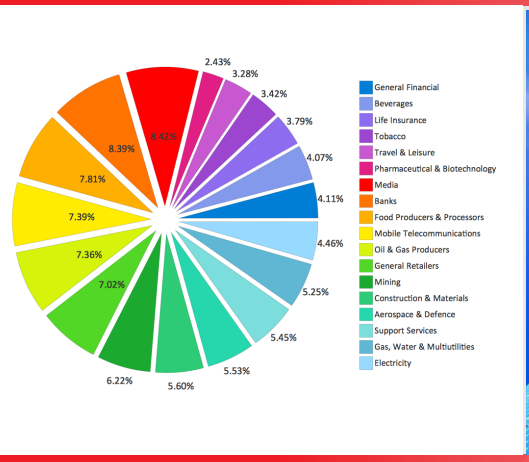
ENERGY REGULATION BOARD

STATISTICAL BULLETIN

2017



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OUR MANDATE

The mandate of the Energy Regulation Board is to regulate the energy sector in line with the provisions of the Energy Regulation Act Cap 436 of the Laws of Zambia.

OUR VISION

A proactive, firm and fair energy regulator.

MISSION STATEMENT

To regulate the energy sector in order to ensure efficient provision of reliable and quality energy services and products.

EDITORIAL TEAM

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Table of Contents

List of Figures

List of Tables

LIST OF ABBREVIATIONS

COMESA	Common Market for Eastern and Southern Africa
ERB	Energy Regulation Board
HFO	Heavy Fuel Oil
INDENI	INDENI Petroleum Refinery Company Limited
NFT	Ndola Fuel Terminal
OMC	Oil Marketing Company
SAPP	Southern African Power Pool
TAZAMA	Tanzania Zambia Mafuta
ZESCO	ZESCO Limited

UNITS OF MEASUREMENT

Bbl	Barrels of oil (159 litres)
GWh	Giga-Watt hour (1,000 MWh)
K	Zambian Kwacha (ZMW)
Km	Kilometre
kV	Kilo Volt
kVA	Kilo Volt Amperes (1,000 Volt Amps)
kW	Kilo Watt
kWh	Kilo Watt Hour
MW	Mega Watt
MWh	Mega Watt Hour (1,000 kWh)
MT	Metric Tonne (in this document means a mass equivalent to 1,000 kg)
m^3	Cubic Meters
US$	United States of America dollar

FOREWORD

It is an honour to present the 2017 Energy Regulation Board (ERB) annual statistical bulletin. This is the fifth publication of the annual statistical bulletin and builds from the previous editions. The publication is in line with our mandate to regulate the energy sector in an efficient manner by providing energy statistics. It is published bi-annually and provides an extensive overview of the statistics published in the Energy Sector Report. It highlights statistics on licensing, electricity generation, petroleum consumption and other energy related statistics which are accompanied by graphics; that give detailed technical annotations, notes and descriptions for easy understanding.

The statistics provided are of great significance to several stakeholders including the Government, investors and regulators. The report is made available in various formats including print and electronic media; and can be accessed from our website in pdf format.

By regularly publishing the statistical bulletin, and making such data publicly available, the ERB seeks to ensure greater access to data on key developments in the energy sector in Zambia.

I therefore would like to thank all stakeholders that provided valuable contributions and data used in this publication. I trust and believe that you will find this publication useful and therefore would like to invite you, the reader to send us your comments and suggestions on the relevance of the information presented herein. Your feedback and suggestions will help us to improve this publication according to your information needs.

Langiwe H. Lungu (Ms)

Executive Director

March 2018

1.0 LICENSING STATISTICS

The development of the energy sector demands regulation. Regulation is conventionally understood as the disposition of administrative authority to inaugurate systematic oversight by reference to rules over some activities valued by the general public, normally involving a committed municipal agency concerned with both monitoring and enforcement[1]. The criterion for awarding licences is premised on the fact that the ERB must regulate all undertakings in the energy sector. The ERB regulates all undertakings in the three energy sub-sectors namely: Electricity, Fossil Fuels and renewable energy. Different types of licenses are awarded to different industry players in the electricity, petroleum and renewable energy sub-sectors.

The types of licenses issued in the electricity sub-sector include, generation, transmission, supply and distribution of electricity. Different licenses issued by the petroleum sub sector include, importation of petroleum feedstock, importation of petroleum products, pipeline of transportation of petroleum feedstock, refining of petroleum feedstock, terminal storage of petroleum products, distribution of petroleum products, retail of petroleum products, road transportation of petroleum products, blending and packaging of lubricants and temporary importation of petroleum products. Meanwhile, four types of licenses are issued in the renewable energy sub-sector namely; processing and marketing of coal, transportation of coal, marketing of coal as well as licence to manufacture, supply, installation and maintenance of renewable/solar energy systems

During the year 2017, a total of 241 licences were issued in the electricity and petroleum sub-sectors. The total number of licenses issued in 2017 increased by 48.77%, from a total of 162 in 2016 to 241 in 2017. Section 1.1 and 1.2 presents details of the licences issued.

1.1 Electricity sub-sector licensing

In 2017, a total of 110 licences were issued in the electricity sub-sector of which 52 were standard licenses and 58 were provisional as summarised in Table one.

[1]Selznick, Philip, 'Focusing Organizational Research on Regulation' in Roger Noll (ed), Regulatory Policy and the Social Sciences (1985); Black, Julia, 'Critical Reflections on Regulation' (2002) 27 Australian Jounal of Legal Philosophy

Sub-sector	Type of Licence	Standard	Provisional	Total
Electricity sub-sector	Generation	1	0	1
	Generation of Electricity for own use	0	0	0
	Transmission	0	0	0
	System Operator Licence – Operation for the	0	0	0
	Zambia Interconnected Power System Supply	0	0	0
	Manufacture, Supply , Installation and Maintenance	51	58	109
Total		**52**	**58**	**110**

Table 1: Licences issued in the Electricity sub-sector in 2017

1.2 Petroleum sub-sector licensing

Table 2 depicts that there were 131 licences issued in the petroleum sub-sector in 2017. This comprised 79 standard and 71 provisional licenses as shown in Table 2.

Sub-sector	Type of Licence	Standard	Provisional	Total
Petroleum	Combined Licence to Distribute, Import and Export Petroleum Products	14	20	34
	Importation Of Petroleum Products (Lubricants)	10	8	18
	Combined Licence to Distribute, Import and Export Petroleum Products (LPG)	2	1	3
	Retail of Petroleum Products	6	7	13
	Retail of Petroleum Products – LPG	1	2	3
	Road Transportation of Petroleum Products	28	23	51
	Bio Ethanol production	1	0	1
	Authority to operate a filling station	0	8	8
	Grand total	**62**	**69**	**131**

Table 2: Licences issued in the petroleum sub-sector in 2017

2.0 ELECTRICITY SUB-SECTOR STATISTICS

2.1 Installed generation capacity

The total national installed electricity capacity increased from 2,827 MW in 2016 to 2,897 MW in 2017 reflecting an increase of 2.48%. This increase was on account of the uprating of Musonda falls to 10 MW and the commissioning of the second phase 60 MW Heavy Fuel Oil (HFO) power plant at Ndola Energy Company. In terms of installed capacity by technology, hydro generation continued to dominate accounting for 82.79%, followed by coal at 10.36%. This was followed by HFO, diesel and solar with 3.80%, 3.06% and 0.002%, respectively. Table 3 shows a summary of the installed national generation capacity by technology in 2017.

Undertaking	Station	Machine Type	Installed Capacity (MW)
ZESCO Limited Generation Plants	Kafue Gorge	Hydro	990
	Kariba North	Hydro	720
	Kariba North extension	Hydro	360
	Victoria Falls	Hydro	108
	Lunzua River	Hydro	14.5
	Lusiwasi	Hydro	12
	Chishimba Falls	Hydro	6
	Musonda Falls	Hydro	10
	Shiwang'andu	Hydro	1
Itezhi-tezhi Power Corporation	Itezhi-tezhi	Hydro	120
Zengamina Generation Plants	Ikelengi	Hydro	0.75
Lusemfwa Generation Plants	Mulungushi	Hydro	32
	Lunsemfwa	Hydro	24
	Total Hydro		**2,398.25**
Maamba Collieries Limited	Maamba Power Plant	Coal	300
	Total Coal		**300**
Copperbelt Energy Generation Plants	Bancroft	Diesel	20
	Luano	Diesel	40
	Luanshya	Diesel	10
	Mufulira	Diesel	10
ZESCO Generation Plants	Kabompo	Diesel	2.00
	Zambezi	Diesel	1.9
	Mufumbwe	Diesel	0.8
	Luangwa	Diesel	2.6
	Lukulu	Diesel	0.5
	Chavuma	Diesel	0.8
	Total Diesel		**88.60**
Ndola Energy Generation Plants	Ndola	Heavy Fuel Oil	110
	Total HFO		**110**
Rural Electrification Authority Generation Plants	Samfya	Solar	0.06
	Total Solar		**0.06**
	Grand Total		**2,896.91**

Table 3: Installed national generation by capacity and technology as at 31st December 2017.

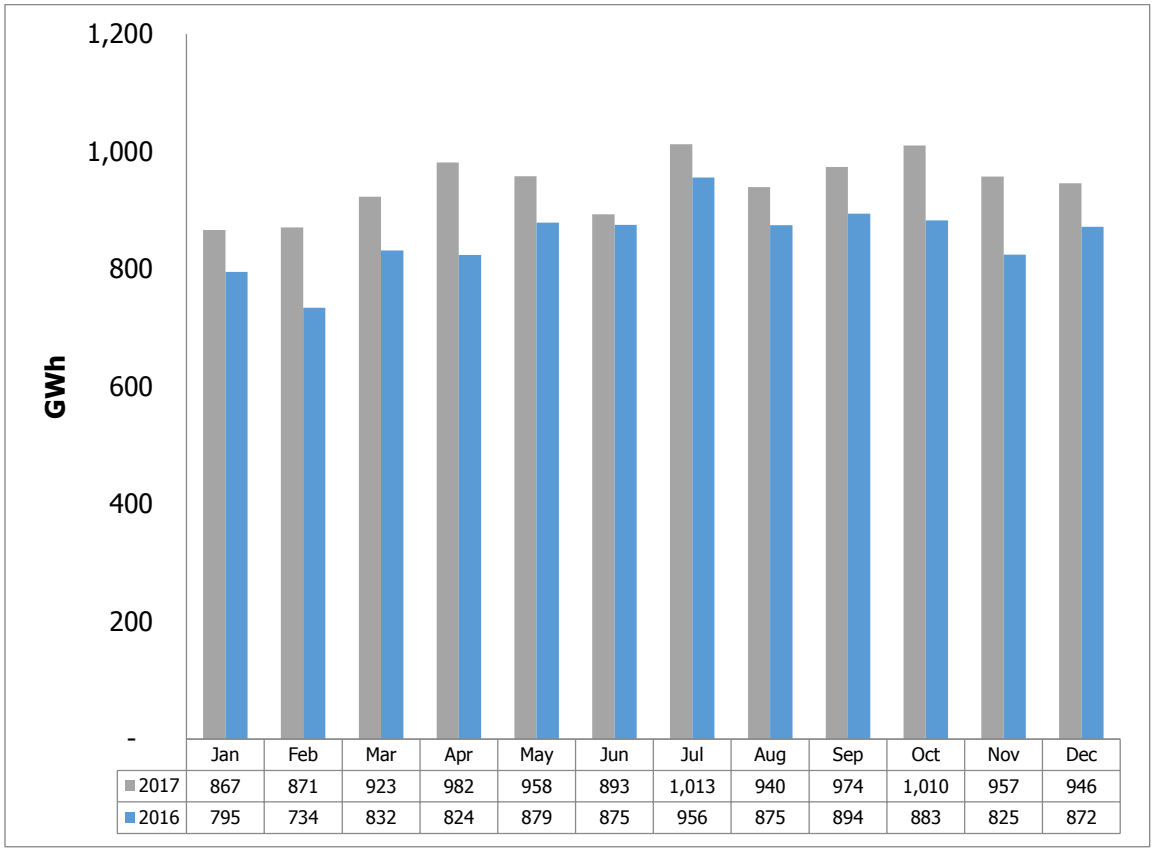
2.2 Generation sent out

The total national electricity generation sent out from ZESCO and Independent Power producers increased from 11,696 GWh in 2016 to 14,460 GWh in 2017 reflecting a percentage increase of 23.6%. This was mainly on account of:

i. Good rainfall in the 2016/2017 rainy seasons which lead to improved generation from the hydro power plants; and
ii. The commissioning of new HFO power plant.

2.2.1 Generation from large hydro power plants

During the period under review, the total generation sent out from ZESCO large hydro power plants increased by 10.64 % from 10,244 GWh in 2016 to 11,334 GWh in 2017. The increase was due to the increased rainfall in the 2016/2017 rainy season that led to high water levels and consequently increased generation capacity from hydro power plants. Figure 1 shows generation sent out from ZESCO's major hydropower plants in 2017 compared to the same period in 2016 on a monthly basis.

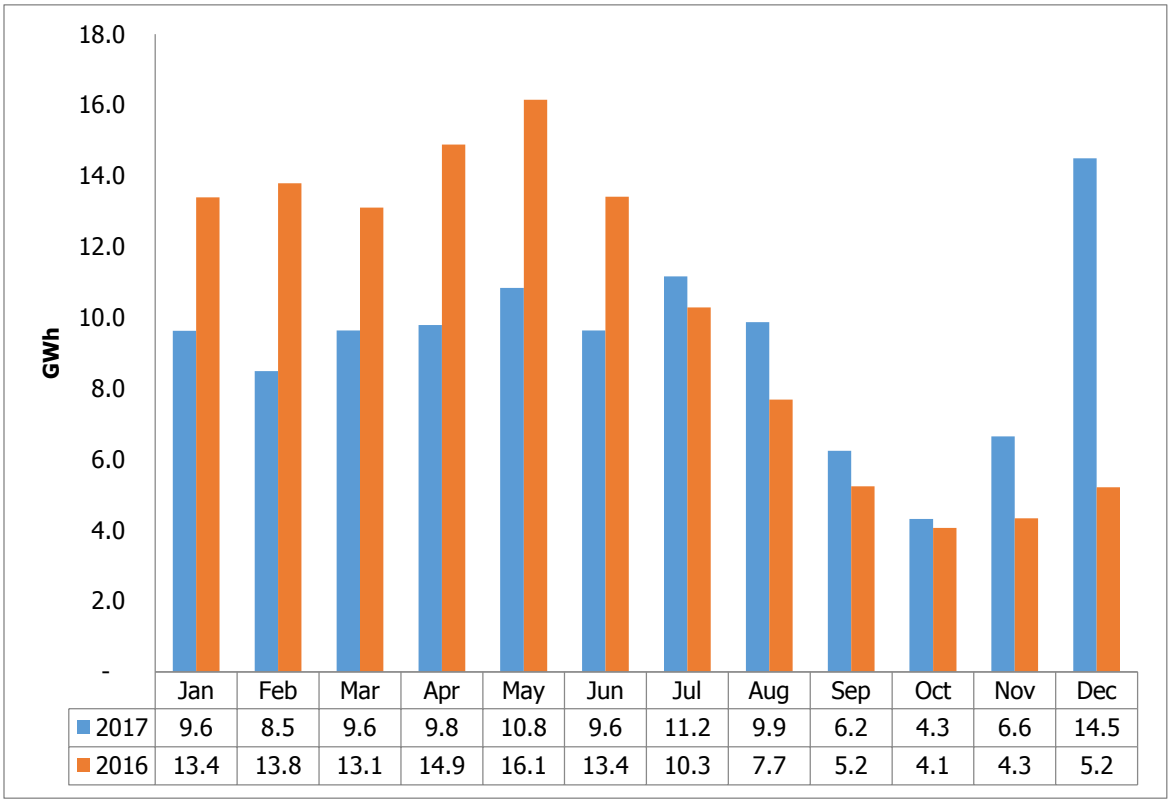


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	867	871	923	982	958	893	1,013	940	974	1,010	957	946
2016	795	734	832	824	879	875	956	875	894	883	825	872

Figure 1: Electricity generation from ZESCO's large hydro power plants, 2016 and 2017

2.2.2 ZESCO's generation from small and mini hydro power plants

Figure 2 shows the total generation sent out from ZESCO's small and mini hydro power plants in 2016 and 2017. As depicted, the total generation sent out from ZESCO's small and mini hydro power plants declined by 8.97 % to 110.6 GWh in 2017 from 121.5 GWh in 2016. The observed decline resulted from decreased generation sent out from Lunzua power station and Chishimba Falls as a result of technical problem. In the case of Musonda Falls, the station underwent uprating and produced 6.1 GWh during the test runs.

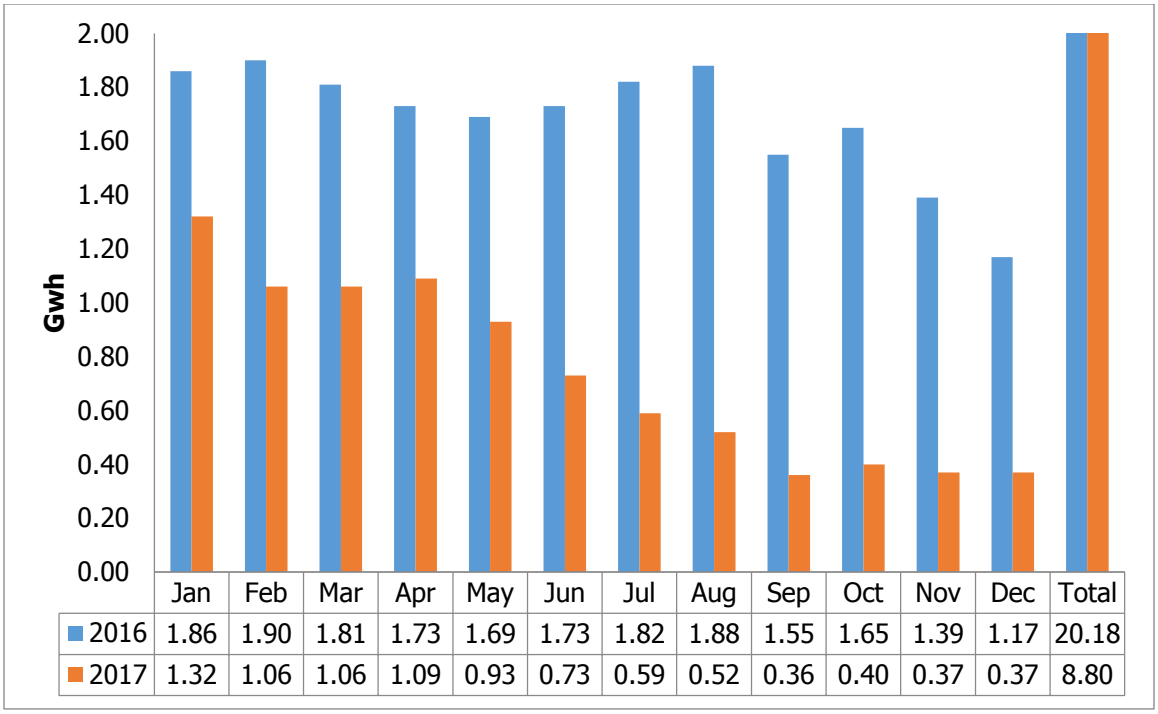


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	9.6	8.5	9.6	9.8	10.8	9.6	11.2	9.9	6.2	4.3	6.6	14.5
2016	13.4	13.8	13.1	14.9	16.1	13.4	10.3	7.7	5.2	4.1	4.3	5.2

Figure 2: Generation sent out from ZESCO's small and mini hydro power plants, 2016 and 2017.

2.2.3 ZESCO's generation from diesel power plants

The total electricity generation sent out from ZESCO's diesel power plants significantly reduced by 56.39% to 8.79 GWh in 2017, from 20.2 GWh in 2016.This was attributed to the connection of Zambezi, Kabompo, Lukulu and Mufumbwe Districts to the national grid and subsequent decommissioning of the diesel power plants. Figure 3 shows generation sent out by ZESCO's diesel power plants in 2017 compared to the same period in 2016.



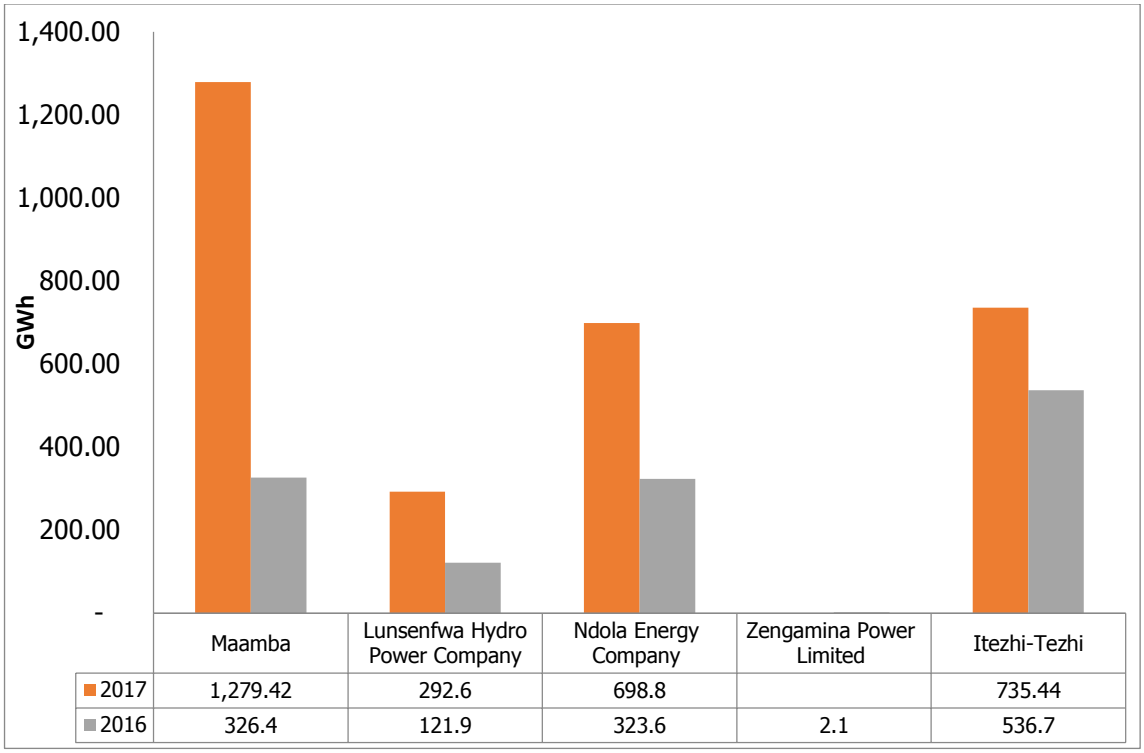
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2016	1.86	1.90	1.81	1.73	1.69	1.73	1.82	1.88	1.55	1.65	1.39	1.17	20.18
2017	1.32	1.06	1.06	1.09	0.93	0.73	0.59	0.52	0.36	0.40	0.37	0.37	8.80

Figure 3: Generation sent out from ZESCO's diesel power plants, 2016 and 2017

2.2.4 Generation from Independent Power Producers

The total electricity generation sent out by Independent Power Producers increased from 1,310.70GWh in 2016 to 3,006.26 GWh representing an increase of 129.36%. This increase in generation was mainly on account of, increased generation from the Maamba power plant, from 326.40 in 2016 to 1,279.42 in 2017 representing 291.98%; the commissioning of the new Ndola Energy HFO power plant which came to stream in March 2017 and the improvement in rainfall recorded in the 2016/2017 rainy season.

Figure 4 shows the electricity generation sent out by IPPs in 2017 compared to the same period in 2016.



	Maamba	Lunsenfwa Hydro Power Company	Ndola Energy Company	Zengamina Power Limited	Itezhi-Tezhi
2017	1,279.42	292.6	698.8		735.44
2016	326.4	121.9	323.6	2.1	536.7

Figure 4: Electricity generation sent out trend by IPPs, 2016 and 2017

2.3 Planned electricity generation projects

There is hydro potential of about 6,000 MW in Zambia. A number of electricity generation projects have commenced, while some have been planned for construction. This is expected to increase the national installed generation capacity and promote the diversification of the energy generation mix. Table 4 shows some of the planned electricity generation projects.

Project Name	Type	Owner	Capacity (MW)	Expected Completion Date
Kafue Gorge Lower Hydro Power Project	Hydro	ZESCO	750	2020
Batoka Hydro Power Project	Hydro	ZESCO	1,200	TBA
Maamba coal fired power plant II	Thermal	Maamba Collieries Limited	300	TBA
Kabompo Gorge	Hydro	CEC	34	TBA
Luapula Hydropower Project	Hydro	ZESCO	1,200	TBA
Musonda Falls	Hydro	ZESCO	10	TBA
EMCO Thermal Plants	Thermal	EMCO Energy Zambia Limited	340	2018
Luisiwasi Upper	Hydro	ZESCO	86	TBA
Luisiwasi Lower	Hydro	ZESCO	15	TBA

Project Name	Type	Owner	Capacity (MW)	Expected Completion Date
Mkushi	Hydro	Lunsemfwa	65	TBA

Table 4: Expected electricity generation projects

2.4 ZESCO electricity exports and imports

ZESCO participates in the trading of power through the Southern African Power Pool (SAPP) which is a cooperation of the electricity companies in the Southern African Development Community (SADC). During the period under review, ZESCO's exports increased by 33.85% from 794.20 GWh in 2016 to 1,062.91 GWh in 2017. Meanwhile, imports declined by 65.54% from 2,184.9 GWh in 2016 to 752.94 GWh in 2017. ZESCO's power exports and imports are summarised in Table 5.

	2016		2017	
Month	**Exports (GWh)**	**Imports (GWh)**	**Exports (GWh)**	**Imports (GWh)**
Jan	68.60	209.00	64.40	114.64
Feb	62.60	170.90	67.96	65.22
Mar	60.60	176.60	91.11	56.29
Apr	58.60	156.60	111.05	41.44
May	56.60	159.00	122.03	58.10
Jun	61.20	198.20	97.56	58.82
Jul	54.50	187.10	89.23	60.37
Aug	71.50	237.10	76.91	57.65
Sep	73.40	158.50	83.65	63.19
Oct	96.40	169.80	85.73	64.40
Nov	68.70	173.30	87.07	58.80
Dec	61.50	188.90	86.22	54.02
Total	**794.20**	**2,185.00**	**1,062.91**	**752.94**

Table 5: ZESCO electricity power imports and exports, 2016 and 2017

2.5 Electricity consumption by economic sector

Total national electricity consumption increased by 12.29% from 10,857.5 GWh in 2016 to 12,191.86 GWh in 2017. Figure 5 depicts the proportion of electricity consumption by economic sub-sector in 2017 compared to 2016.

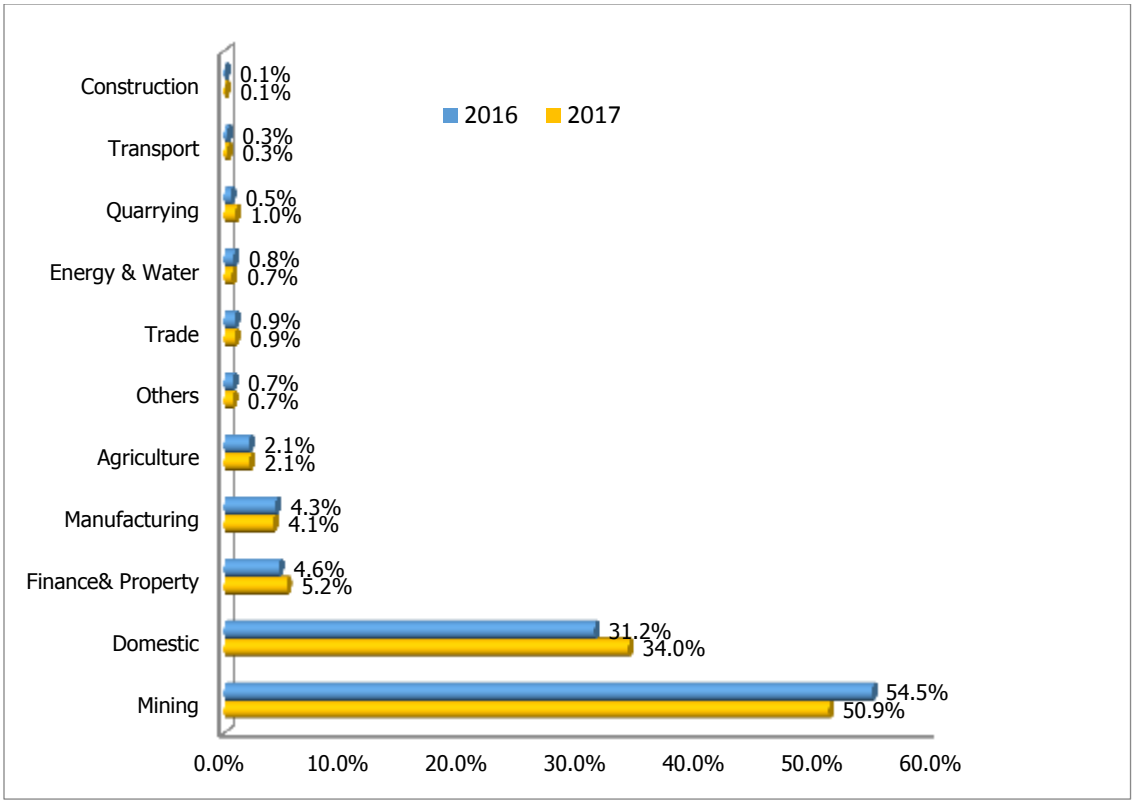
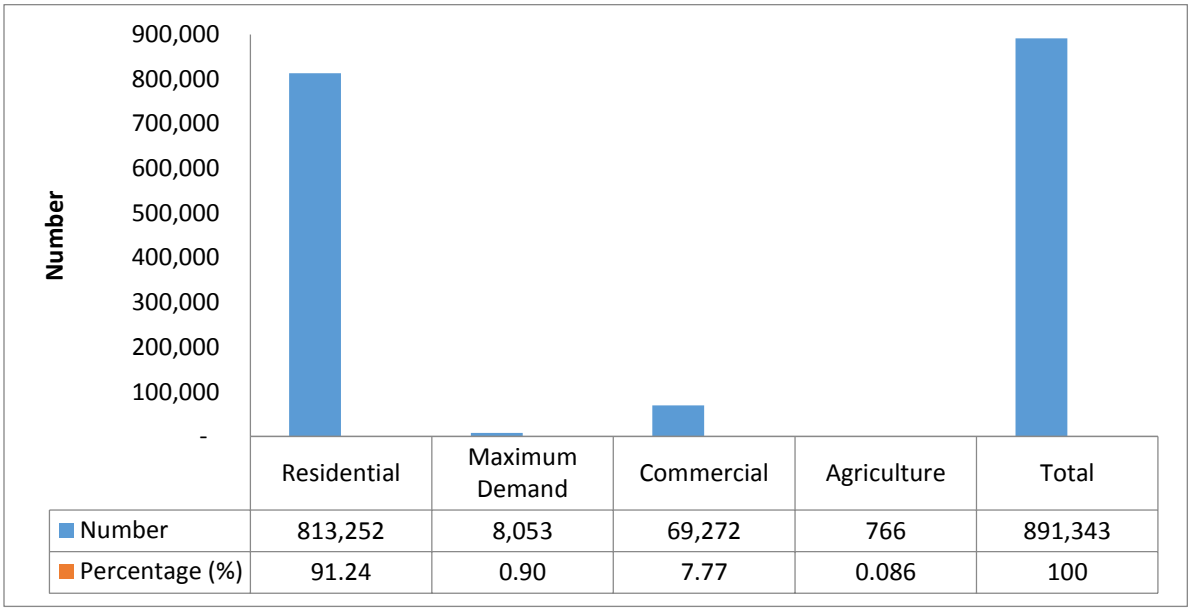


Figure 5: Electricity consumption by economic sub-sector, 2016 and 2017

2.6 ZESCO's customer base by sector

There were a total of 891,343 ZESCO's customers as at 31st December 2017. The distribution of ZESCO's customers by sector is depicted in Figure 6.



	Residential	Maximum Demand	Commercial	Agriculture	Total
Number	813,252	8,053	69,272	766	891,343
Percentage (%)	91.24	0.90	7.77	0.086	100

Figure 6: ZESCO's customer base as at 31st December, 2017

2.7 Electricity tariffs

The ERB approved electricity tariffs for the various customer categories as at 31st December, 2017 are depicted in Table 6.

CUSTOMER CATEGORY		TARIFFS
1.METERED RESIDENTIAL(Prepaid) (capacity 15 kVA)		
R1 -Consumption up-to 200kWh in a month	Energy charge/kWh)	0.15
R2 - Consumption above 201 kWh in a month	Energy charge/kWh)	0.89
	Fixed Monthly Charge	18.23
2.COMMERCIAL TARIFFS (capacity 15kVA)		
Commercial	Energy charge/kWh)	0.54
	Fixed Monthly Charge	96.41
3.SOCIAL SERVICES		
Schools, Hospital, Orphanages, churches, water pumping & street lighting	Energy charge K/kWh	0.49
	Fixed Monthly Charge	83.84
4.MAXIMUM DEMAND TARIFFS		
MD1- Capacity between 16 - 300 kVA	MD Charge (K/kVA/Month)	24.45
	Energy Charge (K/kWh)	0.35
	Fixed Monthly Charge (K/Month)	239.44
	Off Peak MD Charge (K/KVA/Month)	12.22
	Off Peak Energy Charge (K/kWh)	0.26
	Peak MD Charge (K/KVA/Month)	30.56
	Peak Energy Charge (K/kWh)	0.44
MD2- Capacity 301 to 2,000 kVA	MD Charge (K/kVA/Month)	45.73
	Energy Charge (K/kWh)	0.30
	Fixed Monthly Charge (K/Month)	478.84
	Off Peak MD Charge (K/KVA/Month)	22.87
	Off Peak Energy Charge (K/kWh)	0.23
	Peak MD Charge (K/KVA/Month)	57.17
	Peak Energy Charge (K/kWh)	0.37
MD3- Capacity 2,001 to 7,500kVA	MD Charge (K/kVA/Month)	73.06

CUSTOMER CATEGORY		TARIFFS
	Energy Charge (K/kWh)	0.25
	Fixed Monthly Charge (K/Month)	1,014.55
	Off Peak MD Charge (K/KVA/Month)	36.52
	Off Peak Energy Charge (K/kWh)	0.18
	Peak MD Charge (K/KVA/Month)	91.33
	Peak Energy Charge (K/kWh)	0.30
MD4-Capacity above 7500kVA	MD Charge (K/kVA/Month)	73.47
	Energy Charge (K/kWh)	0.21
	Fixed Monthly Charge (K/Month)	2,029.13
	Off Peak MD Charge (K/KVA/Month)	36.73
	Off Peak Energy Charge (K/kWh)	0.16
	Peak MD Charge (K/KVA/Month)	91.84
	Peak Energy Charge (K/kWh)	0.25
NOTE; The above tariffs are:- **(a) Exclusive of 3% Government excise duty** **(b) Exclusive of 16% Value Added Tax (VAT)**		

Table 6: ERB approved electricity tariffs as at 31st December 2017

3.0 PETROLEUM SUB-SECTOR STATISTICS

Zambia's total petroleum requirements are met through imports because the country has no proven reserves of crude oil. The Zambian national fuel supply chain is made up of TAZAMA Pipelines, INDENI Refinery, Ndola Fuel Terminal and Government fuel storage depots. These institutions form what is known as the upstream. Other players include Oil Marketing Companies (OMCs), transporters, dealers and consumers, these form the downstream.

The major activities played by each of these upstream and downstream players in the national fuel supply chain include; procurement, transportation, refining, distribution and supply of petroleum products to various customers.

TAZAMA Pipelines is responsible for transportation of petroleum feedstock, while INDENI Refinery processes the petroleum feedstock into different petroleum

products. The Ndola Fuel Terminal and other Government storage depots act as storage facilities, as well as distribution points for the refined petroleum products. The refined products are distributed through OMCs and dealers to retail service stations using transporters. Meanwhile, the role of the ERB in the supply chain includes issuance of licences to specific players as well as monitoring the efficiency and performance of these players, having regard, the purpose for which they were established. Figure 6 presents the players in the fuel supply chain.

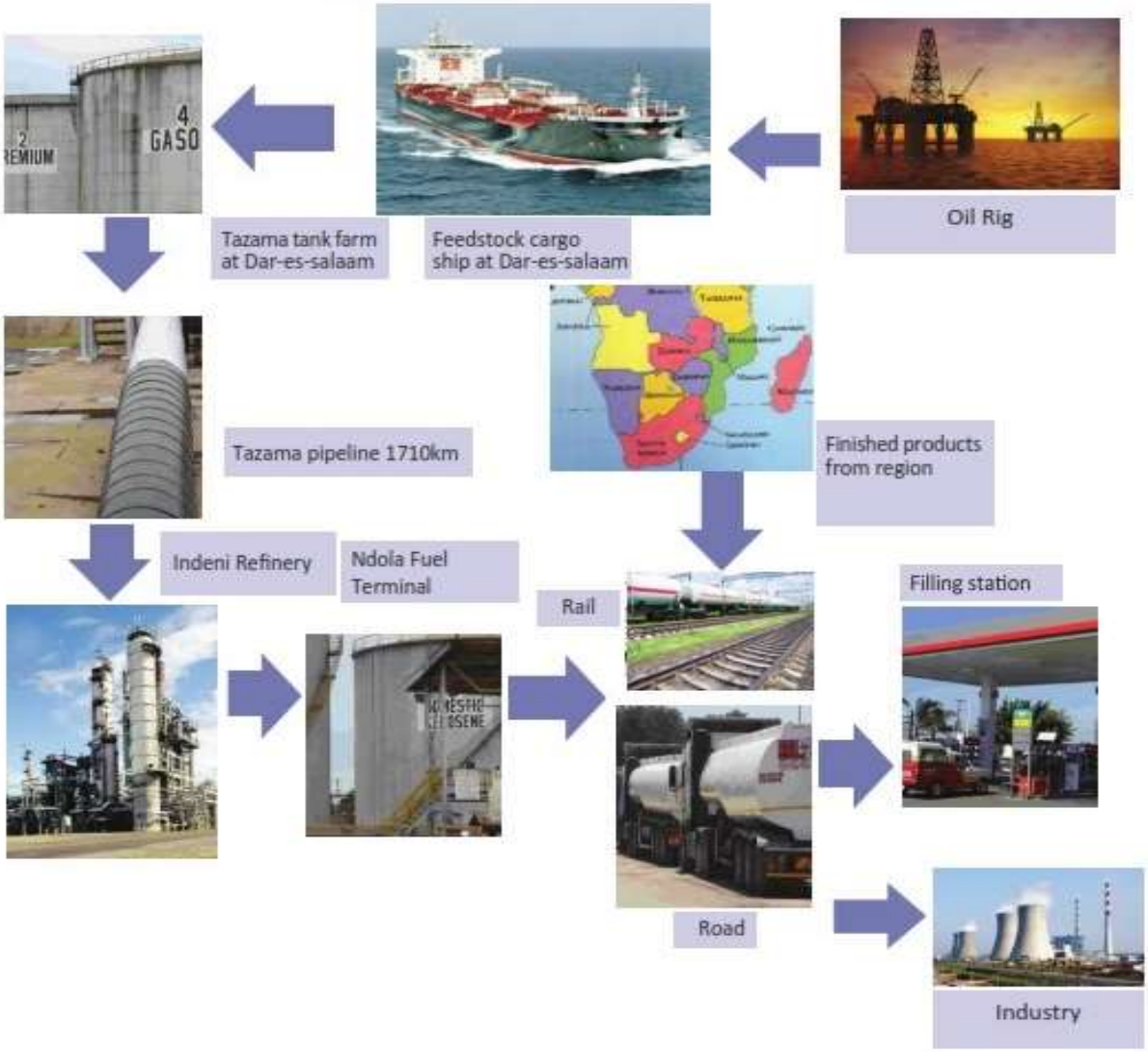


Figure 6: Players in the fuel supply chain

3.1 Retail Service stations provincial distribution

The nation recorded an increase in the number of retail service stations from a total of 325 in 2016 to 333 retail service stations across the country, in 2017. Out of the 333 retail sites, only 327 were operational as six (6) retail sites were closed for rehabilitation, as at 31st December, 2017. The 333 retail sites were provincially distributed as follows; 118 (35.44%) retail sites in Lusaka province, 96 (28.83%) retail sites in the Copperbelt province, 27 (8.11%) retail sites in Central province, Southern province had a total of 25 sites (7.51%), Eastern province had 20 (6.01%), North western province had 12 (3.60%) retail sites, Muchinga province had 10 (3.00%), while Luapula province had 9 (2.70%) retail sites. The lowest number of retail sites per province recorded in 2017 was 8 sites in Western and Northern Province representing 2.40%. Figure 7 shows the distribution of retail service stations per province in the country in 2017.

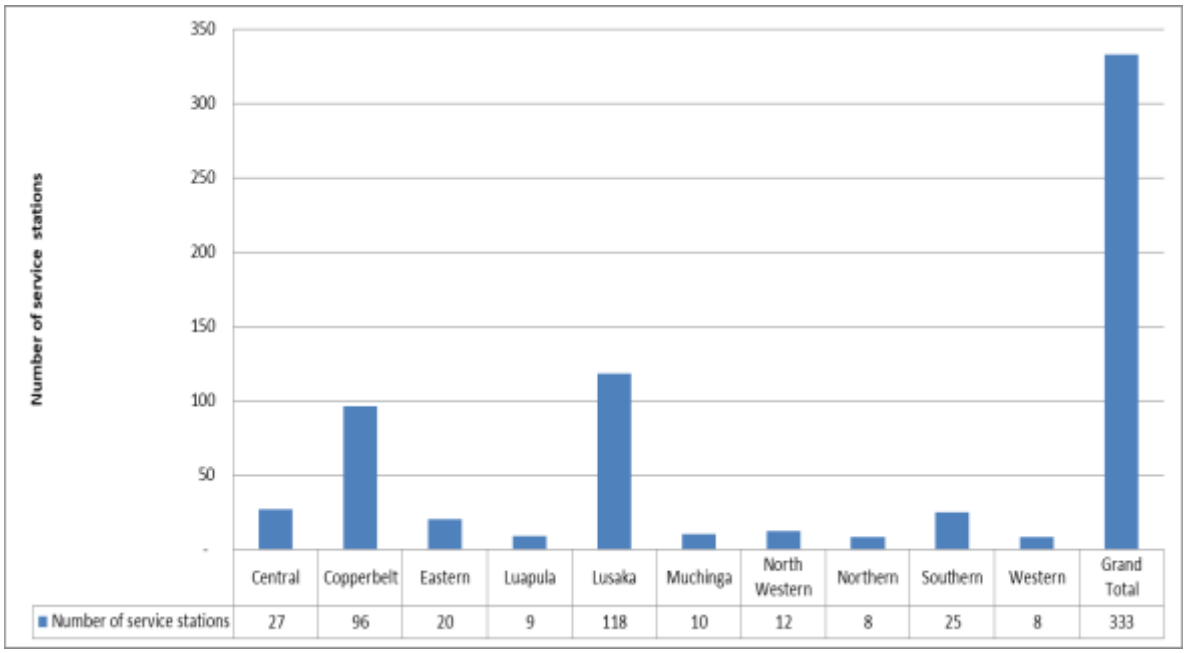


Figure 7: Retail service stations by provincial distribution in 2017

3.2 Petroleum Transportation

The refined petroleum products in the country are transported mainly via road except for isolated cases, where the rail is used. In line with its mandate, the ERB grants licences to transporters for the purposes of transporting petroleum products by road. The transporters uplift petroleum products from Ndola Fuel Terminal (NFT) and Government fuel depots located in Lusaka, Mpika Solwezi and Mongu.

During the year 2017, the total quantity of petrol uplifted from government depots increased by 21.53% to 424,332 m^3 from a total of 349,148 m^3 in 2016. This represented an average number of 33 fuel tankers in 2017 and 27 fuel tankers in 2016, respectively. Table 7 below depicts the monthly quantities of petrol uplifts and average number of uplifts in terms of trucks per day from the terminal and all government depots during the period under review compared to 2016.

Petrol	**2016**		**2017**	
Month/ Product	**Quantity (m^3)**	**Average No Trucks/Day**	**Quantity (m^3)**	**Average No Trucks/Day**
January	40,500	37	24,082	22
February	35,191	35	29,188	30
March	31,505	29	35,182	32
April	28,769	27	30,650	29
May	22,960	21	40,066	37
June	23,933	23	34,019	32
July	32,847	30	37,257	34
August	28,601	26	40,062	37
September	29,189	28	39,687	38
October	33,947	31	35,067	32
November	19,949	19	38,559	37
December	21,757	20	40,514	37
Grand Total	**349,148**	**27**	**424,332**	**33**

Table 7: Actual Petrol quantities uplifted at Government fuel depots in 2016 and 2017

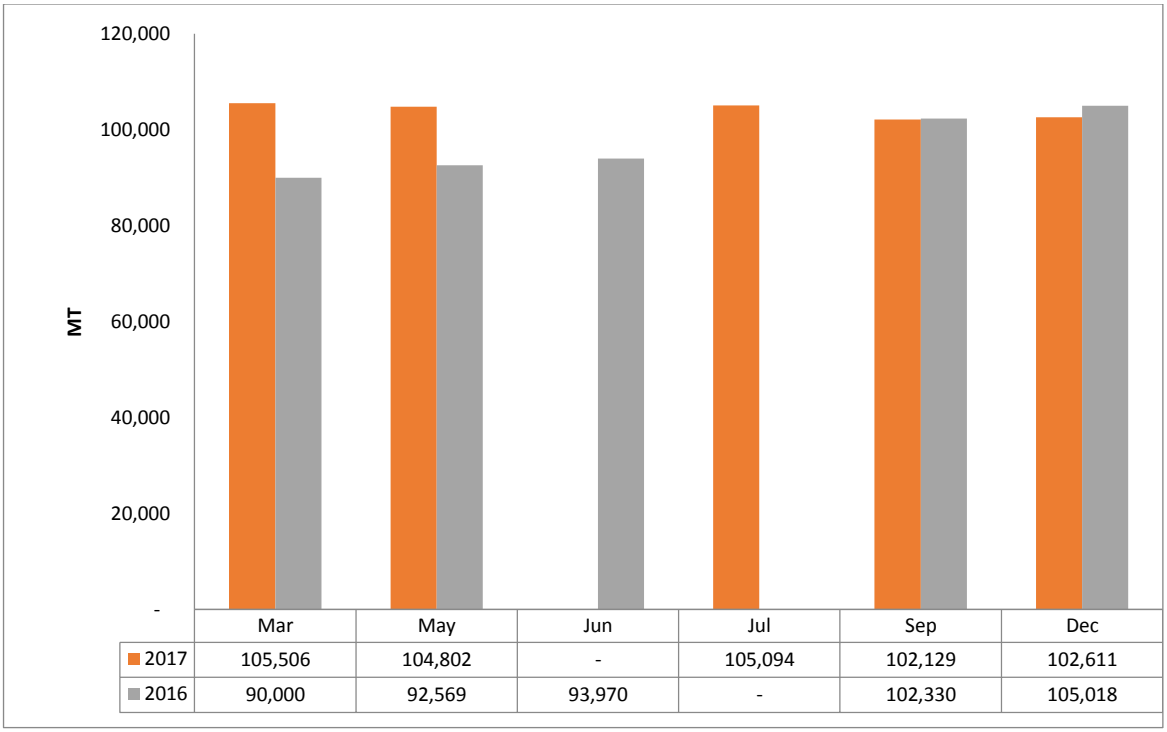
Similarly, diesel uplifts from Government depots increased by 12.98% from 615,962 m^3 in 2016 to 695,898 m^3 in 2017. This represents an average of 54 and 48 daily diesel fuel tankers in 2017 and 2016 respectively. The actual uplifts were as depicted in table 8 below.

Diesel	Diesel 2016		Diesel 2017	
Month/ Product	**Quantity (m^3)**	**Average No Trucks/Day**	**Quantity (m^3)**	**Average No Trucks/Day**
January	59,929	55	38,182	35
February	63,390	62	42,589	43
March	45,433	42	46,274	43
April	38,254	36	48,703	46
May	49,499	46	62,013	57
June	54,499	52	60,297	57
July	59,176	55	63,345	58
August	52,703	49	68,329	63
September	59,693	57	71,471	68
October	57,389	53	66,327	61
November	40,842	39	66,248	63
December	35,155	32	62,120	57
Grand Total	**615,962**	**48**	**695,898**	**54**

Table 8: Actual diesel quantity uplifts at Government fuel depots in 2016 and 2017

3.3 Petroleum feedstock imports

All petroleum products consumed in Zambia are imported either as petroleum feedstock or finished petroleum products. The Government procures a cargo of petroleum feedstock on average, every six weeks. A cargo of petroleum feedstock typically comprises Crude Oil, Naphtha, Condensate and Gasoil. During the period under review, total petroleum feedstock imports increased from 483,887 MT in 2016 to 520,142 MT in 2017. The amount of petroleum feedstock imported per cargo varied and ranged between 102,129 MT to 105,506 MT in 2017. Figure 8below shows petroleum feedstock imports for 2017 and 2016.

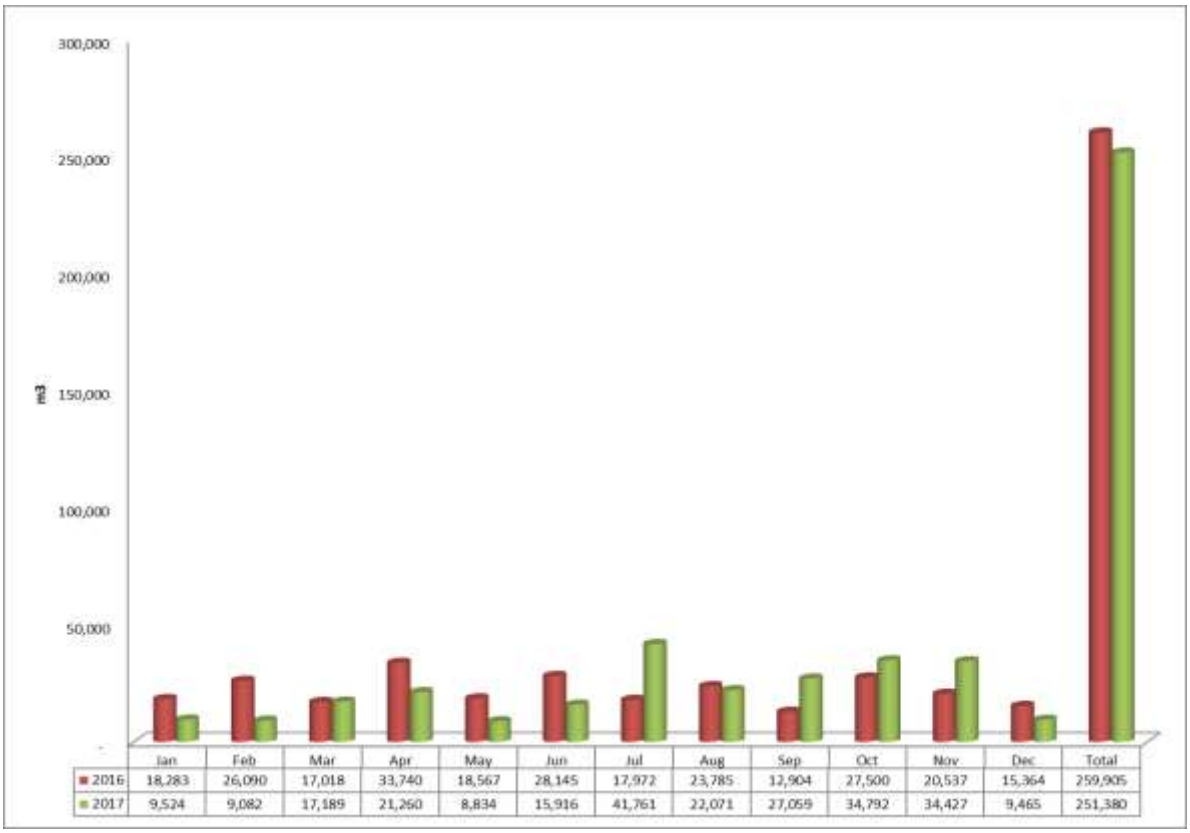


	Mar	May	Jun	Jul	Sep	Dec
2017	105,506	104,802	-	105,094	102,129	102,611
2016	90,000	92,569	93,970	-	102,330	105,018

Figure 8: Petroleum feedstock imports, 2016 and 2017

3.4 Imports of finished petroleum products

Figure 9 shows the Government imports of petrol in 2017 compared to the same in 2016.

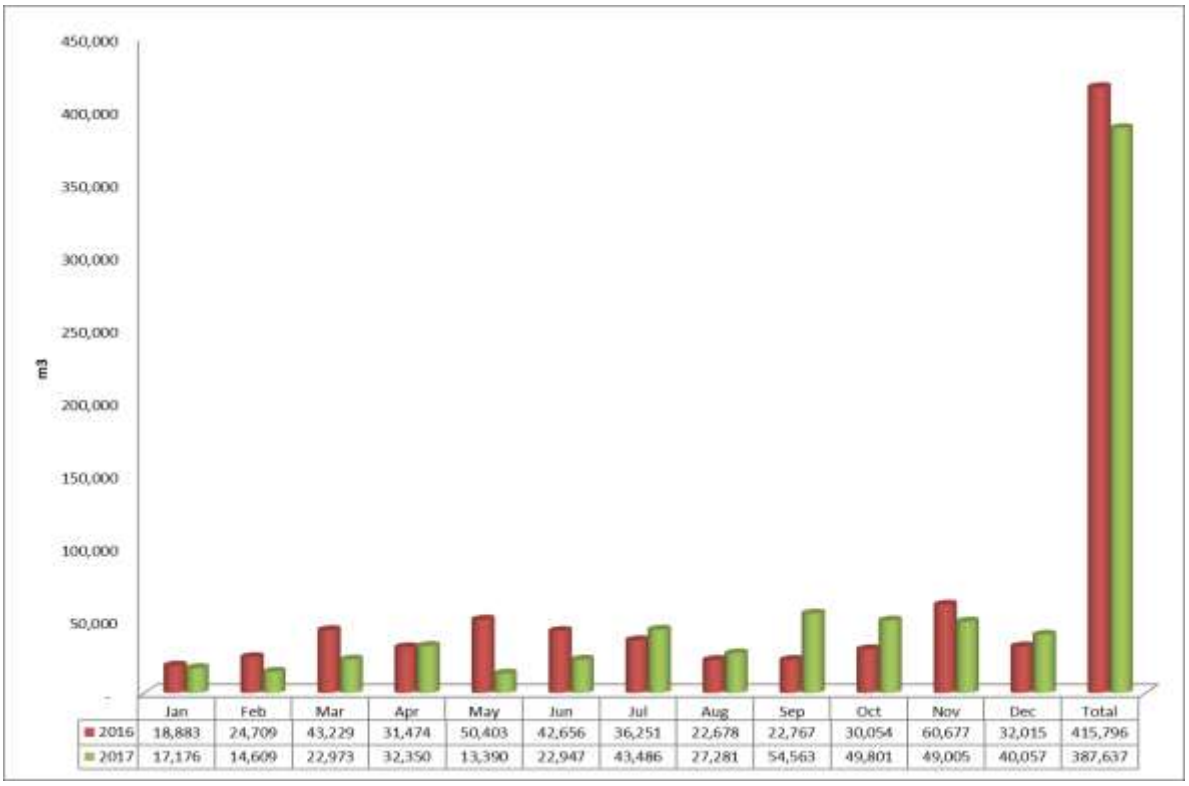


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2016	18,283	26,090	17,018	33,740	18,567	28,145	17,972	23,785	12,904	27,500	20,537	15,364	259,905
2017	9,524	9,082	17,189	21,260	8,834	15,916	41,761	22,071	27,059	34,792	34,427	9,465	251,380

Figure 9: Government imports of petrol, 2016 and 2017

As indicated in figure 10 above, government imports of petrol reduced by 3.39 % between 2017 and 2016. In 2017, Government import of petrol amounted to 251,380 m^3 compared to 259,905 m^3 in 2016.

Figure 10 shows the Government imports of Low Sulphur Gas oil (LSGO) in 2017 compared to the same in 2016.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2016	18,883	24,709	43,229	31,474	50,403	42,656	36,251	22,678	22,767	30,054	60,677	32,015	415,796
2017	17,176	14,609	22,973	32,350	13,390	22,947	43,486	27,281	54,563	49,801	49,005	40,057	387,637

Figure 10: Government imports of low sulphur gasoil, 2016 and 2017

In 2017, government imported a total of 387,673m^3 of LSG compared to a total 415,796m^3 in 2016. This shows that during the period under review, low sulphur gas oil imports declined by 7.26%.

3.5 Refinery production of petroleum products

Table 9 and Table 10 show the production of petroleum products in 2017 and petroleum product production in 2016.

As depicted in the two tables below, INDENI production of all petroleum products increased except for Bitumen, kerosene and Jet A1 whose production declined. Production of petrol, diesel, Butane/LPG and Heavy Fuel (HFO) increased by 29.71%, 1.90%, 81.20% and 72.55% respectively. That is petrol increased from 95,285.15mt to 123,591mt, diesel increased from 212,637.94 MT to 216,672 MT, Butane/LPG increased from 4,838.89mt to 8,768mt and HFO increased from 102,132.87mt to 176,231 MT. Meanwhile refinery production of kerosene and Jet A1 declined by 1.99% and 95.92%; from 18,498.98mt and 9,464.34 MT to 18,130 MT and 386mt respectively. The refinery did not produce any bitumen in 2017.

Month/Product	PETROL	DIESEL	KEROSENE	JET A1	LPG	BITUMEN	HFO
	MT						
Jan	6,921.00	12,049.00	1,049.00	-	321	0	6,615.00
Feb	10,809.00	18,814.00	564.00	386	178	0	13682
Mar	11,244.00	18,026.00	1,487.00	-	272	0	13,961.00
Apr	13,548.00	21,430.00	1,540.00	-	462	0	16,379.00
May	11,358.00	17,402.00	2,545.00	-	59	0	17,994.00
Jun	11,401.00	23,666.00	1293	-	436	0	16,204.00
Jul	11,166.00	19,394.00	1,284.00	-	326	0	19,246.00
Aug	12,626.00	24,074.00	3,740.00	-	503	0	21,246.00
Sep	9,354.00	18,438.00	1,090.00	-	244	0	13,588.00
Oct	1,764.00	1,793.00	699.00	-	149	0	8,271.00
Nov	11541	18,770.00	1133	-	555	0	18,806.00
Dec	11,859.00	22,816.00	1,706.00		600	0	10,239.00
Grand Total	**123,591.00**	**216,672.00**	**18,130.00**	**386.00**	**4,105**	**0.00**	**176,231.00**

Table 9: Refinery monthly production trend in 2017[2]

Month/Product	PETROL	DIESEL	KEROSENE	JET A1	LPG	BITUMEN	HFO
	MT						
January	9,630.05	26,480.19	1,893.25	-	767.92	2.00	9,387.51
February	8,437.02	9,634.59	1,324.12	-	318.90	-	(243.74)
March	5,013.87	8,859.54	1,028.23	-	247.36	1.00	2,861.34
April	9,992.54	26,518.32	1,780.07	2,180.85	951.38	-	10,155.12
May	16,672.71	26,424.34	3,508.89	2,001.56	886.96	483.00	13,500.28
June	7,984.68	10,308.55	(755.66)	2,754.05	431.21	(386.00)	6,983.69
July	6,664.15	20,237.90	2,542.41	317.45	315.78	475.00	4,734.60
August	8,694.33	26,227.28	1,586.79	2,414.12	178.68	(457.00)	14,139.07
September	10,113.19	25,534.59	1,837.72	(203.69)	531.46	(349.00)	15,235.11
October	6,827.20	14,624.11	1,257.42	-	316.12	(1.00)	8,510.40
November	637.64	3,947.54	4.00	-	(233.00)	3.00	7,933.79
December	4,617.77	13,840.99	2,491.74	-	126.12	1.00	8,935.70
Grand Total	**95,285.15**	**212,637.94**	**18,498.98**	**9,464.34**	**4,838.89**	**(228.00)**	**102,132.87**

Table 10: Refinery monthly production trend in 2016[3]

Despite HFO registering the highest increase, diesel remained the most produced petroleum product at 216,672 MT followed by HFO at 176,231 MT and petrol at 123,591 MT in 2017.

[2] A negative figure indicates quantities of a product that was upgraded into another product.
[3] A negative figure indicates quantities of a product that was upgraded into another product.

3.6 National consumption of petroleum products

During the period under review, the aggregate annual consumption of diesel (including Low Sulphur gasoil), kerosene and Heavy Fuel Oil (HFO) increased to 945, 815,594 litres; 20,429,764 litres and 198,135,707 litres respectively in 2017 from 941,996,807 litres; 20,881,163 litres and 97,881,163 litres in 2016. While total annual consumption for unleaded petrol and Jet A-1 declined to 434,586,846 litres and 32,792,141 litres in 2017 from 463,056,675 litres and 34,259,885 litres in 2016, respectively. The petroleum product mainly consumed in Zambia in 2017 was diesel (ordinary and Low Sulphur Gasoil). The aggregate annual consumption pattern of all petroleum products from 2016 to 2017 were as shown in Table 11.

Product	**Total Consumption (litres)**		**Average Daily Consumption (litres)**	
	2016	**2017**	**2016**	**2017**
Diesel (L)	941,996,807	945,815,594	2,580,813	2,591,275.60
Unleaded Petrol (L)	463,021,018	434,586,846	1,268,551	1,190,648.89
Kerosene (L)	20,056,675	20,429,764	54,950	55,971.96
Heavy Fuel Oil (Kg)	97,881,163	161,766,367	268,168	443,195.53
Jet A1 (L)	34,259,885	32,792,141	93,863	89,841.48
LPG (Kg)	2,742,348	4,719,040	7,513	12,928.88

Table 11: Annual and average daily consumption of petroleum products in 2016 and 2017

3.7 OMCs market share for white petroleum products

Market share refers to the percentage of the total volume of sales of an OMC to the total sales in the industry in a specified period of time. The OMCs are the distributors of petroleum products in Zambia. There were a total of 55 as at 31st December 2017. Figure 11 shows the market share for white petroleum products in 2016 and 2017.

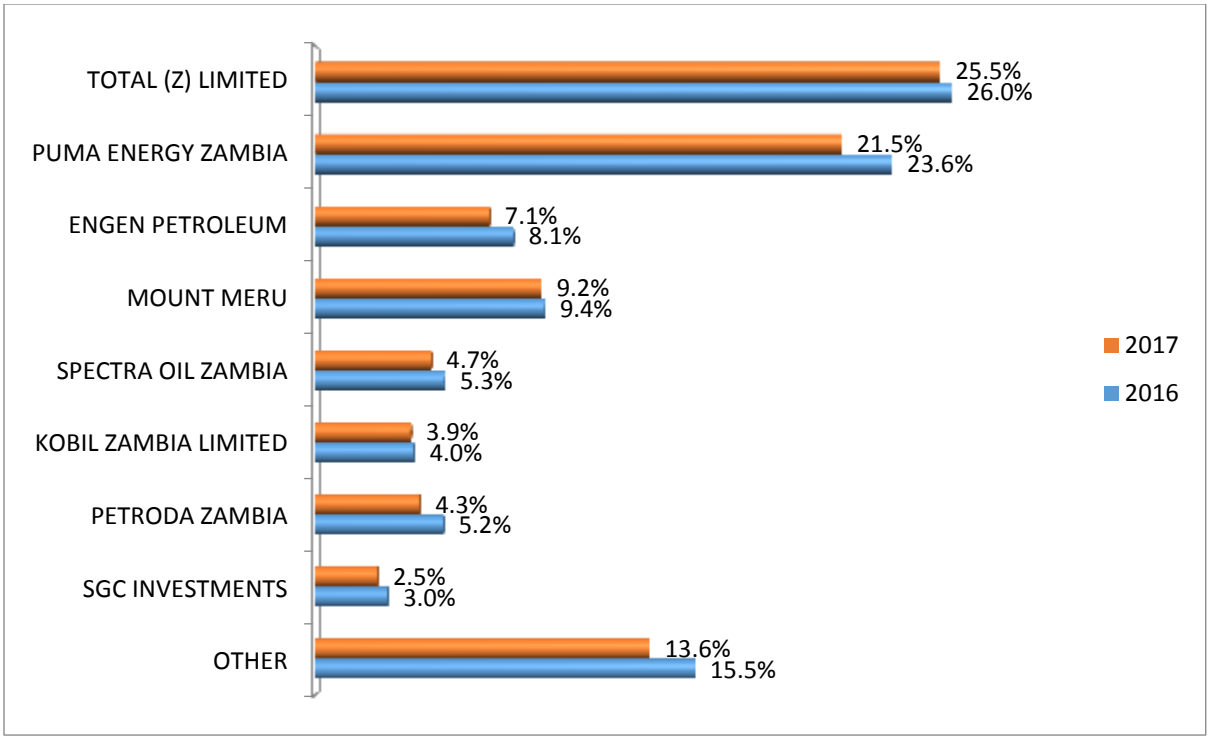


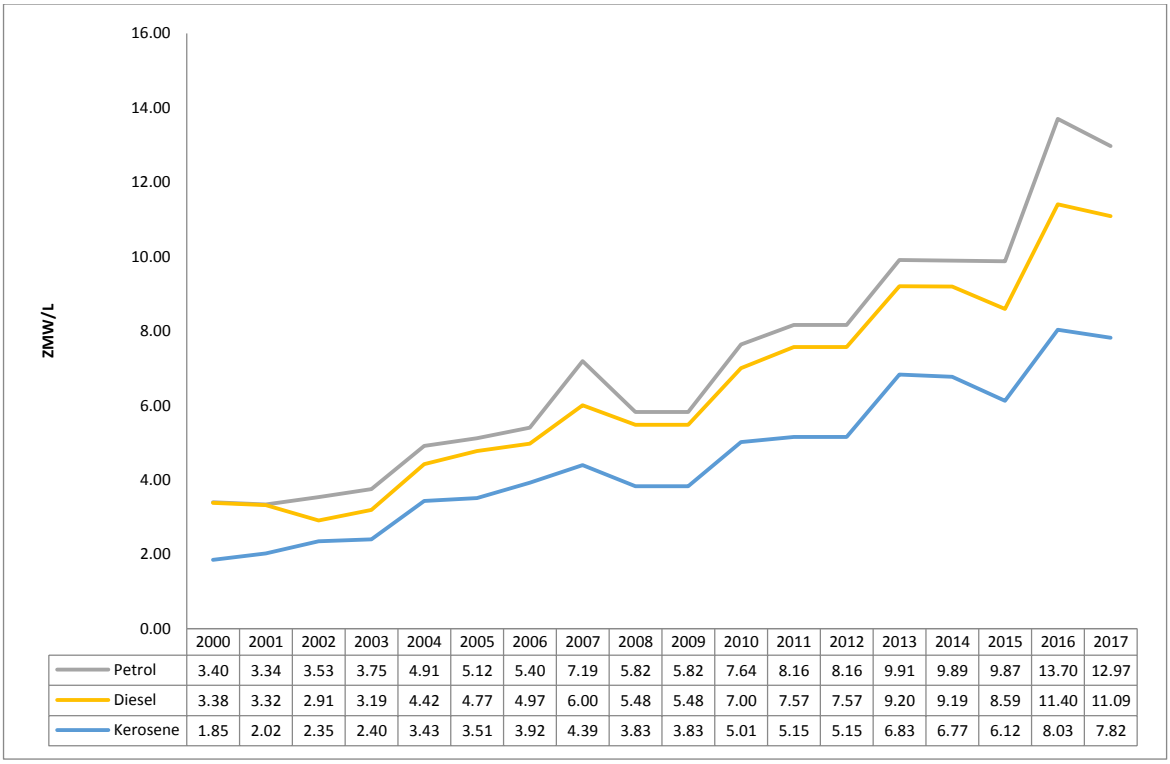
Figure 11: OMC market share for white petroleum products, 2016 and 2017

During the period under review, the combined market share for the largest two (Puma Energy and Total Limited) declined by 0.3 percentage points to 49.3% from 49.6% in 2016, The other 7 OMCs had the following market shares; 9.6%, 7.5%.5.0%, 4.1%,4.1%, 2.7% and 3.2% for Mount Meru, Engen, Spectra Oil, Petroda, Kobil, SGC and Oryx respectively. The other OMCs accounted for 14.3 % market share.

3.8 National fuel pump price and regional comparison

3.8.1 National fuel pump price

Figure 12 depicts the trend in the national fuel end-year prices for petrol, diesel and kerosene for the period 2000 to 2017. The year-end prices of petrol, diesel and kerosene declined to K12.97, K11.09 and K7.82 in 2017 from K13.7, K11.4 and K8.03 in 2016 respectively.

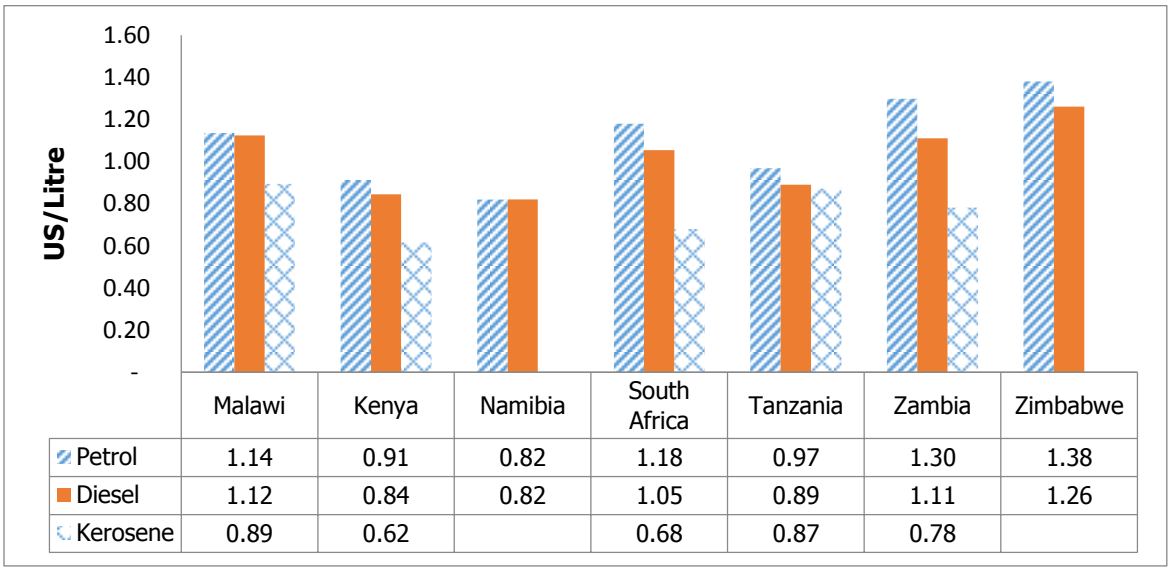


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Petrol	3.40	3.34	3.53	3.75	4.91	5.12	5.40	7.19	5.82	5.82	7.64	8.16	8.16	9.91	9.89	9.87	13.70	12.97
Diesel	3.38	3.32	2.91	3.19	4.42	4.77	4.97	6.00	5.48	5.48	7.00	7.57	7.57	9.20	9.19	8.59	11.40	11.09
Kerosene	1.85	2.02	2.35	2.40	3.43	3.51	3.92	4.39	3.83	3.83	5.01	5.15	5.15	6.83	6.77	6.12	8.03	7.82

Figure 12: National year-end fuel pump prices trend, 2000 to 2017[4]

3.8.2 Regional Fuel Pump Price Comparison

The regional prices of petrol, diesel and kerosene as at 31st December 2017 are shown in Figure 13.



	Malawi	Kenya	Namibia	South Africa	Tanzania	Zambia	Zimbabwe
Petrol	1.14	0.91	0.82	1.18	0.97	1.30	1.38
Diesel	1.12	0.84	0.82	1.05	0.89	1.11	1.26
Kerosene	0.89	0.62		0.68	0.87	0.78	

Figure 13: Regional prices of petrol, diesel and kerosene in US Dollars[5] as at 31st December 2017

[4] Prices for the period 2000 to 2012 were rebased.
[5] Prices for petrol and diesel in Figure 13 are for the year end (December 2016)

In 2017, the price for petrol ranged from US$ 0.82 to US$1.38, while diesel ranged from US$ 0.82 to US$1.26 in 2017. Zimbabwe had the highest price of both petrol and diesel at US$1.38/litre and US$1.26/litre. Meanwhile, Namibia had the lowest price of diesel and petrol in the region in 2017 at US$0.82/litre for both diesel and petrol. The pump price for kerosene was highest in Malawi at US$0.89 / litre and lowest in Kenya at US$0.62/litre in 2017.

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