EVOLUTION OF PETROLEUM DOWNSTREAM REGULATORY REGIME

IN INDIA

पी एन जी आर बी
PNGRB

2025

EVOLUTION OF PETROLEUM DOWNSTREAM REGULATORY REGIME

IN INDIA

2025

Authors

Tanmay Vats
Asst. Consultant, PNGRB

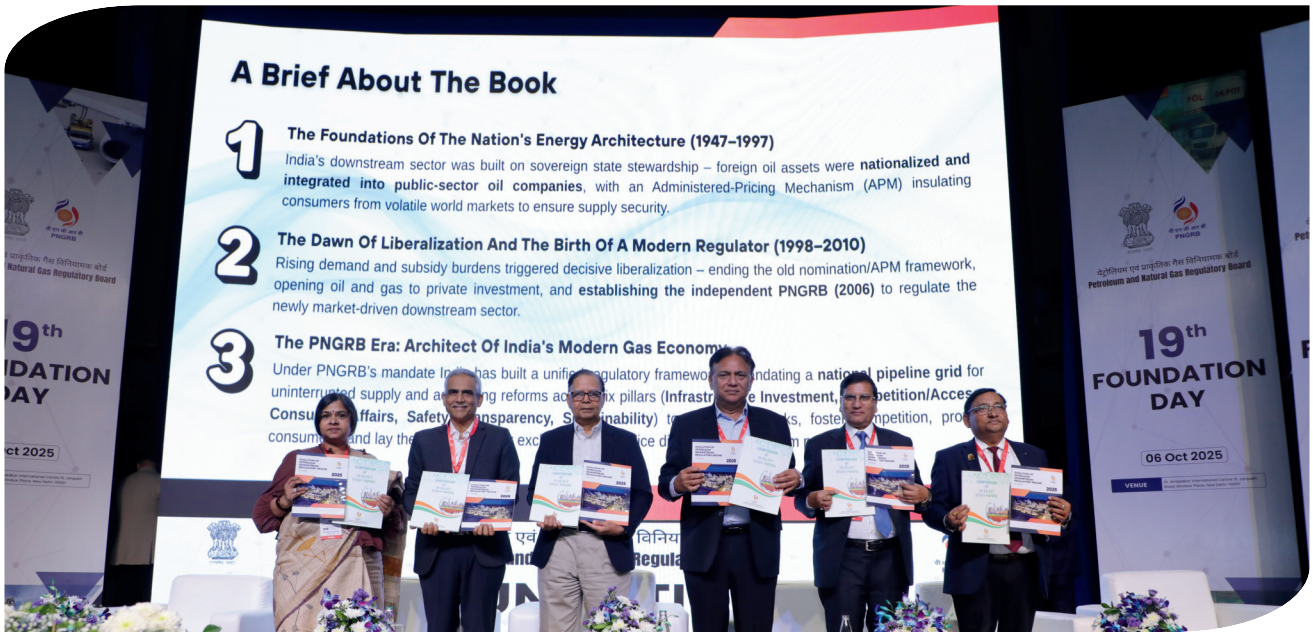
Farhan Akhter
Asst. Consultant, PNGRB

Arvind Kumar
Expert Advisor, PNGRB

UNVEILING OF THE BOOK

AT PNGRB'S 19TH FOUNDATION DAY BY

Dr. Arvind Panagariya, Chairman, 16th Finance Commission



डॉ. अनिल कुमार जैन, भा.प्र.से.
Dr. ANIL KUMAR JAIN, IAS
अध्यक्ष
CHAIRPERSON

पेट्रोलियम एवं प्राकृतिक गैस विनियामक बोर्ड
Petroleum and Natural Gas Regulatory Board
ई-400, चतुर्थ तल, वर्ल्ड ट्रेड सेंटर, नौरोजी नगर, नई दिल्ली - 110029
E-400, 4th Floor, World Trade Centre, Nauroji Nagar, New Delhi - 110029
Tel.: 011-21600021, E-mail: chairperson@pngrb.gov.in

FOREWORD

I take pride in presenting the study on Evolution of Downstream Regulatory Regimes in India. It is the duty of independent regulators to engage with stake holders through studies, reports, and outreach programmes. This publication/study aims to fulfil the above obligation.

PNGRB Act was passed by the Parliament in 2006, and the Board came into existence in 2007. Eighteen years is a long enough period for a new Regulatory Body to evaluate its performance and share the same with the stake holders. With the opening of India's petroleum sector, starting in the late 1990s and culminating with the abolition of Oil Coordination Committee regime in 2002, an independent Regulatory Body was the need of the hour. After several legislative attempts, the creation of PNGRB was much hailed by the Government and Stakeholders.

The above background and objectives leading to formation of the Board are also strong reasons to evaluate whether the promise has been realised or not. This chronological account traces the history of decision-making process and delegation of powers by the Government in this sector since Independence, and even offers insight into future outlook of the activities intended to be taken up by the PNGRB.

Understandably, it was not easy in the initial decade of the formation of this Board when Regulations and Rules were being drawn out both by the PNGRB and the Government, respectively. But the real struggle began once these Regulations were put into practice. It is difficult for a large economic sector to transition from protected environment to a competitive one. The fact that energy is a public good and India has a large population of low-income families, further complicates the matter. However, PNGRB has risen to the occasion, and over its life of 18 years offered a regulatory regime that combines tough

....contd/-

regulatory decision-making with understanding and cognizance of the national imperatives. It has adopted the Government's aim to help transition the Indian energy sector to a clean energy future mindful of Indian circumstances. We have also initiated work that would help deliver hydrogen from production centers to consumer centers via pipelines.

The above is a snapshot of evolution of PNGRB as an institution, as a team player which has endeavored to drive initiatives and investment in the downstream Oil & Gas sector, while also delivering the VIKSIT BHARAT ambition and holding consumer interests at the highest pedestal.

I commend Shri Arvind Kumar, Expert Advisor, Shri Tanmay Vats and Shri Farhan Akhter, Assistant Consultants, PNGRB for undertaking this task which was certainly not an easy one. I also hope that this publication helps the stakeholders in understanding the framework within which the Board functions against a challenging environment, while we also look forward to a constructive debate on the future shape of this vital organization.

(Dr. Anil Kumar Jain)

सुधा रानी रेलांगी, भा.वि.से.
SUDHA RANI RELANGI, ILS
सदस्य (विधि)
MEMBER (LEGAL)

पेट्रोलियम एवं प्राकृतिक गैस विनियामक बोर्ड
Petroleum and Natural Gas Regulatory Board
ई-400, चतुर्थ तल, वर्ल्ड ट्रेड सेंटर, नौरोजी नगर, नई दिल्ली - 110029
E-400, 4th Floor, World Trade Centre, Nauroji Nagar, New Delhi - 110029
Tel.: 011-21600068, E-mail: member.legal@pngrb.gov.in

Message

It gives me immense satisfaction to contribute to this publication on the Evolution of Regulatory Regimes in the Downstream Oil and Gas Sector in India (1947 – till date). This volume presents not only the historical progression of policies and laws that have shaped the sector but also outlines the pathways for its continued evolution in the years ahead in a right direction to meet the vision 2030.

The downstream oil and gas sector has traversed a remarkable journey, from a period of centralized controls and government-administered mechanisms to the emergence of modern, independent regulation. Each stage of this transition reflects India's broader economic priorities and the growing recognition of the need for transparent, competitive, and consumer-oriented governance. While upholding the Rule of Law for its supremacy, legal and regulatory frameworks have consistently provided the foundation on which this transformation has been built.

Equally important, this publication looks to the future with a vision. As India advances towards energy transition, enhanced market efficiency, and deeper integration of technology, regulation must continue to evolve in tandem. The forward-looking insights captured here emphasize the importance of adaptability, clarity of law, and institutional resilience in enabling the sector to meet national aspirations of sustainability, security, and growth.

I congratulate the team whose diligent efforts have resulted in this comprehensive work. By bridging the lessons of history with the vision for tomorrow, this book will serve as a valuable guide for policymakers, practitioners, and all stakeholders committed to strengthen India's downstream Oil and Gas framework.

Sudha Rani.

(Sudha Rani Relangi)

Preface

We present this paper, Evolution of Downstream Regulatory Regimes in Oil and Gas Sector, at a time of unprecedented change in the energy landscape. Over the past several decades, India's downstream oil and gas sector has transformed dramatically – from an era of state-controlled monopolies and administered pricing to a more open, competitive market structure. Our motivation in writing this paper stems from witnessing these shifts firsthand and recognizing the need to document and reflect on this journey. In an environment defined by growing energy demand, technological advancements, and a global push for cleaner energy, we believe it is vital to understand how historical policies and regulatory decisions have shaped the present-day sector.

In this evolving landscape, strong regulatory institutions are more important than ever. As practitioners in the field, we acknowledge the indispensable role of the Petroleum and Natural Gas Regulatory Board (PNGRB) in India's downstream sector. Since its establishment in 2006, PNGRB has provided the governance framework needed to manage a liberalized market – preventing monopolistic practices, fostering fair competition, and safeguarding consumer interests. We reflect on how an independent regulator like PNGRB became a cornerstone of the modern oil and gas industry, guiding the development of pipelines, city gas distribution networks, and transparent market mechanisms. The strength and adaptability of such institutions will continue to determine how effectively the sector responds to new challenges and opportunities, from infrastructure expansion to energy transition imperatives. We also draw on insights from PNGRB's Strategic Leadership Retreat, which articulated the PNGRB 2.0 blueprint: consumer-centric, data-driven, transparent, resilient, and innovation-ready and set an actionable roadmap across energy transformation, stakeholder engagement, digital regulation, communication effectiveness, and bridging statutory-practice gaps, including specific actions on hydrogen blending and CBG enablement. Consistent with this outlook, we note PNGRB's forward-looking approach to transition fuels, advancing hydrogen blending and integrating compressed biogas alongside dedicated sustainability initiatives as pragmatic, near-term pathways that support a cleaner, more resilient energy system.

Our broader goal in this endeavor is to contribute to informed policy discourse. By examining the evolution of downstream regulations and comparing India's experience with international best practices, we aim to provide energy policymakers and professionals with a rich context for decision-making. We have written this preface and the study that follows in a professional yet accessible manner, hoping to spark meaningful discussions on regulatory reforms and future strategies. It is our earnest hope that this paper serves as a valuable resource for those shaping the next chapter of India's energy story, helping to ensure that regulatory frameworks remain robust, responsive, and aligned with the nation's long-term goals.

Acknowledgment

We extend our gratitude to **Dr. Anil Kumar Jain, Chairperson, PNGRB**, for his strategic guidance and thorough review of this study. We also thank the PNGRB Board Members – **Mr. Anjani Kumar Tiwari (Member, Commercial)**; **Mr. A. Ramana Kumar (Member, Monitoring & Infrastructure)**; **Ms. Sudha Rani Relangi (Member, Legal)**; and **Mr. Jayanta Narayan Das (Member, Technical)** along with **Mr. Anjan Kumar Mishra (Secretary, PNGRB)** for their counsel and multidisciplinary perspectives, which strengthened our analysis.

We acknowledge the contributions of the Heads of Divisions for their specialized support. In particular, we thank **Md. Tanweer Akhter (HOD, Authorisation)** for his contributions related to authorisation processes and infrastructure-related inputs; **Lt. Col. Pawan Kumar Uniyal (HOD, Administration & IT)** for support with critical logistics; **Lt. Col. Kumar Abhishek (HOD, Monitoring)** for supporting the analysis with data insights and forward-looking projections; **Mr. Muktikam Phukan (HOD, Coordination)** for inputs on hydrogen-related content; **Mr. Ghan Shyam (HOD, Commercial)** for commercial insights; **Mr. Maneesh David Singh (HOD, Statistics)** for statistical and data support; **Rakesh Kumar Shahi (HOD, Consumer Affairs)** for his inputs on consumer-related matters; **Mr. Gagan Aggarwal (HOD, Technical)** for technical content support; and **Mr. Nishant Parashar (HOD, Legal)** for legal inputs and review.

We further recognize the valuable input of PNGRB's Principal and Expert Advisors; **Mr. Hirak Dutta, Mr. Vivek Chitale, Mr. Ghan Shyam, Mr. Sunit Verma, Mr. Anil K Garg** and thank the teams across the Board for their support. Finally, we acknowledge the contributions of the consultants and staff, which were integral to the completion of this work.

Any errors or omissions are the authors' own.

Abstract

This work offers a comprehensive examination of the evolution of India's downstream oil and gas regulatory regime from independence to the present. It chronicles the shift from a state-controlled framework – characterized by nationalization and the Administered Pricing Mechanism (1975–2002) – to a market-oriented regime marked by liberalization in the 1990s and 2000s. A key focus is the establishment of the Petroleum and Natural Gas Regulatory Board (PNGRB) in 2006 as an independent regulator, a milestone that redefined institutional oversight in the sector. The analysis highlights how PNGRB's creation and its unique design (reporting directly to Parliament, with broad mandates to regulate infrastructure, tariffs, and competition) have enabled more transparent and efficient downstream operations. The paper also incorporates international benchmarking, comparing India's regulatory framework with global counterparts to draw comparative insights and best practices. Regulators such as those in the United States, United Kingdom, and other jurisdictions are briefly examined to contextualize PNGRB's approach on the world stage. Consistent with this vision, the paper articulates upon Authorisation Division's initiatives to fast-track connectivity to high-demand clusters and advancing the idea of a completing the Natural Gas Pipeline Grid along with Arterial Grid by integrating the Cross-country Pipelines with Steel Pipeline infrastructure of CGD Networks and in a similar manner establish a Petroleum Products Pipeline Grid with the intent of increasing the supply security to the overall benefits of the consumers. Finally, the paper discusses ongoing reforms and PNGRB's forward-looking initiatives – including infrastructure expansion, unified tariffs, consumer protection measures, and steps toward creating petroleum product exchanges – that aim to future-proof the sector. Through this evolution, the study illuminates how robust regulation has underpinned market development and energy security in India, and it provides policymakers and energy professionals with a nuanced understanding of regulatory progress to inform future policy decisions.

TABLE OF CONTENTS

PART 1

THE FOUNDATIONS OF THE NATION'S ENERGY ARCHITECTURE (1947–1997)

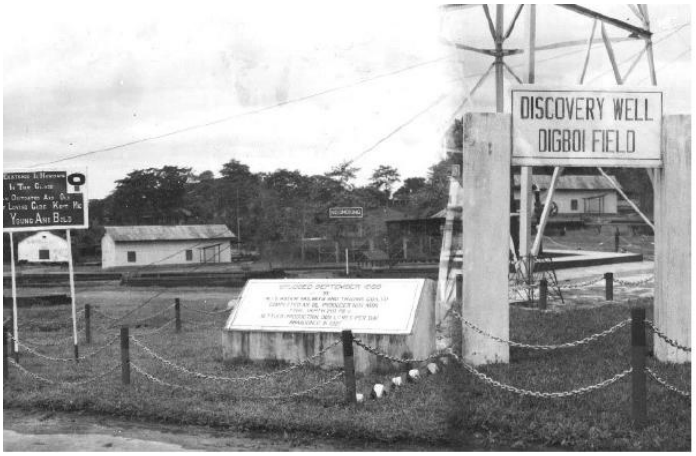
The trajectory of India's oil and gas sector is inextricably linked to the nation's broader economic and political evolution. From the moment of independence, the governance of hydrocarbons has been a matter of strategic national importance, shaping policies that prioritized sovereign control and energy security above all else. The initial decades were defined by a systematic consolidation of state power, the creation of national oil companies, and the establishment of a pricing regime designed to insulate a developing economy from the volatilities of the global market. This foundational period established an architecture of state stewardship that would define the industry for nearly half a century.

1.1 Forging a Path to Energy Supply Security

1.1.1 The Inherited Landscape (1947)

Petroleum industry was dominated by foreign, **primarily British entities** at the time of independence. The **Assam Oil Company** held sway in the northeastern region, while the **Attock Oil Company** operated in the northwestern part of undivided India. Compounding this external control was a prevailing **geological pessimism**; the majority of India's vast sedimentary basins were deemed unlikely to yield significant oil and gas resources, cementing a heavy and precarious dependence on imports. The market structure reflected this colonial legacy, with the **Burmah-Shell Oil Storage and Distributing Company**, a 1928 venture between the **Asiatic Petroleum Company and Burmah Oil Company**, commanding an overwhelming **67 percent market share**. This single entity had laid the groundwork for India's petroleum infrastructure, including the country's **first refinery at Digboi**, established in **1901**.

The newly formed government of independent India was quick to grasp the strategic gravity of this situation. The **Industrial Policy Statement of 1948** explicitly identified the development of the hydrocarbon industry as a critical pillar for the nation's rapid industrialization and defence. However, despite this recognition, the sector remained firmly under foreign control through



Discovery Well: Digboi Oil Well

pre-existing concession agreements, a reality that the government would soon move decisively to change.

1.1.2 The State-Led Development Model (1955-1975)

The mid-1950s marked a pivotal turning point. In 1955, the Government of India established the **Oil and Natural Gas Directorate** under the **Ministry of Natural Resources and Scientific Research**, which was swiftly converted into the **Oil and Natural Gas Commission (ONGC) in August 1956**. This move was not merely administrative; it was a declaration of intent to systematically explore India's geological potential under national leadership. The ideological and strategic underpinnings of this shift were codified in the landmark **Industrial Policy Resolution of 1956**. This policy placed the mineral oil industry among **'Schedule A'** industries, designating its future development as the exclusive responsibility of the government. This decision was aimed at ensuring that the nation's natural resources would serve public welfare rather than foreign shareholders.

This era saw the birth and rise of the **Public Sector Undertakings (PSUs)** that would become the backbone of India's energy economy.

- **Oil and Natural Gas Corporation (ONGC):** Established on August 14, 1956, ONGC quickly validated the state-led model with its first oil discovery in the Cambay basin in 1959. Its crowning achievement came in 1970 with the

discovery of the massive Bombay High offshore field, a find that transformed India's production landscape and established the country as a significant oil producer.

- **Indian Oil Corporation Limited (IOCL):** Formed in 1964 through the merger of the Indian Oil Company Ltd. (est. 1959) and Indian Refineries Ltd., IOCL was conceived as an integrated national champion capable of coordinating both refining and marketing, thereby creating a powerful counterweight to foreign dominance in the downstream sector.
- **Oil India Limited (OIL):** Initially a joint venture with the Burmah Oil Company in 1959, the government progressively increased its stake, eventually assuming majority control over this key exploration and production entity.

The establishment of these PSUs was not simply an economic choice but a manifestation of a deeply held national security doctrine. The experience of colonial-era resource exploitation, combined with the strategic lessons of World War II, where the Digboi oil fields' output, reaching a peak of **7,000 barrels per day**, was crucial for the Allied effort, forged a conviction that sovereign control over energy was non-negotiable. Initially the emphasis was more on exploration and production and less on distribution. The imperative to secure a strategic asset from foreign hands and ensure self-reliance framed the creation of state monopolies, prioritizing national security even at the potential cost of market efficiency. To build this national capacity, India sought technical assistance from foreign experts from **Romania, the United States, and West Germany**, with **Soviet experts** playing a particularly influential role in developing comprehensive exploration plans.

1.2 Ensuring supply security

1.2.1 Managing Scarcity: The Role of Foundational Laws and Control Orders

The state's control over the sector was enabled by a layered legal scaffold. Independent India inherited and adapted foundational colonial-era statutes like the **Petroleum Act, 1934** (governing safety and transport), while enacting new laws to serve post-independence objectives. The **Oilfields (Regulation and Development) Act, 1948**, provided the framework for upstream activities, authorizing the government to regulate oilfields and grant mining leases. This was initially complemented by the **Petroleum Concession Rules, 1949**, which governed concessions to the still-dominant foreign companies. These were later superseded by the **Petroleum and Natural Gas Rules, 1959**, which established the legal basis for the nomination-based allocation of exploration blocks to national oil companies. To build the nation's energy arteries, the government enacted the **Petroleum and Minerals Pipelines (Acquisition of Right of User in Land) Act, 1962**, which empowered the state to acquire right-of-way for pipelines while ensuring a process for landowner objections and compensation.

To manage distribution and prevent malpractices in a scarcity-prone environment, the government relied heavily on statutes like the **Essential Commodities Act, 1955**. This Act empowered the state to issue specific Control Orders that became the backbone of downstream regulation for decades. Even before the major oil crises, state-level instruments like the **Uttar Pradesh Kerosene Control Order, 1962**, were used to prevent hoarding and black marketing. During and after the APM era, this framework was used to issue a comprehensive suite of product-specific national orders such as:

- **Kerosene (Restriction on Use and Fixation of Ceiling Price) Order, 1993**: Restricted subsidized kerosene for cooking and illumination only, curbing its diversion.

1.2.2 The Nationalization Wave (1970s)

1971 Indo – Pak war and fuel supply: During the 1971 war, **Esso and Burmah Shell (foreign oil companies)** refused to supply fuel to the Indian Defence. This refusal was attributed to the pressure from their respective governments. This refusal highlighted the strategic vulnerability India faced with its reliance on foreign oil companies for critical defence needs. In response to these, the Indian government nationalized the foreign-owned oil

companies between 1973 and 1976, creating **Bharat Petroleum Corporation Ltd. (BPCL) from Burmah Shell and Hindustan Petroleum Corporation Ltd. (HPCL), formed through the nationalization of Esso and later Caltex merged with HPCL,** expanding HPCL's refining and marketing footprint. This nationalization was a key step in asserting India's control over its strategic resources and ensuring supplies in times of crisis.

- On **January 24, 1976**, the government nationalized the **Burmah-Shell**, initially renaming it Bharat Refineries Limited before it became **Bharat Petroleum Corporation Limited (BPCL)** on August 1, 1977.

- Similarly, the **Standard Vacuum Refining Company (originally incorporated in 1952**) was taken over in 1976, following the **Esso (Acquisition of Undertakings in India) Act of 1974**, and was subsequently restructured to become **Hindustan Petroleum Corporation Limited (HPCL)**.

By the end of the 1970s, the architecture of India's petroleum sector was firmly in the hands of the state. While this structure provided a measure of energy security, it would soon be tested by international oil crises that forced a strategic rethinking of pricing, supply, and investment across the entire value chain.

1.2.3 The 1973 Global Oil Crisis: A Defining Shock

The **Arab-Israeli War** of October 1973 and the subsequent **OPEC oil embargo** sent shockwaves through the global economy, and for India, the impact was nothing short of devastating. Despite its friendly relations with Arab states, India's hopes for favourable treatment were severely impacted when OPEC refused to adopt a **dual-pricing system**. The nation's oil import bill skyrocketed from **$414 million**, or 20% of its export earnings, in 1973 to an unsustainable **$1.35 billion**, equivalent to 40% of potential export earnings, in 1974. This sudden expenditure consumed double the country's existing foreign exchange reserves, creating immense balance of payments pressure.

The domestic consequences were severe. The government was forced to hike petroleum product prices, with the steepest increases for petrol while sparing politically sensitive kerosene and diesel. This caused **demand growth to plummet from 7% to zero**. The crisis triggered rampant **inflation that exceeded 20%**, fuelled a rise in unemployment, and other related issues. In a long-term strategic response, India turned inward to its vast coal reserves; coal production, which had been stagnating at **75 million tons annually**, shot up as the country sought domestic alternatives.

1.2.4 The 1979 Oil Crisis: Compounding Challenges

A second oil shock in 1979, following the Iranian Revolution and Iran-Iraq War, further compounded these challenges as prices more than doubled to **$39.50 per barrel**, reinforcing the government's conviction that domestic control and self-reliance were paramount.

1.2.5 The Administered Pricing Mechanism (APM) - A System Born of Crisis (1975-1997)

The acute vulnerability exposed by the 1973 crisis prompted a direct and defining policy response. In July 1975, based on the recommendations of the **Oil Price Committee headed by K.S. Krishnaswamy**, the government introduced the **Administered Pricing Mechanism (APM)**. This system fundamentally altered how petroleum products were priced, shifting from an import-parity principle to a cost-plus model designed to ensure price stability and shield consumers from global volatility.

The mechanics of the APM were intricate:

- **Retention Pricing:** Refineries were allowed to recover their crude oil and refining costs, plus a guaranteed 12% post-tax return on their net worth. It insulated the refineries from fluctuations of crude oil prices.
- **Oil Pool Accounts:** A complex system of pool accounts was maintained to manage price differentials and freight costs across the country. These included the Crude Oil Price Equalisation

(COPE) account, Cost and Freight Adjustment, Freight Surcharge Pool, and Product Price Adjustment accounts.

- **Cross-Subsidization:** The APM's most significant social feature was its system of cross-subsidies. Higher prices were charged for petrol and aviation turbine fuel to subsidize sensitive products like kerosene and domestic LPG.

The APM was more than just a pricing formula; it functioned as a **critical tool and a form of social contract**. By insulating the populace from unpredictable global price shocks, it provided a crucial measure of economic and social stability.

This combination of state ownership, administered pricing and a detailed web of legislative controls defined India's energy landscape for decades, ensuring supply security but ultimately constraining the sector's efficiency and growth potential. Throughout this period, petroleum products were taken to be public good, and the entire sector was almost in the hands of the Government with CPSEs serving as its extended arms.

Table 1: Key Milestones in India's Oil & Gas Regulatory Evolution

Year	Event/Legislation	Significance
1948	Industrial Policy Statement	Identified hydrocarbons as strategic for industrialization and defence.
1948	Oilfields (Regulation and Development) Act	Provided the foundational legal framework for upstream exploration and production
1955	Essential Commodities Act	Empowered the government to issue Control Orders to regulate fuel supply and distribution
1956	Industrial Policy Resolution	Placed the mineral oil industry under the exclusive control of the state.
1959	Petroleum and Natural Gas Rules	Superseded earlier rules and established the legal basis for the nomination regime.
1962	Petroleum and Minerals Pipelines Act	Enabled the creation of a national pipeline network by streamlining land acquisition
1974	Esso (Acquisition of Undertakings in India) Act	Initiated the final wave of nationalization.
1975	Introduction of APM	Established a cost-plus, subsidized pricing regime to ensure stability after the oil shock.

PART 2

THE DAWN OF LIBERALIZATION AND THE BIRTH OF A MODERN REGULATOR (1998–2010)

By the 1990s, the limitations of the state-controlled model had become increasingly apparent. Rising energy demand, coupled with the fiscal unsustainability of the APM, necessitated a fundamental shift in policy. This period marked a decisive pivot towards market-oriented reforms, beginning with the opening of the upstream sector to private investment and culminating in the landmark decision to establish an independent regulator to oversee a newly liberalized mid and downstream market.

2.1 Unlocking India's Upstream Potential

2.1.1 The End of the Nomination Regime

For decades after independence, India's upstream sector was the exclusive domain of the state. ONGC and OIL operated under a "nomination regime," where exploration blocks were directly allocated to them by the government. While this system provided a degree of energy security and led to significant discoveries like Bombay High, it insulated the sector from competition, advanced technology, and the risk capital that private and foreign players could bring.

2.1.2 The NELP Era (1997): A Paradigm Shift

In the 1990s, the push for economic liberalization forced a strategic shift in India's upstream policy. Approved in 1997 and effective from February 1999, the **New Exploration Licensing Policy (NELP)** opened exploration to private and foreign investors through transparent international competitive bidding, putting national oil companies on an equal footing with private players.

NELP expanded exploration acreage and brought new investment and crucially, India's first deepwater discoveries under NELP occurred soon after: **Cairn's**

Annapurna discovery in 2001 (KG-DWN-98/2) marked the policy's first deepwater success, followed by **Reliance's Dhirubhai** discoveries in 2002 (KG-DWN-98/3), which led to India's first deepwater field going onstream in 2009.

2.1.3 The HELP/OALP Framework (2016): Simplifying and Accelerating

To create a more investor-friendly environment, the **Hydrocarbon Exploration and Licensing Policy (HELP) was introduced** in 2016, marking a significant evolution in upstream policy with several key innovations:

- **Uniform License**: It replaced the patchwork of different contracts with a single, uniform license for the exploration and production of all hydrocarbons, including conventional oil and gas, shale gas, and coal-bed methane.
- **Revenue-Sharing Model**: It moved away from the profit-sharing model to a simpler revenue sharing framework, where companies share a portion of

their revenue with the government from day one.

- **Marketing and Pricing Freedom**: It granted greater freedom to operators, particularly for production from difficult deepwater and high-pressure reservoirs, to market their gas at competitive prices.

Crucially, HELP also ushered in the **Open Acreage Licensing Policy (OALP).** It is allowing companies to propose blocks for exploration at any time during the year. This continuous access model was designed to accelerate the pace of exploration by giving companies the flexibility to pursue opportunities as they arose.

2.2 Opening the Downstream

The market price stability through APM came at a steep long-term cost and needed reform. The mechanism effectively created an economic trap by distorting market signals, which might have disincentivized energy conservation and operational efficiency among the state-owned oil companies. Over time, the fiscal burden of maintaining the subsidies became unsustainable, a reality that would eventually force the government to embark on the path of deregulation. The downstream petroleum sector needed to be synced with the opening of economy, starting from the early nineties.

2.2.1 The Unravelling of the APM

The governments formed various study groups for coming out of the wriggles of the APM driven market price of petroleum products. One of the major findings is that of Strategic Planning Group (R Group).

Strategic Planning Group (R Group) Recommendations: In January 1995, the government appointed the 'R' Group headed by Vijay Kelkar to review the petroleum sector. The group recommended gradual APM dismantling and introduction of free market mechanisms, leading to the government's September 1997 decision to dismantle APM in phases.

Acting on these recommendations, the government announced its decision in September 1997 to deregulate the sector in stages, followed by a formal roadmap in November 1997 to guide the transition. This process culminated on April 1, 2002, with the final dismantling of the APM, the deregulation of petrol and diesel prices, and the abolition of the oil pool account system.

Parallel to dismantling APM, the downstream sector shifted to a comprehensive Control Order regime under the Essential Commodities Act to tackle adulteration and diversion risks. While this was a tectonic shift, some vestiges of the old regime continue, and we are yet to see independent price discovery and free competition in the market. However, barring some sensitive products the above goal has been achieved in other petroleum products.

2.3 The Imperative for Independent Oversight

NELP discoveries had promised large increments of natural gas with domestic pricing oversight since they were largely coming from private sector, which was given marketing freedom under PSC. An enabler was needed to oversee pipeline developments, grant of CGD rights and drive gas economy. Of course, with private sector likely to play a major role, for natural gas an independent regulator was essential. Also, the **LNG supply to India began in 2004** with the commissioning of the Dahej terminal and for this too, pipeline development and associated issues like tariff determination, common carriers, and cross subsidy of tariff were issues which government did not want to tackle at a Ministry level.

Further, opening of the downstream market to competition with pricing freedom needed infrastructure for bulk transportation of the petroleum products through common carrier pipelines. It also required conversion of the then existing petroleum products pipelines into common carriers as its move of transferring the then existing pipelines and upcoming new product pipelines through joint ventures via an independent transportation company Petronet India Ltd. could not succeed.

The simultaneous opening of the upstream sector with NELP in 1997 and dismantling the APM for Petroleum Products in 2002 led to the establishment of a downstream regulator and passing of the PNGRB Act in 2006. The increased supply of gas with pricing freedom, in turn, created the imperative for a transparent, non-discriminatory regulatory framework to govern the petroleum and natural gas. An independent regulator's oversight was also required to prevent monopolies, ensure fair competition, and protect consumers.

2.3.1 The Legislative Genesis of PNGRB (2005-2006)

The journey to create this independent regulator began in the early 2000s. The **Petroleum and Natural Gas Regulatory Board (PNGRB) Bill** was introduced in Parliament in **2005** and, after rigorous scrutiny by Parliamentary committees, the PNGRB Act received Presidential assent on **March 31, 2006**. The legislative intent behind the Act was unambiguous: **to establish an independent statutory authority to govern the downstream petroleum and natural gas sector (excluding upstream production).** The parliamentary debates underscored deep concerns about consumer welfare and energy security, with a clear mandate for the new body to protect the interests of consumers while simultaneously fostering fair trade and competition among entities.

2.3.2 Institutional Design for Autonomy and Accountability

The institutional design of PNGRB is unique and was deliberately crafted to ensure its independence. In a unique positioning, PNGRB reports directly to Parliament. This structure was intended to insulate the regulator from day-to-day executive interference while ensuring that it remained accountable to the nation's highest legislative body. This autonomy is reinforced through several key mechanisms:

- **Financial Independence:** The Board is funded through the Petroleum and Natural Gas Regulatory Board Fund, which comprises fees, charges, and penalties it collects, freeing it from dependence on annual government budgetary allocations.
- **Regulatory Autonomy:** The Act grants the Board the power to frame its own regulations, allowing it to respond dynamically to market developments.
- **Parliamentary Accountability:** This autonomy is balanced by a framework of accountability that includes the submission of annual reports to Parliament and scrutiny through parliamentary questions and committees.

2.3.3 Ensuring Credibility: The Board's Appointment Process

To ensure the Board's credibility and expertise, the PNGRB Act lays down a transparent, multi-disciplinary selection process. The Board comprises a **Chairperson, a Member (Legal), and three other Members**, selected from fields such as **industry, finance, law, or consumer affairs**. The selection process is managed by a high-level Search Committee, chaired by the **Member, Planning Commission (NITI Aayog)**, in charge of the energy sector and Secretaries of Ministry of Petroleum and Natural Gas; Ministry of Finance, Department of Economic Affairs; Ministry of Commerce and Industry, Department of Commerce; and Ministry of Law and Justice, Department of Legal Affairs. The committee's recommendations are then forwarded to the **Appointments Committee of the Cabinet (ACC),** for final approval followed by appointment by the President of India appoints. This rigorous process is designed to ensure the Board is led by person of eminence in the fields of Petroleum and Natural gas industry, management, finance, law administration or consumer affairs, and functions with full autonomy and accountable to the citizens of India through parliament.

2.3.4 The Rule maker: Section 61 and Subordinate Legislation

Section 61 of the PNGRB Act, 2006, is one of its most significant provisions, empowering the Board to frame regulations with the force of law. Its scope is wide, covering authorisation of pipelines and city gas distribution networks, tariff determination and access

codes for common and contract carriers, technical specification standards including safety standards, marketing and retail obligations, dispute resolution, data reporting, and complaint handling. In effect, it allows PNGRB to convert the Act's broad principles into actionable rules that govern daily operations of the downstream oil and gas sector, while adapting to technological advances, market changes, and new policy priorities. All regulations undergo stakeholder consultation as a pre-requisite before notification, ensuring industry participation and transparency.

Through Section 61, PNGRB has built a comprehensive body of subordinate legislation that underpins India's petroleum and natural gas regulatory framework. These regulations not only provide certainty and clarity to industry players but also give effect to the objectives of the Act, reinforcing PNGRB's credibility and the stability of energy markets. This delegated authority is balanced by a measure of accountability under **Section 62**, subjecting every regulation to be laid before both Houses of the Parliament.

2.3.5 The Adjudicator: Quasi-Judicial Framework

One of the essential functions of PNGRB is that of an adjudicator, a role exercised under **Chapter V** for **settlement of disputes under the act.** It can resolve disputes between entities through Benches that must include the **Member (Legal).** Disputes between entities, or between entities and other persons, are decided by Benches constituted under **Section 24**, which must include the Member (Legal) along with one or more members nominated by the Chairperson. This ensures every Bench combines legal expertise with technical or commercial inputs.

Beyond adjudication, **Section 24 and 25** together empowers the Board hear and adjudicate the complaints and also to investigate complaints on restrictive trade practices, regulatory non-compliance, or consumer rights violations. It can conduct inquiries, summon witnesses, examine documents, and impose penalties, functioning in many respects like a civil court. **Section 13** further states that all proceedings before the Board shall be deemed to be judicial proceedings," granting it civil court powers to summon, require discovery of documents, receive affidavits, and issue commissions for witness examination. Through this framework, PNGRB combines legal authority with sector-specific expertise, enabling it to deliver fair, enforceable, and balanced regulatory justice while safeguarding both industry integrity and consumer interests. The Board is empowered under **Section 28** to impose civil penalty for contravention of its directions.

2.3.6 Judicial Remedy for PNGRB's Orders

The Act establishes a robust, independent appellate mechanism to balance these powers. Under Chapter VI, any person aggrieved by a PNGRB order can appeal to the **Appellate Tribunal for Electricity (APTEL)**. Section 30 empowers APTEL to exercise its power as Appellate Tribunal for the purpose of PNGRB Act 2006, with Section 31 requiring a Technical Member (Petroleum and Natural Gas) to ensure sector expertise.

Importantly, High Courts can also intervene if a regulation framed by PNGRB is challenged for its validity that it is against the provisions of the parent Act, but not that of day-to-day regulatory decisions. Finally, **Section 37** provides that appeals from APTEL's orders can be made to the Supreme Court only on substantial questions of law.

2.3.7 The Knowledge Hub: Absolute Mandate in Data and Technical Standards

Two areas where the Board's mandate is absolute are data management and the setting of technical and safety standards. **Sections 51 and 52** empower PNGRB to maintain a comprehensive data bank and require all entities to furnish accurate information, which is the bedrock of evidence-based regulation. Simultaneously, the power under **Section 61 to frame the T4S framework** gives the Board exclusive mandate to ensure safety and adherence to technical specifications standards for all infrastructure of the sector, with non-compliance potentially leading to penalty and includes cancellation of authorization.

PART 3

THE PNGRB ERA: ARCHITECT OF INDIA'S MODERN GAS ECONOMY

3.1 A New Era of Regulatory Foresight

The establishment of the Petroleum and Natural Gas Regulatory Board (PNGRB) in 2007 marked a pivotal moment in India's energy sector. Before its creation, the landscape was fragmented, lacking a unified regulatory framework or a long-term strategic vision for infrastructure development. The pre-2007 era was characterized by pipelines that operated in isolation, with their development driven by specific project needs rather than a cohesive national plan. This resulted in regional imbalances in access and supply, as infrastructure lacked uniformity and interconnectivity across the country.

The **PNGRB Act, 2006**, provided the legal foundation for a new approach, granting the Board a **multifaceted mandate to regulate the sector, protect consumer interests, promote competition, and facilitate infrastructure development**. From its inception, PNGRB was tasked with a colossal mission: to create **a national grid** that would ensure an "**uninterrupted and adequate supply of natural gas and petroleum products in all parts of the country**".

3.2 Catalysing Growth & Reform: The Six Pillars of PNGRB's Vision

Universally, a regulator's efficacy is measured not by the number of rules it issues, but by the real-economy outcomes: timely investment, reliable and affordable access, safe operations, empowered consumers, and a predictable, innovation-friendly market design. In India's gas and petroleum ecosystem, PNGRB's reform journey is best read through six mutually reinforcing pillars:

(A) Investment & Infrastructure Growth
(B) Competition & Market Access
(C) Consumer Protection
(D) Safety & Emergency Preparedness
(E) Transparency & Governance
(F) Sustainability & Innovation

The sections that follow, track how these pillars translate intent into measurable progress, beginning with Investment & Infrastructure Growth.

3.2.1 Investment & Infrastructure Growth

PNGRB's regulatory and facilitatory role has directly driven an unprecedented boom in India's energy infrastructure. Its initiatives are not merely a list of projects but a deliberate strategy to achieve energy equity and national integration: linking remote regions, lowering delivered costs, and opening networks to competition.

A. The City Gas Distribution (CGD) Revolution

At inception, CGD Geographical Areas (GAs) were framed as **city/local networks** anchored to municipal limits and urban agglomeration. As India's ambition to lift natural gas to **~15% of the energy mix by 2030** gathered pace, PNGRB **recast "Geographical Areas" at the district or multi-district scale from the 9th bidding round (2018),** a shift that quickly expanded access after the 9th–10th rounds. Subsequent **11/11A rounds** pushed authorizations to **~98% of population and ~88% of land area**, and in **October 2023** the **12th round** was launched to extend coverage to North-Eastern States and remaining area. By **April 2025**, PNGRB reported **307 GAs covering the entire mainland (country excluding islands)**, with island authorizations under consultation.

The sector's expansion was fragmented prior to PNGRB's formation, with only **19 CGD Geographical Areas (GAs)** in operation. Following the Board's empowerment, it introduced a **structured, transparent, competitive bidding** framework. Progress till the first eight rounds was steady but gradual, with **56 new GAs** awarded. A **fundamental strategic shift** occurred with the **9th and 10th rounds**

in 2018, dramatically expanding the national footprint and committing **₹1.2 lakh crore+** in investment. This marked a pivot from a cautious, demand-driven approach to a **proactive, supply-driven** rollout, backed by policies that encouraged rapid execution; this was a significant shift from the pre-2007 scenario where infrastructure development was guided largely by immediate commercial viability rather than broader policy objectives.

Subsequent rounds, especially **Round 12 and 12A (2023–24)** strategically targeted previously underserved and challenging terrains, including the **Northeast** and the **Union Territories of Jammu & Kashmir and Ladakh**. This deliberate focus on **energy equity** moved gas availability from a niche service to a near-universal offering, with **~100% of the mainland population and geographical area** covered.

On-ground outcomes: Piped Natural Gas (PNG) connections have surged from **0.28 crore (2015)** to **>1.5 crore by 2025**, while CNG stations rose from **850** to **8,154 by May 2025**. The **City Gas Distribution (CGD) steel pipeline network** now spans huge **2,22,365 inch-kilometres (inch-km).** The infrastructure boom has fuelled a **~25% CAGR in CNG vehicle registrations** and a significant increase in gas sales, underscoring the efficacy of PNGRB's strategy.

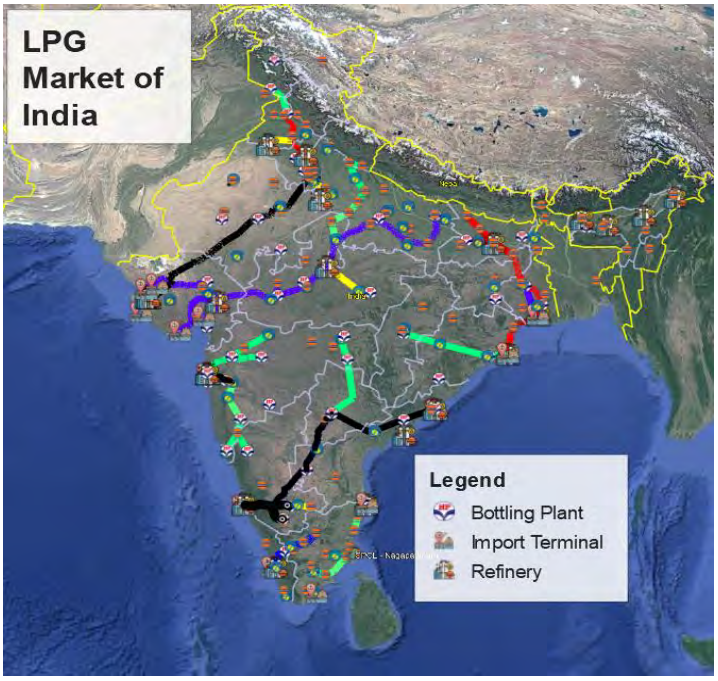
B. Completion of the National Gas Grid

PNGRB has been instrumental in building the physical backbone of India's gas economy: the One Nation, One Gas Grid. The Board has authorized ~34,233 km of natural gas pipelines, with ~25,429 km operational. This network reduces regional disparities and enables seamless, equitable access to natural gas nationwide, including in remote and difficult terrains. Together with CGD GAs' steel pipeline network, these assets form the arterial system for industrial growth, clean mobility, and urban air-quality gains.

C. Petroleum & Petroleum Products Infrastructure & Network Expansion

PNGRB's PPPL push is shifting product movement from road to pipeline by pairing **suo-motu bids** with **open-access and tariff reforms**, so that ATF to airports, LPG to bottling plants, and multi-products move faster, safer, and at lower cost. Petroleum & Petroleum Product Pipelines (PPPL) length has risen from 6,430 km to 9,223 km under its oversight. With an aim to raise the share of liquid fuel pipelines, following measures are underway:

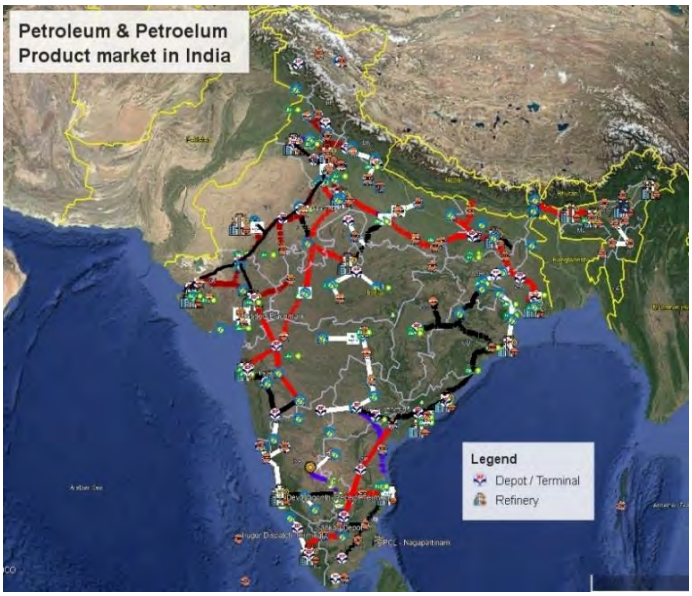
- In the current year (2025), PNGRB-invited bids to lay **five ATF pipelines** to major airports, shifting airport fuelling by road tankers to pipelines and plans to provide **twenty-two major airports** with pipeline connectivity in a phased manner.



- A PNGRB's zonal study showed that only **~25.7% of 210** LPG bottling plants (BPs) were pipeline-connected. Of India's ~32 MMTPA. LPG demand, about **52%** still moves by road, 8% by rail, and 40**%** by pipeline. **Three pipelines now under construction** will lift connectivity to **~84 BPs (~40%)**. To close the remaining gap, **PNGRB has proposed nine new LPG pipelines (~3,470 km)** plus **five spurs,** and **bidding is underway**. The programme targets **~70% BP connectivity** and is expected to avoid **~7.4 million road trips/year** and **~6 million tonnes of CO_2/year**.

- **Optimised national product movement (case study → national roll-out):** A PNGRB case study on primary movement to North India OMC terminals exposed costly criss-cross flows and recommends an **Optimized National Distribution Program of Petroleum Products**. **MoPNG** is now getting a country-wide detailed study undertaken.

- **PNGRB-led multi-product pipeline gap study (underway):** PNGRB is conducting a gap / adequacy study, **mapping the pipeline to build / expansion needed** and **initiating declaration of select existing lines as common carriers**. It will **identify priority corridors** for multi-product pipelines.



Collectively, these measures will improve last-mile connectivity and network redundancy which would otherwise move by road with attendant risks.

D. Other Important Infrastructure & Network Expansion

Beyond above, PNGRB has rolled out **pragmatic flexibilities and ecosystem anchors** that unlock early gas availability, connect difficult geographies, and compress time to get gas.

- **Mobile CNG/LNG refuelling units** now **count towards CGD work-program targets**, allowing quicker market entry where land for permanent stations is scarce.

- **Flexibility for City Gate Stations (CGS) and compressor facilities**: entities may set these up **outside their authorized GA** for an **initial 2-year period**, improving gas availability into underserved pockets.

- **LNG stations for heavy vehicles**: along **highways and industrial corridors** to assure long-haul coverage for trucks and buses.

- **Connecting difficult geographies**: targeted initiatives (e.g., **Andaman & Nicobar Islands**) explore hybrid models that integrate **LNG import/regas + power generation + CGD**, bridging the last major geographical gaps.

- **LNG terminal ecosystem**: India's re-gas capacity has scaled to **~52 MTPA**; regulatory steps, including **terminal registration** and improved pipeline integration, support balanced utilization and better market access.

- PNGRB has initiated **three long-distance NG pipelines** (**Ennore – Suryapet**, **Kochi – Thoothukudi**, and **Mallavaram – Srikakulam**) to fast-track connectivity in under-served corridors and enable early gas availability. These complement PNGRB's grid completion push: **~34,233 km NGPL authorized** with **~25,429 km commissioned (Mar '25)**, which is already supplying **216 GAs** reliably; PNGRB also **designated NGPL/gas sources for 132 of 136 Round 9–10 GAs** to ensure supply readiness as new networks come up.

- **Transport fuel transition – multi-fuel roadmap:** PNGRB convened a roundtable of auto OEMs and CGD entities to shape a **multi-fuel road map**: accelerate **CGD** build-out, scale **CBG**, position **LNG** for **heavy-duty vehicles**, and track **hydrogen** as an emerging option for **LCVs.**

- **User-side levers to speed adoption:** Policy levers under discussion include **diesel truck restrictions** in major cities, **tax exemptions for LNG vehicles**, and addressing **high tanker loading charges** where relevant.

- **Optimising LNG infrastructure (study):** PNGRB is examining **LNG infrastructure optimisation** to strengthen availability and lower logistics frictions along key corridors.

- **Boil-Off Gas (BOG) handling:** PNGRB has issued the BOG handling guidelines based on the PNGRB **industry working group led by PNGRB team** to improve safety, reduce losses, and support the LNG-for-transport ecosystem.

These enablers, paired with connectivity drives and terminal integration **de-bottleneck supply, de-risk capex, and extend coverage** where land and logistics are tight.

E. Market Access & Regulatory Reforms

PNGRB has progressively **opened access**, **standardized tariffs**, and **de-risked investment**, creating a level field for shippers, CGD entities, and consumers:

i. Opening Petroleum Product pipelines

PNGRB is advancing non-discriminatory access across the liquid-fuels chain by notifying eligible product (**around 43**) and ATF pipelines as common carriers and, in alignment with AERA, operationalizing shared airport fuel storage with integrated pipeline operations, improving safety, reducing duplication, and widening third-party access.

ii. Opening CGD & transmission networks

- **CGD networks post-exclusivity**: PNGRB has initiated declaring **74 CGD networks** as **common/contract carriers**, guided by new set of regulations including guiding principles. Costs are recovered through regulated tariffs allowing a **12% post-tax return**.

- **Capacity sharing & transparency**: enforcement of **true capacity** under Capacity Determination Regulations to counter understating and to run assets near optimal utilization.

- **Access Code upgrades**: standard **GTA**, **NGGMS** for common-carrier capacity allocation/dispatch, **GABB** for real-time info (Schedule II), an **Operating Code** (Annexure V), clear **timelines** for booking/nomination, **intraday trade**, and **ship-or-pay** discipline.

iii. Capital efficiency & market development

- **Performance Guarantees**: after full build-out, **CGD PBGs** are reduced to **40%** of the original, **unlocking ~₹28,641 crore** for reinvestment into networks.

- **Gas Exchange**: under 2020 regulations, **IGX** was authorized in **Dec 2020**, enabling transparent spot/term gas trading and price discovery.

- **Imbalance Management**: expanded services (**parking, lending, netting, trading**) for shippers to handle real-time imbalances, stabilizing flows and lowering balancing costs.

- **Pipeline Development Reserve Fund**: operators with high utilization plough back part of surplus earnings: **50%** into **new pipelines/expansion** and **50%** as **tariff rebates**, creating a virtuous cycle of reinvestment.

- **Long-term sourcing discipline**: pipelines to source **≥75%** of system-use gas via **3+ year contracts**, reducing volatility pass-through and improving tariff predictability.

- **Structural reforms in progress**: a **High-Level Committee** has examined separation of transportation from marketing (toward a neutral **TSO/ISO** model) to remove conflicts of interest and bolster non-discriminatory access.

F. CGD Sector Expansion & Consumer Outreach

Coordinated demand creation: From **January–March 2024**, PNGRB ran a **National PNG Drive** with all CGD companies to add household connections, targeting areas with existing/planned pipelines:

- 24 new GAs gasified
- ~3.10 lakh households registered
- ~5.96 lakh new PNG connections achieved

Ambitious MWP commitments (by 2034): 12.63 crore PNG-domestic connections; **18,336** CNG stations; **5.46 lakh inch-km** of pipelines, taking clean energy to virtually every corner of India.

State policy alignment: Interaction with LGs, Chief Ministers, Chief Secretaries of the states resulted into adoption/notification of **state-level CGD policies by 11 States/UTs** (Punjab, Uttar Pradesh, West Bengal, Assam, Tripura, Tamil Nadu, Puducherry, Karnataka, Madhya Pradesh, Bihar, Rajasthan), including rationalisation of VAT rates together representing **~55% of population** and **~60% of households**. PNGRB targets within these states **7.85 crore** PNG connections and **10,131** CNG stations.

G. Why these matters — investment, inclusion, and system resilience

Rules create opportunity; execution converts it into access and volumes. PNGRB's integrated approach: **strategic authorizations + access reforms + facilitation**, is translating design into delivery. The results are visible in coverage **(~100% of mainland),** domestic PNG connections, vehicle conversions to CNG, and sales growth, while tariff reforms and open access lower the delivered cost and expand competition. Together, this architecture brings India materially closer to a gas-based economy, with benefits in air quality, industrial competitiveness, and energy security.

3.2.2 Market Efficiency & Competition

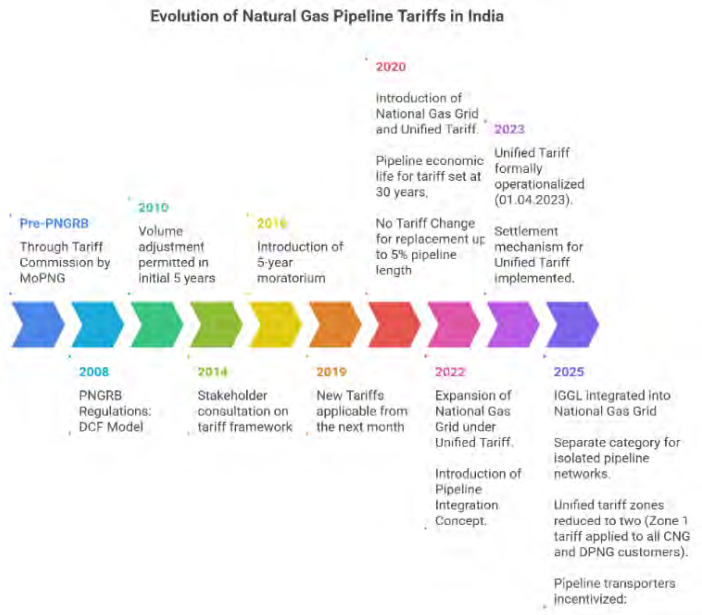
PNGRB's reforms have progressively liberalized India's downstream gas market, aligning infrastructure incentives with consumer welfare and competitive access. The emphasis is simple: reduce delivered costs, open networks fairly, and make capacity easy to book and hard to hoard.

A. Reforming Tariffs: "One Nation, One Grid, One Tariff"

The evolution of natural gas pipeline tariffs in India has moved from government-administered pricing to a more structured and unified regime under PNGRB. Initially, tariffs were set through the **Tariff Commission by MoPNG until 2008**, when PNGRB introduced regulations based on the **Discounted Cash Flow (DCF) model**. In 2010, volume adjustment provisions were allowed to support new pipelines, followed in 2014 by exemptions on imbalance management income and the formal introduction of stakeholder consultations.

A major shift came in 2020 with the launch of the **National Gas Grid** and the **Unified Tariff system**, which standardized tariff determination. Also, fixing the pipeline **economic life at 30 years** and introduction of operational norms helped it. This framework was strengthened in 2022 through **pipeline integration**, **normative efficiency parameters**, and **longer ramp-up allowances**, laying the foundation for stability. The

Unified Tariff was formally operationalized in April 2023 with three tariff zones viz. **Zone 1 (0–300 km**) is 52.5% of Zone 3**; Zone 2 (300–1,200 km)** is 75% of Zone 3 and a settlement mechanism, and **by 2025, it was further refined through integration of new networks, reduction to two tariff zones**, and incentive-linked provisions for transporters.



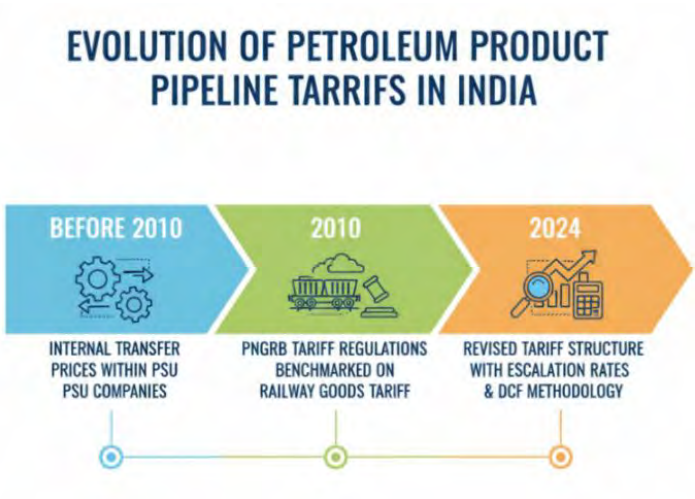
Overall, the trajectory reflects a shift toward uniformity, integration, and efficiency in tariff determination.

B. Petroleum Product Pipeline (PPPL) Tariff Reforms

Before PNGRB, tariffs for product pipelines were largely internal transfer prices within PSUs. PNGRB's 2010, regulations linked the **pipeline tariff to railway goods tariffs**.

However, in 2024–25, this framework was extensively reformed creating a formal, dual-structure methodology, with a **one-time 17 percent tariff increase for older pipelines** conceived before 2010,

along with an **escalation of about 3.4 percent linked to inflation annually**. And for those pipelines conceived after 2010, **cost-plus approach** called the **Discounted Cash Flow (DCF) model** has now been adopted which comprehensively takes into account the **Rate of Return (RoR), Capital Employed, Operating Costs and Volumes**. Similarly, for the Bid-out pipelines the DCF model with 12% RoR shall be applicable only from the **11th year of operation**. Nowadays, the bid asks to quote tariff for **25 years**.



C. Common Carrier & Open Access

To optimize asset use and competition, PNGRB is opening pipelines and networks to third parties. It has begun declaring captive OMC product pipelines as common carriers. So far **≈10,319 km** of formerly private pipelines (**69% of all 14,920 km**) is being notified for third-party access and are in process of being declared as common carrier. In July 2023 PNGRB declared **two jet-fuel (ATF) pipelines** in **Mumbai as common carriers**, and similar declarations are underway.

Also, post detailed study of ATF pipeline infrastructure and inviting bids for few pipelines, through a press release dated **18 June 2025** it was declared that PNGRB will support AERA's directive for establishing

common fuel storage facilities on an open-access basis at all major airports **within 12 months in line with PNGRB's intent to link all major airports with common carriers.**

Likewise, PNGRB initiated **declaring 74 CGD networks** (formerly under exclusive franchises) as common/contract carriers now that their exclusivity has ended. This **"opening" of networks** (supported by new **Guiding Principles** and **Access Code regulations**) will allow multiple suppliers to use CGD and pipeline systems, promoting competition and better service. Entities are to recover costs via regulated tariffs (**12% post-tax return**), ensuring a reasonable return as networks open up.

D. Authorization of the Indian Gas Exchange (IGX)

A significant market access reform was the authorization of the **Indian Gas Exchange (IGX)**. This created the country's first transparent, market-based platform for trading natural gas, enabling efficient price discovery and broadening market access for a wider range of participants.

This reform broadened market access and improved price discovery. In parallel, pipeline operators must offer parking, lending, netting, and imbalance trading services so shippers can manage real-time flow swings, keeping the system stable, liquid, and cost-efficient.

E. VAT Rationalisation as a Demand Catalyst: PNGRB's State-Level Facilitation

VAT rationalization has been another strong driver of gas adoption. Differential VAT rates across states have been a long-standing challenge, with some levying as **low as 5%** and others charging **over 20%.** PNGRB worked with state governments to rationalize rates, with success stories like **Bihar**, which reduced VAT on **CNG and PNG (domestic and commercial) from 20% to 12.5%,** and on **PNG for industrial use to 5%,** impacting **1.9 crore households**.

Similarly, **Chhattisgarh** cut **VAT on natural gas from 14.5% to 5%**. Other states such as **Andhra Pradesh, Assam, Rajasthan, and Dadra & Nagar Haveli & Daman & Diu** also implemented reductions. These reforms have made gas cheaper and more attractive to households and industries, while improving the economic viability of networks.

F. Outcomes & Adoption Signals (FY 2024–25)

The impact of PNGRB's reforms is now visible in hard, on-ground metrics: adoption is climbing, networks are densifying, and states are aligning policy levers to speed gas uptake. The snapshot below shows how facilitation is translating into real consumer access,

cleaner air, and smoother execution.

i. Strong retail uptake (financial year 2024–25):

- The **CNG vehicle fleet** increased from **58.61 lakh in March 2023 to 81.95 lakh in March 2025**, amounting to approximately **25 percent year-on-year** growth in financial year 2024–25.
- **1,206 new CNG stations** were commissioned in financial year 2024–25, expanding access and convenience.
- Total gas sales grew by **21 percent** in financial year 2024–25.
- Households added **21 lakh new PNG connections** in financial year 2024–25, and PNG sales rose by **11 percent** nationwide.

ii. State-level push and price relief:

- In July 2025, Tamil Nadu approved conversion of **1,000 diesel buses in Chennai to Compressed Natural Gas** under the **Metropolitan Transport Corporation**, and the **Maharashtra State Road Transport Corporation** advanced the shift of parts of its fleet to **Liquefied Natural Gas (LNG)** technology.
- By late 2024, **five states** had issued or updated state-level City Gas Distribution policies, with **four additional states** drafting such policies, thereby easing project approvals.
- **Value Added Tax** on CNG and PNG was reduced in **Karnataka, Assam, Rajasthan, Chhattisgarh, Bihar** and **Andhra Pradesh**, lowering consumer prices.

iii. High-touch coordination:

- Senior leadership of PNGRB met **Chief Ministers** (including those of **Assam, Madhya Pradesh, and Punjab**) and the **Chief of the Naval Staff** in October 2024 to expand institutional use of natural gas.
- Regular coordination meetings between City Gas Distribution entities and Natural-Gas Pipeline companies help synchronise **tie-ins**, **commissioning schedules**, and **gas nominations.**
- The Board collaborates with the **Central Pollution Control Board (CPCB)** and the **Ministry of Environment, Forest and Climate Change (MoEFCC)** to align gas substitution with the **National Clean Air Programme**.

iv. Execution enablers:

- **State-Level Coordinators** have been appointed to liaise with state authorities on City Gas Distribution, natural-gas pipelines, and petroleum and petroleum products pipelines.
- **On-site and quarterly reviews** of City Gas Distribution projects are conducted across states (for example, in Madhya Pradesh and Uttarakhand) to resolve **right-of-way**, **utility-shifting**, and **permitting delays**.
- In October 2024, the Board issued **standard force-majeure forms** on its website to speed claims handling by City Gas Distribution companies.

v. Continuous improvement:

- PNGRB uses **centralised data, structured field feedback, and regular studies** to identify gaps, replicate effective practices, and create learning loops that improve both policy design and on-ground execution.

Together, these measures are expanding access, lowering costs and emissions, and building the institutional muscle for consistent delivery. Sustaining the momentum will hinge on steady engagement, data-driven reviews, and clear, predictable signals to industry and consumers alike.

3.2.3 Consumer Affairs

In April 2024, PNGRB established a dedicated **Consumer Affairs Division** to safeguard end-user

interests, in line with the mandate of the Act. The foundational work of the **High-Level Expert Committee (HLEC),** chaired by **Mr. Ratan P. Watal**, provided a roadmap. The committee's report, submitted in March 2025, recommended key measures such as the creation of an **Ombudsman mechanism**, the framing of Consumer Protection Regulations, and the establishment of **Consumer Advocacy Bodies**.

PNGRB has already begun implementing these recommendations in a phased manner, laying the groundwork for a robust, consumer-centric regulatory environment.

A. Strengthening Grievance Redressal

- The Board has reimagined the **consumer grievance redressal system** to be more **transparent and accountable**. It now mandates that all City Gas Distribution (CGD) entities file **monthly reports** on consumer complaints and their resolution status on the **PNGRB E-Portal**.
- A **dedicated grievance escalation email facility** has been created for consumers whose complaints remain unresolved at the entity level, and monthly grievance analysis reports are being hosted on the **PNGRB website**, providing insights into the nature of complaints and tracking resolution timelines.
- An industry committee is working to develop a **uniform classification and escalation framework**, including **compensation mechanisms**, to ensure fairness across the sector. PNGRB's intervention has already resulted in significant improvement in complaint redressal timelines.

B. Enhanced Transparency & Accountability

- A landmark achievement has been the introduction of a **standardized billing framework**, which has already **benefited over 77 lakh consumers**, representing more than **half of all PNG consumers**. This framework mandates clear price breakups, consumption details, and emergency contacts, providing a high level of transparency. The standardized bills also include **details on complaint handling officials**, **bill collection centre addresses**, and a **QR code for easy payment**.
- Furthermore, PNGRB now publishes state-wise CNG and PNG prices along with **detailed price breakups** on its website, ensuring almost 100% compliance from CGD entities and **empowering consumers to easily verify charges**. The initiation of **Consumer Satisfaction Surveys (CSS)** by five empanelled Third-Party Agencies (TPAs) **across 92 Geographical Areas** is a forward-looking step designed to capture measurable consumer feedback on service quality, safety, and grievance handling.

C. Safety & Empowerment Initiatives

- PNGRB has introduced a first-of-its-kind insurance scheme for PNG consumers. Already **rolled out by nine entities** covering over **70 lakh consumers**, the scheme provides vital coverage against **public and third-party liability**, **medical expenses**, and **offers immediate relief in case of mishaps**.
- This initiative is comparable to the insurance safety net available to LPG consumers. The Board has also championed **the shift to high-efficiency PNG stoves**, initiating a pilot study on PNG stove efficiency in six geographical areas, covering 6,000 households. In parallel, the division is encouraging the adoption of **BIS (IS 17153)** compliant energy-efficient PNG stoves.

- Further, PNGRB has also given equal emphasis to consumer awareness and empowerment. A dedicated consumer section on the PNGRB website provides FAQs, updated prices, and emergency contact numbers. CGD entities conduct consumer awareness campaigns via SMS, emails, and WhatsApp to educate consumers on fraud prevention and safe gas usage practices.

- In July 2025, **PNGRB organized the 1st National Consumer Conclave**, bringing together policymakers, consumer bodies, and industry experts to foster dialogue on grievance redressal and consumer empowerment.

D. Future Roadmap

As part of its future endeavours, PNGRB is in the process of drafting comprehensive regulations that will cover **complaint management, Service Level Agreements (SLAs), and the appointment of an Ombudsman**. A **Centralized Digital Grievance Redressal System** is under development to offer real-time complaint tracking and analytics. Additional proposals under consideration include independent consumer advocacy panels, a **National Consumer Helpline,** and a **Consumer Welfare Fund** for vulnerable sections of society. The goal is to build an integrated consumer ecosystem that is proactive, supportive, and transparent.

3.2.4 Reliability & Security

Ensuring the physical integrity and uninterrupted supply of India's energy infrastructure is a fundamental responsibility of PNGRB.

A. The Foundational Role of Technical Regulations

i. Legal mandate: why PNGRB can make these regulations

- The PNGRB Act, 2006 empowers the Board to make regulations "**to carry out the provisions of this Act**" (**Section 61**), including laying down technical standards and specifications, including safety standards (**Section 11**).

- When directions or regulations are violated, PNGRB can impose **civil penalties** and pursue offences under **Chapter IX** (e.g., Section 28; orders executable as civil court decrees).

Everything that follows: T4S, IMS, ERDMP and the new ERC framework, sits squarely on this legal bedrock.

ii. T4S: "Design-to-retail" technical standards (THE WHOLE DOWNSTREAM, END-TO-END)

T4S: Technical Standards & Specifications including Safety Standards codifies how assets are designed, constructed, commissioned, operated and maintained. It is the backbone for safe infrastructure that performs as intended across its lifecycle.

How T4S spans the entire downstream chain

- **City/Local CGD Networks (2008):** distribution grids, service lines, metering, pressure regulation.

- **Natural Gas Pipelines (2009):** design & construction aligned to ASME B31.8; materials, welding, testing, commissioning, operations.

- **Petroleum & Petroleum Products Pipelines (2016):** multi-product/LPG/ATF pipeline engineering, station design, integrity and safety systems.

- **Retail Outlets Dispensing Automotive Fuels (2018):** layout, storage, dispensing, fire protection, operations.

- **Liquefied Natural Gas Facilities (2018):** LNG storage, handling, re-gas systems, safety distances, fire protection.

- **LPG Storage/Handling & Bottling (2019):** storage vessels, bottling plant operations, transfer and fire safety.

- **Petroleum Installations (2020):** depots/terminals,

tank farms, truck/rail loading, firefighting and emergency systems.

- **Petroleum Refineries & Gas Processing Plants (2023):** process safety across units/utilities, flare, instrumentation, emergency systems.

What T4S guarantees in practice

- One **uniform safety and engineering baseline** from high-pressure trunklines to the last retail nozzle.
- **Interoperability** and auditability (e.g., materials, welding, hydrotests, SCADA, leak detection, hazardous-area classification).
- **Built-in references** to global codes/standards where appropriate (e.g., ASME B31.8 within NG pipelines).

T4S makes "**safe by design**" the default: before gas or product ever flows.

iii. IMS: keeping assets safe after they're built

Integrity Management System (IMS) regulations kick in once assets are operating, risk-based, data-driven programs to prevent failures, protect people/environment, and sustain reliability.

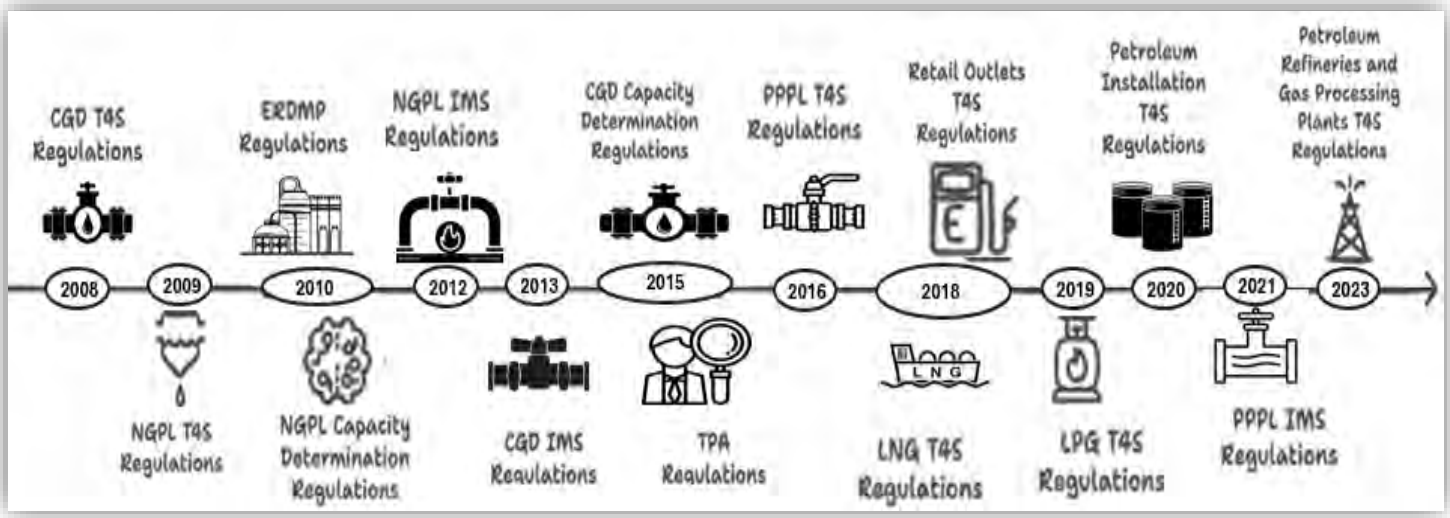
Sector-specific IMS regulations:

- **Natural Gas Pipelines (2012; 2025 consolidated):** risk assessment, class-location, ILI/direct assessment, mitigation, performance metrics.
- **City/Local CGD Networks (2013; 2025 consolidated):** risk ranking, surveillance, leakage control, MAOP management, periodic audits.
- **Petroleum & Petroleum Products Pipelines (2021; 2025 update):** pipeline integrity governance for multi-product/LPG lines.

How IMS complements T4S:

- T4S ensures the asset is born right; IMS ensures it stays right, continuously.
- Mandatory internal & third-party audits, review cycles, and corrective-action tracking are built into IMS.

With IMS, PNGRB turns one-time compliance into a living, monitored discipline**.**



iv. Compliance assurance & consequences (TPCA → "Default & Consequences")

PNGRB builds independence into verification and clarity into enforcement.

Third-Party Conformity Assessment (TPCA):

- Empanelled TPIAs audit conformance to PNGRB's technical and safety regulations across facilities; the Board also specifies audit frequency and scope.

"Default & Consequences" (standard clause, 2025 updates across T4S/IMS/ERDMP):

- **Harmonised clause across all technical regulations:** All PNGRB technical regulations carry **"Defaults & Consequences"** provisions that **empower the Board to penalise** entities for non-compliances or violations.

- Through a public notice dated 15th September 2025, PNGRB **notified 12 amendments** that revise the "Defaults & Consequences" clauses and **prescribe a clear procedure for penal action** (the amended regulations are listed in Annexure-I). The goal is **greater clarity and consistency** across all technical regulations and **uniformity in enforcement**.

- **Due process and natural justice:** The amendments **codify a transparent procedure**, including an **opportunity to take remedial action** and **an opportunity of being heard**. **No punitive action** is taken if timely remedial measures satisfy the Board. However, **where a non-compliance/violation leads to a major incident**, the Board may **proceed directly to punitive action** after giving the entity an opportunity to be heard.

- **Why these matters:** The strengthened framework is meant to act as a **strong deterrent** against non-compliances and the **recurrence of incidents**, while prioritising **public safety**, **asset protection**, and **environmental preservation**. It promotes **safe operating practices** and a stronger culture of **compliance, accountability, and safety** across the sector.

The message is simple: independent audits verify, and a clear penalty ladder enforces.

v. ERDMP: India's benchmark for emergency readiness

The **Emergency Response & Disaster Management Plan (ERDMP) Regulations (2010)** are widely regarded as a first-of-their-kind, specifying hazard identification, risk assessment, resource mobilisation, multi-agency coordination, drills and incident reporting across downstream facilities.

What ERDMP requires:

- On-site and off-site plans, periodic mock drills with district authorities, reporting timelines, and integration with other statutes/guidelines

- Referenced and cross-linked within other PNGRB regulations

ERDMP hard-codes preparedness so that response is fast, coordinated and effective.

vi. New layer: ERC Regulations (draft) — specialised Emergency Response Centres

To handle catastrophic (**Level III**) events beyond in-house capability, PNGRB is formulating draft **Emergency Response Centres (ERC) Regulations, 2025** for risk-prioritised, shared, high-capacity firefighting and response.

What the draft ERC framework sets out:

- **Applicability:** high-risk contiguous clusters (e.g., >1.5 lakh KL cumulative tankage), major crude pipeline terminals, large, isolated installations, or as flagged by QRA/risk assessment.

- **30-minute response benchmark** within the coverage cluster and a phased roll-out.

- **Capability & equipment:** UL-listed HVLR monitors (4,000-8,000 GPM), foam stocks sized to

worst credible tank fires (NFPA/API methods), pumps/hoses/PPE, additional water storages, DG backup, trained "fire commandos," integrated command & communications.

- **Governance & assurance:** ERCs integrated into ERDMP; annual performance validation (live-fire exercises, flow tests, foam QA), third-party audits, and penalty/suspension provisions linked to Section 28/Chapter IX.

ERCs add a special-forces layer to India's emergency architecture: ready, resourced, and regulated.

vii. Road-transport safety: PNGRB's guidelines (2025)

After a major LPG tanker accident, PNGRB issued **Guidelines** for safe Road Transportation of Petroleum Products, LPG, Natural Gas, etc. on **28 Feb 2025**.

What entities must now do (highlights)

- **Prefer pipelines/rail** for long distances; keep road transport for shorter last-mile legs; consider common-carrier use of spare pipeline capacity.
- Implement a **Journey Management Plan**: authorised halts, black-spot awareness, defensive driving, route weather, emergency actions, TREM card discipline, explicitly tied to Petroleum Installations T4S & ERDMP clauses.
- **Technology & surveillance:** ABS, vehicle tracking, speed governors, front/rear cameras, anti-collision devices; investigate route deviations.
- **Human-factors controls: no night driving (2300–0600)** unless formally relaxed; **alternate driver/helper mandatory**; biometric/app attendance at loading/unloading; **duty-hour caps and rest intervals** (aligned with the Motor Transport Workers Act + PNGRB Petroleum Installations T4S).
- **Accountability:** medical fitness checks, escalatory **penal action/blacklisting** for violations; quarterly intensive safety checks; one-month compliance reporting to PNGRB.

These guidelines translate tragic lessons into **clear, monitorable requirements** that cut risk on Indian roads.

viii. Capacity & access (the transparency layer that underpins third-party access and tariffs)

- PNGRB's **capacity determination regulations** for **NG pipelines (2010)** and **CGD networks (2015)** standardise how **sustainable capacity** is calculated (software/flow equations), **web-hosted**, and then used for **non-discriminatory access** and **tariff setting**.
- Capacity declarations and updates are routinely published/notified (e.g., PPPL capacities, CGD capacities).

ix. How the stack fits together

- **T4S** makes assets **safe by design** → **IMS** keeps them **safe in service** → **ERDMP** ensures **everybody is ready** for the worst day → **ERCs** add **specialist surge capability** for catastrophic events → **TPCA** checks **independently** that it all happens → **Defaults & Consequences** ensure **non-compliance hurts** → **Capacity & Access** keep the market **fair and transparent**.
- The result is a single, coherent framework that covers the whole downstream—from pipelines and refineries to depots, bottling plants, LNG facilities, retail outlets, and road movement: end to end.

B. Independent Gap Analysis & Expert Committees: How PNGRB Updates Its Rulebook in a consultative manner

PNGRB constitutes technical committees, which are composed of senior representatives from regulated entities, typically **senior technical experts** nominated by their organization to represent them. The committees review the regulations, debate sectoral implications, and **formulate consensus recommendations**. On that basis, **amendments are placed before the Board** for consideration and notification, ensuring that updates are grounded in global best practice, tested against operating realities, and aligned with the Act's objectives.

Furthermore, to keep its technical regulations aligned with global best practice, PNGRB has launched a competitive, **quality-and-cost–based selection** on the government e-procurement portal to appoint a **knowledge partner** for a six-month, end-to-end **gap analysis**. The assignment benchmarks PNGRB's codes against peer jurisdictions (**the United Kingdom, United States, Japan, Australia, Germany and Saudi Arabia**), checks coverage against the PNGRB Act, and drafts time-bound amendments or new regulations as required, including clear monitoring methodologies and penal provisions. Draft recommendations produced under this exercise then move to PNGRB's technical committees, for review and consensus, before proposals are placed before the Board for approval and notification.

C. Enhancing Safety and Compliance

PNGRB has implemented several initiatives to strengthen safety and compliance, many of these measures were undertaken on the recommendations of the High-Level Expert Committee on Safety chaired by Mr. M. B. Lal. It maintains a mechanism for investigating major incidents to **analyse failures, identify root causes, and develop preventive strategies**. The board also **web-hosts case studies of these incidents** to share learnings across the industry and enhance safety culture.

In addition to developing new T4S regulations for refineries and gas processing plants, PNGRB is also formulating **road safety regulations** for the transportation of petroleum and gas cargo, which will standardize safe driving practices and strengthen compliance.

To improve the safety audit process, PNGRB has framed remuneration guidelines and introduced a **QCBS-based tendering system** for selecting Third Party Inspection Agencies (TPIAs). Currently**, 32 TPIAs** are empanelled to conduct technical and safety audits. Furthermore, PNGRB has standardized **audit man-hours** and **selection criteria** for third-party safety audits. An "**Audit Man-Days Matrix**" now dictates audit durations by plant size, and criteria matrices ensure only qualified lead auditors are used.

PNGRB has constituted a panel of **18 subject-matter experts** drawn from across the downstream value chain, primarily ex- Executive Directors, ex – Chief General Managers and ex - General Managers from operating companies (pipelines, city gas distribution, LPG/LNG facilities), refineries, marketing depots/terminals, and safety/engineering functions. This panel conducts a **technical peer review of Third-Party Inspection Agency (TPIA) reports**, calibrating findings, harmonising interpretations of the Technical Standards and Specifications (T4S), and flagging systemic gaps for code updates. In parallel, PNGRB is now planning to collaborate with a reputed agency which will carry out structured assessments, refresher trainings and certification programmes for TPIA auditors to standardise methodologies and strengthen audit process. Coupled with PNGRB's QCBS-based onboarding of TPIAs and a standardised audit man-day matrix, the expert review streamlines inspections, improves consistency across audits, and lifts overall compliance and sector safety.

D. Digital Transformation and Sustainability

PNGRB is also focused on digital transformation to modernize the downstream sector. One key initiative involves enabling **smart domestic PNG meters** and stoves in the City Gas Distribution (CGD) sector. By leveraging **IoT and real-time data**, these smart meters aim to improve safety through features like leak detection and enhance billing accuracy. An industry

committee has been formed to develop a roadmap for implementing these meters.

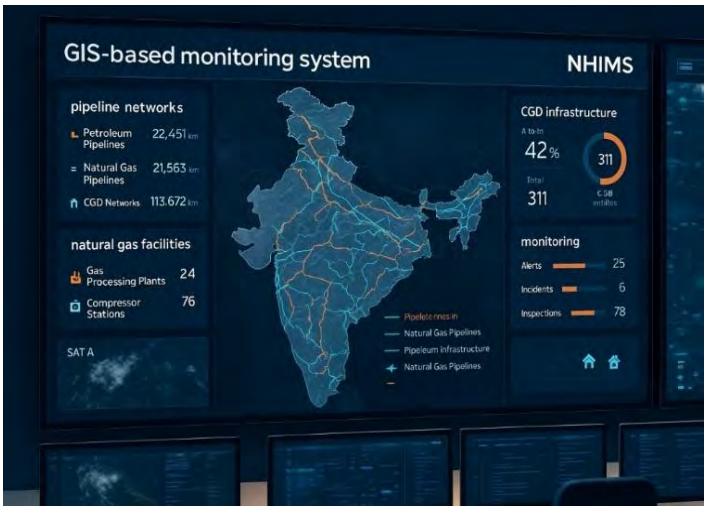
Furthermore, in the CGD sector, PNGRB is upgrading equipment: it championed the shift to **high-efficiency PNG stoves**. Standard LPG stoves lose efficiency **(68%→45%)** when retrofitted for PNG. PNGRB has hosted conferences and issued advisories pushing CGD companies and manufacturers to adopt IS-**17153 stoves (65%+ efficiency).** It even piloted **6,000 advanced PNG stoves** in five metro areas across different CGD companies (**Delhi, Mumbai, Bengaluru, Ahmedabad, Assam**) to demonstrate savings. This aims to **reduce consumer gas bills by 20–25%** and cut greenhouse gas emissions.

PNGRB has also developed a dedicated digital portal to streamline audit compliance monitoring and authorization, which aims to improve efficiency and transparency. These initiatives, along with strategic **MoUs with various institutions and international collaborations** with organizations like the **Federal Energy Regulatory Commission (FERC), American Society of Mechanical Engineers (ASME)** and the **American Petroleum Institute (API),** help align India's downstream oil and gas sector with global benchmarks.

E. Digitalization for Real-Time Oversight

The Board has embraced digital transformation to enhance its oversight capabilities. One of its key digital initiatives is the ***National Hydrocarbon Infrastructure Monitoring System (NHIMS)***, a GIS-based platform designed for real-time tracking and strategic monitoring of the country's petroleum, natural gas and CGD infrastructure.

NHIMS will gather live data from companies engaging in hydrocarbon transport, and integrate this with geographical layers such as roads, railways, water bodies and forests. Through this fusion of spatial information and live operational metrics, the system aims to enable more accurate planning, better oversight of pipelines authorised by PNGRB, and to ensure that petroleum and natural gas flows are monitored more transparently across India.



With NHIMS to be housed in the upgraded headquarters, PNGRB intends this system to strengthen regulatory effectiveness by giving authorities **near-real time visibility into infrastructure progress, transport activity, and any potential risks or non-compliance**. This will support faster decision-making, safer infrastructure planning, and greater accountability of companies operating in the hydrocarbon domain. The initiative underscores PNGRB's broader push toward digitalization, transparency, and safety in India's petroleum and natural gas sector.

F. Ensuring Supply Resilience

To ensure the stability and security of the supply chain, PNGRB has introduced several key measures. The regulations now mandate that pipeline operators procure at least **75% of their annual system-use gas** via long-term contracts. This requirement is designed to enhance stability, reduce exposure to volatile spot prices, and ensure more predictable transport costs for users, thereby safeguarding the entire system against supply disruptions. The Board is also developing a "**Supply Security Roadmap**" to build resilience and redundancy into the system, further enhancing preparedness against unforeseen contingencies.

3.2.5 Transparency & Governance

PNGRB has worked to create a predictable and accountable regulatory environment, a cornerstone for fostering investor confidence and promoting fair

competition.

A. Objective & Independent Oversight

To ensure transparency and objectivity in compliance verification, PNGRB mandates that audits and conformity assessments be conducted by empanelled **Third-Party Inspection Agencies (TPIAs).** For major incident investigations, the Board engages independent subject matter experts to minimize conflicts of interest and uphold the highest standards of safety and accountability. This mechanism ensures that **root-cause analyses** are **fact-based** and **corrective actions** are robust.

B. Research, Knowledge & Data Sharing

PNGRB is building transparency through **data and studies**. Statistics Division now tracks **nationwide pipeline, CGD and petroleum infrastructure growth**, and has streamlined data platforms for regular reporting by operators. This centralized data supports regulatory decisions and investment planning.

On knowledge dissemination, PNGRB has published **in-depth reports and case studies**: examples include optimization of primary product transport to OMC terminals, LNG supply chain studies, and analyses of completed CGD work programs. It released **state-wise data** on **LPG and PNG connections** and **CNG vehicle growth**, and reviewed pipeline expansion across bidding rounds. Along with these **several reports/ research and case studies** are regularly published on PNGRB's website. These analytic outputs translate its regulatory data into actionable insights.

C. Strategic Guidance through HLECs

PNGRB has created a Strategic Planning Division along with certain high-level committees to set long-term strategy. In **April 2024**, it hosted a roundtable with **auto manufacturers and CGD companies** to boost CNG in transport. It also conducted a comprehensive **study on optimizing LNG flows** (supply routes and terminal use). A separate case study on petroleum product logistics in North India prompted PPAC to launch a nationwide review of product transport. In October 2024, PNGRB co-organized an **LNG/CNG trucking conference** with GAIL to chart a roadmap for natural gas in freight and formed an industry committee to tackle boil-off issues.

PNGRB also set up High-Level Expert Committees (HLECs**)** to guide reforms:

a) **HLEC on Safety:** Chaired by **Mr. M.B. Lal** (ex-Member APTEL & Ex HPCL CMD), it reviewed the entire **downstream safety framework**. Its **Oct 2024** report (now public) gave **21 recommendations** to unify safety and emergency response standards. PNGRB has already formed an internal task force and set timelines to adopt these. A downstream safety conference (Dec 2024) was also held to sensitize all operators.

b) **HLEC on Consumer Protection:** Led by **Mr. Ratan Watal** (ex-Finance Secretary), it is defining best practices to **protect consumer interests** in gas supplies. Its report (**Mar 2025**) has been submitted and will be published on PNGRB's website.

c) **HLEC on Vision 2040 – Natural Gas Infrastructure:** Chaired by **Mr. D.K. Sarraf** (ex-Chairman, PNGRB). Given India's aim to raise gas's share to **15% by 2030**, this committee is forecasting **demand/supply scenarios out to 2040**. It examines **LNG/pricing trends**, **pipeline needs**, and **competition with other fuels**. Its **2025 report** will propose infrastructure rollout and policy measures needed for that target.

d) **HLEC on Competition & Unbundling:** Chaired by **Mr. Ajay Tyagi** (ex- Chairman, SEBI), this group (formed in Sep 2024) is tackling market-play issues like **CGD exclusivity** and **gas-market vs gas-infrastructure separation** (**Section 21 of PNGRB Act**). It has analysed global best practices in **unbundling** and recommended how to create a level playing field and **enforce third-party access** laws (e.g. post-exclusivity CGD).

Each committee's findings shall shape board's future regulations and reforms to ensure the gas sector grows competitively and sustainably. A strong safety

base lets the system handle new fuels with confidence. Hydrogen and bio-gas need fresh codes, tests, and pilots before wider use. The new cells build this pathway step by step.

D. Certified Workforce Framework for India's Petroleum & Natural Gas Sector

Comprehensive capacity building framework for petroleum industry workforce

Purpose and Scope: PNGRB is initiating deployment and up-skilling manpower across the petroleum and natural gas sector to enhance consumer safety and national energy security with features:

- Alignment with education bodies like University Grants Commission, All-India Council for Technical Education, the Directorate General of Training, and the National Council for Vocational Training.
- Independent assessment and certification**:** by the National Council for Vocational Education and Training
- Mandatory certified workforce
- Standards under National Skills Qualifications Framework
- Accredited training delivery.
- Phased roll-out and coverage
- Trainer and assessor competence
- Digital platform for governance
- Time-bound action plan

3.2.6 Sustainability & Transition

PNGRB's current initiatives reflect a proactive approach to India's energy transition, with a focus on integrating cleaner fuels. Specialized cells for **hydrogen, compressed biogas (CBG), and sustainability** are adapting the regulatory framework to support the country's environmental goals.

A. Hydrogen Integration

In response to India's **National Green Hydrogen Mission**, PNGRB established a **dedicated Hydrogen Cell** to prepare the gas network for hydrogen blending. In partnership with the World Bank and consultants, the Board has completed comprehensive studies on **hydrogen transmission pathways**, culminating in a **finalized roadmap**.

To gain real-world experience in hydrogen handling, safety, and consumer acceptance, PNGRB has approved **five pilot projects for blending hydrogen** (**at 2-8% concentration**) into city gas networks. These projects, starting with **Indore in June 2021 and expanding to cities like Surat and Gorakhpur**,

provide invaluable data.

The Board proposes to amend its technical standards to incorporate hydrogen-specific requirements and developing testing facilities to assess pipeline compatibility. This will happen once the PNGRB Act is amended to bring hydrogen under its ambit.

B. Compressed Biogas (CBG) Integration

Aligning with India's focus on a circular economy, the CBG Cell is working to connect the country's bio-gas producers to the national gas grid. India's target is to establish **5,000 CBG plants by 2030**, and PNGRB's mandate is to streamline the **pipeline hookups and off-take agreements** needed to achieve this. The Cell is coordinating between producers and CGD companies to accelerate connectivity of CBG plants so as to support the **national goal of 5% CBG blending in the gas supply** from FY 2028 - 2029 onwards.

C. Sustainability Initiatives

A dedicated Sustainability Cell integrates climate objectives into PNGRB's work. It focuses on **minimizing fugitive methane emissions from pipelines**, encourages the **electrification of gas compressors** to cut operational emissions, and is working to incorporate **sustainability criteria** into its authorization and compliance processes. In essence, this cell helps align the gas sector's growth with India's long-term **net-zero by 2070 goal**.

Focusing on safe hydrogen blending, pipeline links for biogas, and lower methane losses brings both climate and reliability gains, shifting the entire system toward a cleaner future.

3.3 Evidence of Change: Networks Built, Demand Unlocked

PNGRB's strategic initiatives have yielded tangible results, as evidenced by key performance indicators that demonstrate a rapid and sustained transformation of India's gas sector. The growth of CGD infrastructure has been unprecedented, with the number of **PNG connections growing from 11.6 million to 14.2 million between 2023 and May 2025**, and **CNG stations increasing from 6,000 to 8,154 in the same period**. This infrastructure boom has directly fuelled a **25% increase in CNG vehicle** registrations and a **21% surge in CNG sales** in the 2024–25 financial year. The concerted efforts of PNGRB and its partners are clearly reflected in these metrics, which signify a national shift toward cleaner and more efficient energy sources.

The Board's success in expanding infrastructure and rationalizing tariffs has created a vast, captive consumer base that **de-risks large-scale investments** in pipelines and LNG terminals. This foundational work is the lynchpin of India's strategy to increase the share of gas in its energy mix from **6% to 15% by 2030**. By balancing market dynamism with consumer protection and strategic oversight, PNGRB has cemented its role as the principal architect of India's modern gas economy, creating a framework that is robust, transparent, and aligned with the nation's long-term energy and environmental goals.

PART 4

COMPARATIVE ANALYSIS OF REGULATORY FRAMEWORKS AND EFFECTIVENESS

Energy regulation stands as one of the most critical aspects of modern economic governance, with regulatory authorities worldwide tasked with balancing market efficiency, consumer protection, infrastructure development, and environmental sustainability. The comparative analysis of global energy regulators reveals a complex landscape where each authority operates within distinct institutional frameworks, facing unique challenges while striving to achieve similar fundamental objectives.

After nearly two decades of active regulation, it's possible to assess PNGRB's effectiveness and place its performance in a global context. This analysis reveals a regulator that has successfully adapted global best practices to India's unique developmental challenges. Looking ahead, the journey of reform is far from over, with a clear agenda emerging for the next phase of the sector's evolution towards a truly competitive and sustainable energy future.

4.1 Functional Dynamics of International Regulators

4.1.1 Federal Energy Regulatory Commission (FERC) - United States

The Federal Energy Regulatory Commission represents one of the most mature and comprehensive energy regulatory frameworks globally. Established in 1977, FERC operates as an independent agency within the U.S. Department of Energy, wielding extensive authority over interstate energy markets. FERC's regulatory scope encompasses the transmission and wholesale sale of electricity, natural gas sale and transportation, and oil pipeline transportation regulation.

Strengths

1. **Strong market oversight –** keeps a close watch on how energy market functions.
2. **Effective monitoring systems –** ensures fair play and transparency in wholesale markets
3. **Prevention of market manipulation –** strict rules to stop unfair practices
4. **Powerful enforcement –** has fined companies over $1 billion since 2005 for violations
5. **Wide regulatory role –** manages licensing of hydropower projects and reviews environmental impacts

Limitations

1. **Weak consumer protection –** mainly looks after wholesale energy markets, while retail customer issues are handled by states, leaving some gaps
2. **Limited role in climate policy –** supports renewable energy integration, but other federal agencies lead on climate action

FERC's framework reflects maturity, enforcement strength, and market integrity, positioning it as a global benchmark in energy regulation. However, its restricted consumer protection role and limited leadership in climate policy highlight areas where complementary agencies or reforms are necessary.

4.1.2 Office of Gas and Electricity Markets (Ofgem) - United Kingdom

Ofgem, established in 2000 during the UK's energy market liberalization, is widely regarded as one of the most consumer-focused regulators globally. It oversees both gas and electricity markets across Great Britain and has developed a reputation for putting consumer interests at the heart of regulation.

Strengths

1. **Strong consumer protection –** clear rules, fair tariffs, and strict enforcement of consumer rights
2. **Easy switching process –** consumers can change suppliers quickly and transparently
3. **Price cap mechanism –** shields households from excessive pricing by suppliers
4. **Close monitoring of competition –** tracks switching data and supervises the retail energy market, setting global benchmarks
5. **Focus on sustainability –** drives decarbonization, smart meter rollout, and EV infrastructure readiness

Limitations

1. **Gas sector weakness** – expertise in electricity grid management is much stronger than in gas infrastructure development
2. **Balancing challenge** – sometimes struggles to maintain a fair balance between consumer protection and market efficiency

Ofgem stands out as a regulator that has set global standards in consumer protection and market transparency, while also advancing the UK's energy transition goals. However, its relatively weaker role in gas infrastructure and the constant trade-off between strong protections and efficient markets highlight areas for improvement.

4.1.3 European Union Agency for the Cooperation of Energy Regulators (ACER)

ACER represents a unique regulatory model, coordinating energy regulation across European Union member states while focusing primarily on cross-border energy market integration. Established in 2010, ACER operates with a mandate to facilitate cooperation between national regulatory authorities.

Strengths

1. **Cross-border market coordination –** enhances liquidity and supports price convergence across European markets
2. **Wholesale market monitoring –** advanced tools for supervising cross-border energy trade
3. **European network codes –** leads the development and coordination of rules for electricity and gas markets
4. **Transmission System Operator (TSO) coordination –** enables efficient, multinational energy system management
5. **Market abuse surveillance –** operates under the REMIT framework, ensuring transparency and preventing manipulation

Limitations

1. **Indirect role –** works mostly at the wholesale level, with limited direct interaction with consumers
2. **Dependence on national regulators –** effectiveness relies heavily on coordination, which may cause delays and inefficiencies
3. **Less focus on new infrastructure –** emphasis on cross-border projects limits its role in greenfield development

ACER plays a critical role in integrating Europe's energy markets and ensuring fair, transparent wholesale operations across borders. Its strengths in coordination and market surveillance make it indispensable at the EU level, though its limited consumer role, reliance on national regulators, and narrower focus on infrastructure highlight areas where its influence remains constrained.

4.1.4 Australian Energy Regulator (AER)

The Australian Energy Regulator (AER), created in 2005, operates within the National Electricity Market (NEM) framework. It forms part of a three-body governance structure alongside the Australian Energy Market Commission (AEMC) and the Australian Energy Market Operator (AEMO). The AER's mandate combines natural monopoly regulation, market monitoring, and elements of consumer protection.

Strengths

1. **Sophisticated network regulation** – uses revenue cap mechanisms and transmission benchmarking to regulate monopoly networks
2. **Consumer focus** – offers hardship programs, ensures transparent decision-making, and assesses tariff fairness
3. **Retail market oversight** – in several states, directly protects consumers through price monitoring and enforcement

Limitations

1. **Reliability standards still developing** – performance benchmarks are less advanced compared to international peers
2. **Gas sector weakness** – regulatory expertise lags behind electricity, especially in gas infrastructure
3. **Balancing challenge** – must weigh network

investment needs against consumer price pressures

The AER demonstrates a strong balance between network regulation and consumer protection, positioning itself as a key player in Australia's energy governance. While its frameworks for electricity oversight are advanced, its gas regulation, maturing reliability standards, and investment–affordability trade-offs remain areas that need strengthening to match global benchmarks.

4.1.5 National Energy Regulator of South Africa (NERSA)

The National Energy Regulator of South Africa (NERSA), established in 2004, oversees electricity, gas, and petroleum pipelines. Operating in a challenging environment marked by infrastructure constraints and supply issues, NERSA plays a critical role in shaping South Africa's energy future.

Strengths

1. **Independent power producer (IPP) licensing** – progress in expanding private sector participation
2. **Renewable energy support** – active role in the REIPPPP program to integrate renewables
3. **Commitment to affordability** – regulatory focus on cost control for consumers
4. **Public hearing processes** – promotes transparency and reflects democratic governance
5. **Expanded mandate** – recent legislative changes allow NERSA to help build competitive electricity markets

Limitations

1. **Weak market competition** – both electricity and gas markets dominated by a few players
2. **Grid instability** – frequent outages and ongoing infrastructure bottlenecks
3. **Limited institutional capacity** – weaker consumer complaint mechanisms and enforcement powers compared to global peers
4. **State-owned dominance** – heavy role of SOEs adds complexity to effective regulation

NERSA has made progress in renewable energy integration and market liberalization, while maintaining a focus on affordability and public accountability. However, persistent challenges in competition, infrastructure reliability, and institutional capacity highlight the need for stronger reforms to enhance its regulatory effectiveness.

4.2 PNGRB on the Global Stage: A Comparative Analysis

A Unique Mandate: The Developmental Regulator

Against its international peers, PNGRB's unique role becomes clear. Unlike regulators in mature markets, such as FERC in the United States or Ofgem in the United Kingdom, which primarily oversee well-established competitive markets, PNGRB's primary function has been developmental. It has been tasked with creating markets, catalysing greenfield infrastructure investment, and fostering competition from a very raw base. This dual mandate while simultaneously building and regulating a market, sets its role apart.

This approach has given rise to a distinct "Indian Model" of energy regulation. It is a model characterized by its pragmatic adaptation of global principles to local socio-economic realities. The large presence of state-owned companies helps in promoting equity and social welfare more than the profit motive. PNGRB prioritizes tangible outcomes like rapid infrastructure rollout and grassroots consumer protection, such as standardized billing and mandatory insurance, over the complex wholesale market monitoring that often preoccupies western regulators. This reflects a conscious choice to focus on the most pressing needs of a large, developing, and highly price-sensitive economy.

4.3 Benchmarking Performance Across Key Dimensions

Further, a comparative analysis across several key dimensions highlights the specific strengths and characteristics of this model.

Table 3: Comparison of major energy regulators across the Globe against different parameters

Dimension	PNGRB (India)	FERC (USA)	Ofgem (UK)	ACER (EU)	AER (Australia)	NERSA (South Africa)
Market Efficiency & Competition	Tariff rationalization, common carrier access; but limited spot/wholesale gas market	Mature wholesale market monitoring, anti-manipulation measures	Strong retail competition oversight, switching data	Cross-border hub liquidity, price convergence	Monitors wholesale markets, retail reforms ongoing	Weak competition in both electricity and gas markets
Investment & Infrastructure Growth	Major CGD expansion, LNG/pipeline monitoring, fastest growth among peers	Long history of pipeline & transmission approvals	Strong on electricity grid, limited in gas	Facilitates cross-border projects, less on greenfield	Transmission/ distribution benchmarks, moderate gas infra	IPP licensing progress, but grid bottlenecks persist
Consumer Protection	Transparent billing, grievance redress, surveys, NGO/VCO engagement, end-user insurance	Limited (focus is wholesale, consumer handled by states)	Strongest globally, consumer tariffs, protections, switching	Indirect role, mostly wholesale markets	Hardship programs, tariff fairness	Focus on affordability, weaker consumer complaint systems
Reliability & Security	Emergency response, uninterrupted supply mandate; lacks standardized reliability indices	Reliability standards, capacity adequacy	Security of supply assessments, outage indices (SAIDI/SAIFI)	Gas/electricity resilience, interconnection metrics	Reliability performance standards evolving	Grid stability challenged, frequent outages
Transparency & Governance	Public consultations, tariff orders online, annual action plans	Annual reports to Congress, stakeholder hearings	Consultations, market reports	Annual market monitoring reports, high openness	Public reporting, transparent decisions	Public hearings but weaker institutional capacity
Sustainability & Transition	Gas as transition fuel, hydrogen & CBG integration; still early stage vs. EU peers	Supports renewables integration, but climate policy led elsewhere	Strong decarbonisation , smart meters, EV readiness	Green Deal integration, renewable benchmarks	Renewable integration and emission reduction progress	Supports REIPPPP but fossil reliance remains

Strengths

Moderate Areas

Weak Areas

When benchmarked against global regulators such as **FERC (US), Ofgem (UK), ACER (EU), AER (Australia), and NERSA (South Africa)**, PNGRB stands out as both a **developmental regulator** viz. building infrastructure and competitive markets from scratch and a consumer-centric regulator in a highly price-sensitive economy.

PART 5

THE NEXT CHAPTER: PNGRB'S VISION FOR 2025 AND BEYOND

PNGRB, for the first time in the history of a Regulator, hosted the complete action plan for the Year on its web site in public domain and it is continuously moving to excel the self-set goals. It is committed to presenting a report on its achievements and short falls next year.

Further to that, again in a pioneering and strategic move, held its Strategic Meet, to usher in **PNGRB 2.0**.

PNGRB 2.0 stands for Agility, Innovation, Stakeholders' Delight and Commitment towards Next Generation. It is defined by its allegiance to fair and open access, **robust consumer protection**, digital-first, predictable enforcement, and readiness for energy transition, **including hydrogen and CBG integration.**

The aim would be to prioritize closing statutory-practice gaps, modernizing data governance, strengthening stakeholder engagement, and embedding best-in-class communication practices.

5.1 The 2025–26 Action Plan: A Multi-Pronged Strategy

A central strand of PNGRB's plan is the rapid expansion of pipelines and full use of the existing ones. The Authorisation Division is fast-tracking connectivity to high-demand clusters and advancing the idea of a completing the **Natural Gas Pipeline Grid** along with **Arterial Grid** by integrating the Cross-country Pipelines with Steel Pipeline infrastructure of CGD Networks and the **Petroleum Products Pipeline Grid** with the intent of increasing the supply security to the overall benefits of the consumers.

Alongside infrastructure, the Board is committed to deepening market reforms. The agenda includes strengthening the **Gas Exchange**, positioning it as a regional trading hub, and continuing the move towards a **"One Nation, One Tariff"** regime to eliminate regional price disparities.

Consumer interests remain at the core of the roadmap. Key initiatives include rolling out a **Centralized Digital Grievance Redressal System**, creating an **ombudsman**, and registering independent consumer advocacy bodies. Safety and technical robustness also feature prominently, with plans to revisit regulations, strengthen penalties, and prepare for the integration of **hydrogen** into the pipeline system.

The plan also emphasizes strategic innovations. Work is underway to design a **Petroleum Products Exchange** to bring transparency to the trading of refined products starting with non-sensitive products like petrol and diesel. Internally, PNGRB is investing in its own institutional strength by creating a dedicated regulatory cadre and adopting "smart office" systems to become more agile and modern. Creating an ecosystem that supports Government's top priorities like hydrogen economy, promotion of CBG, roll out of LNG fuelling stations are also high on PNGRB's agenda.

Table 4: Sector wise consumption (MMSCMD) and projected demand for 2030/40

Sector	Sector Consumption (MMSCMD) 2024	2030		2040	
		Good to Go	Good to Best	Good to Go	Good to Best
CGD	36.9	87.1	126.1	216.4	270.8
Power	25.2	35.7	40	43.5	52.8
Refinery	22	43.4	50.9	52.4	57.8
Fertilizer	58	65.3	69.3	72.9	80.5
Steel	3.2	4.3	5.1	6.4	9.3
LNG Transport	0	3.9	6.6	26.3	65.7
Others (Tea plantation, Industries, LPG Shrinkage)	42	57.3	66.6	76.9	93.3
Total	**187**	**297**	**365**	**495**	**630**

5.2 Infrastructure Milestones and Future Trajectory

PNGRB has set ambitious targets that reflect the sector's potential. The regulator's Minimum Work Programme (MWP) aims to achieve **12.63 crore domestic PNG connections** and **18,336 CNG stations by 2034**. A minimum of 7.85 crore of these PNG connections and 10,131 CNG stations are targeted for states that have already notified comprehensive CGD policies to support this expansion.

5.3 Economic Impact and Market Transformation

The CGD sector's growth is creating a substantial economic impact. The sector is projected to become India's **largest consumer of natural gas by 2030**, surpassing even the fertilizer industry. With a current market size estimated at **USD 11.33 billion in 2025** and projected to reach **USD 20.93 billion by 2030** at a CAGR of 13.06%, the sector represents one of India's fastest-growing energy segments.

The automotive segment currently dominates consumption, accounting for approximately **54% of the total market share**, while the industrial and residential segments represent significant potential for future expansion. This also gels with India's Net Zero objectives as CNG / LNG are less carbon intensive than liquid transport fuels.

Taken together, PNGRB's immediate plans highlight an institution that is forward-looking yet grounded in its mandate. Whether through pipelines and exchanges, consumer protection, sustainability measures, or digital monitoring, the Board is positioning itself as a regulator that not only enforces compliance but also enables growth, competition, and innovation.

5.4 From Regulated Prices to Market Discovery: The Case for a Petroleum Product Exchange

As mandated by the Act, PNGRB is creating infrastructure for the transportation of petroleum products, natural gas, as well as the city gas distribution network. It is ensuring non-discriminatory access to such infrastructure by declaring pipelines as common carriers and framing regulations for storage and distribution. However, when it comes to pricing of petroleum products, this remains outside PNGRB's direct ambit. Presently, prices of products like petrol and diesel are determined by refiners based on the **Trade Parity Price (TPP)** mechanism, calculated as 80% Import Parity Price and 20% Export Parity Price. While this approach attempts to balance India's import dependence with export competitiveness, it has often been criticized for **limited transparency**, **averaging of freight costs, and masking the inefficiency.**

The refinery margin, Inland freight charges and marketing costs is added in TPP (to arrive at ESPP (Ex-Storage Point Price) which is the price at OMCs' marketing depots.

The final Retail Sale Price is determined by adding the excise duty, dealer's commission, delivery, and VAT charged by the state governments to ESPP.

The averaging of RTPs for determining RSP and the inland freight calculations based on movement from the designated port disregarding the actual movement may lead to inefficiencies, as it sometimes entices entities to move products from farther locations despite closer sources being available with the intent to sale their own products. It may push the RSP upward.

This has not driven efficiency in logistics. It is noteworthy that in the APM era (pre-2002), logistics was determined on a pan industry basis. The RTP mechanism was apt for it. While the companies are today competing with each other for market share, but RTP system continues and assures full cost pass through. Hence, there is a need to align pricing with competition.

The issues related to pricing methodology can be minimised through bringing efficiency in the bulk transportation and price transformation. PNGRB is trying to incentivise the entities for more usages of the Common Carriers Pipelines through construction, expansion and declaration of common carriers coupled with Tariff Regulations amendment. Further, it is aiming for establishing a **National Petroleum Product Exchange**, a transparent trading platform where prices can be discovered based on actual demand and supply. PNGRB has already outlined this vision in its action plan, proposing that such an exchange initially cover products like **ATF, naphtha, and bitumen**, and eventually may extend to **petrol, diesel, and LPG** as per Government decision. Naturally, this would address the bulk prices in different regions while the retail pricing could be in line with the government's policy.

Further, PNGRB's ongoing reforms such as **framing storage regulations, promoting common-carrier pipelines, and even considering the monetization of a separate entity for pipeline ownership, are all complementary to this vision**.

World's first Ship-To-Ship (STS) with backhaul and India's first Ship-To-Ship transfer of LNG Cargo (2)

A petroleum product exchange would therefore transform the current system in three major ways. First, it would **shift price discovery from being refiner-dominated to market-driven**, ensuring prices reflect domestic demand-supply conditions rather than only international parity. Second, it would **enhance transparency and governance**, aligning with PNGRB's regulatory mandate to promote competition and avoid market concentration. Third, it would **stimulate investment in storage, trading, and logistics infrastructure**, as greater market participation would require robust delivery systems.

The current petroleum products market is well balanced. However, this is set to change due to energy transition, geo-political reasons, and addition of refining capacity in greenfield and brownfield. The market is bound to change as buyers' market for which an **Exchange** would be very useful. Even geo-politics may make our export-oriented refineries look at domestic market. This may call for opening up pipelines to competition.

In the long run, as India fully liberalizes petrol and diesel prices and gradually transitions LPG and ATF to market-determined regimes, these products can seamlessly move onto the exchange. The petroleum product exchange can emerge as India's check for refined product pricing, reducing opacity, fostering competition, and aligning the downstream petroleum sector with international best practices.

5.5 Key Regulatory and Legal Challenges

PNGRB's efforts to deepen market competition and reform legacy structures have been met with significant legal challenges from established entities, leading to several key issues that are currently under judicial review. There is a misalignment between the objectives of competitive markets that drive efficiency and entrenched players in the petroleum sector. The Act included several key proposals that would help transition the existing governance of key downstream infra into the common use, competitive and tariff-controlled mechanism to the benefits of the consumers. Until these provisions are given effect to, the aims of a competitive and shared downstream infra remains on paper. Three major challenges confront the sector.

***A. Other than Common Carrier (Captive) Petroleum Products Pipelines**:*

Over the past years, the Board has initiated the process for declaring multiple petroleum & petroleum products pipelines, alleged to be captive by entities, as common carrier, or contract carrier, for facilitating greater access for multiple stakeholders, promoting competitive practices and ensuring that market demands are met more efficiently. By allowing common carrier capacity access, it would avoid unnecessary investments and redundancies, streamline operations, and eliminate the reliance on less efficient and less safer modes of transport, such as road and rail.

Multiple lawsuits have been filed before courts, assailing the power of the Board to declare a captive self-use pipeline as a common carrier or contract carrier under Section 20 of the PNGRB Act, 2006, read in conjunction with Regulation 10 of the PPPPL Authorization Regulations which is presently sub-judice. Notably, Hon'ble Single Judge of Hon'ble High Court of Delhi vide its judgment dated 14.08.2024 has specifically upheld powers of PNGRB to declare any pipeline, including captive pipeline as common/contract carrier.

***B. CGD Guiding Principles Regulations**:*

Under the mandate of the PNGRB Act, 2006, the Board enacted the CGD Guiding Principles Regulations, 2024, to declare the CGD Networks as common carrier or contract carrier. Multiple CGD entities have brought cases before the court to challenge the guiding principles regulations. Currently PNGRB is proceeding ahead in the subject matter subject to directives of Hon'ble High Court of Delhi in pending cases.

***C. Unbundling: Entity engaged in Marketing and Transportation of Natural Gas to be separated in two entities at Ownership level**:*

In order to achieve the objective of development of

competitive markets, and as mandated in Section 21 of PNGRB Act, in case an entity engaged in both marketing of natural gas and laying, building operating or expanding a pipeline for transportation of natural gas on common carrier basis, the Board shall require such entity to separate the activities of marketing of natural gas and the transportation including ownership of the pipeline. To fulfil the mandate of Act, PNGRB inserted Reg. 5A in the PNGRB (Affiliate Code of conduct for Entities engaged in marketing of Natural Gas and laying natural gas pipeline) Regulations vide Amendment Regulation, 2014 which was challenged by entities, where Hon'ble High Court of Delhi has granted interim relief to the petitioners.

Meanwhile, PNGRB has constituted a High-Level Expert Committee (HLEC) to review the issue and suggest further course of action to implement the mandate of Act in effective manner. Recommendations made by HLEC are under consideration by Board for further needful action.

As India's energy sector stands at the crossroads of growth and transition, PNGRB is preparing to play a defining role in shaping the downstream and midstream landscape. First time, a Regulator has web-hosted its Action Plan for 2025–26**,** which captures this ambition, weaving together infrastructure expansion, market reforms, consumer protection, safety, and sustainability into a unified vision.

5.6 The Unfinished Journey of India's Petroleum Regulation

The story of India's petroleum and natural gas regulation is a story of national evolution. It began in the decades following independence, with a state-led model that used strict control orders and an Administered Pricing Mechanism (APM) to ensure energy security for a young, developing nation. In this era, public sector undertakings like ONGC, IOCL, BPCL, and HPCL shouldered the monumental task of building the country's energy backbone, ensuring that fuel reached every corner of a vast and diverse geography.

The opening of the upstream and dismantling of the APM was a watershed moment, ushering in an era of new possibilities and complex challenges. The central question became how to balance market freedoms with consumer interests, attract private investment while safeguarding national priorities, and ensure fairness in a sector historically dominated by the state. It was to answer this call that the **Petroleum and Natural Gas Regulatory Board (PNGRB)** was born in 2006, not merely to regulate, but to enable.

PNGRB is cognisant of the imperatives to safeguard the public at large and cushion them from the impact of market determined prices of the fuels.

Over the past two decades, PNGRB has evolved into a transformative institution, **becoming the architect of a more competitive, transparent, and inclusive market**. By **creating frameworks for city gas distribution, pushing for a unified national tariff, opening networks to third-party access, incentivising creation of infrastructure and fostering platforms like the Gas Exchange,** it has reshaped the sector's landscape.

Simultaneously, it has built consumer confidence through **landmark initiatives like mandatory insurance for PNG households, standardized billing, and robust grievance redressal systems**. Each action speaks to an institution deeply aware of its dual role: as a guardian of fairness, protecting the consumers and as a catalyst for growth. Yet, this journey is far from complete. India now stands at a pivotal moment where the challenge is no longer simply about availability, but about achieving true **competitiveness, affordability, and sustainability**.

To meet this, PNGRB has articulated a bold, forward-looking vision.

The evolution from the rigid controls of the 1950s to today's dynamic framework has been remarkable, but it is also a prelude. The next chapter of India's energy story requires a regulatory philosophy that champions fair competition while fiercely protecting consumers; that invites private capital while preserving the public interest; and that balances growth with unwavering commitments to safety and sustainability. India's energy journey is not over; the most important chapters are still being written. This is not a conclusion, but a call to action, a reminder that the best way to honour decades of state-led effort is to finally allow the sector to stand on its own feet, to compete, to innovate, and to serve the nation in the most efficient, transparent, and sustainable way possible.

THIS JOURNEY HAS NOT REACHED THE DESTINATION

ABOUT THE AUTHORS

Arvind Kumar
Expert Advisor, PNGRB

Ex Executive Director of IOCL, having 4 decades of experience in Petroleum and Natural Gas industry including a decade of regulatory experience, as Additional Adviser and Head of Authorization Division in PNGRB, played the pivotal role in mega CGD Bidding rounds from 5th to 10th Round and authorization of more than 200 GAs for expansion of CGD Networks; setting up the Gas Exchange; authorization and extension of Jagdishpur Haldia Natural Gas Pipeline to Bokaro, Dhamra and Guwahati; NGPL for all north east states to IGGL and the LPG Pipeline from Kandla to Gorakhpur to IHB Ltd.

Tanmay Vats
Asst. Consultant, PNGRB

A Petroleum Engineer, with extensive experience in pipeline design and engineering across the City Gas Distribution sector. He currently serves as an Assistant Consultant with the Petroleum and Natural Gas Regulatory Board (PNGRB), where he contributes to strategic planning, infrastructure development, and policy initiatives shaping India's downstream oil and gas landscape.

Farhan Akhter
Asst. Consultant, PNGRB

An Electronics and Instrumentation Engineer, he began his career as a Systems Reliability Engineer before moving into Petroleum and EV Retail Operations. Currently serving as an Assistant Consultant in the Hydrogen Cell and Technical Division at PNGRB, focused on integrating hydrogen into natural-gas networks and overseeing POL / RO / PPPL sectors. He has authored three publications on Hydrogen and H_2–NG blending, two of which are published and one under process.

पी एन जी आर बी
PNGRB

पेट्रोलियम एवं प्राकृतिक गैस विनियामक बोर्ड

Petroleum and Natural Gas Regulatory Board

पीएनजीआरबी, ई-400, टॉवर-ई, वर्ल्ड ट्रेड सेंटर,
चौथी मंजिल, नौरोजी नगर, नई दिल्ली, दिल्ली 110029

PNGRB, E-400, Tower-E, World Trade Center,
4th Floor, Nauroji Nagar, New Delhi, Delhi 110029

www.pngrb.gov.in