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Petroleum and Natural Gas Regulatory Board

Powering India's Energy Transition

Image Courtesy: IGGL; Laying of North-East Gas Grid pipeline

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Our Vision

"To establish world class regulatory regime that provides affordable and sustainable oil and gas energy to consumers through a vibrant and competitive energy market, and collaborate towards creation of a reliable infrastructure to deliver the same to consumers while ensuring highest standards of safety."

Preface

The Petroleum and Natural Gas Regulatory Board (PNGRB), since its inception in 2007, has been entrusted with ensuring orderly growth of the petroleum and natural gas sector, promoting fair trade, safeguarding consumer interests, and enabling a level playing field for all stakeholders. Over the years, PNGRB has undertaken initiatives that reflect not only regulatory rigor but also a clear consumer focus, ensuring affordability, transparency, and fairness in energy access.

As India advances towards a gas-based economy and takes decisive steps in the global energy transition, PNGRB's role has become more critical than ever. This eBook highlights key contributions of the Board in strengthening India's energy ecosystem — expanding city gas distribution to nearly all of India, introducing consumer-centric tariff reforms, promoting clean and future fuels, and enabling market-based mechanisms through the Indian Gas Exchange. Special emphasis has also been placed on petroleum product pipelines, with reforms to enhance efficiency, reduce logistics costs, and improve supply security.

Our strategic initiatives — such as the development of the *National Hydrocarbon Infrastructure Monitoring System* (NHIMS) — demonstrate PNGRB's commitment to harnessing technology and data-driven oversight. Simultaneously, PNGRB is preparing for the future by enabling integration of new fuels like *Hydrogen* and *Compressed Biogas* (CBG) into the energy system, thereby supporting India's transition toward a sustainable and low-carbon economy.

At the core of every reform lies the belief that *infrastructure, markets, and regulations must ultimately serve the consumer*. By combining regulatory innovation with strategic foresight, PNGRB continues to play a pivotal role in India's transition to a gas-based and sustainable energy economy.

I am confident that this compilation will serve as a valuable reference for industry stakeholders, policymakers, and the wider energy community. It showcases how PNGRB, through collaborative effort and regulatory foresight, is shaping India's petroleum and natural gas ecosystem to meet the aspirations of a rapidly growing economy and the imperatives of a cleaner and greener future.

Dr. Anil Kumar Jain
Chairperson

Highlights

Strategic Initiatives: Building a Business-Friendly and Consumer-Centric Ecosystem

PNGRB has undertaken wide-ranging reforms to dismantle regulatory barriers, promote investment, strengthen infrastructure, and ensure consumer protection. The strategic focus has been on creating an ease-of-doing-business environment while advancing India's clean energy transition.

Authorisation

PNGRB has consistently advanced infrastructure creation, market development, and investment attraction through transparent, fair, and forward-looking authorisation processes. These measures have laid the foundation for the "One Nation, One Gas Grid" vision and accelerated the transition to clean energy.

Monitoring

PNGRB continuously monitors infrastructure growth, market performance, and compliance to ensure timely expansion of networks, consumer adoption, and alignment with India's clean energy goals.

Commercial Oversight: Expanding Access, Driving Reforms

PNGRB's commercial initiatives have transformed India's downstream gas sector by Ensuring universal CGD network coverage and expansion of the national gas grid and Implementing regulatory and financial reforms to make gas affordable, competitive, and sustainable.

Legal Framework and Regulatory Oversight

Since its inception under the PNGRB Act, 2006, PNGRB has progressively developed a robust legal and regulatory framework for India's downstream oil and gas sector. With powers that combine rule-making and adjudication, PNGRB safeguards consumer interests, promotes competition, and ensures the orderly growth of infrastructure in alignment with India's energy objectives.

Technical Oversight and Innovation

PNGRB ensures the safety, reliability, and modernization of downstream oil and gas infrastructure through a transparent, participatory regulatory framework. Technical regulations, compliance monitoring, and technology adoption to ensure safety of People, Asset and Environment while enabling industry growth.

Consumer Affairs

PNGRB's commitment to consumer protection is deeply embedded in its statutory mandate and reinforced by several pioneering initiatives. These measures ensure transparency, fairness, and accountability in the natural gas sector, safeguarding the interests of millions of end-users.

Data Intelligence through Statistics

The newly formed Statistics Division is evolving from a data compilation unit to a strategic intelligence hub, empowering PNGRB with evidence-driven regulation, operational insights, and sectoral foresight.

Hydrogen and Energy Transition

PNGRB has taken proactive steps to support India's clean energy transition by piloting hydrogen blending in city gas networks, developing safety guidelines, collaborating internationally, and preparing a roadmap for hydrogen transportation through pipelines. These initiatives position PNGRB at the forefront of enabling India's hydrogen economy.

Compressed Biogas (CBG) in India's Energy Transition

CBG is a key pillar of India's clean energy future. Under the SATAT initiative (2018), the Government of India set a target of 5,000 CBG plants with a production capacity of 15 MMTPA (~62 MMSCMD). CBG not only reduces greenhouse gas emissions but also supports waste management, rural employment, and energy self-sufficiency.

Human Resource and Administrative Transformation

PNGRB believes that its true strength lies in its people. Over the years, the Board has transformed its human resources framework to attract talent, build institutional capacity, and create a digitally empowered, people-centric workplace.

Enabling Digital Transformation

Information Technology is the backbone of modern regulation. PNGRB's IT Division has led transformative initiatives to build a digitally empowered, secure, and transparent regulatory ecosystem, ensuring efficiency, stakeholder engagement, and alignment with India's energy transition.

Strategic Initiatives: Building a Business-Friendly and Consumer-Centric Ecosystem

PNGRB has undertaken wide-ranging reforms to dismantle regulatory barriers, promote investment, strengthen infrastructure, and ensure consumer protection. The strategic focus has been on creating an ease-of-doing-business environment while advancing India’s clean energy transition.

Reforms in City Gas Distribution (CGD)

Mobile Refueling Units (MRUs): Introduced in 2023 to overcome land constraints and accelerate CNG rollout in remote and underserved areas.

Captive CNG and SS-LNG: Enabled flexible supply solutions for industries, mining, and remote locations.

Boil-off Gas Management: Created a framework for safe utilization of LNG boil-off gas (BOG) through power generation, CNG conversion, or pipeline injection.

City Gate Station (CGS) Flexibility: Allowed CGS and compression facilities outside GAs (with safeguards), improving connectivity and system integration.

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Tariff and Financial Reforms

Unified Tariff Simplification: Reduced from 3 zones to 2 (2025), moving towards a **single national tariff**.

Insurance Surety Bonds: Allowed as alternatives to bank guarantees, improving financial flexibility for entities.

Fee Rationalization: Simplified fee structures for shareholding changes and asset transfers, reducing administrative burden.

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Pipeline Tariff Reforms

Petroleum Product Pipelines (PPPL): Pre-2010 pipelines linked to Railway Goods Tariff with WPI escalation.

Post-2010 pipelines under DCF methodology with 12% returns.

Bid-out pipelines: 10-year tariff protection followed by DCF-based regime.

Framework ensures transparency, fair returns, and predictability.

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Market Development and Gas Exchange

Indian Gas Exchange (IGX): Authorized in 2020, providing transparent price discovery and efficient allocation.

Identified Industrial Demand in GAs: Demand for Natural Gas by MSMEs has been identified across GAs and Industrial Areas. Pipeline connectivity is being provided.

Imbalance Charge Utilization: Amended to channel funds into capacity studies, IT upgrades, staff training, and consumer awareness — linking system inefficiencies to system improvements.

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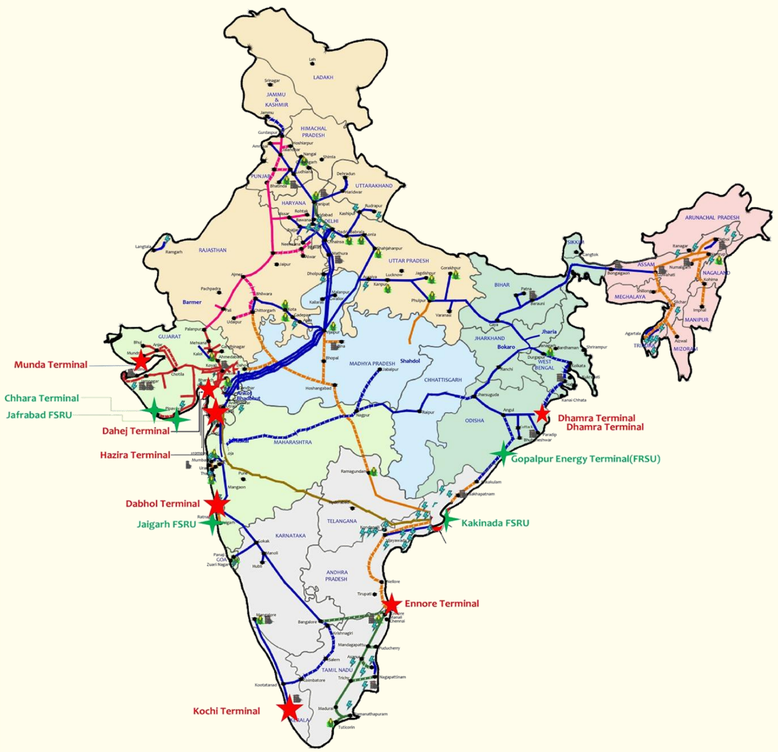
Optimizing LNG Infrastructure



LNG Terminal Utilization: Advocating flexible tariffs, terminal-to-terminal competition, and better contract terms to improve utilization.

Optimizing LNG Flows: Promoting international voyage optimization to lower costs and benefit consumers.

Optimizing RLNG Flows: Ensuring customers are served from the nearest regasification terminal, minimizing tariffs. Shipping cost differentials are offset by tariff efficiency.

Niche Market Promotion: Positioning LNG as a fuel for transport and specialized industrial segments, enabling future opportunities.

Contract Structuring: Encouraging flexible contract frameworks, including high-seas sales, to overcome challenges of rigid, terminal-specific contracts.

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Consumer Protection and Welfare

Unified Tariff Benefits for Households: Extended Zone 1 tariffs to **domestic PNG and CNG**, ensuring affordability.

Dissemination of Information: Consumers are being empowered with information on prices, price break-up, deciphering of Indices based R-LNG prices, etc.

Force Majeure Reforms: Standardized formats for claims (2024) to simplify processes and improve transparency.

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Infrastructure Creation and Knowledge Sharing

Conclaves and Conferences (2024): Hosted national and international forums (Visakhapatnam, Goa) on gas and petroleum infrastructure, global best practices, and future fuels.

Roundtables: Partnered with GAIL, SIAM, and stakeholders on LNG, CBG, and alternative fuels in transport.

Capacity Expansion Incentives: 5-year tariff moratorium for new source additions, encouraging network integration and system utilization.

Strategic Vision

Through flexible infrastructure policies, progressive tariff reforms, market-driven mechanisms, and consumer-focused initiatives, PNGRB has created a **business-friendly and consumer-centric ecosystem**.

Supply security is being assured through LPG pipeline connectivity to Bottling Plants, ATF pipelines to Airports and loop line dual connectivity to major GAs.

The Board's strategic interventions position India's downstream gas sector as a model of regulatory transformation **supporting national energy security and the clean energy transition**.

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Authorisation

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Ease of Doing Business

Unified Tariff Reforms: Implemented the *"One Nation, One Grid, One Tariff"* vision. Introduced in 2023 with three zones, simplified into two zones in 2025, eliminating regional disadvantages and ensuring affordable, predictable transport costs across the country.

Simplified Access & Licensing: Converted captive pipelines into common carriers, revised Access Code provisions, and advanced ISO reforms, improving transparency and reducing entry barriers for new participants.

Regulatory Flexibility: Permitted temporary compression facilities with CGS outside authorised GAs under safeguards, enabling faster rollout, early market monetization, and quicker availability of clean fuels.

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Attracting Investment

Pipeline Authorisations: Authorised **82 natural gas pipelines** and **30 petroleum product pipelines**, providing regulatory certainty and investor confidence.

Competitive CGD Bidding: Expanded CGD coverage to **307 Geographical Areas (GAs)** through transparent bidding, unlocking significant private sector investment.

LNG Terminal Integration: Facilitated integration of LNG terminals with the pipeline grid, enhancing utilization, diversifying supply, and raising regasification capacity to **52 MTPA**.

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Infrastructure Creation

National Gas Grid: Authorized over **34,200 km of natural gas pipelines**; **25,400 km operational** and **10,460 km under construction**. This strengthens energy security and bridges regional imbalances.

LPG and ATF pipeline enhancement: Invited bids for LPG pipelines and ATF pipelines. Major airports to have dual connectivity.

City Gas Distribution Expansion: Expanded coverage to nearly **100% of India's mainland population**. Domestic PNG connections have risen **fivefold since 2015**, while CNG infrastructure has expanded rapidly for transport.

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Open-Access & Inclusiveness

Open-Access Networks: Promoted common-carrier and open-access models, enhancing competition, improving asset utilization, and ensuring a level playing field.

Inclusive Coverage: Extended CGD infrastructure to remote and challenging regions, including the **Andaman & Nicobar Islands**, embedding inclusivity into market growth.

Monitoring

PNGRB continuously monitors infrastructure growth, market performance, and compliance to ensure timely expansion of networks, consumer adoption, and alignment with India’s clean energy goals.

Infrastructure Growth and Gasification

	Pre-PNGRB Era	Post-PNGRB Era
Regulation	Unregulated	Regulated
CGD GAs	34	307
PNG Availability	Limited	Increased
Key Entities	IGL, MGL, GGCL, TNGCL	40+ CGD entities
% of Area Covered	3%	100% (excl. Islands)

Natural Gas Pipelines: 34,233 km authorized; 25,429 km operational.

Petroleum Product Pipelines: 13,652 km authorized; 9,301 km operational.

Gasified Areas: Out of 307 GAs, **286 are gasified**.

223 GAs connected through pipeline/adjoining GAs. **63 GAs** connected via LNG or cascades.

By June 2026, **269 GAs (88%)** will be pipeline-linked.

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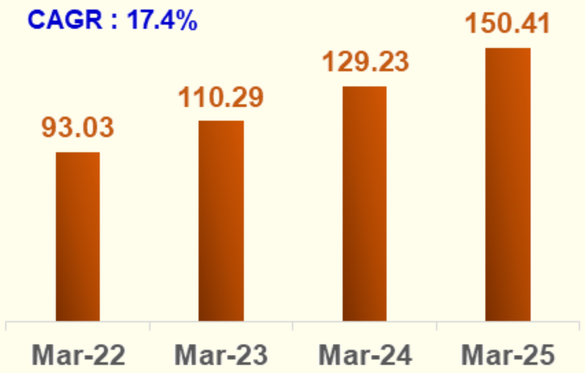
DPNG & CNG Growth

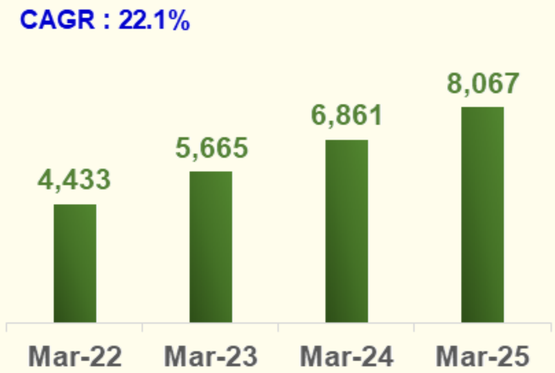
DPNG

DPNG Connections (In Lakhs)

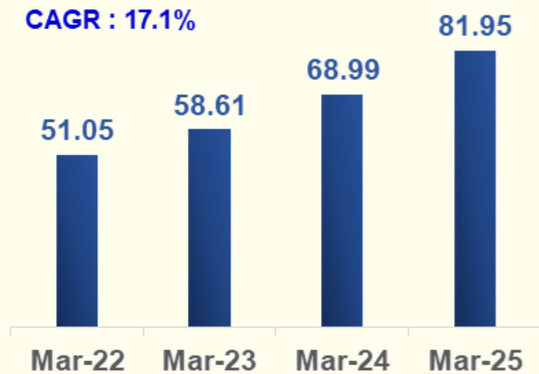


CNG

CNG Stations (Nos)



Cumulative CNG Vehicles (In Lakh)



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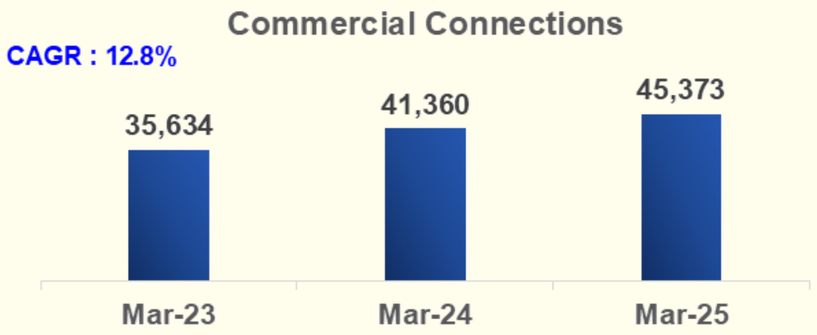
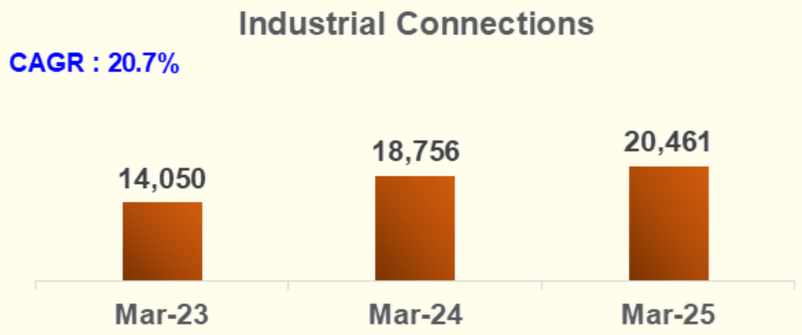
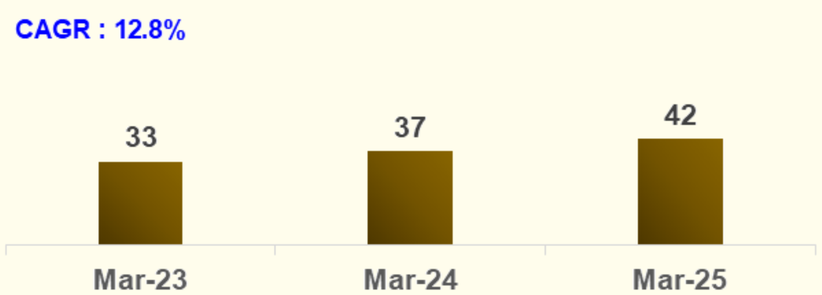
Growth in I & C Segment and Gas Consumption

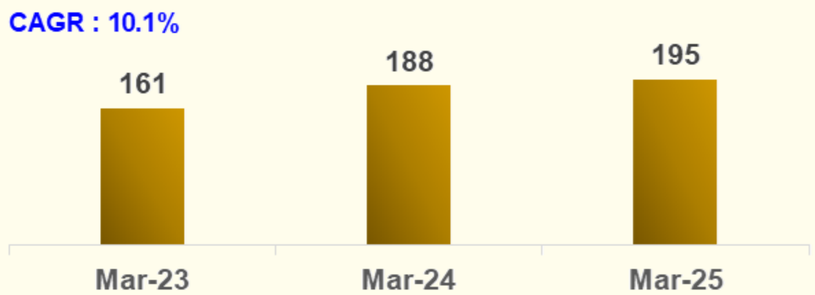
Growth in Industrial & Commercial Segment





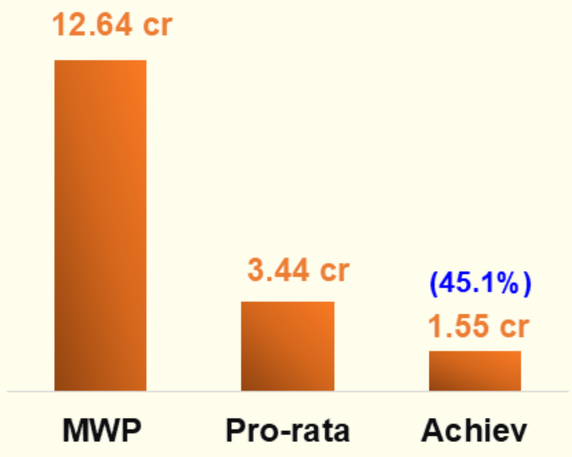
Yearly Gas Consumption & Total Gas Consumption : CGD



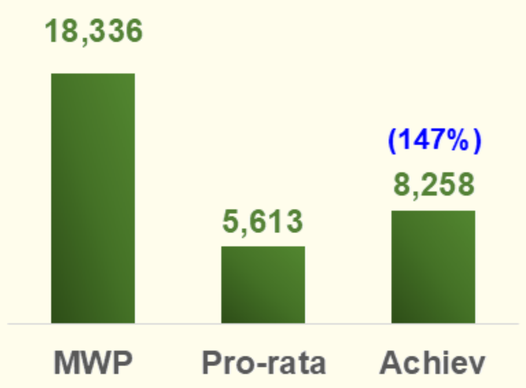


MWP Target vs Achievement

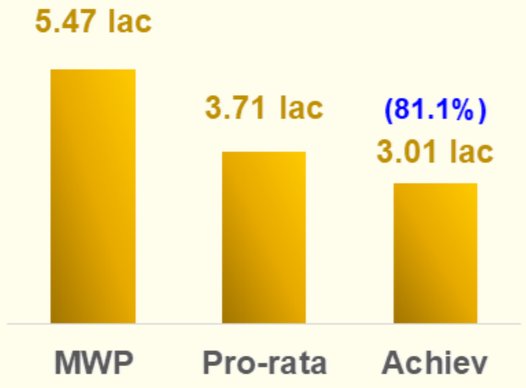
DPNG Connection



CNG Stations



Pipeline (Inch-km)



as on July'25

LPG Bottling Plant Connectivity

LPG transportation mode			
OMC	**Pipeline (%)**	**Rail (%)**	**Road (%)**
IOCL (FY 24-25)	45.41	5.23	49.36
HPCL (FY24-25)	44.00	8.00	48.00
BPCL (FY23-24)	29.74	9.35	60.91

54 of 210 LPG Bottling Plants connected to pipelines (as of Aug 2025).

Eliminates ~**21.7 lakh truck trips annually**, cutting costs and emissions.

30 more plants to be connected by Dec 2025.

50 additional plants through new proposed LPG pipelines.

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Strategic Engagement with States/UTs

State CGD Policies: 11 States/UTs adopted policies (Punjab, UP, West Bengal, Assam, Tripura, Tamil Nadu, Puducherry, Karnataka, MP, Bihar, Rajasthan).

VAT Reduction: In past 2 years, VAT on natural gas reduced in 6 States/UTs (AP, Assam, Bihar, Chhattisgarh, D&NHDD, Rajasthan). PNGRB had engaged with these states at Chief Secy level.

State-Level Coordinators: Appointed to improve coordination between PNGRB, CGD entities, and State authorities.

High-Level Engagements: Regular meetings with Chief Ministers, Governors, and Chief Secretaries to build synergy.

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Meeting with State CMs & Governor

Administrator of Chandigarh & Gov. of Punjab

Assam, CM

Madhya Pradesh, CM

Meeting with State Chief Secretaries

Odisha

Rajasthan

Uttar Pradesh

Haryana

West Bengal

Meeting with State Chief Secretaries

Assam

Madhya Pradesh

Himachal Pradesh

Uttarakhand

Andhra Pradesh

Tamil Nadu

Maharashtra

Bihar

Punjab

Karnataka

Commercial Oversight: Expanding Access, Driving Reforms

PNGRB’s commercial initiatives have transformed India’s downstream gas sector by Ensuring universal CGD network coverage and expansion of the national gas grid and Implementing regulatory and financial reforms to make gas affordable, competitive, and sustainable.

Infrastructure and Network Expansion

Universal CGD Coverage: PNGRB's 12th Bidding Round expanded CGD authorizations to cover **98% of the population and 88% of India's area**, including difficult regions such as the North-East, J&K, Ladakh, and Andaman & Nicobar Islands.

Gas Grid Development: Authorized key projects such as the **North-Eastern Gas Grid** and the **Gurdaspur–Jammu pipeline** to connect underserved regions.

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Regulatory and Financial Reforms

Unified Tariff Reform (2023): Implemented *“One Nation, One Grid, One Tariff”* to ensure equitable and affordable gas access nationwide. Benefits extended to **domestic PNG and CNG** consumers.

Petroleum Pipeline Tariff Regulations (2024): Delinked tariffs from railway freight; introduced a transparent, sustainable model for pipeline entities.

Market Competition: Steps underway to open mature GAs post-exclusivity for new entrants and third-party infrastructure, promoting efficiency.

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Regulatory and Financial Reforms

Indian Gas Exchange (IGX): Introduced new products including **3- and 6-month Term Ahead contracts** (2024–25) and **Balance of Month contracts** (2025–26), enhancing market liquidity.

Imbalance Charge Reforms: Utilization of imbalance funds now directed toward **capacity studies, IT infrastructure, training, consumer awareness, and market development**.

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Market Promotion and Demand Generation

National PNG Drive (2024): Launched with CGD entities to expand household adoption through campaigns, roadshows, and enrollment schemes.

Future Targets: By 2032, expand to **12.5 crore PNG households** and **17,751 CNG stations**.

Transport Sector Transition: Supporting conversion of public transport fleets — e.g., **1,000 diesel buses in Chennai to CNG** and **Maharashtra SRTC fleet to LNG**.

Industrial Conversion: Promoting shift of industries to natural gas by ensuring competitive and stable pricing. Connectivity being provided to Industrial Areas.

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International Collaboration and Capacity Building

International Regulators Conference (IEW 2024): Convened regional regulators from South and Southeast Asia for knowledge exchange.

MoUs: > With **API (USA)** to strengthen safety and regulatory best practices. > With **IGEM (UK)** on hydrogen innovation and gas standards.

Engagements with Energy Regulators of developed economies with established regulations.

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Legal Framework and Regulatory Oversight

Since its inception under the PNGRB Act, 2006, PNGRB has progressively developed a robust legal and regulatory framework for India’s downstream oil and gas sector. With powers that combine rule-making and adjudication, PNGRB safeguards consumer interests, promotes competition, and ensures the orderly growth of infrastructure in alignment with India’s energy objectives.

Foundational Years: Shaping the Regulatory Architecture

Came into effect on **1 October 2007** with wide legislative powers under Section 61.

Early landmark regulations (2008): Authorisation of natural gas pipelines and CGD networks. Determination of pipeline tariffs. Access code for common-carrier pipelines.

Outcomes: Transparent framework for infrastructure creation, competitive bidding, non-discriminatory open access, and clarity in tariff determination.

Continuous evolution: Regulations regularly updated to adapt to sectoral needs, ensuring compliance with judicial dicta such as the Delhi High Court ruling affirming that regulations (not guidelines) constitute valid legislation.

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Administration of Justice and Significant Adjudications

PNGRB vested with **powers akin to Civil Courts, with exclusive jurisdiction in regulatory matters**. Functions as a quasi-judicial authority for efficient dispute resolution.

Judicial scrutiny: *PNGRB v. Indraprastha Gas Ltd.* (2012) clarified scope of Board's powers.

Naveriya Gas Pvt. Ltd. v. GAIL (2022) → Impleading industrial consumers in supply disputes; reinforced limitation principles.

EICL Ltd. v. AGP City Gas Pvt. Ltd. (2022) → Upheld CGD exclusivity while protecting consumer rights.

Torrent Gas Jaipur Pvt. Ltd. (Review Order, 2023) → Deferred MWP obligations due to Supreme Court "status quo" order.

Unauthorized pipelines → Civil penalties imposed with pragmatic regularization measures.

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Robust Legal Approach to Sectoral Transformation

Unified Tariff Regulations simplified tariff structure, improved affordability, and balanced pipeline use.

Consumer-Centric Measures introduced: Mandatory insurance cover for PNG households. Uniform pricing framework for domestic consumers across CGD entities.

2025 Reforms: LNG Terminal Regulations: Framework for registration and operations. Technical Standards & Safety Regulations (Amendments, 2025): Stricter audits, feasibility, and environmental norms. “Defaults and Consequences” provisions: Established uniform enforcement mechanisms. Integrity Management System (Amendments): Expanded compliance scope.

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Preparing for the Future

Proposed **PNGRB Act amendments** to: Enable **hydrogen transportation** through pipelines. Extend **common-carrier principles** to LNG terminals. Facilitate establishment of a **Petroleum & Natural Gas Exchange**.

Ongoing internal review of authorization regulations in light of judicial developments to strengthen enforceability.

MoU signed with reputed legal research firms to assess effectiveness of judicial orders and recommend improvements for stronger legal soundness.

Technical Oversight and Innovation

PNGRB ensures the safety, reliability, and modernization of downstream oil and gas infrastructure through a transparent, participatory regulatory framework. Technical regulations, compliance monitoring, and technology adoption to ensure safety of People, Asset and Environment while enabling industry growth.

Formulation of Technical Regulations and Compliance Monitoring

Statutory Regulations: PNGRB has notified comprehensive Technical and Safety Regulations for various downstream Oil & Gas installations.

Participatory Approach: Sixteen Technical and Safety Regulations are developed through deliberations in expert committees and public consultations, ensuring inclusivity and ease of adoption.

Third-Party Audits: Transparent and independent audits of T4S, IMS, and ERDMP Regulations are mandated every 3/5 years, complemented by annual internal safety audits by entities.

Ease of Doing Business: Participative and rationalized system balances regulatory oversight with reduced compliance burden on entities.

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Safety and Integrity of Installations

PNGRB Domain: Refineries & GPUs, LNG Facilities, NGPL, PPPL, CGD, Petroleum installations, LPG Storage, handling and Bottling facilities, and Retail outlets.

Empanelled Agencies: 32 Third-Party Inspection Agencies (TPIAs) monitor compliance of PNGRB Regulations.

Corrective Action: Entities are required to implement audit recommendations in a time-bound manner.

Incident Investigation: PNGRB investigates incidents, identifies lapses/root causes, and enforces preventive measures. Engages with CEOs where fatalities are high to mitigate future incidents.

Promoting Innovation and Technology Adoption

Certified PNG Stoves: Promoting BIS-compliant PNG stoves (IS 17153) for safer, cleaner & efficient domestic use.

Smart Domestic PNG Meters: Facilitating rollout of smart PNG meters for leak detection, billing accuracy, and supply efficiency.

Research Collaborations: MoUs signed with IIT Delhi, IIT Bombay, and others to encourage research and innovation in downstream Oil & Gas sector.

Regulatory Flexibility: New technologies and products are incorporated into Regulations on recommendations of respective Technical Committee(s).

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Robustness & Reliability of Infrastructure

Design & Layout: Technical standards and Amendments cover equipment design, Plant layout, safety distances etc. for downstream oil & gas installations.

Testing & Inspection: Technical Standards specifies requirements of periodic testing & inspection to maintain integrity of assets.

Redundancy Provisions: Built-in infrastructure redundancy ensures continuous supply in case of disruptions/failure of any equipment/machinery.

Emergency/Disaster Preparedness: Regulations mandate well planned Emergency response including preparedness, mitigation measures, resource mobilization, rescue, and restoration etc. Climate change related risks to be adopted.

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Knowledge Sharing & Training

Workshops & Conferences: Organizing National & International events to sensitize various stakeholders on safety norms and best practices.

Digital Resources: PNGRB hosts case studies of incidents, safety films/animations, concept papers etc. on topics related to Technical domain.

Global & National Partnerships: MoUs signed with NSC, GIDM, ASME, API, and FERC for training and capacity building. Training at cutting edge levels are being organized.

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Capacity Assessment & Alternative Supply Options

Pipeline Capacity : PNGRB assesses maximum carrying capacity of gas and petroleum product pipelines for tariff determination/third-party access.

Mobile Fuel Dispensing: Regulations enable mobile dispensing of HSD, CNG, and LNG, expanding fuel access to remote areas, mining, and industrial sites.

Supply Security: Initiatives taken to formulate a robust Supply Security plan for assured supply of gas and petroleum products in case of any disruption/incident.

Pipelines crossing rivers to be made more robust; in view of increased numbers of breaches due to flash floods, the Technical Standards are being reviewed.

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Consumer Affairs

PNGRB’s commitment to consumer protection is deeply embedded in its statutory mandate and reinforced by several pioneering initiatives. These measures ensure transparency, fairness, and accountability in the natural gas sector, safeguarding the interests of millions of end-users.

Enhanced Disclosure of Information

Complaint Analytics: Analytics dashboards covering average complaint volumes, resolution rates (currently **71% in PNG and 92% in CNG**), and common complaint types such as activation delays, billing issues, and payment challenges.

State-wise Price Disclosure: Both national and state averages for PNG and CNG prices are published, highlighting anomalies and ensuring pricing fairness across regions.

Outreach Programs: Nationwide campaigns through social media, educational institutions, and Resident Welfare Associations (RWAs) raise awareness on consumer rights, safety measures, and grievance mechanisms.

Self-Help Booklets: Entities are mandated to provide handbooks detailing rights, responsibilities, safety tips, and step-by-step complaint procedures, enhancing accessibility and awareness.

Escalation of Grievances to PNGRB

Centralized Grievance Redressal Portal: PNGRB is rolling out a unified, digital platform for complaint registration, tracking, and resolution, ensuring transparency and accountability.

Entity-Level Escalation: Gas entities are required to provide PNGRB's contact details on their portals, offering consumers the option to seek Board intervention if grievances remain unresolved at the entity level.

Structured Data Banks: Mandatory reporting and digital databanks enable trend analysis and targeted policy interventions for recurring consumer issues.

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Effective Consumer Satisfaction Surveys

Consumer Satisfaction Surveys: PNGRB has initiated third-party surveys covering over **1.2 crore consumers**, providing objective assessments of service quality.

Strengthened Processes: Empanelment procedures for survey agencies have been upgraded, ensuring credibility and independence.

Improved Sampling & Tools: Larger and stratified samples combined with diverse data collection methods (phone, in-person, online) ensure comprehensive and accurate feedback.

Transparent Billing Practices

Mandatory Price Transparency: Entities must publish up-to-date PNG and CNG prices, including detailed cost breakups, on their websites and report monthly data to PNGRB's e-portal.

Standardized Billing Formats: Uniform bills with clear cost components empower consumers to verify charges and prevent hidden costs.

LPG, HSD & MS Billing: Billing formats to be extended to these in the next phase providing break-up.

Future Welfare Measures Envisaged

Insurance Schemes for CGD Consumers to enhance safety and assurance, on similar lines as LPG.

Partnerships with NGOs and Voluntary Consumer Organizations (VCOs) for consumer education and policy feedback.

Portability of LPG Connections allowing consumers to choose their OMC freely is on the anvil.

Compensation Frameworks for denial or poor quality of service.

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Data Intelligence through Statistics

The newly formed Statistics Division is evolving from a data compilation unit to a strategic intelligence hub, empowering PNGRB with evidence-driven regulation, operational insights, and sectoral foresight.

MIS & Network Analysis

Designed **monthly MIS reports** tracking performance of CGD, PPPL, and NGPL networks.

Launched ***bi-annual CGD Network Analysis*** for deeper insights into infrastructure optimization.

Regularly hosted **reports and analyses** on PNGRB website for: CGD Networks, PPPL Networks, NGPL Networks

Identified, organized and catalogued: Prescribed data sets under the existing PNGRB regulations; Non-prescribed datasets essential for evidence-based regulatory decision-making for bringing new regulations

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Analytics Excellence & Collaborations

Achieved detailed gas loss analysis across CGD networks, identifying potential reduction in system losses

Strengthened partnerships with International Energy Agency (IEA), Petroleum Planning and Analysis Cell (PPAC), and Indian Statistical Institute (ISI)

Contributed expert analysis to IEA-PPAC India Gas Market Report covering demand forecasts, infrastructure trends, and policy frameworks

Explored collaborative arrangements with Ministry of Statistics and Programme Implementation (MoSPI)

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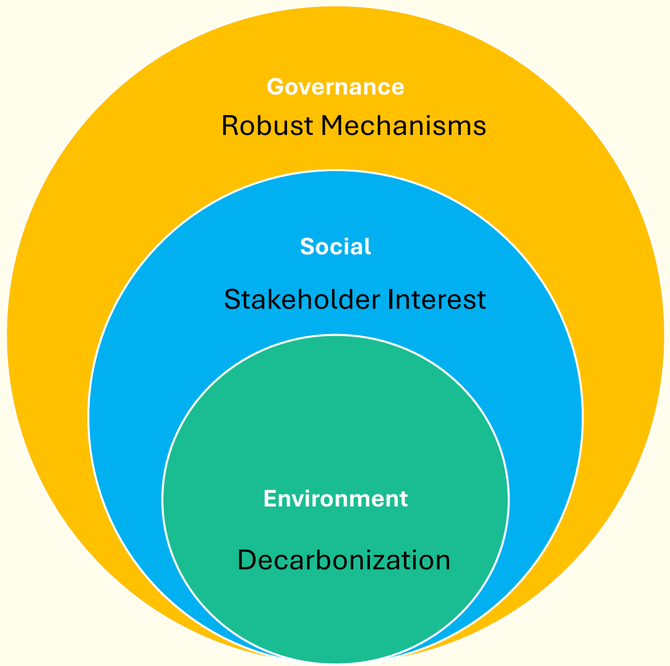
MIS Innovation & Network Analysis

Compiled comprehensive compliance requirements across all PNGRB Act 2006 entities

Designed sustainability reporting frameworks aligned with notified regulations for OMCs and CGD entities

Promoting Sustainability



Sustainability Measures: Directed entities to transition from gas-driven compressors to **electric compressors powered by renewables**, cutting CO_2 emissions.

Repository on best practices and technological innovation.

Knowledge sharing/Hand-holding on measuring technologies and reduction mechanisms.

Leaks and Losses Assessment in CGD, NGPL and PPPL leading to Benchmarking leaks & losses indicator.

Focus on improving operational efficiency, reducing emissions and environmental impact.

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Hydrogen and Energy Transition

PNGRB has taken proactive steps to support India’s clean energy transition by piloting hydrogen blending in city gas networks, developing safety guidelines, collaborating internationally, and preparing a roadmap for hydrogen transportation through pipelines. These initiatives position PNGRB at the forefront of enabling India’s hydrogen economy.

Guidelines and Regulatory Framework

Under the **National Green Hydrogen Mission (Clause 6.4)**, MoPNG and PNGRB are tasked with facilitating hydrogen uptake in refineries and city gas distribution.

Issued **Typical Guidelines for Hydrogen Blending** to ensure safety, operational compatibility, and uniformity across pilot projects. To issue regulations after amendment of the PNGRB Act.

The guidelines form the basis for **future regulations on hydrogen transportation through pipelines** both as blended and 100% Hydrogen.

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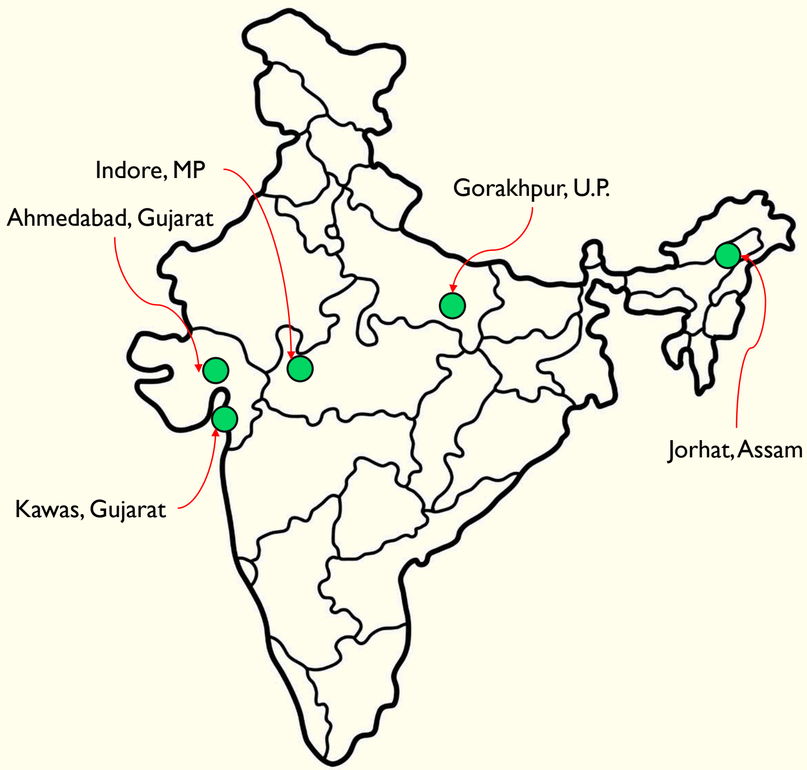
Pilot Projects on Hydrogen Blending



First pilot on **hydrogen blending in CGD networks** approved in Indore, Madhya Pradesh on **23 June 2021**.

Since then, **five more pilots** approved across Madhya Pradesh, Gujarat, Assam, and Uttar Pradesh, testing **2–8% hydrogen blends** in low-pressure CGD networks.

Results so far: > No stratification under stagnant conditions. > No material degradation in steel, PE, or polymer networks. > No adverse impact on odorization, heating value, or consumer experience.

These pilots provide critical inputs for developing future hydrogen blending regulations.

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Research and Collaborations

Study with World Bank–ICF on pathways for hydrogen transmission in pipelines; report finalized in 2024 and published on PNGRB's website.

Roadmap on Hydrogen Transportation and Blending: Draft report prepared by ICF, presented at NITI Aayog in Jul & stakeholder consultation held in Aug 2025. Final report to release in Sep 2025.

MoU signed with Scotia Gas Network, UK: Knowledge sharing on hydrogen blending & 100% hydrogen distribution. **Joint research and pilot projects** on decarbonization & pipeline integrity.

PNGRB is at advanced stages of MoUs with **DVGW (Germany)**, **GERMI (India)**, and **AMPP (US)** for knowledge partnerships.

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Capacity Building and Technology Adoption

Visits to global facilities: *DNV Spadeadam, UK*: Large-scale hazardous trials, pipeline compatibility assessments, and simulation research. *SGN H100 Fife, UK*: 100% hydrogen distribution pilot to 1,000 homes; insights on venting norms and domestic gas detectors.

Key takeaways for India: Establishment of a **test loop bed** in collaboration with entities and academia. Initiation of **trunk pipeline feasibility studies** for hydrogen blending. Adoption of new safety norms for domestic hydrogen use.

Readiness for the Future

Support legislative amendments to include hydrogen in the **PNGRB Act**.

Facilitate establishment of a **national test loop bed** for hydrogen blending trials.

Enter **strategic international collaborations** for technology and knowledge exchange.

Draft and notify **hydrogen-specific regulations** to ensure safe and efficient adoption once PNGRB is empowered by amendment to PNGRB Act.

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Compressed Biogas (CBG) in India’s Energy Transition

CBG is a key pillar of India’s clean energy future. Under the SATAT initiative (2018), the Government of India set a target of 5,000 CBG plants with a production capacity of 15 MMTPA (≈52 MMSCMD). CBG not only reduces greenhouse gas emissions but also supports waste management, rural employment, and energy self-sufficiency.

Mandate and Scope

PNGRB is mandated to promote, monitor, and regulate CBG integration into the gas economy.

Promoting SATAT and other national programs.

Issuing technical and safety guidelines for CBG injection into CGD and NGPL networks.

Monitoring connectivity and offtake agreements between producers and CGD entities.

Developing a **Renewable Gas Certification Framework** to build stakeholder confidence.

Stakeholder consultations, workshops, and capacity building.

Tracking production, blending, and offtake data.

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Pipeline Connectivity to CGD Networks

PNGRB is facilitating direct pipeline connectivity of CBG plants with CGD/NGPL networks to reduce road transport and emissions.

17 out of 105 operational plants (capacity >2 TPD) connected to CGD networks.

28 more connections found feasible, commissioning in ~1.5 years.

Of **173 plants under construction**, **36** will be pipeline-linked.

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Proactive Initiatives

Renewable Gas Certification Framework to ensure traceability and authenticity of CBG.

Taxation Issues: PNGRB engaged with MoF; GST on CBG equipment reduced by 5%.

State Bio-Energy Policies: Provided guidance and support for policy formulation.

DPI Scheme Revisions: Advised MoPNG on cluster-based incentives and NGPL inclusion; scheme revised accordingly.

Major Achievements

Synchronization with CGD Entities: PNGRB facilitated long-term offtake agreements between CBG producers and CGD companies, boosting investor confidence.

Guidelines for Biogas Injection: Technical and safety guidelines under finalization for CBG injection into NGPL and CGD networks, covering quality, pressure, odorization, and metering.

BIS Specification Revision (IS 16087:2025): Improved biomethane quality parameters notified on PNGRB's recommendation, enabling seamless blending with natural gas in CGD networks.

Human Resource and Administrative Transformation

PNGRB believes that its true strength lies in its people. Over the years, the Board has transformed its human resources framework to attract talent, build institutional capacity, and create a digitally empowered, people-centric workplace.

Evolution of Human Resources in PNGRB

Initially staffed through deputation from Oil & Gas PSUs (2006–2021). **PNGRB Rules, 2020** notified — enabling deputation, short-term contracts, and aligned perks/facilities to attract experienced officers.

Today, PNGRB functions with a strengthened workforce aligned with organizational goals. A **large pool of personnel trained in regulatory governance** in-house at all levels.

Plan to establish PNGRB's **Regulatory and Commercial Cadres**. Cadres will retain **institutional memory**, ensure continuity, and build long-term expertise in tariff, licensing, regulation, and compliance.

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Capacity Building

New Divisions: Strategic Planning, IT, Consumer Affairs, and Statistics. **Specialist Cells:** Hydrogen, Compressed Biogas (CBG), and Sustainability — created in response to India's energy transition and COP commitments.

New Office Premises of PNGRB at New Delhi, with modern state-of-the-art facilities, was inaugurated on 6th Mar 2025 by Shri Hardeep Singh Puri, Hon'ble Minister of Petroleum and Natural Gas.

Training Calendar across technical, commercial, legal, administrative, and IT domains. Cultivating a culture of curiosity, growth, and leadership.

Industrial visits, knowledge partnerships with research institutions, and continuous learning through **conclaves and seminars**. All staffers have visited one entity across downstream sector.

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People-First Culture and Youth Engagement

Initiatives for **gender sensitization** (POSH Act seminar, 2023).

Motivational workshops, get-togethers, and employee engagement programs. Focus on inclusivity, workplace comfort, and aligning manpower with organizational goals.

Internship Scheme offers students of engineering, management, finance, law, IT, and communication a **hands-on regulatory experience**.

Provides a stipend of ₹10,000/month — an investment in the next generation of energy leaders. UPES, ISI, IIMC students have done internships in large numbers.

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Enabling Digital Transformation

Information Technology is the backbone of modern regulation. PNGRB's IT Division has led transformative initiatives to build a digitally empowered, secure, and transparent regulatory ecosystem, ensuring efficiency, stakeholder engagement, and alignment with India's energy transition.

Recent IT Initiatives

eOffice: Migrated to cloud-based eOffice for reliability, scalability, and a step towards a paperless office.

SAP Implementation: Adopted SAP Business One for financial governance, improving transparency and real-time insights.

Division-Specific Web Applications: Digital platforms for Technical, Authorization, Monitoring, and Legal Divisions to standardize workflows.

Video Conferencing & IP Telephony: State-of-the-art communication systems deployed for seamless stakeholder engagement.

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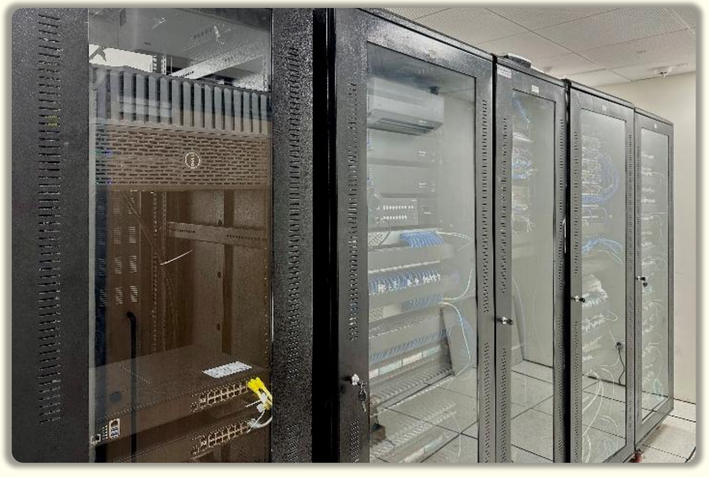
Cybersecurity & Infrastructure Strengthening



Network and perimeter security upgrades (routers, switches, firewalls).

Endpoint Detection & Response (EDR) for continuous device monitoring.

Regular vulnerability assessments. Staff sensitization on safe digital practices.

New Data Centre Commissioned in Feb 2025 at PNGRB's new premises, providing secure, resilient, and high-speed digital infrastructure.

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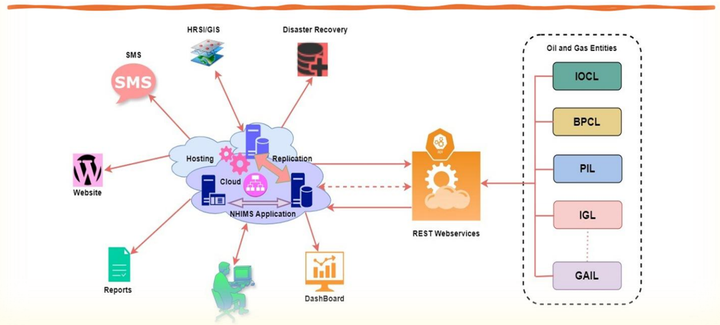
National Hydrocarbon Infrastructure Monitoring System (NHIMS)

PNGRB has initiated the development of NHIMS — a flagship digital platform designed to revolutionize monitoring, planning, and regulatory oversight of India's petroleum & natural gas infrastructure.

NHIMS is a Fusion of Emerging ICT Tools: GIS, Mobile, Secure Messaging, Data Analytics, etc. It is an **Enterprise Solution** having Secure **API-based framework** for seamless data sharing.

Combines P&NG infrastructure data with Administrative layers (States, Districts), Transport networks (Roads, Railways), Natural features (Forests, Water bodies), and Satellite Imagery.

NHIMS Functional Architecture



NHIMS Impact & Benefits

Enhances **transparency, efficiency, and scientific planning**. Facilitates **data-driven decision-making** for policymakers, regulators, and operators.

Hosted on the **National Government Cloud (NGC)** with **NIC as technology partner**. Future-ready, scalable, and aligned with *Digital India*.

Key Features include: Role-based access, **eBulletin Board** for transparent updates, Geo-Spatial visualizations with **dashboards, queries, reports, and charts**, and Mobile support for **geo-tagging** & near **real-time feedback**.

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Petroleum and Natural Gas Regulatory Board

E-400, 4th Floor, Tower-E, World Trade Center,
Nauroji Nagar, New Delhi – 110029
EPABX No.: +91 (11) 24060151
www.pngrb.gov.in

Image Courtesy: IGGL; Laying of North-East Gas Grid pipeline