

Business units			Refinery Business					M-Tower and Reginal office					Marketing Business					
Indicators	Material Aspects	Unit	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	
GRI305-1 (scope 1)	Reports according to Operational Control Approach	Total Direct GHG emission (SCOPE 1)																
		Total Direct GHG emission (SCOPE 1)	tCO2e	972,926.23	900,682.85	898,292.02	885,619.47	820,901.52	-	-	-	-	478.63	-	-	-	509.72	580.53
		- CO2	tCO2e	972,011.56	899,954.62	897,562.70	883,796.95	819,065.76	-	-	-	-	468.15	-	-	-	499.21	485.38
		- Biogenic CO2	tCO2e	40.21	52.25	31.42	28.04	5.39	-	-	-	-	64.76	-	-	-	53.61	90.71
		- CH4 and Fugitive CH4	tCO2e	385.06	328.77	331.11	1,435.77	1,471.65	-	-	-	-	-	-	-	-	-	-
		- *CH4 and Fugitive CH4 emission (DJSI's disclosure requirements)	tons	15.40	13.15	13.24	57.43	58.87	-	-	-	-	-	-	-	-	-	-
		- CH4	tCO2e	385.06	328.77	331.11	322.84	307.50	-	-	-	-	0.68	-	-	-	0.67	86.12
		- *CH4 emission (DJSI's disclosure requirements)	tons	15.40	13.15	13.24	12.91	12.30	-	-	-	-	0.03	-	-	-	0.03	3.44
		- Fugitive CH4	tCO2e	-	-	-	1,112.93	1,164.15	-	-	-	-	-	-	-	-	-	-
		* Fugitive CH4 had been reported with CH4 since 2020. In 2021, fugitive CH4 and CH4 are separately reported for data transparency.	tCO2e	-	-	-	1,112.93	1,164.15	-	-	-	-	-	-	-	-	-	-
- N2O	tCO2e	529.61	399.46	398.10	386.66	364.08	-	-	-	-	9.80	-	-	-	9.65	9.04		
- Other Biogenic (CH4 & N2O)	tCO2e	-	-	0.11	0.10	0.02	-	-	-	-	-	-	-	-	0.19	-		
GRI305-2 (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 )	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	591.33	8,716.48	13,070.61	13,655.24	11,927.39	11,609.19
		Total Indirect GHG emission from power and biogas purchased (SCOPE 2 ) (Gross location-based scope 2 GHG emissions)	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	591.33	8,716.48	13,070.61	13,655.24	11,927.39	11,609.19
		- CO2	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	585.86	8,716.48	13,070.61	13,655.24	11,927.39	11,501.83
		- Biogenic CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- CH4	tCO2e	-	-	-	-	-	-	-	-	-	1.80	-	-	-	-	35.41
		- N2O	tCO2e	-	-	-	-	-	-	-	-	-	3.67	-	-	-	-	71.95
		- Other Biogenic (CH4 & N2O)	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total Indirect GHG emission from power and biogas purchased (SCOPE 2 ) (Gross market-based scope 2 GHG emissions)	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Biogenic CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Scope 1+2		Total GHG emissions (SCOPE 1+2)	tCO2e	987,764.23	914,812.22	909,042.43	892,436.44	826,650.86	-	-	-	-	1,069.96	8,716.48	13,070.61	13,655.24	12,437.11	12,189.72



1. The report of direct and indirect GHG emissions data are calculated by using the BCP GHGs calculation tool in accordance with IPCC 2006
2. The calculation of scope 1 GHG emissions uses emission factor values from IPCC 2006 and API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry 2009
3. The calculation of scope 2 GHG emissions from electricity consumption uses 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 Gases includes in the calculation are CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O.
7. GHGs Intensity is calculated from Scope 1 and Scope 2 GHG emissions only.