

Energy Consumption						
Indicator	Material Aspect	Unit	2020	2021	2022	2023
GRI 302-1	Net energy consumption within the organization (non-renewable energy + renewable Energy - energy sold)					
	Net energy consumption of Refinery Business and Office building and Region Business Centers	TJ	12,845.84	12,241.19	13,687.68	13,647.46
		MWh	3,568,287.62	3,400,330.02	3,802,162.54	3,790,992.60
	Net energy consumption of Refinery Business, Office building and Region Business Centers, and Marketing Business	TJ	12,942.24	12,332.30	13,753.21	13,708.36
		MWh	3,595,066.35	3,425,640.03	3,820,253.81	3,807,909.34
	Net energy consumption of Refinery Business, Office building and Region Business Centers, Marketing Business, Bangkok Fuel Pipeline and Logistics (BFPL), and BCP Trading (BCPT)	TJ				13,749.84
		MWh				3,819,431.81

**Remarks:**

- The Refinery Business consists of Bangchak Phra Khanong Refinery and Oil Depot at Sukhumvit 64, Oil Depot at Bang Pa Inn, Oil Depot at Surat Thani, and offices at the refinery area.
- The Marketing Business consists of Bangchak Green Net Co., Ltd. and Bangchak Retail Co., Ltd.
- Office building and Region Business Center consists of the main office building (M Tower), the Central Region Business Center, the Northeastern Region Business Center, the Northern Region Business Center, and the Southern Region Business Center.
- The reporting boundary of energy consumption has been expanded to Bangkok Fuel Pipeline Transportation and Logistics (BFPL) and BCP Trading (BCPT) in 2023.
- Conversion of fuel to energy by applying heating value provided by the Department of Alternative Energy Development and Efficiency.
- Transporting finished petroleum products is included in the refinery business's downstream transportation and distribution, excluding heavy fuel oil and lubricant transportation.
- N/A means not applicable.

GHG emissions scope 1 & scope 2																		
Business unit			Refinery Business <sup>1</sup>				Bangkok Fuel Pipeline and Logistics (BFPL) <sup>4</sup>	BCP Trading (BCPT) <sup>4</sup>	Marketing Business <sup>2</sup>				Office building and Region Business Centers <sup>3</sup>					
Indicator	Material Aspect	Unit	2020	2021	2022	2023	2023	2023	2020	2021	2022	2023	2020	2021	2022	2023		
GRI305-1	Total direct GHG emission (Scope 1)																	
	Reporting according to operational control approach	Total direct GHG emission (Scope 1)	tCO <sub>2</sub> e	885,906.72	821,155.65	930,897.27	940,428.34	-	-	507.98	493.41	738.50	730.53	-	478.63	484.69	419.44	
		• CO <sub>2</sub>	tCO <sub>2</sub> e	883,796.95	819,065.76	928,384.04	938,073.49	-	-	499.21	485.38	572.33	559.60	-	468.15	475.33	411.61	
		• CH <sub>4</sub> and fugitive CH <sub>4</sub>	tCO <sub>2</sub> e	1,723.01	1,766.10	2,045.70	1,992.96	-	-	0.80	103.34	160.49	62.38	-	0.82	0.71	0.66	
			tonne	57.43	58.87	68.19	66.43	-	-	0.03	3.44	5.80	2.23	-	0.03	0.03	0.02	
		• CH <sub>4</sub>	tCO <sub>2</sub> e	387.41	369.00	413.10	412.18	-	-	0.80	103.34	160.49	0.90	-	0.82	0.71	0.66	
			tonne	12.91	12.30	13.77	13.74	-	-	0.03	3.44	5.80	0.03	-	0.03	0.03	0.02	
		• Fugitive CH <sub>4</sub>	tCO <sub>2</sub> e	1,335.60	1,397.10	1,632.60	1,580.77	-	-	-	-	-	61.49	-	-	-	-	
			tonne	44.52	46.57	54.42	52.69	-	-	-	-	-	2.20	-	-	-	-	
		• N <sub>2</sub> O	tCO <sub>2</sub> e	386.66	323.76	361.76	360.59	-	-	8.58	8.04	11.39	9.27	-	9.80	8.44	7.08	
		• Hydrofluorocarbon (HFC)	tCO <sub>2</sub> e	-	-	105.76	1.29	-	-	-	-	154.78	99.13	-	-	-	-	
		• Other biogenic (CH <sub>4</sub> and N <sub>2</sub> O)	tCO <sub>2</sub> e	0.10	0.02	0.01	0.02	-	-	0.19	-	-	0.14	-	-	0.17	0.09	
		Direct GHG emission (separately reporting)		tCO <sub>2</sub> e	28.04	5.39	3.80	166.00	-	-	53.61	90.71	102.13	123.19	-	64.76	48.52	26.98
		• Biogenic CO <sub>2</sub>	tCO <sub>2</sub> e	28.04	5.39	3.80	4.50	-	-	53.61	90.71	102.13	41.52	-	64.76	48.52	26.98	
• CO <sub>2</sub> of R-22 refrigerant	tCO <sub>2</sub> e	-	-	-	161.50	-	-	-	-	-	81.66	-	-	-	-			



GHG emissions scope 1 & scope 2																		
Business unit			Refinery Business <sup>1</sup>				Bangkok Fuel Pipeline and Logistics (BFPL) <sup>4</sup>	BCP Trading (BCPT) <sup>4</sup>	Marketing Business <sup>2</sup>				Office building and Region Business Centers <sup>3</sup>					
Indicator	Material Aspect	Unit	2020	2021	2022	2023	2023	2023	2020	2021	2022	2023	2020	2021	2022	2023		
GRI305-1	Total direct GHG emission (Scope 1)																	
	Total direct GHG emission (Scope 1)		tCO <sub>2</sub> e	885,906.72	821,155.65	930,897.27	940,428.34	-	-	509.72	580.53	480.44	473.72	-	478.63	484.69	419.44	
	• CO <sub>2</sub>		tCO <sub>2</sub> e	883,796.95	819,065.76	928,384.04	938,073.49	-	-	499.21	485.38	318.87	332.76	-	468.15	475.33	411.61	
	• CH <sub>4</sub> and fugitive CH <sub>4</sub>		tCO <sub>2</sub> e	1,723.01	1,766.10	2,045.70	1,992.96	-	-	0.67	86.12	80.03	35.93	-	0.68	0.71	0.66	
			tonne	57.43	58.87	68.19	66.43	-	-	0.03	3.44	2.93	1.28	-	0.03	0.03	0.02	
	• CH <sub>4</sub>		tCO <sub>2</sub> e	387.41	369.00	413.10	412.18	-	-	0.67	86.12	80.03	0.54	-	0.68	0.71	0.66	
			tonne	12.91	12.30	13.77	13.74	-	-	0.03	3.44	2.93	0.02	-	0.03	0.03	0.02	
	• Fugitive CH <sub>4</sub>		tCO <sub>2</sub> e	1,335.60	1,397.10	1,632.60	1,580.77	-	-	-	-	-	35.39	-	-	-	-	
			tonne	44.52	46.57	54.42	52.69	-	-	-	-	-	1.26	-	-	-	-	
	• N <sub>2</sub> O		tCO <sub>2</sub> e	386.66	323.76	361.76	360.59	-	-	9.65	9.04	6.73	5.80	-	9.80	8.44	7.08	
	• Hydrofluorocarbon (HFC)		tCO <sub>2</sub> e	-	-	105.76	1.29	-	-	-	-	154.78	99.13	-	-	-	-	
	• Other biogenic (CH <sub>4</sub> and N <sub>2</sub> O)		tCO <sub>2</sub> e	0.10	0.02	0.01	0.02	-	-	0.19	-	0.07	0.10	-	-	0.17	0.09	
	Direct GHG emission (separately reporting)		tCO <sub>2</sub> e	28.04	5.39	3.80	166.00	-	-	26.27	44.45	50.04	75.24	-	64.76	48.52	26.98	
	• Biogenic CO <sub>2</sub>		tCO <sub>2</sub> e	28.04	5.39	3.80	4.50	-	-	26.27	44.45	50.04	29.48	-	64.76	48.52	26.98	
• CO <sub>2</sub> of R-22 refrigerant		tCO <sub>2</sub> e	-	-	-	161.50	-	-	-	-	-	45.76	-	-	-	-		
GRI305-2	Total Indirect GHG emission (Scope 2)																	
	Total Indirect GHG emission (Scope 2)		tCO <sub>2</sub> e	6,845.13	5,923.19	5,110.71	6,274.75	5,148.38	1.86	11,927.39	11,609.19	4,890.31	4,072.81	-	591.33	733.23	800.19	
	Total Indirect GHG emission (Scope 2) (Location-based)		tCO <sub>2</sub> e	6,845.13	5,923.19	5,110.71	6,274.75	5,148.38	1.86	11,927.39	11,609.19	4,890.31	4,072.81	-	591.33	733.23	800.19	
	• CO <sub>2</sub>		tCO <sub>2</sub> e	6,845.13	5,923.19	5,110.71	6,274.75	5,148.38	1.86	11,927.39	11,501.83	4,890.31	4,072.81	-	585.86	733.23	800.19	
	• Biogenic CO <sub>2</sub>		tCO <sub>2</sub> e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	• CH <sub>4</sub>		tCO <sub>2</sub> e	-	-	-	-	-	-	-	35.41	-	-	-	1.80	-	-	
	• N <sub>2</sub> O		tCO <sub>2</sub> e	-	-	-	-	-	-	-	71.95	-	-	-	3.67	-	-	
	• Other biogenic (CH <sub>4</sub> and N <sub>2</sub> O)		tCO <sub>2</sub> e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total Indirect GHG emission (Scope 2) (Market-based)		tCO <sub>2</sub> e	6,845.13	5,923.19	5,110.71	6,274.75	5,148.38	1.86	11,927.39	11,609.19	4,890.31	4,072.81	-	591.33	733.23	800.19	
	• CO <sub>2</sub>		tCO <sub>2</sub> e	6,845.13	5,923.19	5,110.71	6,274.75	5,148.38	1.86	11,927.39	11,501.83	4,890.31	4,072.81	-	585.86	733.23	800.19	
	• Biogenic CO <sub>2</sub>		tCO <sub>2</sub> e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	• Other biogenic (CH <sub>4</sub> and N <sub>2</sub> O)		tCO <sub>2</sub> e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	GRI305-1 and GRI305-2	Total GHG emission (Scope 1 and 2)		tCO <sub>2</sub> e	892,751.85	827,078.83	936,007.98	946,703.10	5,148.38	1.86	12,437.11	12,189.72	5,370.75	4,546.53	-	1,069.96	1,217.91	1,219.63



**Remarks:**

- The Refinery Business consists of Bangchak Phra Khanong Refinery and Oil Depot at Sukhumvit 64, Oil Depot at Bang Pa Inn, Oil Depot at Surat Thani, and offices at the refinery area.
- The Marketing Business consists of Bangchak Green Net Co., Ltd. and Bangchak Retail Co., Ltd.
- Office building and Region Business Center consists of the main office building (M Tower), the Central Region Business Center, the Northeastern Region Business Center, the Northern Region Business Center, and the Southern Region Business Center.
- The reporting boundary of GHG emissions has been expanded to Bangkok Fuel Pipeline Transportation and Logistics (BFPL) and BCP Trading (BCPT) in 2023.
- Bangchak Corporation Public Company Limited (Refinery Business, M-Tower and Region Business Centers, and Marketing Business) firstly disclosed GHG emission scope 3 in 2021.
- The reporting boundary of scope 3 emissions has been expanded to crude oil purchasing and business travel activities in 2023. The GHG calculation of business travelling based on the ICAO Carbon Emissions Calculator (ICEC) principle.
- The report of scope 1, 2, and 3 emissions data are calculated by using the BCP GHG calculation tool following IPCC 2006.
- The emission factors from IPCC 2006 and API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry 2009 are used for scope 1 emissions calculation.
- The emission factors from Energy Policy and Planning Office, Ministry of Energy, Thailand (EPPO) are used for scope 2 emissions calculation.
- The emission factors from Thailand Greenhouse Gas Management Organization (TGO), IPCC, and Thai National LCI Database are used for scope 3 emissions calculation.
- Greenhouse gas emissions intensity is calculated from scope 1 and 2 emissions.
- GHG emissions reductions are calculated based on energy saving activities carried out in 2023.
- Conversion of fuel to energy by applying heating value provided by the Department of Alternative Energy Development and Efficiency.
- Global Warming Potential (GWP) values are based on the Fifth Assessment Report (AR5) of the Greenhouse Gas Protocol.
- Transporting finished petroleum products is included in the refinery business's downstream transportation and distribution, excluding heavy fuel oil and lubricant transportation.
- The gases included in the green house gas calculation are CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and HFC.
- N/A means not applicable.

Water Management <sup>1</sup>										
Business unit			Refinery Business <sup>2</sup> and office building <sup>3</sup>			Refinery Business <sup>2</sup>	BCP Trading (BCPT)	Marketing Business <sup>5</sup>	Office building and Region Business Centers <sup>4</sup>	
Indicator	Material Aspect	Unit	2020	2021	2022	2023				
GRI 303-3 (2018)	<b>Total water withdrawal</b>									
	<b>Total water withdrawal (excluding brine water from crude oil extraction)</b>		million cubic meter	2.495	2.411	2.344	2.792	0.082	0.507	0.003
	• Freshwater ≤ 1000 mg/L Total Dissolved Solids		million cubic meter	2.395	2.294	2.334	2.710	0.082	0.507	0.003
	• Other water > 1000 mg/L Total Dissolved Solids		million cubic meter	0.100	0.117	0.010	0.082	-	-	-
	<b>Total water withdrawal (including brine water from crude oil extraction)</b>		million cubic meter	21.325	2.444	2.383	2.803	0.082	0.507	0.003
	• Freshwater ≤ 1000 mg/L Total Dissolved Solids		million cubic meter	2.395	2.294	2.334	2.710	0.082	0.507	0.003
	• Other water > 1000 mg/L Total Dissolved Solids		million cubic meter	18.930	0.150	0.049	0.093	-	-	-
	<b>Total water withdrawal by source<sup>7</sup></b>									
	<b>Surface water<sup>8</sup></b>		million cubic meter	0.185	0.197	0.147	0.165	-	-	-
	• Freshwater ≤ 1000 mg/L Total Dissolved Solids <sup>8</sup>		million cubic meter	0.085	0.080	0.136	0.083	-	-	-
	• Other water > 1000 mg/L Total Dissolved Solids <sup>8</sup>		million cubic meter	0.100	0.117	0.010	0.082	-	-	-
	<b>Groundwater<sup>9</sup></b>		million cubic meter	0.270	0.112	0.440	0.020	-	0.062	0.000
	• Freshwater ≤ 1000 mg/L Total Dissolved Solids <sup>9</sup>		million cubic meter	0.270	0.112	0.440	0.020	-	0.062	0.000
	• Other water > 1000 mg/L Total Dissolved Solids <sup>9</sup>		million cubic meter	-	-	-	-	-	-	-
	<b>Produced water<sup>10</sup></b>		million cubic meter	18.830	0.033	0.039	0.011	-	-	-
	• Freshwater ≤ 1000 mg/L Total Dissolved Solids <sup>10</sup>		million cubic meter	-	-	-	-	-	-	-
	• Other water > 1000 mg/L Total Dissolved Solids <sup>10</sup>		million cubic meter	18.830	0.033	0.039	0.011	-	-	-
	<b>Third-party water<sup>11</sup></b>		million cubic meter	2.040	2.101	1.757	2.608	0.082	0.445	0.003
	• Freshwater ≤ 1000 mg/L Total Dissolved Solids <sup>11</sup>		million cubic meter	2.040	2.101	1.757	2.608	0.082	0.445	0.003
	• Other water > 1000 mg/L Total Dissolved Solids <sup>11</sup>		million cubic meter	-	-	-	-	-	-	-
<b>Third-party water withdrawal by source<sup>12</sup></b>										
• Surface water		million cubic meter	2.040	2.101	1.757	2.608	0.082	0.445	0.003	