THE SOUTH AFRICAN ENERGY SECTOR REPORT

2021

mineral resources & energy
Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

2030 NDP

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Engen refinery in Durban - pic from Alarabiya news website

DIRECTORATE: ENERGY ECONOMICS AND STATISTICS

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FOREWORD

It is with the greatest appreciation and honour to introduce the 2021 South African Energy Sector Report. This report presents us with an opportunity to inform and update all the relevant stakeholders about the latest energy demand and supply trends in South Africa as prescribed in the National Energy Act no.8 of 2008. The report is based on the 2018 Energy Balance compiled by the Department of Mineral Resources & Energy (DMRE) and mainly focusses on analysing energy supply and the subsequent consumption broken down into various sectors of the economy.

This report is published annually with data and analysis based on the latest published South African Energy Balances. We have made remarkable progress in improving the overall quality of our energy data in order to ensure that accurate, timely and reliable data is provided in all our publications and hope that this report will become a source of reference among energy analysts in South Africa and abroad. We will continuously collaborate with all our data providers to ensure that our energy data is of highest quality possible.

I extend my most sincere thanks and appreciation to the Energy Economics and Statistics Directorate for the hard work that went into the compilation of this publication. I would also like to extend my appreciation to all the energy data providers and stakeholders for their concerted efforts and support during the process of compiling this report. Comments and inputs are welcome and could be addressed to Publications@energy.gov.za.

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Director General

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Introduction

The energy sector in South Africa is at the center of the economy due to the country's high energy intensity. Despite its recent electricity struggles, South Africa has a well-developed electricity network and one of the highest rates of electricity access in sub-Saharan Africa (IEA, 2020). In both urban and rural areas, electricity is the favorite option for cooking, and the country also relies on oil and gas for its energy needs.

The Department of Mineral Resources and Energy is mandated to ensure that energy resources are available, and that there`s access to energy services in an affordable, reliable and sustainable manner, while minimizing the associated adverse environmental impacts.

The National Development Plan (NDP) envisages that by 2030 South Africa will have an energy sector that promotes economic growth and development through adequate investment in energy infrastructure. The plan also envisages that by 2030 South Africa will have an adequate supply of electricity and liquid fuels to ensure that economic activities and welfare are not disrupted, and that at least 95% of the population will have access to grid or off-grid electricity.

In this report, the 2018 South African Energy Balance is analyzed by breaking it down per sub-sectors, that is, the total primary energy supply which includes domestic production as well as imports and exports and total final consumption which includes the economic sectors, industry, transport, agriculture, commercial and public as well as residential sectors. There is also a further breakdown into the various industry subsectors in terms of energy consumption. The purpose of this report is therefore to show how and in what proportions the country's available energy is supplied and consumed by different sectors.

List of Abbreviations

bbl/d	Barrels per day
CAIA	Chemical and Allied Industries' Association
CEF	Central Energy Fund
CTL	Coal-To-Liquid
DMRE	Department of Mineral Resources & Energy
DOE	Department of Energy
GDP	Gross Domestic Product
GTL	Gas-To-Liquid
IEP	Integrated Energy Plan
INEP	Integrated National Electrification Programme
IRP	Integrated Resource Plan
JPoI	Johannesburg Plan of Implementation
LPG	Liquified Petroleum Gas
Mt	Megaton
MW	Megawatts
MYPD	Multi-Year Pricing Determination
NERSA	National Energy Regulator of South Africa
PetroSA	Petroleum Oil and Gas Corporation of South Africa
TJ	Tera Joules
R/t	Rand per Ton
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
ROM	Run-of-Mine
SAPIA	South African Petroleum Industry Association
StatsSA	Statistics South Africa
SWH	Solar Water Heaters
WSSD	World Summit on Sustainable Development

Key Energy Policies and Legislations

1. White Paper on the Energy Policy, December 1998

The White Paper on the Energy Policy was developed so as to clarify government policy regarding the supply and consumption of energy for the next decade. It was intended to address all elements of the energy sector as practical as it could. This White Paper gives an overview of the South African energy sector's contribution to GDP, employment, taxes and the balance of payments. It concludes that the sector can greatly contribute to a successful and sustainable national growth and development strategy.

The main objectives of the White Paper are the following:-

- Increasing access to affordable energy services.
- Improving energy governance.
- Stimulating economic development.
- Managing energy-related environmental impacts.
- Securing supply through diversity.

2. White Paper on Renewable Energy, November 2003

The White Paper on Renewable Energy supplements the Government's overarching policy on energy as set out in its White Paper on the Energy Policy (as stated above), which pledges *'Government support for the development, demonstration and implementation of renewable energy sources for both small and large-scale applications'.*

This White Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa. Additionally, it has the following two goals:

- to inform the public and the international community of the Government's goals, and how the Government intends to achieve them, and;
- to inform Government agencies and Organs of State of these goals, and their roles in achieving them.

3. Nuclear Energy Policy, October 2008

The nuclear sector in South Africa is mainly governed by the Nuclear Energy Act 1999, Act 46 of 1999 and National Radioactive Waste Disposal Institute Act, Act 53 of 2008. National Nuclear Regulator (NNR) Act 1999, Act 47 of 1999. The Cabinet approved the Nuclear Energy Policy for South Africa in October 2008. The Nuclear Energy Policy outlines the South African government's vision for the development of an extensive nuclear energy programme by ensuring that Government's objective on the prospecting and mining of uranium ore and the use of uranium (or other relevant nuclear materials) as a primary resource of energy must be regulated and managed in a manner that will be for peaceful purposes.

Through the Nuclear Energy Policy, Government aims to achieve the following objectives:

- Promotion of nuclear energy as an important electricity supply option through the establishment of a national industrial capability for the design, manufacture and construction of nuclear energy systems;
- Establishment of the necessary governance structures for an extended nuclear energy programme;
- Creation of a framework for safe and secure utilization of nuclear energy with minimal environmental impact;
- Contribution to the country's national programme of social and economic transformation, growth and development;
- To guide in the actions to develop, promote, support, enhance, sustain and monitor the nuclear energy sector in South Africa;
- Attainment of global leadership and self-sufficiency in the nuclear energy sector in the long-term;
- Exercise control over unprocessed uranium ore for export purposes for the benefit of the South African economy;
- Establishing of mechanisms to ensure the availability of land (nuclear sites) for future nuclear power generation;
- Allow for the participation of public entities in the uranium value chain;
- Promoting energy security for South Africa;
- Improvement of the quality of human life and to support the advancement of science and technology;
- Reduction of greenhouse gas emissions; and
- Skills development related to nuclear energy.

4. Integrated Resource Plan (IRP) 2010-30

The IRP is an electricity infrastructure development plan based on least cost supply and demand balance taking into account security of supply and the environment (minimize negative emissions and water usage).

When the IRP 2010-2030 was promulgated in March 2011, it was envisaged that it would be revised frequently due to the increasing demand of electricity in South Africa. The IRP, together with Ministerial Determinations issued in terms of Section 34 of the Electricity Regulation Act No. 4 of 2006, help investors to plan their investments in the country's energy sector and are used as a roadmap to meet the country`s electricity demand. In order to update and address gaps in the assumptions that were made in the IRP 2010-2030, the Department reviewed and updated the IRP and also extended the review period to 2050. The update process was mainly aimed at ensuring security of electricity supply, minimizing cost of electricity, minimizing negative environmental impact (emissions) and minimizing water usage.

5. National Energy Act, 2008

The National Energy Act, 2008 (Act 34 of 2008) ensures that diverse energy resources are available in sustainable quantities and at affordable prices in South Africa. In addition, the Act provides for the increased use of renewable energies, contingency energy supplies, the holding of strategic energy feedstock and carriers, and adequate investment in energy infrastructure.

6. Petroleum Products Act, 1977

The aim of Petroleum Products Act, 120 of 1977, is to:

- Provide measures in the saving of petroleum products and an economy in the cost of the distribution thereof, the maintenance and control of a price, for the furnishing of certain information regarding petroleum products, and for the rendering of services of a particular standard, in connection with petroleum products;
- Provide for the licensing of persons involved in the manufacturing and sale of certain petroleum products;
- Promote transformation of the South African petroleum and liquid fuels industry;
- Provide for the promulgation of regulations relating to such licenses; and
- Provide for matters incidental.

7. Nuclear Energy Act, 1999

The aims of the Nuclear Energy Act, 1999 (Act 46 of 1999) are:

- To provides for the establishment of the National Energy Corporation of South Africa (Necsa) and defines its functions, powers, financial and operational accountability, governance and management;
- To provide for responsibilities for the implementation and application of the Safeguards Agreement and any additional protocols entered into by the Republic of South Africa and the International Atomic Energy Agency in support of the Nuclear Non-Proliferation Treaty acceded to by the Republic;
- To regulate the acquisition and possession of nuclear fuel, certain nuclear and related material and certain related equipment, as well as the importation and exportation of, and certain other acts and activities relating to, that fuel, material and equipment in order to comply with the international obligations of the Republic;
- To prescribe measures regarding the discarding of radioactive waste and the storage of irradiated nuclear fuel; and to provide for incidental matters.

8. The Gas Act, 2001

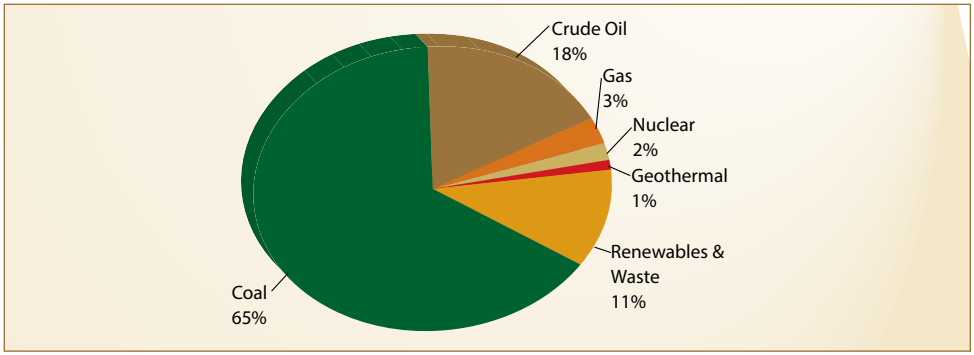
The aims of the Gas Act are as follows:

- To promote the orderly development of the piped gas industry;
- To establish a national regulatory framework;
- To establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework; and
- To provide for matters connected therewith.

1. ENERGY SUPPLY

The South African energy supply is dominated by coal which made up 65% of the primary energy supply in 2018, followed by crude oil with 18% and renewables with 11%. Natural gas contributed 3% while nuclear contributed 2% to the total primary supply during the same period. The primary energy supply in this case includes indigenous production and imported sources less exported quantities.

Figure 11: Total primary energy supply, 2018



Source: DoE Energy Balances, 2018

1.1 Crude oil and Petroleum Products

Overview

Owing to the lack of reserves, the country imports almost 90% of its crude oil from Saudi Arabia, Nigeria and Angola. During the transformation stage, the country produced approximately 3.2% of its fuel requirements from gas (GTL), 42.3% from coal (CTL), and 54.4% from crude oil (DoE, Energy Balance 2018). Majority of petroleum products are refined in the country, however, some petroleum products were imported to supplement the production shortfall.

South Africa has the second largest refining capacity in Africa amounting to 718 000 barrels per day following Egypt. There are six refineries in the country; four of the refineries are on the coast and two are inland. Two of the refineries are synthetic fuels production facilities that produce liquid fuels from coal and gas, which are owned by Sasol and PetroSA respectively.

Sasol uses both the Coal-To-Liquids (CTL) and Gas-To-Liquids (GTL) technologies. The Petroleum Oil and Gas Corporation of South Africa (PetroSA) produce synthetic products using GTL technology. Major refineries include Sapref and Enref in Durban, Chevron in Cape Town, and Natref at Sasolburg. The capacity and location of the six refineries is shown in Table 1-1 below.

Table 1-1: Refinery production capacity

Refinery	Area and Province	Type	Capacity*
Chevref	Cape Town, Western Cape	Crude	100 000
Enref	Durban South, KwaZulu Natal	Crude	135 000
Natref (Sasol Oil owns 64% and Total SA 36%)	Sasolburg, Free State	Crude	108 000
PetroSA	Mossel Bay, Western Cape	Synthetic (GTL)	45 000
Sasol Synfuels	Secunda, Mpumalanga	Synthetic (CTL)	150 000
Sapref (BP owns 50% and Shell 50%)	Durban South, KwaZulu Natal	Crude	180 000
Total			**718 000**

Source: SAPIA Annual Report 2018

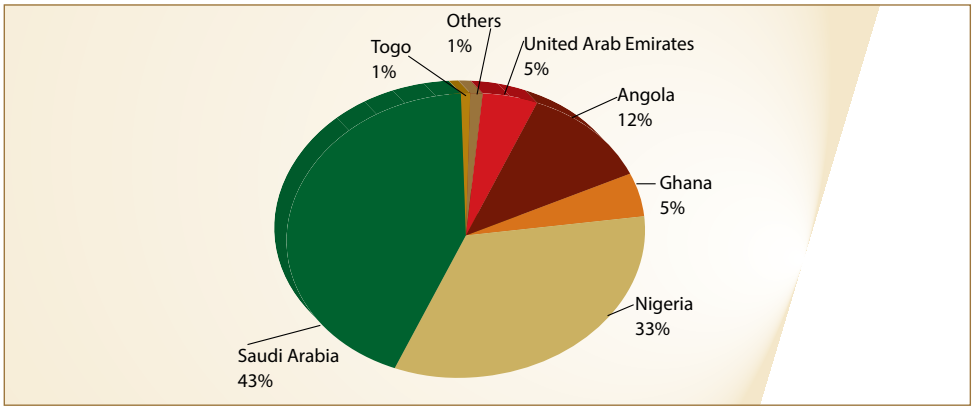
***Crude equivalent (bbl/day)**

Crude Oil

South Africa continued to import almost 100% of its crude oil requirements in 2018. The total primary crude oil supply was used by refineries during transformation process for liquid fuels production. Almost all the imported crude oil is used for the production of liquid fuels, with a small percentage used towards lubricants, bitumen, solvents and other petrochemicals.

As depicted in the figure 1-2 and table 1-2 below, majority of crude oil volumes (43%) was imported from Saudi Arabia. This was followed by imports from African countries with Nigeria at 33% and Angola at 12% in 2018.

Figure 1-2: Crude oil imports by region, 2018



Source: South African Revenue Service (SARS), 2018

United Arab Emirates and Ghana contributed 5.1% and 4.7%, respectively while small amounts from Togo and other different countries contributed the rest of the imported oil into the country.

Table 1-2: Crude Oil imports volumes by country of origin, 2018

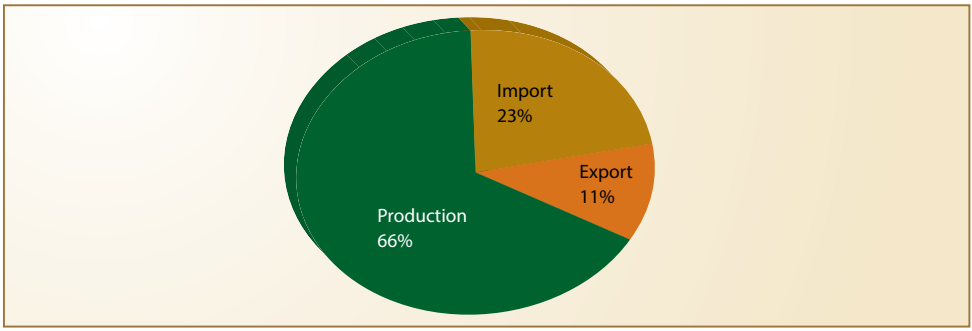
Country of Origin	Imports volume	
	Tons	%
United Arab Emirates	1 230 910	5,07
Angola	2 856 941	11,78
Ghana	1 149 469	4,74
Nigeria	7 905 469	32,59
Saudi Arabia	10 480 047	43,20
Togo	336 479	1,39
Others	297 424	1,23
Grand Total	**24 256 739**	**100**

Source: South African Revenue Service (SARS), 2018

Petroleum products

According to the 2018 Energy Balances, 66% of the total petroleum products supply was produced locally. Imports amounted to 23% to make up for the local production shortfall while exports amounted to 11%.

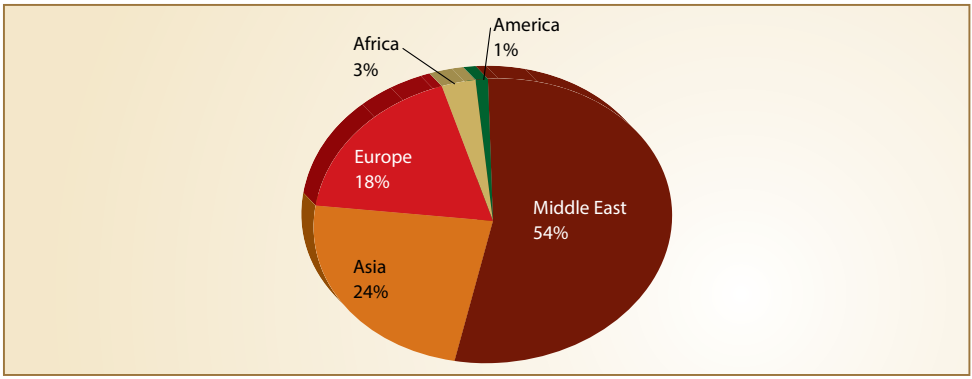
Figure 1-3: Petroleum products supply, 2018



Source: DoE Energy Balances, 2018

Majority of the petroleum products imported into South Africa was from the Middle East at 46% as depicted in figure 1-5 below. This was followed by the Asian region at 33% which was dominated by India, followed by Singapore and Malaysia, respectively. Europe accounted for 14% of the imported products, followed by Africa (6%) and America (1%), respectively.

Figure 1-4: Petroleum products imports by region, 2018



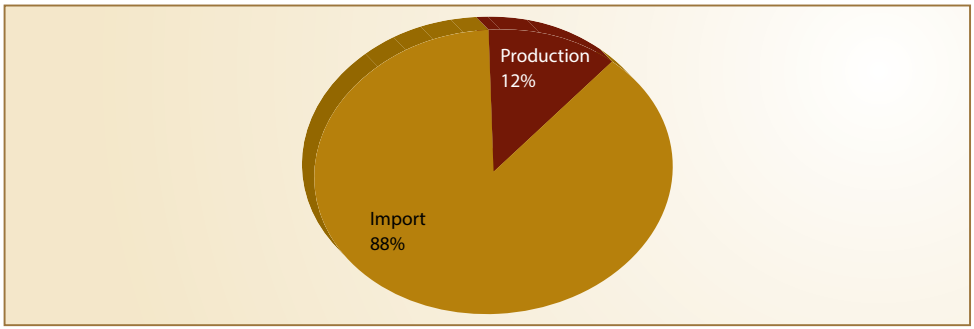
Source: South African Revenue Service (SARS), 2018

1.2 Natural gas

Currently natural gas is imported into South Africa by Sasol Gas via a 865 km pipeline from the Temane and Pande gas fields in Mozambique. Reserves in the Temane and Pande are estimated around 2.6 trillion cubic feet (TCF). The pipeline has a capacity of 240 million gigajoules (GJ) per annum. Approximately 120 million GJ is used annually by Sasol in the GTL and chemicals plant in Secunda, while the balance is distributed to commercial and industrial customers via a pipeline network covering more than 2 000km in the Free State, Gauteng, Mpumalanga and KwaZulu-Natal.

In 2018, natural gas made up 3% of the total primary energy supply in South Africa. Natural gas domestic production amounted to 12% in 2018 whilst imports amounted to 88% during the same period.

Figure 1-5: Natural gas primary supply, 2018



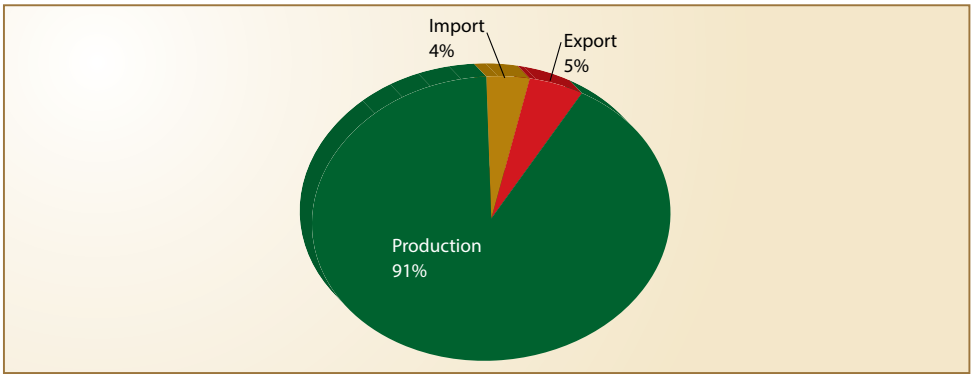
Source: DoE Energy Balances, 2018

1.3 Electricity

Eskom is vertically integrated across a value chain that supplies electricity to South Africa and the Southern African Development Community (SADC) region. An integrated grid connects the Southern African Power Pool (SAPP), which comprises South Africa, Botswana, eSwatini, Lesotho, Mozambique, Namibia, Zambia and Zimbabwe (Eskom, 2019). The utility import electricity from Lesotho, Mozambique, Zambia and Zimbabwe, and export to Botswana, eSwatini, Lesotho, Mozambique, Namibia, Zambia and Zimbabwe.

The electricity generated by Eskom and IPPs, combined with imports from neighbouring countries, is supplied in bulk to distributors, i.e. large metros and other municipalities and also distributed to industrial, commercial, residential and others (Eskom, 2019). It owns and operates a number of coal-fired, gas-fired, hydro and pumped storage power stations, as well as one nuclear power station. Local production amounted to 91% of total electricity supply in 2018, while the country's net exports amounted to 5%.

Figure 1-6: Electricity supply, 2018

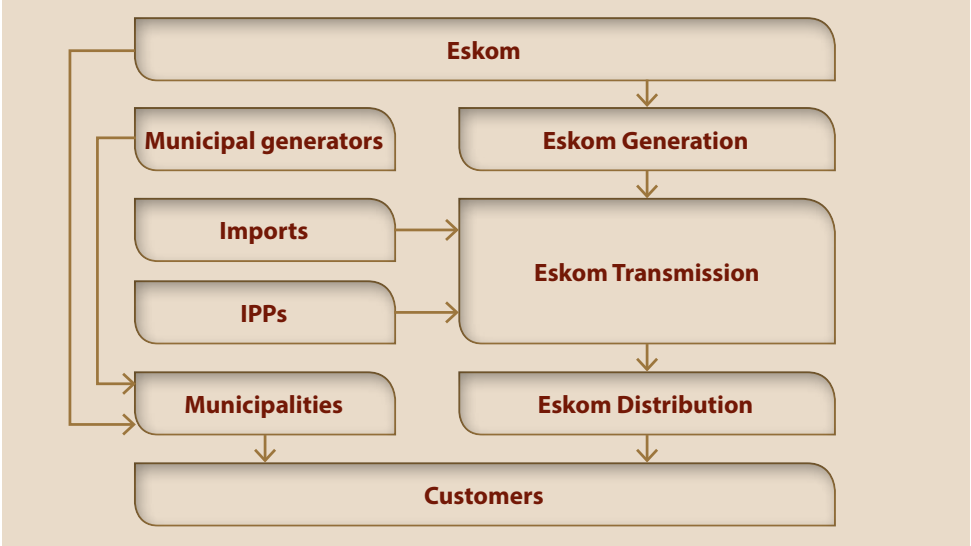


Source: DoE Energy Balances, 2018

Generation, Transmission and Distribution

Electricity infrastructure comprises of three sub-sectors, namely: - generation, transmission and distribution. In terms of generation, Eskom dominates the production of electricity. Eskom generates, transmits and distributes electricity to industrial, mining, commercial, agricultural and residential customers in South Africa, and to municipalities, who in turn redistributes electricity to businesses and households within their areas. The utility also purchases electricity from Independent Power Producers (IPPs) in terms of various agreement schemes as well as electricity generating facilities beyond the country's borders. Most power stations are located in Mpumalanga, except for Lethabo and Matimba which are located in the Free State and Limpopo provinces respectively.

Figure 1-7: Electricity Generation, Transmission and Distribution

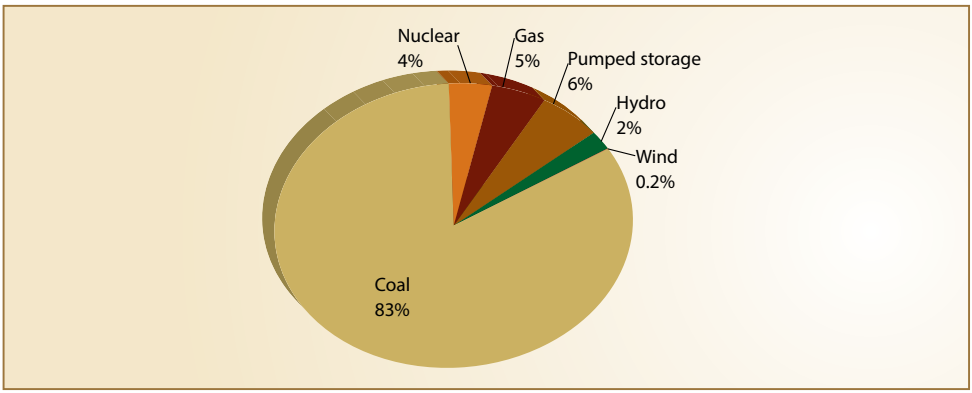


Source: Eskom

Eskom Generating Capacity

According to the Eskom's Integrated Results 2019, the total nominal capacity as at March 2019 amounted to 44GW.

Figure 1-8: Power Station Maximum Generating Capacity Mix



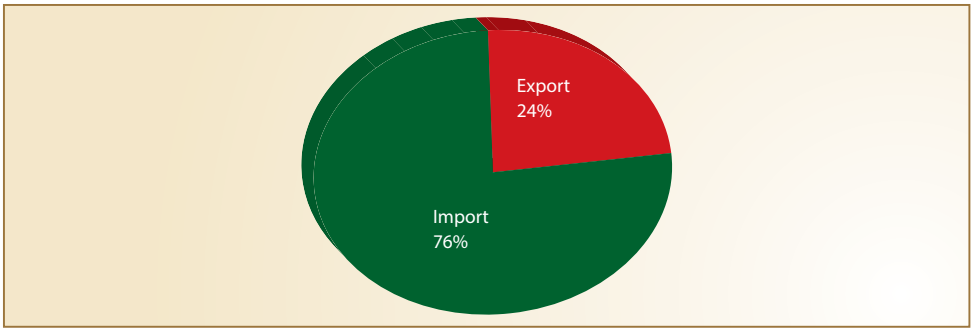
Source: Eskom Integrated Results, 2019

Coal fired power stations which makes up 83% to the nominal capacity mix generated just over 90% of the total energy in 2018. The rest of the energy generated came from a combined contribution by other power stations which accounted for 17% in total nominal capacity.

1.4 Coal

South Africa's indigenous energy-resource base continues to be dominated by coal and the country's dependency on coal-based energy is unlikely to change significantly in the next two decades. In addition to the extensive use of coal in the domestic economy, South Africa exported 24% of coal in 2018 with relatively low imports, as shown in Figure 1-10 below.

Figure 1-9: Coal primary supply, 2018



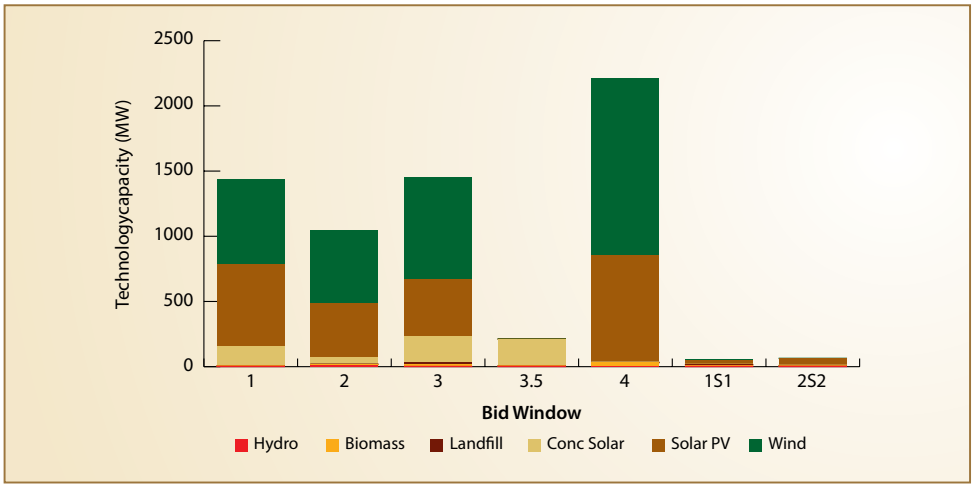
Source: DoE Energy Balances, 2018

1.5 Renewables

Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

The REIPPPP is aimed at bringing additional power into the electricity system through private sector investment in onshore wind, photovoltaic, concentrated solar power (CSP), biomass, landfill gas and small hydro technologies. The REIPPP programme constitutes one of the energy mixes as outlined in the National Development Plan and the Integrated Resource Plan 2010. The energy supply capacity per technology is currently dominated by onshore wind power at 52%, followed by photovoltaic power (36%) and CSP (9%), respectively.

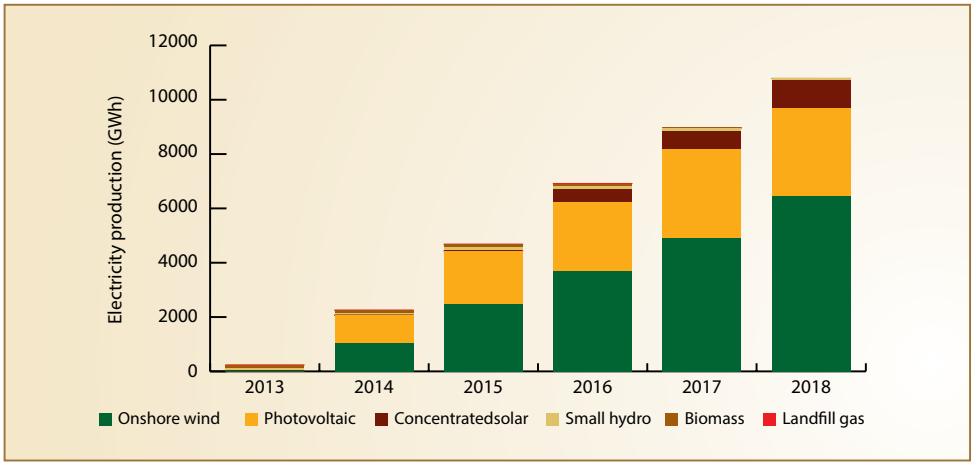
Figure 1-10: Programme capacity in windows 1, 2, 3 and 4



Source: Department of Energy (DoE), 2018

In 2018, the REIPPPP power production was dominated by onshore wind power at 60%, followed by photovoltaic power at 30%. Concentrated solar power and small hydro power contributed 10% and 1%, respectively, to electricity produced through the REIPPPP. A total of 10 809 GWh was produced in 2018.

Figure 1-11: Electricity production through REIPPPP, 2013 - 2018



Source: Department of Mineral Resources and Energy (DMRE), 2018

1.6 Nuclear

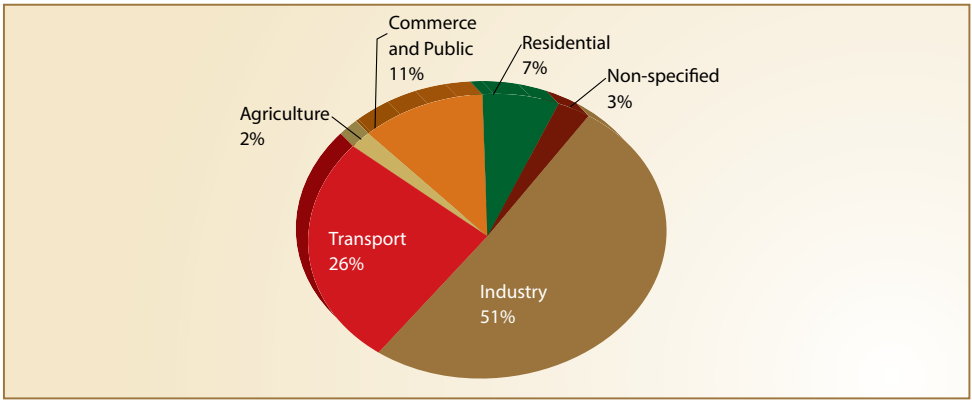
Nuclear energy contributed about 2% to total energy supply. Koeberg nuclear power station is the only nuclear power station in South Africa and contains two 900MW uranium pressurized water reactors. All the uranium used at the Koeberg Power Station is produced locally. The station located 30 km north of Cape Town. The plant is owned and operated by the country's national electricity supplier, Eskom.

2. ENERGY DEMAND

Energy is the lifeblood of the South African economy and is an important sector of the economy that creates jobs and value by extracting, transforming and distributing energy goods and services throughout the economy.

The share percentage of energy consumed by various sectors in the economy is depicted in figure 2-1 below. The five sectors identified in this report are industrial, transport, agriculture, residential, commerce and public services. The sector "non-specified" refers to unaccounted energy (energy that has not been classified into a specific sector).

Figure 2-1: Energy demand by sector, 2018

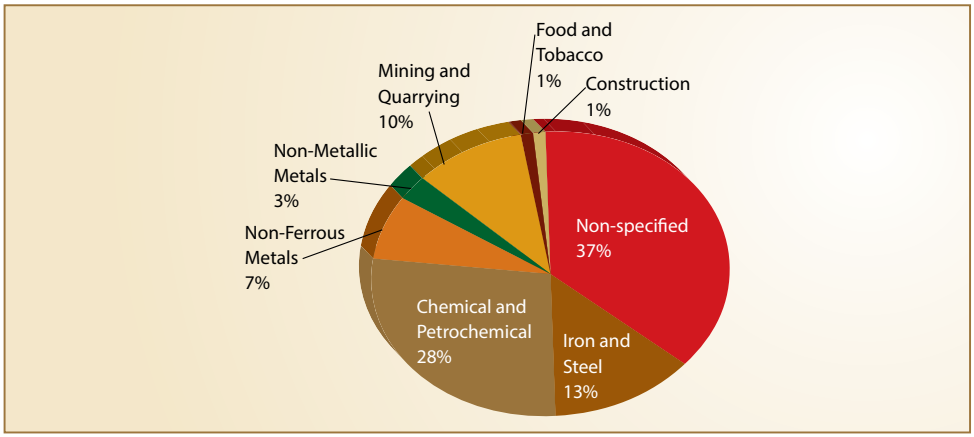


Source: DoE Energy Balances, 2018

2.1 Industrial sector

Chemical and petrochemical at 28% followed by iron and steel at 13% and mining and quarrying at 10%, respectively, are the largest consumers of energy in the industrial sector as depicted in Figure 2.2 below. Non-ferrous metals account for 7% while non-metallic minerals account for 3%. The remaining sub-sectors had minor energy consumption of 1% or less. The industrial sector consumed 51% of the final energy supplied in 2018.

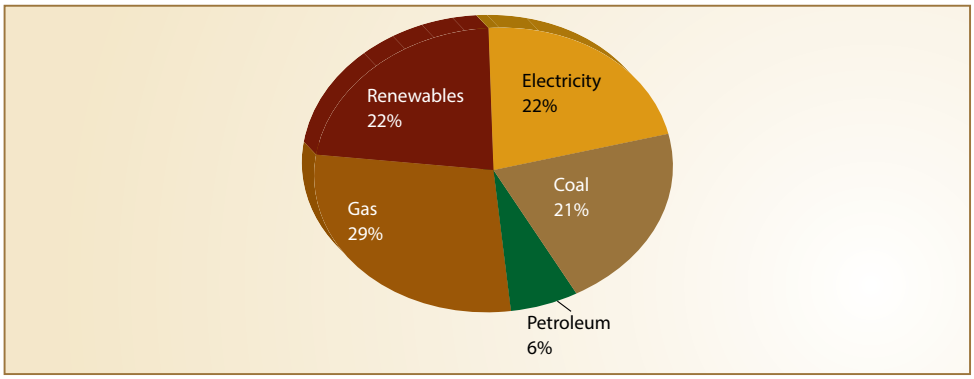
Figure 2-2: Energy demand by industrial sub-sectors, 2018



Source: DoE Energy Balances, 2018

As depicted below in figure 2-3, renewable energy and electricity both accounted for 22% as the most consumed sources of energy in the industrial sector. This was followed by gas at 29% and coal at 21%, respectively. Petroleum products accounted for 6% to the total energy consumption in the sector.

Figure 2-3: Energy demand in the industrial sector, 2018

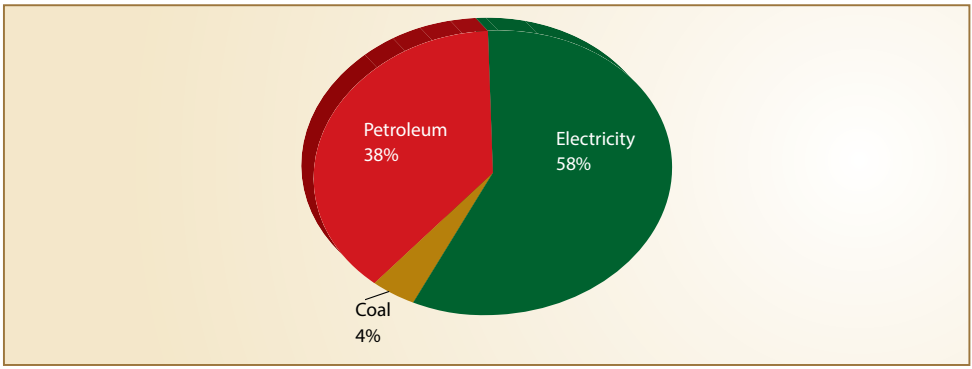


Source: DoE Energy Balances, 2018

2.1.1 Mining

The mining sector is one of the main consumers of energy in the country, particularly electricity. Electricity accounted for 58% of all the energy available to the sector in 2018, followed by petroleum products at 38% and coal at 4% as depicted in figure 2-4 below. The total energy used by the sector is approximately 183 435TJ.

Figure 2-4: Energy demand in mining, 2018

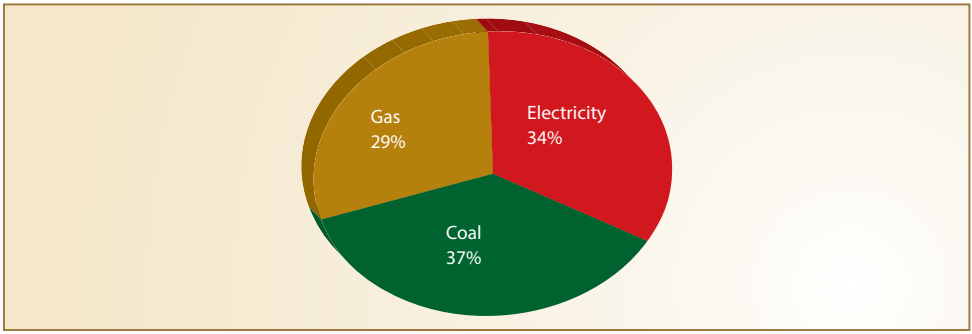


Source: DoE Energy Balances, 2018

2.1.2 Iron and steel

The main energy carriers for iron and steel industry are coal, electricity and gas. In 2018, coal contributed 37% towards the final energy demand of the sector whereas electricity contributed 34% as depicted in figure 2-5. The remainder of its energy requirements was derived from gas contributing 29%. The total amount of energy used by the sector was 224 670TJ.

Figure 2-5: Energy demand in Iron and Steel industry, 2018

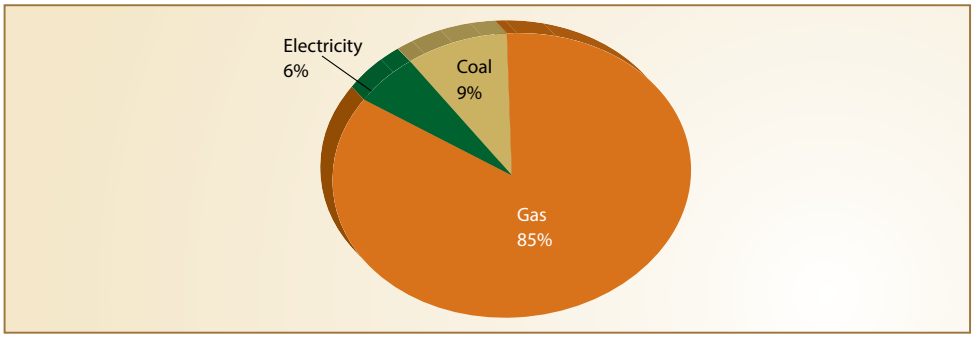


Source: DoE Energy Balances, 2018

2.1.3 Chemicals

South Africa chemical industry is gas and coal intensive thereby becoming the first most consumer of gas at 418 406TJ and second for coal at 46 094TJ following the iron and steel industry. Electricity consumption by the sector accounted for 6% of the total energy supplied to the sector. Figure 2-6 depicts the energy demand in the chemical and petrochemical industry.

Figure 2-6: Energy demand in Chemical and Petrochemical industry, 2018

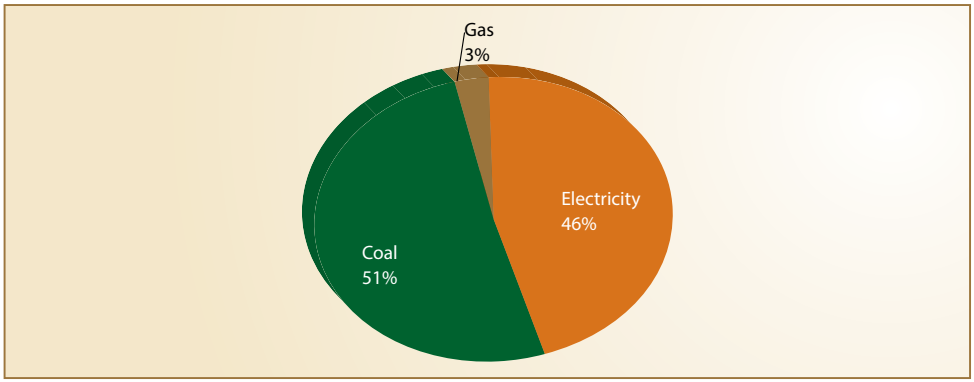


Source: DoE Energy Balances, 2018

2.1.4 Non-Ferrous Metals

The non-ferrous metal sector consumed roughly 119 240TJ of energy supplied in 2018. The non-ferrous metals coal consumption amounted to 60 949TJ, which makes up 51% as depicted below. Electricity and gas contributed 46% and 3% respectively.

Figure 2-7: Energy demand in non-ferrous metals, 2018

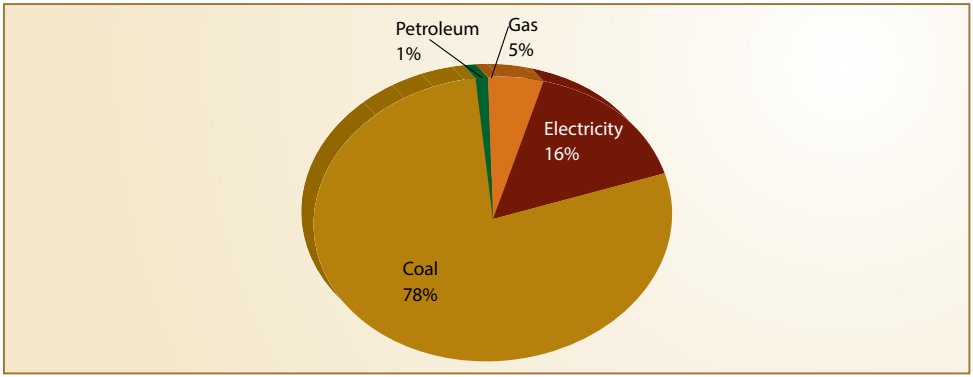


Source: DoE Energy Balances, 2018

2.1.5 Non-Metallic Minerals

Coal was the dominant energy carrier for the non-metallic minerals sector at 78%, followed by electricity contributing 16% while gas contributed 5%. The total energy consumed by the sector is 48 765TJ.

Figure 2-8: Energy demand in non-metallic minerals, 2018

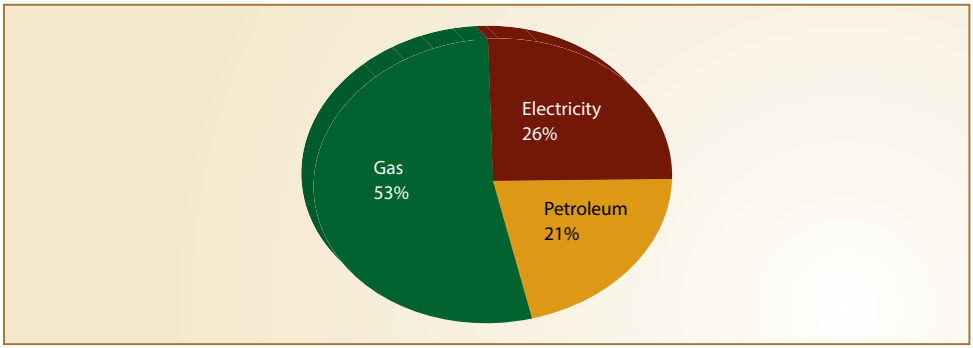


Source: DoE Energy Balances, 2018

2.1.6 Food and Tobacco

The total energy consumption by the food and tobacco sector in 2018 was 9 806TJ with gas and electricity contributing 53% and 26%, respectively. Petroleum products contributed 21% to the total energy consumed in the sector as depicted in the figure below.

Figure 2-9: Energy demand in food and tobacco, 2018

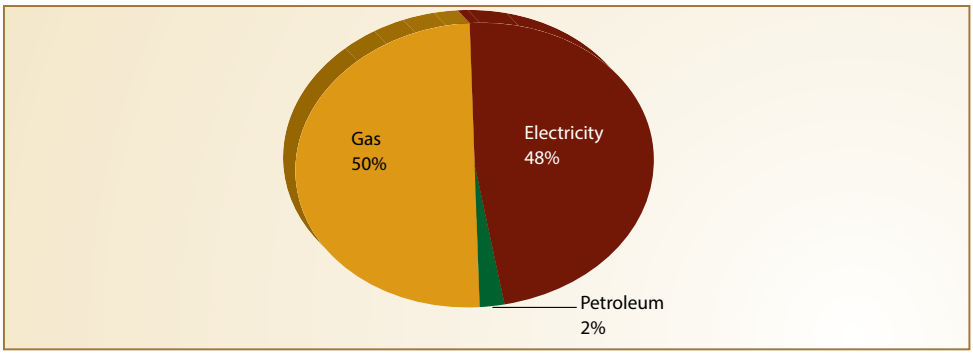


Source: DoE Energy Balances, 2018

2.1.7 Pulp and Paper

The pulp and paper industry used 50% of gas and 48% of electricity as energy sources, consuming 8 629TJ in total. Energy demand in this sector excludes own generation from biomass, which is currently not reported.

Figure 2-9: Energy demand in pulp and paper industry, 2018

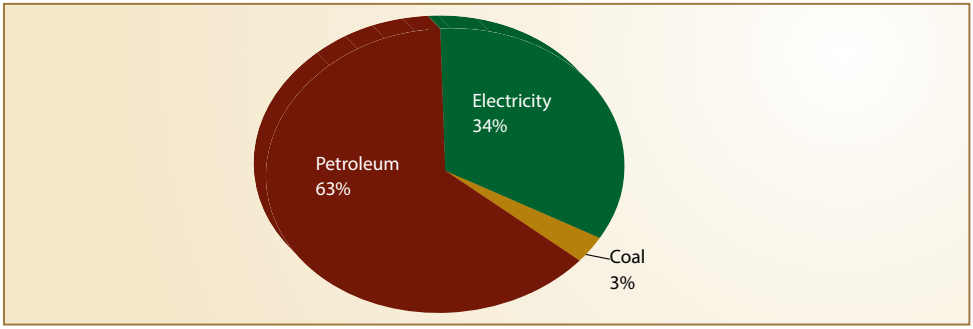


Source: DoE Energy Balances, 2018

2.2 Commerce and Public Services Sector

The commercial sector comprises of financial services, information technology, retail, tourism and services industry. Public services sector comprises of government and quasi government institutions which provides goods and services to the public, mainly for free. The total energy used by this sector is approximately 391 822TJ. The sector consumed electricity at 34% of the total energy consumed in the sector while petroleum products accounted for 63% and coal's contribution accounted for 3% as depicted below.

Figure 2-10: Energy demand in the commerce and public services sector, 2018

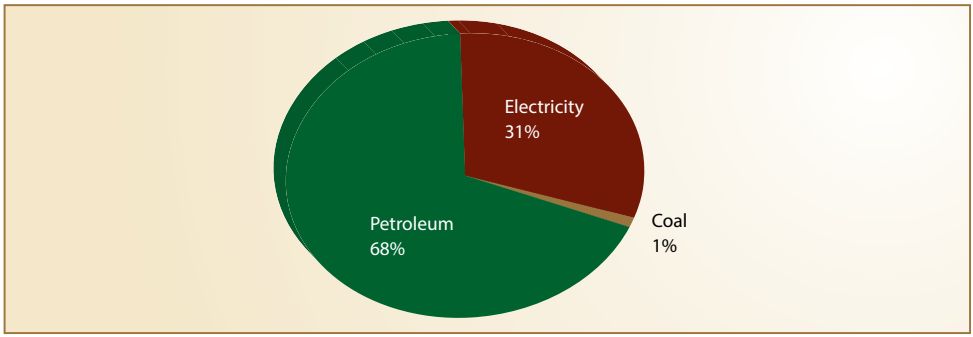


Source: DoE Energy Balances, 2018

2.3 Agricultural Sector

As shown in figure 2-11, the agricultural sector consumed 47 920TJ of liquid fuels which amounted to 68% of the energy consumed in the sector in 2018. This is as a result of transportation of agricultural raw materials, feeds, intermediary and finished products from farms to various market areas. Electricity accounted for 31% of energy demanded in the same year amounting to 21 485TJ in consumption.

Figure 2-11: Energy demand in the agriculture sector, 2018

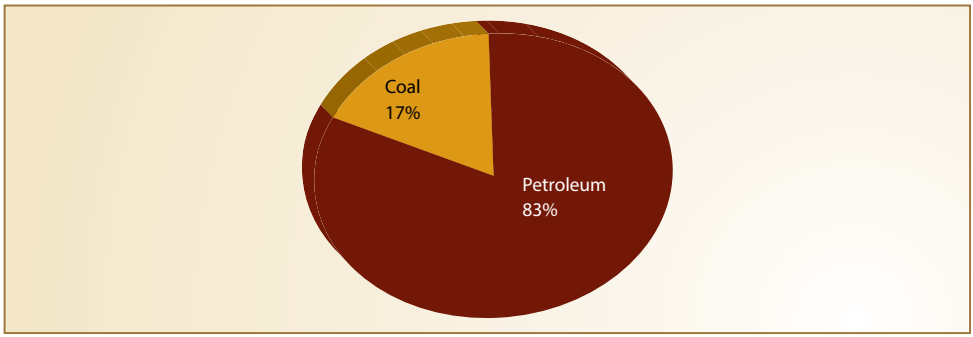


Source: DoE Energy Balances, 2018

2.4 Transport Sector

As the largest user of liquid fuels, the transport sector consumed 726 306TJ in 2018. Most of the liquid fuels (78%) were used on the road followed by international civil aviation and domestic air transport both consuming 10%. The transport sector accounted for 63% of the total petroleum products consumed in the country.

Figure 2-12: Energy demand in the transport sector, 2018

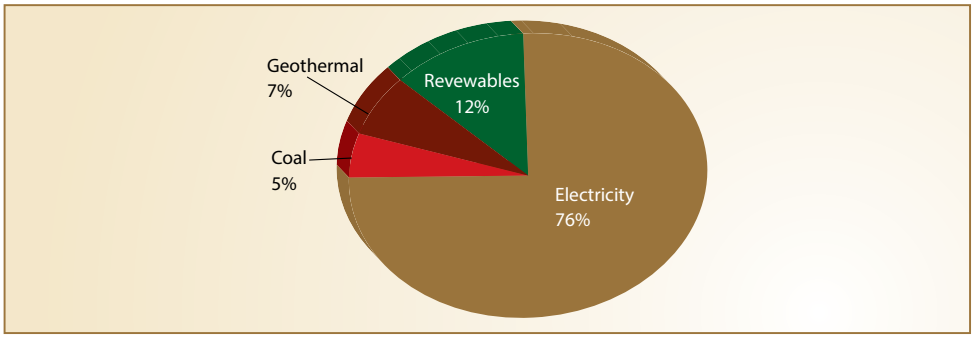


Source: DoE Energy Balances, 2018

2.5 Residential Sector

The residential sector accounted for 7% of the total energy consumption in 2018. The consumption of electricity amounted to 76% of the total energy consumed in the sector. Renewables accounted for 12% while geothermal and coal accounted for 7% and 5%, respectively. In total the sector consumed 230 064TJ of energy.

Figure 2-13: Energy demand in the residential sector, 2018



Source: DoE Energy Balances, 2018

NB: Due to misaligned mappings of the raw data on consumption to the ISIC codes, the Department of Energy estimated the residential consumption of coal as one third of sales to merchants and domestic markets. This estimate kept on increasing over the years, which is contrary to the increasing number of residential electricity connections.

It was subsequently found necessary to estimate the actual consumption in this sector using methodologies that take into account the actual residential coal end-use data (from the General Household Survey) carried out by Statistics South Africa (StatsSA). The methodology was based on the average (in Rands) spent each month by sampled household. This average was used to calculate tons of coal consumed by dividing the total expenditure by the average coal price. Inferring these to the total population resulted in the massive drop in coal consumption in residential sector.

References

1. DMR (2019), South African Mining Industry 2017/2018, Department of Mineral Resources, Pretoria.
2. DoE (2010). Nuclear Energy Policy 2008, Department of Energy, Pretoria.
3. DoE (2010). White Paper on Renewable Energy, November 2003, Department of Energy, Pretoria.
4. DoE (2010). White Paper on the Energy Policy 1998, Department of Energy, Pretoria.
5. DOE, 2017, Annual Performance Plan 2016/17, Department of Energy, Pretoria.
6. Energy Research Institute, Energy Outlook for South Africa, May 2002.
7. Eskom. (2019). Integrated Results for the year ended 31 March 2019, Eskom, Johannesburg.
8. IPP-Projects, 2020, Independent Power Producers Procurement Programme (IPPPP), An Overview
9. Pamela M. and Roberts S. (2014). Review of economic regulation of liquid fuels and related products, 24 June 2014.
10. South Africa Yearbook 2018/2019, Energy.

Notes

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