

**ENVIRONMENTAL ACCOUNTS
STATISTICS
2019**

Foreword

The National Statistics Bureau (NSB) is pleased to publish the Annual Environmental Accounts Statistics (EAS), 2019. The EAS presents green economy indicators, other environmental accounts such as electricity, fossil fuel (diesel, petrol, liquid petroleum gas or LPG and kerosene), fuelwood and briquette. It also includes timber and mineral accounts covering from 2010 to 2018. Further, the publication presents additional chapters on experimental energy and waste accounts for policy and planning purposes. This is the third publication by the Economic and Environment Statistics Division of the National Statistics Bureau.

The EAS is compiled using the framework of the System of Environmental – Economic Accounts (SEEA). We hope that the information in the report will be helpful in policy formulation, evaluation and monitoring of economic development plans and programs.

The National Statistics Bureau would like to sincerely thank and acknowledge all agencies, both government and private sector, for the continued support and cooperation in the publication of this report. We would appreciate any feedback or comments in improving this report for the larger benefit of data users.

Chhime Tshering

DIRECTOR

October, 2019

National Statistics Bureau

Abbreviations & Acronyms

DGM: Department of Geology & Mines.....	19
GDP: Gross Domestic Product.....	8
GNH: Gross National Happiness	1
LPG: Liquid Petroleum Gas.....	2, 11, 14, 15
MoEA: Ministry of Economic Affairs	19
NSB: National Statistics Bureau	2, 4, 20, 36
<i>SEEA: System of Environmental- Economic Accounting</i>	2, 18
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Chapter 1: Introduction

1.1. Objective

The Annual Environmental Accounts Statistics (EAS) is intended to provide environmental related information in key economic sectors in Bhutan so that planners, policy makers, researchers and other data users can use the information for better decision and policy-making purposes.

The report aims to provide a good basis towards improved decision makings related to sustainable development and green economy. Improvement in the management of our environmental assets are critical in making sustainable use of our scarce resources and the environment has the capacity to continue providing inputs to the economy and society. It is for this reason that the state of environment and resource use needs to be monitored and reported on an annual basis to inform decision makers for long-term policy formulation relating to environmental assets.

Further, there are national requirements that provide the rationale for the development of such accounts. Bhutan places high priority for preservation and management of its nature and environment. The Article 5 of *The Constitution of the Kingdom of Bhutan* requires conserving the country's natural resources and to prevent degradation of the ecosystem, and maintain at least 60% of forest cover in the country for all times.

Environmental conservation is one of the pillars of GNH and it is integrated in every policy and developmental plans of the country. Some of our legal and policy documents such as, *The Forest and Nature Conservation Act (1995)*, *National Forest Policy (2010)*, *The National Environment Protection Act (2007)* and *The Five-Year Development Plans* emphasize sustainable utilization and management of natural resources.

Hence, the development of environmental related accounts is crucial, as it

provides primary information for improved decision making. The development and compilation of environmental economic accounts has become a core mandate of the Environmental Accounts Section of the National Statistics Bureau. *The NSB compiles various environmental accounts in a phased manner and a full set of environmental economic accounts shall be published in the future as data and capacity issues are addressed.*

1.2. Method and Scope

The EAS adopts the System of Environmental-Economic Accounting (SEEA) Central Framework in preparing and developing environmental economic accounts.

The focus of the analyses is more on the physical quantities and values of environmental assets and explains the changes in these assets over a period of time. The physical and monetary (value) changes record additions to the stock of environmental assets due to new discoveries and reductions in the stock through extraction and natural loss.

The main focus of this report is on accounting electricity and fossil fuel (diesel, petrol, LPG gas, briquette & kerosene). Further, other accounts include asset accounts for major mineral production by type such as coal, dolomite, limestone, gypsum, marble, quartzite, stone and iron ore. In addition, fuelwood consumption account is also developed in our efforts to develop a full set of energy account. Experimental waste and energy accounts are presented as these are growing concerns for the government. As a part of additional asset accounts, timber resource account, aggregate stone, briquette, sand and stone chips supplied by the Natural Resource Development Co-operation and Department of Forest & Park Services are also compiled. The measurement scope of environmental assets is not limited to these accounts, but as and when the data are available, the NSB shall extend its effort to other natural resources accounts to help policy and planning.

1.3. Data revision

As in any other statistical organizations, the published figures are subject to revision based on the recent available information. As the publication draws information from annual reports of companies and co-operations, it undergoes revision as reported in the subsequent annual financial reports.

1.4. Reporting

The Environmental Accounts Statistics is reported on a calendar year basis.

Chapter 2: Green Economy Indicators

2.1. Overview

Green Economy or green growth is in the limelight of the global development agenda. There is a growing demand for green economy indicators both from policy and decision makers. Green growth economy indicators are pathway to sustainable development (WorldBank, 2012). Thus, the NSB compiles relevant core indicators that will inform and enhance our ability to sustainably manage our natural resources with minimal environmental impacts, increase resource efficiency and reduce waste.

Table 1: Green Economy Indicators

Indicators	Source	Unit	2015	2016	2017	2018
Economic, demographic and social context for sustainable development						
Demographic patterns and trends						
Total population, both sexes combined	PHCB	Nos	717,748	726,596	727,145	734,374
Population growth rate		%	1.3	1.3	1.3	1.3
Percentage of urban population		%	41.02	n.a	37.80	37.80
Growth rate of urban population		%	1.3	1.3	n.a	n.a
Population (age 65 and above), total, both sexes		Nos	38656	36983	43064	44338
Population density, inhabitant per km2		per km2	18.69	18.92	18.94	19.13
Life expectancy at birth, both sexes combined		Years	68.93	68.93	69.1	69.1
Labour						
Labour force participation	DoE, MoLHR	%	63.1	62.2	63.3	62.6
Proportion of employment by relevant economic activities		Pry	199640	198429	166646	167862
		Second	33263	30137	63852	35748
		Trit	111390	118564	101601	107245
		Σ (in Nos)	344293	347130	332099	310856
Unemployment rate	%	2.5	2.1	2.4	3.4	
Poverty, income distribution and other social issues						
Income inequality: GINI coefficient	Poverty Analysis Report		0.36	0.36	0.38	0.38
Percentage of population living in poverty and extreme poverty [measured by National/Regional poverty lines]		%	12	12	8.2	8.2
Subsistence Poverty rate		%	2.8	2.8	1.5	1.5
Educational attainment: at least completed lower secondary (ISCED 2 or higher), population 25+ years (%)	Annual Education Statistics	%	74.2	74.2	74.2	
Total net enrolment ratio in primary education [both sexes]		%	95.2	95	94.8	92.9

Indicators	Source	Unit	2015	2016	2017	2018
Inflation and commodity prices						
Consumer price index		%	4.58	3.22	4.96	2.72
Export price of the major commodity groups [as determined by the reporting country]		Nu/unit as of Dec. 2017	2.12	THP/KHP=2.12, CHP=2.55	THP/KHP=2.12, CHP=2.55	THP/KHP=2.12, CHP=2.55
International trade and tourism						
Terms of trade index [base year as determined by the reporting country]			n.a	n.a	n.a	n.a
International tourist arrivals in % to population	Annual Report	%	6.80	7.51	9.82	9.78
International tourism, receipts	Annual Report	in Mil USD	71.04	73.74	79.81	85.41
The environmental and Resource Productivity						
Carbon emissions						
Carbon dioxide emissions (CO2), thousand metric tons of CO2	UNFCCC Report	Metric tons	1559560	1559560	1559560	1559560
Carbon dioxide emissions (CO2), metric tons of CO2 per capita		Tons/Capita	2.173	2.146	2.145	2.124
Carbon dioxide emissions (CO2), kg CO2 per \$1 GDP (PPP)		Kg/GDP	0.76	n.a	n.a	n.a
Energy						
Renewable energy supply [total energy supply ,TES]		GWh	7,745.89	5,959.29	7,721.43	6,594.31
Renewable electricity [% total electricity generation]	EAS Report	%	100	99.99	99.99	99.98
Fuelwood, production [thousand cubic metres]	Annual Report	1000 m3	125.49	140.29	132.20	80.31
The natural asset base						
Renewable resources						
Forest area	Forestry Facts & Figure of FRMD, MoAF	Sq Km	27,053	27,053	27,053	27,309
Proportion of land area covered by forest [percentage]		%	70.5	70.5	71.00	71.00
Natural forest as % of total forest area			n.a	n.a	99.25	99.22
Planted forest as % of total forest area		ha	n.a	n.a	0.75	0.78
Deforestation [Ha and % of forest area per year]					0.01	0.07
Fish Produced, total [marine and freshwater]	DoL	Kgs	149109	187631	199,918	223,623
Non-renewable resources						
Mineral resources: stocks or reserves of selected minerals, including fossil fuels and critical raw materials, as determined by the reporting country	Types					
Extraction rates of selected minerals, including fossil fuels and critical raw materials, as determined by the reporting country	Dolomite	MT	2662309.68	2367659	2546256	2821166
	Limestone	MT	850431.17	1257101	1235162	1344038
	Gypsum	MT	389364.8	317597	328128	461128
	Coal	MT	85164.45	117783	161527	186824
	Marble	MT	97647.84	75031	96567	188901
	Quartzite	MT	79818.5	92770	175501	145714
	Talc	MT	5807.27	2261	1293	2042
	Stone	MT	2203065.41	3414215	3828254	3730975
	Granite	MT	3889.05	n.a	26423	6080
	Phyllite	MT	40417.25	41800	61910	53189
	Calc Tufa	MT	n.a	n.a	n.a	12324
	Iron Ore	MT	43201.96	28065	32974	37843
	Clay	MT	n.a	n.a	n.a	n.a

Indicators	Source	Unit	2015	2016	2017	2018
Proportion of agricultural area to total land area			2.93	2.93	2.93	2.93
Area equipped for irrigation as % of agricultural area	RNR statistics	%	94.2	94.2	94.2	94.2
Arable land, % total land area	RNR statistics	%	2.93	2.93	2.93	2.93
Pasture, % total land area			n.a	n.a	n.a	n.a
Land area affected by degradation, by type of degradation, as % of total land area		%	0.54	0.54	0.54	0.54
Proportion of organic agricultural area in total agricultural area			n.a	n.a	n.a	n.a
Pesticides used on crop areas [kg / ha]		kg/hect	n.a	n.a	n.a	n.a
Chemical fertilizers used, kilogram per hectare of crop land		kg/hect	n.a	n.a	n.a	n.a
Natural fertilizer use, kilogram per hectare of crop land			n.a	n.a	n.a	n.a
Biodiversity and ecosystems						
Number of known flora and fauna species by status category		Nos	5603 Vascular plants	5603 Vascular plants	5603 Vascular plants	< 5,600 Vascular plants
			400 Lichens	400 Lichens	400 Lichens	287 Lichens
			200 Mammals	200 Mammals	200 Mammals	200 Mammals
			700 Birds appx	700 Birds appx	721 Birds appx	740 Birds appx
Number of endemic flora and fauna species by class (mammals, reptiles, etc)		Nos	105 endemic plants	105 endemic plants	144 endemic plants	145 endemic plants
			27 Globally Threatened mammal	27 Globally Threatened mammal	27 Globally Threatened mammal	27 Globally Threatened mammal
			18-Critically endangered & vulnerable birds	18-Critically endangered & vulnerable birds	18-Critically endangered & vulnerable birds	47-Globally threatened birds
% of threatened flora and fauna species by class (mammals, reptiles, etc.)		%				
Proportion of terrestrial protected areas to total surface area, %	MoAF	%	51.32	51.32	51.44	51.44
Footprints						
Ecological footprint	GNHC	Hec/capita	1.8	1.8	1.8	1.8
The environmental dimension of quality of life						
Environmental health and risks						
Concentration of particulate matter (PM10) in urban air [main cities]	UNFCC Report	Microgram/m ³	45.51	43.88	40.28	n.a
Environmental services and amenities						
Proportion of total population using an improved drinking water source	BLSS Report	%	92.60	92.60	98.60	98.60
Proportion of urban population using an improved drinking water source		%	99.50	99.50	99.60	99.60
Proportion of rural population using an improved drinking water source		%	97.20	97.20	98.00	98.00
Proportion of total population using an improved sanitation facility		%	66.30	66.30	74.80	74.80
Proportion of urban population using an improved sanitation facility		%	92.60	92.60	84.72	84.72
Proportion of rural population using an improved sanitation facility		%	57.90	57.90	69.00	69.00
Municipal waste collected [total]		Tons	20429.05	25367.50	30966.60	38076.80
Municipal waste collected [per capita]		Tons per capita	0.07	0.09	0.11	0.14

Indicators	Source	Unit	2015	2016	2017	2018
Policy responses and economic opportunities						
Regulations and management						
Annual government environment protection expenditure [as % of government expenditure and/ or as % of GDP]	Public Expenditure Review Report	%	2.6	2.6	2.6	2.6
Participation in multilateral environmental agreements [list and number of MEAs]		Nos	15	15	15	15
Number of regulated pollutants by media [water, air, soil, etc]	Environmental Standards - 2010 (NEC)	Water = 5				
		Industrial effluent = 32				
		Sewerage effluent = 3				
		Ambient air = 5				
		Industrial emission = 4				
		Workplace emission = 5				
		Vehical emission = 2				
		Noise level = 3				
Green taxes (number and/or annual revenue)		Mil Nu	545.87	1007.12	909.65	938.56
International financial flows						
Official Development Assistance, total	AFS	Mil Nu	9955.02	14,889.60	12,986.75	14,847.07

Chapter 3: Electricity Account

3.1. Overview

Electricity sector is the leading contributor to growth of the economy and accounts for a major share of the total GDP of Bhutan. Hydropower is the major source of energy resources in Bhutan. Apart from hydropower and solar, most energy resources are non-renewable. Hence, it is important to understand the stock, the rate at which these types of energy resources are being tapped into. Although hydropower is the main source of energy in Bhutan, for the transport sector until such time that electric transport technologies are economically viable, Bhutan will continue to depend on fossil fuel, which is not clean energy.

3.2. Hydro-electricity: Supply & Consumption

The supply of electricity decreased to 6,893.86 Gwh in 2018 from 7469.23 Gwh in 2017, which is a fall of 7%. The average growth of electricity supply was around 9% from 2001 to 2018. Import accounted for slightly more than 4% of the total supply in 2018, an increase by more than 30% as compared to 2017. While, in monetary terms, the supply of electricity has slightly increased from Nu. 12,718.20 million in 2017 to Nu. 12,816.79 million in 2018. It could be due to change in the price or change in the pattern of electricity consumption.

The consumption of electricity by industries increased by little more than 16% in 2018 as compared to 2017. At an aggregated level, of the total domestic consumption of 2774.18 Gwh, industry accounted for almost 45% of the total consumption while consumption by household accounted for the remaining 55%.

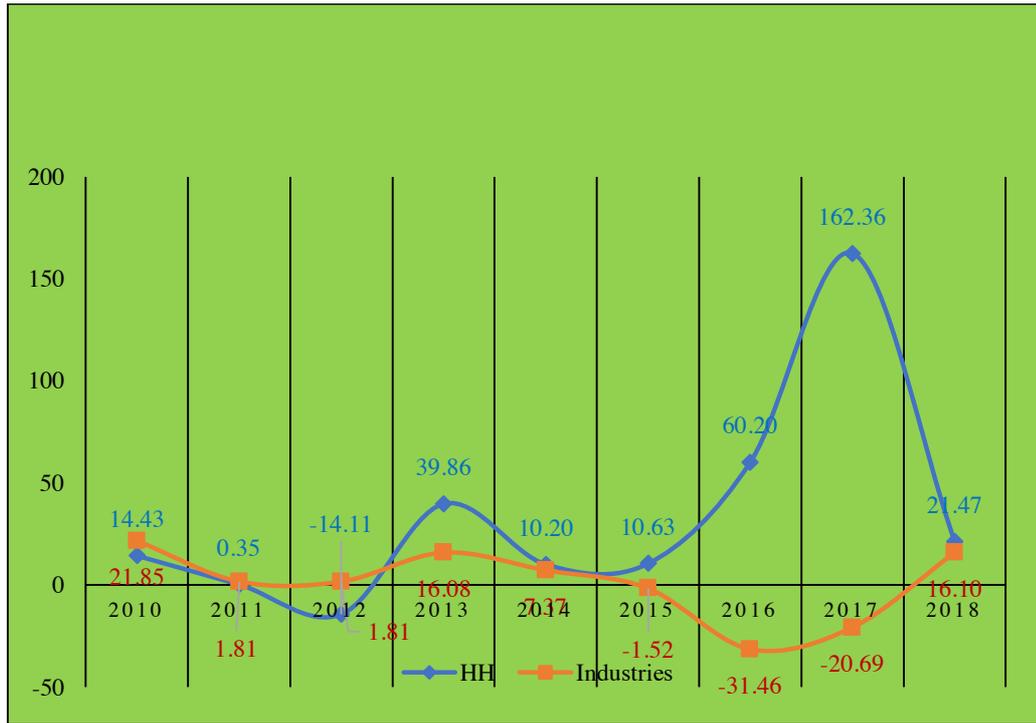


Figure 1 Consumption growth of electricity

In terms of share, manufacturing sector leads the consumption of electricity with almost 90% followed by Community Social & Personal Services with 5% and the Whole sale retail trade at 3% among the industries. On overall, almost 60% of the total electricity supply were exported while 40% were consumed domestically. The overall domestic consumption of electricity increased by 19% in 2018 compared to 2017 whereas, the share of export has decreased by 20% in 2018.

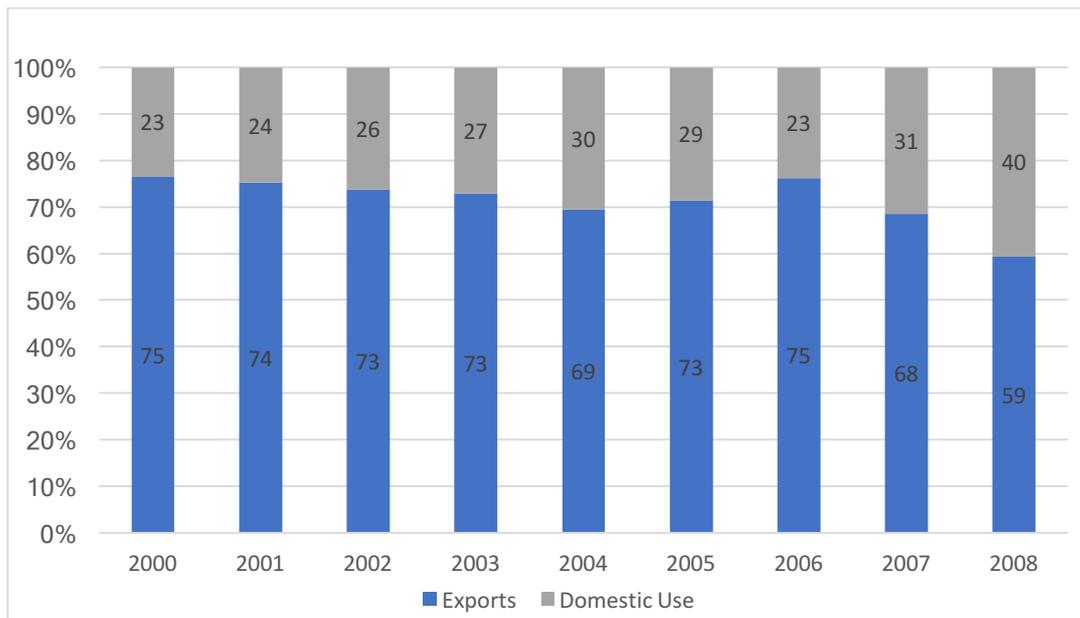


Figure 2 Share of export and domestic use

3.3. Electricity Trade and Transmission Loss

The overall electricity production in the country has dropped by 9% in 2018 compared to 2017. Although Bhutan is a net exporter of electricity, the country does import electricity during the lean season. In 2017, export of electricity dropped by almost 20% while import increased by slightly more than 40%.

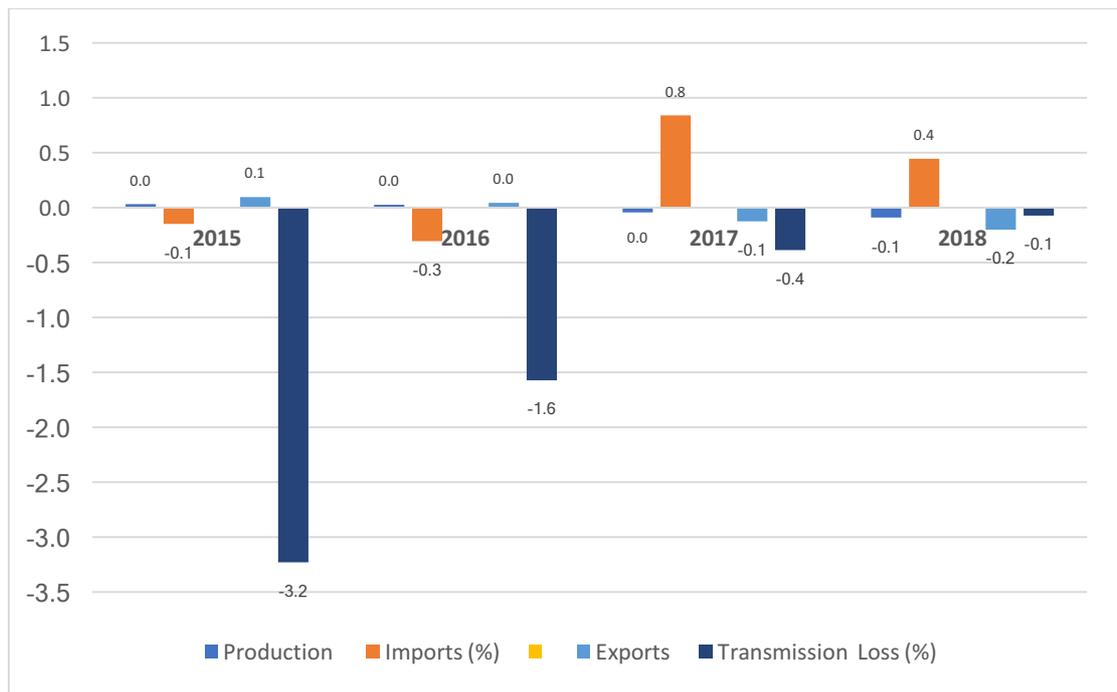


Figure 3 Growth in production, export, import and transmission loss

In terms of the transmission loss¹, it has decreased by almost 10%. The transmission loss, when calculated as the percentage to total generation is not so significant. In 2018, the loss as the percentage of generation barely accounted for 1%.

¹ The transmission losses are the energy losses through cables.

Chapter 4: Fuel Account

4.1. Fossil Fuel: Supply & Consumption of Diesel & Petrol

Fossil fuels such as diesel, petrol & LPG is imported from India as we do not have any domestic production in our country. Import of diesel grew by 12% in 2018 as compared to 10% in 2017, an increase of just 2 percentage points. Petrol import grew by 20% in 2018 compared to 8% in 2017, an increase of almost 12 percentage points.

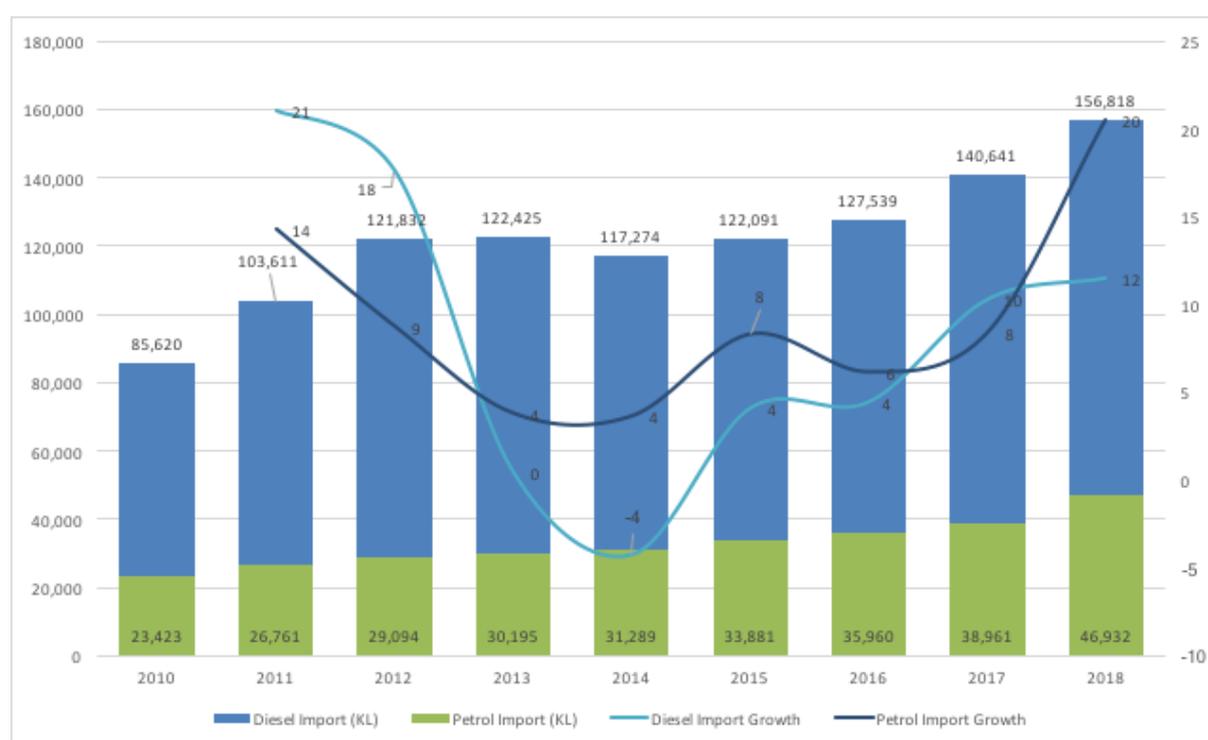


Figure 4 Fuel imports and growth trends

In absolute terms, the total supply of diesel increased from 140,64 KL in 2017 to 156,818 KL in 2018 and the supply of petrol has increased from 38,961 KL in 2017 to 46,932 KL in 2018. The uses of petrol and diesel are directly proportional to import growths of 20% and 12% respectively.

In terms of consumption, service sector accounts for a little more than 36%, the highest, followed by industrial sector at 22%, household at 19%, agriculture sector at almost 15% and consumption by foreign vehicles at 8% in 2018. The trend was similar in 2017 with little changes in the percentage composition. Further, in terms of percentage share, diesel import accounts for 77% while petrol accounts for 23%.

The consumption of fuel in monetary values adjusting for trade and transport margin recorded at Nu. 10,148 million in 2017 and Nu. 12,051 million in 2018, which is an increase of little more than 18% in 2018.

4.2. *Import of vehicles over the years by Industries and Households*

The number of vehicles imported over the years has gradually increased. In 2018 alone, 8,961 units of vehicles were imported. Of the total imports in 2018, the import of light vehicles was the highest at 54% followed by heavy vehicles at 17%, two wheelers and taxi at 9%, power tiller & tractor at 8%, earth mover at 3% and medium vehicle at 1%. As of 31st December 2018, there were 99,918 units of vehicles in the country.

In terms of ownership, household sector owns the highest with 60% followed by service sector with 24%, and others such as industries and agriculture, livestock & forestry sector accounts for close to 16%.

4.3. *Import and re-export² of Fossil Fuel*

From the total import of petrol and diesel, some portion is consumed by Indian vehicles plying on Bhutanese roads transporting goods in and out of Bhutan. It also includes fuel consumed by Indian tourist vehicles and refueling by Indian vehicles in the border towns of Samdrup Jongkhar, Gelephu, Phuentsholing, Gomtu, Samtse, etc.

The re-export of fuel increased to 0.02 million kiloliters in 2018 from 0.01 million kiloliters in 2017, an increase by almost 30%. The re-export of diesel has increased from 0.004 million kiloliters in 2017 to 0.006 kiloliters in 2018, whereas, the re-export of petrol has increased from 0.007 million kiloliters in 2017 to 0.009 million kiloliters in 2018.

² Re-export is a term used for refueling by vehicles that are not registered in Bhutan

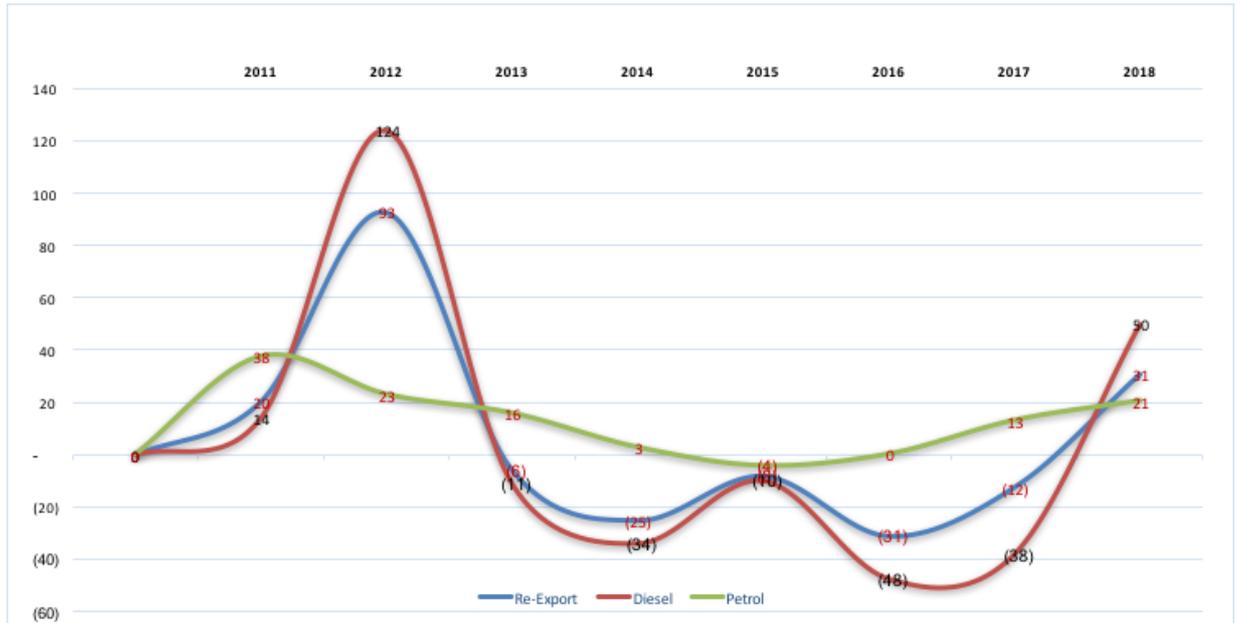


Figure 5 The growth of re-export of fuel

4.4. Kerosene: Supply & Consumption

Kerosene is imported from India. Import of kerosene decreased from 4,238 KL in 2017 to 3,597 KL in 2018. The import decreased by more than 15% in 2018 compared to a decrease of 12% in 2017.

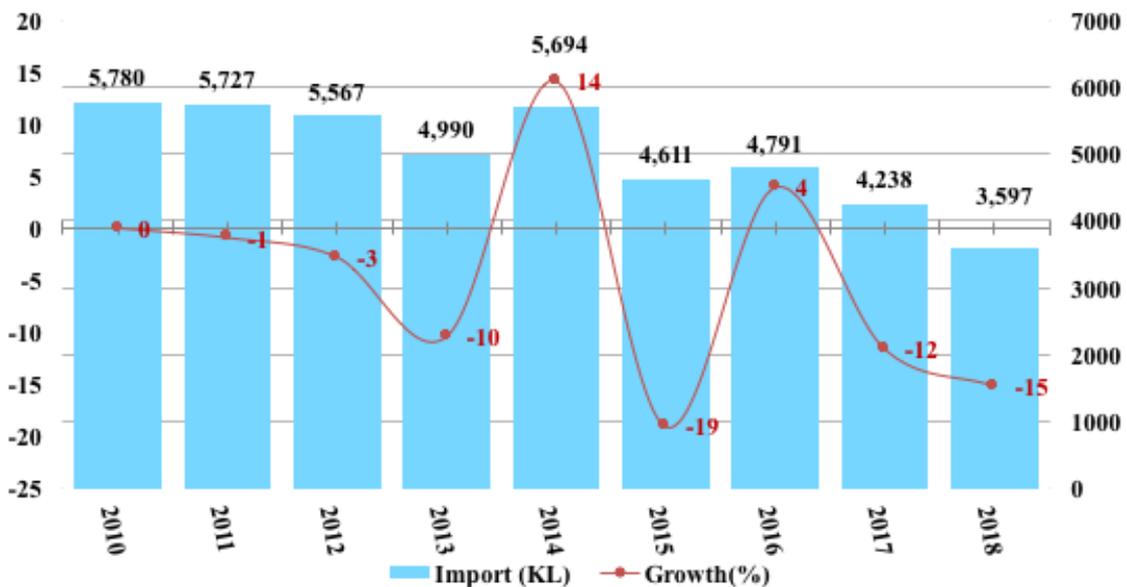


Figure 6 Import of kerosene and growth trend

Kerosene is mostly consumed by households. In the absence of reliable data on consumption, the NSB aggregated the consumption by households and industry based on the import share of kerosene (Quota) and kerosene (industrial) as provided by the Dept. of Trade, MoEA. However, there was no import of kerosene (industrial) in 2018. On an average, each household consumes 23 litres of kerosene annually.

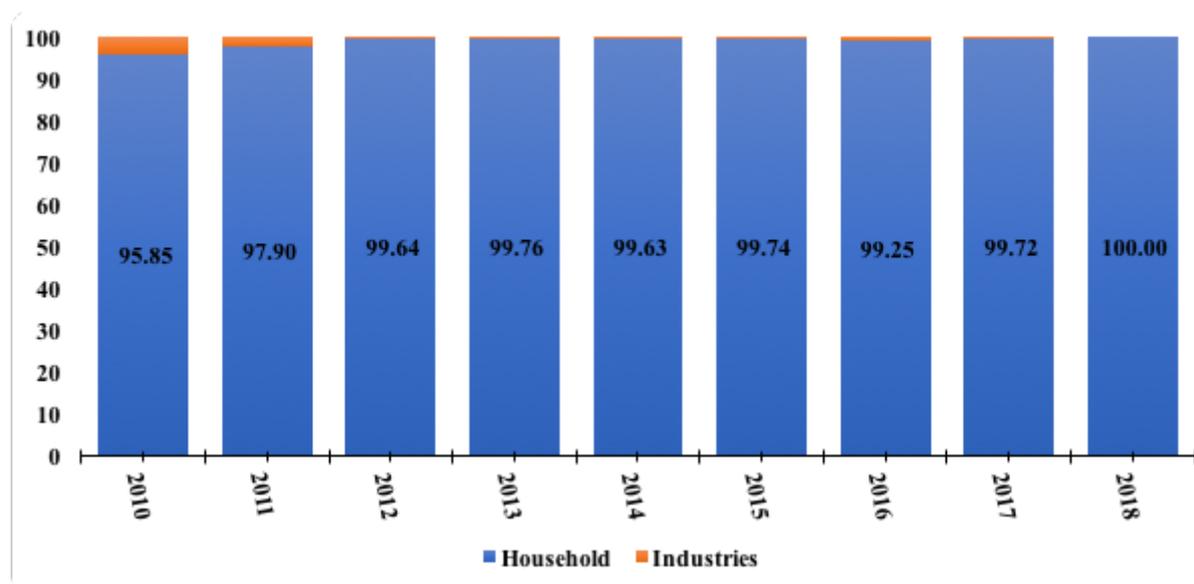


Figure 7 Consumption share of kerosene

In monetary terms, Nu. 79.34 million worth of kerosene was imported in 2018 compared to Nu. 98.41 million in 2017.

4.5. LPG: Supply & Consumption

Like fossil fuel, Bhutan relies on import of LPG from India. The use of electric cooking stoves is not common in Bhutan unlike in other countries. Thus, Bhutanese households use LPG for cooking and heating purposes. The import of LPG increased from 9,299 Mt in 2017 to 10,002 Mt in 2018, an increase of almost 8%.

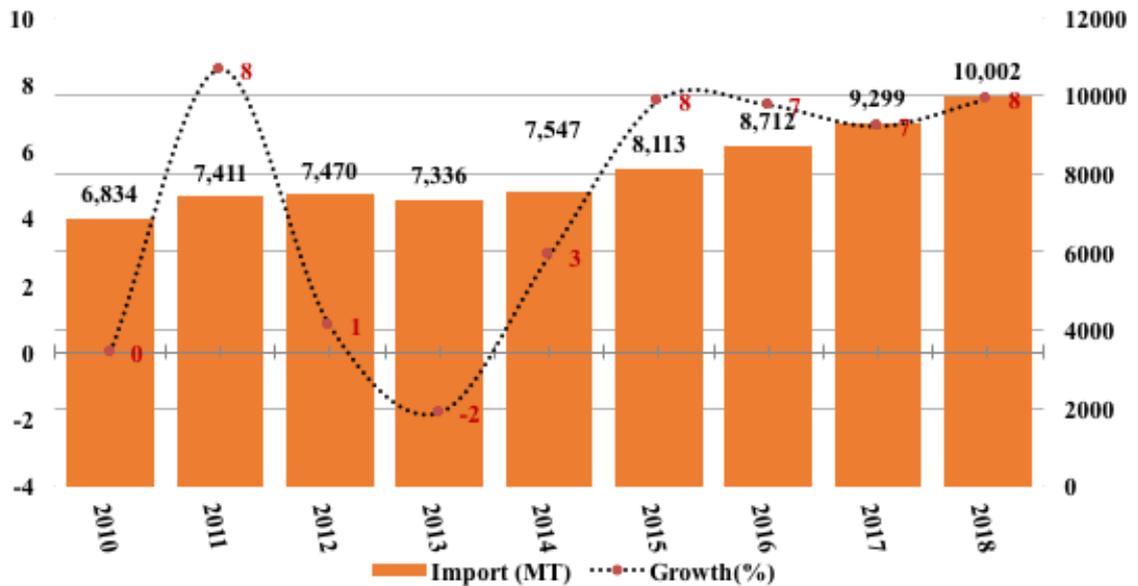


Figure 8 LPG import and growth trend

The consumption of LPG by industries increased from 1,251.72 Mt in 2017 to 1,274.08 Mt in 2018, an increase of almost 2%. On the other hand, consumption by households grew from 8,046.82 Mt in 2017 to 10,002.22 Mt in 2018 which was an increase of 9%.

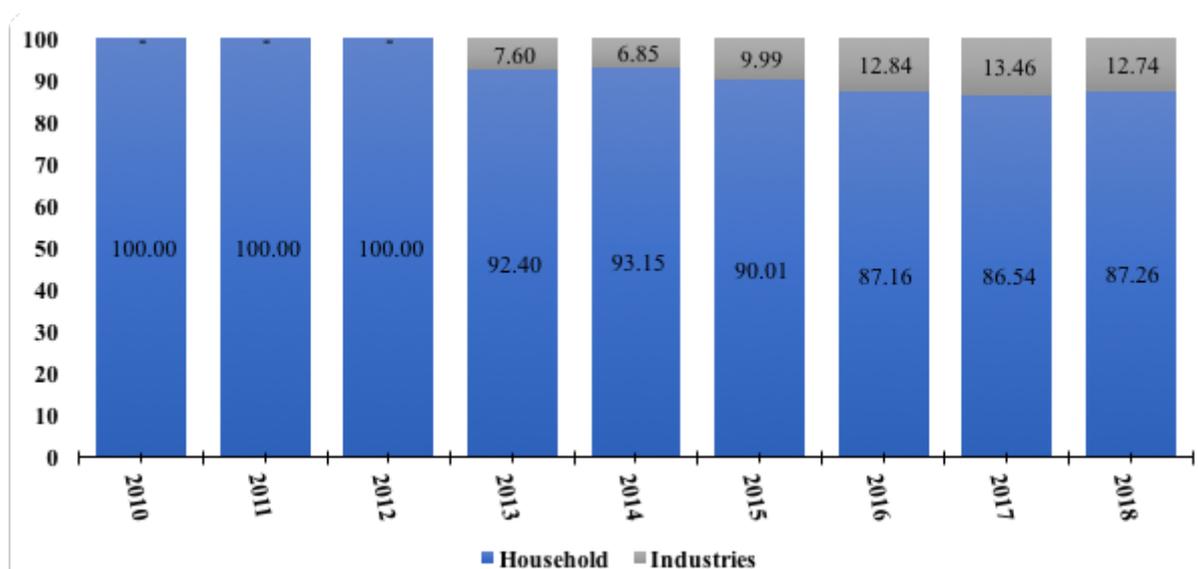


Figure 9 Consumption share of LPG

In order to estimate the number of cylinders a household consumes, the import value, which is in Mt, was converted to number of cylinders by considering the net weight of the cylinder, which is 14.2 kg per cylinder. In 2018, a total of 614,658 LPG cylinders

were consumed compared to 566,667 cylinders in 2017. Thus, considering the national average household size of 3.9, a household consumes, an average of 3 cylinders a year.

4.6. Fuelwood: Supply & Consumption

Fuelwood continues to be a critical source of energy for rural households. Natural Resource Development Corporation Ltd. and Department of Forest and Park Services, Ministry of Agriculture and Forests supply fuelwood to both rural and urban population in Bhutan. Fuelwood reported in this report accounts only the fuelwood supplied by NRDCL and DoFPS, MoAFs. It is estimated from the permit issued by these two agencies and it does not include the fuelwood collected by households without permit.

A total of 32,950 cubic meter of fuelwood was supplied in 2018. The supply of fuelwood decreased by 4% in 2018 compared to negative growth of 6% in 2017. Fuelwood supply to rural household are mostly done by the DoFPS, MoAF while NRDCL supplies to industries. In terms of the overall share, fuelwood supply by NRDCL is about 41%, while supply by DoFPS, MoAF was about 59% in 2018.

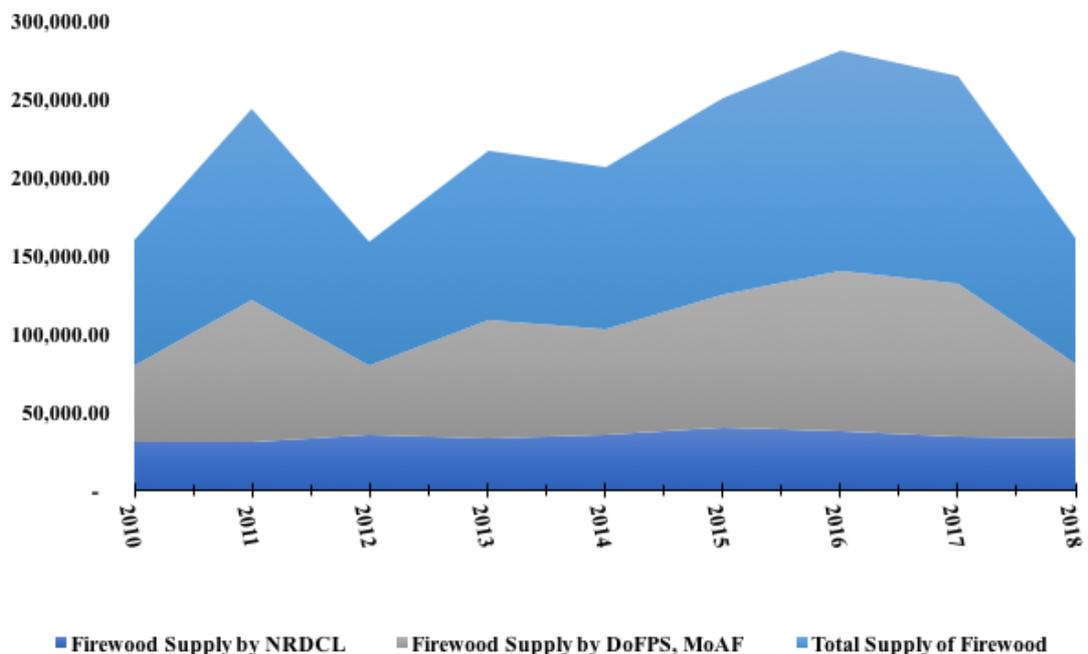


Figure 10 Fuelwood supply

4.7. Briquette: Supply & Consumption

The demand for briquette is provisioned through NRDCL. Although there may be some private sawmills that produce briquette, the figure is insignificant and there is no reliable data. The stock of briquette increased by 23% in 2018 when compared to 2017 while disposal grew by 16%.

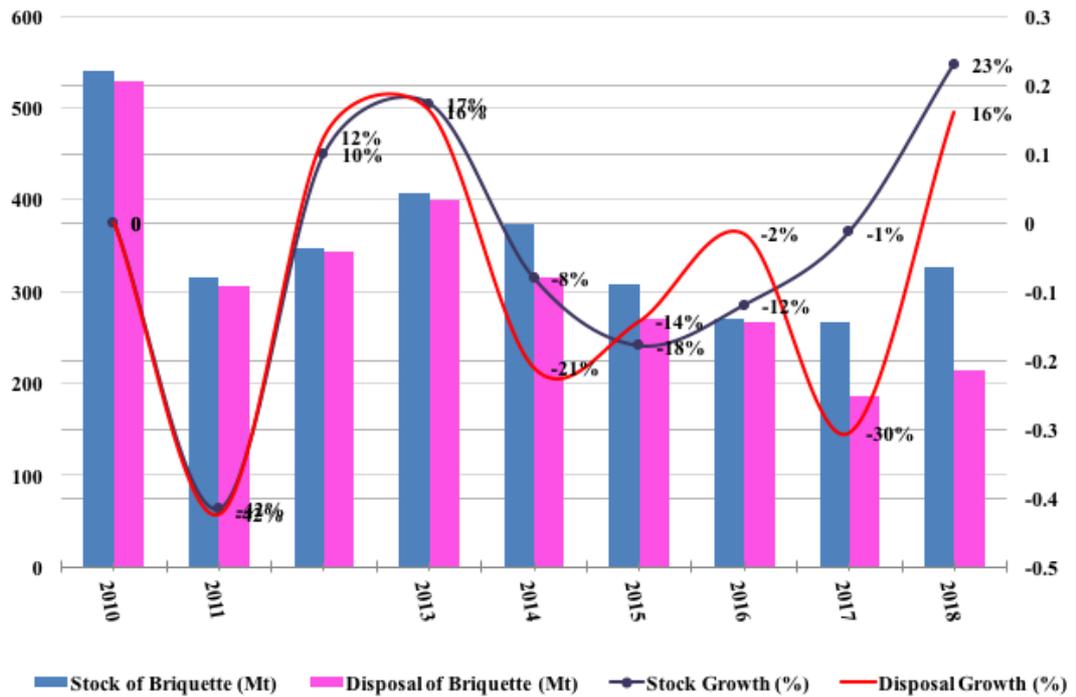


Figure 11 Briquette production, disposal and growth trend

Chapter 5: Asset Account

5.1. Introduction

The SNA 2008 defines an asset “*as a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time*”. NSB compiled asset account for natural resources such as timber, sand, stone aggregates and stone chips supplied and disposed by NRDCL and the Department of Forest and Park Services, MoAF. In addition, NSB included mineral resources. The mineral resources comprised known deposits of natural resources, coal, non-metallic minerals and metallic minerals. The valuation of accounts includes valuation of stocks of the resources and the changes in stocks over the accounting periods.

The System of Environmental-Economic Accounting (SEEA) Central Framework provides that the flows of extraction, depletion and discoveries are central to asset account, which provides valuable information regarding the sustainability of individual resources.

5.2. Timber: Supply & Consumption

Timber is used particularly for construction purposes, renovation of Dzongs & Lhakhangs, rural constructions, etc. NRDCL supplies timber for commercial use while DoFPS, MoAF supplies both for commercial, concessional and some distributed for free.

The total timber supply in the economy decreased by 26% in 2018 when compared to 19% drop in 2017. The supply by NRDCL increased by almost 18% while supply by MoAF dropped by almost 40% in 2018. In terms of monetary value, the timber production is estimated at Nu. 322.41 million in 2018 compared to Nu. 284.73 million in 2017, which is a increase of almost 13%.

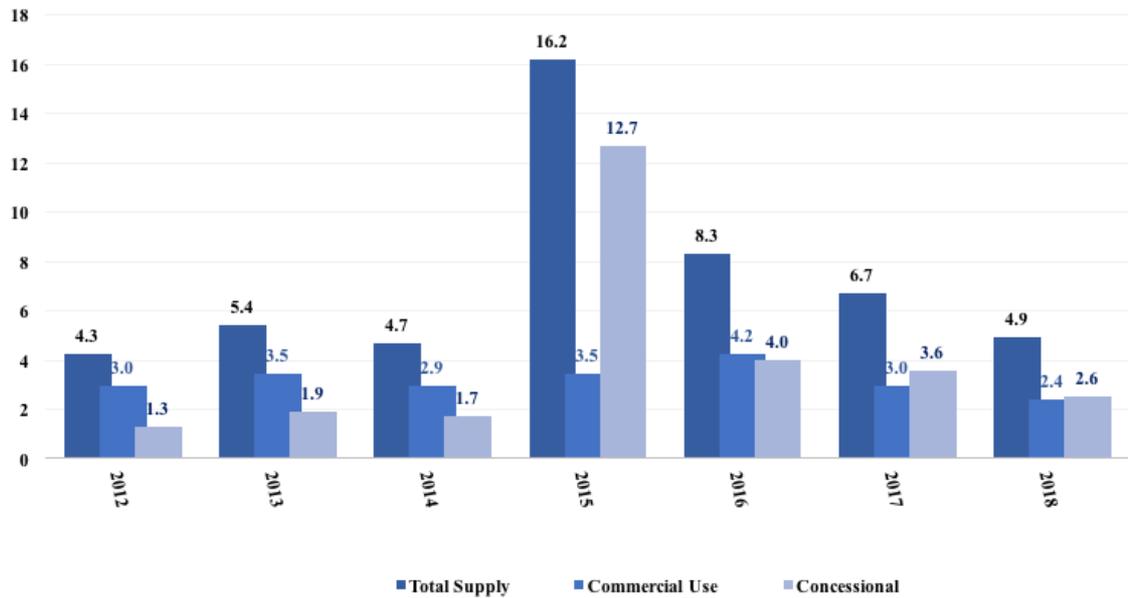


Figure 12 Supply of timber

The consumption of timber by different sectors of the economy could not be estimated, as NSB couldn't get any relevant information.

5.3. Mineral Asset Account

NSB compiled mineral accounts for only non-metallic mineral resources as information on metallic mineral resources in Bhutan are not available. The DGM, MoEA has the primary data to start the compilation of mineral asset account for non-metallic mineral resources. The key factors in the measurement of mineral asset accounting are understanding the mineral resources in the form of deposits or reserves and its extractions by different mining and quarrying companies. The deposits influence the likelihood and the cost of current and future extraction.

Mineral resources (non-metallic) in Bhutan are resources which are geologically known and extracted by mining and quarrying companies. The non-metallic resources include quarry resources that are found in the country such as coal, dolomite, limestone, gypsum, quartzite, talc and iron ore.

The physical mineral asset accounts show the level of stock of individual mineral at a particular point in time and then records transactions that cause changes in the level of

stock. NSB considered reserves of minerals which are geologically known reserves and its level as the opening stock, while the extractions were recorded as depletion.

5.3.1. Mineral Reserve

The data on reserves used in developing physical accounts are gathered so that we can understand the opening stock of individual mineral resources. There are three categories of mineral resources: proved, probable and possible. *Proved are economically mineable with high degree of certainty (high confidence level). Probable are economically mineable with lower level of confidence than proved reserves. Possible minerals are part of a mineral resource for which grade and mineral content are estimated with a low level of confidence.*

Metallic reserves particularly copper, iron ore and tungsten are probable reserve, while lead-zinc reserve constitutes 86% as proven reserve. Non-metallic reserve such as Talc (100%), Dolomite (99.68%) and coal (78.68%) are possible reserve. Quartzite and gypsum are proven reserve with 100% and 85% respectively.

In terms of overall reserve, the country has 1.04 million Mt of coal, 14,542.47 million Mt of dolomite, graphite ore 48.75 million Mt, gypsum 134.22 million Mt, limestone 164.65 million Mt and quartzite 5.18 million Mt. Non-metallic mineral such as copper has reserve of 2.04 million Mt, lead-zinc 3.30 million Mt, iron-ore 2.69 million Mt and tungsten 3.87 million Mt.

5.3.2. Extraction of Minerals

Mining and quarrying companies extract minerals from different areas in the country. Information on extraction of minerals are compiled to ascertain whether or not mineral extractions or harvest per se, are carried out sustainably.

Coal extraction averages 0.12 million Mt annually from 2010 to 2018. The extraction ranges from 0.09 million Mt to 0.19 million Mt. The coal extraction in 2018 was highest at 0.19 million Mt. Extraction of dolomite on the other hand has occurred on an average of 2.00 million Mt. The extraction of dolomite in 2018 was 2.82 million Mt compared to

2.54 million Mt in 2017. Limestone and gypsum extractions have been quite steady with an average of 0.98 million Mt and 0.36 million Mt respectively.

The talc extraction increased dramatically in 2018 with 0.07 million Mt from 0.01 million Mt in 2017. The only metal accounted in this report is iron ore, averages annual extraction of 0.03 million Mt from 2013 to 2018.

Table 2 Trend in mineral extraction (Million MT)

Minerals	2010	2011	2012	2013	2014	2015	2016	2017	2018
Coal	0.09	0.11	0.10	0.08	0.12	0.09	0.12	0.16	0.19
Dolomite	1.21	1.08	1.50	1.74	2.04	2.66	2.37	2.54	2.82
Limestone	0.70	0.65	0.68	1.01	1.12	0.85	1.26	1.24	1.34
Gypsum	0.34	0.35	0.31	0.35	0.41	0.39	0.32	0.33	0.46
Quartzite	0.11	0.10	0.09	0.09	0.08	0.08	0.09	0.18	0.15
Stone	6.65	1.84	1.49	0.04	1.47	2.20	3.41	3.83	3.41
Talc	0.04	0.01	0.02	0.01	0.01	0.01	-	0.01	0.07
Iron ore	-	-	-	0.02	0.02	0.04	0.03	0.03	0.04

5.3.3. Physical Asset Account for Minerals

The physical asset account records both the opening stock levels and the closing stock of minerals and the changes over a period of time. The changes over a period of time include both upward and downward. The total reserve of a particular mineral resource was considered as the opening stock in 2010, as it is done in many other countries. Extractions by different mining and quarrying companies are accounted and thus, subtracted from the total known reserves to ascertain the outstanding reserves of individual mineral resources. Here, the outstanding reserves does not necessarily mean reserves remaining from the known reserve, but also unknown reserve in the ground.

The physical asset account for different minerals records the opening stock: the level of coal resources at the beginning of the year; increases in stocks through discoveries and other increases; the decrease in stock through extractions and other decreases; and the closing stock at the end of the accounting year. Coal reserve (opening stock) as of 2018

was estimated at 0.18 million Mt; dolomite at 14,527.32 million Mt; limestone at 157.47 million Mt; gypsum at 132.70 million Mt; quartzite at 4.45 million Mt; talc at 0.03 million Mt; and iron-ore at 2.54 million Mt.

In terms of remaining mineral reserve from the known reserve, the balance dolomite reserve as of 2018 is 99%, gypsum 99%, limestone 96%, iron ore 97% and quartzite 86%. These are minerals that are still heavily available in the ground in relation to total known reserve. However, the extraction of coal and talc has exceeded the known reserve in 2018. Since these two minerals falls under possible mineral category, it is difficult to estimate the exact quantity of remaining reserve.

5.3.4. Monetary Asset Account for Minerals

The monetary asset account for mineral resources shows the value of an individual mineral at 2018 prices. The Net Present Value (NPV) approach is adopted to value the mineral resources. The formula for the calculation of NPV using an appropriate discount rate is:

$$V_t = \sum_{r=1}^{Nt} \frac{RR_{(t+r)}}{(1 + r_t)^t}$$

where V_t is the value of the asset of time t ; N is the asset life; RR is the resource rent; and r is a nominal discount rate.

In this calculation, NSB derived the harvest or actual quantity of extraction of individual mineral on the total volume of mineral resource left for future extraction dividing by the number of years, lease period provided to mining and quarrying companies. The resource rent for each mineral resource is calculated using company's books of accounts. The NPV of future extraction are discounted back to current value term using appropriate discount rate.

In most countries around the world, in the absence of any appropriate discount rate, lending or interest rate is used as the basis to estimate the discount factor. For the current

initiative, NSB used Bank of Bhutan’s fixed lending rate of 12 percent to Mining & Quarrying Companies as the discount rate.

The monetary asset account shows the value of mineral resources at 2018 prices. For Dolomite, if constant average extraction of 2.00 million Mt is maintained for future years with constant per unit future resource rent of Nu. 293.98 and the constant social discount rate of 12%, the net present value (NPV) of dolomite for future extractions was estimated at Nu. 254,167 million under the above assumptions. For determining constant extraction quantity, 10-year moving average approach was applied.

Table 3 Monetary Asset Account for Dolomite (Million Nu)

Extraction year	Quantity	resource rent per unit	Total resource rent from extraction	Discount rate, 12 per cent	Discount factor	Net present value (NPV) of extraction
2019	968.30	293.99	284,667.11	0.12	0.89	254,167.06
2020	968.30	293.99	284,667.04	0.12	0.80	226,934.82
2021	968.30	293.99	284,667.04	0.12	0.71	202,620.37
2022	968.30	293.99	284,667.04	0.12	0.64	180,911.05
2023	968.30	293.99	284,667.04	0.12	0.57	161,527.72
2024	968.30	293.99	284,667.04	0.12	0.51	144,221.18
2025	968.30	293.99	284,667.04	0.12	0.45	128,768.91
2026	968.30	293.99	284,667.04	0.12	0.40	114,972.24
2027	968.30	293.99	284,667.04	0.12	0.36	102,653.79
2028	968.30	293.99	284,667.04	0.12	0.32	91,655.17
2029	968.30	293.99	284,667.04	0.12	0.29	81,834.97
2030	968.30	293.99	284,667.04	0.12	0.26	73,066.94
2031	968.30	293.99	284,667.04	0.12	0.23	65,238.34
2032	968.30	283.63	284,667.04	0.12	0.20	58,248.52
2033	968.30	293.99	284,667.04	0.12	0.18	52,007.60

Similar approach has been applied to calculate the NPV of other mineral resources such as Limestone, Quartzite, Gypsum, etc. and presented in the annex tables.

Chapter 6: Experimental Energy Account

6.1. Overview

Some 13% of the global population still lacks access to modern electricity. Energy is the dominant contributor to climate change and it accounts for almost 60% of the total global Ghg emission. SDG goal 7 targets that by 2030, to ensure universal access to affordable, reliable and modern energy services. Bhutan has promised to remain carbon neutral for eternity (UN Climate Change Conference, Paris).

The experimental energy accounts presented in this publication is in accordance with the principles of the System of Environmental-Economic Accounting (SEEA). It records flows of energy in physical units from the initial extraction or capture of energy resources from the environment into the economy; the flows of energy within the economy in the form of the supply and use of energy by industries and households; and flows back to the environment.

The SEEA 2012 recommends energy flow accounts as important indicators such as energy intensity, efficiency and productivity can be derived for policy purposes. The SEEA recommends physical supply and use (PSUT) approach to account for energy flows. The PSUT records flows of energy from natural inputs, energy products, energy residuals and other residual flows in physical units of measure. It is based on the principle that the total supply of energy products equals total use of energy products.

For Bhutan, hydro-electricity is the main source of energy. However, to cater energy needs of other economic sectors such as for industries and transport sector, energy products like coal and fossil fuels are imported from India. Using the latest available information from the Bhutan Trade Statistics (BTS) of Ministry of Finance and data from other administrative sources, the experimental energy accounts is compiled. It adopts the *Standard International Energy Product Classification* (SIEC) and uses *Intergovernmental Panel on Climate Change (IPCC)* Conversion Factor (CF). The CF used is as follow:

Fuel	Basic Unit	Terajoules	Tonnes of Oil Equivalent (ToE)	Petajoules
ATF (Jet Kerosene)	kl	0.03561	0.8505	0.000036
Coal (Anthracite)	MT	0.02670	0.6377	0.000027
Coal (Sub-bituminous)	MT	0.01890	0.4514	0.000019
Other Coal (Lignite)	MT	0.01190	0.2842	0.000012
Coke of Coal	MT	0.02820	0.6735	0.000028
Diesel (Gas Diesel Oil)	kl	0.03741	0.8935	0.000037
Electricity	GWh	3.60000	85.9845	0.003600
Wood (fuelwood and Briquette)	MT	0.01560	0.3726	0.000016
Kerosene	kl	0.03590	0.8578	0.000036
LPG	MT	0.04730	1.1297	0.000047
Petrol (Motor Gasoline)	kl	0.03411	0.8147	0.000034
Bio-gas	MT	0.05040	1.2038	0.000050
Light Diesel Oil (LDO)	kl	0.03655	0.8730	0.000037
Units	Abbreviation	Terajoules		Petajoules
Tonnes of Oil Equivalent	TOE	0.041868		0.000041868
Terajoules	TJ	1		0.001
Megawatt Hour	MWh	0.0036		0.0000036
Kilowatt Hour	kWh	0.0000036		3.6E-09
Kilocalorie	Kkcal	4.19E-09		4.19E-12
Joule	J	1E-12		1E-15
Gigawatt Hour	GWh	3.6		0.0036

The NSB intends to develop emission account in future once the full set of energy accounts has been compiled. The energy sector is the primary source of CO₂ emission and therefore energy accounts and statistics are important.

6.2. Bhutan's Energy at a Glance

- ✓ In 2017-18 a total of 692.96 kilotonne of oil equivalent (ktoe) of energy were produced within the economy.
- ✓ In gross terms, Bhutan's energy production decreased by more than 10% between 2016/17 and 2017/18.

6.3. Energy: Supply & Use

The total supply of energy decreased by 5%, an approximately 978 ktoe in 2018 from 1034 ktoe in 2017. The supply was predominantly the extraction from the environment with 693 ktoe with around 286 ktoe of energy from imports of energy products. The hydro-electricity remains the predominantly the main source of renewable energy.



Figure 13 Renewable energy share to total energy generation

On the use side, use by industry is about 346 ktoe, households with 181 ktoe, changes in inventory or accumulation with 76 ktoe and exports with 376 ktoe. The energy loss through distribution which flows back into environment as residual barely accounts for 5.68 ktoe. The energy loss captured here pertains to loss of hydroelectricity reported to NSB by BPC.

6.4. Energy: Trade

Bhutan imports varied energy products such as fossil fuel (diesel & petrol), aviation turbine fuel, kerosene, furnace oil, LPG, coal, etc. Import of diesel accounts for 40-50% of the total energy import for transport sector followed by coal for industry sector with 20-30%, petrol with 10-15% for transport sector. Bhutan import electricity during lean

season in winter and this accounted for almost 1-10% of the total energy import.

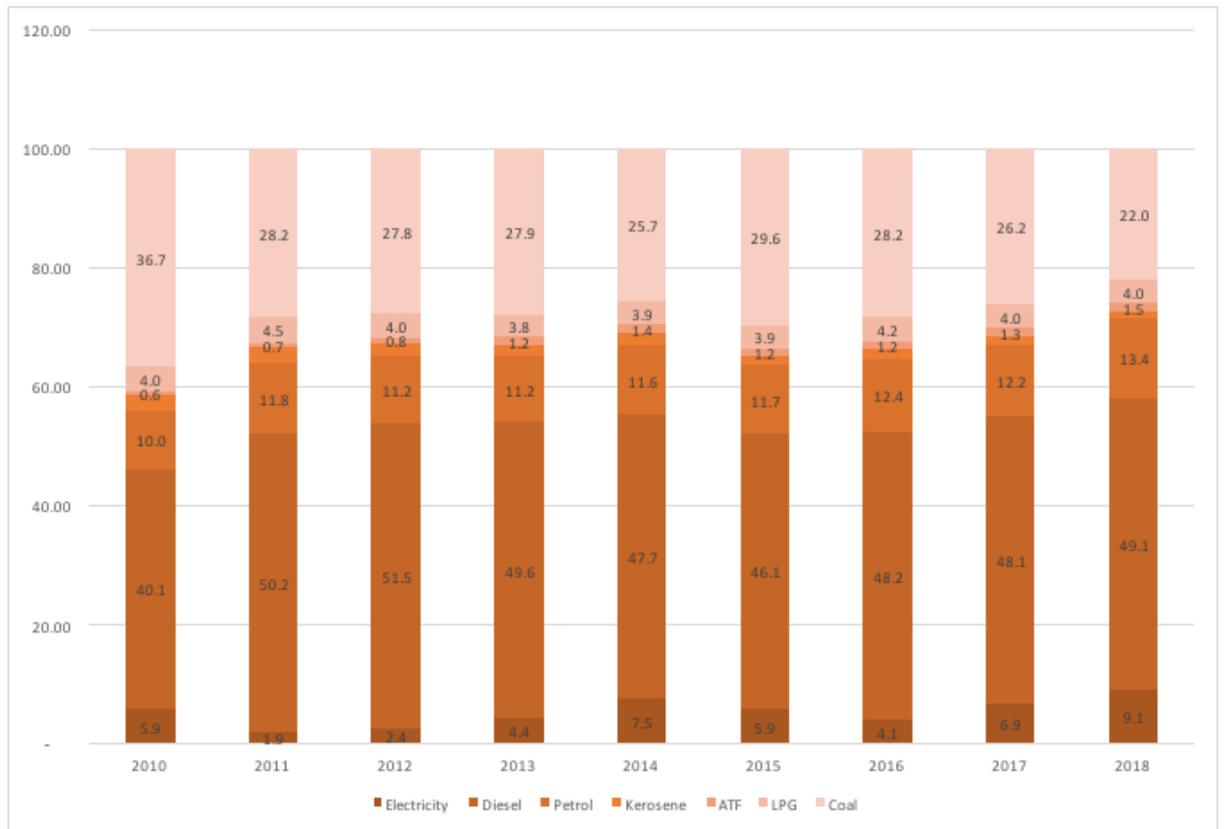


Figure 14 Share of energy import from RoW

The share of energy export to the rest of the world (RoW) is mainly hydro-electricity and coal. Hydro-electricity accounts for almost 89-97% of the total energy export and coal with the remaining share.

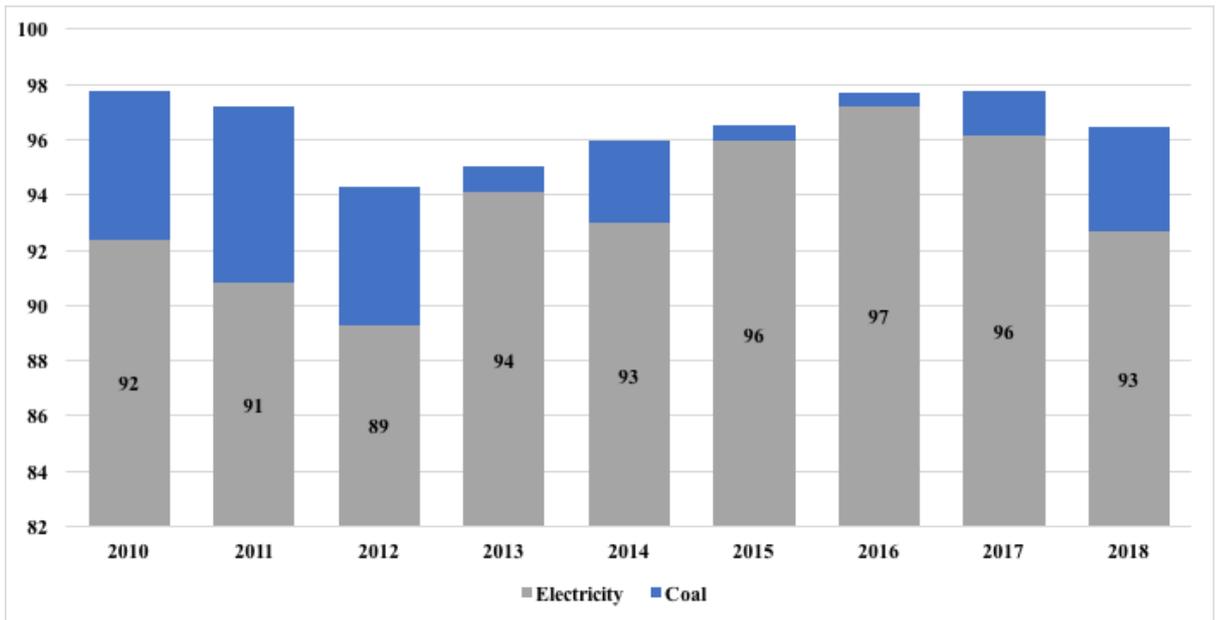


Figure 4 Share of energy export to RoW

Chapter 7: Experimental Waste Account

7.1. *Background and Policy*

The importance of our environment is articulated in the profound wisdom of *His Majesty the King* at the inaugural of the Royal Bhutan Flower Exhibition in April 2015, said that “*Where we live must be clean, safe, organized and beautiful, for national integrity, national pride, and for our bright future. This too is nation building*”. In addition, there are number of national policies and requirements which provide the rationale for the development of waste accounts.

Bhutan’s 12th Five-Year Development Plan (2019-2023) emphasizes effective waste management at national level as one of the key performance indicators (KPI). It sets out clear performance indicators to be measured by the absolute amount of solid waste (in tonnes) recycled at national level. It envisages to measure the efficiency of Municipality services through the percentage of urban population that are satisfied with the effectiveness and efficiency of waste collection services.

The Constitution of the Kingdom of Bhutan provides constitutional right to every Bhutanese as a trustee of the Kingdom’s natural resources and environment for the benefit of the present and future generations. The Article 5.1 of the Constitution empowers every citizen with fundamental duty to contribute to the protection of the natural environment, conservation of the rich biodiversity of Bhutan and prevention of all forms of ecological degradation including noise, visual and physical pollution through the adoption and support of environment friendly practices and policies.

The National Environment Protection Act of 2007 requires anyone taking natural resources or deriving economic benefits from them to ensure that they are sustainably used and managed.

The Waste Prevention and Management Act 2009 provides:

- Reducing the generation of waste at source;
- Promoting the segregation, reuse and recycling of wastes; and

- Disposal of waste in an environmentally sound manner.

The Waste Prevention and Management Regulation 2012 stipulates:

- Promotion of the principles of 3Rs (Reduce, Re-use & Recycle);
- Consumption habits of the people should help promoting the principles; and
- Waste segregation at source is essential.

In Bhutan, proper waste management system across the country is yet to be put in place. To address the issue of waste, an integrated waste system needs to be implemented and this would require meetings and consultations amongst key stakeholders such as legislators, policy-makers, private partners, local communities, CSOs, and government authorities. Efforts are being made by different entities to this end. For example, Thimphu and some urban towns are already implementing Public Private Partnership (PPP) for integrating waste management. The habit of waste segregation by households into dry and wet in urban town like Thimphu is picking up.

Beside the legal and policy documents listed above, Bhutan has also produced a range of policy documents, strategies and assessments that could be informed by and guide priority setting for waste management. These include:

- ***National Integrated Solid Waste Management 2014***: provides strategic goals and objectives to promote towards “*Zero Waste Bhutan*” in partnership with public, industry, CSO, government authorities both at local and central levels, municipalities, and other funding agencies. It also emphasizes to honour the principles of Gross National Happiness and Zero Waste Principles through increased citizen participation in segregation, resource conservation, processing and landfill diversion. The concept of 3Rs has been extended to 4R as prevent and reduce, reuse, recycle and responsibility. Every individual is expected to be responsible for waste management and take measures to prevent waste-related pollution through Extended Producer Responsibility (EPR), Polluter Pays Principle (PPP) and Public-private partnership models.

- ***Bhutan State of Environment***: The National Environment Commission is mandated to report the State of the Environment (SoE) annually to PM's office with detail information on the current state and trends in Bhutan's environment with underlying causes of environmental change and the responses to changes. The report identifies waste management as the major emerging environmental issue for Bhutan. The poor management practices of waste threaten public health and natural environment in terms of water pollution, air and emission of Greenhouse gases.

Policies on waste provide a lot of demand for integrated information on waste. However, there is a lot of data gaps and therefore efforts are required to strengthen waste statistics. Currently, a number of key institutions or agency stakeholders maintain or at least report a small section of waste information as hereunder. However, there is no integrated or a comprehensive waste information system.

- ***National Environment Commission (NEC)***: The Commission in its annual report on the Bhutan State of the Environment identifies waste management as the cross-cutting issues. The publication reports only solid waste survey conducted by the MoWHS in 2008. There is no further information on waste other than waste composition based on the National Solid Waste Survey of MoWHS. However, medical waste generated (aggregated figure only) from health facilities in the country as per Business Bhutan is reported. E-waste based on MoHWS 2008 survey and as per the kuensel reported are mentioned in the publication. Further, information on industrial waste are sourced from the report of the Compliance Monitoring Division, NECS.
- ***Ministry of Works & Human Settlements (MoWHS)***: As mentioned earlier, the ministry has conducted Solid Waste Survey in 2008. In addition, the annual bulletin reports some information on waste generation and equipment available with Municipalities. However, information on waste are not on regular basis and even in terms of coverage it is quite limited.

Construction wastes are increasing with the growth in the construction sector. The proper

management of the construction wastes poses to be an issue.

- **National Statistical Bureau (NSB):** The NSB publishes annual dzongkhag statistics (ADS) covering various information on population, health, education and some information on environment. Under Construction and Housing chapter, basic information on total waste generated by the district (information mostly sourced from municipalities) are reported.
- **Ministry of Health (MoH):** Medical waste is another type of waste generated from health facilities. Medical waste management is under the Department of Public Health at JDWNRH, MoH. On an average, JDWNRH generates 350kg of medical waste per day. The annual health bulletin of the ministry doesn't have any information on medical waste. Similarly, there are increasing number of private pharmacies in the country. In addition, medical hospitals in RBA and IMTART are also concerning issue. The waste generated from these pharmacies and hospitals have to be managed as well. However, as per the communication of NSB with the Environment Officer, Thimphu Thromdey, these medical wastes remain the biggest challenge and it's not managed as it should be.

7.2. Methods for compilation

Waste accounting (WA) as per the UN System of Environmental-Economic Accounts (SEEA) guides National Statistics Offices around the world to collect information on the generation and disposal of waste to landfills or to recycling facilities, the supply of recycled materials in the economy. It suggests using the Supply-Use framework with detail information on production, reuse, disposal and various other types of residuals generated by the different economic units in the country.

Waste accounts can be useful in many ways. It helps government to understand the extent of waste generation in the country. Waste management is a serious issue which poses a number of challenges. Every household, businesses and government are involved in waste generation in some way or the other, and if left unmanaged will eventually pose challenges. Thus, waste management is largely the responsibility of everyone. The policy

makers and government therefore require waste statistics for effective modelling of waste management policy and strategies.

Even from global prospective, solid wastes cause environmental & health impacts such as pollution, aesthetic, land use, etc. The 2030 Agenda for Sustainable Development, particularly Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable provides evidence to account for waste. By 2030, global target is to reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management. Further, by 2030, it also aims to achieve the environmentally sound management of chemicals (treatment of waste, generation of hazardous waste, hazardous waste management, by type of treatment) and all other wastes. By 2030, global agenda is to substantially reduce waste generation through prevention, reduction, recycling and reuse. These will only be possible through sustainable consumption and production.

7.3. Overview

The Solid Waste Account presented in this release highlights the waste generation which flows back as residuals to the environment. The Account is an experimental as energy account given the limited information from the source. However, the coverage shall be expanded once other information of waste flows become available.

As the country develops, the consumption and the imports in particular are placing substantial pressure on the management of waste. The waste account therefore compiled would enable better informed decisions and policy making pertaining to solid waste management in the country.

The experimental waste account includes the proportion of waste collected and sent to landfills from four major Thromdes and other urban areas. Data for rural areas are not part of the release at the present due to data constraint. Further, the estimate does not include waste through illegal dumping and litter which is still significant and damages the environment.

An overall increasing trend in waste generation is observed over the years by the four

thromdes and other urban areas. The substantial increase in the waste generated every year could be also because of growth in urban households and increased waste collection services in the urban areas. This demands improved management through technologies and other facilities to collect waste. The waste is becoming an emerging issue and concern for all. The waste generation has increased by more than 100 percent in the past five years.

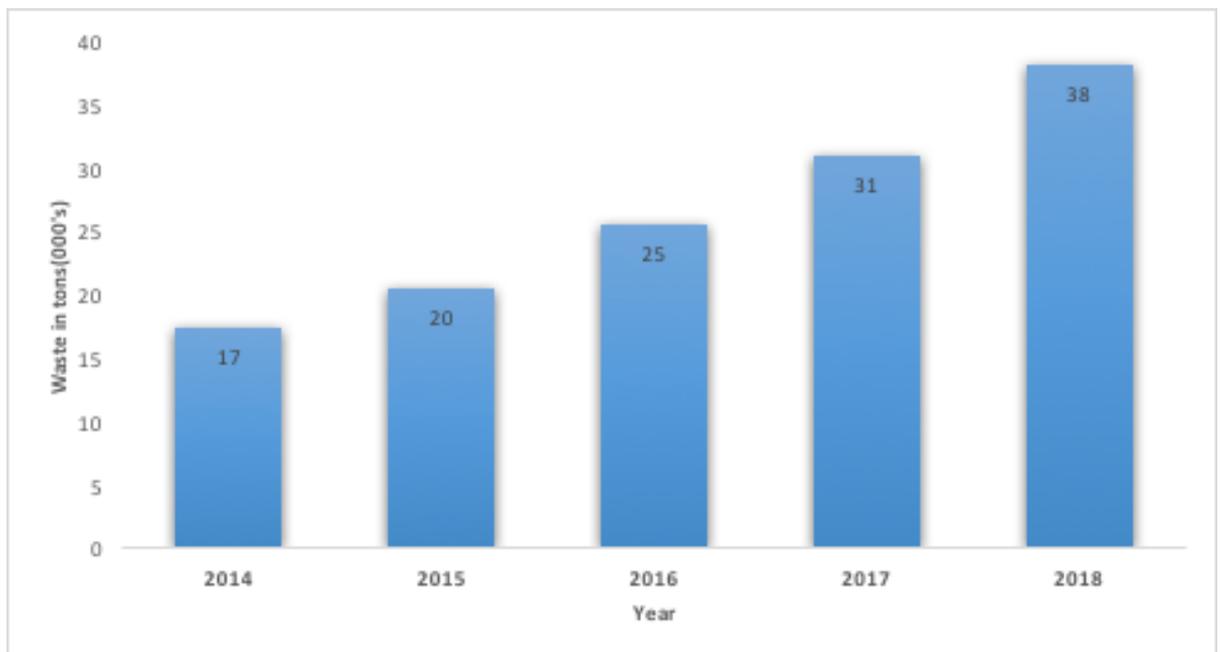


Figure 5 Waste generation

7.4. Waste Management Cost

The National Statistics Bureau collected information on the cost of waste management by four thromdeys. The information on the waste management cost for other urban towns could not be included. The cost here includes the **Operational Cost** of managing solid waste and landfills through the salary payments for staff, fuel cost and maintenance of trucks and tractors, landfill management cost and other day-to-day operational costs related to waste management activities. It does not include **Up-Front Costs** such as acquisition of land, building, public education or advocacy and outreach. Further, the **Back-End Costs** such as the cost for site closure, post-service benefits of the employee,

the cost of decommissioning building and equipment are excluded.

There are 218 staff including drivers and conductors working in waste management related activities in four thromdes. A total of 39 transportation facilities (trucks and tractors) are deployed in collecting and disposing waste to landfills. The annual total operational expenditure was valued at Nu. 53.61 million BTN for collection and disposition of waste to landfills. With the annual total of 14,490.5 tons of waste collected and dumped at the landfills by the four thromdes and an annual expenditure of Nu. 53.61 million BTN for waste management activities, the cost of managing waste was estimated at Nu.4 per kg of waste.

Chapter 8: Looking Ahead

Environmental-Economic Accounting has been recognized globally for its usefulness in terms of strategic and sustainable development planning. NSB has made a small beginning based on the availability of information and support by DANIDA project on environmental accounts and statistics. However, NSB plans to build a comprehensive environmental-economic accounting compendium in future to provide information for national policy planning and also to help monitor and report on SDGs and other Green Economy Indicators.

The NSB shall work towards developing priority accounts such as waste, water, land, forest, timber resource account, carbon and selected ecosystem services. A detailed waste account will be carried out in next publication after the completion of Waste Inventory Survey which is scheduled to conduct in December, 2019.

To address the need of information requirements, the NSB shall work to strengthen partnerships and coordination with agencies both from the government and non-governmental organization. Training and capacity building in environmental-economic accounting is another key area to be considered. This need shall be addressed with in-house capacity building through HR development, training on environmental accounts compilation, analysis and valuation, and finally conducting knowledge dissemination workshops for data users.

Chapter 9: Concepts, Definitions & Terminologies of SEEA

9.1. Green Economy

UNEP 2011 defines green economy as one that results in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”. The Green Economy Indicators are compiled based on the framework of United Nations Statistics Division (UNSD), which closely follows the OECD green growth structure. It consists of 44 core set of indicators (CS) and 53 indicators that are non-core (NCS).

9.2. SEEA

The System of Environmental-Economic Accounting (SEEA) is an international statistical standard that provides a comprehensive set of accounting tables to guides national statistics offices for compilation of consistent and comparable statistics and indicators for policymaking, analysis and research. It provides conceptual framework for understanding the interactions between the environment and the economy.

9.3. Electricity Account

The total supply as explained above is accounted as: $S=DP+M$; where, S =Total Supply, DP =Domestic Production and M =Import. Information on the production side (supply) are sourced from the annual reports of DGPC. The total use is computed as: $U=DU+X$; where U =Total Use, DU =Domestic Use (input in industries & household consumption), X =Export. The consumption data are sourced from BPCL and accordingly mapped into different sectors of economy.

9.4. SNA

The System of National Accounts is the framework of accounts which measures the level of economic development and the rate at which the economy of the country grows over time.

9.5. Depletion

SEEA defines depletion as the decrease in the quantity of the stock of a natural resource over an accounting period due to the extraction of the natural resource by economic units.

9.6. Opening stock of minerals

The opening stock is the level of mineral resources at the beginning of the year and it should be equal to the closing stock of the previous year.

9.7. Closing stock of minerals

The closing stock of mineral is the level of reserve at the end of the year and it should be equal to the opening stock of the subsequent year.

9.8. Upward changes

Upward changes are any new discoveries of new stock of minerals through exploration and evolution.

9.9. Downward changes

Downward changes are changes through extractions or any other decreases like catastrophic losses and reclassifications.

9.10. Resource Rent

The resource rent is the economic value of the mineral and it is estimated to ascertain whether mineral resources are being harvested sustainably. It is calculated based on the residual value method of SEEA which excludes operating costs, specific taxes and subsidies, and consumption of fixed capital from the output.

9.11. Social discount rate

The Net present value (NPV) method uses social discount rates to discount the value of future returns to explain in the current terms. The returns earned in the current period are worth more than returns earned in the future.

9.12. Energy accounts

Energy accounts provides information on energy supply and use. It applies the principle that supply of energy equals use. It presents information on energy production, domestic consumption and net export.

9.13. Energy from natural inputs

Energy from natural inputs encompasses flows of energy from the removal and capture of energy from the environment by resident economic units.

9.14. Energy products

Energy products are products that are used as a source of energy. They comprise fuels that are produced/generated by economic unit as a source of energy; electricity generated by economic units; and heat sold or generated by other economic units.

9.15. Energy residuals

Energy residuals are mainly energy losses through flaring and venting of natural gas and losses during transformation in the production processes, leakages of liquid fuels, loss of heat during transport, losses during distribution, electricity transmission and transport.

10. Statistical Tables

Table 1 Physical Account of Electricity (GWh)

Year	SUPPLY			USE			
	Production	Imports	Total	Exports	Transmission Loss	Domestic Use	Total
2000	1,921.70	34.39	1,956.08	1,460.48	35.30	460.30	1,956.08
2001	1,967.75	6.90	1,974.65	1,392.62	39.14	542.89	1,974.65
2002	2,173.08	24.30	2,197.38	1,476.37	68.06	652.94	2,197.38
2003	2,377.43	18.72	2,396.15	1,695.80	93.05	607.30	2,396.15
2004	2,423.27	22.80	2,446.07	1,707.19	122.72	616.17	2,446.07
2005	2,519.56	18.43	2,537.99	1,713.61	130.18	694.20	2,537.99
2006	3,354.67	34.69	3,389.36	2,526.15	117.20	746.01	3,389.36
2007	6,421.95	22.22	6,444.17	5,372.57	121.05	950.55	6,444.17
2008	7,158.17	9.38	7,167.55	5,922.38	150.59	1,094.58	7,167.55
2009	6,922.94	64.16	6,987.10	5,404.82	165.47	1,416.81	6,987.10
2010	7,327.73	131.56	7,459.29	5,579.49	166.99	1,712.81	7,459.29
2011	7,067.55	40.32	7,107.87	5,273.10	93.98	1,740.79	7,107.87
2012	6,826.48	59.36	6,885.84	4,895.67	84.17	1,738.98	6,718.82
2013	7,549.84	112.26	7,662.10	5,557.63	43.06	2,061.41	7,662.10
2014	7,163.79	191.83	7,355.62	5,044.33	90.90	2,220.39	7,355.62
2015	7,396.28	163.15	7,559.43	5,541.76	(39.47)	2,057.14	7,559.43
2016	7,585.06	113.11	7,698.17	5,779.32	115.80	1,803.05	7,698.17
2017	7,261.13	208.10	7,469.23	5,068.48	71.05	2,329.82	7,469.35
2018	6,593.20	300.66	6,893.86	4,053.59	66.09	2,774.18	6,893.86

Table 2 Monetary Account of Electricity (Million Nu.)

Year	SUPPLY			USE			
	Production	Imports	Total	Exports	Losses through transmission &	Industries and households	Total
2000	2,307.26	51.58	2,358.85	2,190.72	38.22	129.90	2,358.85
2001	2,237.78	6.90	2,244.68	2,097.85	48.53	98.31	2,244.68
2002	2,530.55	24.30	2,554.85	2,289.82	85.75	179.28	2,554.85
2003	2,867.94	18.72	2,886.66	2,603.33	121.62	161.71	2,886.66
2004	3,005.05	30.73	3,035.78	2,711.75	149.47	174.56	3,035.78
2005	3,956.64	32.77	3,989.41	3,479.20	209.14	301.07	3,989.41
2006	5,552.83	63.13	5,615.95	4,976.18	247.25	392.52	5,615.95
2007	10,962.37	37.73	11,000.10	10,034.33	91.71	874.06	11,000.10
2008	12,593.17	14.26	12,607.43	11,032.60	103.94	1,470.89	12,607.43
2009	10,889.85	111.03	11,000.88	10,071.00	111.57	818.31	11,000.88
2010	11,811.46	233.87	12,045.33	10,411.46	139.73	1,494.14	12,045.33
2011	10,948.33	67.18	11,015.51	9,839.21	162.12	1,014.18	11,015.51
2012	11,140.80	110.30	11,251.10	9,714.53	148.23	1,388.34	11,251.10
2013	13,051.66	214.93	13,266.59	11,013.99	149.96	2,102.64	13,266.59
2014	13,905.77	371.28	14,277.05	10,698.31	-	3,578.74	14,277.05
2015	14,258.09	341.51	14,599.60	10,991.32	-	3,608.28	14,599.60
2016	12,882.94	222.50	13,105.44	11,421.89	0.80	1,682.75	13,105.44
2017	12,277.25	440.95	12,718.20	8,267.51	1.38	4,449.31	12,718.20
2018	11,681.98	1,134.81	12,816.79	9,868.45	1.35	2,946.99	12,816.79

Table 3 Gross Electricity Consumption by Household & Industry

Year	(GWh)			(Million Nu.)		
	Household	Industry	Total	Household	Industry	Total
2000	64.01	396.30	460.30	14.54	115.36	129.90
2001	72.09	470.81	542.89	10.50	87.81	98.31
2002	91.28	561.67	652.94	20.16	159.11	179.28
2003	88.40	518.89	607.30	18.96	142.75	161.71
2004	87.59	528.57	616.17	19.98	154.58	174.56
2005	93.23	600.97	694.20	32.48	268.58	301.07
2006	90.37	655.64	746.01	38.12	354.40	392.52
2007	110.97	839.58	950.55	81.86	792.20	874.06
2008	126.41	968.16	1,094.58	136.27	1,334.62	1,470.89
2009	182.47	1,234.34	1,416.81	84.64	733.67	818.31
2010	208.80	1,504.01	1,712.81	146.20	1,347.94	1,494.14
2011	209.53	1,531.26	1,740.79	97.89	916.29	1,014.18
2012	179.96	1,559.03	1,738.98	136.23	1,252.11	1,388.34
2013	251.69	1,809.72	2,061.41	206.31	1,896.32	2,102.64
2014	277.37	1,943.02	2,220.39	414.54	3,164.20	3,578.74
2015	284.31	1,772.83	2,057.14	433.97	3,174.31	3,608.28
2016	491.58	1,311.47	1,803.05	458.78	1,223.97	1,682.75
2017	1,289.73	1,040.09	2,329.82	1,951.60	2,497.71	4,449.31
2018	1,566.67	1,207.51	2,774.18	329.41	2,617.58	2,946.99

Table 4 Gross Electricity Consumption by Economic Sectors (GWh)

Year	Total Industry	Agriculture, Livestock & Forestry	Mining & Quarrying	Manufacturing	Electricity & Water	Construction	Trade	Hotel & Restaurant	Transport, Storage & Communication	Finance, Insurance & Real Estate	Community, Social & Personal	Private, Social & Recreational
2000	396.30	0.24	1.06	335.44	12.89	2.84	7.29	0.58	1.71	0.55	33.66	0.03
2001	470.81	0.27	1.26	401.93	13.44	4.05	8.91	0.77	2.04	0.62	37.48	0.03
2002	561.67	0.36	1.82	471.99	17.88	5.70	12.48	0.93	2.74	0.72	47.03	0.04
2003	518.89	0.32	1.96	432.21	19.21	5.16	11.97	0.89	2.50	0.76	43.86	0.04
2004	528.57	0.33	1.39	444.06	16.46	5.51	13.32	1.04	2.92	0.83	42.68	0.04
2005	600.97	0.35	1.75	500.88	19.54	6.01	16.24	1.31	3.47	1.08	50.30	0.05
2006	655.64	0.34	2.54	548.71	26.10	5.29	16.38	1.69	3.32	1.16	50.05	0.05
2007	839.58	0.36	2.54	704.26	48.58	5.87	17.40	2.04	3.58	1.36	53.55	0.06
2008	968.16	0.39	3.62	813.39	56.44	5.49	19.04	3.20	4.35	1.53	60.62	0.07
2009	1234.34	0.50	4.64	1025.91	66.65	7.58	23.95	3.49	5.61	1.92	94.00	0.08
2010	1504.01	0.54	5.29	1267.70	70.60	10.25	30.02	3.87	6.38	2.10	107.19	0.09
2011	1531.26	0.56	5.79	1288.26	60.10	12.62	33.87	5.51	7.14	2.43	114.88	0.09
2012	1559.03	0.51	3.52	1345.23	45.32	14.13	34.39	5.61	6.47	2.07	101.71	0.08
2013	1809.72	0.62	5.75	1549.77	61.01	15.75	42.44	7.42	7.62	2.52	116.71	0.10
2014	1943.02	1.54	4.50	1710.72	71.09	26.95	22.41	18.72	13.27	2.91	70.08	0.81
2015	1772.83	0.67	7.00	1550.37	67.57	4.06	8.93	19.57	12.18	0.47	101.81	0.20
2016	1311.47	2.02	8.50	738.45	208.33	17.12	23.64	45.25	32.89	13.21	221.48	0.59
2017	1040.09	0.80	4.38	932.12	41.45	6.33	5.07	8.27	5.34	0.99	34.82	0.52
2018	1207.51	1.51	2.88	1048.37	16.08	17.79	39.40	13.61	2.34	0.12	65.38	0.04

Table 5 Gross Electricity Consumption by Industry by Economic Sectors (Million Nu.)

Year	Total Industry	Agriculture, Livestock & Forestry	Mining & Quarrying	Manufacturing	Electricity & Water	Construction	Trade	Hotel & Restaurant	Transport, Storage & Communication	Finance, Insurance & Real Estate	Community, Social & Personal	Private, Social & Recreational
2000	115.36	0.07	0.39	95.92	3.87	0.95	2.19	0.16	0.55	0.16	11.09	0.01
2001	87.81	0.05	0.29	73.69	2.59	0.87	1.71	0.14	0.42	0.11	7.92	0.01
2002	159.11	0.11	0.64	131.26	5.22	1.86	3.64	0.25	0.86	0.20	15.07	0.01
2003	142.75	0.09	0.67	116.66	5.44	1.64	3.39	0.24	0.76	0.21	13.64	0.01
2004	154.58	0.10	0.51	127.53	4.96	1.86	4.01	0.29	0.94	0.24	14.13	0.01
2005	268.58	0.16	0.97	219.69	8.99	3.10	7.47	0.56	1.71	0.47	25.42	0.02
2006	354.40	0.19	1.71	291.38	14.54	3.30	9.12	0.88	1.98	0.62	30.63	0.03
2007	792.20	0.36	2.99	653.96	47.33	6.41	16.94	1.86	3.73	1.27	57.30	0.06
2008	1334.62	0.58	6.24	1103.70	80.36	8.76	27.10	4.27	6.64	2.09	94.80	0.09
2009	733.67	0.32	3.45	599.08	40.84	5.20	14.67	2.00	3.68	1.13	63.26	0.05
2010	1347.94	0.51	5.92	1117.37	65.29	10.62	27.75	3.35	6.32	1.86	108.87	0.08
2011	916.29	0.35	4.33	757.65	37.09	8.73	20.89	3.18	4.72	1.43	77.86	0.05
2012	1252.11	0.45	4.98	1055.89	43.61	12.62	30.32	4.96	5.83	1.73	91.64	0.07
2013	1896.32	0.69	7.54	1599.14	66.05	19.11	45.93	7.52	8.84	2.62	138.78	0.11
2014	3164.20	3.02	11.26	2687.10	122.27	58.23	41.79	44.52	29.49	6.31	158.50	1.72
2015	3174.31	1.42	16.69	2670.50	125.18	9.23	20.90	44.34	29.60	1.00	255.01	0.43
2016	1223.97	1.89	7.93	689.18	194.43	15.98	22.07	42.23	30.69	12.32	206.70	0.55
2017	2497.71	2.96	15.00	2112.89	105.64	29.60	29.60	22.74	24.84	4.41	147.58	2.46
2018	2617.58	5.72	10.14	1986.04	41.30	73.28	157.51	57.80	9.79	0.54	275.31	0.15

Table 6: Total Supply & Use of Electricity by Sectors (GWh)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
(I) TOTAL SUPPLY	7,459.29	7,107.87	6,885.84	7,662.10	7,355.62	7,559.43	7,698.17	7,469.23	6,893.86
Production	7,327.73	7,067.55	6,826.48	7,549.84	7,163.79	7,396.28	7,585.06	7,261.13	6,593.20
Imports	131.56	40.32	59.36	112.26	191.83	163.15	113.11	208.10	300.66
(II) TOTAL USE	7,459.29	7,107.87	6,718.82	7,662.10	7,355.62	7,559.43	7,698.17	7,469.35	6,893.86
1. Agriculture, Livestock & Forestry	0.54	0.56	0.51	0.62	1.54	0.67	2.02	0.80	1.51
2. Mining & Quarrying	5.29	5.79	3.52	5.75	4.50	7.00	8.50	4.38	2.88
3. Manufacturing	1,267.70	1,288.26	1,345.23	1,549.77	1,710.72	1,550.37	738.45	932.12	1,048.37
4. Electricity & Water	70.60	60.10	45.32	61.01	71.09	67.57	208.33	41.45	16.08
5. Construction	10.25	12.62	14.13	15.75	26.95	4.06	17.12	6.33	17.79
6. Wholesale & Retail Trade	30.02	33.87	34.39	42.44	22.41	8.93	23.64	5.07	39.40
7. Hotels & Restaurants	3.87	5.51	5.61	7.42	18.72	19.57	45.25	8.27	13.61
8. Transport, Storage & Communication	6.38	7.14	6.47	7.62	13.27	12.18	32.89	5.34	2.34
9. Finance, Insurance, Real Estate & Business Services	2.10	2.43	2.07	2.52	2.91	0.47	13.21	0.99	0.12
10. Community, Social & Personal Services	107.19	114.88	101.71	116.71	70.08	101.81	221.48	34.82	65.38
11. Private Social & Recreational Services	0.09	0.09	0.08	0.10	0.81	0.20	0.59	0.52	0.04
Household	208.80	209.53	179.96	251.69	277.37	284.31	491.58	1,289.73	1,566.67
Export	5,579.49	5,273.10	4,895.67	5,557.63	5,044.33	5,541.76	5,779.32	5,068.48	4,053.59
Cable Losses	166.99	93.98	84.17	43.06	90.90	(39.47)	115.80	71.05	66.09

**Table 6 Total Supply & Use of Electricity by Sectors Table 7 Supply & Use of Fossil Fuel
(Million Nu.)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
(I) TOTAL SUPPLY	12,045.33	11,015.51	11,251.10	13,266.59	14,277.05	14,599.60	13,105.44	12,718.20	12,816.79
Production	11,811.46	10,948.33	11,140.80	13,051.66	13,905.77	14,258.09	12,882.94	12,277.25	11,681.98
Imports	233.87	67.18	110.30	214.93	371.28	341.51	222.50	440.95	1,134.81
(II) TOTAL USE	12,045.33	11,015.51	11,251.10	13,266.59	14,277.05	14,599.60	13,105.44	12,718.20	12,816.79
1. Agriculture, Livestock & Forestry	0.51	0.35	0.45	0.69	3.02	1.42	1.89	2.96	5.72
2. Mining & Quarrying	5.92	4.33	4.98	7.54	11.26	16.69	7.93	15.00	10.14
3. Manufacturing	1,117.37	757.65	1,055.89	1,599.14	2,687.10	2,670.50	689.18	2,112.89	1,986.04
4. Electricity & Water	65.29	37.09	43.61	66.05	122.27	125.18	194.43	105.64	41.30
5. Construction	10.62	8.73	12.62	19.11	58.23	9.23	15.98	29.60	73.28
6. Wholesale & Retail Trade	27.75	20.89	30.32	45.93	41.79	20.90	22.07	29.60	157.51
7. Hotels & Restaurants	3.35	3.18	4.96	7.52	44.52	44.34	42.23	22.74	57.80
8. Transport, Storage & Communication	6.32	4.72	5.83	8.84	29.49	29.60	30.69	24.84	9.79
9. Finance, Insurance, Real Estate & Business Services	1.86	1.43	1.73	2.62	6.31	1.00	12.32	4.41	0.54
10. Community, Social & Personal Services	108.87	77.86	91.64	138.78	158.50	255.01	206.70	147.58	275.31
11. Private Social & Recreational Services	0.08	0.05	0.07	0.11	1.72	0.43	0.55	2.46	0.15
Household	146.20	97.89	136.23	206.31	414.54	433.97	458.78	1,951.60	329.41
Export	10,411.46	9,839.21	9,714.53	11,013.99	10,698.31	10,991.32	11,421.89	8,267.51	9,868.45
Cable Losses	139.73	162.12	148.23	149.96	-	-	0.80	1.38	1.35

Table 8. Supply and Use of Fossil Fuel (Diesel and Petrol)

Year	Supply								(in KL)
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Domestic Production	-	-	-	-	-	-	-	-	-
Import									
1. Diesel	85,620.00	103,610.90	121,832.00	122,424.80	117,273.80	122,091.40	127,539.00	140,640.50	156,817.50
2. Petrol	23,422.50	26,761.10	29,094.00	30,195.20	31,289.20	33,880.60	35,960.00	38,960.50	46,932.00
Total Supply	109,042.50	130,372.00	150,926.00	152,620.00	148,563.00	155,972.00	163,499.00	179,601.00	203,749.50
Use									
Major sectors	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. Agriculture, Livestock & Forestry	7,555.83	10,016.58	11,269.47	11,676.31	12,810.17	16,838.55	19,471.82	23,289.57	29,861.54
Diesel	7,554.64	10,015.39	11,268.28	11,675.12	12,808.97	16,827.71	19,457.05	23,273.36	25,284.31
Petrol	1.19	1.19	1.19	1.20	1.19	10.85	14.77	16.21	4,577.24
2. Industry	18,479.83	23,188.34	24,450.98	24,934.18	25,751.13	26,626.96	31,787.68	38,583.40	44,152.03
Diesel	18,365.15	23,040.77	24,305.61	24,771.61	25,588.21	26,409.68	31,551.73	38,352.93	43,914.53
Petrol	114.68	147.57	145.37	162.57	162.92	217.28	235.95	230.47	237.50
3. Services	47,855.76	56,805.04	58,346.78	60,852.59	61,058.08	62,132.52	64,184.98	68,512.88	74,427.77
Diesel	47,070.86	56,048.19	57,652.61	60,079.95	60,285.98	61,149.61	63,077.83	67,397.86	73,291.01
Petrol	784.89	756.85	694.16	772.64	772.10	982.92	1,107.14	1,115.03	1,136.76
3. HH consumption	21,957.49	24,472.51	26,218.26	26,304.71	27,345.30	30,527.70	34,380.85	37,237.01	39,623.39
Diesel	3,003.06	3,525.11	4,000.95	4,033.25	4,166.79	4,719.66	6,650.35	7,405.85	8,012.03
Petrol	18,954.43	20,947.41	22,217.31	22,271.46	23,178.51	25,808.04	27,730.50	29,831.16	31,611.37
4. Re-Export	13,193.60	15,889.53	30,640.51	28,852.20	21,598.32	19,846.27	13,673.67	11,978.14	15,684.77
1. Diesel	9,626.30	10,981.45	24,604.55	21,864.87	14,423.84	12,984.75	6,802.03	4,210.50	6,315.63
2. Petrol	3,567.30	4,908.08	6,035.96	6,987.33	7,174.48	6,861.52	6,871.64	7,767.64	9,369.14
Total use of Diesel	85,620.00	103,610.90	121,832.00	122,424.80	117,273.80	122,091.40	127,539.00	140,640.50	156,817.50
Total use of Petrol	23,422.50	26,761.10	29,094.00	30,195.20	31,289.20	33,880.60	35,960.00	38,960.50	46,932.00
Total use	109,042.50	130,372.00	150,926.00	152,620.00	148,563.00	155,972.00	163,499.00	179,601.00	203,749.50

Table 8 Percentage Share of the Supply & Use of Fossil Fuel

Supply								(Percentage)	
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
Domestic Production	-	-	-	-	-	-	-	-	-
Import									
1. Diesel	78.5	79.5	80.7	80.2	78.9	78.3	78.0	78.3	77.0
2. Petrol	21.5	20.5	19.3	19.8	21.1	21.7	22.0	21.7	23.0
Total Supply	100	100							
Use									
Major Sectors	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. Agriculture, Livestock & Forestry	6.9	7.7	7.5	7.7	8.6	10.8	11.9	13.0	14.7
Diesel	8.8	9.7	9.2	9.5	10.9	13.8	15.3	16.5	16.1
Petrol	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8
2. Industry	16.9	17.8	16.2	16.3	17.3	17.1	19.4	21.5	21.7
Diesel	21.4	22.2	20.0	20.2	21.8	21.6	24.7	27.3	28.0
Petrol	0.5	0.6	0.5	0.5	0.5	0.6	0.7	0.6	0.5
3. Services	43.9	43.6	38.7	39.9	41.1	39.8	39.3	38.1	36.5
Diesel	55.0	54.1	47.3	49.1	51.4	50.1	49.5	47.9	46.7
Petrol	3.4	2.8	2.4	2.6	2.5	2.9	3.1	2.9	2.4
4. HH consumption	20.1	18.8	17.4	17.2	18.4	19.6	21.0	20.7	19.4
Diesel	3.5	3.4	3.3	3.3	3.6	3.9	5.2	5.3	5.1
Petrol	80.9	78.3	76.4	73.8	74.1	76.2	77.1	76.6	67.4
Re-Export	12.1	12.2	20.3	18.9	14.5	12.7	8.4	6.7	7.7
1. Diesel	11.2	10.6	20.2	17.9	12.3	10.6	5.3	3.0	4.0
2. Petrol	15.2	18.3	20.7	23.1	22.9	20.3	19.1	19.9	20.0
Total use of Diesel	100	100	100	100	100	100	100	100	100
Total use of Petrol	100	100	100	100	100	100	100	100	100
Total use	100	100	100	100	100	100	100	100	100

Table 9 Supply & Use of Fossil Fuel

Supply								(Nu. in million)	
Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
Production	-	-	-	-	-	-	-	-	-
Imports	4,201.76	4,927.00	6,228.71	7,218.10	7,731.32	6,730.68	7,307.19	8,479.01	10,348.01
1. Diesel at basic price	3,250.61	3,562.81	4,601.90	5,471.94	5,911.38	5,024.82	5,549.46	6,505.27	7,965.84
2. Petrol at basic price	951.15	1,364.19	1,626.82	1,746.16	1,819.94	1,705.86	1,757.73	1,973.74	2,382.17
Total Margin	636.70	690.87	749.12	841.32	1,035.00	1,233.21	1,669.84	1,668.68	1,702.96
Trade and Transport margin (Diesel)	480.09	526.19	571.09	637.05	760.59	966.20	1,113.18	1,272.15	1,297.37
Trade and Transport margin (Petrol)	156.62	164.67	178.03	204.26	274.40	267.01	556.66	396.52	405.59
Supply at market price (Diesel)	3,730.70	4,089.00	5,172.99	6,108.99	6,671.97	5,991.02	6,662.64	7,777.42	9,263.21
Supply at market price (Petrol)	1,107.77	1,528.86	1,804.85	1,950.42	2,094.34	1,972.87	2,314.39	2,370.26	2,787.76
Total Supply at market Price	4,838.46	5,617.87	6,977.83	8,059.42	8,766.32	7,963.89	8,977.02	10,147.69	12,050.97
Use									
Major sectors	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. Agriculture, Livestock & Forestry	278.46	395.33	478.53	582.67	728.81	826.37	1,017.39	1,288.00	1,751.10
Diesel	278.41	395.26	478.45	582.59	728.73	825.74	1,016.44	1,287.02	1,480.71
Petrol	0.06	0.07	0.07	0.08	0.08	0.63	0.95	0.99	270.39
2. Industry	682.23	917.73	1,041.03	1,246.60	1,466.68	1,308.58	1,663.45	2,134.94	2,608.14
Diesel	676.80	909.30	1,032.02	1,236.10	1,455.77	1,295.92	1,648.26	2,120.92	2,594.03
Petrol	5.42	8.43	9.02	10.50	10.91	12.65	15.19	14.02	14.11
3. Services	1,776.06	2,260.06	2,495.54	3,064.24	3,532.77	3,099.31	3,424.95	3,859.73	4,460.58
Diesel	1,738.93	2,216.83	2,452.47	3,014.33	3,481.09	3,042.08	3,353.69	3,791.90	4,393.05
Petrol	37.12	43.24	43.06	49.91	51.68	57.24	71.26	67.84	67.52
4. HH consumption	1,007.12	1,335.84	1,548.13	1,639.86	1,788.51	1,734.40	2,132.15	2,224.40	2,350.99
Diesel	110.67	139.12	169.88	201.26	237.06	231.59	347.41	409.54	473.27
Petrol	896.45	1,196.73	1,378.25	1,438.60	1,551.45	1,502.80	1,784.73	1,814.86	1,877.72
Re-Export	1,094.60	708.90	1,414.61	1,526.05	1,249.54	995.24	739.09	640.61	880.17
1. Diesel	925.88	428.50	1,040.17	1,074.71	769.32	595.70	296.83	168.05	322.14
2. Petrol	168.72	280.40	374.44	451.34	480.22	399.55	442.26	472.56	558.03
Total use of Diesel	3,730.70	4,089.00	5,172.99	6,108.99	6,671.97	5,991.02	6,662.64	7,777.42	9,263.21
Total use of Petrol	1,107.77	1,528.86	1,804.85	1,950.42	2,094.34	1,972.87	2,314.39	2,370.26	2,787.76
Total use	4,838.46	5,617.87	6,977.83	8,059.42	8,766.32	7,963.89	8,977.02	10,147.69	12,050.97

Table 10 Supply & Use of Kerosene (in KL)

Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
Domestic Production	0	0	0	0	0	0	0	0	0
Import	5780	5727	5567	4990	5694	4611	4791	4238	3597
Total Supply	5780	5727	5567	4990	5694	4611	4791	4238	3597
Use	2010	2011	2012	2013	2014	2015	2016	2017	2018
Household	5540	5607	5547	4978	5673	4599	4755	4226	3597
Industries	240	120	20	12	21	12	36	12	0
Total Use	5780	5727	5567	4990	5694	4611	4791	4238	3597

Table 11 Growth in Supply & Use of Kerosene (In percent)

Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
Domestic Production	-	-	-	-	-	-	-	-	-
Import	-	(0.92)	(2.79)	(10.36)	14.11	(19.02)	3.90	(11.54)	(15.13)
Total Supply	-	(0.92)	(2.79)	(10.36)	14.11	(19.02)	3.90	(11.54)	(15.13)
Use	2010	2011	2012	2013	2014	2015	2016	2017	2018
Household	-	1.21	(1.07)	(10.26)	13.96	(18.93)	3.39	(11.13)	(14.88)
Industries	-	(50.00)	(83.33)	(40.00)	75.00	(42.86)	200.00	(66.67)	(100.00)
Total Use	-	(0.92)	(2.79)	(10.36)	14.11	(19.02)	3.90	(11.54)	(15.13)

Table 12 Supply & Use of Kerosene (Million Nu.)

Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
Domestic Production	-	-	-	-	-	-	-	-	-
Import	60.61	72.68	72.71	65.56	75.83	60.69	66.06	98.41	79.34
Total Supply	60.61	72.68	72.71	65.56	75.83	60.69	66.06	98.41	79.34
Losses	-	-	-	-	-	-	-	-	-
Trade and Transport margin (TTM)	37.65	36.13	33.06	30.98	11.18	11.77	11.61	4.65	34.00
Total Supply (at market price)	98.26	108.81	105.77	96.54	87.01	72.46	77.67	103.06	113.34
Use	2010	2011	2012	2013	2014	2015	2016	2017	2018
Household	94.18	106.53	105.39	96.30	86.69	72.27	77.09	102.77	113.34
Industries	4.08	2.28	0.38	0.23	0.32	0.19	0.58	0.29	-
Total use (3+4)	98.26	108.81	105.77	96.54	87.01	72.46	77.67	103.06	113.34

Table 13 Supply & Use of LPG (in MT)

Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
Domestic Production	-	-	-	-	-	-	-	-	-
Import	6,834.16	7,410.87	7,470.22	7,335.82	7,546.54	8,113.14	8,711.57	9,298.54	10,002.22
Total Supply	6,834.16	7,410.87	7,470.22	7,335.82	7,546.54	8,113.14	8,711.57	9,298.54	10,002.22
Use	2010	2011	2012	2013	2014	2015	2016	2017	2018
Household	6,834.16	7,410.87	7,470.22	6,777.98	7,029.93	7,302.60	7,593.23	8,046.82	8,728.14
Industries*	-	-	-	557.84	516.61	810.54	1,118.34	1,251.72	1,274.08
Total Use	6,834.16	7,410.87	7,470.22	7,335.82	7,546.54	8,113.14	8,711.57	9,298.54	10,002.22

Table 14 Growth in Supply & Use of LPG (in Percent)

Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
Domestic Production	-	-	-	-	-	-	-	-	-
Import	-	8.44	0.80	(1.80)	2.87	7.51	7.38	6.74	7.57
Total Supply	-	8.44	0.80	(1.80)	2.87	7.51	7.38	6.74	7.57
Use	2010	2011	2012	2013	2014	2015	2016	2017	2018
Household	-	8.44	0.80	(9.27)	3.72	3.88	3.98	5.97	8.47
Industries	-	-	-	-	(7.39)	56.90	37.97	11.93	1.79
Total Use	-	8.44	0.80	(1.80)	2.87	7.51	7.38	6.74	7.57

Table 15 Supply and Consumption of Fuelwood

SUPPLY	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. Supply by NRDCI	31,176.00	30,360.00	35,824.00	32,866.91	35,988.34	40,491.32	38,184.81	34,451.54	32,949.91
2. Supply by DoFPS, MoAF	48,860.00	91,270.00	43,650.00	75,791.55	67,415.00	85,002.99	102,109.87	97,744.08	47,367.00
Total Supply (1+2)	80,036.00	121,630.00	79,474.00	108,658.46	103,403.34	125,494.31	140,294.68	132,195.62	80,316.91
USE	2010	2011	2012	2013	2014	2015	2016	2017	2018
3. NRDCI Disposal (3.1+3.2)	31,176.00	30,360.00	35,824.00	32,866.91	35,988.34	40,491.32	38,184.81	34,451.54	32,949.91
3.1 Household	4,271.45	4,159.65	4,908.27	4,503.12	4,930.79	5,547.75	5,231.73	4,720.23	4,283.49
3.2 Industries	26,904.55	26,200.35	30,915.73	28,363.79	31,057.55	34,943.57	32,953.08	29,731.31	28,666.42
4. DoFPS, MoAF Disposal (4.1+4.2)	48,860.00	91,270.00	43,650.00	75,791.55	68,301.44	85,002.99	102,109.87	97,744.08	47,367.00
4.1 Household (4.1.1+4.1.2)	40,890.00	58,980.00	20,910.00	41,665.62	36,995.10	48,367.55	60,662.19	57,395.31	35,473.00
4.2 Industries	7,970.00	32,290.00	22,740.00	34,125.93	31,306.34	36,635.43	41,447.68	40,348.76	11,894.00
Total Household	45,161.45	63,139.65	25,818.27	46,168.73	41,925.89	53,915.30	65,893.92	62,115.54	39,756.49
Total Industries	34,874.55	58,490.35	53,655.73	62,489.72	62,363.89	71,579.01	74,400.76	70,080.07	40,560.42
Total Use	80,036.00	121,630.00	79,474.00	108,658.46	104,289.78	125,494.31	140,294.68	132,195.62	80,316.91

Table 16 Share of Supply and Consumption of Fuelwood (Percentage)

Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. Supply by NRDCI	38.95	24.96	45.08	30.25	34.80	32.27	27.22	26.06	41.02
2. Supply by DoFPS, MoAF	61.05	75.04	54.92	69.75	65.20	67.73	72.78	73.94	58.98
Total Supply (1+2)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
USE	2010	2011	2012	2013	2014	2015	2016	2017	2018
3. NRDCI Disposal (3.1+3.2)	38.95	24.96	45.08	30.25	34.51	32.27	27.22	26.06	41.02
3.1 Household	5.34	3.42	6.18	4.14	4.73	4.42	3.73	3.57	5.33
3.2 Industries	33.62	21.54	38.90	26.10	29.78	27.84	23.49	22.49	35.69
4. DoFPS, MoAF Disposal (4.1+4.2)	61.05	75.04	54.92	69.75	65.49	67.73	72.78	73.94	58.98
4.1 Household	51.09	48.49	26.31	38.35	35.47	38.54	43.24	43.42	44.17
4.2 Industries	9.96	26.55	28.61	31.41	30.02	29.19	29.54	30.52	14.81
Total Household	56.43	51.91	32.49	42.49	40.20	42.96	46.97	46.99	49.50
Total Industries	43.57	48.09	67.51	57.51	59.80	57.04	53.03	53.01	50.50
Total Use (3+4)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 17 Physical Asset Account for Briquette (KG)

Supply	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total Stock (1+2)	541,190.0	316,155.0	347,610.0	407,610.0	374,390.0	307,240.0	270,210.0	266,340.0	327,420.0
1. Opening Stock	147,860.0	11,275.0	10,140.0	3,270.0	6,930.0	58,240.0	36,330.0	3,180.0	81,000.0
2. Additions to stock (via production)	393,330.0	304,880.0	337,470.0	404,340.0	367,460.0	249,000.0	233,880.0	263,160.0	246,420.0
Total Reductions in stock (3)	529,915.0	306,015.0	344,250.0	400,410.0	316,150.0	270,910.0	266,580.0	185,340.0	215,040.0
3. Disposal	529,915.0	306,015.0	344,250.0	400,410.0	316,150.0	270,910.0	266,580.0	185,340.0	215,040.0
Closing stock (1+2-3)	11,275.0	10,140.0	3,360.0	7,200.0	58,240.0	36,330.0	3,630.0	81,000.0	112,380.0

Table 18 Physical account for timber production (Cft.)

SUPPLY	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. Supply by NRDCI	1,999,406.67	1,971,564.36	2,173,825.97	2,039,619.97	1,871,928.76	1,954,917.00	1,770,200.20	1,567,282.39	1,849,307.60
2. Supply by DoFPS, MoAF			2,100,034.00	3,371,686.73	2,794,325.07	14,233,257.87	6,529,630.09	5,172,512.81	3,099,780.99
Total Supply (1+2)	1,999,406.67	1,971,564.36	4,273,859.97	5,411,306.70	4,666,253.83	16,188,174.87	8,299,830.29	6,739,795.20	4,949,088.59
USE	2010	2011	2012	2013	2014	2015	2016	2017	2018
3. NRDCI	1,999,406.67	1,971,564.36	2,173,825.97	2,039,619.97	1,871,928.76	1,954,917.00	1,770,200.20	1,567,282.39	1,849,307.60
3.1. Commercial	1,999,406.67	1,971,564.36	2,173,825.97	2,039,619.97	1,871,928.76	1,954,917.00	1,770,200.20	1,567,282.39	1,849,307.60
4. DoFPS, MoAF	-	-	2,100,034.00	3,371,686.73	2,794,325.07	14,233,257.87	6,529,630.09	5,172,512.81	3,099,781.03
4.1. Commercial			784,387.00	1,418,489.34	1,068,819.59	1,506,804.07	2,472,601.66	1,408,914.38	537,066.00
4.2. Concessional			1,285,174.00	1,936,553.95	1,719,928.12	12,706,721.83	4,015,903.40	3,588,205.42	2,553,111.55
4.3. Free			30,473.00	16,643.44	5,577.36	19,731.97	41,125.03	175,393.01	9,603.48
Total Use (3+4)	1,999,406.67	1,971,564.36	4,273,859.97	5,411,306.70	4,666,253.83	16,188,174.87	8,299,830.29	6,739,795.20	4,949,088.63

Table 19 Monetary valuation for timber production (Million Nu.)

SUPPLY	2010	2011	2012	2013	2014	2015	2016	2017	2018
1. Supply by NRDC	189.37	220.20	294.27	283.49	258.03	280.61	282.63	277.77	313.03
2. Supply by DoFPS, MoAF			25.46	27.36	7.06	17.89	7.05	6.96	9.38
Total Supply (1+2)	189.37	220.20	319.73	310.85	265.09	298.50	289.68	284.73	322.41
USE	2010	2011	2012	2013	2014	2015	2016	2017	2018
3. NRDC	189.37	220.20	294.27	283.49	258.03	280.61	282.63	277.77	313.03
3.1. Commercial	189.37	220.20	294.27	283.49	258.03	280.61	282.63	277.77	313.03
4. DoFPS, MoAF	-	-	25.46	27.36	7.06	17.89	7.05	6.96	9.38
4.1. Commercial			23.25	24.98	5.00	4.97	5.30	4.32	5.79
4.2. Concessional			2.22	2.38	2.06	12.92	1.74	2.64	3.59
4.3. Free	-	-	-	-	-	-	-	-	-
Total Use (3+4)	189.37	220.20	319.73	310.85	265.09	298.50	289.68	284.73	322.41

Table 21 Physical Asset Account for Coal (Million MT)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Opening stock (as of 1 January)	1.04	0.95	0.84	0.74	0.67	0.54	0.46	0.34	0.19
(+) Increases in stocks	-	-	-	-	-	-	-	-	-
Discoveries	-	-	-	-	-	-	-	-	-
Other increases	-	-	-	-	-	-	-	-	-
(-) Decreases in stocks	0.09	0.11	0.10	0.08	0.12	0.09	0.12	0.16	0.19
Extractions	0.09	0.11	0.10	0.08	0.12	0.09	0.12	0.16	0.19
Other decreases	-	-	-	-	-	-	-	-	-
Closing stock levels (as of 31 December)	0.95	0.84	0.74	0.67	0.54	0.46	0.34	0.18	-

Table 22 Physical Asset Account for Dolomite (Million MT)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Opening stock (as of 1 January)	14,542.47	14,541.26	14,540.17	14,538.67	14,536.93	14,534.89	14,532.23	14,529.86	14,527.32
(+) Increases in stocks	-	-	-	-	-	-	-	-	-
Discoveries	-	-	-	-	-	-	-	-	-
Other increases	-	-	-	-	-	-	-	-	-
(-) Decreases in stocks	1.21	1.08	1.50	1.74	2.04	2.66	2.37	2.54	2.82
Extractions	1.21	1.08	1.50	1.74	2.04	2.66	2.37	2.54	2.82
Other decreases	-	-	-	-	-	-	-	-	-
Closing stock levels (as of 31 Decen	14,541.26	14,540.17	14,538.67	14,536.93	14,534.89	14,532.23	14,529.86	14,527.32	14,524.50

Table 23 Asset Account for Limestone (Million MT)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Opening stock (as of 1 January)	164.65	163.95	163.32	162.64	161.64	160.51	159.66	158.40	157.47
(+) Increases in stocks	-	-	-	-	-	-	-	-	-
Discoveries	-	-	-	-	-	-	-	-	-
Other increases	-	-	-	-	-	-	-	-	-
(-) Decreases in stocks	0.70	0.63	0.68	1.01	1.12	0.85	1.26	0.93	1.34
Extractions	0.70	0.63	0.68	1.01	1.12	0.85	1.26	0.93	1.34
Other decreases	-	-	-	-	-	-	-	-	-
Closing stock levels (as of 31 December)	163.95	163.32	162.64	161.64	160.51	159.66	158.40	157.47	156.13

Table 24 Physical Asset Account for Gypsum (Million MT)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Opening stock (as of 1 January)	134.22	133.88	133.52	134.53	134.18	133.76	133.37	133.05	132.70
(+) Increases in stocks	-	-	1.32	-	-	-	-	-	-
Discoveries	-	-	1.32	-	-	-	-	-	-
Other increases	-	-	-	-	-	-	-	-	-
(-) Decreases in stocks	0.34	0.35	0.31	0.35	0.41	0.39	0.32	0.35	0.46
Extractions	0.34	0.35	0.31	0.35	0.41	0.39	0.32	0.35	0.46
Other decreases	-	-	-	-	-	-	-	-	-
Closing stock levels (as of 31 December)	133.88	133.52	134.53	134.18	133.76	133.37	133.05	132.70	132.24

Table 25 Physical Asset Account for Quartzite (Million MT)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Opening stock (as of 1 January)	5.18	5.07	4.98	4.89	4.80	4.71	4.63	4.54	4.45
(+) Increases in stocks	-	-	-	-	-	-	-	-	-
Discoveries	-	-	-	-	-	-	-	-	-
Other increases	-	-	-	-	-	-	-	-	-
(-) Decreases in stocks	0.11	0.09	0.09	0.09	0.08	0.08	0.09	0.09	0.15
Extractions	0.11	0.09	0.09	0.09	0.08	0.08	0.09	0.09	0.15
Other decreases	-	-	-	-	-	-	-	-	-
Closing stock levels (as of 31 Decemb	5.07	4.98	4.89	4.80	4.71	4.63	4.54	4.45	4.30

Table 26 Physical Asset Account for Talc

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Opening stock (as of 1 January)	0.13	0.09	0.08	0.08	0.07	0.06	0.05	0.05	0.07
(+) Increases in stocks	-	-	-	-	-	-	-	-	-
Discoveries	-	-	-	-	-	-	-	-	-
Other increases	-	-	-	-	-	-	-	-	-
(-) Decreases in stocks	0.04	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.07
Extractions	0.04	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.07
Other decreases	-	-	-	-	-	-	-	-	-
Closing stock levels (as of 31 December)	0.09	0.08	0.08	0.07	0.06	0.05	0.05	0.03	-

Table 27 Physical Asset Account for Iron Ore (Million MT)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Opening stock (as of 1 January)	2.69	2.69	2.69	2.69	2.67	2.65	2.60	2.57	2.54
(+) Increases in stocks	-	-	-	-	-	-	-	-	-
Discoveries	-	-	-	-	-	-	-	-	-
Other increases	-	-	-	-	-	-	-	-	-
(-) Decreases in stocks	-	-	0.00	0.02	0.02	0.04	0.03	0.03	0.04
Extractions	-	-	0.00	0.02	0.02	0.04	0.03	0.03	0.04
Other decreases	-	-	-	-	-	-	-	-	-
Closing stock levels (as of 31 December)	2.69	2.69	2.69	2.67	2.65	2.60	2.57	2.54	2.50

Table 28 Monetary Asset Account for Dolomite (Million Nu.)

Extraction year	Quantity	ressource rent per unit	Total ressource rent from extraction	Discount rate, 12 per cent	Discount factor	Net present value (NPV) of extraction
2019	968.30	293.99	284,667.11	0.12	0.89	254,167.06
2020	968.30	293.99	284,667.04	0.12	0.80	226,934.82
2021	968.30	293.99	284,667.04	0.12	0.71	202,620.37
2022	968.30	293.99	284,667.04	0.12	0.64	180,911.05
2023	968.30	293.99	284,667.04	0.12	0.57	161,527.72
2024	968.30	293.99	284,667.04	0.12	0.51	144,221.18
2025	968.30	293.99	284,667.04	0.12	0.45	128,768.91
2026	968.30	293.99	284,667.04	0.12	0.40	114,972.24
2027	968.30	293.99	284,667.04	0.12	0.36	102,653.79
2028	968.30	293.99	284,667.04	0.12	0.32	91,655.17
2029	968.30	293.99	284,667.04	0.12	0.29	81,834.97
2030	968.30	293.99	284,667.04	0.12	0.26	73,066.94
2031	968.30	293.99	284,667.04	0.12	0.23	65,238.34
2032	968.30	283.63	284,667.04	0.12	0.20	58,248.52
2033	968.30	293.99	284,667.04	0.12	0.18	52,007.60

Table 29 Monetary asset account for Limestone (Million Nu.)

Extraction year	Quantity	ressource rent per unit	Total ressource rent from extraction	Discount rate, 12 per cent	Discount factor	Net present value (NPV) of extraction
2019	10.50	5,019.86	52,699.56	0.12	0.89	47,053.18
2020	10.50	5,019.86	52,699.56	0.12	0.80	42,011.77
2021	10.50	5,019.86	52,699.56	0.12	0.71	37,510.51
2022	10.50	5,019.86	52,699.56	0.12	0.64	33,491.52
2023	10.50	5,019.86	52,699.56	0.12	0.57	29,903.15
2024	10.50	5,019.86	52,699.56	0.12	0.51	26,699.24
2025	10.50	5,019.86	52,699.56	0.12	0.45	23,838.61
2026	10.50	5,019.86	52,699.56	0.12	0.40	21,284.47
2027	10.50	5,019.86	52,699.56	0.12	0.36	19,003.99
2028	10.50	5,019.86	52,699.56	0.12	0.32	16,967.85
2029	10.50	5,019.86	52,699.56	0.12	0.29	15,149.86
2030	10.50	5,019.86	52,699.56	0.12	0.26	13,526.67
2031	10.50	5,019.86	52,699.56	0.12	0.23	12,077.38
2032	10.50	5,019.86	52,699.56	0.12	0.20	10,783.37
2033	10.50	5,019.86	52,699.56	0.12	0.18	9,628.01

Table 30 Monetary asset account for Gypsum (Million Nu.)

Extraction year	Quantity	ressource rent per unit	Total ressource rent from extraction	Discount rate, 12 per cent	Discount factor	Net present value (NPV) of extraction
2019	8.85	813.46	4,264.07	0.12	0.89	3,399.29
2020	8.85	813.46	4,264.07	0.12	0.80	3,035.08
2021	8.85	813.46	4,264.07	0.12	0.64	2,709.89
2022	8.85	813.46	4,264.07	0.12	0.57	2,419.55
2023	8.85	813.46	4,264.07	0.12	0.51	2,160.31
2024	8.85	813.46	4,264.07	0.12	0.45	1,928.85
2025	8.85	813.46	4,264.07	0.12	0.40	1,722.18
2026	8.85	813.46	4,264.07	0.12	0.36	1,537.67
2027	8.85	813.46	4,264.07	0.12	0.32	1,372.92
2028	8.85	813.46	4,264.07	0.12	0.29	1,225.82
2029	8.85	813.46	4,264.07	0.12	0.26	1,094.48
2030	8.85	813.46	4,264.07	0.12	0.23	977.21
2031	8.85	813.46	4,264.07	0.12	0.20	872.51
2032	8.85	813.46	4,264.07	0.12	0.18	872.51
2033	8.85	813.46	4,264.07	0.12	0.16	779.03

Table 31 Monetary Asset account for Quartzite (Million Nu.)

Extraction year	Quantity	ressource rent per unit	Total ressource rent from extraction	Discount rate, 12 per cent	Discount factor	Net present value (NPV) of extraction
2019	0.29	3,220.00	923.33	0.12	0.89	824.40
2020	0.29	3,220.00	923.33	0.12	0.80	736.07
2021	0.29	3,220.00	923.33	0.12	0.71	657.21
2022	0.29	3,220.00	923.33	0.12	0.64	586.79
2023	0.29	3,220.00	923.33	0.12	0.57	523.92
2024	0.29	3,220.00	923.33	0.12	0.51	467.79
2025	0.29	3,220.00	923.33	0.12	0.45	417.67
2026	0.29	3,220.00	923.33	0.12	0.40	372.92
2027	0.29	3,220.00	923.33	0.12	0.36	332.96
2028	0.29	3,220.00	923.33	0.12	0.32	297.29
2029	0.29	3,220.00	923.33	0.12	0.29	265.43
2030	0.29	3,220.00	923.33	0.12	0.26	236.99
2031	0.29	3,220.00	923.33	0.12	0.23	211.60
2032	0.29	3,220.00	923.33	0.12	0.20	188.93
2033	0.29	3,220.00	923.33	0.12	0.18	168.69

Table 32 Energy trend for supply, consumption and trade (KToE)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Production	689.39	681.21	653.62	701.72	698.24	723.52	591.87	772.86	692.96
Hydro-electricity	630.07	607.70	586.97	649.17	615.97	666.03	512.35	663.83	566.91
Wind	-	-	-	-	-	-	0.06	0.10	0.10
Solar	-	-	-	-	-	-	-	-	-
Coal	59.14	73.35	66.50	52.36	82.09	57.36	79.33	108.79	125.83
Firewood	0.03	0.05	0.03	0.04	0.04	0.05	0.05	0.05	0.03
Briquettee	0.15	0.11	0.13	0.15	0.14	0.09	0.09	0.10	0.09
Consumption	273.50	298.19	329.13	372.41	398.79	393.91	422.95	471.54	509.99
Hydro-electricity	147.28	149.68	149.53	177.25	190.92	190.91	187.21	200.33	218.40
Wind	-	-	-	-	-	-	0.06	0.10	0.10
Solar	-	-	-	-	-	-	-	-	-
Diesel	76.54	92.61	108.90	109.42	104.82	109.12	113.96	125.66	140.12
Petrol	19.08	21.80	23.70	24.60	25.49	27.60	29.30	31.74	38.24
Kerosene	5.16	5.12	4.96	4.46	5.09	4.12	4.28	3.64	3.09
ATF	1.13	1.24	1.76	2.69	3.02	2.83	2.81	3.39	3.39
LPG	4.60	4.99	5.03	4.94	5.08	5.46	5.87	10.50	10.50
Coal	19.53	22.60	35.11	48.86	64.20	53.72	79.33	96.04	96.04
Firewood	0.03	0.05	0.03	0.04	0.04	0.05	0.05	0.05	0.03
Briquettee	0.15	0.11	0.13	0.15	0.14	0.09	0.09	0.10	0.09
Export	519.31	499.34	471.53	507.90	466.52	496.64	511.28	453.33	376.06
Electricity	479.75	453.40	420.95	477.87	433.73	476.51	496.93	435.81	348.55
Diesel	8.60	9.81	21.98	19.54	12.89	11.60	6.08	3.76	5.64
Petrol	2.91	4.00	4.92	5.69	5.85	5.59	5.60	6.33	7.63
Coal	28.06	32.12	23.68	4.80	14.05	2.94	2.67	7.43	14.23
Import	190.76	184.36	211.42	220.44	219.63	236.81	236.44	261.12	285.50
Electricity	11.31	3.47	5.10	9.65	16.49	14.03	9.73	17.89	25.85
Diesel	76.54	92.61	108.90	109.42	104.82	109.12	113.96	125.66	140.12
Petrol	19.08	21.80	23.70	24.60	25.49	27.60	29.30	31.74	38.24
Kerosene	4.96	4.91	4.78	4.28	4.88	3.96	4.11	3.64	3.09
ATF	1.13	1.24	1.76	2.69	3.02	2.83	2.81	3.39	4.15
LPG	7.72	8.37	8.44	8.29	8.53	9.17	9.84	10.50	11.30
Coal	70.02	51.96	58.74	61.51	56.40	70.11	66.70	68.29	62.76
Total Supply	880.15	865.57	865.05	922.17	917.87	960.34	828.31	1,033.97	978.45

Table 33 Physical supply table for energy, 2018

Physical Supply Table for Energy (2018)						
Unit: As specified.	PRODUCTION		Accumulation	Flows from	Flows from the	Total Supply
	Industries	Households		RoW		
				Imports		
I. Energy from natural inputs						
Inputs of energy from renewable sources					6,594.31	6,594.31
(1) Hydro (GWh)					6,593.20	6,593.20
(2) Solar (GWh)					-	-
(3) Wind (GWh)					1.11	1.11
Natural resource inputs					187,150.45	187,150.45
(1) Coal (MT)					186,823.75	186,823.75
1.1) Bituminous / Sub-Bituminous					-	-
1.2) Anthracite					-	-
1.3) Coke/Semi-coke of coal					186,823.75	186,823.75
1.4) Other coal					-	-
(2) Fuelwood (MT)					80.30	80.30
(3) Briquette (MT)					246.40	246.40
Total energy from natural inputs						
II. Energy products						
Production of energy products by SIEC* class						
(1) Coal (MT)	186,823.75			117,151.32		303,975.07
1.1) Bituminous / Sub-Bituminous	-			4,510.82		4,510.82
1.2) Anthracite	-			947.76		947.76
1.3) Coke/Semi-coke of coal	186,823.75			72,885.62		259,709.37
1.4) Other coal	-			38,807.12		38,807.12
(2) Diesel (KL)	-			156,817.50		156,817.50
2.1) Diesel	-			156,817.50		156,817.50
2.2) Light Diesel Oil (LDO)	-			-		-
(3) Petrol (KL)	-			46,932.00		46,932.00
(4) Aviation Turbine Fuel (ATF) (KL)	-			4,878.00		4,878.00
(5) Kerosene (KL)	-			3,597.00		3,597.00
5.1) Kerosene (SK Oil)	-			3,597.00		3,597.00
5.2) Kerosene (SK Oil-Industrial)	-			-		-
(6) Furnace Oil (FO) (KL)	-			-		-
(7) LPG (MT)	-			10,002.22		10,002.22
(8) Electricity (GWh)	6,594.31			300.66		6,894.97
(9) Biogas for cooking (MT)	-			-		-
(10) Fuelwood (MT)	80.30			-		80.30
(11) Briquette (MT)**	246.40			-		246.40
Total use of energy products						
III. Energy residuals***						
Losses during extraction (GWh)	-	-				-
Losses during distribution (GWh)	66.09	-				66.09
Losses during transformation (GWh)	-	-				-
Other energy residuals (GWh)	-	-				-
Total energy from residuals						

Note: *Standard International Energy Classification

**The production only pertains to those handled by NRDCL

***Energy losses relates to only hydro-electricity

Table 34 Physical use table for energy, 2018

Physical Use Table for Energy (2018)						
Unit: As specified.	USE		Accumulation	Flows to RoW Exports	Flows to the Environment	Total Use
	Industries	Households				
I. Energy from natural inputs						
Inputs of energy from renewable sources	6,594.31					6,594.31
(1) Hydro (GWh)	6,593.20					6,593.20
(2) Solar (GWh)	-					-
(3) Wind (GWh)	1.11					1.11
Natural resource inputs	186,904.05					186,904.05
(1) Coal (MT)	186,823.75					186,823.75
1.1) Bituminous / Sub-Bituminous	-					-
1.2) Anthracite	-					-
1.3) Coke/Semi-coke of coal	186,823.75					186,823.75
1.4) Other coal	-					-
(2) Fuelwood (MT)	80.30					80.30
(3) Briquette (MT)	246.40					246.40
Total energy from natural inputs						
II. Energy products						
Production of energy products by SIEC* class						
(1) Coal (MT)	154,324.14	-		32,499.62		303,975.07
1.1) Bituminous / Sub-Bituminous	-		(23,869.42)	28,380.24		4,510.82
1.2) Anthracite	-	-	947.76	-		947.76
1.3) Coke/Semi-coke of coal	154,324.14	-	104,739.14	646.09		259,709.37
1.4) Other coal	-	-	35,333.83	3,473.29		38,807.12
(2) Diesel (KL)**	142,489.84	8,012.03	-	6,315.63		156,817.50
2.1) Diesel	142,489.84	8,012.03	-	6,315.63		156,817.50
2.2) Light Diesel Oil (LDO)	-	-	-	-		-
(3) Petrol (KL)***	5,951.50	31,611.37	-	9,369.14		46,932.00
(4) Aviation Turbine Fuel (ATF)	4,878.00	-	-	-		4,878.00
(5) Kerosene (KL)	-	3,597.00	-	-		3,597.00
5.1) Kerosene (SK Oil)	-	3,597.00	-	-		3,597.00
5.2) Kerosene (SK Oil-Industrial)	-	-	-	-		-
(6) Furnace Oil (FO) (KL)	-	-	-	-		-
(7) LPG (MT)	1,274.08	8,728.14	-	-		10,002.22
(8) Electricity (GWh)	1,207.51	1,566.67	66.09	4,053.59		6,893.86
(9) Biogas for cooking (MT)						-
(10) Fuelwood (MT)	40.50	39.70				80.20
(10) Briquette (MT)	246.40	-	-	-		246.40
Total use of energy products						
III. Energy residuals						
Losses during extraction (GWh)					-	-
Losses during distribution (GWh)					66.09	66.09
Losses during transformation (GWh)					-	-
Other energy residuals (GWh)					-	-
Total energy from residuals						

Note: *Standard International Energy Classification

** & *** Export figures refers to re-export of fuels: refueling by Indian vehicles in southern borders of Bhutan

Table 35 Physical Supply table for energy, 2018

Physical Supply Table for Energy (2018)						
Unit: KToE	PRODUCTION		Accumulation	Flows from	Flows from the	Total Supply
	Industries	Households		RoW		
I. Energy from natural inputs						
Inputs of energy from renewable sources					567.01	567.01
(1) Hydro					566.91	566.91
(2) Solar					-	-
(3) Wind					0.10	0.10
Natural resource inputs					125.95	125.95
(1) Coal					125.83	125.83
1.1) Bituminous / Sub-Bituminous					-	-
1.2) Anthracite					-	-
1.3) Coke/Semi-coke of coal					125.83	125.83
1.4) Other coal					-	-
(2) Fuelwood					0.03	0.03
(3) Briquettee					0.09	0.09
Total energy from natural inputs					692.96	692.96
II. Energy products						
Production of energy products by SIEC* class						
(1) Coal	125.83			62.76		188.58
1.1) Bituminous / Sub-Bituminous	-			2.04		2.04
1.2) Anthracite	-			0.60		0.60
1.3) Coke/Semi-coke of coal	125.83			49.09		174.91
1.4) Other coal	-			11.03		11.03
(2) Diesel	-			140.12		140.12
2.1) Diesel	-			140.12		140.12
2.2) Light Diesel Oil (LDO)	-			-		-
(3) Petrol	-			38.24		38.24
(4) Aviation Turbine Fuel (ATF)	-			4.15		4.15
(5) Kerosene	-			3.09		3.09
5.1) Kerosene (SK Oil)	-			3.09		3.09
5.2) Kerosene (SK Oil-Industrial)	-			-		-
(6) Furnace Oil (FO)	-			-		-
(7) LPG	-			11.30		11.30
(8) Electricity	567.01			25.85		592.86
(9) Biogas for cooking	-			-		-
(10) Fuelwood	0.03			-		0.03
(11) Briquette**	0.09			-		0.09
Total energy products	692.96			285.50		978.45
III. Energy residuals***						
Losses during extraction	-	-				-
Losses during distribution	5.68	-				5.68
Losses during transformation	-	-				-
Other energy residuals	-	-				-
Total energy residuals***	5.68	-				5.68
TOTAL SUPPLY	698.64	-	-	285.50	-	984.13

Note: *Standard International Energy Classification

**The production only pertains to those handled by NRDC

***Energy losses relates to only hydro-electricity

Table 36 Physical Use table for energy, 2018

Physical Use Table for Energy (2017)

Unit: KToE			Accumulation	Flows to RoW Exports	the environmen t	Total Use
	Industries	Households				
I. Energy from natural inputs						
Inputs of energy from renewable sources	567.01					567.01
(1) Hydro	566.91					566.91
(2) Solar	-					-
(3) Wind	0.10					0.10
Natural resource inputs	125.95					125.95
(1) Coal	125.83					125.83
1.1) Bituminous / Sub-Bituminous	-					-
1.2) Anthracite	-					-
1.3) Coke/Semi-coke of coal	125.83					125.83
1.4) Other coal	-					-
(2) Fuelwood	0.03					0.03
(3) Briquettee	0.09					0.09
Total energy from natural inputs	692.96					692.96
II. Energy products						
Production of energy products by SIEC* class						
(1) Coal	103.94	-	70.41	14.23		188.58
1.1) Bituminous / Sub-Bituminous	-	-	(10.77)	12.81		2.04
1.2) Anthracite	-	-	0.60	-		0.60
1.3) Coke/Semi-coke of coal	103.94	-	70.54	0.44		174.91
1.4) Other coal	-	-	10.04	0.99		11.03
(2) Diesel	127.31	7.16	-	5.64		140.12
2.1) Diesel	127.31	7.16	-	5.64		140.12
2.2) Light Diesel Oil (LDO)	-	-	-	-		-
(3) Petrol	4.85	25.75	-	7.63		38.24
(4) Aviation Turbine Fuel (ATF)	4.15	-	-	-		4.15
(5) Kerosene	-	3.09	-	-		3.09
5.1) Kerosene (SK Oil)	-	3.09	-	-		3.09
5.2) Kerosene (SK Oil-Industrial)	-	-	-	-		-
(6) Furnace Oil (FO)	-	-	-	-		-
(7) LPG	1.44	9.86	-	-		11.30
(8) Electricity	103.83	134.71	5.68	348.55		592.77
(9) Biogas for cooking	-	-	-	-		-
(10) Fuelwood	0.02	0.01	-	-		0.03
(11) Briquette	0.09	-	-	-		0.09
Total use of energy products	345.61	180.57	76.10	376.06		978.33
III. Energy residuals						
Losses during extraction					-	-
Losses during distribution					5.68	5.68
Losses during transformation					-	-
Other energy residuals					-	-
Total energy residuals					5.68	5.68
TOTAL USE	345.61	180.57	76.10	376.06	5.68	984.01

**Standard International Energy Classification*

Data Sources

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4. —. Civil Service Statistics.
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