

Chapter 2

Final Primary Energy Data in 2000–2019

Fossil fuels, such as coal and petroleum products, are imported, while biomass is produced domestically. Electricity production depends on hydro and coal, with some imports from the Lao People's Democratic Republic (Lao PDR), Thailand, and Viet Nam.

The GDE and the GDP-MME maintain the primary energy data. These departments have a key role in releasing timely, complete, and accurate energy statistics. ERIA has supported the MME in publishing the national energy statistics since 2015.

The previous Cambodia energy statistics only covered the period 2010–2018. To extend the energy statistical analysis, the MME collected primary energy data from 2000 to 2009 and 2019. Most of the consumption data were available post 2003, and others were available after 2007. In this regard, the missing data were being estimated and analysed to check consistency with the existing data.

This chapter shows the final primary energy data from 2000 to 2019. Meanwhile, the methodology to estimate missing data and assess the inconsistent data is elaborated on in chapter 3.

1. Coal

Two types of coal data exist in Cambodia: domestic coal (lignite) and imported coal (sub-bituminous). Domestic coal is only for 2017 and 2018; imported coal started in 2008. Table 2.1. shows the coal balance of Cambodia.

Table 2.1. Coal Balance (in kilotonnes)

Year	Supply			Consumption		
	Production	Import	Total	Industry	Power Plant	Total
2000			-	-	-	-
2001			-	-	-	-
2002			-	-	-	-
2003			-	-	-	-
2004			-	-	-	-
2005			-	-	-	-
2006			-	-	-	-
2007			-	-	-	-
2008		25.5	25.5	-	25.5	25.5
2009		30.6	30.6	-	30.6	30.6
2010		45.2	45.2	10.2	35.0	45.2
2011		52.0	52.0	11.9	40.1	52.0
2012		71.2	71.2	13.0	58.1	71.2
2013		105.3	105.3	13.4	91.9	105.3
2014		582.3	582.3	18.9	563.3	582.3
2015		1,029.5	1,029.5	26.7	1,002.8	1,029.5
2016		1,428.6	1,428.6	34.6	1,394.1	1,428.6
2017	56.0	1,652.9	1,708.9	162.9	1,546.0	1,708.9
2018	34.0	1,772.1	1,806.1	151.6	1,654.5	1,806.1
2019		2,345.5	2,345.5	252.8	2,092.7	2,345.5

Source: GDE-MME in-house data (2021).

2. Oil

2.1. Oil supply

Cambodia does not produce oil and, thus, imports all its petroleum products. The Customs Office prepares the primary data source for oil imports. Table 2.2 shows the imported petroleum data of Cambodia by type from 2000 to 2019.

Table 2.2 Oil Supply (in kilotonnes)

Year	Import							Total
	Jet A-1	Gasoline	Diesel	Fuel Oil	Lubricant	LPG	Kerosene	
2000	17.37	119.76	387.83	95.51	3.64	13.43	29.55	667.09
2001	16.78	120.86	465.65	92.12	3.14	16.66	28.27	743.48
2002	16.83	116.93	389.20	122.46	5.13	18.13	50.41	719.08
2003	16.83	103.80	400.58	118.53	5.65	22.28	83.69	751.36
2004	19.67	96.75	409.62	142.35	6.52	27.54	47.82	750.28
2005	20.03	129.30	346.58	180.03	7.46	28.24	30.34	741.99
2006	27.06	158.98	449.81	248.80	6.94	38.26	24.41	954.27
2007	48.73	238.40	492.53	293.95	11.41	47.34	32.62	1,164.98
2008	44.31	293.22	456.10	310.09	12.83	43.29	30.78	1,190.62
2009	35.19	313.61	677.06	269.94	17.54	56.95	28.95	1,399.24
2010	46.35	384.09	762.08	244.07	16.74	65.11	30.59	1,549.04
2011	54.60	398.52	814.54	228.78	17.64	71.94	12.07	1,598.09
2012	68.99	387.73	897.64	213.74	18.02	84.68	6.26	1,677.06
2013	79.21	392.01	918.44	165.93	18.84	98.69	3.03	1,676.16
2014	91.66	426.83	1,005.48	89.28	11.69	112.12	-	1,737.06
2015	96.95	507.26	1,073.25	35.59	20.39	162.33	-	1,895.77
2016	105.74	513.76	1,240.18	138.53	25.13	193.60	-	2,216.94
2017	152.81	562.04	1,247.63	77.69	12.10	224.37	-	2,276.65
2018	201.52	606.09	1,343.34	84.07	11.83	270.32	-	2,517.17
2019	224.71	725.65	1,661.33	179.92	13.83	340.96	-	3,146.40

* Lubricants include base oil; gasoline includes naphtha and methyl tert-butyl ether (MTBE).
Source: GDP-MME In-house data (2021).

2.2. Oil consumption

Cambodia consumes several types of oil (petroleum products, including additives) for various economic activities (transport, industry, residential, commercial, and others) and electricity generation. However, no data for oil sales is available because the GDP-MME did not collect it from foreign oil companies in Cambodia. Therefore, petroleum consumption by each final sector in 2000–2009 and 2019 was estimated based on the current Cambodia energy statistics of 2010–2018. Table 2.3 shows the petroleum consumption data for each sector by type from 2000 to 2019.

Table 2.3. Oil Consumption by Type (in kilotonnes)

Year	Gasoline	Jet Fuel			Diesel					Fuel Oil			Lubricant*	LPG			Kerosene
	Road	Air	Domestic	International	Power	Road	Agriculture	Industry	Other	Industry	Power	Other	Road	Commercial	Road	Residential	Residential
2000	119.8	17.4	5.3	12.0	71.0	277.4	0.1	31.7	7.6	37.0	53.6	4.9	3.6	11.9	-	1.6	29.6
2001	120.9	16.8	5.2	11.6	77.6	339.7	0.1	38.8	9.4	29.6	58.6	3.9	3.1	14.7	-	1.9	28.3
2002	116.9	16.8	5.2	11.7	84.5	266.8	0.1	30.5	7.3	51.7	63.8	6.9	5.1	16.0	-	2.1	50.4
2003	103.8	16.8	5.2	11.7	94.7	267.9	0.1	30.6	7.4	41.5	71.4	5.5	5.7	19.7	-	2.6	83.7
2004	96.7	19.7	6.0	13.6	108.2	263.9	0.1	30.2	7.3	45.4	90.9	6.1	6.5	24.4	-	3.2	47.8
2005	129.3	20.0	6.2	13.9	134.7	185.5	0.1	21.2	5.1	72.3	98.1	9.6	7.5	25.0	-	3.3	30.3
2006	159.0	27.1	8.3	18.7	172.6	242.7	0.1	27.7	6.7	117.6	115.6	15.7	6.9	22.9	12.3	3.0	24.4
2007	238.4	48.7	15.0	33.8	215.9	242.2	0.1	27.7	6.7	131.8	144.5	17.6	11.4	28.4	15.3	3.7	32.6
2008	293.2	44.3	13.6	30.7	235.2	193.4	0.1	22.1	5.3	134.7	157.4	18.0	12.8	25.9	14.0	3.4	30.8
2009	313.6	35.2	10.8	24.4	192.3	424.5	0.1	48.5	11.7	124.6	128.7	16.6	17.5	34.1	18.4	4.5	28.9
2010	384.1	46.3	14.2	32.1	149.9	536.3	0.2	61.0	14.7	136.3	100.4	7.4	16.7	39.0	21.0	5.1	30.6
2011	398.5	54.6	16.8	37.8	151.6	573.1	0.2	81.5	8.2	120.3	101.5	7.0	17.6	43.1	23.2	5.6	12.1
2012	387.7	69.0	21.2	47.8	142.9	631.1	0.2	89.8	33.7	111.6	95.7	6.5	18.0	50.7	27.3	6.6	6.3
2013	392.0	79.2	24.3	54.9	96.6	644.8	0.2	91.8	85.0	96.2	64.7	5.0	18.8	59.1	31.9	7.7	3.0
2014	426.8	91.7	28.2	63.5	54.5	704.9	0.2	100.5	145.3	50.1	36.5	2.7	11.7	67.2	36.2	8.8	0.0
2015	507.3	96.9	29.8	67.2	27.3	760.0	0.2	107.3	178.4	15.7	18.3	1.6	20.4	97.2	52.4	12.7	0.0
2016	513.8	105.7	32.5	73.2	79.8	852.7	0.3	124.0	183.4	70.3	53.4	14.8	25.1	116.0	62.5	15.2	0.0
2017	562.0	152.8	47.0	105.8	48.3	875.5	0.3	124.8	198.8	42.9	32.3	2.4	12.1	134.4	72.4	17.6	0.0
2018	606.1	201.5	61.9	139.6	49.9	941.3	0.3	134.3	217.5	44.7	33.4	6.0	11.8	161.9	87.2	21.2	0.0
2019	725.7	224.7	69.1	155.7	122.1	1,119.9	0.3	160.0	259.0	86.6	81.7	11.6	13.8	204.2	110.0	26.7	0.0

* Lubricant includes base oil; gasoline includes naphtha and methyl tert-butyl ether (MTBE).

Source: GDE-MME in-house data, (2021).

3. Biomass

Biomass consists of firewood, bagasse, and biogas from animal dung. Firewood and biogas are mainly consumed for cooking by the residential sector in rural areas. Firewood is also used to produce charcoal. Bagasse is consumed to produce electricity. Biomass production is shown in Table 2.4.

Table 2.4. Biomass Production

Year	Production				
	Firewood	Bagasse	Charcoal	Biogas	Total
	kilotonne	kilotonne	kilotonne	kilotonne	kilotonne
2000	3,455		212	0.3	3,667
2001	3,533		216	0.3	3,749
2002	3,606		221	0.3	3,828
2003	3,708		227	0.4	3,935
2004	3,842		235	0.4	4,077
2005	4,031	0	247	0.5	4,279
2006	4,206	2	257	0.5	4,465
2007	4,267	6	261	0.6	4,534
2008	4,454	5	272	1.3	4,733
2009	4,576	8	280	1.4	4,864
2010	4,638	7	283	2.0	4,930
2011	4,842	14	296	2.6	5,154
2012	5,040	14	308	2.3	5,364
2013	5,255	8	321	0.6	5,584
2014	5,500	20	336	0.9	5,857
2015	5,633	49	341	1.7	6,025
2016	5,581	46	342	1.7	5,971
2017	5,439	43	343	2.0	5,827
2018	5,169	39	332	2.2	5,542
2019	5,044	111	321	2.5	5,478

Source: GDE-MME in-house data (2021).

Biomass consumption is shown in Table 2.5.

Table 2.5. Biomass Consumption (in kilotonnes)

Year	Consumption (kilotonnes)						Total
	Firewood			Biogas	Charcoal	Bagasse	
	Residential	Industrial	Charcoal Factory	Residential	Residential	Power Generation	
2000	1,160	443	1,852	0.3	212	-	3,667
2001	1,183	457	1,893	0.3	216	-	3,749
2002	1,204	470	1,932	0.3	221	-	3,828
2003	1,234	488	1,986	0.4	227	-	3,935
2004	1,273	512	2,057	0.4	235	-	4,077
2005	1,328	547	2,157	0.5	247	0	4,279
2006	1,378	578	2,250	0.5	257	2	4,465
2007	1,381	605	2,281	0.6	261	6	4,534
2008	1,441	632	2,381	1.3	272	5	4,733
2009	1,481	649	2,446	1.4	280	8	4,864
2010	1,501	658	2,479	2.0	283	7	4,930
2011	1,567	687	2,588	2.6	296	14	5,154
2012	1,631	715	2,694	2.3	308	14	5,364
2013	1,701	745	2,809	0.6	321	8	5,584
2014	1,780	780	2,940	0.9	336	20	5,857
2015	1,807	842	2,984	1.7	341	49	6,025
2016	1,731	859	2,991	1.7	342	46	5,971
2017	1,658	826	2,955	2.0	343	43	5,827
2018	1,575	734	2,860	2.2	332	39	5,542
2019	1,522	710	2,812	2.5	321	111	5,478

Source: GDE-MME in-house data (2021).

4. Electricity

4.1. Electricity production

Cambodia initially produced electricity only from oil (diesel/heavy fuel oil [HFO]) and hydro. In 2005, bagasse started to be used to generate electricity. Coal entered the country's power production mix in 2008. Since 2017, Cambodia has also been utilising solar energy to generate power. Currently, hydro and coal power are the major power sources. Table 2.6 shows Cambodia's power production mix.

Table 2.6. Electricity Production by Energy Source (in GWh)

Year	Production					
	Hydro	Coal	Oil	Bagasse	Solar	Total
2000	30	-	447	-	-	478
2001	33	-	489	-	-	522
2002	36	-	533	-	-	569
2003	41	-	596	-	-	637
2004	28	-	715	-	-	743
2005	44	-	836	0	-	879
2006	51	-	1,035	2	-	1,087
2007	50	-	1,294	5	-	1,349
2008	46	23	1,410	5	-	1,484
2009	47	28	1,153	6	-	1,235
2010	32	32	899	6	-	968
2011	52	47	909	12	-	1,019
2012	517	37	857	12	-	1,423
2013	1,016	169	579	7	-	1,770
2014	1,852	863	327	17	-	3,058
2015	2,160	2,128	164	38	-	4,489
2016	2,568	2,394	478	42	-	5,483
2017	2,711	3,569	290	59	5	6,634
2018	4,737	3,057	299	64	16	8,172
2019	4,025	3,734	732	91	93	8,675

GWh = gigawatt-hour.

Source: GDE-MME in-house data (2021).

4.2. Electricity supply

Cambodia's total power supply includes imported electricity from neighbouring countries, such as the Lao PDR, Thailand, and Viet Nam. Importing electricity is needed due to seasonal factors because the volume of water for hydropower generation decreases during the dry season. The significant increase in electricity demand due to stable economic growth and insufficient investment in the power sector led Cambodia to keep importing electricity from its neighbouring countries. However, more coal power plants to generate domestic electricity can decrease electricity import. Table 2.7 shows the country's total electricity supply.

Table 2.7. Electricity Supply (in GWh)

Year	Production	Import	Total Supply
2000	478	44	521
2001	522	48	570
2002	569	52	621
2003	637	58	695
2004	743	59	803
2005	879	81	960
2006	1,087	110	1,197
2007	1,349	167	1,517
2008	1,484	374	1,858
2009	1,235	842	2,077
2010	968	1,541	2,509
2011	1,019	1,830	2,848
2012	1,423	2,104	3,527
2013	1,770	2,282	4,052
2014	3,058	1,803	4,861
2015	4,489	1,526	6,015
2016	5,483	1,550	7,033
2017	6,634	1,439	8,073
2018	8,172	1,567	9,739
2019	8,675	3,063	11,738

GWh = gigawatt-hour.

Source: GDE-MME in-house data (2021).

4.3. Electricity consumption

Electricity consumption is based on three final energy consumption sectors: residential, commercial, and industry (factories) (Table 2.8). The commercial sector consumes electricity dominantly (office buildings, hotels, shopping malls, and hospitals). Next, the residential sector (urban and rural areas) and the industry sector, including special economic zones, follow. In 2019, due to the rapid rise of electricity consumption in the industry sector, these three sectors' share in electricity consumption was balanced at around one third.

Table 2.8. Electricity Consumption by Sectors (in GWh)

Year	Consumption (GWh)			
	Residential	Commercial	Industrial	Total
2000	237.10	185.81	26.45	449.36
2001	252.61	204.27	34.73	491.61
2002	268.45	223.49	43.45	535.39
2003	292.17	229.86	76.46	598.49
2004	325.19	270.74	105.93	701.86
2005	365.84	348.03	143.76	857.63
2006	388.83	449.22	215.98	1,054.03
2007	458.25	548.91	338.61	1,345.77
2008	575.40	694.41	389.62	1,659.43
2009	682.03	778.15	388.59	1,848.77
2010	869.08	892.89	489.88	2,251.85
2011	854.16	1,082.45	629.87	2,566.48
2012	1,079.28	1,275.90	900.32	3,255.50
2013	1,186.58	1,539.47	820.04	3,546.09
2014	1,323.08	1,645.19	1,054.35	4,022.62
2015	1,527.15	2,530.31	1,140.70	5,198.16
2016	1,998.00	2,651.45	1,572.60	6,222.05
2017	2,177.00	3,101.98	1,748.00	7,026.98
2018	2,898.65	3,442.68	2,290.34	8,631.67
2019	3,399.57	3,408.23	3,383.29	10,191.09

GWh = gigawatt-hour.

Source: GDE-MME in-house data (2021).