ERIA Research Project Report 2018, No. 20

Energy Demand and Supply of Cambodia

2010-2018

Prepared by

Ministry of Mines and Energy, Cambodia

Supported by

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Energy Demand and Supply of Cambodia 2010-2018

Economic Research Institute for ASEAN and East Asia (ERIA)
Sentra Senayan II 6th Floor
Jalan Asia Afrika no.8, Gelora Bung Karno
Senayan, Jakarta Pusat 1270
Indonesia

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1. Introduction

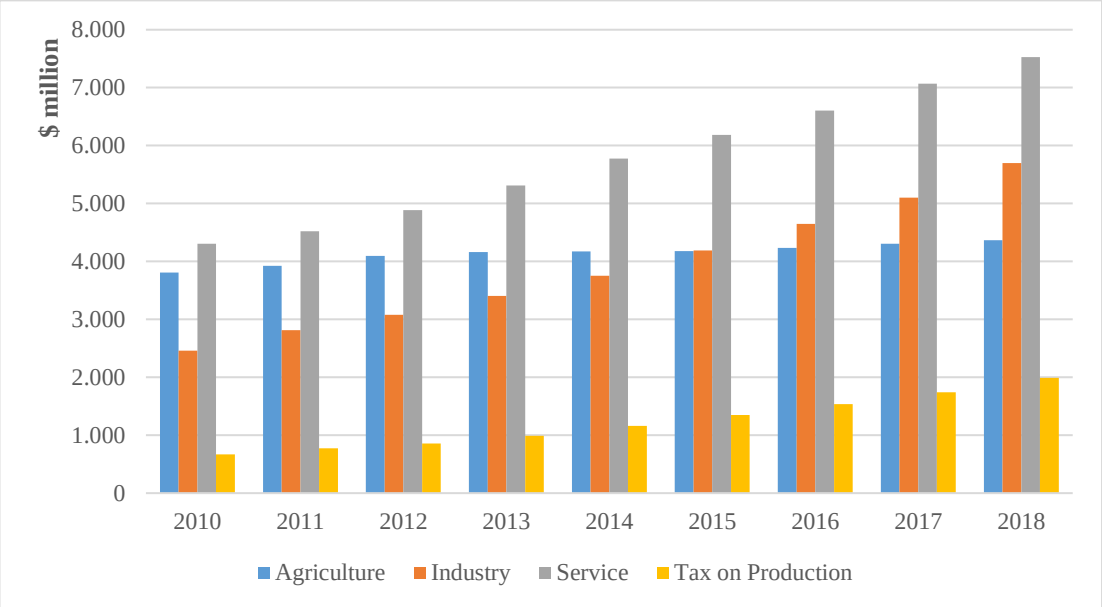
This paper on the Energy Demand and Supply for Cambodia in 2010–2018 was prepared as an update to the *Cambodia Energy Statistics 2018* publication. The paper was produced by the Department of Energy Development, the General Department of Energy, the Department of Petroleum Technology, Operation supporting and Energy Security , the General Department of Petroleum, the Ministry of Mines and Energy, Cambodia, through the energy internship programme of the Economic Research Institute of ASEAN and East Asia (ERIA). The Ministry of Mines and Energy appreciates ERIA's support in improving the energy data quality of Cambodia.

2. Social and Economic Situation

2.1. 2010–2018 Period

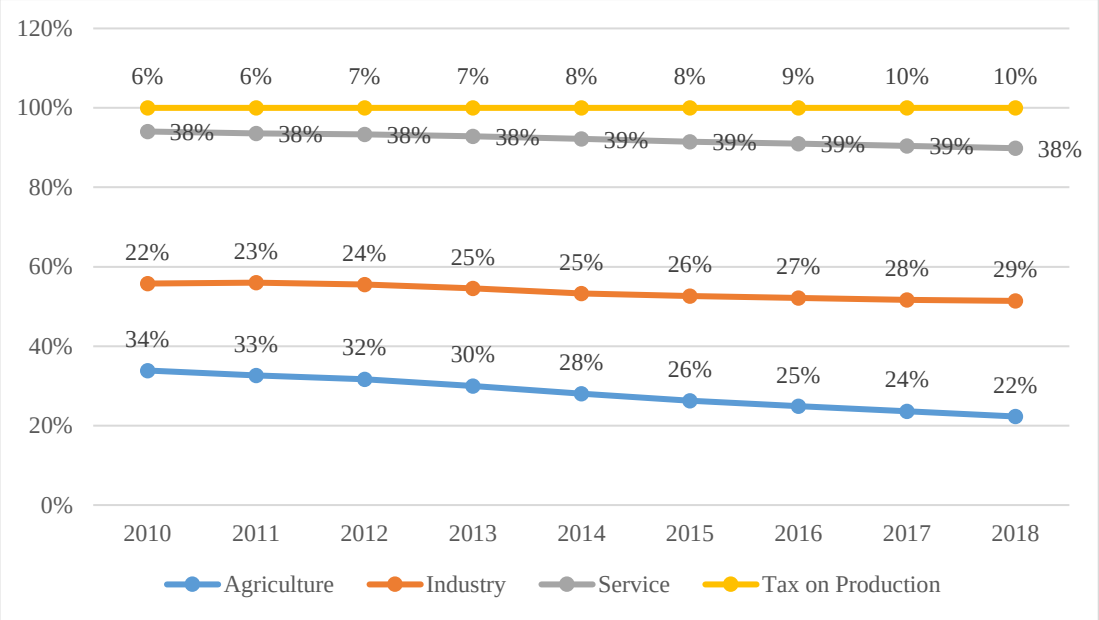
Cambodia's gross domestic product (GDP) average annual growth rate (AAGR) was 7.2% in 2010–2018 and with a share of around 38% in 2018, the service sector was the main contributor to the country's economy. Although the service sector had constantly the largest share, its AAGR was 7.2% in 2010–2018, which was lower than the industry sector (11.1%). This indicated the growing importance of the industry sector in the GDP. The agriculture sector's share was around 34% in 2010 and decreased to 22% in 2018 with an AAGR of 1.7 %. (Figures 1 and 2).

Figure 1. GDP in Constant 2010 US Dollars



GDP = gross domestic product.
Source: World Bank (2019).

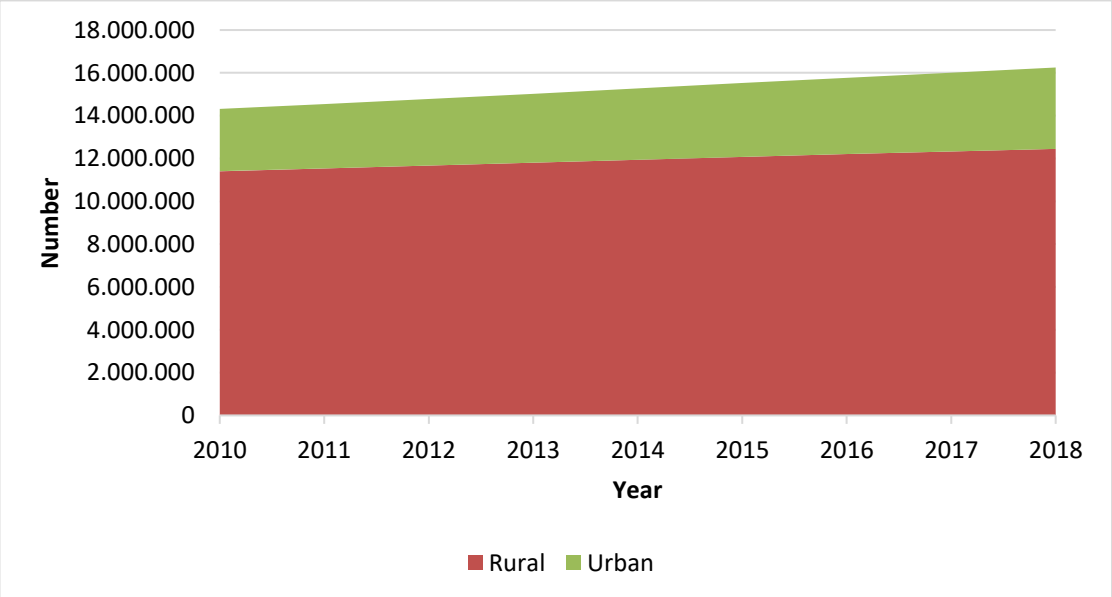
Figure 2. Share of GDP per Sector (%)

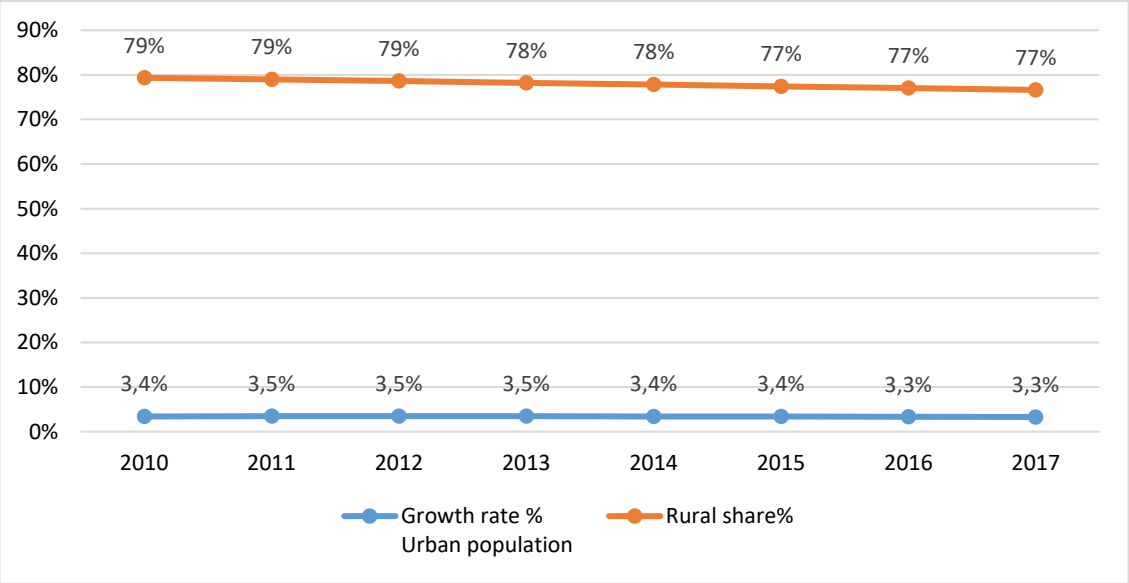


GDP = gross domestic product.
Source: World Bank (2019).

Cambodia's population increased steadily with an AAGR of 1.6% in the 2010–2018 period. The population in the urban areas grew by 3.4% per year, higher than the growth rate of the population in the rural areas. Nevertheless, the share of the population in the rural areas was still bigger than the share of the population in the urban areas. The share of the population living in the rural areas was around 77% in 2018. (Figure 3).

Figure 3. Population, 2010–2018

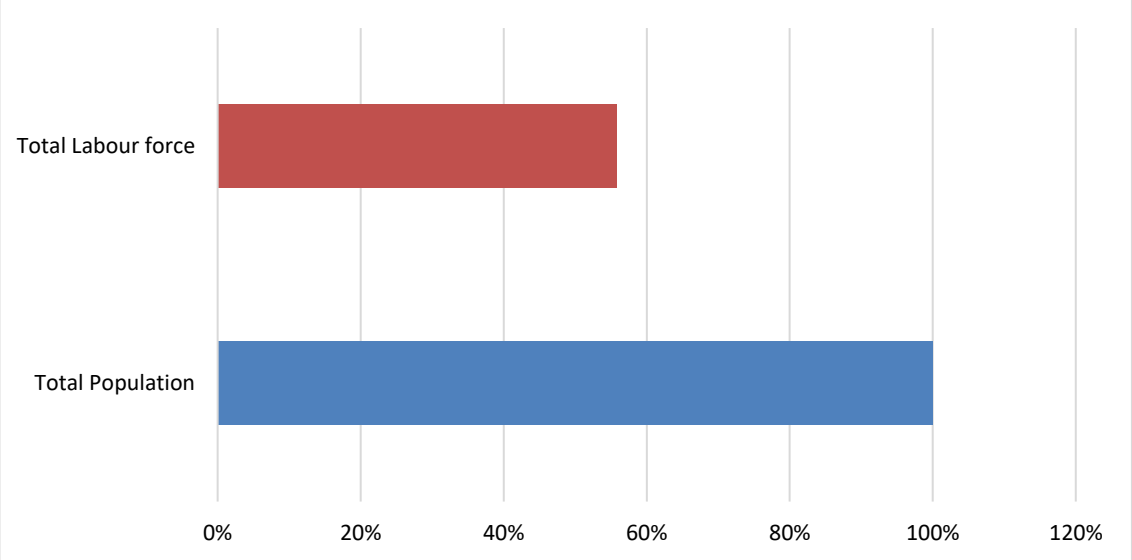




Source: World Bank (2019).

The consumer price index increased by 3.2% per year in the 2010–2017 period and the average annual growth rate of the GDP deflator was 2.46% between 2010 and 2018. The labour force ratio was around 55.8% of the total population in 2018 (Figure 4). The ratio of the labour force was also influenced by foreign direct investment, at around 13% of the GDP in 2018.

Figure 4. Total Labour Force, 2018



Source: World Bank (2019).

2.2. 2017–2018 Period

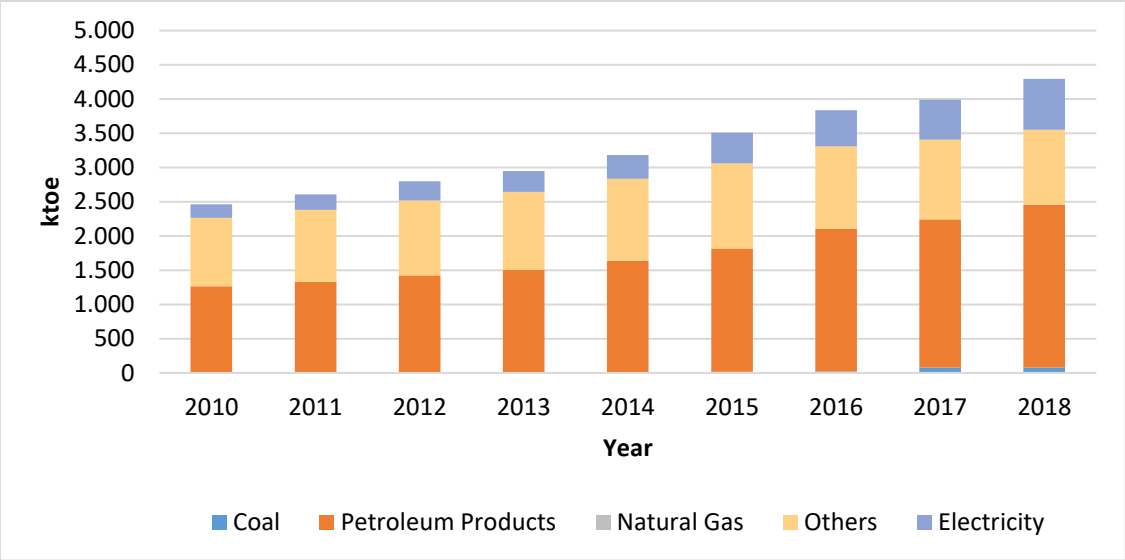
Cambodia's GDP grew by 7.5% during the 2017–2018 period, whilst the industry sector grew by 11.7% followed by the service sector (6.5%) and agriculture (1.4%). Cambodia's population grew

by 1.5% during the 2017–2018 period. The population grew by 3.3% in the urban areas, while the rural area population grew by 1.1%.

3. Final Energy Consumption

The final energy consumption of Cambodia increased steadily by 7.2% per year over the 2010–2018 period. Electricity consumption grew the fastest at an average annual rate of 18.3%, followed by oil (8.3%). Oil, however, still composed the majority of Cambodia's total final energy consumption (TFEC) at 55.5%. Biomass increased slightly from 2010 to 2015 and started to decrease from 2016 to 2018. Although biomass consumption is declining, its share in the total energy consumption remained high, at around 25.5% in 2018 (Figure 5).

Figure 5. Total Final Energy Consumption by Fuel Type (ktoe)

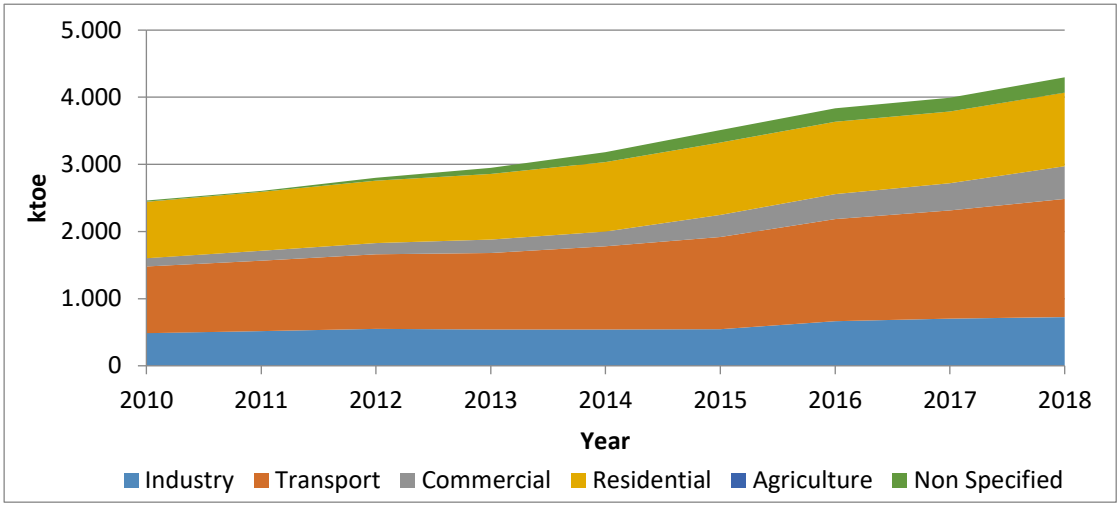


ktoe = kilo ton of oil equivalent.
Source: Cambodia Energy Balance Table (EBT) 2010–2018.

Looking at the final sectors, the transport and commercial sectors were the two sectors with the highest growth rates, i.e. 7.4% per year and 18.8% per year in 2010–2018, respectively. The industry and residential sectors, on the other hand, showed a stable increase, respectively at 5.1% per year and 3.3% per year (Figure 6). By share, the transport sector is dominant (41% in 2018), whilst the commercial sector share was only 11%.

The high growth of the transport and commercial sectors was due to the significant economic development as reflected by the remarkable foreign direct investment for construction of commercial buildings, infrastructure, and economic zones. The country's GDP increased by 7.2% per year in 2010–2018, with the midterm elasticity of the GDP towards TFEC (2010–2018) was 7.2/7.2 = 1. More energy efficiency and conservation programmes will be necessary for improving the elasticity in the future.

Figure 6. Total Final Energy Consumption by Sector (ktoe)

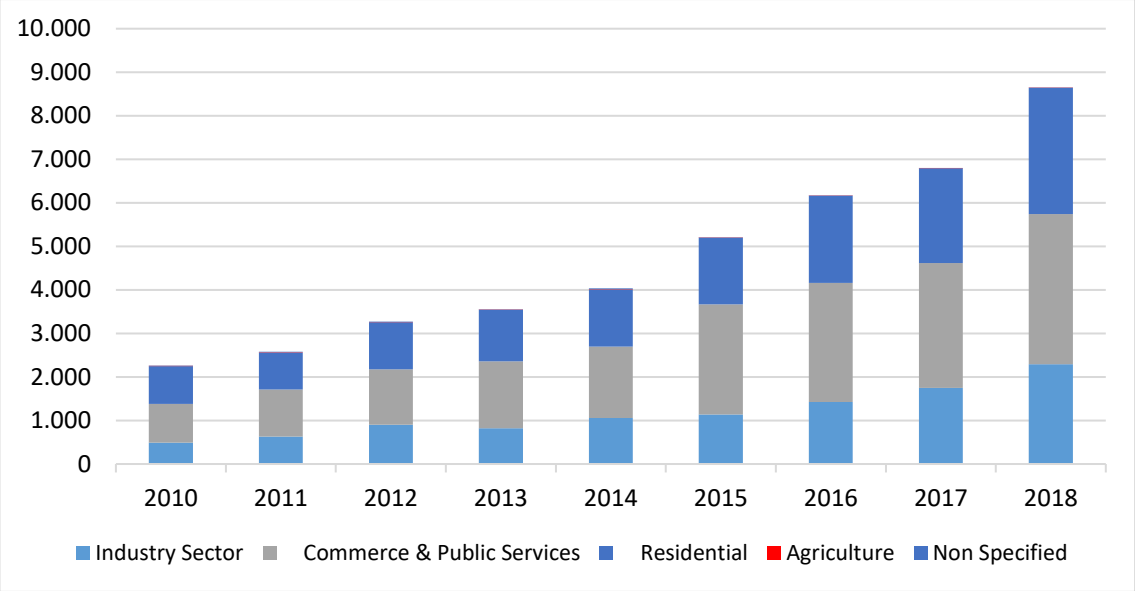


Source: Cambodia EBT 2010–2018.

4. Power Generation

Electricity consumption grew at an AAGR of 18.3% over the 2010–2018 period (Figure 7). Between 2017 and 2018 electricity consumption increased by 27%. The residential sector grew the fastest at 33.1%, followed by the industry sector at 31.0%. A stable increase of income and the expansion of the electricity distribution network contributed to this large increase of electricity demand in 2018. Although growing more slowly, the commercial sector still dominated the electricity demand in Cambodia in 2018 (39.9%), followed by the residential sector (33.5%), and the industry sector (26.5%). Saving electricity through the use of highly-efficient appliances and machines is essential.

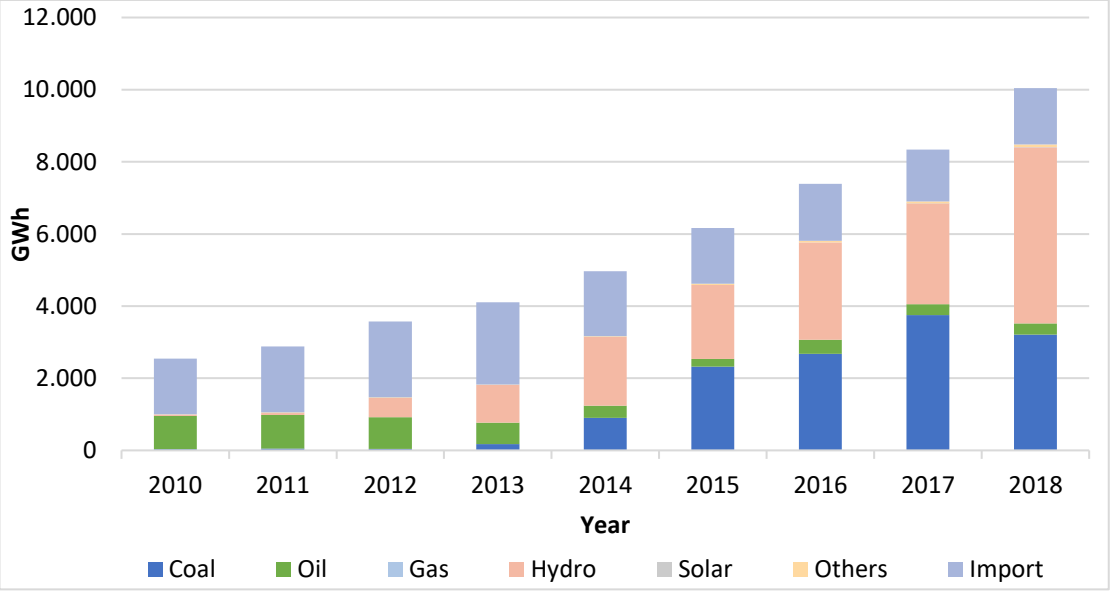
Figure 7. Electricity Demand by Sector (GWh)



GWh = gigawatt hours.Source: Cambodia EBT 2010–2018.
Source: Cambodia EBT 2010–2018.

Total electricity generation increased from 998 gigawatt hours (GWh) in 2010 to 8476 GWh in 2018 at an AAGR of 31% (Figure 8). Oil was the main power source of generation in 2010. The share of oil decreased as hydropower-based electricity generation started to operate in 2012 and that of coal in 2015. By 2018 the share of oil declined to 4% whilst coal was 38% and hydropower 58%.

Figure 8. Electricity Generation by Fuel Type (GWh)



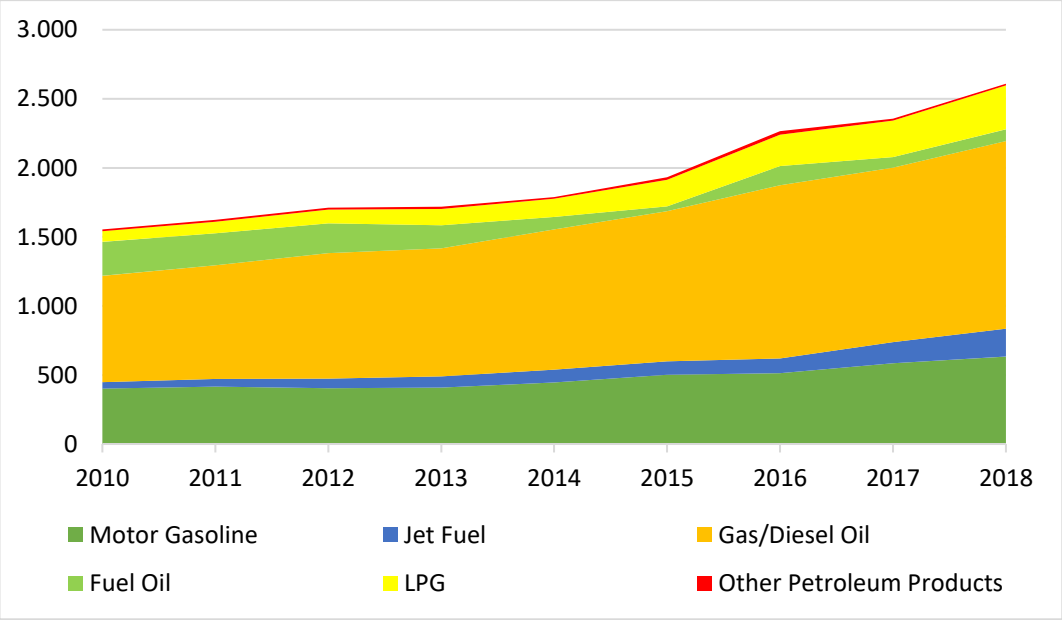
Source: Cambodia EBT 2010–2018.

Cambodia imported electricity mainly in the dry season. Electricity imports grew at an AAGR of 0.2% over 2010–2018. However, between 2017–2018 the electricity import reached to 8.9% due to the increase of electricity consumption, especially by the commercial and industries' special economic zone.

5. Petroleum Products

Cambodia imported 100% of its petroleum products from Singapore, Thailand, and Viet Nam to supply domestic consumption. The AAGR of imported petroleum products was 7% in 2010–2018 and between 2017 and 2018 was 11%. The high growth of imported petroleum products between 2017 and 2018 was largely contributed by the rapid increase of jet fuel and liquefied petroleum gas (LPG) as the result of increased domestic air traffic, and residential, commercial, and road transport (Figure 9).

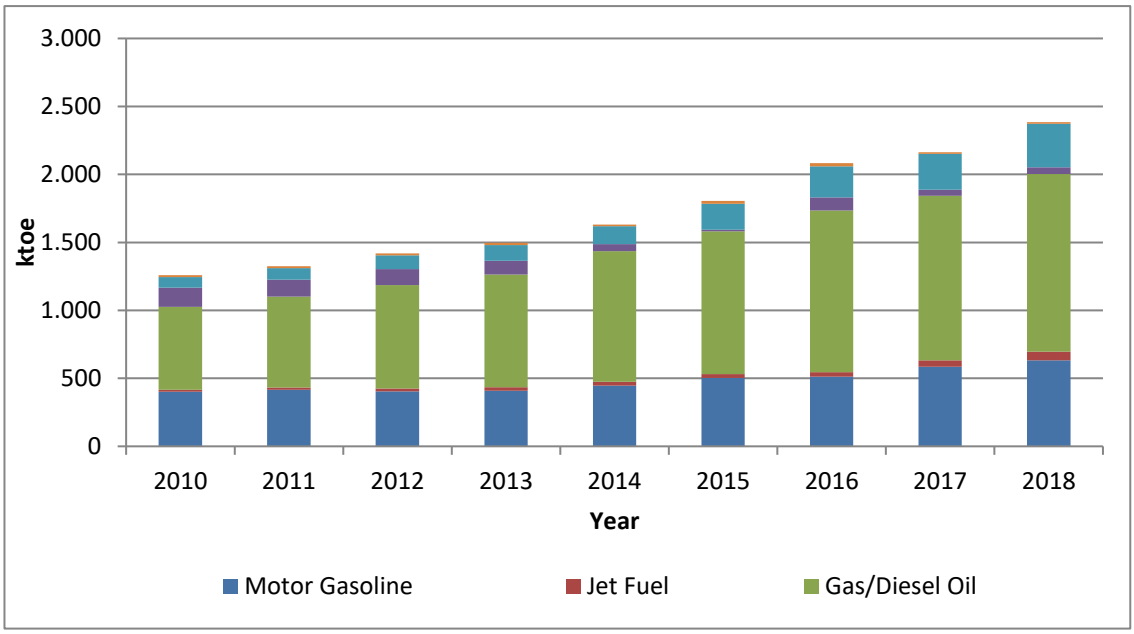
Figure 9. Import of Petroleum Products (ktoe)



LPG = liquefied petroleum gas, ktoe = kiloton of oil equivalent.
Source: Cambodia EBT 2010–2018.

The AAGR of Cambodia's petroleum products demand was 8% in 2010–2018 period and between 2017 and 2018 was 10.5%. (Figure 10).

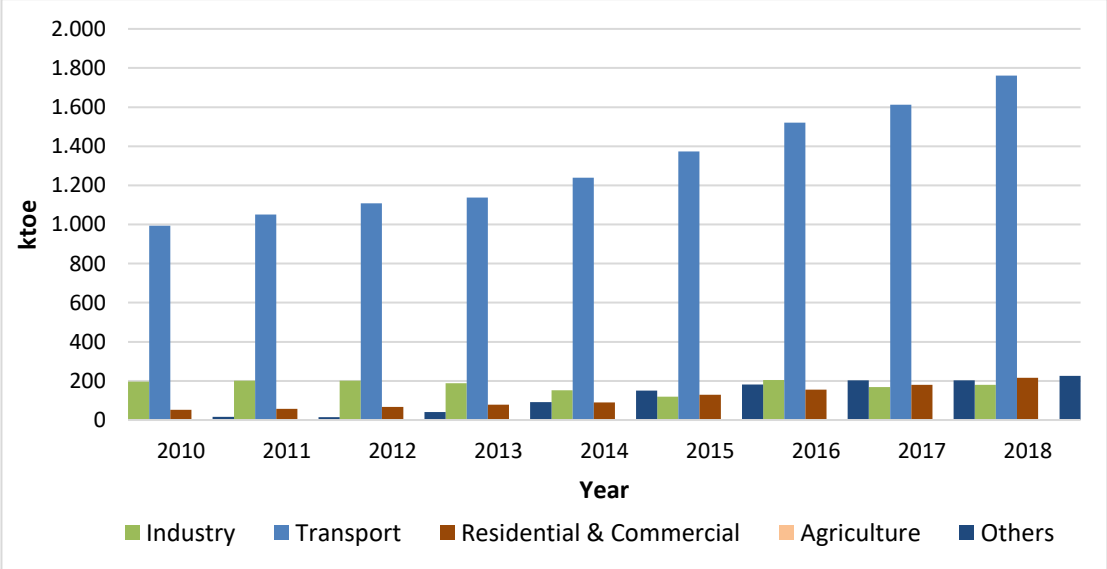
Figure 10. Petroleum Production Demand (ktoe)



LPG = liquefied petroleum gas, ktoe = kiloton of oil equivalent.
Source: Cambodia EBT 2010–2018.

The main consumer of petroleum products was the transport sector at 74% share of the total consumption in 2018. The other consumers of petroleum products were industry (8%), residential and commercial (9%), and agriculture with 'others' (9%). The average annual growth rate of the consumption of petroleum products was 8% in 2010–2018 period and grew by 10.15% between 2017 and 2018. (Figure 11).

Figure 11. Petroleum Consumption by Sector (ktoe)



ktoe = kiloton of oil equivalent.
Source: Cambodia EBT 2010–2018.

6. Primary Energy Supply

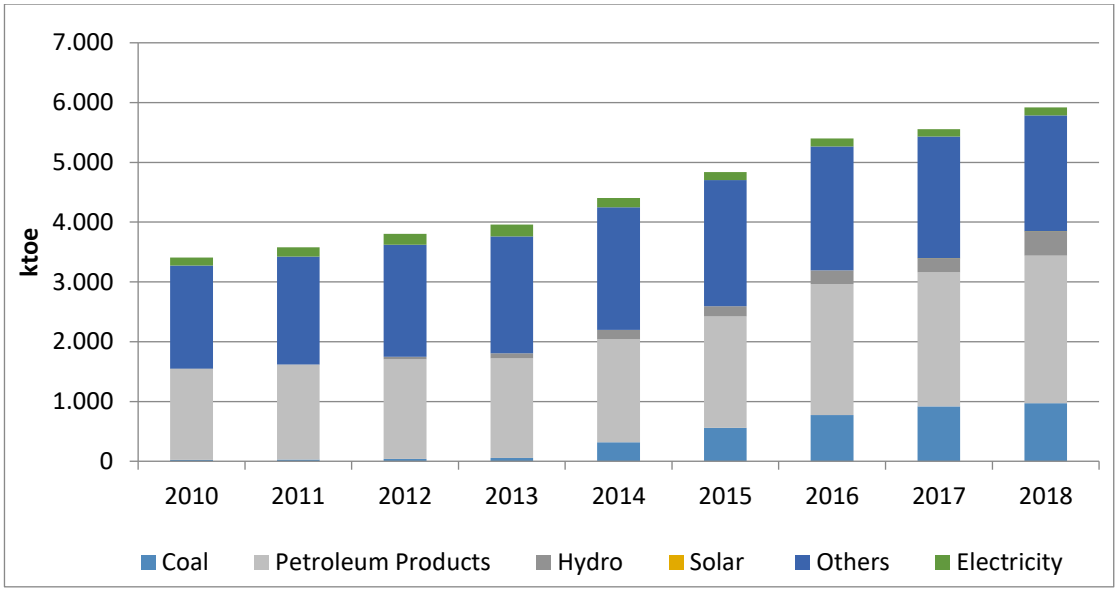
The primary energy supply is theoretically defined as a total sum of the transformation sector and the final energy consumption sector. Another definition is shown in the equation below:

$$indigenous\ production\ +\ import\ -\ export\ +$$
$$stock\ change\ (beginning\ -\ ending)\ -\ international\ marine\ and\ aviation\ bunkers$$

Cambodia imported coal, oil (petroleum products), and electricity. Domestic energy in Cambodia comprised hydropower and biomass only.

The total primary energy supply (TPES) grew at an AAGR of 7.1% over the 2010–2018 period. (Figure 12). Between 2017 and 2018 the growth of TPES was 6.5%. The hydropower supply grew the fastest at 74.7% due to the 36% increase of installed capacity. Coal supply increased by 6.2%, whilst the petroleum products supply increased by 9.8%. The traditional biomass supply, on the other hand, declined by 5% as Cambodia continued to shift from non-commercial energy to commercial energy (oil and electricity) (Figure 12).

Figure 12. Total Primary Energy Supply (ktoe)

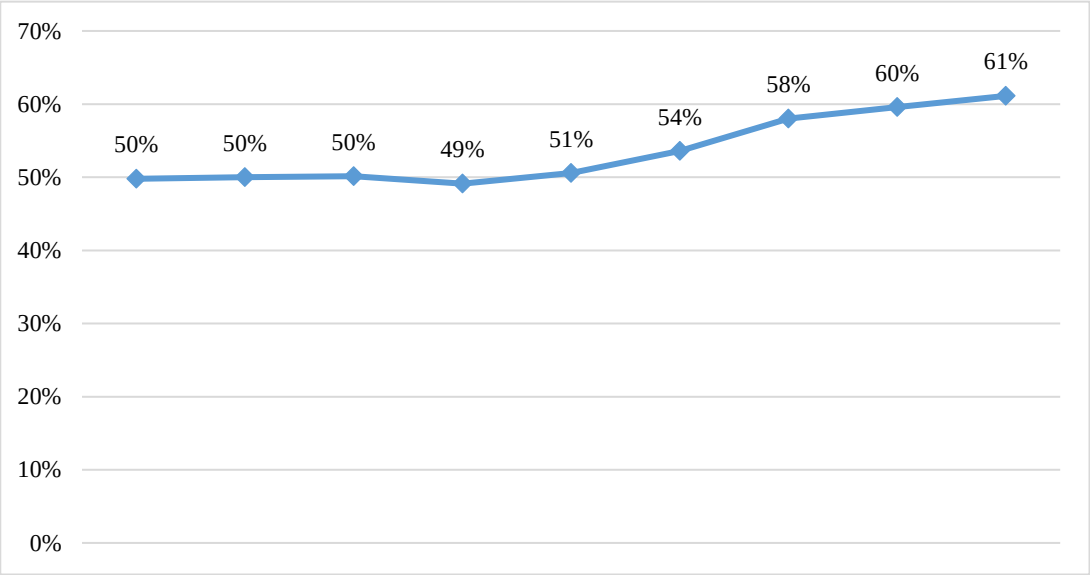


ktoe = kiloton of oil equivalent.
Source: Cambodia EBT 2010–2018.

7. Energy Indicators

The import dependency ratio of Cambodia, defined as the energy import divided by the sum of energy production and energy import increased from 50% in 2010 to 61% in 2018. This indicates that the country still depends on outside sources, making Cambodia vulnerable to the security of its energy supply. Emergency response and preparedness at the national level, including strategic stockpiling, will then be needed. (Figure 13).

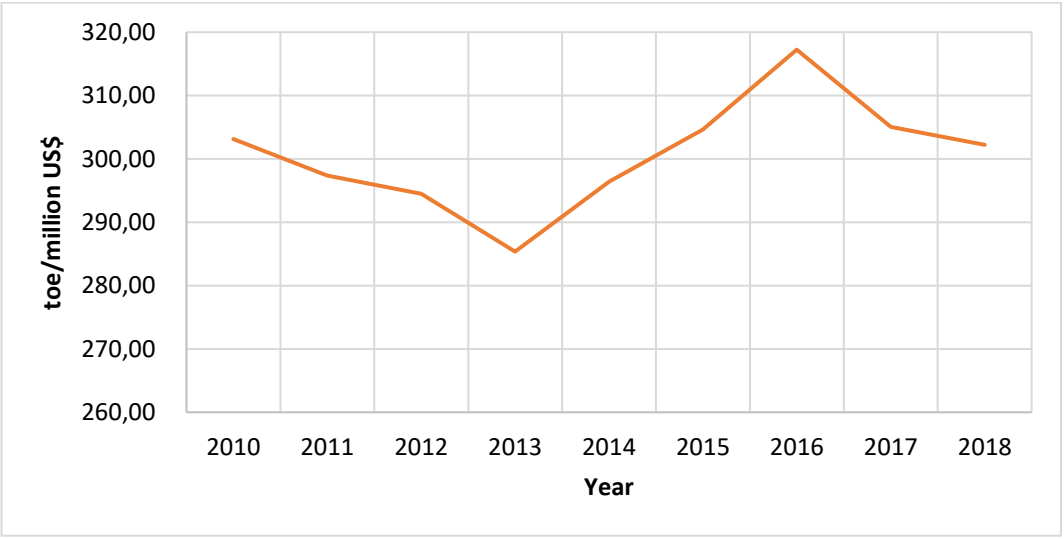
Figure 13. Import Dependency Ratio (%)



Source: Cambodia EBT 2010–2018.

Energy intensity is defined as the total primary energy supply (TPES) divided by the gross domestic product (GDP). Figure 14 shows that Cambodia's energy intensity slightly decreased to an AAGR of 0.04% over the 2010–2018 period. The growth rate decreased by 2% from 2010 to 2013 as the result of oil-based electricity generation reduction. After that, the energy intensity increased to 3.5% up to 2016 because the coal-fired power plant was started and decreased 2.4 % in 2018 as coal use was reduced. The energy intensity was 303.14 toe/million US$ in 2010 and decreased to 302.21 toe/million US$ in 2018.

Figure 14. Energy Intensity (toe/million US$)

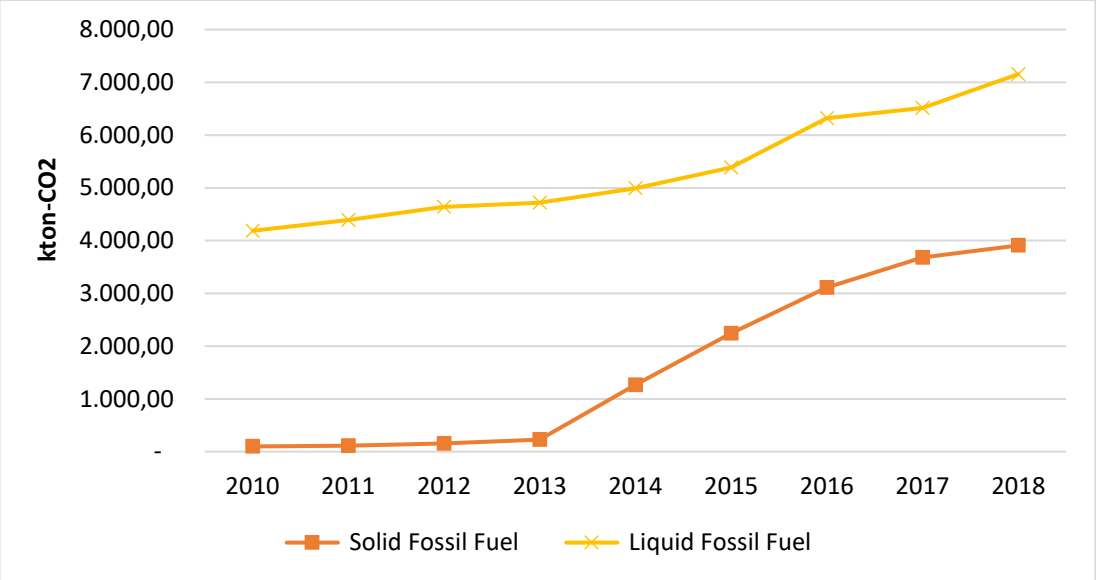


toe = ton of oil equivalent.
Source: Cambodia EBT 2010–2018.

8. CO_2 Emissions

Cambodia's CO_2 emissions have been increasing at an AAGR of 13% over the 2010–2018 period. The total amount of CO_2 emissions was 11,062.35 kiloton (kton)-CO_2 in 2018 (Figure 15). CO_2 emissions of liquid fossil fuel grew at an AAGR of 7% over 2010–2018 period because of the import of petroleum products. CO_2 emissions of solid fossil fuel grew by 32% between 2014 and 2018 as a result of the coal-fired power plant operation.

Figure 15. CO_2 Emissions from Fuel Combustion



Source: Cambodia EBT 2010–2018.

9. Conclusion

Cambodia's energy supply has been increasing due to the country's high economic development. Its economic growth will continue for at least another 5 years, according to international economic organizations such as the International Monetary Fund. Thus, Cambodia faces the following challenges that need to be met with appropriate government policies:

a. Currently, energy demand is fully linked to economic growth (elasticity is near 1). But the demand for conventional energy – except biomass – such as coal, oil, and electricity (defined as TFEC without biomass) has increased more quickly than economic growth since 2014. Cambodia needs to control its conventional energy demand by strengthening its energy efficiency and conservation policies, such as increasing the number of official energy managers through human resource development. This development will need support from developed countries.
b. To continue to secure the energy supply, Cambodia should maximize its domestic energy capacity, such as hydropower and biomass. The use of efficient types of biomass stoves and biofuel is one option to decrease oil imports (gasoline and LPG).

c. Currently, the use of LPG by the three-wheeled Tuk-Tuk transport mode has increased significantly due to the low price of LPG. LPG is used mostly in the residential and commercial sectors by the countries in the region. Nevertheless, Cambodia differs from its neighbouring countries such as Thailand and Viet Nam. Cambodia needs to actualize its LPG consumption survey results to verify this finding.

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World Bank (2019), *World Development Indicators*. Washington, DC: World Bank. Available at: https://databank.worldbank.org/source/world-development-indicators (accessed 10 July 2019).[2]

[1] Energy data revisions developed by ERIA and data support from the Electricité du Cambodge (EDC), the General Department of Energy (GDE), and the Department of Petroleum Technology, the General Department of Petroleum of the Ministry of Mines and Energy (MME), including raw energy data, consist of:

1. Coal Data
   Coal production, sales, and export data from 2010 to 2018 were collected from EDC.
2. Petroleum Data
   Petroleum import data were collected from the Customs and General Department of Petroleum, MME.
3. Electricity Data
   Electricity data collected by GDE.
4. Biomass Data
   Biomass data collected by EDC.

[2] Gross domestic product (GDP) (constant 2010 US$), population, foreigner direct investment, labour force, and unemployment of Cambodia were collected from the World Development Indicators.

Appendix 1

Energy Balance Tables of Cambodia, 2010–2018

Year: 2010, Unit (ktoe)

Year: 2010		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Others	Electricity	Total
1.	Indigenous Production									3	1,725		1,728
2.	Imports	24	1,555	401	47	771	246	77	14			133	1,712
13.1	International Aviation Bunkers		-32		-32								-32
5.	Stock Changes												
6.	Total Primary Energy Supply	24	1,523	401	14	771	246	77	14	3	1,725	133	3,408
8.	Total Transformation Sector	-19	-258			-155	-103			-3	-722	86	-916
8.1	Main Activity Producer	-19	-258			-155	-103			-3	-3	86	-196
8.8	Charcoal Processing										-719		-719
9.	Loss & Own Use											-25	-25
10.	Discrepancy		-7			-7		0			0		-7
11.	Total Final Energy Consumptions	6	1,258	401	14	610	143	77	14		1,003	194	2,461
12.	Industry Sector	6	197			62	135				241	42	486
12.4	Non Metallic Mineral Products	6											6
12.13	Non-specified Industry		197			62	135				241	42	480
13.	Transport Sector		993	401	14	540		25	14				993
13.2	Domestic Air Transport		14		14								14
13.3	Road		979	401		540		25	14				979
14.	Other Sector		68			9	7	52			762	152	982
14.1	Residential & Commercial		52					52			762	152	966
14.1.1	Commerce and Public Services		46					46				77	123
14.1.2	Residential		6					6			762	75	843
14.2	Agriculture		0.16			0.16							0.16
14.4	Non-specified Others		16			8	7					0	16
15.	of which Non-Energy Use												
16	Electricity Output in GWh	34	926							33	6		998

Year: 2011, Unit (ktoe)

Year: 2011		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Others	Electricity	Total
1.	Indigenous Production									4	1,803		1,808
2.	Imports	28	1,624	416	55	824	230	85	14			157	1,809
13.1	International Aviation Bunkers		-38		-38								-38
6.	Total Primary Energy Supply	28	1,586	416	17	824	230	85	14	4	1,803	157	3,579
7.	Transfers												
8.	Total Transformation Sector	-22	-260			-156	-104			-4	-751	90	-948
8.1	Main Activity Producer	-22	-260			-156	-104			-4	-5	90	-202
8.8	Charcoal Processing										-746		-746
9.	Loss & Own Use											-26	-26
10.	Discrepancy	0	0		0	0	0	0			0	0	0
11.	Total Final Energy Consumptions	6	1,325	416	17	668	126	85	14		1,052	221	2,605
12.	Industry Sector	6	202			82	119				254	54	517
12.4	Non Metallic Mineral Products	6											6
12.13	Non-specified Industry		202			82	119				254	54	510
13.	Transport Sector		1,051	416	17	577		27	14				1,051
13.2	Domestic Air Transport		17		17								17
13.3	Road		1,034	416		577		27	14				1,034
14.	Other Sector		73			9	7	57			798	167	1,038
14.1	Residential & Commercial		57					57			798	167	1,022
14.1.1	Commerce and Public Services		51					51				93	144
14.1.2	Residential		7					7			798	73	878
14.2	Agriculture		0.16			0.16							0.16
14.4	Non-specified Others		15			8	7					1	16
16	Electricity Output in GWh	49	936							53	12		1,050

Year: 2012, Unit (ktoe)

Year: 2012		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Others	Electricity	Total
1.	Indigenous Production									44	1,877		1,921
2.	Imports	39	1,712	405	69	908	215	100	14			181	1,931
13.1	International Aviation Bunkers		-48		-48								-48
6.	Total Primary Energy Supply	39	1,664	405	21	908	215	100	14	44	1,877	181	3,804
8.	Total Transformation Sector	-31	-246			-147	-98			-44	-782	126	-977
8.1	Main Activity Producer	-31	-246			-147	-98			-44		126	-195
8.8	Charcoal Processing										-782		-782
9.	Loss & Own Use											-26	-26
10.	Discrepancy	0	0		0	0	0	0			0	0	0
11.	Total Final Energy Consumptions	7	1,418	405	21	761	117	100	14		1,095	281	2,801
12.	Industry Sector	7	201			91	111				265	77	551
12.4	Non Metallic Mineral Products	7											7
12.13	Non-specified Industry		201			91	111				265	77	543
13.	Transport Sector		1,108	405	21	636		32	14				1,108
13.2	Domestic Air Transport		21		21								21
13.3	Road		1,087	405		636		32	14				1,087
14.	Other Sector		108			34	6	68			830	203	1,142
14.1	Residential & Commercial		68					68			830	203	1,101
14.1.1	Commerce and Public Services		60					60				110	170
14.1.2	Residential		8					8			830	93	931
14.2	Agriculture		0.19			0.19							0.19
14.4	Non-specified Others		41			34	6					1	41
16	Electricity Output in GWh	39	882							533	12		1,466

Year: 2013, Unit (ktoe)

Year: 2013		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Others	Electricity	Total
1.	Indigenous Production									87	1,954		2,041
2.	Imports	57	1,718	409	80	929	167	116	16			196	1,971
13.1	International Aviation Bunkers		-55		-55								-55
6.	Total Primary Energy Supply	57	1,663	409	24	929	167	116	16	87	1,954	196	3,957
8.	Total Transformation Sector	-50	-166			-100	-66			-87	-815	157	-961
8.1	Main Activity Producer	-50	-166			-100	-66			-87	-3	157	-149
8.8	Charcoal Processing										-812		-812
9.	Loss & Own Use											-48	-48
10.	Discrepancy		0		0	0	0	0			0		0
11.	Total Final Energy Consumptions	7	1,497	409	24	829	101	116	16		1,139	306	2,948
12.	Industry Sector	7	189			93	96				276	71	542
12.4	Non Metallic Mineral Products	7											7
12.13	Non-specified Industry		189			93	96				276	71	535
13.	Transport Sector		1,138	409	24	650		38	16				1,138
13.2	Domestic Air Transport		24		24								24
13.3	Road		1,113	409		650		38	16				1,113
14.	Other Sector		170			86	5	79			863	235	1,268
14.1	Residential & Commercial		79					79			863	234	1,176
14.1.1	Commerce and Public Services		70					70				132	202
14.1.2	Residential		9					9			863	102	974
14.2	Agriculture		0.19			0.19							0.19
14.4	Non-specified Others		91			86	5					1	92
16	Electricity Output in GWh	177	596							1,046	7		1,826

Year: 2014, Unit (ktoe)

Year: 2014		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Others	Electricity	Total
1.	Indigenous Production									159	2,050		2,209
2.	Imports	315	1,788	446	92	1,017	90	132	11			155	2,259
13.1	International Aviation Bunkers		-64		-64								-64
6.	Total Primary Energy Supply	315	1,725	446	28	1,017	90	132	11	159	2,050	155	4,404
8.	Total Transformation Sector	-305	-94			-56	-37			-159	-853	272	-1,139
8.1	Main Activity Producer	-305	-94			-56	-37			-159	-7	272	-293
8.8	Charcoal Processing										-846		-846
9.	Loss & Own Use											-81	-81
10.	Discrepancy	0	0		0	0	0					0	0
11.	Total Final Energy Consumptions	10	1,631	446	28	961	52	132	11		1,196	347	3,184
12.	Industry Sector	10	151			102	50				289	91	541
12.4	Non Metallic Mineral Products	10											10
12.13	Non-specified Industry		151			102	50				289	91	531
13.	Transport Sector		1,240	446	28	712		43	11				1,240
13.2	Domestic Air Transport		28		28								28
13.3	Road		1,212	446		712		43	11				1,212
14.	Other Sector		239			147	3	90			908	256	1,403
14.1	Residential & Commercial		90					90			908	255	1,252
14.1.1	Commerce and Public Services		79					79				141	220
14.1.2	Residential		10					10			908	114	1,032
14.2	Agriculture		0.21			0.21							0.21
14.4	Non-specified Others		150			147	3					1	151
16	Electricity Output in GWh	906	337							1,907	17		3,167

Year: 2015 (ktoe)

Year: 2015		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Others	Electricity	Total
1.	Indigenous Production									171	2,110		2,281
2.	Imports	558	1,932	502	97	1,086	36	192	20			133	2,632
13.1	International Aviation Bunkers		-67		-67								-67
6.	Total Primary Energy Supply	558	1,865	502	30	1,086	36	192	20	171	2,110	133	4,845
8.	Total Transformation Sector	-543	-61			-36	-24			-171	-866	398	-1,243
8.1	Main Activity Producer	-543	-61			-36	-24			-171	-18	398	-395
8.8	Charcoal Processing										-848		-848
9.	Loss & Own Use											-83	-83
10.	Discrepancy	0	0		0			0			0	0	-10
11.	Total Final Energy Consumptions	14	1,804	502	30	1,049	12	192	20		1,244	447	3,510
12.	Industry Sector	14	119			109	11				312	98	543
12.4	Non Metallic Mineral Products	14											14
12.13	Non-specified Industry		119			109	11				312	98	529
13.	Transport Sector		1,374	502	30	760		62	20				1,374
13.2	Domestic Air Transport		30		30								30
13.3	Road		1,344	502		760		62	20				1,344
14.	Other Sector		312			181	1	130			932	350	1,593
14.1	Residential & Commercial		130					130			932	349	1,411
14.1.1	Commerce and Public Services		115					115				218	332
14.1.2	Residential		15					15			932	131	1,078
14.2	Agriculture		0.22			0.22							0.22
14.4	Non-specified Others		182			180	1					1	182
16	Electricity Output in GWh	2,321	218							2,048	38		4,625

Year: 2016, Unit (ktoe)

Year: 2016		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Others	Electricity	Total
1.	Indigenous Production									225	2,073		2,298
2.	Imports	774	2,265	513	106	1,255	140	228	24			136	3,175
13.1	International Aviation Bunkers		-74		-74								-74
6.	Total Primary Energy Supply	774	2,192	513	33	1,255	140	228	24	225	2,073	136	5,400
8.	Total Transformation Sector	-755	-109			-65	-43			-225	-868	500	-1,457
8.1	Main Activity Producer	-755	-109			-65	-43			-225	-17	500	-606
8.8	Charcoal Processing										-851		-851
9.	Loss & Own Use											-105	-105
10.	Discrepancy	0	0				0	0			0		0
11.	Total Final Energy Consumptions	19	2,083	513	33	1,189	96	228	24		1,205	531	3,838
12.	Industry Sector	19	205			125	79				318	122	664
12.4	Non Metallic Mineral Products	19											19
12.13	Non-specified Industry		205			125	79				318	122	645
13.	Transport Sector		1,521	513	33	878		74	24				1,521
13.2	Domestic Air Transport		33		33								33
13.3	Road		1,489	513		878		74	24				1,489
14.	Other Sector		357			186	17	155			887	408	1,652
14.1	Residential & Commercial		155					155			887	408	1,449
14.1.1	Commerce and Public Services		137					137				236	373
14.1.2	Residential		18					18			887	172	1,077
14.2	Agriculture		0.26			0.26							0.26
14.4	Non-specified Others		202			186	17					1	203
16	Electricity Output in GWh	2,679	390							2,698	43		5,809

Year: 2017, Unit (ktoe)

Year: 2017		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	8.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Solar	Others	Electricity	Total
1.	Indigenous Production	20								233	0	2,036		2,290
2.	Imports	895	2,355	585	153	1,262	78	265	12				124	3,374
13.1	International Aviation Bunkers		-106		-106									-106
6.	Total Primary Energy Supply	915	2,249	585	47	1,262	78	265	12	233	0	2,036	124	5,557
8.	Total Transformation Sector	-837	-85			-51	-34			-233	0	-870	594	-1,432
8.1	Main Activity Producer	-837	-85			-51	-34			-233	0	-16	594	-578
8.8	Charcoal Processing											-854		-854
9.	Loss & Own Use												-133	-133
10.	Discrepancy	0	0		0	0		0				0	0	0
11.	Total Final Energy Consumptions	77	2,164	585	47	1,211	44	265	12			1,166	585	3,992
12.	Industry Sector	77	168			126	42					306	150	702
12.4	Non Metallic Mineral Products	58												58
12.13	Non-specified Industry	20	168			126	42					306	150	644
13.	Transport Sector		1,612	585	47	883		85	12					1,612
13.2	Domestic Air Transport		47		47									47
13.3	Road		1,565	585		883		85	12					1,565
14.	Other Sector		383			201	2	179				861	434	1,678
14.1	Residential & Commercial		179					179				861	434	1,474
14.1.1	Commerce and Public Services		159					159					246	405
14.1.2	Residential		21					21				861	187	1,069
14.2	Agriculture		0.26			0.26							0.26	
14.4	Non-specified Others		203			201	2						1	204
16	Electricity Output in GWh	3,747	306							2,792	5	52		6,902

Year: 2018, Unit (ktoe)

Year: 2018		1.	4.	4.1	4.3	4.5	4.6	4.7	4.10	6.	8.	9.	10.	12.
		Coal	Petroleum Products	Motor Gasoline	Jet Fuel	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Hydro	Solar	Others	Electricity	Total
1.	Indigenous Production	12								407	1	1,935		2,356
2.	Imports	960	2,609	633	202	1,359	85	319	11				135	3,704
13.1	International Aviation Bunkers		-140		-140									-140
6.	Total Primary Energy Supply	972	2,469	633	62	1,359	85	319	11	407	1	1,935	135	5,919
8.	Total Transformation Sector	-896	-86			-51	-34			-407	-1	-840	729	-1,394
8.1	Main Activity Producer	-896	-86			-51	-34			-407	-1	-14	729	-568
8.8	Charcoal Processing											-826		-826
9.	Loss & Own Use												-120	-120
10.	Discrepancy	0	0		0	0	0					0	0	-108
11.	Total Final Energy Consumptions	76	2,383	633	62	1,307	50	319	11			1,095	744	4,297
12.	Industry Sector	76	180			136	44					272	197	725
12.4	Non Metallic Mineral Products	64												64
12.13	Non-specified Industry	12	180			136	44					272	197	661
13.	Transport Sector		1,761	633	62	951		103	11					1,761
13.2	Domestic Air Transport		62		62									62
13.3	Road		1,698	633		951		103	11					1,698
14.	Other Sector		442			220	6	216				823	547	1,812
14.1	Residential & Commercial		216					216				823	546	1,585
14.1.1	Commerce and Public Services		191					191					297	488
14.1.2	Residential		25					25				823	249	1,097
14.2	Agriculture		0.29			0.29								0.29
14.4	Non-specified Others		226			220	6						1	227
16	Electricity Output in GWh	3,209	308							4,879	16	64		8,476

GWh = gigawatt hour, ktoe = kiloton of oil equivalent, LPG = liquefied petroleum gas.

Appendix 2

List of Members, Cambodia and ERIA

Cambodian Government Official

No	Name	Position	Institution	Email
1	Mr Hang Kimhourn	Chief Officer	General Department of Petroleum, Ministry of Mines and Energy	hourn.hang@gmail.com
2	Mr Heang Theangseng	Chief, Energy Statistics and Energy Development Department	General Department of Energy, Ministry of Mines and Energy	heangtheangseng.mme@gmail.com
3	Mr Sok Chandareth	Deputy Director, Energy Development Department	General Department of Energy, Ministry of Mines and Energy	schandareth.mme@gmail.com
4	Mr Chith Thuch	Staff	General Department of Petroleum, Ministry of Mines and Energy	chiththuch87@gmail.com

ERIA Team

No	Name	Position	Institution	Email
1	Mr Shigeru Kimura	Special Advisor to President for Energy Affairs, Energy Unit, Research Department, ERIA	ERIA	shigeru.kimura@eria.org
2	Mr Alloysius Joko Purwanto	Energy Economist	ERIA	joko.purwanto@eria.org
3	Ms Cecilya Laksmiwati Malik	ASEAN Energy Policy Planning Expert	Independent consultancy	celly.malik@gmail.com
4	Ms Suharyati Nugroho	Head of Sub Division of Energy Planning	Secretariat General of National Energy Council, Ministry of Energy and Mineral Resource, Indonesia	yatidina@yahoo.com
5	Ms Dian Lutfiana	Research Associate	ERIA	dian.lutfiana@eria.org