effect, the General Fuel Levy rates increased to ZAR 3.54 per litre for 93 octane petrol, ZAR 3.39 per litre for diesel, and ZAR 1.7 for biodiesel. The RAF levy was increased to ZAR 1.98 per litre from April 2019.

### *C. Petroleum Agency South Africa: Subsidies on products and production, and government grants for PetroSA training on projects*

In the past, the Petroleum, Oil and Gas Corporation of South Africa (PetroSA) has received two different kinds of state support. Listed explicitly as subsidies in the 2020 budget review (National Treasury, 2020), the state's national oil company was granted subsidies for its products and production in a non-transparent way. Similarly, no disaggregated data can be found for the "training on projects" that PetroSA records in its annual reports. Thus, the allocation across fuel types is based on production shares in South Africa's upstream oil and gas sector using data from the IEA's Energy Balances extracted by OECD (2020a).



### *D. Market Price Support to Liquid Fuels Produced From Coal*

The total value of market price support to the coal-to-liquid fuel sector is obtained by calculating the difference between the price paid to producers and the reference price as a proxy for unsubsidized market price. Given that South Africa's coal-to-liquid industry is monopolized by Sasol, the reference price equals Sasol's cost of production plus a reasonable margin. However, Sasol provides no public data behind its production costs. Thus, market price support estimates are based on the costs of imported equivalent fuels (Pant et al., 2020): the market price support equals the difference between the domestic price and the border price of petroleum (unleaded-95), multiplied by the total volume of petrol. The domestic price follows the international oil price in Singapore and the Mediterranean. Similarly, the border price is assumed to be the average cost, insurance, and freight price of refineries in these locations (Pant et al., 2020).

## **Renewables and Hydro**

### *A. Various Institutions: Solar Water Heater Project*

As the only quantified subsidy to renewables and hydro explicitly stated in a budget document of the Republic of South Africa (National Treasury, 2020b), no more information can be provided. As this subsidy was only granted in 2017, but not in 2018 or 2019, it seems unlikely that it will need to be listed in another database at any point soon.

## **Non-Quantified Subsidies Due to Lack of Data**

In addition to the subsidies listed and discussed in this review, various others have been identified that—at least up to the end of FY 2019/20—have not been quantified for reasons of data availability or resources. However, they may be of significant value and could benefit from further review. Identified by unquantified subsidies include

- Fiscal Funding for Multiproduct Pipeline Project by Transnet
- PetroSA: Ring-fenced grant income from CEF for shale gas exploration and training and development
- Three months' deferral of first carbon tax payment mid-2020
- CEF: Grant from the DMRE for feasibility studies for Vaal Dam projects
- Income tax deductions for expenditure and losses relating to exploration and post-exploration spending



## Literature Review of Social Costs of Fossil Fuels

**Table A1.** Literature review of the social costs of summary of air pollution and greenhouse gas emissions for fossil fuel combustion in South Africa

Source	Fossil fuel coverage	Externality coverage	Findings (year)	Cost
(Altieri & Keen, 2016)	Fossil fuels	Mortalities due to particulate matter	28,000 deaths (2012) would have been avoided if WHO guidelines for air pollution had been met.	USD 29.1 billion (4.5% of 2012 GDP)
CIRCLE study for OECD in (Holland, 2017)	Coal-based electricity	Mortality and morbidity	Deaths: 11,355	USD 10,761 million
			Chronic bronchitis, adult: 14,103 cases	USD 328 million
			Bronchitis in children aged 6–12: 48,347 cases	USD 11 million
			Equivalent hospital admissions: 12,065 cases	USD 14 million
			Restricted activity days: 20,148,510 cases	USD 673 million
			Asthma symptom days (children): 480,169	USD 7 million
			Lost working days: 5,054,383	USD 239 million



Source	Fossil fuel coverage	Externality coverage	Findings (year)	Cost
(Farrow et al., 2020)	Fossil fuels	Air pollution (PM2.5 and ozone) mortality and morbidity	62,000 (37,000–83,000) asthma-related emergency room visits in South Africa (2012)	USD 4,300 million (low), USD 6,300 million (medium), USD 8,200 million (high)
			14,000 (6,700–14,500) premature births in South Africa (2012)	
			USD 9,700 (low), 13,000 (medium), 16,000 (high) deaths (2018)	
(Holland, 2017)	Coal-based electricity (combustion only) <sup>10</sup>	Mortality and morbidity due to air pollution	Deaths: 2,239 deaths per year (based on 2014 emissions)	USD 2,373 million (based on 2014 emissions)
			Chronic bronchitis: 2,781 cases	
			Bronchitis in children: 9,533	
			Hospital admissions: 2,379	
			Restricted days: 3,972,902	
			Asthma symptoms days: 94,680	
			Lost working days per year: 996,628	
(Nkambule & Blignaut, 2017)	Coal-based electricity (Kusile Power Station)	Total coal-fuel cycle externality cost on both the environment and humans		Over Kusile's lifespan, total cost estimated at ZAR 1,449.9 billion to ZAR 3,279 billion or 91c/kWh to 205c/kWh sent out (baseline: ZAR2 172.7 billion or 136c/kWh)

<sup>10</sup> Numbers exclude the impacts from air pollution from mining (such as coal dust), transport of coal, and contamination of water (Holland, 2017).





Source	Fossil fuel coverage	Externality coverage	Findings (year)	Cost
(Parry et al., 2021)	Fossil fuels	Air pollution, GHG emissions, traffic accidents, congestion, road damage	Mortalities due to fossil fuel combustion: 34,900 (2020)	Price increases needed to reflect societal costs in South Africa: ~USD 8 per gigajoule (GJ) for coal; USD 0.50 per litre for gasoline; and USD 0.90 per litre for diesel. Retail prices for fossil gas were ~USD 1.50 per GJ higher than externality costs
(Roy & Braathen, 2017)	Fossil fuels	Ambient particulate matter pollution	456 premature deaths per 1 million inhabitants in 2015; (value of statistical life 1.501 in 2015)	USD 37,314 million, 5.2% GDP
(Thopil & Pouris, 2015) <sup>11</sup>	Coal-based electricity	GHG emissions	ZAR 0.12 per kWh; ZAR 25,445 million	
		Health impacts from air pollution	ZAR 2,681 million; ZAR 0.012 per kWh	
(WHO, 2021a)	Fossil fuels + biomass burning <sup>12</sup>	Ambient air pollution-attributable deaths	22,917 premature deaths (2016)	
(WWF-SA, 2020)	Coal-based electricity	air pollution + GHG emissions	ZAR 0.4839 per kWh	
	Road freight	GHG + accidents + air pollution	ZAR 10.42 per travelled km	

<sup>11</sup> Mid-range estimates quoted.

<sup>12</sup> The major outdoor pollution sources are from the combustion of fossil fuels, including vehicles, power generation, and industry, as well as biomass burning for residential energy for cooking and heating or agriculture/waste incineration (WHO, 2021b).

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