CHAPTER 4

CAMBODIA COUNTRY REPORT

Chiphong Sarasy, *Ministry of Mines and Energy, Cambodia*

1. Background

The Kingdom of Cambodia is located in the lower Mekong region of Southeast Asia. The country has an area of 181,035 square kilometres; with an 800 kilometre border with Thailand in the west, Lao People's Democratic Republic in the north, and Viet Nam in the east. The physical landscape is dominated by lowland plains around the Mekong River and Tonle Sap Lake. About 2.5 million hectares are arable land and over 0.5 million hectares are pastureland.

The real gross domestic product (GDP) in 2015 was almost US$[1] 15.9 billion (World Bank, 2017), comprising agriculture (29%), industry (26.18%), and services (39.43%). Cambodia's economy maintained high economic growth exceeding 7% since 2011. The Ministry of Economy and Finance predicted that the GDP growth rate will be maintained at the 7% range.

The population census of Cambodia 2008 revealed 13,388,910 people, 56% of whom were under 24 years old (NIS, 2009). Cambodia's population in 2015 was 15.5 million. As migration into urban areas has been continuous, the urban population can be more than 15% of the national population. The population density is about 75 people per square kilometres. About 85%–90% reside in rural areas. Phnom Penh, the capital city, has about 2 million people, and Siem Reap Province has about 100,000.

Cambodia's power generation facility by fuel type is shown in Table 4.1. The installed capacity of hydropower occupied around 55% of the total. The generated energy by hydropower in 2016 was around 1.2 times as much as in 2015. Cambodia's hydropower energy potential was estimated with the theoretical potential of about 10,000 megawatts (MW), of which 50% is in the Mekong mainstream, 40% in its tributaries, and the remaining 10% is in the southwestern coastal area outside the Mekong River Basin. Hydropower capacity will be developed up to 4,000 MW by 2030. Coal-fired power generation will have a capacity of 403 MW by 2015.

[1] All US$ in this report are in constant 2010 values unless specified.

Table 4.1: Power Generation Facility by Fuel Type

No	Type of Generation	Installed Capacity (MW)		Proportion in % for 2016
		2015	2016	
1	Hydro	929.7	930.0	55.3
2	Diesel/heavy fuel oil	304.6	304.2	18.1
3	Biomass	19.9	17.6	1.1
4	Coal	403.0	429.2	25.5
5	Solar	0.0	0.0	0.00
	Total	**1,657.2**	**1,689.0**	**100.00**

MW = megawatt.

Source: EAC (2017).

Cambodia's total primary energy supply in 2015 stood at 7 million tons of oil equivalent (Mtoe). Renewable energy (mostly biomass) represented the first-largest share of the total primary energy supply at 62.4% while oil was the second-largest share at 27.4%, followed by coal at 8.3%. The remaining share is the electricity import (1.9%).

Total final energy consumption was about 6 million tons of oil equivalent (Mtoe) in 2015. It is dependent on imports of petroleum products, having no crude oil production or oil refining facilities. Its electricity supply is dominated by hydro at 45.5% with oil, coal, biomass, and imports accounting for the rest.

2. Modelling Assumptions

2.1. GDP and Population

Forecasting energy demand to 2040 assumes that the GDP of Cambodia will grow at an annual rate of 5.5%. Its population, on the other hand, is projected to grow at 1.5% per year resulting in a growth rate of GDP per capita of 3.9% per year up to 2040 (Table 4.2).

Table 4.2: Updated Cambodia Energy Information

Year	2015	2020	2030	2040	AAGR (%) 2015–2040
GDP	15.9	20.8	35.5	60.6	5.5
Population	15.5	16.7	19.4	22.5	1.5

AAGR = aggregate annual growth rate, GDP = gross domestic product.

Source: Author's assumptions based on various consultations.

2.2. Electricity Generation

On future electricity supply, hydro is expected to dominate Cambodia's fuel mix in 2040, followed by coal. This is a big change from the current oil-dominated electricity generation. According to the Electricity Supply Development Master Plan for 2010–2020, Cambodia will have a total additional installed electricity generation capacity of 3,536 MW, of which 1,050 MW will come from coal-fired power plants to be installed from 2010 to 2018. Hydro will make up 2,606 MW of the total. From 2020 to 2040, hydro will meet the additional electricity generation capacity requirements (Tables 4.3 and 4.4).

Table 4.3: BAU Installed Capacity

Technology	Installed Capacity (MW)					
	2017	2020	2025	2030	2035	2040
Coal	535	785	1,385	1,985	2,185	2,485
Oil	264	0	0	0	0	0
Natural gas	0	0	0	900	900	1500
Hydro	979	1,379	2,523	3,819	4,019	4,619
Other						
Biomass	74	74	74	74	74	74
Solar, wind	10	10	10	10	300	300
Biofuel	0	0	0	0	0	0
Electricity	416	416	416	416	416	416
Total	**2,278**	**2,664**	**4,408**	**7,204**	**7,894**	**9,394**

BAU = Business-As-Usual.

Source: Author's assumptions based on administrative data of various agencies.

Table 4.4: APS Installed Capacity

Technology	Installed Capacity (MW)					
	2017	2020	2025	2030	2035	2040
Coal	535	535	535	535	535	535
Oil	264	0	0	0	0	0
Natural gas	0	300	300	300	300	300
Hydro	979	2,000	2,800	3,600	4,800	5,600
Other						
Biomass	74	150	200	300	400	500
Solar, wind	10	100	400	600	800	1,000
Biofuel	0	0	0	0	0	0
Electricity	416	650	900	1,200	1,500	1,800
Total	**2,278**	**3,735**	**5,135**	**6,535**	**8,335**	**9,735**

APS = Alternative Policy Scenario, MW = megawatt.

Source: Author's assumptions based on administrative data of various agencies.

2.3. Energy Efficiency and Conservation Policies

Cambodia's energy efficiency and conservation (EEC) policies aim to achieve an integrated and sustainable programme that will facilitate improvements in energy efficiency in the major energy-consuming sectors and help prevent wasteful fuel consumption. To achieve these aims, the country realises the need to transform the market towards more efficient energy use, increased access to energy efficiency project financing, and the establishment of energy efficiency regulatory frameworks. As a start, Cambodia is implementing the following pilot projects:

- Improving the efficiency of the overall supply chain for home lighting in rural areas by providing decentralised rural energy services through a new generation of rural energy entrepreneurs.
- Assisting in market transformation for home and office electrical appliances through bulk purchases and dissemination of high-performance lamps, showcasing of energy-efficient products, support to competent organisations for testing and certification of energy-efficient products, and establishment of 'green learning rooms' in selected schools to impart life-long education on the relevance of EEC.
- Improving energy efficiency in buildings and public facilities.
- Improving energy efficiency in industries in cooperation with the United Nations Industrial Development Organization and the Ministry of Industry, Mines and Energy (now changed to Ministry of Mines and Energy) to be implemented in the following sectors: rice mill, brick kiln, rubber refinery, and garment.

Cambodia has also started preparing an action plan for EEC in cooperation with the Energy Efficiency Design sub-working group. Specific actions plans are being drafted for the industry, transport, and 'others' sectors. The initial estimates of sector demand reduction of existing consumers from these actions plans are 10% by 2015 and 15% by 2035 relative to the BAU scenario. These initial estimates were used in forecasting the energy demand in the Alternative Policy Scenario (APS).

The previous Ministry of Industry, Mines and Energy, in close consultation with the European Union Energy Initiative Partnership Dialogue Facility , agreed to launch a project to support the Royal Government of Cambodia in the elaboration of the National Energy Efficiency Policy, Strategy and Action Plan (MIME, 2013). The inception phase of the project began in August 2012; the project was concluded in April 2013 through a final workshop, which elaborated the recommendations and conclusion in the plan.

The National Energy Efficiency Policy, Strategy and Action Plan targets energy efficiency in the following priority areas: industry, end-user products, buildings, rural electricity generation and distribution, and use of biomass resources for residential and industrial purposes.

The energy efficiency assumptions in the Long-range Energy Alternatives Planning System, or LEAP model, are based on the assessment of the energy efficiency potential for buildings, industry, and transport. The overarching target of the National Energy Efficiency Policy is to reduce energy demand by 20% in 2035 relative to the BAU scenario.

2.4. Cambodia's Intended Nationally Determined Contributions (INDC)

Cambodia's intended greenhouse gas (GHG) mitigation contribution for the non-LULUCF[2] sectors, conditional upon the availability of support from the international community, will be a reduction of 3,100 total greenhouse gas emissions (Gg CO_2e) compared to the baseline emissions of 11,600 Gg CO_2e by 2030. This amounts to 27% reduction of GHG emissions by 2030 (Table 4.5).

Table 4.5: Cambodia's INDC Targets

Sector	Priority Action	Reduction as Gg CO_2eq and % in 2030 Compared to the Baseline
Energy industry	• National grid connected renewable energy generation (solar energy, hydropower, biomass, and biogas) and connecting decentralised renewable generation to the grid • Off-grid electricity such as solar home systems, hydro (pico, mini, and micro) • Promoting energy efficiency by end users	1,800 (16%)
Manufacturing industries	Promoting use of renewable energy and adopting energy efficiency for garment factories, rice mills, and brick kilns.	727 (7%)
Transport	• Promoting mass public transport • Improving operation and maintenance of vehicles through motor vehicle inspection and eco-driving, and the increased use of hybrid cars, electric vehicles, and bicycles	390 (3%)
Other	• Promoting energy efficiency for buildings and more efficient cook stoves • Reducing emissions from waste through use of biodigesters and water filters • Using of renewable energy for irrigation and solar lamps	155 (1%)
Total Savings		**3,100 (27%)**

Gg CO_2e - total greenhouse gas emissions, INDC = Intended Nationally Determined Contributions.

Source: Kingdom of Cambodia (2015).

[2] Land use, land-use change, and forestry.

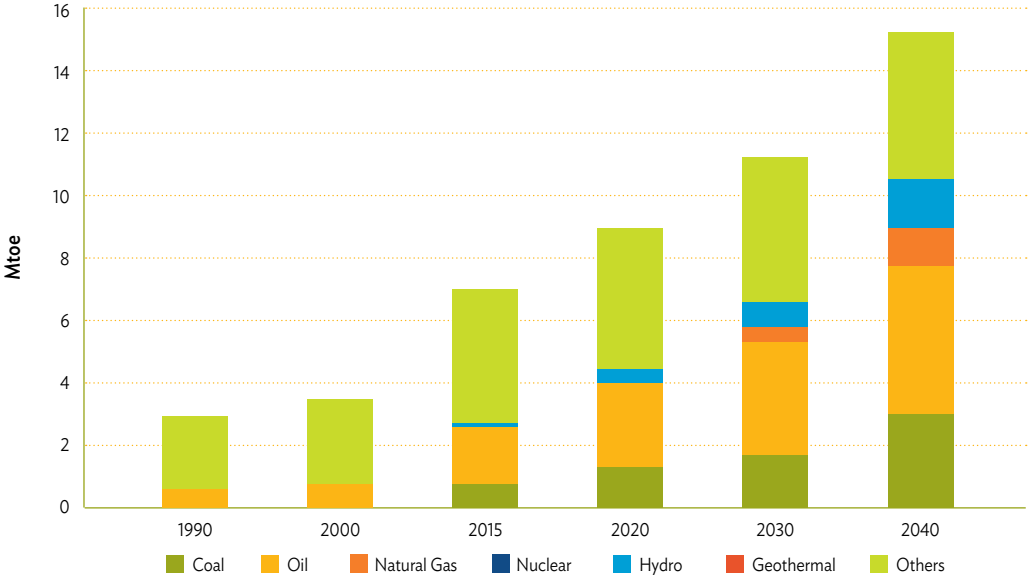
3. Outlook Results

3.1. Business-As-Usual Scenario

3.1.1. Final energy consumption

Primary energy consumption in Cambodia grew at 4.6% per year, which is a slightly faster rate than final energy demand from 2.84 Mtoe in 1995 to 7.04 Mtoe in 2015. Amongst the major energy sources, oil grew the fastest. Oil consumption grew at an average annual rate of 6.9% between 1995 and 2015 (Figure 4.1).

Figure 4.1: Primary Energy Supply by Source, BAU



BAU = Business-As-Usual, Mtoe = miilion tons of oil equivalent.

Source: Author's calculation.

In the BAU scenario, Cambodia's primary energy consumption is projected to increase at an annual rate of 3.1% per year or 2.2 times, from 7.04 Mtoe in 2015 to 15.24 Mtoe in 2040. The fastest growth is expected in hydro, increasing at an annual average rate of 9.1% between 2015 and 2040, followed by coal (6.7%) and oil (3.7%). The share of hydro is projected to increase from 2.4% in 2015 to 9.9% in 2040. This growth in the share is due to the huge potential of water reserves available in Cambodia. The share of oil is projected to increase from 27.4% in 2015 to 31.2% in 2040 due to the growth of the number of cars and motorbikes.

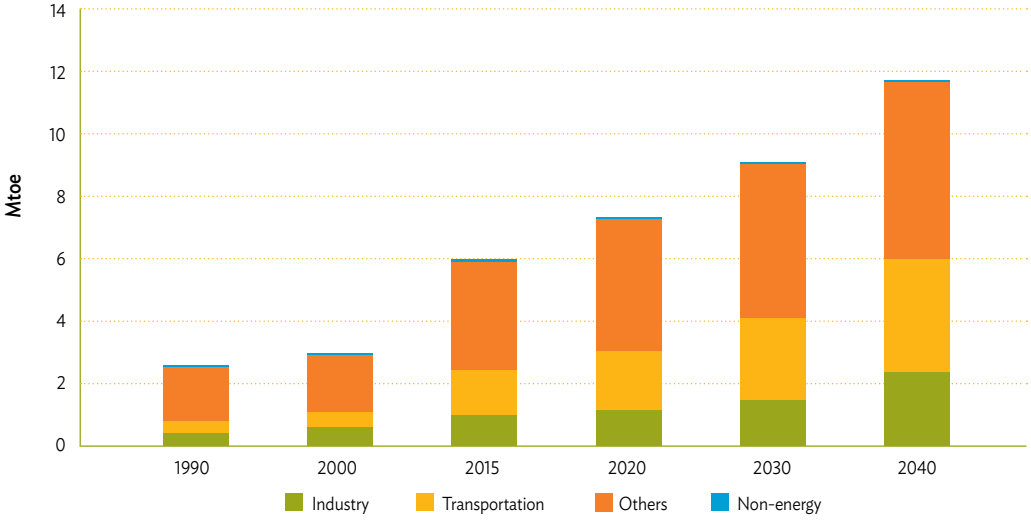
3.1.2. Final energy demand

3.1.2.1. By sector

Cambodia's final energy demand grew at an average annual rate of 4.3% per year, from 2.54 Mtoe in 1995 to 5.93 Mtoe in 2015.

In the BAU scenario, driven by assumed strong economic growth and an increasing population, final energy demand is projected to increase at an average annual rate of 2.8% or around 2 times, from 5.93 Mtoe in 2015 to 11.77 Mtoe in 2040 (Figure 4.2).

Figure 4.2: Final Energy Consumption by Sector, BAU



BAU = Business-As-Usual, Mtoe = miilion tons of oil equivalent.

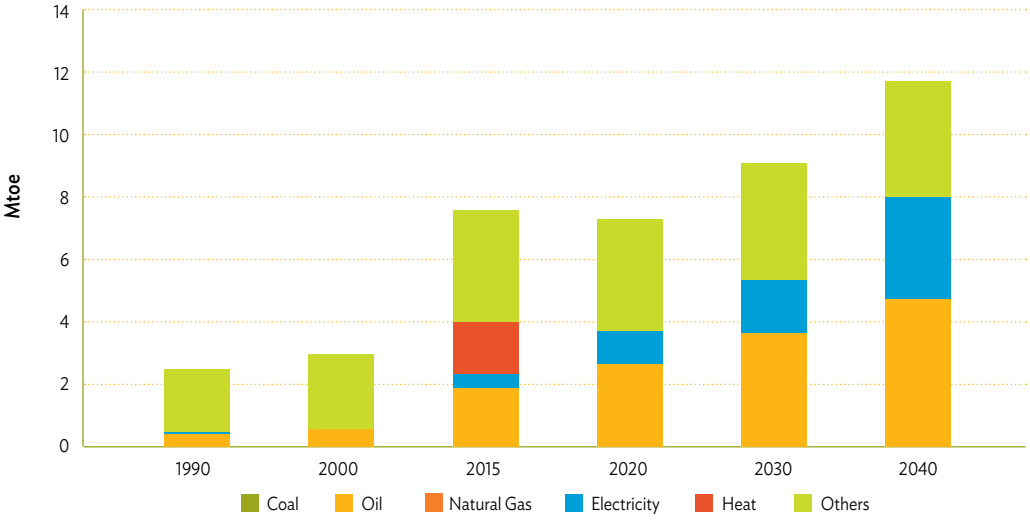
Source: Author's calculation.

The strongest growth in demand is projected to occur in the transport sector at an average annual rate of 3.9% per year or 2.6 times, from 1.39 Mtoe in 2015 to 3.59 Mtoe in 2040. In addition, the industry sector is projected to grow at an annual rate of 3.5% or 2.3 times, from 1.03 Mtoe in 2015 to 2.41 Mtoe in 2040, followed by the non-energy sector at 3.2% (from 0.05 Mtoe in 2015 to 0.10 Mtoe in 2040) and the 'others' sector at 2% (from 3.45 Mtoe in 2015 to 5.67 Mtoe in 2040).

3.1.2.2. By fuel type

Electricity is projected to exhibit the fastest growth in final energy demand at 8.4% per year, or 7.6 times, from 0.43 Mtoe in 2015 to 3.24 Mtoe in 2040. Oil is projected to have the second-highest growth rate of 3.8% per year or 2.5 times, from 1.87 Mtoe in 2015 to 4.75 Mtoe in 2040. 'Others', which mainly include solid and liquid biofuels, will increase at 0.2% per year from 3.62 Mtoe in 2015 to 3.76 Mtoe in 2040 (Figure 4.3).

Figure 4.3: Final Energy Consumption by Fuel Type, BAU



BAU = Business-As-Usual, Mtoe = miilion tons of oil equivalent.

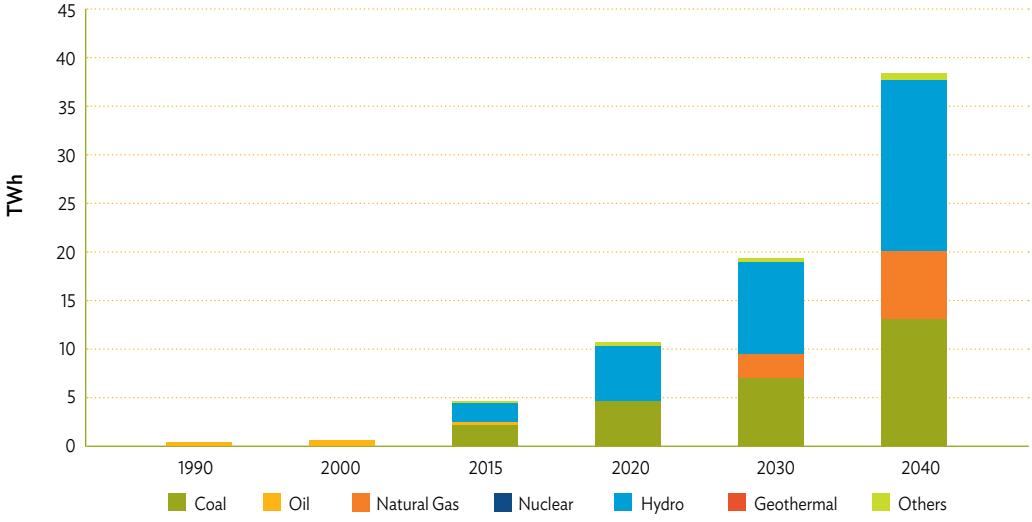
Source: Authors' calculation.

3.1.3. Electricity generation

Electricity generation in Cambodia increased at 16.8% per year from 0.20 TWh in 1995 to 4.40 TWh in 2015. From 1995 to 2000, electricity was 100% generated by oil-powered power plants. By 2015, three other types of power plants had contributed in electricity generation in Cambodia. Coal-fired power plants have a share of 48.4%, hydro with a 45.5% share, and 'others' with a 0.9% share.

In the BAU scenario, to meet the demand for electricity, power generation is projected to increase at an average rate of 9% per year between 2015 and 2040. The fastest growth in electricity generation will be in 'others' (11.7% per year), followed by hydro (9.1% per year) and coal (7.5% per year) (Figure 4.4). Generation from oil-fired power plants will decrease considerably due to high fuel costs.

Figure 4.4: Power Generation by Fuel Type, BAU



BAU = Business-As-Usual, TWh = terawatt-hour.

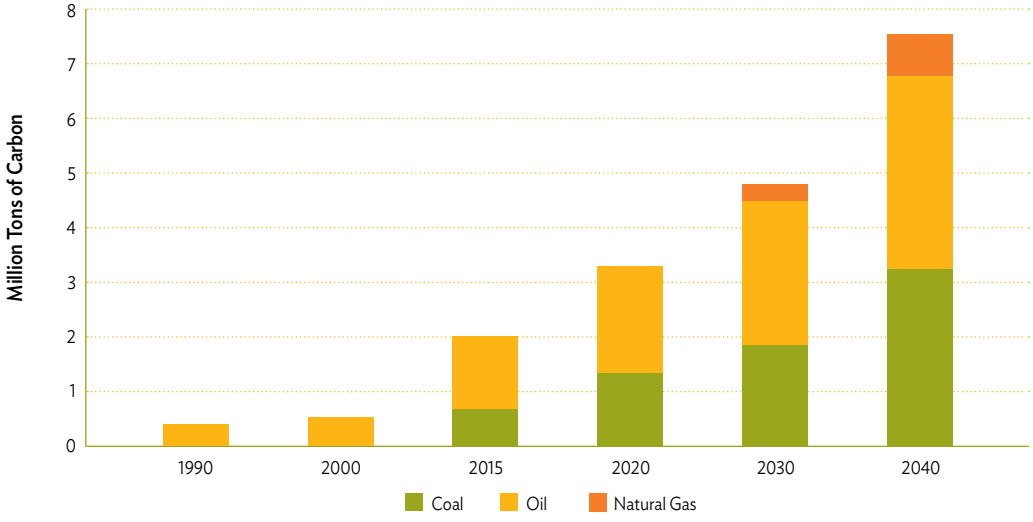
Source: Author's calculation.

3.1.4. CO_2 emissions

CO_2 emissions from energy consumption are projected to increase by 5.4% per year from 2.02 million tons of carbon (Mt-C) in 2015 to 7.60 Mt-C in 2040 under the BAU scenario.

Oil is the largest source of carbon emissions; it will increase from 1.39 Mt-C in 2015 to 3.55 Mt-C in 2040. Emissions from coal would grow the fastest at 6.8% per year, from 0.63 Mt-C in 2015 to 3.24 Mt-C in 2040 (Figure 4.5).

Figure 4.5: CO_2 Emissions from Energy Consumption, BAU



BAU = Business-As-Usual.

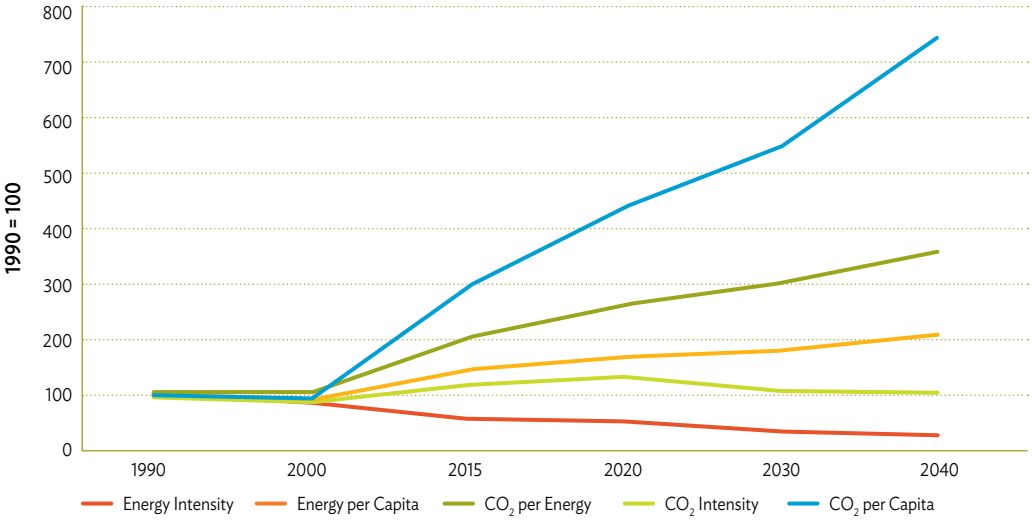
Source: Author's calculation.

3.1.5. Energy indicators

Primary energy intensity had a decreasing trend from US$775 toe/million in 1995 to US$ 442 toe/million in 2015. In the BAU scenario, energy intensity will further decrease to US$ 251 toe/million in 2040. This indicates that energy will be used more efficiently in economic development. Such is mainly due to the dominance of conventional biomass use in the rural areas of the country, and its future growth will be slower than GDP growth.

Primary energy per capita had been increasing from 0.3 toe per person in 1995 to 0.5 toe per person in 2015. In the BAU scenario, energy per capita will further increase to 0.68 toe per person in 2040. This indicates that living standards of people are improving, resulting in increasing energy demand per capita. Figure 4.6 shows various indicators for energy consumption.

Figure 4.6: Energy and CO_2 Indicators



Source: Author's calculation.

CO_2 per primary energy in the BAU scenario is projected to increase from 0.3 metric tons of carbon per toe (t-C/toe) in 2015 to 0.50 t-C/toe in 2040, implying faster growth of fossil fuels in total energy consumption. However, CO_2 intensity had been increasing from 108 t-C/million US$ in 1995 to 127 t-C/million US$ in 2015. It will drop to 125 t-C/million US$ in 2040.

4. Scenario Analysis

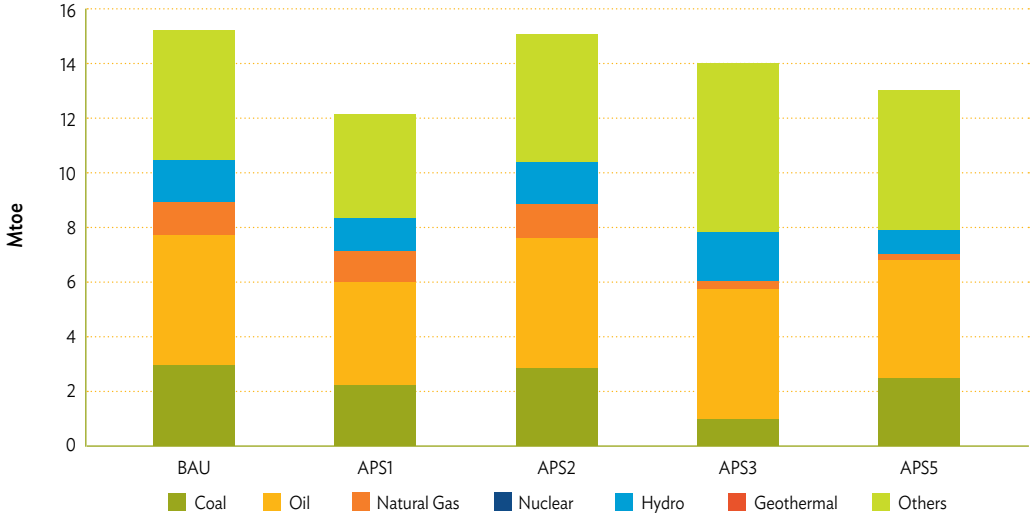
4.1. Alternative Policy Scenario

The APS consists of scenarios such as the EEC scenario (APS1), improvement of energy efficiency in power generation (APS2), and development of renewable energy (APS3). The scenarios were individually modelled to determine the impact of each on reduction of energy consumption and CO_2 emissions. Below are the assumptions in each scenario:

- APS1: focus on EEC on the demand side, such as
  - energy demand in all sectors to be equal in numbers in 2015 and reduced by 20% by the year 2040 relative to the BAU scenario
  - using efficient motorbikes and hybrid car in road transport
  - replacing inefficient devices with efficient ones in the commercial and residential sectors, such as in cooking, lighting, refrigeration, air conditioning.
- APS2: improvement of energy efficiency in thermal power plants. Energy efficiency of coal and fuel oil thermal power plants is assumed to stay constant at 32% until 2040 in the BAU scenario. In the APS, new coal fired power plants are assumed to have thermal efficiencies of 39%.
- APS3: Maximum capacity of 5,000 MW for hydro power plants by 2040 is assumed in this scenario.
- APS5 or APS: combination of APS1 to APS3.

The assumptions in the APS were analysed separately to determine the individual impacts of each assumption in APS1, APS2, APS3, and APS5. Figure 4.7 shows the changes in primary energy supply in all scenarios. APS1 and APS5 have the largest reduction in primary energy supply in 2040 due to the energy efficiency assumptions on the demand side. Energy efficiency assumptions in APS1 could reduce primary energy supply in the BAU scenario by as much as 12.2 Mtoe or 20%. For APS5, the reduction will be slower, amounting to 13 Mtoe or 14.4%.

Figure 4.7: Comparison of Scenarios to Total Primary Energy Supply by 2040

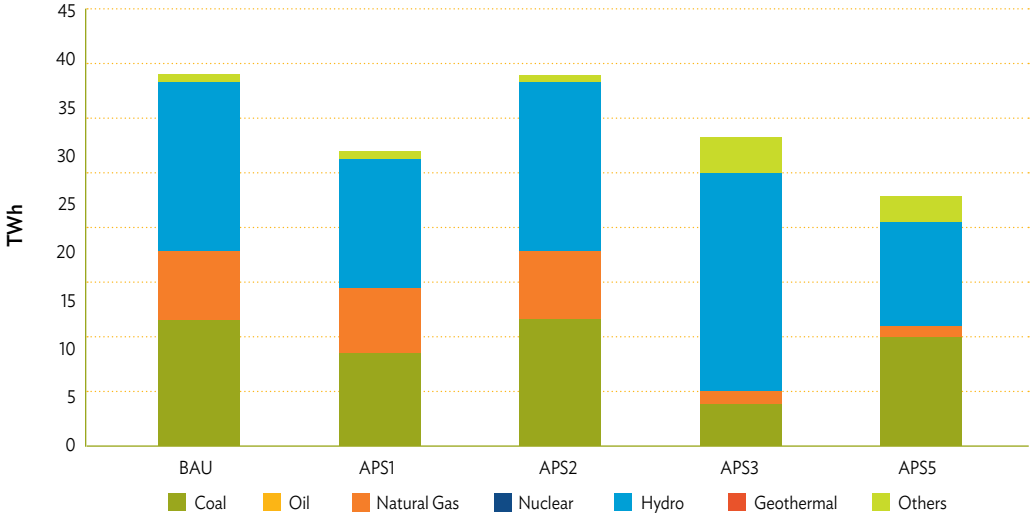


APS = Alternative Policy Scenario, BAU = Business-As-Usual, Mtoe = millions of oil equivalent.

Source: Author's calculation.

Figure 4.8 shows the total electricity generation in 2040 in all scenarios. In APS1, due to the lower electricity demand, the fossil fuel–fired electricity generation will be lower than 19% compared to the BAU scenario. In APS2, the share is the same as that of the BAU scenario. In APS3, due to the assumption of more renewable energy, the fossil fuel–fired generation will only be 14%. In APS5, where all scenarios are combined, the reduction in the share of fossil energy–based generation will be significant at almost 32.6% lower than the BAU scenario.

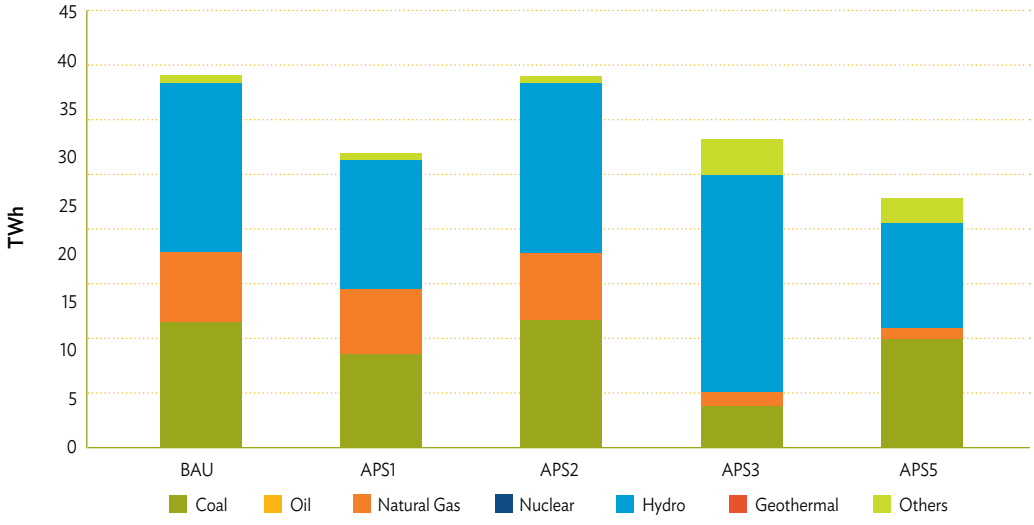
Figure 4.8: Comparison of Scenarios of Electricity Generation by 2040



Source: Author's calculation.

Figure 4.9 compares scenarios of CO_2 emissions in 2040. In terms of CO_2 emission reduction, the energy efficiency assumption in APS1 could reduce emissions by 21.2% in 2040 compared with the BAU scenario. In APS2, the installation of more efficient new power plants is projected to reduce emissions by 16.8%. Higher contributions from renewable energy could reduce emissions by 36.9%. All these assumptions combined (APS5) could reduce the BAU scenario CO_2 emissions by 34.5% in 2040.

Figure 4.9: Comparison of Scenarios to CO_2 Emissions, 2040



APS = Alternative Policy Scenario, BAU = Business-As-Usual, TWh = terawatt-hour.

Source: Author's calculation.

4.2. Energy Saving Potential and CO_2 Emissions Reduction

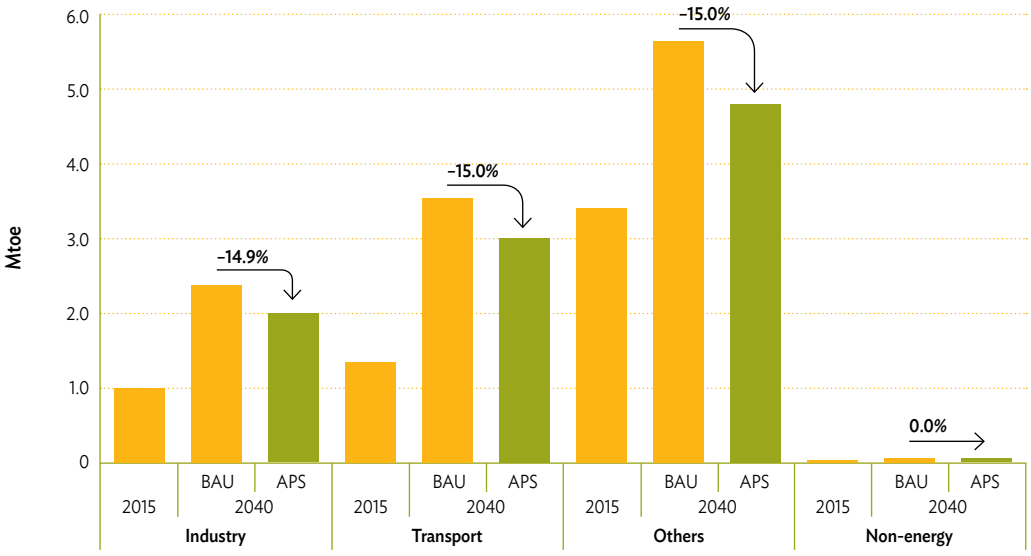
4.2.2. Final energy demand

In the APS, final energy demand is projected to increase at a slower rate of 2.8% (compared with 2.8% in the BAU scenario), from 5.93 Mtoe in 2015 to 10.02 Mtoe in 2040 because of EEC measures assumed in APS1 in the industry, transport, and 'others' (residential and commercial) sectors.

The APS final energy demand is 1.8 Mtoe lower than the BAU scenario, indicating that the APS includes savings up to 1.8 Mtoe. The bulk of the savings are expected to occur in the 'others' sector (0.9 Mtoe), followed by the transport sector (0.5 Mtoe), and the industry sector (0.4 Mtoe).

An improvement in end-user technologies and the introduction of energy management systems are expected to contribute to the slower growth rate of consumption, particularly in the 'others' (residential and commercial), industry, and transport sectors (Figure 4.10).

Figure 4.10: Final Energy Consumption by Sector, BAU vs APS



APS = Alternative Policy Scenario, BAU = Business-As-Usual, Mtoe = millions of oil equivalent.

Source: Author's calculation.

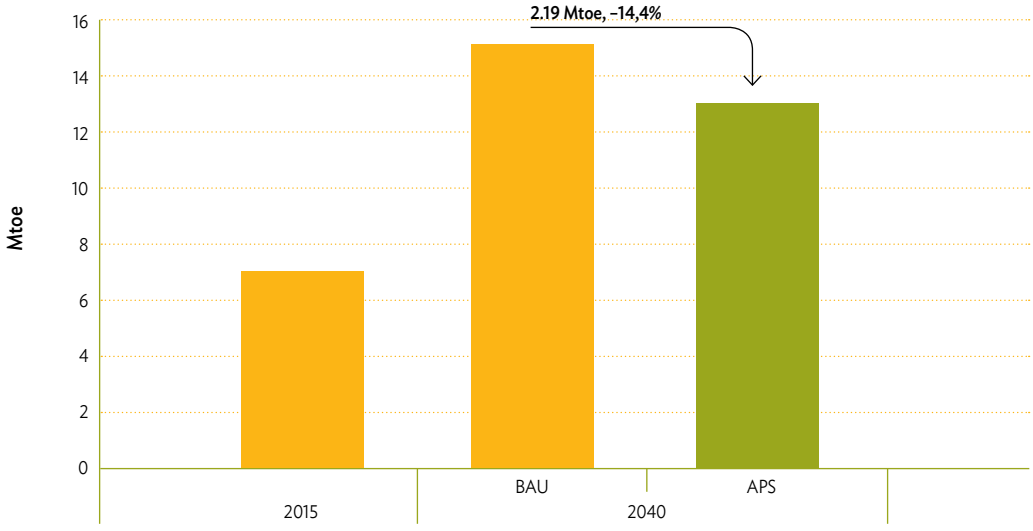
4.2.3. Primary energy consumption

In the APS, primary energy consumption is projected to have a slower increase rate of 2.5% per year, from 7.04 Mtoe in 2015 to 13.04 Mtoe in 2040. The savings could mostly be derived from the EEC scenarios on the demand side and development of renewable energy technology (APS3).

In the APS, hydro is projected to grow at an average annual rate of 7.0% compared with the 9.1% annual growth in the BAU scenario, followed by coal with a 5.9% annual growth rate compared with 6.7% in the BAU scenario, and oil with 3.3% compared with 3.7% in the BAU scenario over the same period.

The total savings amount to 2.2 Mtoe, which is equivalent to 21.5% of Cambodia's primary energy consumption in 2040 (Figure 4.11).

Figure 4.11: Primary Energy Supply by Fuel, BAU and APS

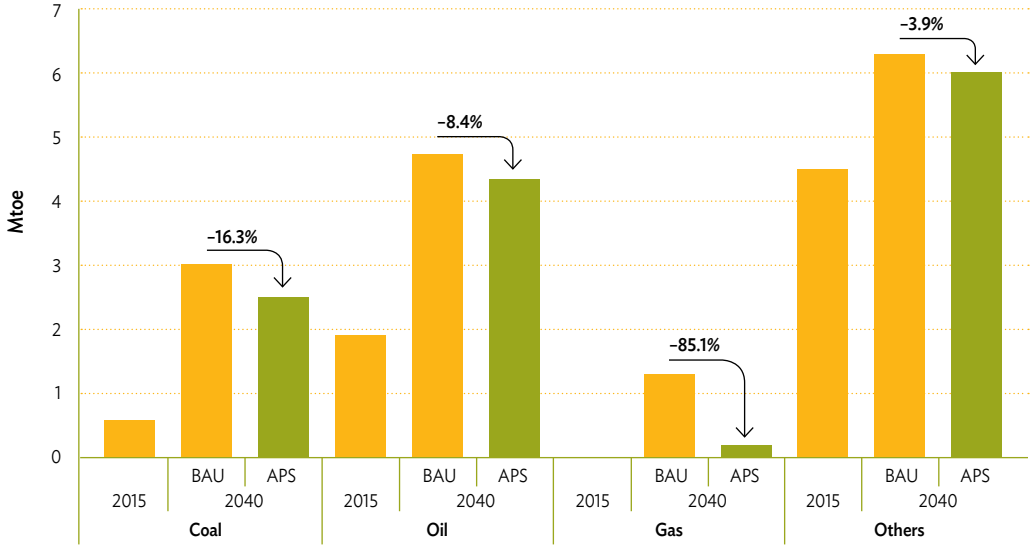


APS = Alternative Policy Scenario, BAU = Business-As-Usual, Mtoe - million tons of oil equivalent.

Source: Authors' calculation.

The reduction in consumption, relative to the BAU scenario, comes from EEC measures on the demand side (APS1), more aggressive uptake of energy efficiency in thermal power plants (APS2), and adoption of renewable energy (APS3) on the supply side. Accordingly, the energy saving potential from gas energy sources would be 85.1%, followed by coal at 16.3%, oil at 8.4%, and 'others' at 3.9% (Figure 4.12).

Figure 4.12: Total Primary Energy Saving Potential by Fuel Type, BAU vs APS



APS = Alternative Policy Scenario, BAU = Business-As-Usual, Mtoe = million tons of oil equivalent.

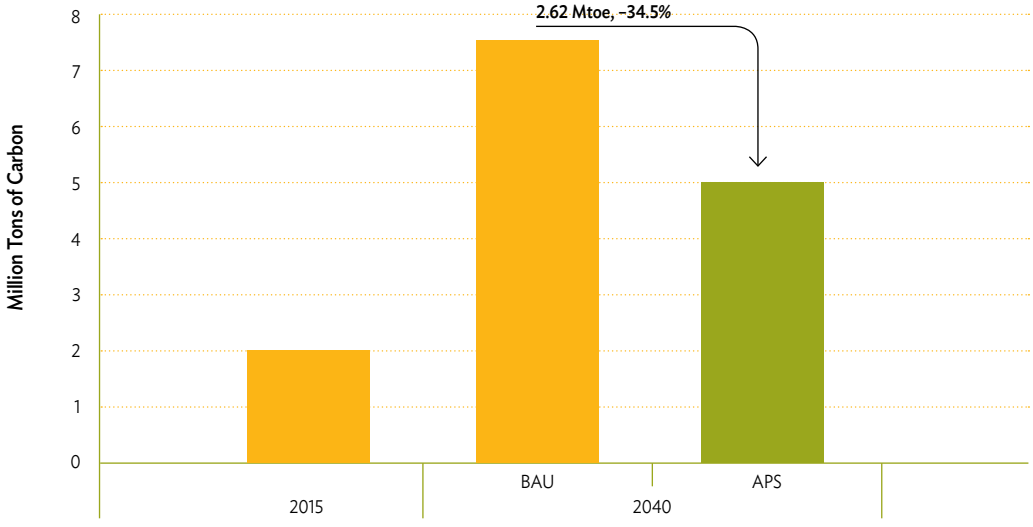
Source: Author's calculation.

4.2.4. CO_2 emissions

CO_2 emissions from energy consumption under the BAU scenario are projected to increase by 5.4% per year from 2.02 (Mt-C) in 2015 to 7.60 Mt-C in 2040. Under the APS, the annual increase in CO_2 emissions is projected to be 3.7% per year between 2015 and 2040, which represents a 34.5% reduction from the BAU scenario.

The CO_2 emissions reduction would be mostly derived from EEC measures on the demand side (APS1). Improvement of energy efficiency in thermal power plants (APS2) and development of renewable energy technologies (APS3) can also contribute significantly to CO_2 reduction (Figure 4.13).

Figure 4.13: CO_2 Emissions by Fuel Type, BAU and APS



APS = Alternative Policy Scenario, BAU = Business-As-Usual, Mtoe = millions of oil equivalent.

Source: Authors' calculation.

4.2.5. Intended Nationally Determined Contributions/Nationally Determined Contributions

CO_2 emissions from energy consumption under the BAU scenario are projected to increase by 5.4% per year from 7.41 Mt-CO_2e in 2015 to 27.8 Mt-CO_2e in 2040. Under the APS, the annual increase in CO_2 emissions is projected to be 3.7% per year between 2015 and 2040. The APS emission in 2030 will be 3.9 Mt-CO_2e lower than BAU, which is in line with Cambodia's INDC.

Table 4.6: Results of CO_2 Emissions by Scenario (Million Tons CO_2)

Scenarios	2015	2020	2025	2030	2035	2040	AAGR (%) 2015-40
Reference (BAU)	7.41	12.00	14.27	17.51	21.56	27.83	54357.3%
Energy Efficiency (APS1)	7.41	11.35	14.48	14.92	15.63	21.93	4.4%
Efficient Supply (APS2)	7.41	12.00	13.49	16.21	19.84	23.15	4.7%
Renewable Energy (APS3)	7.41	10.57	11.61	12.94	14.79	17.57	3.5%
APS (Combined APS)	7.41	10.80	13.15	13.63	14.29	18.22	3.7%

AAGR = average annual growth rate, Alternative Policy Scenario, BAU = Business-As-Usual.

Source: Author's calculation.

5. Key Findings and Policy Implications

The above analysis on energy saving potential yields the following key findings:

- Energy demand in Cambodia is expected to continue to grow significantly, driven by robust economic growth, industrialisation, urbanisation, and population growth. EEC is the 'new source' of energy, and measures reflected in the APS are estimated to have significant potential to help meet future demand in a sustainable manner.
- Cambodia's energy intensity will be further reduced due to efficient use of energy.
- The annual growth of energy demand in the transport sector is projected to be the highest at 3.9% in the BAU scenario and its share will increase continuously from 23.5% in 2015 to 30.5% in 2040. This shows that the transport sector has a large energy saving potential.
- Electricity demand is increasing at the highest annual growth rate of 8.4% in the BAU scenario and is projected to be a slightly lower at 7.7% in the APS.
- Hydropower plants will be the major power generation source in Cambodia. Their share in the total power generation output is increasing slightly from 5.5% in 2015, leading up to 45.8% in 2040.
- Coal thermal plants will be the second major source of power generation in Cambodia. Its share in the total power generation output would decrease continuously from 48.4% in 2015 to 34.1% in 2040.

From the findings above and to be able to implement EEC activities in Cambodia effectively, the following actions are recommended:

- *Promotion of the establishment of targets and road map for EEC implementation*. The targets for EEC in Cambodia should be set up for the short, medium, and long term and focused on the building and industry sectors. The long-term plan should be set up based on an assessment of energy saving potential for all energy sectors, including the residential and commercial sectors, which have a large potential on energy saving until 2040. Moreover, some activities can promote EEC in Cambodia. Examples are (i) support for the development of professionals in the energy conservation field to be responsible persons for energy management and operation, verification and monitoring, consultancy, and engineering services provision and the planning, supervision, and promotion of the implementation of energy conservation measures; (ii) support for the development of institutional capability of agencies/organisations in the public and private sectors responsible for the planning, supervision, and promotion of the implementation of energy conservation measures; (iii) support for the operation of energy-saving companies to alleviate technical and financial risks of entrepreneurs wishing to implement energy conservation measures; (iv) public relations and provision of knowledge on energy conservation to the general public via the teaching/learning process in educational institutions, fostering youth awareness.
- *Compulsory energy labelling for electrical appliances*. The annual growth of electricity demand in the residential and commercial sectors is projected to be substantial compared to the other sectors. Compulsory energy labelling for electrical appliances could be an effective management measure to generate energy savings.
- *Priority for the development of advanced hydro and coal thermal power technology*. Hydro and coal thermal power plants will be the major power generation in Cambodia up to 2040. Therefore, advanced technologies for both types of resources should be prioritised for development from the project design stage.
- *Priority for renewable energy development*. Renewable energy is an important resource for energy independence, energy security, and GHG emissions abatement. It is necessary to build up the strategy and mechanisms to support renewable energy development.

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