

## ENVIRONMENT

# Powering a Greener Future

We explore opportunities to collaborate and contribute to climate and nature-based solutions, which helped to build new revenue streams, improve productivity and process efficiencies, mitigate risks and conserve resources. By continuously seeking opportunities to minimize our carbon footprint, investing in renewable energy, supporting environmental causes through our employee volunteering programs and CSR interventions, BPCL continues to deliver on its climate and nature commitments.

## MATERIAL TOPICS LINKED



Efficient Water  
Risk Management



Energy Use  
and Transition



Managing & Minimizing  
Environmental Impact

## Performance Snapshot

**100%<sup>1</sup>**

Energy Efficient Lighting (EEL) at Mumbai Refinery, Bina Refinery, Pipelines, Retail, LPG, Aviation SBUs

**4.40%**

Share of renewable energy in total electricity consumed by BPCL in operating locations

**8.64 MMTCO<sub>2</sub>e**

Reduction in GHG Emissions

**10,198 TKL**

Wastewater recycled

**640 TKL**

Rainwater harvested

**4,891 MT**

Plastic disposal under EPR

**Zero waste to landfill**

Certification for all operating marketing and refinery locations<sup>2</sup>

**90,387 MT**

Hazardous waste reused

<sup>1</sup> Other locations have planned to achieve this target by 2025.

<sup>2</sup> Kochi Refinery is expected to be certified by September 2024.

## Achieving Net Zero (2040)

The urgency to act on climate change has never been more critical. Failure to act now could potentially lead to significant adverse impacts that will disrupt businesses and their supply chains. We are committed to being part of the solution and continue collaborating with our stakeholders on climate and nature positive actions.

BPCL has set a target to become Net Zero for its Scope 1 and Scope 2 Greenhouse Gas (GHG) emissions by 2040 in line with India's goal to become Net Zero by 2070. We have carried out a detailed study of all our business units and identified various short-term and long-term levers to reduce emissions in order to achieve Net Zero targets. Renewable Energy (RE) has been identified as one of the key thrust areas and we are trying to increase our usage of renewable sources to meet our in-house energy requirements.

### Net Zero Levers

#### EFFICIENCY

To enhance furnace efficiency at our refineries, we manage steam traps to minimize steam loss, and implement waste heat recovery systems for 10% of total emissions abatement in refineries. For non-operational areas, emission reductions are achieved through end-of-life replacement of pumps and machinery, and operational changes such as installing occupancy sensors and reducing power usage.

#### RENEWABLE ENERGY

Replacing brown energy sources and captive power plants with RE can contribute around 25% of BPCL's total emissions abatement. An Inter-State Transmission System (ISTS) hybrid solution combining solar and wind energy has been devised for refineries to achieve 80-85% capacity utilization. By 2040, we plan for 2.50 GW of RE, supported by 3.30 GW solar and 5.50 GW wind capacity.

## GREEN HYDROGEN

We are planning to replace existing Steam Methane Reforming Process (SMR) in Mumbai and Bina refineries with Green Hydrogen, contributing around 15% of total emissions abatement. Our Mumbai refinery will have a 270 MW set-up, generating approximately 40 KT/annum of Green Hydrogen, while Bina refinery will have an 840 MW set-up producing about 90 KT/annum. The Kochi refinery will use Blue Hydrogen, generated through carbon capture augmentation.

## BIO-CNG

We have developed Bio-CNG, derived from biogenic feedstocks to replace fuel oil and natural gas in the refineries. Bio-CNG is expected to account for approximately 30% of the total emissions abatement. We plan to establish 200-220 mid-sized plants to inject about 1.30 MMT of Bio-CNG annually into the City Gas Distribution (CGD) network by 2040.

## CARBON CAPTURE, UTILIZATION AND STORAGE (CCUS)

CCUS technologies that capture, transport, utilize, and store CO<sub>2</sub> emissions are expected to contribute around 25% of total emissions abatement. CCUS aims to capture approximately 4.20 MMT/PA CO<sub>2</sub> across refineries. The cost of carbon capture varies with CO<sub>2</sub> concentration in refinery streams, based on market attractiveness and technical feasibility.

## OFFSETS

We procure offsets from Indian registries or generate them through projects such as afforestation, renewable energy, community initiatives, and waste-to-energy programs. The decision to generate or procure offsets will depend on operational considerations, the development of carbon markets, and the avoidance of greenwashing perceptions.



# Environment

## Driving Sustainable Mobility



**20.77** MTCO<sub>2</sub>e/crore (₹) revenue from operations  
Scope (1 and 2) Emission Intensity

**299.36** MTCO<sub>2</sub>e/crore (₹) revenue from operations  
Scope 3 Emission Intensity

We consistently oversee and assess our GHG emissions footprint at various sites and transparently disclose information on our emissions and emission reduction initiatives. By adopting the operational control approach in our GHG accounting methodology, we account for 100% of GHG emissions from our operational facilities within India, including Scope 1 (direct emissions), Scope 2 (indirect emissions), and Scope 3 (other emissions).

### SETTING UP OF 2G BIO-ETHANOL PLANT



We are constructing a plant in Bargarh, Odisha which would produce 2<sup>nd</sup> Generation (2G) Bio-Ethanol and 1<sup>st</sup> Generation (1G) Bio-Ethanol from agricultural waste (rice straw) and surplus/damaged rice grain respectively. BPCL is the coordinator and leader for Ethanol in the industry and we play a big part in contributing to the Ethanol Blended Petrol Program of the Government. The increasing use of biofuels in India will improve farmers' income, reduce imports, generate

**1.10** lakh MTCO<sub>2</sub>e/year  
Expected total emission reduction

## Energy Management



**₹ 1,299.58** crore  
Capex in renewable energy projects sanctioned in FY 2023-24

**126.90** thousand TJ  
Energy consumed

Energy efficiency is a key priority for us at BPCL and our efforts in this regard are driven by our environmental goals and the potential for cost reduction at our refineries. Our strategic emphasis on energy resource management and increasing shift to sustainable energy sources play a crucial role in our long-term value creation. By optimizing energy use, adopting renewables and moving towards cleaner sources, we ensure environmental sustainability, drive cost savings boost competitiveness and position the Company for future growth. Energy Conservation (ENCON) schemes introduced in all three BPCL refineries have significantly reduced their specific energy consumption.

### SPECIFIC ENERGY CONSUMPTION (IN MBN)

#### Bina

FY 2023-24	66.00
FY 2022-23	67.20

~1.82% ▼

#### Mumbai

FY 2023-24	60.90
FY 2022-23	62.70

~2.87% ▼

#### Kochi

FY 2023-24	62.60
FY 2022-23	63.90

~2.03% ▼

▼ decrease

### PROMOTING ENERGY TRANSITION THROUGH INNOVATION

The RE business unit is advancing BPCL's clean energy goals. Our aim is to diversify the Company's energy mix with greener options and to evolve into an integrated energy company. A capital outlay of ₹ 1,299.58 crore was allocated for projects sanctioned in FY 2023-24.

#### Sanctioned Projects

- Ground mounted solar project at Prayagraj, UP
- Windfarm projects in Madhya Pradesh and Maharashtra
- Integrated Green Hydrogen Plant and Hydrogen Refueling Station in Kochi, Kerala



## Environment

### Water Management

**34,685 TKL**

Total water consumed

Water plays a vital role across BPCL's operations, supporting refining processes and cooling systems. Effective water management enhances our ability to create value for our stakeholders by reducing environmental impact, lowering costs, increasing productivity and managing risks related to water scarcity and regulations. Through a strategic approach, we optimize production, enhance efficiency and bolster BPCL's financial performance. To further bolster our water management strategy, we have continuously invested in and worked towards increasing the Rainwater Harvesting (RWH) capacity, thus reducing our dependence on water sources.

**640 TKL**

Rainwater harvested



**13.49 lakh sqm**

Rainwater harvesting catchment area 12.89% y-o-y increase

### Biodiversity Management

**1,60,000 trees**

Planted in FY 2023-24

**23,600 MTCO<sub>2</sub>e**

Total carbon sequestered

BPCL is actively mitigating climate change through extensive tree planting initiatives, minimizing environmental impact as a strategy to preserve biodiversity. Planting trees helps increase carbon sequestration and improves air quality apart from conserving biodiversity. In FY 2023-24, we planted over 1,60,000 trees using the Miyawaki Technique, Seed Bombing, and conventional methods to enhance green cover and biodiversity. Our cumulative total now exceeds 1.05 million trees across BPCL sites, increasing CO<sub>2</sub> sinks by sequestering 23,600 MTCO<sub>2</sub>e. Bina Refinery and the Madhya Pradesh State Forest Department signed an MoU to develop a 90-hectare green belt at Kanjia range, Khurai, Vanmandal North Sagar, MP, with a total investment of ₹ 1.96 crore over 5 years, starting in July 2024.



### Waste Management

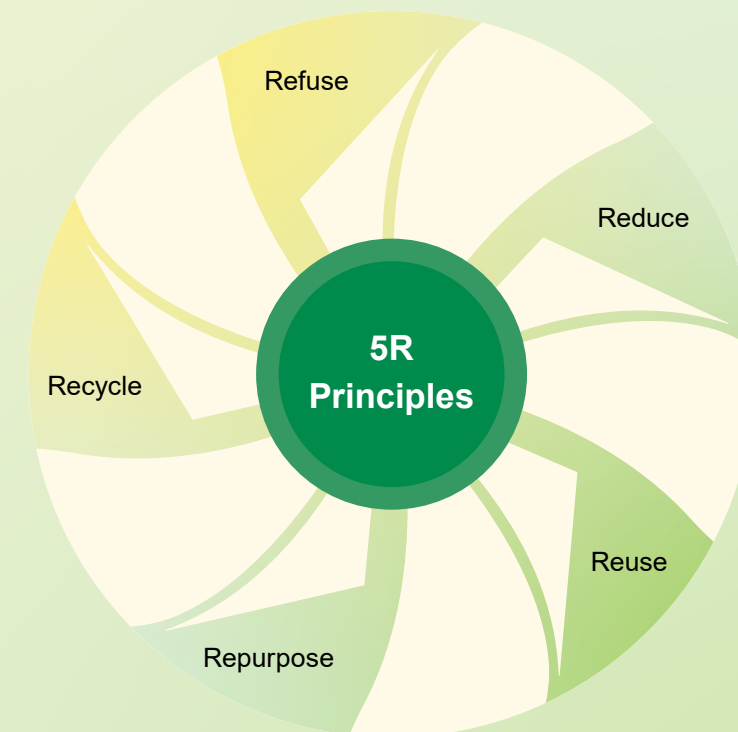


**1,15,862 MT**

Hazardous waste recycled

**4,891 MT**

of plastic waste collected and reprocessed through BPCL's Lubes business unit under EPR as Brand owner



At BPCL, we adhere to the 5R principles (Refuse, Reduce, Reuse, Repurpose, and Recycle) across all operations. We prioritize efficient waste management to minimize environmental impact, identifying, segregating, recycling and ethically disposing of operational waste. We ensure responsible disposal of hazardous waste like spent clay or residues containing oil, employing safe landfilling methods facilitated by Treatment, Storage, and Disposal Facilities (TSDF). Hazardous and non-hazardous waste undergo treatment and reuse in compliance with the set regulations of the Ministry of Environment, Forest and Climate Change, Central Pollution Control Board and the State Pollution Control Board. We are dedicated to earning 'Zero Waste to Landfill' certification for all our refineries and marketing locations, and for Kochi Refinery by September 2024.