



# PTT SUSTAINABILITY PERFORMANCE DATA 2023



# Key Performance 2023



## Environment



### Direct and Indirect Greenhouse Gas Emissions

PTT  
**10.13**  
Million Tonne CO<sub>2</sub> equivalent

PTT Group  
**41.59**  
Million Tonne CO<sub>2</sub> equivalent



### Total Water Withdrawal Volume

PTT  
**1,889.72**  
Million Liters



### Total Amount of Hazardous Waste to Secured Landfill

PTT  
**0** Tonne



### Total Amount of Non-Hazardous Waste Disposed to Landfill

PTT  
**0** Tonne



### VOCs Volatile Organic Compounds Intensity

PTT  
**4.65**  
Tonne per million barrel oil equivalent



### NOx Nitrogen Oxide Intensity

PTT  
**2.65**  
Tonne per million barrel oil equivalent



### SO<sub>2</sub> Sulfur Dioxide Intensity

PTT  
**0.11**  
Tonne per million barrel oil equivalent



### Significant Spills (Spill Volume of 100 barrels or more)

PTT  
**0** Case



### Environmental Investments

PTT  
**492** THB Million



## Social



**Social Investment**  
**1,018.79** THB Million



**Human Capital Return on Investment (HC ROI)**  
**298**



**Lost Time Accident: LTA**  
Employee **0** Person  
Contractor **3** Person



**Total Recordable Injuries Rate (TRIR) per 200,000 hours worked**  
Employee **0.033**  
Contractor **0.028**



**Major Truck Accident Rate**  
**0** Case per 1,000,000 km



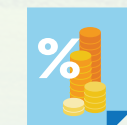
**Process Safety Incidents Tier 1**  
**0** Case



## Economic



**Sales and Service Revenue**  
**3,144,551** THB Million



**Income Taxes Payment**  
**81,313** THB Million

## Economic

GRI	Indicators	Unit	2020	2021	2022	2023
• GRI 201-1	<b>Direct economic value generated</b>					
	Sales and Service Revenue	THB Million	1,615,665	2,258,818	3,367,203	3,144,551
	Revenues as net sales plus revenues from financial investments and sales of assets <sup>[6]</sup>	THB Million	1,619,902	2,260,522	3,373,477	3,165,070
	<b>Economic value distributed</b>					
	Operating costs	THB Million	1,446,649	1,882,252	2,906,726	2,767,102
	Employee wages and benefits <sup>[1]</sup>	THB Million	8,149 <sup>[2]</sup>	9,286	9,993	10,438
	Dividend payments for the performance of the year	THB Million	28,563	57,126	57,126	57,126 <sup>[3]</sup>
	Social investment	THB Million	620	1,271	1,086	1,018.79
	<b>Economic value retained</b>		THB Million	106,518	241,293	301,810
GRI 201-4	<b>Tax</b>					
	Tax privileges from the Board of Investment, Thailand <sup>[4]</sup>	THB Million	0 <sup>[5]</sup>	0 <sup>[5]</sup>	0 <sup>[5]</sup>	0 <sup>[5]</sup>
• GRI 201-1 GRI 207-4 (2019)	Income taxes payment	THB Million	25,166	67,591	90,462	81,313

Remarks:

[1] Employee wages and benefits for employees managed by PTT include: PTT's employees, PTT's secondment and employees in subsidiaries under PTT's financial management. The scope does not include the President & Chief Executive Officer and the top executives. Employee wages and benefits include salaries, bonuses, contributions to provident funds, etc. (if applicable).

[2] Employee wages and benefits in 2020 have decreased from 2019 to approximately 1,700 million baht due to:

- The notice of the minimum standards of employment conditions in state-owned enterprises from the State Enterprise Labor Relations Committee resulting in the increase of maximum threshold of compensation for retirees shown in the fiscal year 2019;
- Smaller amount of bonus paid correlating with decreasing revenue;
- Due to the COVID-19 pandemic, PTT announced a Work@Home policy, in accordance with the government's announcement, causing a decrease in travel expenses from both domestically and internationally and training expense in 2020 from 2019.

[3] Dividend payment for the 2023 performance is subjected to approval from the 2024 Annual General Meeting (AGM).

[4] Amount of PTT's Tax privileges only.

[5] Tax Privileges from the Board of Investment of PTT ended corporate income tax exemption since 2018

[6] The information include sales and service income plus dividend income plus Interest income and gain (loss) on disposals of assets and investments.

## People

GRI	Indicators	Unit	2020		2021		2022		2023	
			Male	Female	Male	Female	Male	Female	Male	Female
GRI 2-7	<b>Permanent employees</b>	Manpower	2,157	1,349	2,189	1,362	2,184	1,356	2,202	1,372
	Employees by area									
	• Bangkok	Manpower	1,015	1,154	1,037	1,150	1,040	1,140	1,038	1,157
	• Others <sup>[2]</sup>	Manpower	1,123	189	1,137	197	1,132	201	1,149	201
	• Overseas	Manpower	19 <sup>[5]</sup>	6 <sup>[6]</sup>	15	15	12	15	15	14
GRI 2-8	<b>Outsourced workers<sup>[1]</sup></b>	Manpower		1,058		1,054		1,077		1,037
GRI 202-1	<b>Ratio of entry level wages by gender compared to local minimum wages</b>									
	• Bangkok	Ratio	2.62	2.37	2.37	2.03	2.21	2.39	2.34	1.91
	• Others <sup>[2]</sup>	Ratio	1.27	2.34	1.27	2.68	1.20	2.38	1.20	2.22
• GRI 401-1	<b>Total new employees</b>	Manpower	46		129		125		128	
	New employees	Manpower	24	22	79	50	74	51	70	58
	New hire rate	%	0.68	0.63	2.22	1.41	2.09	1.44	1.96	1.62
	New employees by area									
	• Bangkok	Manpower	7	14	30	37	39	36	29	47
		%	0.20	0.40	0.84	1.04	1.10	1.02	0.81	1.32
	• Others <sup>[2]</sup>	Manpower	17	8	49	13	35	15	41	11
	%	0.48	0.23	1.38	0.37	0.99	0.42	1.15	0.31	

GRI	Indicators	Unit	2020		2021		2022		2023		
	New employees by age										
	• Over 50 years old	Manpower	1	0	1	0	1	0	2	1	
		%	0.03	0.00	0.03	0.00	0.03	0.00	0.06	0.03	
	• 30-50 years old	Manpower	4	5	7	10	8	7	13	14	
		%	0.11	0.14	0.20	0.28	0.23	0.20	0.36	0.39	
	• Below 30 years old	Manpower	19	17	71	40	65	44	55	43	
		%	0.54	0.48	2.00	1.13	1.84	1.24	1.54	1.20	
	<b>Recruitment</b>		%	71.00		78.00		71.12		81.19	
			%	80.00		81.00		81.00		81.00	
	<b>Internal Hire Rate</b>	%	96.81		90.47		88.38		87.55		
	<b>Total Employee turnover</b>	Manpower	117		86		111		94		
	Total Employee turnover rate	%	3.34		2.42		3.14		2.63		
	Total Employee turnover rate by gender	%	0.63	0.57	0.37	0.45	1.05	1.70	1.45	1.18	
	Total Employee turnover rate by age										
	• Over 50 years old	%	0.48		0.17		1.95		1.59		
	• 30-50 years old	%	0.57		0.54		0.91		0.76		
	• Below 30 years old	%	0.14		0.11		2.79		0.28		
	Voluntary Employee turnover rate	%	3.31		2.42		3.11		2.52		
	Voluntary Employee turnover by gender	Manpower	66	50	48	38	60	50	49	41	
	Voluntary Employee turnover rate by gender	%	1.88	1.43	1.35	1.07	1.69	1.41	1.37	1.15	

GRI	Indicators	Unit	2020		2021		2022		2023	
	Voluntary Employee turnover by area									
	• Bangkok	Manpower	41	45	29	36	37	46	34	39
		%	1.17	1.28	0.82	1.01	1.05	1.30	0.95	1.09
	• Others <sup>[2]</sup>	Manpower	25	5	19	2	23	4	18	3
		%	0.71	0.14	0.54	0.06	0.65	0.11	0.50	0.08
	• Oversee	Manpower	0	0	0	0	0	0	0	0
		%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Voluntary Employee turnover by age <sup>[7]</sup>									
	• Over 50 years old	Manpower	54	37	37	26	45	31	33	24
		%	1.54	1.06	1.04	0.73	1.27	0.88	0.92	0.67
	• 30-50 years old	Manpower	8	12	9	10	11	12	15	12
		%	0.23	0.34	0.25	0.28	0.31	0.34	0.42	0.34
	• Below 30 years old	Manpower	4	1	2	2	4	7	4	6
		%	0.11	0.03	0.06	0.06	0.11	0.20	0.11	0.17
GRI 401-3	Total number of employees entitled to parental leave	Manpower	2,157	1,349	2,189	1,362	2,184	1,356	2,202	1,372
	Total number of employees that took parental leave	Manpower	63	43	45	36	58	35	47	31
	Total number of employees that returned to work after parental leave ended	Manpower	63	43	45	32	55	30	47	31
	Total number of employees that returned to work after parental leave ended that were still employed 12 months after their return to work <sup>[8]</sup>	Manpower	63	39	-	-	-	-	-	-
	Retention rate	%	100.00	90.70	-	-	-	-	100.00	100.00

GRI	Indicators	Unit	2020		2021		2022		2023	
• GRI 404-1	<b>Average hours of training per employee<sup>[9]</sup></b>	Hour per employee								
	Management And Employee									
	• Average hours of training	Hour per employee	19.39	19.57	37.40	36.70	45.03	42.85	49.10	41.32
	Management									
	• Average hours of training	Hour per employee	30.13		34.25		64.93		49.57	
	Employee									
	• Average hours of training	Hour per employee	18.76		37.32		42.78		45.87	
	<b>Average cost of training</b>	Baht per employee	<b>13,526.57</b>		<b>13,485.45</b>		<b>29,502.06</b>		<b>30,513.87</b>	
<b>Resulting HC ROI</b>	-	193.83		239.77		333.00		298.00		
GRI 404-3	<b>Type of Individual Performance Appraisal</b>									
	Management by objectives	% of all employees	100		100		100		100	
	Multidimensional performance appraisal	% of all employees	100		100		100		100	
	Team-based performance appraisal	% of all employees	100		100		100		100	
	Agile conversations	% of all employees	100		100		100		100	



GRI	Indicators	Unit	2020		2021		2022		2023	
GRI 405-1	<b>Employees by level and age group</b>									
	Executive (Level 16 - 19)	%	1.28	0.51	1.35	0.54	0.01	0.00	1.40	0.56
	• Over 50 years old	%	1.23	0.51	1.24	0.51	1.24	0.45	1.37	0.56
	• 30-50 years old	%	0.06	0.00	0.11	0.03	0.06	0.03	0.03	0
	• Below 30 years old	%	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	Middle management (Level 14 - 15)	%	2.25	1.91	2.34	2.03	0.02	0.02	2.5	2.1
	• Over 50 years old	%	1.34	1.34	1.58	1.44	1.50	1.50	1.5	1.5
	• 30-50 years old	%	0.91	0.57	0.76	0.59	0.99	0.62	1.01	0.53
	• Below 30 years old	%	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	Junior management (Level 9 - 10 department and Level 11 - 13)	%	10.38	6.85	10.48	6.98	0.11	0.07	11.44	7.58
	• Over 50 years old	%	3.19	2.65	3.32	2.87	3.42	2.99	3.61	2.99
	• 30-50 years old	%	7.19	4.19	7.15	4.11	7.26	4.24	7.83	4.59
	• Below 30 years old	%	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	Senior (Level 9 -10)	%	18.17	15.20	18.73	15.40	0.19	0.16	19.89	16.26
	• Over 50 years old	%	3.31	2.22	3.38	1.97	3.31	2.01	3.08	1.85
	• 30-50 years old	%	14.69	12.86	15.18	13.40	16.02	14.12	16.79	14.33
	• Below 30 years old	%	0.17	0.11	0.17	0.03	0.06	0.00	0.03	0.08
	Employee (Level 8 and below)	%	29.44	14.00	28.75	13.40	0.28	0.12	26.36	11.92
	• Over 50 years old	%	1.03	0.23	0.99	0.17	0.88	0.11	0.81	0.11
	• 30-50 years old	%	19.48	8.30	20.11	8.73	20.06	8.08	19.25	8.06
• Below 30 years old	%	8.93	5.48	7.66	4.51	6.92	4.15	6.30	3.75	

GRI	Indicators	Unit	2020	2021	2022	2023	
GRI 405-1	<b>Employees by Religion</b>						
	Total Employees by Religion						
	• Buddhism	%	97.1	96.97	96.94	96.92	
	• Christianity	%	1.7	1.59	1.64	1.47	
	• Islam	%	0.9	1.11	1.08	1.20	
	• Others	%	0.3	0.33	0.34	0.41	
	Total Management Employees by Religion						
	• Buddhism	%	98	97.62	97.67	97.37	
	• Christianity	%	1.5	1.78	1.74	2.08	
	• Islam	%	0.4	0.48	0.47	0.33	
	• Others	%	0.1	0.12	0.12	0.22	
	<b>Women in workforce</b>						
	• Women in total workforce			38.51	38.50	38.63	38.35
		% of total workforce					
		% of target at fiscal year		23	23	23	23
	• Women in all management positions			41.35	40.06	40.57	39.80
	% of total management workforce						
	% of target at fiscal year		23	23	23	23	

GRI	Indicators	Unit	2020	2021	2022	2023
	• Women in top management positions	% of total top management positions	29.52	28.70	28.71	26.78
		% of target at fiscal year	23	23	23	23
	• Women in junior management positions	% of total junior management positions	41.55	39.74	40.32	39.44
		% of target at fiscal year	23	23	23	23
	• Women in management positions in revenue generating functions	% of total managers in revenue generating functions	28.07	27.77	28.88	29.14
		% of target at fiscal year	23	23	23	23

GRI	Indicators	Unit	2020	2021	2022	2023
	• Women in STEM-related positions	% of total STEM positions	18.44	18.37	27.51	24.25
		% of target at fiscal year	23	23	23	23
• GRI 405-2	<b>Ratio of salary and remuneration of employee in each area: Female to Male<sup>[10]</sup></b>					
	Bangkok					
	• Executive (Level 16 - 19)	Ratio	0.97	0.93	0.93	0.92
	• Middle management (Level 14 - 15)	Ratio	0.99	0.99	1.05	1.04
	• Junior management (Level 9 - 10 department and Level 11 - 13)	Ratio	1.16	1.16	1.13	1.11
	• Senior (Level 9 -10)	Ratio	0.94	0.95	0.95	0.94
	• Employee (Level 8 and below)	Ratio	0.96	0.94	0.94	0.95
	Others <sup>[2]</sup>					
	• Executive (Level 16 - 19)	Ratio	0.84	1.13	-	-
	• Middle management (Level 14 - 15)	Ratio	0.86	0.94	0.98	1.00
	• Junior management (Level 9 - 10 department and Level 11 - 13)	Ratio	1.08	1.12	1.11	1.11
	• Senior (Level 9 -10)	Ratio	0.93	0.96	1.02	1.10
• Employee (Level 8 and below)	Ratio	1.11	1.13	1.03	1.02	

GRI	Indicators	Unit	2020	2021	2022	2023
-	<b>Employee Engagement</b>					
	Employee engagement result	% of actively engaged employees	80	80	79	82
	Employee engagement target	% of actively engaged employees	80	80	80	80
	Coverage	% of total employees	84	91	89	93
-	<b>Workforce covered by collective bargaining agreements</b>					
	Percentage of employees represented by trade union	% of employees represented by trade union	61	61	59	59
		Case	0	0	0	0

**Remarks:**

- [1] Outsourced workers refers to contractors who deliver tasks specified in the annual TOR and do not include short-t outsourced
- [2] Others refers to other provinces outside Bangkok where PTT's offices are situated.
- [3] Including employees working abroad in Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore, Indonesia and
- [4] Including employees working abroad in Cambodia, Laos, Singapore and England.
- [5] Including employees working abroad in Myanmar, Malaysia, the Philippines, Singapore and England.
- [6] Including employees working abroad in Singapore and England.
- [7] Employee turnover excludes retirement and death.
- [8] Data collection will examine information on maternity leave occurring in each year, including the duration of maternity leave (3 months) and parental leave (5 months). Regarding to the condition, employees return to work after taking maternity and parental leave, and being rehired for 12 months, the information will be summarized
- [9] Hours of training and further study are included in the average hours of training per year per employee.
- [10] Remuneration are included Salary, Bonus and Short-term Incentive

## Safety

GRI	Indicators	Unit	2563	2564	2565	2566
• GRI 403-9 (2018)	Fatalities case and rate as a result of work-related injury					
	• Employee	Person	0	0	0	0
		Person per 1,000,000 hours worked	0	0	0	0
	• Contractor <sup>[5]</sup>	Person	0	0	0	2
		Person per 1,000,000 hours worked	0	0	0	0.069
	Near Misses					
	• Employee and Contractor <sup>[5]</sup>	Case	76	76	52	22
	Lost workday case and rate (LWC, LDR) <sup>[2]</sup>					
	• Employee	Person	1	0	0	0
		Lost day per 200,000 hours worked	0.09	0	0	0
	• Contractor <sup>[5]</sup>	Person	2	0	0	3
		Lost day per 200,000 hours worked	0.54	0	0	0.255

	Total recordable injuries case and rate (TRIC, TRIR) <sup>[3]</sup>					
	• Employee	Person	3	0	2	1
		Person per 200,000 hours worked	0.09	0	0.063	0.033
	• Contractor <sup>[5]</sup>	Person	8	3	3	4
		Person per 200,000 hours worked	0.12	0.038	0.038	0.028
	Lost time injury frequency rate (LTIFR) <sup>[3]</sup>					
	• Employee	Person per 200,000 hours worked	0.03	0	0	0
		Person per 1,000,000 hours worked	0.15	0	0	0
	• Contractor <sup>[5]</sup>	Person per 200,000 hours worked	0.03	0	0	0.021
		Person per 1,000,000 hours worked	0.15	0	0	0.103

	High-consequence rate work-related injuries rate <sup>[6]</sup> (excluding fatalities)					
	• Employee	Person	0	0	0	0
		Person per 1,000,000 hours worked	0	0	0	0
	• Contractor <sup>[5]</sup>	Person	0	0	0	0
Person per 1,000,000 hours worked		0	0	0	0	
• GRI 403-10 (2018)	Occupational illness frequency rate (OIFR) <sup>[3]</sup>					
	• Employee	Person per 200,000 hours worked	0	0	0	0
	• Contractor <sup>[5]</sup>	Person per 200,000 hours worked	0	0	0	0
	The number of fatalities as a result of work-related ill health					
	• Employee	Person	0	0	0	0
	• Contractor <sup>[5]</sup>	Person	0	0	0	0
	The number of cases of recordable work-related ill health					
	• Employee	Person	0	0	0	0
	• Contractor <sup>[5]</sup>	Person	0	0	0	0
	PTT Days Away/Restricted or Transfer Rate (DART)					
	• Employee	Person per 200,000 hours worked	0.03	0.000	0.00	0.00
	• Contractor	Person per 200,000 hours worked	0.029	0.000	0.00	0.021



	PTT Lost Workday Rate (LWD)					
	• Employee	Person per 200,000 hours worked	0.09	0.00	0.00	0.00
	• Contractor	Person per 200,000 hours worked	0.537	0.00	0.00	0.255
	PTT Total Recordable Injury Frequency Rate (TRIFR)					
	• Employee	Person per 1,000,000 hours worked	0.445	0.000	0.315	0.163
	• Contractor	Person per 1,000,000 hours worked	0.545	0.200	0.195	0.138
	Number of accidents from using corporate vehicles	Case	1	1	0	1
		Target	3	2	0	0
	Number of Major Truck Accident Rate	Case per 1,000,000 km	0.00	0.00	0.00	0.00
		Target	0.03	0.014	0.00	0.00
	Tier 1 Process Safety Event	Number per 1,000,000 hours worked	0.032	0.0063	0	0
	The number of safety incidents at Tier 1 production processes within the PTT Group					
	• Target	Time	0	0	0	0
	• Number of Accidents	Time	6	1	3	2

Remarks:

NA: Not available

[1] The reporting boundary covers domestic operations only, not broken down at the regional level. OH&S data is also not broken down by gender because PTT equally regards the importance of safety for all, employees, in accordance with PTT's Code of Business Ethics. The data excludes contractors working on construction projects that have not yet been handed over to PTT, such as the Natural Gas Transmission Pipeline Project.

[2] Monitored by calendar day, and is recorded after the day on which the incident occurred. The target is equal to zero from 2020 onwards.

[3] Do not include first aid cases.

[4] In 2018, there were accidents resulting in one fatality. PTT has investigated and taken actions to prevent recurrence. The incident was raised as a lesson-learnt for relevant parties.

[5] Definition of contractors according to GRI 403: Occupational Health and Safety 2018 is all workers who are not employees but whose work and/or workplace is controlled by the organization.

[6] Work-related injury that results in an injury from which the worker cannot, does not, or is not expected to recover fully to pre-injury health status within 6 months (exclude fatality).

## Water consumption

GRI	Indicators	Unit	2020	2021	2022	2023
<b>PTT</b>						
• GRI 303-3	<b>Water Withdrawal by Sources</b>					
	<b>Total water withdrawal</b>	<b>Million Liters</b>	<b>1,844.43</b>	<b>2,010.74</b>	<b>1,862.48</b>	<b>1,889.72</b>
	Surface water	Million Liters	142.97	140.10	251.74	147.00
	• Fresh water ≤1,000 mg/l TDS	Million Liters	142.97	140.10	251.74	147.00
	• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
	Ground water	Million Liters	44.16	33.19	62.51	32.77
	• Fresh water ≤1,000 mg/l TDS	Million Liters	44.16	33.19	62.51	32.77
	• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
	Produced Water	Million Liters	0.00	0.00	0.00	0.00
	• Fresh water ≤1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
	• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
	Seawater	Million Liters	93.64	83.25	84.13	93.86
	• Fresh water ≤1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
	• Other water >1,000 mg/l TDS	Million Liters	93.64	83.25	84.13	93.86
	Third-party water	Million Liters	1,563.67	1,754.20	1,464.10	1,616.09
	• Fresh water ≤1,000 mg/l TDS	Million Liters	1,563.67	1,754.20	1,464.10	1,616.09
	• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00

<b>Total water withdrawal from areas with water stress</b>	<b>Million Liters</b>	<b>265.66</b>	<b>195.58</b>	<b>324.32</b>	<b>1,775.73</b>
Surface water	Million Liters	71.65	62.91	163.84	81.26
• Fresh water ≤1,000 mg/l TDS	Million Liters	71.65	62.91	163.84	81.26
• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
Ground water	Million Liters	38.33	29.42	60.57	30.36
• Fresh water ≤1,000 mg/l TDS	Million Liters	38.33	29.42	60.57	30.36
• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
Produced Water	Million Liters	0.00	0.00	0.00	0.00
• Fresh water ≤1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
Seawater	Million Liters	0.00	0.00	0.00	84.50
• Fresh water ≤1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00
• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	84.50
Third-party water	Million Liters	155.68	103.25	99.91	1,579.61
Third-party water by water source					
- Surface water	Million Liters	155.68	99.76	99.91	1,579.61
- Ground water	Million Liters	0.00	3.49	0.00	0.00
- Seawater	Million Liters	0.00	0.00	0.00	0.00
- Produced Water	Million Liters	0.00	0.00	0.00	0.00
Third-party water by water quality					
• Fresh water ≤1,000 mg/l TDS	Million Liters	155.68	103.25	99.91	1,579.61
• Other water >1,000 mg/l TDS	Million Liters	0.00	0.00	0.00	0.00

GRI 303-5 (2018)	<b>Total Water Consumption</b>	<b>Million Liters</b>	<b>1,560.27</b>	<b>1,584.77</b>	<b>1,631.88</b>	<b>1,653.58</b>
	• Total water consumption from areas with water stress	Million Liters	246.58	179.33	306.13	1,549.03
	Total net fresh water consumption	Million m3	1.49	1.52	1.57	1.79
		Target Net fresh water consumption Million m3				
	Withdrawal: Total municipal water supplies (or from other water utilities)	Million m3	1.56	1.75	1.46	1.62
	Withdrawal: Fresh surface water	Million m3	0.14	0.14	0.25	0.15
	Withdrawal: Fresh ground water	Million m3	0.04	0.03	0.06	0.03
	Discharge: Water returned to the source of extraction at similar or higher quality as raw water extracted	Million m3	0.27	0.41	0.21	0.00
	Total net fresh water consumption in water-stressed areas	Million m3	0.25	0.18	0.31	1.53
		Target Net fresh water consumption Million m3				
-	Business Impacts of Water Related Incidents	Thai Baht	0	0	0	0

PTT Group						
• GRI 303-3	Total water withdrawal	Million Liters	136.96	129.76	116.71	118.02
Go to top	Total freshwater withdrawal	Million cubic meter	59.80	63.29	61.29	63.78
GRI 303-5 (2018)	Total net fresh water consumption	Million m3	53.87	58.28	58.21	60.64
	Percentage of Reused and Recycled Water Against Total Volume of Water Consumed (freshwater)	% Reused and recycled water/Total freshwater consumption	18.00	17.00	17.00	15.00

Remarks:

- Revise 2019 - 2021 data for better accuracy
- Water discharge remained in line with the legal requirements
- Water discharge of the organization is in accordance with the definition prescribed in the regulation.
- In 2020, the total volume of water withdrawal has decreased due to the Water Conservation project and the reduction of production from Rayong Gas Separation Plant Unit 1.
- In 2022, total water withdrawal decreased as the implementation of water reduce project at Natural gas separation plant unit 1 which can reduce of water withdrawal approximately by 170 million liters per year.
- In 2022, due to the leakage of water storage ponds for fire extinguishers at pipe system operations center, zone 10, Chachoengsao. This causes increasing in water withdrawal for storage in water stress area.
- In 2022, there are 15 establishments located in water stress area e.g., District pipe system operation center 1,2,9,10 and 11, Chonburi Operation Center, PTT Innovation Institute, Main gas distribution stations at Kaeng Khoi, Saraburi Province, Nimit Mai, Nimit Mai 2, Ban Bueng, Rangsit, Lat Lum Kaeo, Lan Krabue and Lam Luk Ka, Pathum Thani Province.

## Effluents

[Go to top](#)

GRI	Indicators	Unit	2020	2021	2022	2023
• GRI 303-4 (2018)	<b>Total water discharge</b>	<b>Million Liters</b>	<b>284.16</b>	<b>425.97</b>	<b>230.60</b>	<b>236.14</b>
	• Total water discharge from areas <u>without water stress</u>	Million Liters	265.08	409.72	212.41	9.44
	Breakdown by water source					
	- Surface water	Million Liters	258.53	402.74	205.32	1.95
	- Ground water	Million Liters	0.00	0.00	0.00	0.00
	- Seawater	Million Liters	6.01	6.98	7.09	7.49
	- Third-party Water	Million Liters	0.54	0.00	0.00	0.00
	Breakdown by water quality					
	• Water discharge by fresh water ( $\leq 1,000$ mg/l Total Dissolved Solids)	Million Liters	265.08	409.72	205.32	1.95
	• Water discharge by other water ( $> 1,000$ mg/l Total Dissolved Solids)	Million Liters	0.00	0.61	7.09	7.49
	• Total water discharge from areas <u>with water stress</u>	Million Liters	19.08	16.25	18.19	226.70
	Breakdown by water source					
	- Surface water	Million Liters	19.08	16.25	18.19	226.70
	- Ground water	Million Liters	0.00	0.00	0.00	0.00
	- Seawater	Million Liters	0.00	0.00	0.00	0.00
	- Third-party Water	Million Liters	0.00	0.00	0.00	0.00
	Breakdown by water quality					
• Water discharge by fresh water ( $\leq 1,000$ mg/l Total Dissolved Solids)	Million Liters	19.08	15.64	18.18	164.39	
• Water discharge by other water ( $> 1,000$ mg/l Total Dissolved Solids)	Million Liters	0.00	0.61	0.00	62.31	

Remarks:

- Data collection and disclosure are adjusted in alignment with the GRI 303-4 Water discharge (2018 version)
- Water discharge remained in line with the legal requirements
- Water discharge of the organization is in accordance with the definition prescribed in the regulation.
- In 2023, an updated version of the WRI Aquaduct (Water Stress Area) was used to assess establishments located in areas at risk of water scarcity.

As a result, establishments located in areas at risk of water shortages have increased, totaling 28 locations including Khanom Gas Separation Plant Rayong natural gas separation plant, NGV main station, Kanlapaphruek, Kaeng Khoi, Khon Kaen, Thung Khru, Nimit Mai, Nimit Mai 2, Ban Bueng, Rangsit, Pathum Thani, Lat Lum Kaeo, Lan Krabue, Lam Luk Ka, PTT Head Office, Ban Rong Pho Gas Depot. Khao Bo Ya Gas Terminal Sriracha District Oil Pipeline Operations Center 1,2,3,4,6,9,10,11,12 Chonburi Operations Center and Coastal Operations Center.

As a result, data on the total amount of water used in areas at risk water shortages are increasing.



## Air Emissions

[Go to top](#)

GRI	Indicators	Unit	2020	2021	2022	2023
<b>PTT</b>						
• GRI 305-7	Volatile Organic Compounds (VOCs)	Tonne	1,800.71	1,867.06	1,812.16	1,796.11
	VOCs Intensity	Tonne per million barrel oil equivalent (mboe) [1]	5.00	5.29	4.84	4.65
		Tonne per million barrel oil equivalent (mboe) [2]	6.73	6.91	6.97	6.53
	Nitrogen oxides (NOx)	Tonne	795.59	883.85	818.32	1,025.88
	NOx intensity	Tonne per million barrel oil equivalent (mboe) [1]	2.21	2.50	2.19	2.65
		Tonne per million barrel oil equivalent (mboe) [2]	2.97	3.27	3.15	3.73
	Sulphur dioxide (SO <sub>2</sub> )	Tonne	26.91	24.68	28.21	42.93
	SO <sub>2</sub> intensity	Tonne per million barrel oil equivalent (mboe) [1]	0.07	0.07	0.08	0.11
	SO <sub>2</sub> intensity	Tonne per million barrel oil equivalent (mboe) [2]	0.10	0.09	0.11	0.16

PTT Group						
• GRI 305-7	Volatile Organic Compounds (VOCs)	Tonne	28,052.71	28,815.15	28,233.10	20,664.03
		Target (Tonne)			29,315.00	34,005.50
	VOCs Intensity	Tonne per million barrel oil equivalent (mboe)	70.84	73.31	68.89	49.04
	Nitrogen oxides (NOx)	Tonne	13,867.84	14,854.43	12,853.03	11,598.51
		Target (Tonne)			16,053.00	18,436.72
	NOx intensity	Tonne per million barrel oil equivalent (mboe)	35.02	37.79	31.36	27.53
	Sulphur dioxide (SO <sub>2</sub> )	Tonne	7,390.10	5,571.37	7,632.80	7,581.77
		Target (Tonne)			9,974.00	11,471.73
	SO <sub>2</sub> intensity	Tonne per million barrel oil equivalent (mboe)	18.66	14.17	18.62	17.99

Remarks:

- Strategic Objective 2020: Zero emission rate of SO<sub>2</sub>, NOx, and VOCs.
  - SO<sub>2</sub> and NOx emissions from all facilities remain below the legal threshold for air quality.
- [1] Barrels of crude oil equivalent (mboe) are calculated from the product sales volume of PTT and PTT Oil and Retail Business Public Company Limited.
- [2] Barrels of crude oil equivalent (mboe) calculated from PTT's product sales volume.
- In 2023, NOx volumes will increase due to increased production capacity. As a result, the amount of gas fed into the Rayong Natural Gas Separation Plant increased. Including from burning fuel using natural gas to produce electricity for one's own use. Substitute for purchasing electricity
  - In 2023, SOx volumes will increase due to increased production capacity. As a result, the amount of gas fed into the Rayong Natural Gas Separation Plant increased. Including an increase in the proportion of hydrogen sulfide in gas from upstream producers compared to 2022.

## Waste

GRI	Indicators	Unit	2020	2021	2022	2023
<b>PTT</b>						
<b>GRI WASTE (2020) - Effective 2022</b>						
• GRI 306-3 (2020)	<b>Total waste generated</b>	<b>Tonne</b>				
	Total hazardous waste generated	Tonne	3,003.24	1,609.80	2,873.50	3,147.39
	Total non-hazardous waste generated	Tonne	2,801.18	3,256.30	11,597.99	3,700.61
• GRI 306-4 (2020)	<b>Total waste diverted from disposal</b>	<b>Tonne</b>	<b>1,778.70</b>	<b>987.26</b>	<b>959.55</b>	<b>1,576.17</b>
	Total hazardous waste diverted from disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Preparation for reuse	Tonne	0.00	0.00	0.00	0.00
	• Recycling	Tonne	0.00	0.00	0.00	0.00
	• Other recovery operations	Tonne	0.00	0.00	0.00	0.00
	Total non-hazardous waste diverted from disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Preparation for reuse	Tonne	0.00	0.00	0.00	0.00
	• Recycling	Tonne	0.00	0.00	0.00	0.00
	• Other recovery operations	Tonne	0.00	0.00	0.00	0.00
	Total hazardous waste diverted from disposal ( <u>Offsite</u> )	Tonne	719.86	186.76	160.89	948.27
	• Preparation for reuse	Tonne	0.00	0.32	0.00	0.00
	• Recycling	Tonne	719.86	186.44	160.89	948.27
	• Other recovery operations	Tonne	0.00	0.00	0.00	0.00

	Total non-hazardous waste diverted from disposal ( <u>Offsite</u> )	Tonne	1,058.84	800.50	798.66	627.90
	• Preparation for reuse	Tonne	1.20	1.20	0.00	0.00
	• Recycling	Tonne	866.89	658.90	610.26	405.89
	• Other recovery operations	Tonne	190.75	140.40	188.40	222.01
• GRI 306-5 (2020)	<b>Total waste directed to disposal</b>	<b>Tonne</b>	<b>3,955.94</b>	<b>3,932.81</b>	<b>13,434.79</b>	<b>5,242.14</b>
	Total hazardous waste directed to disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Incineration (with energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Incineration (without energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Landfilling	Tonne	0.00	0.00	0.00	0.00
	• Other disposal operations	Tonne	0.00	0.00	0.00	0.00
	• Unknown disposal method	Tonne	0.00	0.00	0.00	0.00
	Total non-hazardous waste directed to disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Incineration (with energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Incineration (without energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Landfilling	Tonne	0.00	0.00	0.00	0.00
	• Other disposal operations	Tonne	0.00	0.00	0.00	0.00
	• Unknown disposal method	Tonne	0.00	0.00	0.00	0.00
	Total hazardous waste directed to disposal ( <u>Offsite</u> )	Tonne	2,222.53	1,456.62	2,656.99	2,163.40
	• Incineration (with energy recovery)	Tonne	191.17	756.75	2,520.48	1,845.08
	• Incineration (without energy recovery)	Tonne	1,997.95	643.75	115.10	312.12
	• Landfilling	Tonne	0.00	0.00	0.00	0.00
	• Other disposal operations	Tonne	33.41	56.12	21.41	6.20
	• Unknown disposal method	Tonne	0.00	0.00	0.00	0.00

	Total non-hazardous waste directed to disposal ( <u>Offsite</u> )	Tonne	1,733.41	2,476.19	10,777.80	3,078.74
	• Incineration (with energy recovery)	Tonne	10.02	222.41	148.10	200.91
	• Incineration (without energy recovery)	Tonne	254.10	108.52	15.08	26.51
	• Landfilling	Tonne	24.05	0.00	0.00	0.00
	• Other disposal operations	Tonne	1,445.24	2,145.26	10,614.62	2,851.32
	• Unknown disposal method	Tonne	0.00	0.00	0.00	0.00
<b>PTT Group</b>						
• GRI 306-3 (2020)	<b>Total waste generated</b>					
	Total hazardous waste generated	Tonne	101,876.90	53,035.64	55,696.76	47,875.62
	Total non-hazardous waste generated	Tonne	65,095.14	107,186.78	70,998.64	56,825.72
• GRI 306-4 (2020)	<b>Total waste diverted from disposal</b>	<b>Tonne</b>	<b>44,730.21</b>	<b>56,295.13</b>	<b>39,978.85</b>	<b>36,283.15</b>
	Total hazardous waste diverted from disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Preparation for reuse	Tonne	0.00	0.00	0.00	0.00
	• Recycling	Tonne	0.00	0.00	0.00	0.00
	• Other recovery operations	Tonne	0.00	0.00	0.00	0.00
	Total non-hazardous waste diverted from disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Preparation for reuse	Tonne	0.00	0.00	0.00	0.00
	• Recycling	Tonne	0.00	0.00	0.00	0.00
	• Other recovery operations	Tonne	0.00	0.00	0.00	0.00

	Total hazardous waste diverted from disposal ( <u>Offsite</u> )	Tonne	8,540.22	8,514.57	12,585.33	11,755.75
	• Preparation for reuse	Tonne	73.69	30.45	134.29	26.39
	• Recycling	Tonne	8,457.22	8,484.12	12,451.04	11,253.86
	• Other recovery operations	Tonne	9.31	0.00	0.00	475.50
	Total non-hazardous waste diverted from disposal ( <u>Offsite</u> )	Tonne	36,189.99	47,780.56	27,393.52	24,527.40
	• Preparation for reuse	Tonne	240.33	98.54	480.98	285.24
	• Recycling	Tonne	34,464.93	46,717.99	25,668.13	23,496.11
	• Other recovery operations	Tonne	1,484.73	964.04	1,244.41	746.05
• GRI 306-5 (2020)	<b>Total waste directed to disposal</b>	<b>Tonne</b>	<b>124,285.52</b>	<b>104,176.37</b>	<b>85,150.57</b>	<b>68,418.20</b>
	Total hazardous waste directed to disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Incineration (with energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Incineration (without energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Landfilling	Tonne	0.00	0.00	0.00	0.00
	• Other disposal operations	Tonne	0.00	0.00	0.00	0.00
	• Unknown disposal method	Tonne	0.00	0.00	0.00	0.00
	Total non-hazardous waste directed to disposal ( <u>Onsite</u> )	Tonne	0.00	0.00	0.00	0.00
	• Incineration (with energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Incineration (without energy recovery)	Tonne	0.00	0.00	0.00	0.00
	• Landfilling	Tonne	0.00	0.00	0.00	0.00
	• Other disposal operations	Tonne	0.00	0.00	0.00	0.00
	• Unknown disposal method	Tonne	0.00	0.00	0.00	0.00

Total hazardous waste directed to disposal ( <u>Offsite</u> )	Tonne	94,159.82	44,666.72	42,289.11	36,119.88
• Incineration (with energy recovery)	Tonne	38,967.12	18,469.41	20,507.74	17,543.00
• Incineration (without energy recovery)	Tonne	25,016.08	16,739.29	21,106.04	18,045.00
• Landfilling	Tonne	0.00	0.00	0.00	0.00
• Other disposal operations	Tonne	30,176.62	9,458.02	675.33	531.88
• Unknown disposal method	Tonne	0.00	0.00	0.00	0.00
Total non-hazardous waste directed to disposal ( <u>Offsite</u> )	Tonne	30,125.70	59,509.64	42,861.46	32,298.32
• Incineration (with energy recovery)	Tonne	1,941.08	1,879.46	3,930.23	2,189.69
• Incineration (without energy recovery)	Tonne	3,241.67	2,334.98	2,184.24	2,102.64
• Landfilling	Tonne	122.82	29.30	0.00	0.00
• Other disposal operations	Tonne	24,820.13	55,265.90	36,746.99	28,005.99
• Unknown disposal method	Tonne	21,218.46	23,917.02	20,481.57	0.00

Remarks:

- Waste to landfill from PTT's routine operations is separated from the beginning, allowing for more appropriate waste disposal methods and alignment with the Group Strategic Goal 2020 "Zero industrial waste to landfill"
- The amount of waste from non-routine operations includes waste generated from the construction of capital projects, oil and chemical spills management, and risk & crisis management.
- There is no established minimum threshold for hazardous waste reporting but all operations must report their total volume of hazardous waste sent for disposal.
- Domestic waste disposed by municipality cannot be tracked on disposal method; either landfill and/or incineration due to limited access to municipal data.
- Other recovery operations covers composting etc.
- Other disposal operations covers land reclamation, deepwell injection etc.
- In 2022, the amount of non-hazardous waste will increase. Due to construction work of the PTT GSPLM Phase II project and the RTO project.

**Energy, GHG Emissions and Methane Emissions**

**Energy**

GRI	Indicators	Unit	2020	2021	2022	2023
<b>PTT</b>						
• GRI 302-1 (2016)	<b>Total energy consumption within the organization</b>	<b>GJ</b>	<b>43,679,960</b>	<b>45,622,646</b>	<b>42,357,415</b>	<b>40,984,556</b>
	Total direct energy consumption	GJ	41,975,966	43,686,633	40,434,125	39,185,958
	• Total non-renewable fuel consumed	GJ	43,679,960	47,556,180	42,356,520	39,181,569
	• Total renewable fuel consumed	GJ	0	2,479	895	4,389
	- Solar cell	GJ	1,703,994	2,479	895	4,389
	Total indirect energy consumption	GJ	1,703,994	1,936,013	1,923,290	1,798,598
	• Electricity purchased	GJ	1,703,994	1,933,534	1,922,395	1,798,598
	Total energy sold	GJ	0	0	0	-
	• Electricity sold	GJ	0	0	0	-



PTT Group						
• GRI 302-1 (2016)	<b>Total energy consumption for PTT Group</b>	<b>GJ</b>	<b>516,860,167</b>	<b>513,029,676</b>	<b>497,283,638</b>	<b>447,555,954</b>
	Total direct energy consumption (PTT operational control)	GJ	503,172,681	499,360,062	488,366,722	438,308,582
	• Total non-renewable fuel consumed	GJ	503,172,681	499,360,062	488,366,722	447,555,954
	• Total renewable fuel consumed	GJ	-	2,479	75,170	131,799
	Total indirect energy consumption	GJ	13,687,485	13,669,614	8,916,917	9,247,373
• GRI 302-3 (2016)	<b>Direct energy intensity for PTT Group</b>					
	• Oil and gas production	GJ/mboe	212,244	220,641	159,414	206,979
	• Refinery throughput	GJ/Tonne refinery throughput	1.55	1.55	1.38	1.32
	• Petrochemical throughput	GJ/Tonne petrochemical throughput	5.77	6.03	6.13	6.68

Remarks:

- The organizational boundary of PTT Group based on the equity share approach includes all domestic subsidiaries in which PTT directly owns more than 20% of shares or indirectly owns 100% of shares.
- PTT's indirect energy consumption is including electricity purchase from grid and electricity from solar panel installation at Innovation Institutes (InI), Khanom Gas Separation Plant, Gas Transmission Pipeline Operation Offices, NGV and Wangchan Valley.
- In 2023, PTT's renewable energy consumption is increased as the solar panels have been installed at Khanom Gas Separation Plant, Gas Transmission Pipeline Operation Offices, and Wangchan Valley. PTT's indirect energy consumption is decreased as reducing of electricity purchasing that the reducing demand from energy purchasing at Rayong Gas Separation is replaced by on-site electricity generation. Because of the on-site generation, PTT 's direct energy consumption is increased.
- In 2023, the energy intensity value of oil and gas production affected by the end of the Bongkot project concession in the 1st quarter as well as the transition to a new concession to the G2/61 project.
- In 2023, the energy intensity of petrochemicals will increase. Due to the need for electricity to produce high value products of PTT Global Chemical.
- PTT Group's indirect energy consumption is including electricity purchased and electricity from solar panel at PTT, PTTEP, GC, IRPC, TOP, GPSC, PTT Tank, Enco, PTTLNG
- In 2023, additional reporting as PTT Group has expanded organization boundary to cover Envicco of GC which operates in 2023. PTT's inventory covered Wangchan Valley. PTT Group's operational boundary has expanded to G1/61 G2S and Yanada of PTTEP, GC Estate and HDPE of GC, Bakery factory Dry mix factory Café Amazon Distribution Center of PTTOR.

- .•PTTES has been closed in 2022
- In 2021, energy intensity increased as consumption from GC for high value production.
- Data in 2018-2022 are re-calculated as follows:
  - Organization boundary: in 2022, PTTEP has operated G2 and collected data from TLB, TOPSPP, TPX, LABIX by TOP and BPE, EOEG, GCL, GCME, GCMP, GCO, GCP, BPA, Phenol, GCS, ME I&II, NPS S&E, TPRC, TTT by GC, in 2021, TOP merging TP in business scope, the operational boundary has been expanded as ORP additional form GC, and GPSC has merged GLOW Group in 2019
  - Operational Boundary: additional reporting from IRPC for depot and tank farm, SGP, ENCO and Rayong office, Lab, Innovation2, and Workshop of PTT Global Chemical, IRPC's warehouse and tank, LPG cylinder, Lubricant Distribution Center from OR,
  - Activity boundary has been expanded from that power generator operation at LNG has installed and generated power on site in 2020.
- Source of the conversion factors used from DEDE, IPCC 2006, and API Compendium
- Data regarding GRI 302-2 Energy consumption outside of the organization is out of PTT sustainability reporting scope

## GHG Emissions

[Go to top](#)

GRI	Indicators	Unit	2563	2564	2565	2566
<b>PTT</b>						
	<b>Total GHG emissions within the Organization (GHG Scope 1 and GHG Scope 2)</b>	<b>Tonne CO<sub>2</sub> equivalent</b>	<b>11,353,434</b>	<b>11,725,381</b>	<b>9,988,792</b>	<b>10,127,933</b>
<ul style="list-style-type: none"> <li>• GRI 305-1 (2016)</li> <li>• GRI 305-2 (2016)</li> </ul>	<b>Total Direct GHG Scope 1</b>	<b>Tonne CO<sub>2</sub> equivalent</b>	<b>11,133,501</b>	<b>11,442,492</b>	<b>9,707,941</b>	<b>9,933,207</b>
	<b>Total Indirect GHG Scope 2</b>					
	<ul style="list-style-type: none"> <li>• GHG Scope 2 (location-based)</li> <li>• GHG Scope 2 (Market-based)</li> </ul>	Tonne CO <sub>2</sub>	207,223	234,746	224,816	183,013
		Tonne CO <sub>2</sub>	219,933	282,889	280,851	194,726
<ul style="list-style-type: none"> <li>• GRI 305-3 (2016)</li> </ul>	<b>GHG Scope 3</b>	<b>Tonne CO<sub>2</sub></b>	<b>N/A</b>	<b>74,020,821</b>	<b>70,728,078</b>	<b>73,663,595</b>
	<ul style="list-style-type: none"> <li>• Category 5: Waste generated in operations</li> </ul>	Tonne CO <sub>2</sub> equivalent	N/A	N/A	N/A	3,550
	<ul style="list-style-type: none"> <li>• Category 6: Business travel</li> </ul>	Tonne CO <sub>2</sub>	N/A	N/A	N/A	3,205
	<ul style="list-style-type: none"> <li>• Category 11: Use of sold products</li> </ul>	Tonne CO <sub>2</sub>	N/A	74,020,821	70,728,078	73,656,839
<ul style="list-style-type: none"> <li>• GRI 305-4 (2016)</li> </ul>	<b>GHG Intensity</b>					
	Direct Scope 1 GHG Intensity	Tonne CO <sub>2</sub> equivalent/ Million THB revue	N/A	N/A	N/A	37
	Indirect Scope 2 GHG Intensity	Tonne CO <sub>2</sub> equivalent/ Million THB revue	N/A	N/A	N/A	305

PTT Group						
• GRI 305-1 (2016)	GHG Scope 1					
	PTT operational control	Tonne CO <sub>2</sub> equivalent	43,474,456	47,273,998	45,386,709	40,729,570
	PTT equity share	Tonne CO <sub>2</sub>	23,701,587	27,415,019	26,403,394	25,220,032
	Biogenic CO <sub>2</sub> Emissions	million metric tons of carbon dioxide equivalent	N/A	N/A	0.004	0.007
• GRI 305-2 (2016)	GHG Scope 2					
	PTT operational control					
	• GHG Scope 2 (location-based)	Tonne CO <sub>2</sub>	1,012,071	1,115,078	650,981	862,920
	• GHG Scope 2 (Market-based)	Tonne CO <sub>2</sub>	1,318,878	1,487,244	851,936	872,930
	PTT equity share					
	• GHG Scope 2 (location-based)	Tonne CO <sub>2</sub>	N/A	N/A	N/A	N/A
	• GHG Scope 2 (Market-based)	Tonne CO <sub>2</sub>	700,456	736,258	460,758	467,663
• GRI 305-3 (2016)	GHG Scope 3		<b>116,150,201</b>	<b>113,477,070</b>	<b>132,132,928</b>	<b>135,225,236</b>
	• Category 1: Purchased Good and Service	Tonne CO <sub>2</sub>	N/A	N/A	N/A	50,111
	• Category 2: Capital Good	Tonne CO <sub>2</sub>	N/A	N/A	N/A	9,031
	• Category 3: Fuel-energy related activities	Tonne CO <sub>2</sub> equivalent	N/A	N/A	N/A	7,129
	• Category 11: Use of sold products	Tonne CO <sub>2</sub>	116,150,201	113,477,070	132,132,928	134,259,269
	• Category 12: End-of-Life Treatment of Sold Products	Tonne CO <sub>2</sub>	N/A	N/A	N/A	899,696
• GRI 305-4 (2016)	GHG Intensity					
	• Oil and gas production	Tonne CO <sub>2</sub> equivalent/Million barrel oil	38,247	40,661	33,059	27,609
	• Refinery	Tonne CO <sub>2</sub> equivalent/Ton refinery throughput	0.1441	0.1586	0.1125	0.1132
	• Petrochemical	Tonne CO <sub>2</sub> equivalent/Tonne petrochemical product	0.4423	0.4866	0.5171	0.4081

	The intensity of greenhouse gas emissions from the activities of the PTT Group, both direct and indirect (Scope 1 and 2)					
	• 'Target	kilograms of carbon dioxide equivalent per barrel of crude oil equivalent	≤ 87.6	≤ 87.6	≤ 87.6	≤ 87.6
	• 'Performance	kilograms of carbon dioxide equivalent per barrel of crude oil equivalent	85.16	92.72	82.86	84.35
	The intensity of greenhouse gas emissions from the activities of the PTT Group, including direct emissions, indirect emissions, and emissions from the combustion of fuel products sold by PTT (Scope 1, 2, and 3)					
	• 'Target	kilograms of carbon dioxide equivalent per barrel of crude oil equivalent	≤ 381	≤ 381	≤ 381	≤ 381
	• 'Performance	kilograms of carbon dioxide equivalent per barrel of crude oil equivalent	352.40	398.97	398.38	336.81

Remarks:

The organizational boundary of PTT Group based on the equity share approach which includes all domestic subsidiaries that PTT directly holds more than 20% of shares or indirectly holds 100% of shares.

- In 2023, PTT's Scope 1 emissions is increased by 3 factors as follows: 1) Increasing of production volume from previous year 2) Increasing of CO2 composition in feed gas for natural gas production process and 3) Increasing of natural gas consumption for on-site electricity generation at Rayong Gas Separation Plant to reduce electricity grid electricity purchased
- In 2023, PTT's Scope 2 emissions decreased by 3 factors as follows: 1) Decreasing of grid electricity purchased. 2) On-site solar panel installation and 3) Major turnaround of Rayong Gas Separation Plant Unit 3 (GSP3).
- In 2023 PTT Group has expanded the organization boundary to cover Envicco of GC which has operated in 2023. PTT's inventory covered Wangchan Valley. For PTT Group's operational boundary has expanded to G1/61 G2S and Yanada of PTTEP, GC Estate and HDPE of GC, Bakery factory Dry mix factory Café Amazon Distribution Center of PTTOR.
- In 2023, PTT's Scope 3 emissions is including category 11: Use of sold product from PTT's sale volume, category 5: Waste generated in operations, category 6: Business travel.
- In 2023, PTT Group's Scope 3 emissions is including category 11: Use of sold product from sale volume by PTT, GC, IRPC, TOP, and OR, category 5: Waste generated in operations, category 6: Business travel, Category 3: Fuel-energy related activities for TD&L by grid electricity purchased from outside-PTT Group suppliers, Category 12: End-of-life treatment of sold products from petrochemical products sale volume by GC and IRPC

- In 2019-2021 other indirect GHG emissions includes emissions from the combustion of fuel sold by PTT and PTTOR only.
- Direct and indirect GHG emission excludes GC's operations overseas, whose emission was expected to be at 0.32 million tons of CO2 equivalent approximately (forecasted from 2020 operational performance)
- GHG scope 2 of PTT and PTT group in 2018-2020 are re-calculated by emission factor adjust from EPPO 2021 data

Data in 2018-2022 are re-calculated as follows:

- Organization boundary: in 2022, PTTEP has operated G2 and collected data from TLB, TOPSPP, TPX, LABIX by TOP and BPE, EOEG, GCL, GCME, GCMP, GCO, GCP, BPA, Phenol, GCS, ME I&II, NPS S&E, TPRC, TTT by GC, in 2021, TOP merging TP in business scope, the operational boundary has been expanded as ORP additional form GC, and GPSC has merged GLOW Group in 2019
- Operational Boundary: additional reporting from IRPC for depot and tank farm SGP, ENCO and Rayong office, Lab, Innovation2, and Workshop of PTT Global Chemical, IRPC's warehouse and tank LPG cylinder, Lubricant Distribution Center from OR,
- Activity boundary has been expanded from power generator operation at LNG site in 2020.

- In 2021, energy intensity increases as consumption from GC for high value production
- PTTEP has been closed in 2022
- Direct scope 1 emission includes emission from greenhouse gases as required by GRI 305-1
- Indirect Scope 2 emission (location-based) of PTT includes electricity consumption from national grid. Market-based includes electricity consumption from national grid and GPSC
- Indirect Scope 2 emission (location-based) of PTT Group includes electricity consumption from national grid. Market-based includes electricity consumption from national grid and other companies
- Other indirect GHG emission (Scope 3) includes emission from the combustion of fuel sold by PTT, GC, TOP, IRPC and PTTOR
- Other indirect GHG emission (Scope 3) includes emission from waste generated in operation by PTT, PTTEP, GC, IRPC, GPSC and PTTOR
- In 2018 - 2021 Other indirect GHG emission (Scope 3) includes emission from business travel by PTT only
- Other indirect GHG emission (Scope 3) includes emission from business travel by PTT and PTTEP only
- Source of the emission factors and the global warming potential (GWP) rates used from AR6 value, IPCC
- Standards, methodologies, assumptions, and/or calculation tools used from GHG Protocol and API Compendium

1. The data coverage scope includes Thai companies in which PTT holds direct shareholdings of more than 20% and acts as a major shareholder or holds indirect shareholdings of 100%.

2. Results stemming from increased production capacity, fuel type changes resulting from cost management, and data from 2018-2020 of the PTT Group have been recalculated. This is due to the expansion of the organizational boundary in 2021, incorporating the business consolidation of Thai Oil and Thai Oil Power, the expansion of operational boundaries due to increased reporting of ORP by PTT Global Chemical, IRPC, and LPG Cylinder Songkhla of PTT Oil and Retail Business Public Company Limited, and the addition of activities involving the commencement of power generation units in LNG areas in 2020.

3. In 2022, the organizational boundary was expanded to cover the operations of companies within the PTT Group, including the operations abroad of PTT Exploration and Production, PPCL (GCPC), PTTAC, PTTMCC, HMC, GGC, GC Polyols, GC Oxirane, GC-M PTA, Glycol, TPRC, GC Treasury, GCL, GCM, GCME, Solution Creation, TTT, NPC S&E, NPCSG, GCEC of PTT Global Chemical, the operations of TLB, TPX, TOPSPP, LABIX of Thai Oil, the operations of IRPC Oil, Rakpasak of IRPC, and the operations of GHECO-One, CHPP, GLOW SPP2, GLOW SPP3, GLOW SPP11, GLOW IPP of Global Power Synergy.

4. Greenhouse gas emissions data within Scope 2, between 2018-2020, of PTT and the PTT Group have been adjusted according to the Emission Factor from EPPO 2021.

5. In 2022, the Global Warming Potential (GWP) was adjusted according to AR6 IPCC, which changed the GWP values of CH4, N2O, and the HFCs and PFCs group for calculating greenhouse gas emissions for the PTT Group.

## Methane Emissions

[Go to top](#)

GRI	Indicators	Unit	2020	2021	2022	2023
<b>PTT</b>						
	Volume of methane emitted (leakage, venting, and flaring)	m <sup>3</sup>	25,808,053	21,534,301	18,987,762	26,934,997
	Direct CH <sub>4</sub> emissions (extracted from GHG)	Tonne	17,436	14,549	12,828	18,197
• GRI 305-1 Sector standard	Volume of flared hydrocarbon	Mm <sup>3</sup>	118,880	108,938	76,440	75,671
	Volume of vented hydrocarbon	Mm <sup>3</sup>	19,630	16,932	13,363	11,125
<b>PTT Group</b>						
	Volume of methane emitted (leakage, venting, and flaring)	m <sup>3</sup>	65,664,864	75,376,218	70,446,195	74,270,474
	Direct CH <sub>4</sub> emissions (extracted from GHG)	Tonne	44,546	51,139	47,852	50,948
• GRI 305-1 Sector standard 11.1.5	Volume of flared hydrocarbon	Mm <sup>3</sup>	1,040,865	1,366,608	1,307,370	1,434,862
	Volume of vented hydrocarbon	Mm <sup>3</sup>	19,630	16,932	13,363	11,125

### Remarks:

- The volume of methane emitted includes leakage (fugitive), gas vented from processes (CO<sub>2</sub> separation and ethylene production), methane emitted from vented emissions, and flaring.
- Direct CH<sub>4</sub> emissions include those from aforementioned sources, as well as direct CH<sub>4</sub> emitted from combustion sources.
- In 2023, Direct methane emission of PTT has increased due to gas venting to flare for safety issue
- In 2023 PTT Group has expanded the organization boundary to cover Envicco of GC which has operated in 2023. PTT's inventory covered Wangchan Valley. For PTT Group's operational boundary has expanded to G1/61 G2S and Yanada of PTTEP, GC Estate and HDPE of GC, GEN Phase 4 GEN Phase 5 GSPP2 and CFB3 of GPSC, Bakery factory Dry mix factory Café Amazon Distribution Center of PTTOR.
- In 2023, PTT's CH<sub>4</sub> emission increased by 2 factors as follows: 1) Reducing of vent by managing the vent gas to flaring 2) Increasing of CH<sub>4</sub> composition in vent gas to flaring from the previous year.
- Data in 2018-2020 are re-calculated as in 2021, the organization boundary has been expanded as TOP merging TP in business scope, the operational boundary has been expanded as ORP additional form GC, depot and tank farm additional from IRPC, LPG cylinder from OR, and the activity boundary has been expanded that LNG has installed and generated power on site.
- Data in 2018-2022 are re-calculated as follows:
  - Organization boundary: in 2022, PTTEP has operated G2 and collected data from TLB, TOPSPP, TPX, LABIX by TOP and BPE, EOEG, GCL, GCME, GCMP, GCO, GCP, BPA, Phenol, GCS, ME I&II, NPS S&E, TPRC, TTT by GC, in 2021, TOP merging TP in business scope, the operational boundary has been expanded as ORP additional form GC, and GPSC has merged GLOW Group in 2019
  - Operational Boundary: additional reporting from IRPC for depot and tank farm, SGP, ENCO and Rayong office, Lab, Innovation2, and Workshop of PTT Global Chemical, IRPC's warehouse and tank, LPG cylinder, Lubricant Distribution Center from OR,
  - Activity boundary has been expanded that from power generator operation at LNG has installed and generated power on site in 2020.

## Spills

GRI	Indicators	Unit	2020	2021	2022	2023
<ul style="list-style-type: none"> <li>• GRI 306-3 (2016)</li> </ul>	<b>Oil and chemical spills</b>					
	From PTT operational boundary					
	• Number of hydrocarbon spills	Number of spills	0	0	0	0
	• Volume of hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00
	• Number of non-hydrocarbon spills	Number of spills	0	0	0	0
	• Volume of non-hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00
	From 3rd party (transportation): truck transportation					
	• Number of hydrocarbon spills	Number of spills	0	0	0	0
	• Volume of hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00
	• Number of non-hydrocarbon spills	Number of spills	0	0	0	0
	• Volume of non-hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00
	From 3rd party (transportation): ship and barge transportation					
	• Number of hydrocarbon spills	Number of spills	0	0	0	0
	• Volume of hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00
	• Number of non-hydrocarbon spills	Number of spills	0	0	0	0
	• Volume of non-hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00



Significant spill (Volume ≥ 100 barrel)						
From PTT operational boundary						
• Number of hydrocarbon spills	Number of spills	0	0	0	0	0
• Volume of hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00	0.00
• Number of non-hydrocarbon spills	Number of spills	0	0	0	0	0
• Volume of non-hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00	0.00
From 3rd party (transportation): truck transportation						
• Number of hydrocarbon spills	Number of spills	0	0.00	0.00	0.00	0.00
• Volume of hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00	0.00
• Number of non-hydrocarbon spills	Number of spills	0	0	0	0	0
• Volume of non-hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00	0.00
From 3rd party (transportation): ship and barge transportation						
• Number of hydrocarbon spills	Number of spills	0	0	0	0	0
• Volume of hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00	0.00
• Number of non-hydrocarbon spills	Number of spills	0	0	0	0	0
• Volume of non-hydrocarbon spills	m <sup>3</sup>	0.00	0.00	0.00	0.00	0.00

Remarks:

- Volume of hydrocarbon and non-hydrocarbon spills include spills which occur in operational areas, as well as those from truck and shipping transportation, that result in a volume of more than 1 barrel of oil spilled to the environment. In spill cases, PTT executes spill response procedures to control spills within the shortest time possible in order to minimize widespread environmental impacts, for instance, with the use of booms and skimmers.

## Environmental Management

GRI	Indicators	Unit	2020	2021	2022	2023
-	<b>Environmental Policy/Management System</b>					
	Capital investments	THB Million	6	170	133	184
	Operating expenses	THB Million	323	289	311	308
	Total expenses (Capital Investment + Operating Expense)	THB Million	329	459	443	492
	Savings, cost avoidance, income, tax incentives, etc.	THB Million	42	205	512	312
	Operations covered (by revenue, production volume, or employees, etc.)	%	100	100	100	100
GRI 2-27	<b>Environmental Violations (significant instances of non-compliance)</b>					
	Number of violations of legal obligations/regulations	Case	0	0	0	0
	Amount of fines/penalties related to the above	Baht	0	0	0	0
	Environmental liability accrued at year end	Baht	0	0	0	0

**Remarks:**

- Environmental investment refers to investment made to gain environmental assets, specifically for PTT
- Since 2016, PTT improved the methodologies for completeness and to be in accordance with the Environmental Management Accounting Procedures and Principles developed by the United Nations. Return on environmental investment calculation was improved by including the projects registered under PTT's Productivity Improvement Circle Programs.
- Eventhough PTT's and Oil Retail Business' assets have been separated since July 1st, 2018; environmentally-related assets has increased compares to 2017. In 2018, PTT worked to raise investment for implementation of Selective Catalyst Reduction (SCR) type NOx emission reduction system at Waste Heat Recovery Unit (WHRU) of Gas Separation Plan No. 5, and was able to raised more.
- In 2019, PTT has deveoped e-Expense system, enabling more comprehensive collection of corporate envionrmental expenditure. PTT is also investing in 'Regenerative Thal Oxidizer (ROT) type remover of hydrogen sulfide contaminantin acaidic gaseous by-product' and 'SO2 Scrubber' of Natural gas Separation Plan No.5, Rayong.'
- In 2019, there were some revisions in expense, avoidable cost and corporate income tax from 288 million baht to 298 million baht.
- In 2021, environmental investment increased from the installation of sewage pipe system in Wangchan valley area, Rayong.
- Describe how it has determined significant instances of non-compliance

