

Task Force on Climate Related Financial Disclosure

In 2017, the Financial Stability Board established the Task Force on Climate Related Financial Disclosure (TCFD) to provide companies with a set of recommendations for effective climate related financial disclosures.

The TCFD recommendations require disclosure of qualitative and quantitative information on four key elements (Governance, Strategy, Risk-management, and Metrics & targets). HMEL fully supports the recommendations by TCFD and has reported on its climate-related financial disclosures in accordance with the framework.

Governance

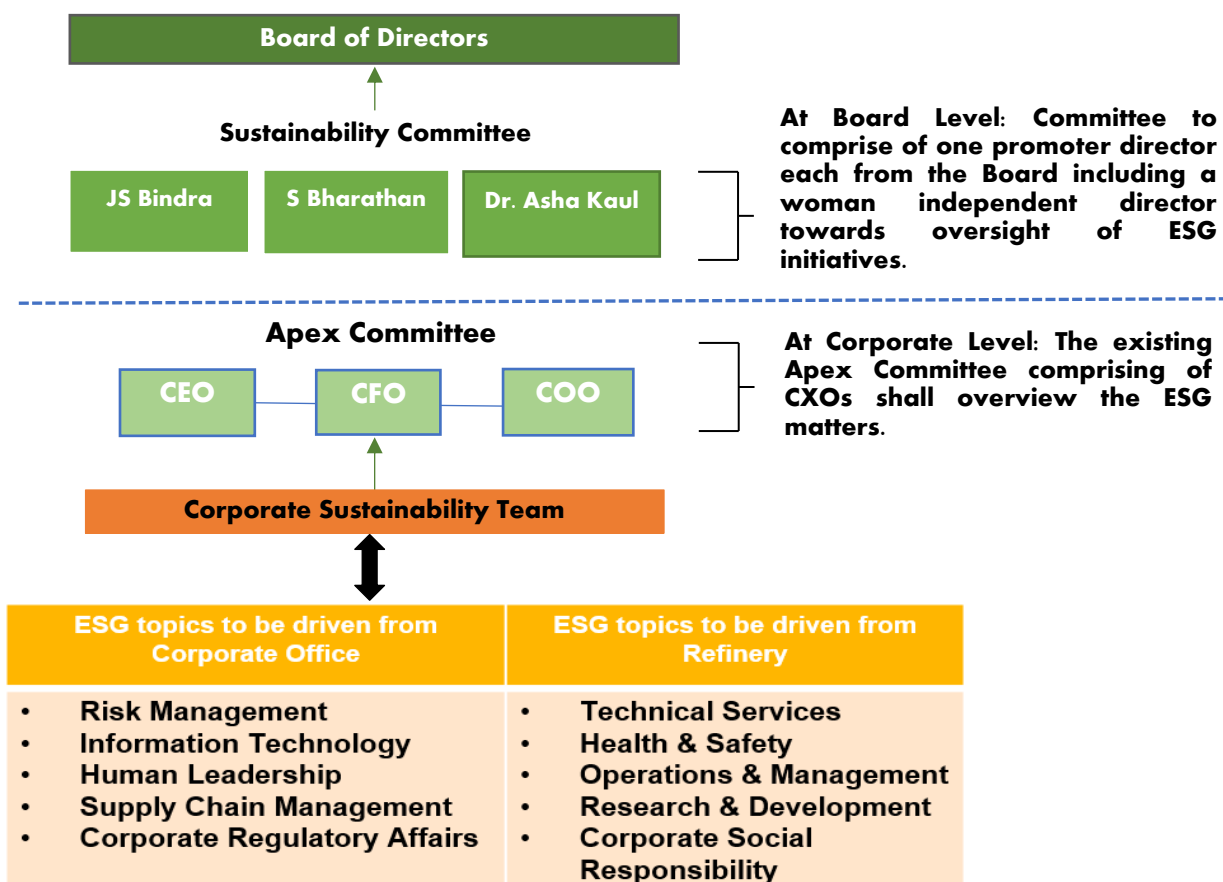
Q1. Describe the Board's oversight of climate-related risks and opportunities.

HMEL has formed a Board-Level Sub-committee which is responsible for all Environment, Social and Governance (ESG) related matters relevant to the company, including climate-change-related risks and opportunities.

The Sustainability Committee comprises of three Board members including one promotor Director and one female Independent Director. The Committee examines the Group-level sustainability frameworks, policies, norms, and recommendations. The sustainability committee meets quarterly. It examines and makes recommendations to the Board regarding the sufficiency of reporting on sustainability opportunities, risks and issues in the Sustainability Report and other relevant public documents. It shares its recommendations with the Board regarding sustainability opportunities and risks,

Furthermore, HMEL has formed a new department within the organization – “Sustainability and New Energy” to further enhance its commitment to ESG.

Q2. Describe management's role in assessing and managing climate-related risks and opportunities.



Strategy

Q1. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

Q2. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

Q3. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

This year, HMEL undertook the exercise of identifying climate-related risks which will have an impact on its facilities and assets in the short and long run. Risks were classified as physical and transition risk basis the TCFD Recommendations. These risks were identified using globally recognized databases as described below:

- **Acute Risk:** [Think Hazard tool](#) was used for assessing acute physical risks. It is a web-based tool developed and maintained by the Global Facility for Disaster Reduction and Recovery (GFDRR) and has been adopted into World Bank Operations Portal for core use in project planning. The tool provides an overview of the climate hazards that should be considered when designing and implementing projects to increase disaster and climate resilience for a specific place. The tool categorizes the probability that certain natural hazards will have an impact on project regions as extremely low, low, medium, and high. The information about the climate risk indicators was collected from the [IPCC data](#) (Data from intergovernmental panel on climate change), Climate portal (CCKP) published by World Bank Group and from academic studies. Global data on the climate's past, present, and future vulnerabilities and effects are available via the Climate Change Knowledge Portal (CCKP). Additionally, databases such as [World Resource Institute \(WRI\) Water Risk Atlas](#), [World Wildlife Fund \(WWF\) water risk filter](#) were also considered to analyze geographical risks.
- **Chronic Risk:** Projections from [CMIP](#) climate model were considered for chronic risk analysis for the assets. It provides climate projections supporting climate science. Two warming scenarios were considered for analyzing the data for this category: RCP2.6 and RCP8.5.
- **Transition Risks¹:** Task Force on Climate-related Financial Disclosures Report recommends using scenarios developed by the International Energy Agency (IEA) or Network for Greening the Financial System (NGFS). HMEL has considered near to [Net Zero Emissions by 2050 Scenario](#) (NZE)- and [STEPS \(Stated policy scenario\) Scenario](#) for evaluating transition risks.

In line with TCFD recommendations, HMEL has considered following scenarios to identify and understand present and future risks.

	Physical Risk	Transition Risk
Scenario	IPCC's Representative Concentration Pathway <ul style="list-style-type: none">• RCP 2.6 presents the "peak" scenario which means the radiative forcing level reaches 3.1 W/m² by mid-century but returns to 2.6 W/m² by 2100. RCP 2.6 scenario <2°C temperature (i.e., 1°C temperature) rise by the end of the century due to global efforts to reduce emissions.	International Energy Agency's <ul style="list-style-type: none">• The Net Zero Emissions by 2050 Scenario (NZE) is a normative IEA scenario that shows a pathway for the global energy sector to achieve net zero CO₂ emissions by 2050, with advanced economies reaching net zero emissions in advance of others.

¹ Other Sources: <https://www.oecd.org/tax/tax-policy/carbon-pricing-india.pdf>
<https://pib.gov.in/PressReleasePage.aspx?PRID=1705772>
<https://www.iea.org/policies/17006-national-policy-on-biofuels-2022-amendment>
<https://www.india.gov.in/spotlight/national-green-hydrogen-mission#:~:text=The%20National%20Green%20Hydrogen%20Mission,Green%20Hydrogen%20and%20its%20derivatives>

	<ul style="list-style-type: none"> RCP8.5 being extreme scenario represents business as-usual approach, 3.7°C temperature rise by the end of the century due to minimal to no effort to reduce emissions. 	<ul style="list-style-type: none"> STEPS (Stated policy scenario) Scenario - Global temperature continue to rise. Temperature rise reaches 2°C by 2050 and 2.6°C by 2100
Time Horizon	Present day and 2050	Present day and 2050

Further, HMEL has evaluated possible impacts based on how climate induced risks affect its manpower, operations, and supply chain. These identified risks are monitored basis the following time horizons- Short term (up to 5 years), Medium (5-10 years) and long term (over 10 years)

Physical Risk

Risk Type	Risk Description	Possible Impact	Time-Horizon	Mitigation Measures
Acute Risk	Cyclone and flooding: Coastal regions are the most vulnerable to cyclonic storms, high winds, and flash flooding. In June 2023, Cyclone Biparjoy made a landfall in Kutch district of Gujarat causing high rainfall and high wind speed in July this year. HMEL's Crude oil port at Mundra lies in Kutch district and is at risk.	<ul style="list-style-type: none"> Fuel or power supply delays or interruptions. Damage to roads, bridges, and rail crossings etc. Movement restriction of key staff. Impact on staff health and well-being Damage to structural elements leading to operations shutdown. Damage to Single Point mooring system (SPM) and its associated infrastructure. Increased risk of an oil spill leading to damages. Sinking of storage tanks and flooding of the internal plant drainage systems, increasing the risk of a fire threat. Interruptions and delays to the delivery and distribution system. Financial Impact: The financial implications will range from medium to high due to the infrastructural damage caused and investments required to enhance resilience. 	Short, medium, and long term	<ul style="list-style-type: none"> HMEL has Standard Operating Procedures and emergency plan in place. Employees and workers are directed to stay inside the plant premise where accommodation, food and other facilities are made available. To mitigate impact of power disruption, HMEL tops up crude oil tank at its Bhatinda refinery. The company is also looking at increasing its crude oil storage capacity at Bhatinda Plant. Maintenance crafts take shelter near the port and are provided with adequate fuel, water, and food. HMEL ensures that storage tanks are not empty in order to avoid floating of tanks. HMEL is exploring the feasibility of using bio-remedial agents for combating oil spill. HMEL is exploring the feasibility of adding power backup for the pumping stations at the port

Chronic Risk	<p>Heat stress: Heatwave might be a risk in the future as the number of days for heat stress may increase with rising temperature.</p>	<ul style="list-style-type: none"> • Workers may experience heat rash, heat cramps, heat exhaustion, and potentially fatal heatstroke. • Higher out-migration among workers • Higher cost of operations and maintenance • Widening gender gap as heat exposure adds to the health and productivity risks faced by pregnant women. • Increased turnaround time for transportation of materials impacting the downstream distribution network. • Higher water demand in the region leading to water scarcity and unrest in local communities. • Financial Impact: The financial implications will range from low to medium depending on the severity of heat stress days. 	Medium, and long term	<ul style="list-style-type: none"> • Isotonic drinks are provided for all workforce on heat-affected days. • Night shifts for construction related activities. • Ensuring sufficient manpower-during heat-affected days. • Loading and unloading of products can be planned during night-time. • HMEL is working on measures such as climate adapted clothing for its workers. • Development of an emergency plan in the event of heatwave.
	<p>Water scarcity: The likelihood of water stress and water depletion are extremely high for HMEL facilities especially its Refinery at Bhatinda.</p>	<ul style="list-style-type: none"> • Non-availability of water for a long period may result in plant shutdown. • Labor migration and higher attrition rate • Greater competition for water leading to water conflict with local communities. • Financial Impact: The financial implications will range from medium to high because of impact on production due to water unavailability and cost of building infrastructure to tap alternate sources of water. 	Short, medium, and long term	<ul style="list-style-type: none"> • Several water efficiency and recycling measures have been undertaken to reduce consumption of freshwater. • HMEL has capacity to store water to meet its operational needs for 14-16 days. It is also exploring the feasibility of increasing water storage capacity. • HMEL is planning to install floating solar photovoltaic panels over water reservoirs to reduce evaporation losses.

Transition Risk

Risk Type	Risk Description	Possible Impact	Time-Horizon	Mitigation Measure
Market	Oil demand is expected to peak in India in mid-2030s and decline after 2040. Crude oil price is also projected to increase till 2040 and then decline.	<ul style="list-style-type: none"> Reduced sales. Reduced revenue. 	Long term	<ul style="list-style-type: none"> Diversification of product portfolio through investments in petrochemicals.
Policy	Carbon Tax Policies: Carbon taxes are projected to be in place in all regions, globally.	<ul style="list-style-type: none"> Increase in operational costs 	Medium to Long term	<ul style="list-style-type: none"> Investments in low carbon technologies. Purchase of carbon offsets
	Requirement to adopt circular economy initiatives in production		Short, Medium, and Long term	<ul style="list-style-type: none"> Exploring circular economy initiatives such as biofuels and sustainable aviation fuel.
Technology	Low carbon energy generation: India has set a target of meeting 50% of energy requirements from renewables by 2030.	<ul style="list-style-type: none"> Increase in capital investment 	Short, Medium, and Long term	<ul style="list-style-type: none"> Product portfolio diversification to include renewables. Commitment to the research on renewable technologies and green business Exploring opportunities to invest in Green Hydrogen projects.
	Transition to Biofuels: India's "National Policy on Biofuels" is aimed at reducing the import of petroleum products by fostering domestic biofuel production.			
	Green hydrogen: Global hydrogen use is expected to expand from less than 90 Mt in 2020 to more than 200 Mt in 2030; The proportion hydrogen in the global energy mix rises from 10% in 2020 to 70% in 2030. In India, the Union Cabinet approved the National Green Hydrogen Mission in 2022 which has the objective of development of the green hydrogen production capacity of at least 5 MMT (Million Metric Ton) per annum with an associated renewable energy			

	capacity addition of about 125 GW in the country by 2030.			
	Effect of shift to electric vehicles			
Reputational	Shareholder and investor preferences: Consumers and investors are increasingly prioritizing sustainability and environmental responsibility. Large private actors have also increased their clean energy ambitions.	<ul style="list-style-type: none"> • Impact on investor funding • Impact on Company reputation and brand image • Impact on stakeholder relationships 	Short, Medium, and Long term	<ul style="list-style-type: none"> • HMEL is transparent in its ESG disclosures and has undertaken targets as part of its decarbonization journey.

Risk Management

Q1. Describe the organization's processes for identifying and assessing climate-related risks.

HMEL has adopted a multistep process to analyze the impacts of climate-related risks under scenarios in present day and 2050, to facilitate medium to long term business planning.

Scenario review and selection:

- HMEL reviewed climate scenarios drawing from existing reference scenarios published by various organisations: e.g., IEA, NGFS, IPCC and Peers.
- Climate scenarios and timeframes which are most appropriate for HMEL were finalized.
- Stakeholder discussions were conducted to understand the past risks faced by HMEL and their impacts so far.

Assess climate risks:

- Global climate databases were used to identify risks relevant for HMEL.
- Stakeholder discussions/workshops were conducted to shortlist the physical and transition risks relevant for HMEL.
- High level assessment was conducted to understand the magnitude of risks and opportunities, including financial impacts on a few key risks.
- Various recommendations were proposed, discussed, and finalized focusing on mitigating climate risks and impacts.

Reporting and Disclosure:

- The identified risks and related mitigation efforts were disclosed in line with the requirements of TCFD recommendations.

Q2. Describe the organization's processes for managing climate-related risks.

Q3. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.

At HMEL, climate related risks are fully integrated with its risk management framework. The company has an Apex Committee which also manages climate related risks. The Committee is chaired by the CEO and comprises of CXOs and Senior Executives. The Apex Committee examines the details of the risk assessments conducted by management and assures compliance with applicable requirements. The Apex Committee oversees risks at the management level, evaluates the success of risk management operations, and reviews mitigation plans on a regular basis. In addition, the Chief Risk Officer (CRO) is assigned to coordinate all enterprise-level risk initiatives and deliver frequent briefings to the Board, Apex Committee, and Audit Committee.

Metrics and Targets

Q1. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.

The Metrics used by the organization is as given under the Intellectual, Manufactured and Natural Capital sections in the Annual Integrated Report for FY 2022-23.

Q2. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks

HMEL has calculated its GHG metrics based on the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard.

The Greenhouse Gas Protocol is a global framework developed by World Resource Institute and World Business Council for Sustainable Development which helps organizations to account for and manage their GHG emissions. With its first edition released in 2001, it is now one of the most widely used standards globally. The protocol provides reporting standards, calculation tools, trainings, and guidance for businesses to measure their GHG emissions along with other resources on Scope 3 guidance, Product Life Cycle Standard etc.

Metrics	Unit	2022-23
Total Scope 1 emissions	Million tCO ₂ e	4.29
Total Scope 2 emissions	Million tCO ₂ e	0.13
Total Scope 1 & 2 emissions	Million tCO ₂ e	4.42

The company is also in the process of incorporating Scope 3 emissions calculations into its current GHG inventory.

Q3. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

HMEL's ESG mission focuses on reducing the company-wide environmental footprint. It had set targets last year in FY 2022 on climate change related parameters and will report on its progress year on year.

Environment Targets

KPI	Aspirations	Target Year	Progress in FY 2022-23
Renewable energy	10% of the total energy mix to be constituted by renewables	2027	In progress: 0.3% of energy mix is constituted by renewables
GHG Emissions	15% reduction in GHG emissions	2027	In progress: 1.7% reduction in the current year*
Energy efficiency	Follow the PAT targets given by the Bureau of Efficiency, Government of India to achieve MBN	YoY	Achieved: MBN Target was 58.43 and our MBN was 56.60.
Environmental management policy	Publish environmental management policy of the company on the company website	YoY	Achieved
Waste recycling & Generation	To achieve the ERP targets as given by the Government of India	YoY	Achieved: 70%

Water consumption	20% reduction in withdrawal of freshwater use per unit of crude processed	2027	FY21-22: 1.32 m3/MT of Crude FY22-23: 1.95 m3/MT of Crude** Waste-water recycling improved (sour water generation reduced by diverting water to DCU instead of ETP). Steam requirement for the ref reduced ultimately saving on energy and water. Kindly refer to Water management strategy section for more information
Focus on ESG	Impact of R&D investment on ESG should be clearly delineated	2023	Applied 3 patents on process improvement & optimizations. Implemented ~300kWh solar power plants at township to reduce the Scope 2 emissions
	Increase R&D spending to 5% of EBITDA and measure the impact on financial indicators	YoY	FY22-23 R&D expenses increased more than 100% y-o-y
	100% integration of ESG risks in capital allocation decisions - SOPs for investment appraisals and decisions need to be framed and incorporated in material ESG risks	2024	In progress We are currently in process of incorporating ESG risks in capital allocation decision
	Sustainability-targets to be linked to annual remuneration for functional heads and management committee	YoY	Achieved The targets are currently included in our KRA
Reporting	Undertake TCFD assessment and disclose findings annually	2024	Achieved

*Note: We have recorded an ~8.5% reduction in carbon emissions intensity in the current fiscal year. Since Petrochemical complex is under commissioning; hence data has been recorded only for Refinery.

**The increase in consumption is attributed to the commissioning activities of the petrochemical complex. Further, the baseline consumption for the complex, encompassing both the refinery and the petrochemical complex, can only be accurately determined once the complex operates at its full potential, which is expected from FY23-24.

Our Emission reduction Roadmap

To achieve our emission reduction targets, we have formulated a Net Zero roadmap which will provide a comprehensive view of our decarbonization journey and will help guide our efforts and investments in the right direction.

HMEL is working towards employing clean technologies and energy-efficient practices, such as sourcing electricity from renewable sources to mitigate its overall carbon footprint. HMEL has achieved a substantial increase in renewable energy consumption, soaring from 2014 MWh to 3803 MWh, this fiscal year. The company has completed over 30 energy and fuel-efficient projects and are exploring opportunities in ethanol, green chemicals, green hydrogen, and solar energy.

Our Water Management Strategy

HMEL prioritizes mindful consumption and responsible disposal of water used across its operations. The company recycles 100% of its wastewater through sewage treatment plants and effluent treatment plants. The recycled water is then used for horticulture purpose, in utilities and in cooling towers thereby reducing its dependence on freshwater use.

Our water management strategy is based on these pillars:

Efficient management of wastewater

By recycling 100% of its wastewater through sewage treatment plants and effluent treatment plants, HMEL protects local water sources and the environment from pollutants and contamination.

Investing in water conservation projects

Installation of community- based wastewater treatment plant in Phulokhari village in Bhatinda, shows HMEL's commitment in investing in long-term water projects that aims to enhance water quality.

To ensure mindful consumption of water, HMEL has undertaken several initiatives to improve water efficiency across its operations like employing Karnal technology for irrigation and projects on steam conversion. As part of community led initiatives, HMEL has constructed community-based wastewater treatment plant in Phulokhari village in Bhatinda.

Apart from the existing measures, HMEL is also planning to undertake following initiatives to achieve its target of 20% reduction in withdrawal of freshwater use per unit of crude processed.

- Installation of floating solar photovoltaic panels over water reservoirs to reduce evaporation losses.
- Use robotic arm technology to remove silt from water reservoirs.

Abbreviations

CCKP: Climate Change Knowledge Portal

CEO: Chief Executive Officer

CFO: Chief Financial Officer

CMIP: Coupled Model Intercomparison Project

COO: Chief Operating Officer

CRO: Chief Risk Officer

CXO: Chief Experience Officer

ESG: Environment, Social and Governance

GFDRR: Global Facility for Disaster Reduction and Recovery

GHG: Greenhouse gas

IEA: International Energy Agency

IPCC: Intergovernmental Panel on Climate Change

MBN: Million British Thermal Unit per Thousand barrels per Energy Factor

NGFS: Network for Greening the Financial System

NZE: Net Zero Emissions by 2050 scenario

PAT: Perform, Achieve and Trade scheme

RCP: Representative Concentration Pathway

STEPS: Stated Policies Scenario

TCFD: Task Force on Climate-Related Financial Disclosures

WRI: World Resources Institute

WWF: World Wildlife Fund