

Sustainability Performance Statistics

Economic Performance

Revenue							
Indicators	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 201-1	Revenue						
	- Sales and Services	Million THB	192,025.32	190,488.59	136,450.29	199,417.00	312,202.37
	- Total Revenue	Million THB	193,340.41	190,983.67	136,982.82	200,695.74	314,056.07
	- Net Profit	Million THB	3,234.70	2,488.49	- 5,769.98	9,844.72	15,152.48
	- EBITDA	Million THB	10,201.00	8,709.00	4,104.00	25,818.00	44,724.00

Expenditure for Income distribution to stakeholders							
Indicators	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 201-1	Expenditure for Income distribution to stakeholders						
	- Operating expenses	Million THB	180,594.37	180,256.90	132,122.13	175,744.43	265,933.70
	- Interest expenses paid to financial institution creditors and debentures	Million THB	1,559.06	1,839.24	2,050.58	2,395.39	2,975.74
	- Tax payment to government and local authorities	Million THB	194.45	258.46	20.44	20.13	1,229.97
	- Financial supports for membership of associations	Million THB	3.34	3.28	5.35	2.72	3.20
	- Community and social development	Million THB	36.00	34.00	21.67	27.74	25.68
	- Donation to society and schools	Million THB	62.94	64.60	22.62	16.00	6.20
	- Dividend payment to shareholders	Million THB	3,090.52	1,759.84	742.55	2,672.18	4,260.85
	- Dividend payment to shareholders (Baht/Share)	Million THB	1.35	0.80	0.40	2.00	2.25
	- Wages and employee benefits	Million THB	3,310.33	3,609.11	3,401.92	4,572.62	6,302.61

Supply chain management							
Indicators	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 204-1	Supply chain management						
	- Local purchases of goods and services*	Million THB	4,424	2,764	1,846	1,814	5,688
	- Percentage of Local purchases of goods and services*	Percentage	98	98	97	98	93

*Local purchasing in Thailand, exclude raw materials and crude oil

Corporate Income Tax (Bangchak Corporation Public Company Limited) (Unit : Million THB)

Tax Jurisdiction	Revenue									Profit / (Loss) before Income Tax			Income Tax Paid (on a Cash Basis)			Income Tax Accrued - Current Year		
	Related Party			Unrelated Party			Total											
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
Thailand	42,073	57,899	73,173	116,466	149,192	237,935	158,539	207,091	311,108	(7,330)	11,239	21,173	(14)	275	1,192	103	19	115
Japan	113	675	571	221	953	1,048	334	1,628	1,619	(156)	(220)	(55)	(6)	16	(6)	-	19	82
Singapore	24,418	29,520	76,827	19,225	42,643	53,684	43,643	72,164	130,511	(3,838)	1,350	808	21	46	41	27	47	149
Philippines	-	-	-	-	-	-	-	-	-	(378)	-	-	-	-	-	-	-	-
Australia	51	-	-	-	-	-	51	-	-	(133)	-	-	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-	-	-	-	64	-	(5)	6	-	-	-	-	-
British Virgin Islands	346	-	-	-	-	-	346	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	24,720	-	-	24,720	-	-	11,787	-	-	8,273	-	-	1,683
Taiwan	-	-	12	-	-	-	-	-	12	-	-	(37)	-	-	-	-	-	-
Laos	-	-	7	907	35	1,180	907	35	1,187	323	13	80	-	-	38	4	1	1

Customer Relationship Management and Responsibility

Indicator	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 102-43 GRI 102-44	Customer Satisfaction						
	End users at Service Stations						
	- Customer Satisfaction : End Users	percentage	85.80	86.60	88.10	87.45	87.83
	- Net Promotor Ranking (NPS)	Ranking	Ranking 1st (Joint)	Ranking 1st (Joint)	Ranking 1st (Joint)	Ranking 1st (Joint)	Ranking 1st (Joint)
	- Net Promotor Score (NPS)	percentage	71.50	76.10	81.30	77.50	73.50
	Industrial Customers						
	- Customer Satisfaction : Industrial Customers	percentage	82.00	87.00	83.30	91.50	91.00
GRI 417-3	Incidents of non-compliance concerning marketing communications						
	- Significant Case of Customers data breach	case	0	0	0	0	0
	- Significant Case of Non-compliance in marketing communication laws	case	0	0	0	0	0
GRI 419-1	Non-compliance with laws and regulations in the social and economic area						
	- Number/Monetary Value of significant fines associated with economic and social law	case	0	0	0	0	0

Environmental Performance																	
Business units			Refinery Business					M-Tower and Reginal office					Marketing Business				
Energy Consumption																	
Indicators	Material Aspects	Unit	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
GRI 301-1	Materials used by weight or volume																
	Total Materials used by weight or volume	Ton	6,520,170	6,928,490	7,056,851	6,774,152	8,440,006	-	-	-	-	-	-	-	-	-	-
	- Non-renewable material	Ton	426,633	459,665	407,333	370,105	384,790	-	-	-	-	-	-	-	-	-	-
	- Renewable material	Ton	6,093,537	6,468,825	6,649,518	6,404,046	8,055,216	-	-	-	-	-	-	-	-	-	-
	Production Volume																
	- Production volume	MLPY	11,856.44	12,380.00	11,066.00	10,894.40	13,190.74	-	-	-	-	-	-	-	-	-	-
GRI 302-1	Energy consumption within the organization/1																
(1+2)-3	Net Energy consumption within the organization ³ (Non-Renewable Energy + Renewable Energy - Energy Sold)	TJ	13,116.77	13,182.00	12,845.84	12,229.66	13,674.79	-	-	-	11.53	12.89	94.11	99.92	96.40	91.12	65.53
		MWh	3,643,548.30	3,661,667.98	3,568,287.62	3,397,126.75	3,798,583.33	-	-	-	3,203.27	3,579.21	26,141.23	27,754.55	26,778.73	25,310.01	18,091.27
(1+2+3)	Total Energy consumption within the organization (Non-Renewable Energy + Renewable Energy)	TJ	13,116.77	13,182.00	12,845.84	12,229.66	13,674.79	-	-	-	11.53	12.89	94.11	99.92	96.40	91.12	65.53
		MWh	3,643,548.30	3,661,667.98	3,568,287.62	3,397,126.75	3,798,583.33	-	-	-	3,203.27	3,579.21	26,141.23	27,754.55	26,778.73	25,310.01	18,091.27
1	Total Non-Renewable Energy Consumption (Electricity + Fuel Consumption within the Organization)	TJ	13,116.77	13,181.96	12,845.78	12,229.57	13,674.72	-	-	-	11.53	12.89	94.11	99.92	96.40	91.12	64.34
		MWh	3,643,548.30	3,661,656.65	3,568,272.85	3,397,103.87	3,798,563.06	-	-	-	3,203.27	3,579.21	26,141.23	27,754.55	26,778.73	25,310.01	17,873.21
	Total Fuel Consumption within the Organization	TJ	13,015.04	13,103.77	12,795.08	12,184.87	13,633.47		-	-	7.27	7.32	-	-	7.69	7.53	8.88
		MWh	3,615,289.57	3,639,936.21	3,554,188.22	3,384,686.29	3,787,103.97		-	-	2,020.67	2,032.30	-	-	2,135.36	2,092.74	2,466.67
	- Total stationary combustion	TJ	13,004.91	13,096.77	12,789.71	12,184.17	13,632.88	-	-	-	-	-	-	-	-	-	-
	- Fuel gas and LPG	TJ	5,450.46	5,505.87	5,306.82	4,086.32	5,080.25	-	-	-	-	-	-	-	-	-	-
	- Natural gas	TJ	3,770.84	3,796.34	7,482.26	8,097.24	8,552.13	-	-	-	-	-	-	-	-	-	-
	- Natural gas for cogeneration	TJ	3,783.61	3,794.57	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Fuel oil	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Other fuel	TJ	-	-	0.62	0.61	0.49	-	-	-	-	-	-	-	-	-	-
	- Total mobile combustion	TJ	10.13	7.00	5.36	0.70	0.59	-	-	-	7.27	7.32		-	7.69	7.53	8.88
	- Mobile fuel	TJ	10.1	7.0	5.4	0.7	0.59	-	-	-	7.27	7.32	-	-	7.69	7.53	8.88
	- Total electricity and steam purchased for consumption	TJ	101.73	78.19	50.70	44.70	41.25	-	-	-	4.26	5.57	94.11	99.92	88.72	83.58	55.46
		MWh	28,258.74	21,720.44	14,084.63	12,417.58	11,459.09	-	-	-	1,182.61	1,546.91	26,141.23	27,754.55	24,643.36	23,217.26	15,406.54
	- Electricity consumption	TJ	101.73	78.19	50.70	44.70	41.25	-	-	-	4.26	5.57	94.11	99.92	88.72	83.58	55.46
	- Steam consumption	MWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Total Renewable Energy Self-Generation	TJ	-	0.04	0.05	0.08	0.07	-	-	-	-	-	-	-	-	-	1.19
		MWh	-	11.33	14.77	22.87	20.27	-	-	-	-	-	-	-	-	-	218.07
	- Wind and Solar Energy	TJ	-	0.04	0.05	0.08	0.07		-	-	-	-	-	-	-	-	-
	- Biomass ^{/2} and Biogas	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Total energy sold (Electricity, Heating, Cooling and Steam)	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		MWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Non-Renewable Energy Sale	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		MWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Renewable Sale : Electricity generated by solar power	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Energy Consumption for Production (%FOEB)	%	5.46	5.07	5.68	5.24	4.83	-	-	-	-	-	-	-	-	-	-
*GRI 302-1	Net energy consumption within the organization/3 (Non-Renewable Energy + Renewable Energy - Energy Sold)																
	Energy Consumption within the organization Target	MWh				3,562,127.37	3,943,083.23										
	- Refinery Business + M-Tower and Regional Office	TJ	13,116.77	13,182.00	12,845.84	12,241.19	13,687.68										
		MWh	3,643,548.30	3,661,667.98	3,568,287.62	3,400,330.02	3,802,162.54										
	- Refinery Business + M-Tower and Regional Refinery Business + M-Tower ans Regional Office + Marketing Business	TJ	13,210.88	13,281.92	12,942.24	12,332.30	13,753.21										
		MWh	3,669,689.53	3,689,422.53	3,595,066.35	3,425,640.03	3,820,253.81										
	- Refinery Business + M-Tower and Regional Refinery Business + M-Tower and Regional Office + Marketing Business + Bio-based Product Business + Green Power Business	TJ	13,417.66	14,512.59	14,112.52												
	MWh	3,727,128.09	4,031,275.40	3,920,144.20													

Remarks:

/1 Calculated by multiplying fuel volumes with the conversion factor provided by the Department of Alternative Energy Development and Efficiency

/2 Calculated energy consumption of biomass (rice husk and wood chip) by using wet weight multiply by Net Caloric Value (NCV) since percentages of moisture content of biomass are not available.

/3 Calculated from the difference of total energy consumption from every business and sold electricity and steam (Refinery Business, M-Tower and Regional Office and Marketing Business),

/4 Disclosure of greenhouse gas emissions scope 3 and energy consumption data outside the organization starting from 2021 with energy conversion provided by the Department of Alternative Energy Development and Efficiency and assessed the disclosure significance at 0.5 percent as well as greenhouse gas emissions.

/5. Excluding heavy fuel oil and lubricants transportation

/6. Crude Oil Transportation excluded Upstream transportation of crude oil

Business units			Refinery Business					M-Tower and Reginal office					Marketing Business							
GHG emissions scope 1 & scope 2																				
Indicators	Material Aspects	Unit	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022			
GRI 305-1 scope 1	Reports according to Operational Control Approach	Total Direct GHG emission (SCOPE 1)																		
		Total Direct GHG emission (SCOPE 1)	tCO ₂ e	900,704.37	898,314.15	885,906.72	821,155.65	930,897.27	-	-	-	478.63	484.69	-	-	507.98	493.41	738.50		
		- CO ₂	tCO ₂ e	899,954.62	897,562.70	883,796.95	819,065.76	928,384.04	-	-	-	468.15	475.33	-	-	499.21	485.38	572.33		
		- Biogenic CO ₂	tCO ₂ e	52.25	31.42	28.04	5.39	3.80	-	-	-	64.76	48.52	-	-	53.61	90.71	102.13		
		- CH ₄ and Fugitive CH ₄	tCO ₂ e	394.53	397.33	1,723.01	1,766.10	2,045.70	-	-	-	-	-	-	-	-	-			
		- *CH ₄ and Fugitive CH ₄ emission (S&P Global CSA disclosure requirement)	tons	13.15	13.24	57.43	58.87	68.19	-	-	-	-	-	-	-	-	-			
		- CH ₄	tCO ₂ e	394.53	397.33	387.41	369.00	413.10	-	-	-	0.82	0.71	-	-	0.80	103.34	160.49		
		- *CH ₄ emission (S&P Global CSA disclosure requirement)	tons	13.15	13.24	12.91	12.30	13.77	-	-	-	0.03	0.03	-	-	0.03	3.44	5.80		
		- Fugitive CH ₄ emission Fugitive CH ₄ has been reported with CH ₄ since 2020. Start from 2021, fugitive CH ₄ and CH ₄ are separately reported for data transparency.	tCO ₂ e	-	-	1,335.60	1,397.10	1,632.60	-	-	-	-	-	-	-	-	-			
		- N ₂ O	tCO ₂ e	355.22	354.01	386.66	323.76	361.76	-	-	-	9.80	8.44	-	-	8.58	8.04	11.39		
		- Hydrofluorocarbon (HFC)	tCO ₂ e	-	-	-	-	105.76	-	-	-	-	-	-	-	-	-	154.78		
		- Other Biogenic (CH ₄ and N ₂ O)	tCO ₂ e	-	0.11	0.10	0.02	0.01	-	-	-	-	0.17	-	-	0.19	-	-		
		GRI 305-2 Scope 2	Reports according to Operational Control Approach	Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)																
				Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)	tCO ₂ e	12,474.52	10,684.86	6,845.13	5,923.19	5,110.71	-	-	-	591.33	733.23	13,070.61	13,655.24	11,927.39	11,609.19	7,701.17
Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2) (Gross market-based scope 2 GHG emissions)	tCO ₂ e			12,474.52	10,684.86	6,845.13	5,923.19	5,110.71	-	-	-	591.33	733.23	13,070.61	13,655.24	11,927.39	11,609.19	7,701.17		
- CO ₂	tCO ₂ e			12,474.52	10,684.86	6,845.13	5,923.19	5,110.71	-	-	-	585.86	733.23	13,070.61	13,655.24	11,927.39	11,501.83	7,701.17		
- Biogenic CO ₂	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-			
- CH ₄	tCO ₂ e			-	-	-	-	-	-	-	-	1.80	-	-	-	-	35.41			
- N ₂ O	tCO ₂ e			-	-	-	-	-	-	-	-	3.67	-	-	-	-	71.95			
- Other Biogenic (CH ₄ and N ₂ O)	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2) (Gross market-based scope 2 GHG emissions)	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
- CO ₂	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
- Biogenic CO ₂	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
- Other Biogenic (CH ₄ and N ₂ O)	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Scope 1+2				Total GHG emissions (SCOPE 1+2)	tCO ₂ e	913,178.90	908,999.01	892,751.85	827,078.83	936,007.98	-	-	-	1,069.96	1,217.91	13,070.61	13,655.24	12,435.37	12,102.61	8,439.67
GRI 305-1 scope 1	Reports according to Equity Share Approach			Total Direct GHG emission (SCOPE 1)																
		Total Direct GHG emission (SCOPE 1)	tCO ₂ e	900,704.37	898,314.15	885,906.72	821,155.65	930,897.27	-	-	-	478.63	484.69	-	-	509.72	580.53	480.44		
		- CO ₂	tCO ₂ e	899,954.62	897,562.70	883,796.95	819,065.76	928,384.04	-	-	-	468.15	475.33	-	-	499.21	485.38	318.87		
		- Biogenic CO ₂	tCO ₂ e	52.25	31.42	28.04	5.39	3.80	-	-	-	64.76	48.52	-	-	53.61	90.71	70.11		
		- CH ₄ and Fugitive CH ₄	tCO ₂ e	394.53	397.33	1,723.01	1,766.10	2,045.70	-	-	-	-	-	-	-	-	-			
		- *CH ₄ and Fugitive CH ₄ emission (S&P Global CSA disclosure requirement)	tons	13.15	13.24	57.43	58.87	68.19	-	-	-	-	-	-	-	-	-			
		- CH ₄	tCO ₂ e	394.53	397.33	387.41	369.00	413.10	-	-	-	0.68	0.71	-	-	0.67	86.12	80.03		
		- *CH ₄ emission (S&P Global CSA disclosure requirement)	tons	13.15	13.24	12.91	12.30	13.77	-	-	-	0.03	0.03	-	-	0.03	3.44	2.93		
		- Fugitive CH ₄ emission Fugitive CH ₄ has been reported with CH ₄ since 2020. Start from 2021, fugitive CH ₄ and CH ₄ are separately reported for data transparency.	tCO ₂ e	-	-	1,335.60	1,397.10	1,632.60	-	-	-	-	-	-	-	-	-			
		- N ₂ O	tCO ₂ e	355.22	354.01	386.66	323.76	361.76	-	-	-	9.80	8.44	-	-	9.65	9.04	6.73		
		- Hydrofluorocarbon (HFC)	tCO ₂ e	-	-	-	-	105.76	-	-	-	-	-	-	-	-	-	154.78		
		- Other Biogenic (CH ₄ and N ₂ O)	tCO ₂ e	-	0.11	0.10	0.02	0.01	-	-	-	-	0.17	-	-	0.19	-	0.07		
		GRI 305-2 Scope 2	Reports according to Equity Share Approach	Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)																
				Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)	tCO ₂ e	12,474.52	10,684.86	6,845.13	5,923.19	5,110.71	-	-	-	591.33	733.23	13,070.61	13,655.24	11,927.39	11,609.19	4,890.31
Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2) (Gross market-based scope 2 GHG emissions)	tCO ₂ e			12,474.52	10,684.86	6,845.13	5,923.19	5,110.71	-	-	-	591.33	733.23	13,070.61	13,655.24	11,927.39	11,609.19	4,890.31		
- CO ₂	tCO ₂ e			12,474.52	10,684.86	6,845.13	5,923.19	5,110.71	-	-	-	585.86	733.23	13,070.61	13,655.24	11,927.39	11,501.83	4,890.31		
- Biogenic CO ₂	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-			
- CH ₄	tons			-	-	-	-	-	-	-	-	1.80	-	-	-	-	35.41			
- N ₂ O	tCO ₂ e			-	-	-	-	-	-	-	-	3.67	-	-	-	-	71.95			
- Other Biogenic (CH ₄ and N ₂ O)	tons			-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2) (Gross market-based scope 2 GHG emissions)	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
- CO ₂	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
- Biogenic CO ₂	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
- Other Biogenic (CH ₄ and N ₂ O)	tCO ₂ e			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Scope 1+2				Total GHG emissions (SCOPE 1+2)	tCO ₂ e	913,178.90	908,999.01	892,751.85	827,078.83	936,007.98	-	-	-	1,069.96	1,217.91	13,070.61	13,655.24	12,437.11	12,189.72	5,370.75
GRI 305-4	GHGs Intensity			tCO ₂ e/tons raw material	0.14	0.14	0.13	0.12	0.11											

Remarks:

1. The report of GHG emissions scope 1 and 2 data are calculated by using the BCP GHGs calculation tool in accordance with IPCC 2006
2. The calculation of scope 1 using emission factor from IPCC 2006 and APICompendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry 2009.
3. The calculation of scope 2 using emission factor values from Energy Policy and Planning Office, Ministry of Energy.
4. Conversion of fuel to energy by applying heating value provided by the Department of Alternative Energy Development and Efficiency.
5. Global Warming Potential (GWP) values are based on the Fourth Assessment Report (AR4) of the Greenhouse Gas Protocol.
6. The gases included in the calculations are CO₂, CH₄, N₂O.
7. GHG emission intensity was calculated at Scope 1 and 2 only.

Business units			Refinery Business					M-Tower and Reginal office					Marketing Business					
Indicators	Material Aspects		Unit	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
GRI 305-3 Scope 3	Reports according to Operational Control Approach	Other relevant indirect GHG emission (SCOPE 3)																
		Other relevant indirect GHG emission (SCOPE 3)	tCO ₂ e	-	-	-	424,801.41	602,181.87	-	-	-	-	0.00	-	-	-	2,841,458.23	3,271,986.26
		Upstream	tCO ₂ e	-	-	-	396,265.56	570,034.16	-	-	-	-	0.00	-	-	-	423,332.03	378,384.31
		- Purchased goods and services	tCO ₂ e	-	-	-	-	-	-	-	-	-	11.24	-	-	-	423,014.95	378,098.88
		- Crude oil transportation	tCO ₂ e	-	-	-	394,544.45	568,613.17	-	-	-	-	0.00	-	-	-	-	-
		- Upstream transportation and distribution	tCO ₂ e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	53.13	54.41
		- Use of municipal water	tCO ₂ e	-	-	-	1,672.72	1,394.86	-	-	-	-	1.68	-	-	-	263.96	231.02
		- Waste transportation	tCO ₂ e	-	-	-	48.39	26.13	-	-	-	-	0.00	-	-	-	-	-
		- Business travel	tCO ₂ e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		- Employee commuting	tCO ₂ e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		Downstream	tCO ₂ e	-	-	-	28,535.84	32,147.71	-	-	-	-	0.00	-	-	-	2,418,126.20	2,893,601.95
		- Product transportation	tCO ₂ e	-	-	-	28,535.84	32,147.71	-	-	-	-	0.00	-	-	-	-	-
		- Processing of sold products	tCO ₂ e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		- Use of sold products	tCO ₂ e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	2,418,126.20	2,893,601.95
		- End-of-life treatment of sold products tCO2e	tCO ₂ e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		- Franchises	tCO ₂ e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
GRI 305-3 Scope 3	Reports according to Equity Share Approach	Other relevant indirect GHG emission (SCOPE 3)																
		Other relevant indirect GHG emission (SCOPE 3)	tCO ₂ e	-	-	-	424,801.41	602,182.87	-	-	-	-	-	-	-	-	1,393,706.39	1,605,007.05
		Upstream	tCO ₂ e	-	-	-	396,265.56	570,035.16	-	-	-	-	-	-	-	-	208,824.56	187,142.10
		- Purchased goods and services	tCO ₂ e	-	-	-	-	-	-	-	-	-	11.24	-	-	-	208,642.09	186,963.52
		- Crude oil transportation	tCO ₂ e	-	-	-	394,544.45	568,614.17	-	-	-	-	-	-	-	-	-	-
		- Upstream transportation and distribution	tCO ₂ e	-	-	-	-	-	-	-	-	-	-	-	-	-	53.13	54.41
		- Use of municipal water	tCO ₂ e	-	-	-	1,672.72	1,394.86	-	-	-	-	1.68	-	-	-	129.34	124.16
		- Waste transportation	tCO ₂ e	-	-	-	48.39	26.13	-	-	-	-	-	-	-	-	-	-
		- Business travel	tCO ₂ e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- Employee commuting	tCO ₂ e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Downstream	tCO ₂ e	-	-	-	28,535.84	32,147.71	-	-	-	-	-	-	-	-	1,184,881.84	1,417,864.96
		- Product transportation	tCO ₂ e	-	-	-	28,535.84	32,147.71	-	-	-	-	-	-	-	-	-	-
		- Processing of sold products	tCO ₂ e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- Use of sold products	tCO ₂ e	-	-	-	-	-	-	-	-	-	-	-	-	-	1,184,881.84	1,417,864.96
		- End-of-life treatment of sold products tCO2e	tCO ₂ e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- Franchises	tCO ₂ e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRI 305-5	Reduction of GHG emissions																	
	Total estimated annual CO ₂ savings	tCO ₂ e	-	-	-	8,308.62	3,531.85	-	-	-	-	-	-	-	-	-	-	

Remarks:

- Bangchak Corporation Public Company Limited (Refinery Business, M-Tower and Regional office and Marketing Business) firstly disclosed GHG emission scope 3 in 2021.
1. The report of GHG emissions scope 3 data are calculated by using the BCP GHGs calculation tool in accordance with IPCC 2006
 2. The calculation of scope 3 GHG emissions from upstream and downstream uses emission factor values from Energy Policy and Planning Office, Ministry of Energy and Thailand Greenhouse Gas Management Organization's emission factors and Thai National LCI Database, TIS-MTEC-NSTDA (with TGO electricity 2016-2018).
 3. Conversion of fuel to energy by applying heating value provided by the Department of Alternative Energy Development and Efficiency.
 4. Global Warming Potential (GWP) values are based on the Fourth Assessment Report (AR4) of the Greenhouse Gas Protocol
 5. The ratio of GHG emission scope 3 is compared with scope 1 and scope 2, and evaluated using the value at 0.5% which are considered on the borderline of statistical significance. The value which is not reach 0.5% will not be reported in GHG emission scope 3.
 6. The production transportation reported from the refinery is the transport of finished petroleum products but excludes heavy fuel oil, and lubricant products.
 7. Upstream crude oil transportation does not include crude oil transportation from oversea.
 8. Reduction of GHG emissions are calculated from energy saving activities which implement during year 2022.

Air Emission							
Indicator	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 305-7	Air Emission						
	Nitrogen oxides (NO _x) ^{/1}						
	NO _x (Combustion)	ton	644.00	236.41	280.00	458.88	506.11
	Control Limit (not exceed)	ton				1,000.00	1,000.00
	Intensity NO _x	ton / thousand tons crude	0.120	0.044	0.060	0.099	0.087
	Sulfur Dioxide (SO ₂) ^{/1}						
	SO ₂ (Combustion)	ton	24.00	32.10	27.00	53.48	45.25
	Control Limit (not exceed)	ton				1,000.00	1,000.00
	Intensity SO ₂	ton / thousand tons crude	0.004	0.006	0.010	0.012	0.008
	Total Suspended Particulate (TSP) ^{/1}						
	TSP PM10 (Combustion)	ton	5.00	11.43	3.00	3.50	7.54
	Control Limit (not exceed)	ton					386.00
	Intensity TSP	ton / thousand tons crude	0.001	0.002	0.002	0.001	0.001
	Hydrogen sulfide (H ₂ S) ^{/1}						
	H ₂ S (SRU/TGTU Stack)	ton	14.30	0.69	4.00	4.37	2.22
	Control Limit (not exceed)	ton					65.59
	Intensity H ₂ S	ton / thousand tons crude	0.003	0.000	0.000	0.001	0.000
	Volatile Organic Compound (VOC) ^{/2/3/4}						
	VOC Inventory ^{/2/3}	ton	520.84	371.51	417.61	341.47	480.21
	Fugitive VOC ^{/4}	ton	2.47	2.50	2.51	2.53	2.99
	Control Limit (not exceed)	ton				500.00	500.00
	Intensity Fugitive VOCs	Ton/Thousand Tons crude	0.001	0.002	0.002	0.001	0.001
	Flared Hydrocarbon ^{/5}						
	Flared hydrocarbon	KL	1,777.00	2,472.90	1,174.30	2,311.28	1,327.24
	Flared hydrocarbon	ton C.U.M. (Gas)	0.245	0.374	0.167	0.575	0.272
	Flared hydrocarbon per total product produced	ton C.U.M. (Gas) / million barrel oil equivalent	0.006	0.009	0.002	0.015	0.003
	Vented Hydrocarbon						
	Vented hydrocarbon	ton C.U.M. (Gas)	N.A.	N.A.	N.A.	N.A.	N.A.
	Vented hydrocarbon per total product produced	ton C.U.M. (Gas) / million barrel oil equivalent	N.A.	N.A.	N.A.	N.A.	N.A.

/1 Calculated from production capacity using a third-party entity

/2 Include VOC Inventory from combustion, flare, tank, marketing and terminal, and wastewater

/3 Use emission factors from AP 42-US EPA, for VOC inventory calculation from combustion, flare, and marketing and terminal. Tank 4 program and Water 9 program are used as tools for VOC inventory calculation from tank and wastewater respectively.

/4 Calibrated measurement tools

/5 Including Flared hydrocarbon from Plant 2, 3, 4

Water Management							
Indicator	Material Aspects	Unit	2018	2019	2020	2021	2022
	Total water withdrawal by source (excluded brine water from Crude oil extraction)						
	Total water withdrawal by source (excluded brine water from Crude oil extraction)	Million cubic meters	2.381	2.697	2.495	2.411	2.344
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	2.395	2.294	2.334
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	0.1	0.117	0.010
	Total water withdrawal by source (included brine water from Crude oil extraction)	Million cubic meters	2.381	2.697	21.325	2.444	2.383
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.008	0.030	2.395	2.294	2.334
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	18.930	0.150	0.049
	Total surface water withdrawal (From Chao Phraya River) ^{/1}	Million cubic meters	0.103	0.200	0.185	0.197	0.147
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/1 /6}	Million cubic meters	N/A	N/A	0.085	0.080	0.136
	- Other water > 1000 mg/L Total Dissolved Solids ^{/1 /6}	Million cubic meters	N/A	N/A	0.1	0.117	0.010
	Total groundwater withdrawal ^{/2}	Million cubic meters	0.0080	0.030	0.270	0.112	0.440
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/2 /6}	Million cubic meters	0.0080	0.030	0.270	0.112	0.440
	- Other water > 1000 mg/L Total Dissolved Solids ^{/2 /6}	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total seawater withdrawal	Million cubic meters	N/A	N/A	N/A	N/A	N/A
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	N/A	N/A	N/A
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	N/A	N/A	N/A
	Total produced water withdrawal (from Crude oil extraction, processing or Raw material) ^{/3}	Million cubic meters	N/A	N/A	18.830	0.033	0.039
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/3 /6}	Million cubic meters	N/A	N/A	0	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids ^{/3 /6}	Million cubic meters	N/A	N/A	18.830	0.033	0.039
	Total third-party water withdrawal (municipal water supplies) ^{/4}	Million cubic meters	2.270	2.467	2.040	2.101	1.757
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/4 /6}	Million cubic meters	N/A	N/A	2.04	2.101	1.757
	- Other water > 1000 mg/L Total Dissolved Solids ^{/4 /6}	Million cubic meters	N/A	N/A	0	0.000	0.000
	Total water withdrawal in water stressed areas	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total surface water withdrawal (From Chao Phraya River)	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total groundwater withdrawal	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total seawater withdrawal	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total produced water withdrawal (from Crude oil extraction, processing or Raw material)	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total third-party water withdrawal	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000

	Total volume of water discharge in all areas						
	Total volume of water discharge in all areas	Million cubic meters	0.900	0.772	0.727	0.828	0.899
	Total water discharge from Refinery ^{/5}	Million cubic meters	0.900	0.772	0.725	0.827	0.897
	Surface water	Million cubic meters	0.900	0.772	0.725	0.827	0.897
	Groundwater	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Seawater	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Third-party water	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total water discharge from M-Tower ^{/5}	Million cubic meters	0.000	0.000	0.002	0.001	0.002
	Surface water	Million cubic meters	N/A	N/A	0.000	0.000	0.000
	Groundwater	Million cubic meters	N/A	N/A	0.000	0.000	0.000
	Seawater	Million cubic meters	N/A	N/A	0.000	0.000	0.000
	Third-party water	Million cubic meters	N/A	N/A	0.002	0.001	0.002
	Water discharge by freshwater and other water (Refinery) ^{/5}						
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/5 /6}	Million cubic meters	N/A	N/A	0.176	0.206	0.101
	- Other water > 1000 mg/L Total Dissolved Solids ^{/5 /6}	Million cubic meters	N/A	N/A	0.551	0.621	0.796
	Water discharge by freshwater and other water (M-Tower)						
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/6}	Million cubic meters	N/A	N/A	0.000	0.001	0.0015
	- Other water > 1000 mg/L Total Dissolved Solids ^{/6}	Million cubic meters	N/A	N/A	0.001	0.000	0.000
	Water discharge by freshwater and other water in water stressed areas	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/6}	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids ^{/6}	Million cubic meters	0.000	0.000	0.000	0.000	0.000
GRI 303-5 (2018)	Total water consumption (excluded brine water from Crude oil extraction) = Total water withdrawal (excluded brine water from Crude oil extraction) - Total volume of water discharged in all area						
	- Total water consumption (Excluded brine water from crude oil extraction)	Million cubic meters	1.481	1.926	1.768	1.582	1.445
	Water consumption (Target)	Million cubic meters				2.349	2.057
	- Total water consumption in water stressed area.	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Change in water storage, if water storage has been identified as having a significant water-related impact.	Million cubic meters	0.000	0.000	0.000	0.000	0.000
GRI 303-4d. (2018)	Effluents from the Refinery						
	COD	ton	39.02	53.31	33.22	28.98	33.53
	BOD	ton	4.76	7.32	6.53	4.85	5.76
	Oil and Grease	ton	4.52	2.22	2.17	2.48	2.69
	TSS	ton	11.15	8.23	4.54	4.87	5.63
	TDS	ton	791.03	1,125.09	973.23	1,100.98	1,273.38
	Sulfude	ton	0.904	0.341	0.094	0.261	0.448
	Mercury	ton	0.001	0.000	0.001	0.001	0.001
	Effluents from Bangchak Head Office at M Tower						
	COD	ton	N/A	N/A	N/A	N/A	N/A
	BOD	ton	N/A	N/A	0.007	0.003	0.003
	Oil and Grease	ton	N/A	N/A	0.002	0.002	0.002
	TSS	ton	N/A	N/A	0.017	0.017	0.019
	TDS	ton	N/A	N/A	0.550	0.285	0.324
	Sulfude	ton	N/A	N/A	0.002	0.001	0.002
	Mercury	ton	N/A	N/A	N/A	N/A	N/A

- In 2020, Bangchak started to report water and effluents according to GRI 303 (2018). The previous data in 2018 -2019, were recategorized where possible to report as per new criteria. The data in 2018 - 2019 which not meet the new criteria will be replaced by N/A.

Remark

/1 The volume of total surface water withdrawal is collected from pump capacity or tank volume.

/2 The volume of total groundwater withdrawal is collected from meter reading.

/3 The volume of total produced water withdrawal from crude oil extraction, processing or raw material is calculated from the ratio of oil / brine water.

/4 The volume of total 3rd party water withdrawal is collected from invoices.

/5 The volume of total water discharged is collected from flowmeter reading.

/6 Characteristics of water is collected from analysis result from 3rd party laboratory which is licensed by Department of Industrial Works.

Industrial Waste Management (Refinery)							
Indicator	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 306-3	Routine waste						
	Total waste generated						
	Hazardous waste ^{/1}	Metric tons/year	2,808.28	2,023.00	2,671.00	1,414.61	957.76
	Percentage of hazardous waste	%	17.99%	33.81%	84.58%	48.10%	55.37%
	Non-hazardous waste ^{/1}	Metric tons/year	220.21	158.00	388.00	267.06	145.20
	Percentage of non-hazardous waste	%	1.41%	2.64%	12.29%	9.08%	8.39%
	Non-routine waste						
	Hazardous waste ^{/1}	Metric tons/year	0.00	0.00	0.00	0.00	626.68
	Percentage of hazardous waste	%	0.00%	0.00%	0.00%	0.00%	36.23%
	Non-hazardous waste ^{/1}	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	Percentage of non-hazardous waste	%	0.00%	0.00%	0.00%	0.00%	0.00%
	Hazardous waste from oil and chemical spill clean-up ^{/2}	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	Percentage of hazardous waste from oil and chemical spill clean-up	%	0.00%	0.00%	0.00%	0.00%	0.00%
	Construction waste ^{/2}	Metric tons/year	10,582.61	3,696.27	97.00	0.00	0.00
	Percentage of construction waste	%	67.80%	61.77%	3.07%	0.00%	0.00%
	Hazardous waste for turnaround maintenance ^{/2}	Metric tons/year	1916.35	106.00	1.77	1,204.12	0.00
	Percentage of hazardous waste for turnaround maintenance	%	12.28%	1.77%	0.06%	40.95%	0.00%
	Non-hazardous waste for turnaround maintenance ^{/2}	Metric tons/year	81.55	1.00	0.02	55.01	0.00
	Percentage of non-hazardous waste for turnaround maintenance	%	0.52%	0.02%	0.00%	1.87%	0.00%

/1 Weight from waste manifest

/2 Estimate from volume of waste sent to disposal based on calculation of number of bags per container and average weight per bag /container.

GRI 306-3	Total waste generated ^{/1}	Metric tons/year	15,609.37	5,984.87	3,161.27	2,940.80	1,729.64
	- Total hazardous waste	Metric tons/year	4,725.01	2,128.90	2,676.61	2,618.73	1,584.44
	- Total non-hazardous waste	Metric tons/year	10,884.37	3,855.97	484.66	322.07	145.20
	Industrial waste diversion rate from landfilling	%	100.00%	99.75%	100.00%	100.00%	100.00%
	- Reuse and recycling	%	30%	10%	26%	47%	57%
	- Other recovery operation methods	%	68%	62%	2%	9%	8%
	- Energy recovery (Alternative fuel/ Fuel blending)	%	2%	28%	72%	44%	36%
	- Incineration without energy recovery	%	0.28%	0.01%	0.04%	0.22%	0.01%
	- Other disposal operation	%	0.00%	0.00%	0.00%	0.00%	0.00%
	- Landfilling	%	0.00%	0.25%	0.00%	0.00%	0.00%
GRI 306-3	Total hazardous waste - diverted from disposal and directed to off-site disposal ^{/1}	Metric tons/year	4,725.01	2,128.90	2,676.61	2,618.73	1,584.44
GRI 306-4	Hazardous waste - diverted from off-site disposal ^{/1}	Metric tons/year	4320.73	570.54	484.94	1,462.86	991.38
	- Reuse	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	- Recycling	Metric tons/year	4,320.73	570.54	484.94	1,220.57	856.42
	- Recovery (reclamation, regeneration of metal and metallic compounds)	Metric tons/year	0.00	0.00	0.00	242.29	134.96
GRI 306-5	Hazardous waste - off-site disposal	Metric tons/year	404.28	1,558.36	2,191.67	1,155.87	593.06
	Target - off-site disposal hazardous waste	Metric tons/year				1,700.00	1,530.00
	- * ^{DW} Energy recovery (alternative fuel/ fuel blending)	Metric tons/year	360.28	1,543.00	2,190.40	1,149.29	592.95
	- Incineration without energy recovery	Metric tons/year	44.00	0.40	1.27	6.58	0.11
	- Landfilling	Metric tons/year	0.00	14.96	-	0.00	0.00
	- Other disposal operations*	Metric tons/year	0.00	0.00	0.00	0.00	0.00
GRI 306-3	Total non-hazardous waste - diverted from disposal and Directed to off-site disposal ^{/1}	Metric tons/year	10,884.37	3,855.97	484.66	322.07	145.20
GRI 306-4	Non-hazardous waste - diverted from off-site disposal ^{/1}	Metric tons/year	10,884.37	3,701.82	395.72	184.26	123.77
	- Reuse	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	- Recycling	Metric tons/year	301.76	5.55	321.96	166.28	56.06
	- Other recovery operation (other recovery unlisted materials)	Metric tons/year	0.00	0.00	0.00	17.98	0.00
	- Other recovery operation (land reclamation: using construction waste)	Metric tons/year	10582.61	3,696.27	73.76	0.00	0.00
	- Sorting	Metric tons/year	10582.61	3,696.27	73.76	0.00	67.71
	- Composting	Metric tons/year					0.00
GRI 306-5	Non-hazardous waste - off-site disposal	Metric tons/year	-	154.15	88.94	137.81	21.43
	Target - off-site disposal non-hazardous waste	Metric tons/year				160.00	144.00
	- Energy recovery (alternative fuel/ fuel blending)	Metric tons/year	-	154.15	88.94	137.81	21.43
	- Incineration without energy recovery	Metric tons/year	-	0.00	0.00	0.00	0.00
	- Landfilling	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	- Other disposal operations*	Metric tons/year	0.00	0.00	0.00	0.00	0.00

* Declaration for hazardous waste direct to disposal

According to Department of Industrial Works (DIW), Bangchak refinery have complied with DIW's Announcement of Waste processor B.E. 2550, Best Practice of Waste Management and Disposal B.E. 2551 and Hazardous Substance Act. 2535 and the waste management have been classified and managed according to Notification of Ministry of Industry Re: Industrial Waste Disposal B.E. 2548 (2005). Waste management can be classified into 8 methods as follows: Method 01 Sorting, Method 02 Storage, Method 03 Reuse, Method 04 Recycle, Method 05 Recovery, Method 06 Treatment, Method 07 Disposal, and Method 08 Others.

Industrial Waste Management (Refinery)							
Indicator	Material Aspects	Unit	2018	2019	2020	2021	2022
*DIW	Hazardous waste - Off-site disposal ^{/1}	Metric tons/year	404.28	1543.40	2,191.67	1,155.87	593.06
04	- Recycle (042, 041, 044 and 049)	Metric tons/year	360.28	1543.00	2190.40	1149.29	592.95
	- 041: Use as fuel substitution or burn for energy recovery						
	- 042: Fuel blending						
	- 044: Use as co-material in cement kiln or rotary kiln						
07	- Disposal (075: Incineration in hazardous waste incinerator)	Metric tons/year	44.00	0.40	1.27	6.58	0.11

/1 Disposal methods and quantity from DW waste disposal permit documents and manifests

Office Waste Management							
Indicator	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 306-3	Total waste generated ^{/1}	Metric tons/year					55.32
	- Total hazardous waste	Metric tons/year					0.15
	- Total non-hazardous waste	Metric tons/year					55.17
	Total hazardous waste - diverted from disposal and directed to off-site disposal ^{/1}	Metric tons/year					0.15
GRI 306-4	Hazardous waste - diverted from off-site disposal	Metric tons/year					0.00
	- Reuse	Metric tons/year					0.00
	- Recycling	Metric tons/year					0.00
	- Recovery (reclamation, regeneration of metal and metallic compounds)	Metric tons/year					0.00
GRI 306-5	Hazardous waste - off-site disposal	Metric tons/year					0.15
	- Energy recovery (Alternative fuel/ Fuel blending)	Metric tons/year					0.00
	- Incineration without energy recovery	Metric tons/year					0.00
	- Landfilling	Metric tons/year					0.00
	- Other disposal operations*	Metric tons/year					0.15
GRI 306-3	Total non-hazardous waste - diverted from disposal and directed to off-site disposal ^{/1}	Metric tons/year					55.17
GRI 306-4	Non-hazardous waste - diverted from off-site disposal	Metric tons/year					15.96
	- Reuse	Metric tons/year					0.00
	- Preparation for Reuse	Metric tons/year					5.57
	- Sorting	Metric tons/year					0.00
	- Composting	Metric tons/year					10.39
GRI 306-5	Non-hazardous waste - off-site disposal	Metric tons/year					39.21
	- Energy recovery (Alternative fuel/ Fuel blending)	Metric tons/year					0.36
	- Incineration without energy recovery	Metric tons/year					0.00
	- Landfilling	Metric tons/year					38.85
	- Other disposal operations*	Metric tons/year					0.00

*Office hazardous which is batteries is stored and waited for authorized disposal vendor to collect

Environment Compliance							
GRI 307-1	- Number/monetary value of significant fines associated with environment law violation	cases	0	0	0	0	0

Social Performance												
Indicators	Material Aspects	Unit	2018		2019		2020		2021		2022	
			Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
GRI 2-7 and GRI 401-1	Employment											
	Employee* (Persons) The company has an exclusive full-time employment policy. There are no temporary, part-time, self-employment and no seasonal difference in manpower.											
	By gender											
	Total employees	persons / %	1,254	100.00	1,251	100.00	1,230	100.00	1,103	100.00	1,098	100.00
	Male	persons / %	881	70.26	868	69.38	854	69.43	759	68.81	752	68.49
	Female	persons / %	373	29.74	383	30.62	376	30.57	344	31.19	346	31.51
	By religion											
	Total employees	persons / %	1,254	100.00	1,251	100.00	1,230	100.00	1,103	100.00	1,098	100.00
	Buddhism	persons / %	1205	96.09	1204	96.24	1182	96.10	1060	96.10	1055	96.08
	Christian - Catholic	persons / %	27	2.16	22	1.76	24	1.95	19	1.72	20	1.82
	Islam	persons / %	21	1.67	23	1.84	22	1.79	20	1.82	21	1.91
	Others	persons / %	1	0.08	2	0.16	2	0.16	4	0.36	2	0.18
	By generation											
	Total employees	persons / %	1,254	100.00	1,251	100.00	1,230	100.00	1,103	100.00	1,098	100.00
	Baby Boom	persons / %	42	3.35	36	2.88	22		14	1.26	8	0.73
	Generation X	persons / %	550	43.86	541	43.25	533	43.33	451	40.89	450	40.98
	Generation Y	persons / %	632	50.40	625	49.96	626	50.89	585	53.04	584	53.19
	Generation Z	persons / %	30	2.39	49	3.92	49	3.98	53	4.81	56	5.10
	By level											
	Level 10-14: Executive up	persons / %	151	12.04	158	12.63	161	13.09	158	14.32	169	15.39
	Male	persons / %	103	8.21	103	8.23	103	8.37	97	8.79	102	9.29
	Female	persons / %	48	3.83	55	4.40	58	4.72	61	5.53	67	6.10
	Level 8-9: Senior Officer	persons / %	224	17.86	235	18.78	234	19.02	231	20.94	243	22.13
	Male	persons / %	138	11.00	147	11.75	150	12.20	148	13.42	154	14.03
	Female	persons / %	86	6.86	88	7.03	84	6.83	83	7.52	89	8.11
	Level 5-7: Officer	persons / %	461	36.76	462	36.93	454	36.91	390	35.36	382	34.79
	Male	persons / %	278	22.17	270	21.58	263	21.38	227	20.58	225	20.49
	Female	persons / %	183	14.59	192	15.35	191	15.53	163	14.78	157	14.30
	Level 1-4: Operator	persons / %	418	33.33	396	31.65	381	30.98	324	29.37	304	27.69
	Male	persons / %	362	28.87	348	27.82	338	27.48	287	26.02	271	24.68
	Female	persons / %	56	4.47	48	3.84	43	3.50	37	3.35	33	3.01
	By age group											
	Less than 30 years old	persons / %	328	26.16	287	22.94	205	16.67	154	13.96	126	11.48
	30-50 years old	persons / %	810	64.59	827	66.11	875	71.14	809	73.35	804	73.22
	More than 50 years old	persons / %	116	9.25	137	10.95	150	12.20	140	12.69	168	15.30
	By Area											
	Head office	persons / %	544	43.38	545	43.57	533	43.33	476	43.16	492	44.81
	Refinery	persons / %	634	50.56	630	50.36	620	50.41	551	49.95	528	48.09
	North District	persons / %	9	0.72	10	0.80	9	0.73	10	0.91	10	0.91
	Central District	persons / %	49	3.91	49	3.92	49	3.98	46	4.17	47	4.28
	North-East District	persons / %	10	0.80	9	0.72	11	0.89	12	1.09	12	1.09
	South District	persons / %	8	0.64	8	0.64	8	0.65	8	0.73	9	0.82
	By race											
	Asian	%							99.91		99.91	
	White	%							0.09		0.09	
	Black /African American	%							0.00		0.00	
	Hispanic or Latino	%							0.00		0.00	

Indicators	Material Aspects	Unit	2018	2019	2020	2021	2022
BCP Indicators	Diversity of employees						
	Percentage of women share of total workforce	%		30.62	30.57	31.19	31.51
	Percentage of women in all management position (Junior,middle and Top management) - Level 8-14	%		36.39	35.95	37.79	37.96
	(Percentage of females in junior management positions, i.e. first level of management) - Level 8-9	%		37.47	35.90	35.93	37.96
	Percentage of females in top management positions : Maximum two levels away from the CEO - Level 13-14	%		39.13	41.67	36.36	43.48
	Percentage of females in management positions in revenue generating functions (excluding support fuctions such as HR, IT, Legal etc.)	%		22.58	22.44	24.15	26.52
	Percentage of females in management position under STEM (Science Technology Engineering and Mathematics) functions	%		27.60	26.45	24.64	27.14
	Percentage of workforce based on other minority group - people with disability	%		1.00	1.00	1.00	1.00
	LGBTQI+	%			1.79	Survey result : The assessee did not wish to disclose	Survey result : The assessee did not wish to disclose

Social Performance												
Indicators	Material Aspects	Unit	2018		2019		2020		2021		2022	
			Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
GRI 401-1	Employees' Turnover											
	Turnover rate	%	3.55		5.36		3.16		5.13		4.50	
	By gender											
	Male	persons / %	27	58.70	52	74.29	25	64.10	37	64.91	25	51.02
	Female	persons / %	19	41.30	18	25.71	14	35.90	20	35.09	24	48.98
	By age group											
	Less than 30 years old	persons / %	20	43.48	39	55.71	18	46.15	27	47.37	20	40.81
	30-50 years old	persons / %	25	54.35	27	38.57	17	43.59	28	49.12	26	53.06
	More than 50 years old	persons / %	1	2.17	4	5.71	4	10.26	2	3.51	3	6.12
	By level											
	Level 10-14: Manager up	persons / %									6	12.24
	Level 5-9: Officer, Senior Officer	persons / %									38	77.55
	Level 1-4: Operator	persons / %									5	10.20
	By race											
	Asian	persons / %									49	100.00
	White	persons / %									0	0.00
	Black: African American	persons / %									0	0.00
	Hispanic or Latino	persons / %									0	0.00
	New Employees											
	By gender											
	Male	persons / %	46	68.66	45.00	60.81	19.00	63.33	21.00	48.84	28	49.12
	Female	persons / %	21	31.34	29	39.19	11	36.67	22	51.16	29	50.88
	By age group											
	Less than 30 years old	persons / %	37	55.22	55	74.32	24	80.00	24	55.81	30	52.63
	30-50 years old	persons / %	27	40.30	16	21.62	6	20.00	17	39.53	26	45.61
	More than 50 years old	persons / %	3	4.48	3	4.05	0	0	2	4.65	1	1.75
	By level											
	Level 10-14: Manager up	persons / %									9	15.79
	Level 5-9: Officer, Senior Officer	persons / %									46	80.70
	Level 1-4 : Operator	persons / %									2	3.51
	By race											
	Asian	persons / %									57	100.00
	White	persons / %									0	0.00
	Black: African American	persons / %									0	0.00
	Hispanic or Latino	persons / %									0	0.00
GRI 401-3	Parental leave											
	Employees that were entitled to parental leave (female)	Person									346	100.00
	Employees took parental leave (female) (percentage per female employees that were entitled to parental leave) ¹	person / %	5	0.40	7	0.56	4	0.33	8	0.73	4	1.16
	Employees took parental leave (female) (percentage per total employees that were entitled to parental leave)	person / %									4	0.36
	Employees that were entitled to parental leave (Male)	Person									752	100.00
	Employees took parental leave (Male) (percentage per female employees that were entitled to parental leave) ¹	person / %									16	2.13
	Employees took parental leave (Male) (percentage per total employees that were entitled to parental leave)	person / %									16	1.46
	Employees that returned to work after parental leave (female) ²	person / %	5	100.00	7	100.00	4	100.00	8	100.00	4	100.00
	Employees that returned to work after parental leave (male)	person / %									16	100.00
	Employees that returned to work after parental leave that were still employed 12 months after their return to work (female)	person / %									4	100.00
	Employees that returned to work after parental leave that were still employed 12 months after their return to work (male)	person / %									16	100.00
GRI 404-1	Employee development (training hours / person / year)											
	Total training hour	hour	57,487.00		56,448.50		28,650.27		30,869.65		31,931.70	
	Total average training hour	hour	45.88		45.12		23.29		27.99		29.08	
	Average amount spent on training and development per FTEs (DIS/CSA)	Thai Baht	47,048.98		28,120.00		8,717.66		14,447.45		15,930.68	
	By gender											
	Male	hour	43.07		42.82		21.05		29.03		31.97	
	Female	hour	52.65		50.35		28.18		25.69		22.80	
	By level											
	Level 10-14: Manager up	hour	56.66		52.33		45.15		53.66		25.08	
	Level 5-9: Officer, Senior Officer	hour	58.09		56.35		24.03		24.87		27.11	
	Level 1-4 : Operator	hour	22.34		22.48		12.53		21.46		35.36	
	By business category											
	President & Chief Executive Officer (PS)	hour	104.29		56.45		38.45		31.84		26.18	
	Corporate Sustainability Development and Strategic Synergy (CSBU)	hour	159.56		102.23		46.99		-		14.55	
	Corporate Management and Organization Development (MDBU)	hour	73.22		71.68		37.00		23.47		25.23	
	Accounting and Finance (AFBU)	hour	71.06		67.65		18.85		27.00		46.10	
	Marketing Business Group (MKBG)	hour	43.83		44.35		15.58		29.56		13.05	
	Refinery Business Group (RFBG)	hour	30.47		30.63		21.82		28.09		37.22	
	Best Employer Score	%	67.00		56.00		56.00		N/A		N/A	
	Employee Engagement Score	%	69.00		62.00		63.00		70.00		75.00	
	Labour and Human rights Complaints	case	0		0		0		0		0	
	Harassment and Discrimination Complaints	case	0		0		0		0		0	

Social Performance												
Indicators	Material Aspects	Unit	2018		2019		2020		2021		2022	
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
GRI 405-2	Ratio of basic salary and remuneration of women to men ^{/3}											
	By gender											
	Basic salary base	ratio							1.00	0.86	1.00	0.85
	Total remuneration base	ratio									1.00	0.93
	By age_group (Basic salary base)											
	Less than 30 years old	ratio							1.00	0.75	1.00	0.80
	30-50 years old	ratio							1.00	0.83	1.00	0.82
	More than 50 years old	ratio							0.96	1.00	1.00	0.94
	By age_group (Total remuneration base)											
	Less than 30 years old	ratio									0.96	1.00
	30-50 years old	ratio									1.00	0.92
	More than 50 years old	ratio									1.00	0.95
	By religion (Basic salary base)											
	Buddhism	ratio							1.00	0.85	1.00	0.84
	Others	ratio							0.78	1.00	0.87	1.00
	By religion (Total remuneration base)											
	Buddhism	ratio									1.00	0.92
	Others	ratio									0.85	1.00
	By level (Basic salary base)											
	Level 10-14: Executive up	ratio							0.89	1.00	0.92	1.00
	Level 8-9: Senior Officer	ratio							0.98	1.00	0.98	1.00
	Level 5-7: Officer	ratio							0.94	1.00	0.95	1.00
	Level 1-4: Operator	ratio							1.00	0.89	1.00	0.95
	By level (Total remuneration base)											
	Level 10-14: Executive up	ratio									0.92	1.00
	Level 8-9: Senior Officer	ratio									0.95	1.00
	Level 5-7: Officer	ratio									0.81	1.00
	Level 1-4: Operator	ratio									0.82	1.00
	By areas (Basic salary base)											
	Head office	ratio							0.79	1.00	0.83	1.00
	Refinery	ratio							1.00	0.74	1.00	0.73
	Others (North, Central, North-East and South)	ratio							0.78	1.00	0.77	1.00
	By areas (Total remuneration base)											
	Head office	ratio									0.82	1.00
	Refinery	ratio									1.00	0.82
	Others (North, Central, North-East and South)	ratio									0.72	1.00

Indicators	Material Aspects	Unit	2018		2019		2020		2021		2022	
			Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
GRI 202-1	Ratio of Employee Mean Pay (Basic Salary base) per Legal Minimum Pay (GRI 202-1)	ratio									1/0.69	1/0.73
	Ratio of Contractor Mean Pay (Basic Salary base) per Legal Minimum Pay (GRI 202-1b)	ratio									omission	
GRI 202-2	Percentage of employees at manager level or higher (Level 10-14: Executive up) who are local (Thai nationality)	percentage									99.41	

Indicators	Material Aspects	Unit	2018		2019		2020		2021		2022	
BCP Indicators	Gender pay gap (male : female)											
	Mean gender pay gap (Basic salary base)	%					-16.97		-15.66		-17.55	
	Median gender pay gap (Basic salary base)	%					-20.29		-18.88		-21.34	
	Mean gender pay gap (Total remuneration base) ^{/3}	%									-8.03	
	Median gender pay gap (Total remuneration base) ^{/3}	%									-2.90	
	Mean bonus gap	%					-14.92		-14.47		-17.31	
	Median bonus gap	%					-15.96		-17.83		-18.96	

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Occupational Health and Safety Performance												
Indicators	Material Aspects	Unit	2018		2019		2020		2021		2022	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
GRI 403-9	Workers covered by an occupational health and safety management system											
	Total Working Hours											
	- Employees	Hour	2,469,674.80		2,395,054.80		2,344,462.90		1,258,971.00		2,043,251.90	
		Hour	1,806,814.30	662,860.50	1,736,499.30	658,555.50	1,675,031.60	669,431.30	1,149,249.50	109,721.50	1,448,331.30	594,920.60
	- Contractors	Hour	5,459,788.80		6,564,583.52		7,815,554.00		2,810,960.50		1,777,185.50	
		Hour	4,250,297.90	1,209,490.90	4,714,105.12	1,850,478.40	5,959,383.00	1,856,171.00	2,238,417.50	572,543.00	1,401,309.00	375,876.50
	Work-Related Injuries											
	Fatality as a result of Work-Related Injury											
	- Employees	case	0.00		0.00		0.00		0.00		0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		case/million working hours	0.00		0.00		0.00		0.00		0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Data Coverage (% of operations)	100		100		100		100		100	
	- Contractors	case	0.00		0.00		0.00		0.00		0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		case/million working hours	0.00		0.00		0.00		0.00		0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Data Coverage (% of operations)	100		100		100		100		100	
	Total Recordable Injury Frequency Rate: TRIFR											
	- Employees	case	3		0		1		0		2	
			3	0	0	0	1	0	0	0	2	0
		case/million working hours	1.21		0.00		0.43		0.00		0.98	
			1.66	0.00	0.00	0.00	0.60	0.00	0.00	0.00	1.38	0.00
		Data Coverage (% of operations)	100		100		100		100		100	
	- Contractors	case	6		5		4		4		2	
			6	0	5	0	2	2	4	0	2	0
		case/million working hours	1.10		0.76		0.38		1.42		1.13	
1.41			0.00	1.06	0.00	0.34	0.54	1.79	0.00	1.43	0.00	
Data Coverage (% of operations)		100		100		100		100		100		
Lost-Time Injury Frequency Rate: LTIFR												
- Employees	case	1		0		0		0		0		
		1	0	0	0	0	0	0	0	0	0	
	case/million working hours	0.40		0.00		0.00		0.00		0.00		
		0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Data Coverage (% of operations)	100		100		100		100		100		
- Contractors	case	3		2		2		1		2		
		3	0	2	0	2	0	1	0	2	0	
	case/million working hours	0.55		0.30		0.26		0.36		1.13		
		0.71	0.00	0.42	0.00	0.34	0.00	0.45	0.00	1.43	0.00	
	Data Coverage (% of operations)	100		100		100		100		100		
High-Consequence Work-Related Injuries												
- Employees	case	N/A		0		0		0		0		
		N/A	N/A	0	0	0	0	0	0	0	0	
	Data Coverage (% of operations)	N/A		100		100		100		100		
- Contractors	case	N/A		0		0		0		1		
		N/A	N/A	0	0	0	0	0	0	1	0	
	Data Coverage (% of operations)	N/A		100		100		100		100		
Near Miss Incidents												
Total cases	case	17		35		101		24		12		
- Employees	case	15		19		12		21		8		
- Contractors	case	2		16		1		3		4		
- Data coverage	Data Coverage (% of operations)	100		100		100		100		100		
GRI 403-10	Work-Related Illnesses											
	Occupational Illness Frequency Rate: OIFR											
	- Employees	case	N/A		0		0		0		0	
		case (categorized by genders)	N/A	N/A	0	0	0	0	0	0	0	0
		case/million working hours	N/A		0.00		0.00		0.00		0.00	
			N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Fatality case	0		0		0		0		0	
		Data Coverage (% of operations)	N/A		100		100		100		100	

Occupational Health and Safety Performance												
Indicators	Material Aspects	Unit	2018		2019		2020		2021		2022	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Process Safety Management (PSM)	Process Safety Events											
	Process Safety Events - Tier 1	Event	0		0		0		0		0	
		Event / Million working hours	0		0		0		0		0	
		Data coverage (percentage of operations)	100		100		100		100		100	
	Process Safety Events - Tier 2	Event	0		0		0		0		0	
		Event / Million working hours	0		0		0		0		0	
		Data coverage (percentage of operations)	100		100		100		100		100	
	PSM Assessment Score											
	PSM Assessment Score (2022 Target: 4.0)	score	2.7		3.1		3.3		3.5		4.0	

*Injuries are excluded first aid in the injury rate (IR) and lost days count begins the scheduled work day after the accident.

Hydrocarbon Spills and Environmental Compliance							
Indicator	Material Aspects	Unit	2018	2019	2020	2021	2022
GRI 306-3 (2016) Sector standard reference 11.8.2	** 306-3: Significant spills (GRI additional sector recommendations) (**The effluents-related content of the GRI Standard GRI 306: Effluents and Waste 2016 has been superseded by GRI Standard GRI 303: Water and Effluents 2018, and the waste-related content has been superseded by GRI 306: Waste 2020. The spills-related content in GRI 306: Effluents and Waste 2016 remains in effect.)						
	Hydrocarbon spills > 100 barrels per time						
	- Number of case related to hydrocarbon spills (> 100 barrels / time)	case	0	0	0	0	0
	- Volume of hydrocarbon spills (> 100 barrels / time)	barrel	0.00	0.00	0.00	0.00	0.00
		liter	0.00	0.00	0.00	0.00	0.00
	Hydrocarbon spills > 1 barrels per time (but not over 100 barrels)						
	- Hydrocarbon spills > 1 barrels per time (but not over 100 barrels)	cases	3	2	3	0	0
	- Volume of significant hydrocarbon spills (> 1 barrels / time)	barrels	141.00	4.00	11.00	-	-
		liters	22,560.00	640.00	1,760.00	-	-
	- Volume of hydrocarbon > 1 barrel spilled into the environment	barrels	74.00	-	0.00	0.00	0.00
		liters	11,840.00	-	0.00	0.00	0.00
Sector standard reference 11.8.3	Number of Tier 1 cases related to significant spills (LOPC)	cases	0	0	0	0	0
	Number of Tier 2 cases related to significant spills (LOPC)	cases	0	0	0	0	0

Process safety performance indicators (Leading and Lagging), such as indicators regarding Tier 1 and Tier 2 loss of primary containment (LOPC), following API RP 754 (American Petroleum Institute Recommended Practice 754) guidelines.

* LOPC (Loss of Primary Containment) means an unplanned or uncontrolled release of any material from primary containment, including non-toxic and non-flammable materials.

- Tier1 : LOPC Events of Greater Consequence, the count of Tier 1 process safety events is the most lagging performance indicator and represents incidents with greater consequence resulting from actual losses of containment.

- Tier2 : LOPC Events of Lesser Consequence, the count of Tier 2 process safety events represents loss of primary containment events with a lesser consequence, but may be predictive of future, more significant incidents.