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ABSTRACT

State-Owned Multinational Enterprises (SOMNEs) occupy a unique space in the global economy, intertwining the public mandate of state ownership with the competitive demands of international markets. This paper explores the dualistic identity of SOMNEs by examining two oil and gas giants, India's Oil and Natural Gas Corporation (ONGC) and China's China National Petroleum Corporation (CNPC) through the FESPET framework. The study evaluates how these enterprises reconcile socio-political goals with commercial practices across six dimensions: Finance, Environmental, Social, Political Economy, and Technology. The findings underscore how SOMNEs are shaped by the institutional environments and policy objectives of their home countries.

INTRODUCTION

The petroleum sector remains a foundational pillar of the global economy, underpinning key areas such as energy supply, industrial growth, and cross-border trade (Salimovna, 2024). Accounting for more than half of the world's energy consumption, oil and gas continue to play a central role in ensuring economic resilience and supporting geopolitical strategies (Salimovna, 2024; Abdullah & Meri, 2019). While renewable alternatives are gradually gaining prominence, the fossil fuel industry continues to attract substantial investment aimed at improving technological efficiency and minimizing environmental damage (Salimovna, 2024; Ebrahimi & Bagheri, 2021).

This research undertakes a comparative analysis of two prominent state-owned multinational enterprises (SOMNEs) in the oil and gas sector—China National Petroleum Corporation (CNPC) and Oil and Natural Gas Corporation (ONGC) of India. The selection of these two firms is grounded in their shared identity as flagship energy enterprises from large emerging economies, as well as their contrasting institutional, political, and strategic environments. While both companies operate within state ownership frameworks and are vital to their respective countries' energy security agendas, their international expansion strategies, governance structures and engagement with sustainability goals differ significantly.

The rationale behind this comparative case study is twofold. First, CNPC and ONGC both represent archetypal examples of SOMNEs that have expanded globally while remaining anchored in domestic developmental mandates. Comparing them enables an exploration of how state ownership interacts with multinational behaviour under divergent political economies. CNPC, backed by China's centralized authoritarian governance model, is deeply embedded in the state's geopolitical ambitions such as the Belt and Road Initiative. ONGC, meanwhile, operates within India's democratic institutional structure and a more decentralized governance landscape. The juxtaposition offers a rich field to examine how these different state systems shape the strategic behaviour of SOMNEs.

Second, by analysing firms from different geopolitical, regulatory and economic contexts, this study seeks to identify whether the behaviour of SOMNEs abroad is primarily shaped by their public ownership or do they act like private firms when they go abroad. This approach, rather than comparing firms within a single country or region, provides broader insights into

the role of political oversight, financial autonomy, social accountability and technological orientation in defining SOMNE behaviour in international markets.

The objective is not merely to observe differences in organizational behaviour, but to understand the degree to which SOMNEs preserve their public mission while acting as global economic actors. This includes analysing whether profitability and market share are pursued in ways aligned with national policy priorities or whether these firms diverge from their original mandates in pursuit of commercial logic. Such a framework is especially important in the energy sector, where strategic resources intersect with global politics, climate responsibilities and development goals.

METHODOLOGY

The FESPET grid has been formulated to enumerate State Owned Enterprise's operations as multinationals in five specific areas: Finance, Environment, Society, Political Economy and Technology, the acronym being formed with the first letter of these words (Clifton and Fuentes 2023).

- (a) Financial priorities distinctly set apart private firms and state-owned enterprises (SOEs). While private entities primarily aim to boost profits and expand their market presence, SOEs are more focused on fulfilling government-mandated objectives. In such enterprises, financial performance often takes a back seat to broader developmental or policy-driven goals.
- (b) State-owned firms typically integrate environmental concerns into their strategic framework and often highlight them prominently in their reports. In contrast, while private companies comply with environmental laws, their commitment is usually aligned with profitability, ensuring that eco-friendly practices do not compromise financial outcomes.
- (c) SOEs often engage in socially driven initiatives, including operating in underserved regions or undertaking projects that lack immediate profitability but serve the public good. Private corporations might support such efforts too, provided these actions do not interfere with their commercial performance.
- (d) In the realm of political economy, SOEs are expected to prioritize both domestic and foreign policy objectives of the state, even if these conflict with their financial interests. On the other hand, private firms are not obligated to comply with state directives unless legally required.
- (e) Governments may direct SOEs to invest in advanced technologies or innovate production methods as part of national industrial strategies. Private companies may also pursue such advancements, but typically only if they ensure a positive return on investment and do not strain the company's finances.

In essence, an SOMNE mirrors a private enterprise when public interest and governmental priorities override market-driven objectives. Conversely, it behaves more like a private corporation when profitability takes center stage.

THE TWO COMPANIES AND THEIR ORIGINS

7 China National Petroleum Corporation (CNPC), headquartered in China, ranks as the third largest oil firm globally and holds a prominent position within the country's petroleum sector. It possesses a diversified portfolio of oil and gas assets spanning over 30 nations across regions including Africa, Central Asia-Russia, the Americas, the Middle East, the AsiaPacific and others.

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CNPC's origins date back to 1949, when the Fuel Industry Ministry was formed by the Chinese government to regulate national energy policy. In early 1952, the Chief Petroleum Administration Bureau emerged as a specialized department within the ministry to focus on oil exploration and production. This structure was reformed in July 1955 with the creation of the Ministry of Petroleum. Between 1955 and 1969, China discovered major oilfields in regions like Qinghai, Bohai Bay, the Songliao Basin and Heilongjiang—particularly the significant Daqing oilfield. On 17 September 1988, as part of institutional restructuring, the Ministry of Petroleum was dissolved and CNPC was founded as a state-owned enterprise to centralize petroleum operations. In a push towards market liberalization, PetroChina was carved out in November 1999 as CNPC's publicly traded arm. It subsequently launched on several international stock exchanges: the NYSE and the Hong Kong Stock Exchange in April 2000, and the Shanghai Stock Exchange in November 2007 (with its NYSE listing later withdrawn in September 2022).

CNPC's governance structure merges traditional corporate management with substantial political oversight. The Leading Party Group plays a central role in embedding the Chinese Communist Party's (CPC) ideology within the company's operations, ensuring alignment with state policies. This mechanism translates directives from the CPC such as those articulated at the 20th Party Congress and in Xi Jinping Thought into actionable strategies at CNPC, especially concerning national energy security, sustainability, and social stability. This exemplifies how CNPC is leveraged as a political instrument, in contrast to the independent profit-maximizing nature of private multinational firms.

Operationally, CNPC performed robustly in the fiscal year 2023-2024. It recorded a total revenue of 3,160.8 billion RMB yuan, with pre-tax profits at 288.0 billion RMB yuan and net profits reaching 195.1 billion RMB yuan. The company produced 184.35 million metric tons (mmt) of crude oil out of which 105.80 mmt was sourced domestically and 78.55 mmt from overseas equity ventures. Natural gas output totalled 184.62 billion cubic meters (bcm), with domestic production contributing 152.90 bcm.

In refining and petrochemicals, CNPC maintained a crude refining capacity of 247.89 mmt and processed 227.02 mmt, of which 190.15 mmt was refined within China. Major outputs included 123.21 mmt of refined petroleum products, 2.24 mmt of lubricants and 8.00 mmt of ethylene. On the marketing front, refined product sales reached 186.14 mmt, with domestic sales accounting for 123.62 mmt. Additionally, the firm operated 22,755 service stations across China and sold 229.91 bcm of natural gas within the domestic market.

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Oil and Natural Gas Corporation (ONGC) stands as India's leading state-run multinational entity in the energy domain, contributing around 71% of the country's crude oil and nearly 84% of its natural gas production. Before independence, India's petroleum industry was

minimal, comprising only two firms in separate regions. The Assam Oil Company operated in the northeast, extracting crude from the Digboi oilfield discovered in 1889, while the Attock Oil Company functioned in the northwest of undivided India. At the time, the majority of India's sedimentary basins were viewed as geologically unfit for petroleum development. After independence in 1947, the Indian government acknowledged the critical role of hydrocarbons in supporting industrialization and national energy security. This recognition was reflected in the Industrial Policy Statement of 1948 which identified petroleum development as a strategic national priority.

Between 1947 and 1955, private firms played a dominant role in India's oil exploration efforts. The Assam Oil Company continued drilling in Digboi, while Oil India Limited—then a joint venture between Burmah Oil and the Indian government—explored fields like Naharkatiya and Moran in Assam. Meanwhile, the Indo-Stanvac Petroleum collaboration, involving Standard Vacuum Oil Company, focused on West Bengal. However, significant portions of India's hydrocarbon potential remained unexplored during this period.

To accelerate development, the government established the Oil and Natural Gas Directorate in 1955 under the Ministry of Natural Resources. That year, Minister K.D. Malviya led a study tour to countries such as the U.S., Romania, the Soviet Union, and West Germany to gather insights and build domestic expertise. This culminated in the formulation of a structured exploration strategy under the Second Five-Year Plan (1956–61). Furthermore, the Industrial Policy Resolution of 1956 identified petroleum as a core sector, bringing it fully under state control (ONGC India).

In order to enhance administrative capacity, the Directorate was transformed into the Oil and Natural Gas Commission (ONGC) in 1956, affording it expanded autonomy. In 1959, Parliament passed legislation granting ONGC statutory status, authorizing it to develop, regulate and manage India's petroleum resources. Between 1961 and 1990, ONGC significantly advanced the upstream sector, unearthing new reserves in Assam, Gujarat's Cambay Basin, and India's offshore zones. A pivotal achievement occurred in the 1970s with the discovery of the Mumbai High oilfield, which became a cornerstone of India's oil output. By the early 1990s, ONGC had not only secured self-sufficiency in exploration and production but also initiated international operations through its overseas subsidiary, ONGC Videsh Ltd. (OVL).

Following India's economic reforms in 1991, ONGC underwent corporatization in 1994. This period saw partial disinvestment and collaborative ventures with major Indian firms such as Indian Oil Corporation (IOC) and Gas Authority of India Limited (GAIL). In 2003, ONGC diversified into downstream operations by acquiring Mangalore Refinery and Petrochemicals Ltd. (MRPL).

ONGC's technological achievements have garnered international acclaim. By 2014, it was ranked as Asia's fifth-largest energy enterprise and had secured U.S. patents for several innovations. Strategic decisions such as acquiring a controlling stake in Hindustan Petroleum Corporation Limited (HPCL) in 2018 and launching ₹83,000 crore worth of investments across 25 projects in 2019 further underscored its long-term commitment to national energy security.

Over the course of more than six decades, ONGC has been instrumental in discovering eight out of India's nine oil-producing basins, from the Cambay Basin in 1958 to the Vindhyan Basin in 2022. With a global presence in 27 countries and a contribution of around 75% to domestic energy output, ONGC continues to fulfil its dual role of ensuring national energy security while sustaining commercial viability. It is now expanding into emerging domains such as deepwater drilling and renewable energy exploration.

In fiscal year 2023-24, ONGC's total crude oil production was 21.139 million metric tonnes (MMT), with 17.366 MMT produced from nomination blocks and 3.773 MMT from joint venture (JV) and new exploration licensing policy (NELP) blocks. Offshore crude oil production contributed 13.659 MMT, while onshore production was 7.480 MMT. Natural gas production totaled 20.648 billion cubic metres (BCM), of which offshore production was 15.398 BCM and onshore was 5.250 BCM. Gas sales amounted to 17.911 BCM. Production of value-added products (VAP) stood at 2.616 MMT. ONGC also processed 25.588 MMT of oil and gas through its plants. During the year, the company completed 78 seismic surveys covering 10,112 line-kilometres in 2D and 30,452 square kilometres in 3D. A total of 47 new hydrocarbon discoveries were made, comprising 30 in onshore and 17 in offshore areas.

GOING INTERNATIONAL

The global expansion of the China National Petroleum Corporation (CNPC) is a critical pillar of China's broader "Go Global" strategy, formally launched in the late 1990s. This state-led campaign, reinforced under the Belt and Road Initiative (BRI) since 2013, has aimed to transform national champions into globally competitive enterprises while simultaneously securing long-term access to vital energy resources. As a central state-owned enterprise (SOE), CNPC has functioned not only as a commercial actor but also as a diplomatic and strategic tool of the Chinese state. Its overseas operations align closely with national goals related to energy security, geopolitical influence and supply chain integration (Taylor, 2021; Shchelokova et al., 2022).

Between 2000 and 2020, CNPC's overseas investments expanded dramatically, with a presence established in more than 30 countries across Central Asia, the Middle East, Africa, and Latin America. The company has operated some of the largest projects in Sudan, Iraq, Kazakhstan, Venezuela, and Russia. In Iraq alone, CNPC has invested in the Rumaila, Halfaya and Al-Ahdab oilfields, helping increase the country's crude output by over 1 million barrels per day (BP, 2020). In Kazakhstan, CNPC holds controlling interests in key upstream and midstream assets, including the Aktobe and PetroKazakhstan projects and co-owns the Atasu-Alashankou oil pipeline, a critical corridor connecting Kazakh oil to western China.

The firm's presence in Africa is also substantial. In Sudan and South Sudan, CNPC was a lead investor in the Greater Nile Petroleum Operating Company (GNPOC) and despite civil conflict, continued to operate with backing from Chinese diplomatic channels. In Chad, despite being fined \$1.2 billion for environmental violations in 2014, CNPC negotiated a reduced settlement and retained access to key upstream and export infrastructure (Global Times, 2014).

In recent years, CNPC's international strategy has been recalibrated in response to rising geopolitical tensions, sanctions and financial scrutiny. For instance, in 2019, PetroChina was

removed from the Norwegian Government Pension Fund's portfolio due to alleged links with human rights violations in Myanmar. Furthermore, U.S. sanctions on Venezuela and Iran have complicated CNPC's operations, leading to a strategic pullback from high-risk jurisdictions and greater emphasis on stabilizing domestic output and reinforcing low-carbon and gas-based energy assets (Guo et al., 2023).

From a financial perspective, CNPC has benefited from access to state-backed financing through institutions like the China Development Bank, enabling multi-billion-dollar investments in risk-heavy environments without the constraints faced by private multinationals. This state-capitalist model, while effective in enabling rapid expansion, has also exposed the firm to challenges related to over-leveraging, operational opacity and public resistance in host countries.

34 In contrast, India's overseas energy diplomacy is embodied by ONGC Videsh Limited (OVL), the wholly owned foreign investment arm of ONGC. Created in 1965 but substantially internationalized post-1991 liberalization, OVL functions as a public sector multinational entrusted with acquiring and managing India's global upstream oil and gas assets. It plays a critical role in India's strategy of diversifying energy sources and reducing dependency on Middle Eastern imports (Chaudhury, 2011).

25 18 As of 2019-20, OVL maintained Participating Interests in 35 oil and gas projects across 15 countries, spanning regions such as South America, Central Asia, the Middle East, Africa, and Southeast Asia. This includes key stakes in Russia's Sakhalin-I and Vankor fields, the Rovuma offshore gas block in Mozambique and the Block BC-10 in Brazil, operated by Shell. In Colombia, it holds equity in seven projects, making it one of the largest Indian investors in Latin America's hydrocarbon sector (ONGC Annual Report, 2020).

Notably, OVL also holds a 20% stake in the Lower Zakum offshore field in the United Arab Emirates (UAE), marking India's entry into the Gulf's premium upstream assets. Its African footprint includes blocks in South Sudan, Libya and Mozambique while Southeast Asian operations span Myanmar and Vietnam, aligning with India's Act East Policy.

3 OVL contributed approximately 30.3% of India's crude oil production and 23.7% of its combined oil and gas production in 2019-20, thereby playing a vital role in buffering against supply shocks and currency volatility. In terms of reserves, OVL ranks second only to ONGC domestically, highlighting its strategic importance.

However, unlike CNPC, OVL's global strategy is relatively conservative and commercially cautious, shaped by limited access to concessional finance, regulatory scrutiny, and riskaverse public governance norms. Deals typically require inter-ministerial and diplomatic coordination, particularly when host nations are politically unstable. This has occasionally led to delays in project implementation, such as in Iran's Farzad-B gas field and Venezuela's San Cristobal project (Indian Express, 2021; The Hindu, May 2021).

19 OVL's governance also reflects India's pluralist framework. Its investment decisions are scrutinized by the Ministry of Petroleum and Natural Gas, Ministry of External Affairs and in

certain cases, the Cabinet Committee on Economic Affairs (CCEA). While this structure enhances accountability, it may limit agility in responding to volatile international energy markets (Bhasa & Saha, 2015).

COMPARISON

From a social development perspective, ONGC has been consistently involved in various community-oriented initiatives including health services, sanitation programs and rural upliftment efforts. These activities form a substantial part of the company's CSR agenda and aim to proactively resolve social challenges, transcending mere regulatory compliance. Its initiatives span across domains such as public healthcare, rural infrastructure, and environmental conservation (Ogale & Sarnot, 2020). As part of its environmental stewardship, ONGC regularly undertakes ecological assessments around its offshore facilities in the Arabian Sea. These assessments include monitoring parameters like temperature, salinity and dissolved oxygen levels to ensure the stability and health of the surrounding marine ecosystem (Mandal & Ray, 2022).

In the fiscal year 2023–24, Oil and Natural Gas Corporation (ONGC) significantly advanced its social development initiatives, allocating ₹634 crore towards Corporate Social Responsibility (CSR) activities, marking its highest-ever expenditure in this domain. (ETV Bharat, 2024).

ONGC also emphasized education and vocational training, backing over 900 Ekal Vidyalayas and providing preparatory coaching under programs like 'Super 30'. ONGC established a 300-bed multi-specialty hospital in Sivasagar, Assam, which has benefited over 100,000 patients annually. Additionally, the company supported the National Cancer Institute in Nagpur, a 455-bed oncology centre providing affordable cancer treatment to the public. To extend medical services to remote areas, ONGC deployed 31 Mobile Medical Units across 18 districts in 9 states, offering doorstep healthcare to the elderly, women and children. In the realm of sanitation and clean energy, ONGC constructed 68,576 individual household latrines, contributing to the declaration of Open Defecation Free villages. The company also installed over 120,000 solar street lights in remote villages, enhancing safety and energy access. Furthermore, ONGC implemented solid waste management projects, including the recycling of 697 tonnes of waste in Rameswaram (CSR Box, 2019).

Education and skill development were also focal points. ONGC supported 970 Ekal Vidyalayas, providing informal education to children in rural areas. The "ONGC Super 30" program in Sivasagar trained students from economically weaker families for engineering entrance exams, with over 145 students benefiting in the past five years. Additionally, the company established a Skill Development Institute in Ahmedabad, where 780 youths are currently undergoing training in various trades (ONGC India).

In Jammu & Kashmir, ONGC collaborated with the Indian Army to train 300 boys in retail sales and hospitality and 60 girls in fashion designing and tailoring, leading to gainful employment for many (ONGC India). These initiatives underscore ONGC's commitment to fostering inclusive growth and sustainable development across India.

As part of its broad social mandate, CNPC has invested significantly in rural development, healthcare access, and community resilience programs. In 2023, it allocated 230 million yuan

to rural revitalization efforts in 58 counties across 11 provinces, focusing on improving infrastructure, promoting vocational education and supporting agricultural value chains. Through its long-standing “Lifeline Express for Brightness” initiative, CNPC facilitated free cataract surgeries for over 56,000 low-income patients, many from remote ethnic minority communities. The company also strengthened its public engagement through community open days by hosting more than 220,000 participants at its sites nationwide to promote energy literacy and environmental awareness. In Kazakhstan and Myanmar, CNPC initiated vocational training centers and school construction projects to support education in local communities where it operates. These initiatives form part of the company’s broader strategy to project itself as a responsible global actor, aligning corporate expansion with social legitimacy and inclusive development (CNPC Social Responsibility Report, 2023).

16 In the fiscal year 2023–24, Oil and Natural Gas Corporation (ONGC) advanced its environmental sustainability initiatives, reinforcing its commitment to ecological stewardship and climate action.

A significant milestone was the establishment of ONGC Green Limited, a wholly owned subsidiary focused on clean energy ventures, including green hydrogen, compressed biogas (CBG) and renewable power. This strategic move aligns with ONGC's target to achieve netzero Scope 1 and 2 emissions by 2038. To support this goal, ONGC plans to invest approximately ₹2 trillion (US\$24 billion) by 2030, aiming to develop 10 GW of renewable energy capacity. Collaborations have been initiated with entities like NTPC Green Energy Ltd. for offshore wind projects and EverEnviro Resource Management to establish 15 CBG plants, enhancing domestic renewable energy production and reducing reliance on imported gas. (RenewableWatch , 2025)

In its operations, ONGC has implemented measures to mitigate environmental impacts. The company achieved a 2.66% reduction in greenhouse gas emissions in FY 2022–23, with a 17% decrease in Scope 1 and 2 emissions over the past five years. Efforts to eliminate routine gas flaring and reduce methane emissions are underway, with a goal to achieve zero flaring and zero methane emissions by 2030 (Energy Connects, 2024).

20 Waste management practices have been enhanced through the bio-remediation of 93,151 metric tons of oily sludge and oil-contaminated soil in 2022–23, ensuring environmentally safe disposal. Additionally, approximately 6,523 cubic meters of oil were recovered from contaminated soil during restoration efforts.

14 Biodiversity conservation remains a priority, with initiatives such as the translocation of Eastern Swamp Deer from Kaziranga to Manas National Park, conservation of the Amur Falcon in Karbi Anglong, and protection of the White Winged Wood Duck in Assam and Arunachal Pradesh. These projects underscore ONGC's commitment to preserving India's ecological heritage.

24 Through these comprehensive efforts, ONGC continues to integrate environmental considerations into its core operations, contributing to sustainable development and aligning with national and global climate objectives.

Despite these initiatives, ONGC has also been involved in several environmentally damaging incidents. ONGC has faced multiple environmental compliance issues, such as a ₹2.05 crore

fine in Assam (2019) and a crude leak incident in Bharuch (2023), prompting penalties from regulatory authorities (The Economic Times, 2019). Similarly, in 2021, the National Green Tribunal (NGT) reported serious infractions in Andhra Pradesh's Krishna-Godavari basin, where ONGC was found responsible for improper hazardous waste management, mercury pollution, and deficient effluent treatment systems, resulting in a ₹17 crore fine (Down to Earth, 2021). Another significant incident occurred in Tamil Nadu's Kathiramangalam village in 2017, where an oil spill severely degraded soil and water quality, harming agriculture and affecting local livelihoods (One India, 2017). More recently, in 2023, a pipeline rupture in Bharuch district, Gujarat, led to the death of 25 camels due to crude oil exposure, prompting the Gujarat Pollution Control Board to impose a ₹50 lakh penalty on ONGC (Times of India, 2023).

CNPC has also been active in constructing a robust environmental and CSR image. The company's sustainability reports consistently emphasize alignment with national strategies such as the concept of "ecological civilization," showcasing its commitment to low-impact development and green practices. CNPC adopts a variety of discursive strategies including rationalization and moral justification to enhance the legitimacy of its environmental claims and strengthen its reputation on the international stage (Wang et al., 2022; Ke, 2025).

Nevertheless, CNPC has encountered significant environmental controversies abroad. In 2013, the Chadian government suspended CNPC's operations over allegations of crude oil dumping in the Koudalwa region. Although operations resumed later that year, the authorities imposed a \$1.2 billion penalty for environmental damages. CNPC disputed the fine, citing a lack of transparency and the findings of third-party audits that allegedly confirmed environmental compliance. The dispute escalated to international arbitration in Paris. Ultimately, a settlement was reached in late 2014, under which CNPC agreed to pay \$400 million, granted Chad a 10% stake in some oil fields, and secured rights to use the ChadCameroon export pipeline (Global Times, 2014).

In Kazakhstan, CNPC and its subsidiaries, including CNPC-Aktobemunaigaz and PetroKazakhstan, have faced persistent public backlash over environmental degradation. Mass protests in 2016 and 2019 were fueled by concerns over the relocation of heavily polluting Chinese industries to Kazakhstan. A list published in late 2019 identified 55 Chinese-funded projects, half in the oil and gas sector, as sources of environmental anxiety. Transparency remains a critical issue; modernization efforts at facilities like the Shymkent refinery have failed to alleviate pollution or satisfy public concerns. According to Crude Accountability, Kazakh authorities often disregard citizen complaints and fail to conduct night-time environmental monitoring, which leads to inaccurate pollution assessments. In Shymkent, local residents frequently report intense odors and declining water tables. Other industrial operations, such as the Sin Yuan Steel Mill and the Gezhouba Shieli Cement Plant (relocated under the Belt and Road Initiative), have also been implicated in severe health risks and legal violations. Meanwhile, the Zhanatas wind farm—the largest in Central Asia—is a rare example of successful green investment, albeit criticized for violating land compensation protocols (Crude Accountability, 2021).

To align with China's Paris Agreement commitments, CNPC has notably reduced methane emissions and invested in low-carbon technologies such as CCUS."

. In 2023, the company achieved an 11.39% reduction in methane emission intensity, deploying enhanced leak detection systems and satellite-based monitoring tools across pipeline networks. CNPC invested ¥61.9 billion (~\$8.5 billion) in clean energy and low-carbon technologies, including CCUS demonstration projects that apply full-chain solutions, from capture and transport to geological sequestration and utilization. One of its flagship carbon management programs, "Action Plan 3.0," integrates carbon accounting systems, lifecycle ecological design and realtime emissions reporting to reduce operational footprint. The company also introduced closed-loop water recycling systems, saving over 9 million cubic meters of freshwater in 2022, and restored hundreds of hectares of land degraded by oil and gas activities. In recognition of these efforts, CNPC was once again honoured as a "Low-Carbon Model Enterprise" by the China Federation of Industrial Economics for the 12th consecutive year (CNPC Sustainability Report, 2023).

On the renewable energy front, CNPC has invested in biomass, hydrogen, geothermal, solar and wind energy solutions. A major accomplishment is the development of China's first carbon-neutral gas station under the West-East Gas Pipeline Project. The firm also leads China's CCUS innovation landscape, operating the "1+8" full-chain model and conducting large-scale CO₂ sequestration initiatives. CNPC's forestry-based carbon offset program, which saw the planting of nearly 4 million trees in 2023, supplements its efforts in carbon sink development. These undertakings reflect CNPC's deep commitment to ecosystem preservation and its broader goal of long-term sustainability. Its activities are aligned with global agreements such as the UN 2030 Agenda and the Convention on Biological Diversity.

On the technological innovation front, ONGC has made significant advancements, particularly through the deployment of the Integrated Operations System (IOPS) at its KGDWN-98/2 deepwater field. This implementation is expected to enhance production efficiency by 2–3%, reduce operational expenditures by up to 20%, and improve asset reliability and predictive maintenance capabilities (Balachandran & Padmanabhan, 2023).

28 During the 2023–24 financial year, Oil and Natural Gas Corporation (ONGC) marked a series of important technological advancements, notably in the Krishna-Godavari Basin's KGDWN-98/2 deepwater block. This complex subsea initiative began producing oil from the 'M' field in January 2024, building upon earlier gas production from the 'U' field that started in March 2020. The project's comprehensive development plan encompasses 35 wells, comprising 15 designated for oil extraction, 12 for water injection, and 8 for gas production. At full capacity, the block is expected to yield up to 45,000 barrels of oil per day and more than 10 million standard cubic meters of gas daily (The Times of India, 2024).

5 To overcome technical challenges related to the waxy composition of the crude oil, ONGC deployed Pipe-in-Pipe technology—its first application of this kind in India. This method preserves the oil's temperature during transportation, preventing solidification and ensuring steady flow. The company also incorporated a Floating Production Storage and Offloading (FPSO) unit, the Armada Sterling-V, to manage offshore processing and storage operations, thereby increasing overall operational adaptability (Energy Asia, 2024).

The project also emphasized domestic manufacturing, with significant fabrication activities conducted at the Modular Fabrication Facility in Kattupalli, aligning with the 'Make in India' initiative and contributing to energy self-reliance. Beyond field development, ONGC invested in digital technologies to optimize operations. The company is developing a digital twin

system for real-time monitoring and predictive maintenance, enhancing efficiency and reducing downtime (JPT, 2024).

Furthermore, ONGC's Start-Up Fund, established to foster innovation in the energy sector, supported 23 start-ups with a total commitment of ₹757.70 million as of March 31, 2023, promoting entrepreneurship and technological advancement within the industry.

China National Petroleum Corporation (CNPC), on the other hand, has introduced a digitalized financial sharing mechanism that utilizes artificial intelligence and big data analytics to optimize financial management. This system has helped streamline operations, improve resource allocation and reduce overheads, serving as a benchmark for digital transformation across Chinese state-owned enterprises (Li, Lyu & Zhang, 2024). In addition to financial reforms, CNPC has achieved breakthroughs in ultra-deep oil exploration, including the Take-1 borehole project in the Fuman field, which targets a depth of 11,100 meters using an automated drilling system designed for high-pressure, high-temperature conditions (Szymczak, 2023).

In recent years, CNPC has prioritized high-end technological innovation as a core pillar of its energy strategy, committing over \$1.2 billion to R&D in 2023 alone. A key area of advancement was the deployment of intelligent oilfield systems integrating big data, cloud computing, AI, and IoT to enhance automation and efficiency across upstream operations. The company reported a 15% increase in average extraction efficiency, particularly in mature and complex reservoirs, as a result of deploying digital twin technology and advanced subsurface imaging. In deep and ultra-deep exploration, CNPC broke new ground through the Take-1 borehole project in the Fuman Oilfield in the Tarim Basin, aiming to drill over 11,000 meters, one of the deepest vertical wells attempted globally, using an automated rig capable of operating under high-pressure, high-temperature conditions (Szymczak, 2023). Additionally, CNPC has invested in the development of carbon capture, utilization, and storage (CCUS) infrastructure and low-carbon hydrogen production, reinforcing its pivot toward long-term energy transition technologies (Li et al., 2024).

Consequently, both ONGC and CNPC exhibit a sustained commitment to technological advancement, energy security, and environmental sustainability. Yet, the institutional frameworks shaping their leadership models further differentiate the two.

At CNPC, corporate leadership is intrinsically intertwined with the Chinese Communist Party (CCP). Chairmen and Managing Directors (CMDs) are not appointed through conventional corporate board processes but through the Central Organization Department of the CCP, with final validation by the State-owned Assets Supervision and Administration Commission (SASAC) of the State Council (Shchelokova et al., 2022). These executives are typically senior Party members and often hold dual roles as Party Secretaries within the company. This dual appointment structure ensures that the company remains closely aligned with the Party's overarching strategic goals including energy diplomacy, the Belt and Road Initiative (BRI) and China's broader carbon neutrality agenda (Taylor, 2021; Wang & Li, 2022). Such a centralized and politically embedded model enables rapid strategic alignment and statebacked financing, but it also raises concerns around transparency, limited managerial autonomy, and susceptibility to non-commercial political mandates.

In contrast, ONGC operates under a governance model grounded in India's democratic and technocratic public sector framework. The CMD and board-level appointments are made through an institutionalized process governed by the Public Enterprises Selection Board (PESB), under the Department of Personnel and Training and the final decision rests with the Appointments Committee of the Cabinet (ACC), headed by the Prime Minister (Bhasa & Saha, 2015). Candidates are evaluated based on their technical expertise, administrative experience, and leadership capabilities, without any formal political affiliation requirements. This model supports merit-based leadership, greater internal autonomy, and professional insulation from political interference, although it may slow decision-making and limit aggressive expansion in high-risk international markets due to parliamentary scrutiny and regulatory oversight.

These divergent governance architectures shape how the two firms behave in global markets. CNPC's structure enables it to serve as an instrument of state policy, blending commercial activities with China's geopolitical and developmental goals. ONGC, on the other hand, embodies a managerially autonomous public corporation, balancing state ownership with corporate accountability and developmental mandates within a democratic context.

Therefore, while both companies are key tools of state strategy, CNPC's party-state integration contrasts sharply with ONGC's institutionalized public enterprise governance, underscoring how national political systems profoundly influence SOMNE behavior in international arenas (Cuervo-Cazurra et al., 2021; Musacchio & Lazzarini, 2018).

CONCLUSION AND POLICY IMPLICATIONS

This comparative study of ONGC and CNPC, two leading state-owned multinational enterprises (SOMNEs) in the oil and gas sector, illustrates how divergent political systems, institutional frameworks and governance models shape the strategies and behaviour of globally active public enterprises. While both firms are rooted in their respective states' developmental objectives, they demonstrate fundamentally different patterns of internationalization, technological modernization, social engagement, and environmental management. These differences are not incidental but deeply embedded in their institutional DNA - India's democratic, bureaucratically accountable model on one hand, and China's centralized, party-state apparatus on the other.

Rather than converging toward a single model of global corporate behaviour, SOMNEs like ONGC and CNPC reflect the continuity of state preferences, capacities and political goals in shaping commercial engagement. The study reveals that CNPC's strategic autonomy is closely aligned with national geopolitical objectives, often supported by state-backed capital and political influence, while ONGC operates within more circumscribed limits of regulatory oversight and institutional negotiation, reflecting India's pluralist governance style. This divergence also influences how these firms respond to global sustainability norms, social obligations and technological innovation pressures.

The findings reinforce the idea that SOMNEs are not merely hybrid entities balancing commercial and public goals; they are institutional extensions of the state, shaped by and reflective of the political economies from which they emerge. As such, their role in the global

economy must be understood in light of domestic policy logics and governance constraints, rather than as transitional forms moving toward private-sector norms.

For policymakers, this has several implications. First, state ownership alone does not determine SOMNE behavior; the quality and orientation of state institutions do. Strengthening institutional capacity, transparency and performance metrics within SOEs can enhance their global competitiveness without sacrificing public accountability. Second, home-country governments must strike a balance between using SOMNEs as strategic instruments and maintaining operational autonomy, especially when these firms operate in volatile or politically sensitive international contexts. Finally, given their growing global influence, SOMNEs must be integrated into international governance frameworks related to climate action, labor standards, and transparency, particularly in host countries where institutional oversight may be weak.

Finally, this study sought to assess which of the two SOMNEs more closely resembles a private multinational enterprise in its operations. The findings suggest that ONGC, despite being publicly owned, exhibits a greater degree of professional autonomy, managerial accountability and market-conforming behavior. Its operations are more influenced by commercial logics and regulatory compliance, rather than direct political control. In contrast, CNPC's decision-making remains closely tied to the strategic ambitions of the Chinese state, with limited separation between corporate and national objectives. This distinction reinforces the view that state ownership does not inherently preclude market-oriented behavior; rather, it is the structure and nature of state control that determines how 'private' a state-owned enterprise can act on the global stage.

In an era where the boundaries between state and market continue to blur, the role of SOMNEs will likely expand—especially in strategic sectors like energy and infrastructure. Understanding the institutional logic behind their behaviour is essential not just for academic inquiry, but also for designing effective international policy frameworks that can accommodate the complexity of state-led global capitalism.

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