



**7th Petro India 2008 conference
Gas In India- Issues, Opportunities &
Challenges**

Gas Infrastructure & Allied Issues

25th September , 2008


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Need For Gas Infrastructure



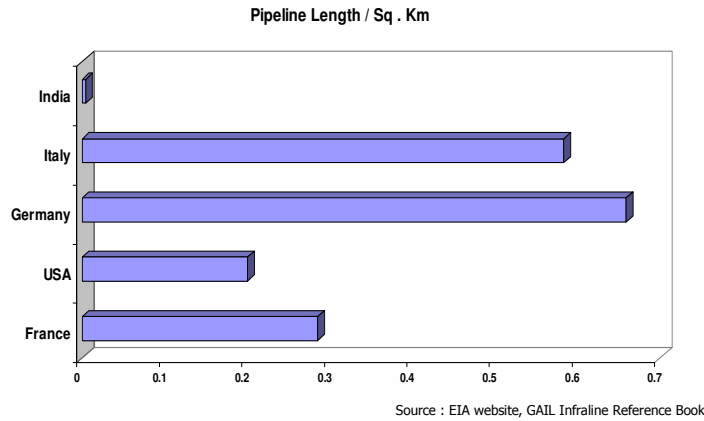
- Rapidly Growing Economy
- Increased Availability
 - New discoveries
 - Gas from KG-D6
 - Other Gas : GSPC, ONGC etc
 - LNG Imports
 - Expansion of existing terminals
 - New terminals being planned
- Demand
 - Supply led demand
 - Fertilizer
 - Conversion of liquid feed plant to Gas & Renewal of closed units
 - City Gas Distributions
 - Emerging Technologies

■ APM ■ PSC ■ LNG

Year	APM (%)	PSC (%)	LNG (%)
2001	88%	12%	0%
2006	61%	19%	20%
2009E	38%	40%	22%

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Need For Gas Infrastructure (Contd..)



Low penetration of Gas Pipeline Infrastructure

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Transportation Infrastructure to Link Supply & Demand Centers

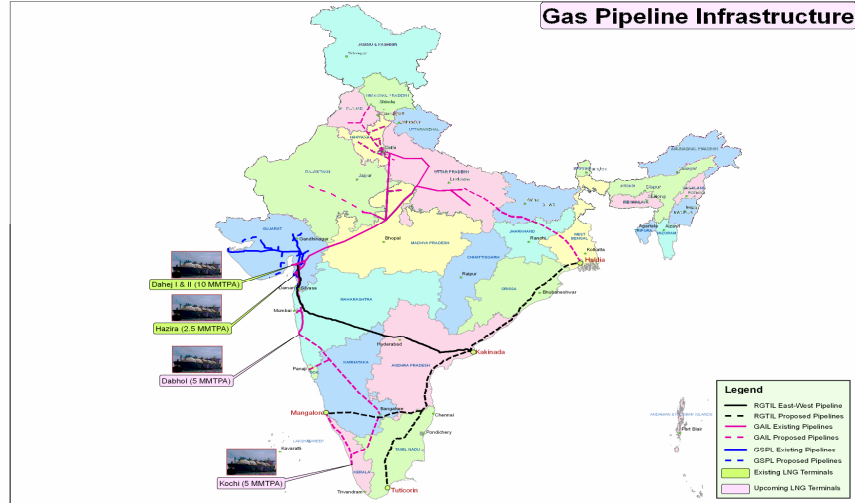


- Transmission Infrastructure needed to develop regional markets
- Huge investment proposed for setting up transmission networks across country
 - Over 7,000 km, big inch pipelines in next 5 to 7 years
- Most of the new territories would require simultaneous development of bulk and retail consumers, triggering construction of spur pipelines
 - Approx. 5,000 to 10,000 km medium to small diameter pipelines
- Policy initiatives like Common carrier principle and unbundling to ensure access to third party networks

National gas market will evolve from regional gas hubs with infrastructure in place

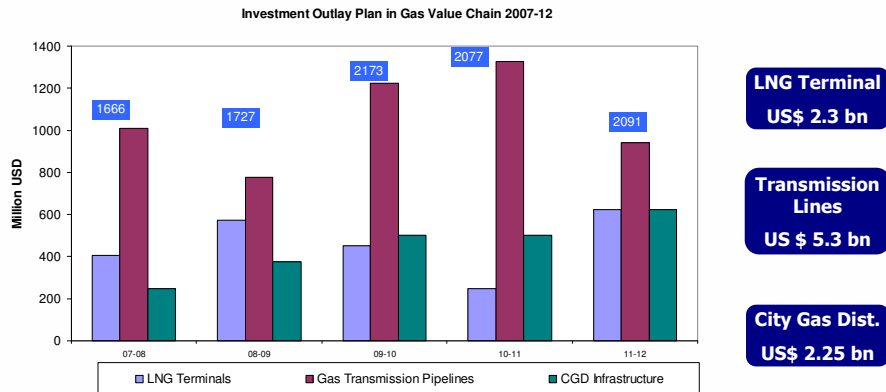
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Gas Infrastructure – Existing & Proposed



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Projected Gas Infrastructure Development



Source : Planning Commission Report – XI Plan

USD 10 bn Investment in Gas Infrastructure expected in next 5 years

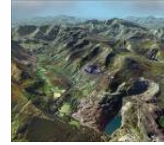
Demand to grow by 40 BCM/yr

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Gas Pipeline Infrastructure - Challenges



- Long gestation period for Capital Recovery
- Varied and difficult terrains
- Scarce availability of domestic resources for construction of large dia pipelines
- Complex and time consuming process for RoU acquisition
- Meticulous Planning & Execution
- Combined Efforts from Govt. & Industry



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Gas Pipeline Challenges – RGTIL Experience



- Use of Technology
 - Water body Crossings
 - *Permanent rivers (Micro tunneling)*
 - *Dam reservoirs (Tapti reservoir crossing)*
 - Difficult Terrains
 - *Mud mats in waterlogged areas*
 - *Cable cranes to cross steep mountain drops*
- RoU – acquisition and prevention of encroachments
 - Limited time windows after harvesting – concentrate resources
 - Joint efforts for RoU protection through participation of local populace






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Allied Issues 

- **Standardization in Methods of Pipeline Operation**
 - Robust communications mechanisms and web based applications for daily operations between Shippers and Transporters 
 - Allocation methodologies
- **Interconnection between two pipelines**
 - Interconnect Agreements
 - Operational Balancing Agreements (OBA) between interconnecting parties 

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Allied Issues (contd....)



➤ Day to Day Monitoring & Reconciliation

- Customer / Shipper wise Inventory Accounting
- System disciplines to maintain pipeline integrity



➤ Imbalance Management

- Imbalance curing in shortest time
- Permissible Imbalance levels to be within limits permitted by Pipeline hydraulics



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PNGRB Act: Enabling Provisions




- Open access to transportation infrastructure
- Selection of entities in transparent manner- Promoting competition and level playing field
- Retail service obligations – quality of products & services, complaint redressal
- Standardization of Codes/standards/best practices- to improve quality of services and ensure safety




Proactive steps of PNGRB - Participation of all stake holders to evolve effective and conducive regulatory mechanism

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- ## Summary & Way Forward
- Gas pipeline infrastructure poised for quantum growth
 - Application of technology to overcome challenges
 - Standardization of operating practices
 - Increased interaction between stakeholders to tackle common problems.
 - Continuation of Active role of Regulator to ensure conducive environment for Gas Infrastructure development.
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Thank you