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# Green Finance Practices in the Indian Oil & Gas Industry: A Comparative Analysis of BPCL and ONGC

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**ABSTRACT:** This study presents a comparative analysis of green finance practices adopted by two leading Indian public sector enterprises in the oil and gas industry—Bharat Petroleum Corporation Limited (BPCL) and Oil and Natural Gas Corporation Limited (ONGC)—during the financial years 2023–24 and 2024–25. Green finance, encompassing investments in renewable energy, carbon reduction technologies, and sustainable infrastructure, plays a pivotal role in enabling the energy transition and achieving national climate Objectives. The study employs a descriptive and analytical methodology using secondary data sourced from annual reports, sustainability disclosures, industry portals, and news publications. Findings reveal that BPCL is strategically focused on long-term energy diversification through Project Aspire, emphasizing renewable energy, green hydrogen, and EV infrastructure. ONGC, on the other hand, has pursued aggressive green expansion through acquisitions such as Ayana Renewable Power and PTC Energy, supported by significant capital outlays. While both companies have committed to net-zero emission targets and enhanced ESG integration, their approaches differ in scale, strategy, and execution. This comparative assessment highlights the importance of tailored green finance strategies in India's public energy sector and underscores the growing role of sustainable investment in shaping the country's low-carbon future.

**KEYWORDS:** Green Finance, Sustainable Disclosures, Oil and Gas sector, Green Bonds, ESG Integration.

## I. INTRODUCTION

**Green finance** Green finance (GF) refers to financial activities such as investments, loans, bonds, and insurance that are specifically targeted at supporting environmental sustainability and addressing climate change. Furthermore, it is regarded as the allocation of capital to projects and initiatives that deliver environmental benefits, particularly in the areas of clean energy, pollution reduction, climate adaptation, and natural resource conservation [1]. Green finance is all about avoiding promotion of any business or activity that could be harmful to the environment now or future generations. Environmentally sustainable projects encompass a broad range of initiatives aimed at reducing environmental impact and promoting ecological balance. One key area is the production of energy from renewable sources, including solar power, wind energy, and biogas, which significantly reduce dependence on fossil fuels and help mitigate climate change. Another vital component is waste management, which involves not only the proper collection and disposal of waste but also advanced methods such as waste-to-energy conversion and recycling, enabling the recovery of valuable resources while minimizing landfill use. Clean transportation is also a major focus, involving the adoption of vehicles and systems that produce lower greenhouse gas emissions, such as electric vehicles and alternative fuels, thereby contributing to improved air quality and reduced carbon footprints. Additionally, energy-efficient infrastructure projects, like green buildings, efficient lighting and HVAC (Heating, Ventilation, and Air Conditioning) systems and renewable energy integration to minimize energy consumption. Collectively, these initiatives form the foundation of environmentally sustainable development and support the global transition toward a greener and more resilient future. The oil and gas (O&G) sector is a cornerstone of India's energy economy but is also a significant contributor to environmental degradation. As climate change gains urgency, companies are increasingly adopting green finance practices to balance profitability with sustainability. Green finance serves as a key enabler in transitioning the sector towards low-carbon operations. Public sector enterprises such as BPCL and ONGC have integrated environmental, social, and governance (ESG) principles into their core strategies to attract sustainable investment and comply with evolving regulatory frameworks [2], [3].



## **II. LITERATURE SURVEY**

Green finance led the environmentally responsible investment into the Global Energy sector to align financial flows with sustainable development goals. According to the United Nations Environment Programme [1], green finance involves financial flow into sustainable development projects that encourage the development of a more sustainable economy. KPMG [2] emphasizes that environmental, social, and governance (ESG) integration in oil firms is essential for long-term risk management and regulatory compliance. The World Bank [3] highlights that green bonds, climate-linked loans, and blended finance instruments are vital tools to fund cleaner technologies in fossil fuel-based industries.

In India, green finance is gaining momentum due to regulatory push from institutions like SEBI and the Reserve Bank of India (RBI). The RBI's 2021 discussion paper on climate risk [4] highlights the need for sector-specific green lending guidelines. Chatterjee & Mukherjee [5] analyzed India's ESG investment landscape and observed that state-owned enterprises (SOEs) like ONGC and BPCL have started adopting climate disclosures under BRSR (Business Responsibility and Sustainability Reporting), though their approaches vary significantly

Ghosh & Patel [6] stated that ONGC adopted green finance practices but they are often compliance-driven, with limited innovation in financial instruments. Studies like Rao et al. [7] highlight BPCL's growing emphasis on ESG metrics, voluntary disclosure practices, and alignment with the Sustainable Development Goals (SDGs). Unlike ONGC, BPCL's initiatives show stronger integration between financial performance and environmental responsibility. Singh & Verma [8] conducted a benchmarking analysis of ESG performance in ONGC and BPCL, concluding that while both companies are progressing, BPCL demonstrates greater agility and innovation, whereas ONGC benefits from scale and policy alignment.

This review highlights the need for firm-level comparative analyses, especially in terms of quantifying green finance impact, to better understand how public sector oil companies in India are navigating the energy transition.

## **III. METHODOLOGY**

### **1.Objectives**

The primary objective of the present study is to compare Green Finance practices adopted by BPCL and ONGC companies. However, study is further guided by following sub-objectives.

1. To assess the adoption of green finance practices by BPCL and ONGC.
2. To evaluate the effectiveness of ESG integration in both companies.
3. To compare their sustainability performance and climate-related financial initiatives.

### **2.Methodology:**

The present study is descriptive and analytical in nature. Two public sector giant companies, BPCL and ONGC, were selected to compare and contrast the Green finance initiatives and strategies adopted to reduce carbon footprints and increase the use of renewable energies such as solar and wind by venturing into environmentally sustainable investments. The study is based on Secondary data collected from annual and sustainability reports and Official Websites of company and Industry portals. Data was also collected from magazines and newspapers like Economic Times, Financial Express, PSU Watch, Fortune India, and Reuters. A convenient sampling technique is used to select the sample. The present study is limited to Green finance initiatives undertaken in the Oil and Gas sector with special reference to BPCL and ONGC only.

## **IV. ANALYSIS**

### **1.Green finance and Energy Transition Strategies at BPCL**

In the following section, Green Finance practices adopted by Bharat Petroleum Corporation limited (BPCL) in FY 2023–24 and FY 2024–25 are compared and evaluated. BPCL demonstrated significant progress in its energy transition through both quantitative metrics and qualitative strategies. The company recorded a 12% reduction in greenhouse gas (GHG) emissions intensity, bringing it down to 0.22 tCO<sub>2</sub> per metric ton of throughput in FY 2023, and further reduced its total emissions by 8.64 million tonnes of CO<sub>2</sub> equivalent in FY 2024 (CRISIL). It also expanded renewable energy capacity from 62.3 MW in FY 2023 to 94.9 MW in FY 2024, with renewables accounting for about 4.5% of total

energy consumption in FY 2023. The company wants to achieve 2 GW of renewable energy capacity by 2025 and scale this to 10 GW by 2035 (Reuters).

To support this transition, BPCL launched its “Project Aspire” strategy and approximately ₹1 lakh crore (~\$1.2 billion) for green energy investments such as renewable power, green hydrogen, compressed biogas (CBG), carbon capture, utilization and storage (CCUS), and carbon offsets, as part of a larger ₹1.7 lakh crore capex plan (GreentechLead). Specific capital allocations during FY 2023–24 included ₹1,000 crore for two 50 MW captive wind farms in Maharashtra and Madhya Pradesh, and ₹300 crore for a 72 MW solar project in Prayagraj, Uttar Pradesh (The CSR Journal, GreentechLead). To reduce the pollution, BPCL encouraging petrol and Ethanol blending, which rose to 11.7%, totaling approximately 166 crore litres blended into conventional fuel. Over 4,200 retail outlets were upgraded to supply E20 fuel (Dzambhala). Sales of CBG increased substantially from 2,600 tonnes to 6,526 tonnes, supported by eight plants, including a municipal solid waste-based facility in Kochi that processes nearly 150 tonnes per day (TPD) of municipal waste and produces about 6 TPD of CBG (Scribd). Meanwhile, BPCL’s EV charging stations expanded from 3,100 to a planned 7,000 stations, of which about 900 being fast-charging units located along major highways (GreentechLead).

BPCL is committed to sustainability with a roadmap to achieve net-zero Scope 1 and Scope 2 emissions by 2040, in alignment with India's national decarbonization goals (Dzambhala). The company’s emission abatement strategy includes a diversified portfolio: bio-CNG (29%), renewable energy (20%), CCUS (19%), green hydrogen (14%), energy efficiency (9%), and carbon offsets (9%) (Newsmantra).

BPCL has a joint venture with **Sembcorp Green Hydrogen India** in 2025 to develop green hydrogen, renewables, green ammonia, and decarbonization infrastructure for ports and bunkering operations (Reuters). The company has several clean energy installations, including a 5 MW green hydrogen electrolyzer at the Bina refinery, a 14 MW solar installation (possibly at Bina or Mumbai) and 150 TPD feed biomethanation plant in Kochi (Capital Market). BPCL was ranked 8th globally in the Oil & Gas sector on the Dow Jones Sustainability Index (DJSI) for 2023–24 (GreentechLead). The company is committed to its CSR and ESG efforts by planting 160,000 trees, promoting circular economy initiatives such as plastic recycling. In FY 2024, it allocated ₹315.7 crore to CSR activities, with ₹158.2 crore spent on initiatives that benefited over 7.1 million people through interventions in water conservation, healthcare, education, and community development. BPCL is **transitioning steadily** from a traditional refiner to a diversified energy company investing in renewable energy, biofuels, green hydrogen, CCUS, and EV infrastructure.

**Table :1 BPCL green finance Initiatives – A Comparision**

Metric/ Initiative	FY 2023–24	FY 2024–25
GHG Intensity Reduction	0.22 tCO <sub>2</sub> /MT throughput (12% y-o-y)	8.64 MMT CO <sub>2</sub> e decrease
Renewable Capacity Installed	62.3 MW (4.5% of total energy consumption)	94.9 MW (Target: 2 GW by 2025)
Ethanol Blending	166 crore Ltrs, 11.7%	(1G+2G) Ethanol plant started in 2025 in Odisha (200 KLPD)
Compressed Biogas (CBG) Sales	~6,526 tonnes via ~8 plants	5 MW green hydrogen at Bina and hydrogen fueling at kochi
EV Charging Stations	3,100 installed (expandable to 7,000)	3,100 installed and planning to expand 7000 of which 900 being fast charging stations (JV with TATA motors)
Green Energy Capex	₹1,000 crore (wind) + ₹300 crore (solar)	₹1,300 cr in RE; ₹10,000 cr earmarked over next 5 yrs (Rs. 1.70 lakh crore Project Aspire strategy)
Net-Zero Target	Scope 1 & 2 by 2040	Scope 1 & 2 by 2040

**Source:** BPCL’s Annual and Sustainability Reports

## 2.ONGC Green Initiatives and Energy transition strategies

In the following section, Green Finance practices implemented by Oil and Natural Gas Corporation (ONGC) in FY 2023–24 and FY 2024-25 are presented. These practices can be categorized as different strategies, namely capital investment in Renewable energy, CDM projects, reduction in GHG emissions, installation of LED lighting, investment in decarbonization mechanisms, and acquisition of renewable energy projects. One of the core achievements was the continued expansion of its **Clean Development Mechanism (CDM)** portfolio. In FY 2024-25 ONGC had successfully registered 15 CDM projects with the United Nations Framework Convention on Climate Change (UNFCCC) under the Kyoto Protocol. These projects represent substantial contributions toward global emission mitigation efforts, collectively generating approximately **2.1 million Certified Emission Reductions (CERs)** annually. Further, company continues the verification and renewal of existing projects and is pursuing **new CDM registrations**. ONGC intends to spend up to ₹3,500 crore in FY 2024-25 to expand renewable energy generation capacity as part of its target of achieving 10 GW by 2030. A large share of the green budget used to setup 1 GW of renewable project equally split between solar and wind by the end of FY2024-25 with investment of Rs. Rs1000 crores. Among the most notable investments was the acquisition of **Ayana Renewable Power** through a **50:50** joint venture with **ONGC Tripura Power Company (ONGPL)**. The deal, valued at ₹19,500 crore (approximately USD 2.3 billion), added around **4.1 GW** of operational and under-construction solar and wind assets to ONGC's portfolio. In another strategic move, **ONGC Green Ltd** acquired **PTC Energy** for **₹925 crore**, which brought in **288 MW** of wind capacity spread across three Indian states. To support these transactions, ONGC infused approximately **₹3,300 crore** in equity into **ONGPL**, demonstrating strong financial backing for its green expansion.

In terms of direct emissions management, ONGC reported **8.897 million metric tonnes (MMT)** of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) under Scope 1 and Scope 2 emissions, reflecting a **2.66%** reduction in FY 2023-24 over previous year. The company has a target to achieve net-zero emissions for Scope-1 and 2 by **2038** with continued GHG emission reduction around 2% to 3% in FY 2024-25 consistent with prior years' pace. Through its **fugitive methane leak surveys** at Hazira, Uran, and multiple assets, prevented **~20.48 million standard cubic meters (MMSCM)** methane emissions, equivalent to **~306,250 tCO<sub>2</sub>e** mitigation.

ONGC had an installed capacity of renewable energy of around **189.5 MW** as of 31 March 2023 (36.5 MW from solar energy and 153 MW from wind installations) with the extensive implementation of **LED lighting retrofits** across ONGC's operations. The company signed an MoU with IOCL to use CO<sub>2</sub> captured at Koyali refinery for **CO<sub>2</sub>-based Enhanced Oil Recovery (EOR)** in Gandhar field with a potential to sequester 5–6 million tCO<sub>2</sub> by 2040. ONGC's operations were integrated with technological innovations by deploying **Micro Turbines** (e.g. 65 kW units) at remote sites to generate captive power and reduce gas flaring. It also implemented **Dynamic Gas Blending (DGB)** technology on several drilling rigs, achieving up to **45% high-speed diesel (HSD)** savings and lowered emissions.

The company long-term decarbonization roadmap of **₹2 lakh crore (~USD 24 billion)** includes:

- **₹97,000 crore by 2030** for adding **5 GW of renewables**, launching green hydrogen and ammonia projects, biogas infrastructure, pumped hydro storage, offshore wind farms, and CCUS initiatives.
- **₹65,500 crore by 2035** to scale up hydrogen production, carbon capture, and long-duration energy storage systems.
- **₹38,000 crore by 2038** to fund incremental projects, including **another 1 GW of offshore wind and solar capacity**.

A notable new venture in FY 2024–25 is the signing of an MoU with **EverEnviro**, aimed at setting up **10 Compressed Biogas (CBG) plants** across India. This project supports ONGC's vision of diversifying its clean energy mix and contributing to the circular carbon economy.

**Table 2: ONGC's Green Initiatives -A Comparison**

Initiative Area	FY 2023-24	FY 2024-25
Renewable Energy Portfolio	~189.5 MW (36.5 MW solar + 153 MW wind)	Expanded via ~1 GW planned plus Ayana (~4.1 GW) and PTC Energy (288 MW)
Capex on Renewables	Not separately stated	₹3,500 crore plan; ONGC Green sub-capex ₹1,000 crore; large acquisitions
CDM Projects & CERs	15 CDM projects, yielding ~2.1 M CERs/year	CDM projects continuing; no new count published yet
GHG Emissions (Scope-1 & 2)	8.897 MMT CO <sub>2</sub> e; -2.66% YoY reduction	Ongoing measurement; trajectory toward net-zero by 2038
Methane Mitigation (GMI)	Surveys prevented ~306,250 tCO <sub>2</sub> e	Continuing; no new quantitative update publicly reported
LED Retrofit	Installed 4,344 LEDs; total ~355,344 units	Likely ongoing but not specifically quantified for FY25
CCUS / CO <sub>2</sub> -EOR	MoU with IOCL; sequestration goal 5–6 Mt by 2040	Initiative ongoing; future scale part of long-term roadmap
Technology Adoption: Micro-Turbines, DGB	Active deployment in multiple rigs/sites	Likely ongoing; not newly quantified in FY 25 disclosures
Biogas & Green Fuels (new)	Conceptual planning stage	JV for 10 CBG plants signed in FY 25
Total Strategic Capex Commitment (through 2038)	~₹1 trillion by 2030 designated	~₹2 lakh crore earmarked for complete decarbonisation

### 3. Comparative Analysis of BPCL and ONGC: Green Finance Impact and Energy Transition Strategies

India's public sector oil companies, Bharat Petroleum Corporation Limited (BPCL) and Oil and Natural Gas Corporation Limited (ONGC), are increasingly investing in green finance and energy transition to meet national and international climate commitments. This comparative analysis focuses on evaluating the green capital expenditure (CapEx), renewable energy initiatives, emissions mitigation, and strategic investments made by BPCL and ONGC during FY 2024–25 along with qualitative and strategic insights.



Table -3: Green Finance Practices at BPCL and ONGC -A Comparision in FY 2024-25

Company	BPCL	ONGC
Installed Renewables (MW)	94.9 MW (Target: 2 GW by 2025)	Expanded via ~1 GW planned plus Ayana (~4.1 GW) and PTC Energy (288 MW)
2023–24 Green Capex	₹1,300 cr in RE; ₹10,000 cr earmarked over next 5 yrs (Rs. 1.70 lakh crore Project Aspire strategy)	₹3,500 crore plan; ONGC Green sub-capex ₹1,000 crore; large acquisitions
Long-term RE Target	10 GW by 2035	10 GW by 2030
Ethanol / CBG	(1G+2G) Ethanol plant started in 2025 in Odisha (200 KLPD)	JV for 10 CBG plants signed in FY 25
EV Charging	3,100 stations → 7,000 stations	Not primary focus yet
Net Zero Emission goal	Scope 1 & 2 by 2040	Net Zero by 2038
Notable Highlights	Strong DJSI ranking; Project Aspire	Acquired Ayana, PTC Energy for scale
Green Bonds	Planned, not issued	Under consideration

Source: Annual Reports and Sustainability Reports of BPCL & ONGC

Table : 4 Comparison of Strategic and Qualitative Insights at BPCL and HPCL

Factor	BPCL	ONGC
Strategic Vision	10 GW RE by 2040	Hydrogen, CCUS, offshore wind
Partnerships	Allox, BARC	NTPC, HPCL, IOCL
Employee Training	1,200 trained on ESG	2,300 trained in ESG & finance
Board Oversight	Sustainability Committee	CSR & ESG under Board
Strategic Focus	Retail solar, biofuels, hydrogen	Asset acquisition, RE scale-up
Sustainability Reporting	BRSR aligned with SEBI	GRI + BRSR framework

## V. CONCLUSION

- ONGC is more aggressive in FY 2024–25 in both capital deployment and RE capacity expansion.
- BPCL maintains strong forward-looking commitments, with investments in hydrogen, EV infrastructure, and alternative fuels.
- ONGC has green energy expansion through acquisitions and joint ventures, while BPCL is organically building green projects.

Both BPCL and ONGC are navigating the energy transition with distinct approaches. While ONGC's green strategies highlight immediate RE asset growth through acquisitions, BPCL's strategy reflects a gradual but broad-based clean energy transition. Moving forward, both firms are expected to utilize green finance instruments such as Green bonds more effectively and make meaningful contributions to India's net-zero goals. Their collective efforts will be crucial in achieving India's decarbonization targets and positioning the country as a leader in energy transition within the Global South.

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