



ENERGY SOLUTIONS FOR
GROWTH

A NATURAL GAS MARKETING COMPANY which leverages the experience of its promoters to grow India's gas market.

LNG as a Auto Fuel for Medium & Heavy Commercial Vehicles (M&HCVs)

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4th March 2020

Confidential

GASTech2020 Mumbai

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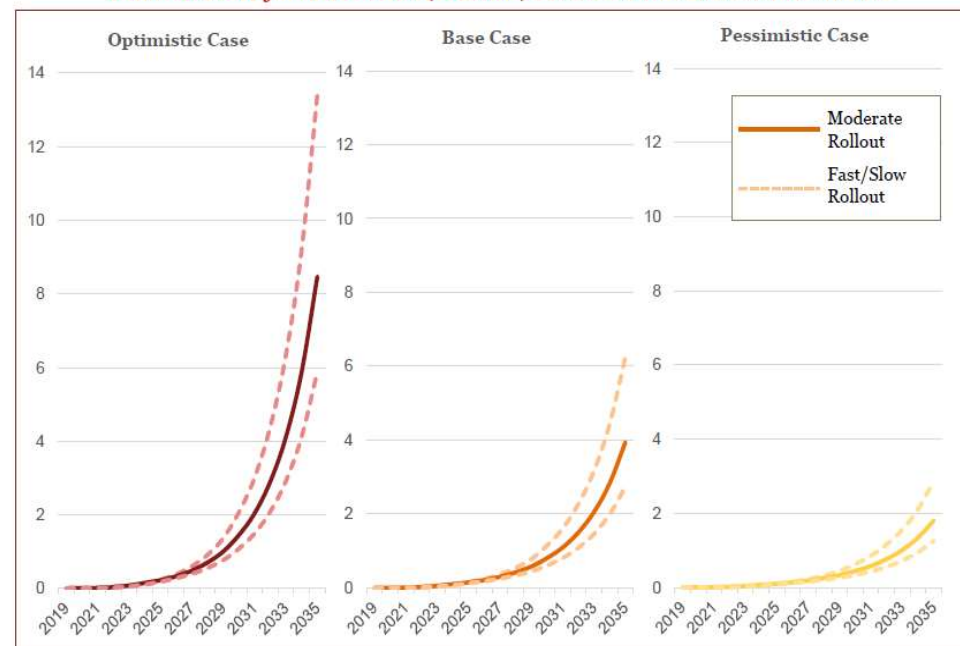
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Significant potential LNG demand for M&HCVs

Market Scenarios ↓	Infrastructure Rollout Scenarios →		
	Slow Rollout	Moderate Rollout	Fast Rollout
Optimistic Scenario	21.2 MMTPA	30.5 MMTPA	48.3 MMTPA
Base Case	9.8 MMTPA	14.2 MMTPA	22.5 MMTPA
Pessimistic Scenario	4.5 MMTPA	6.5 MMTPA	10.3 MMTPA

Estimated LNG fuelled vehicles (in Lakhs) across various Economic Scenarios

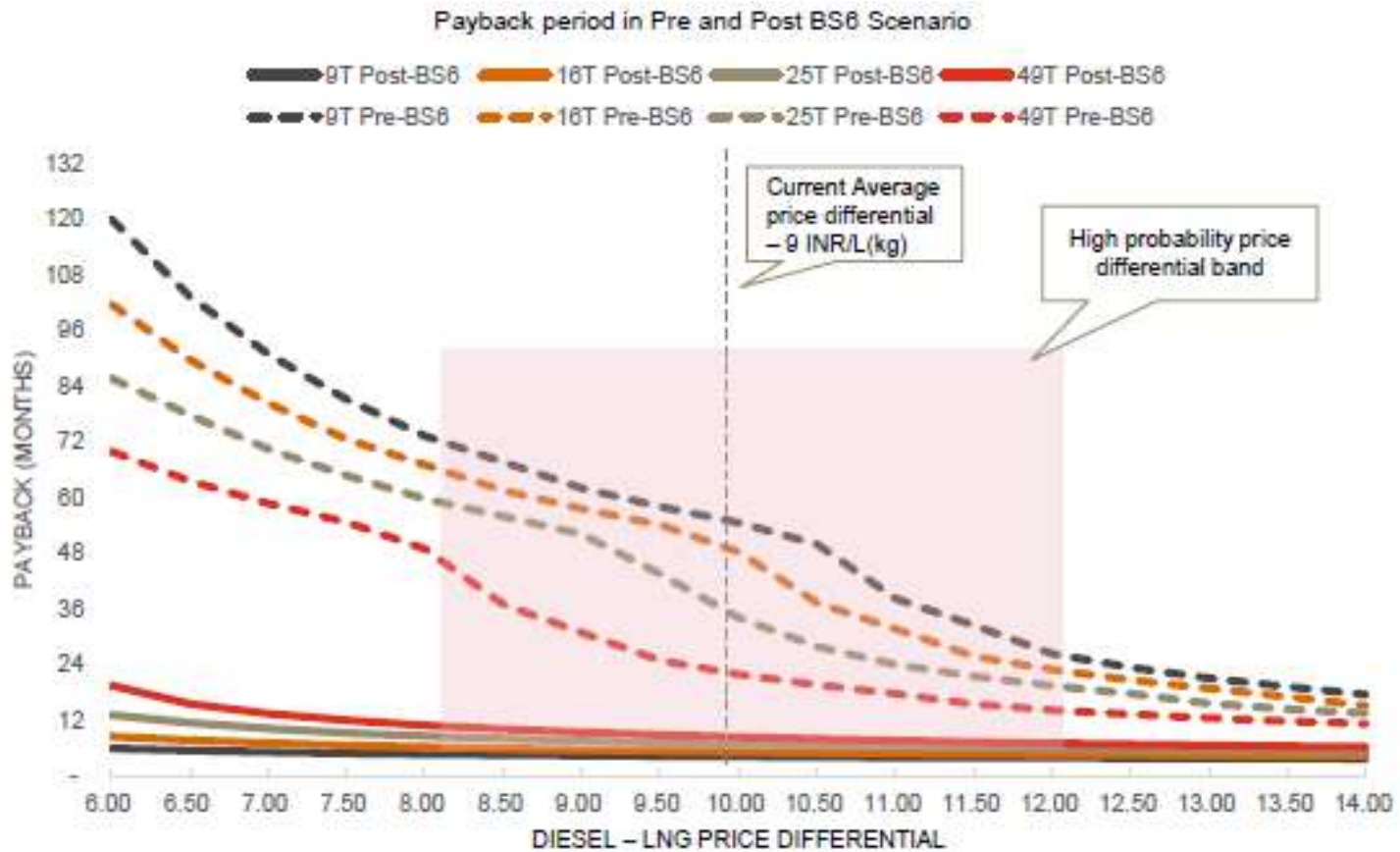


Source: PwC Analysis

In a moderate infrastructure rollout scenario, base case demand of 14 mmtpa LNG demand for fueling 0.4 million vehicles by 2035

Level of regulatory support and pace of infrastructure roll out will determine market growth trajectory

Conversion to LNG vehicles is attractive for Fleet Operators



Source: PwC Analysis

Attractiveness for LNG conversion to be driven by capex differential and price differential on LNG versus diesel

Significant environmental benefits by shifting to LNG

GHG Emission Factors for transportation fuels

Fuel	LPG	Diesel	Petrol	Natural gas
CO2 (Kg/ MMBTU)	61.71	68.02	70.22	53.06
N2O (g/ MMBTU)	0.60	0.60	0.60	0.10
Methane (g/ MMBTU)	3	3	3	1

Source: US Department of Energy, US EPA, BP Statistics conversion factors, EIA conversion calculators (PWC report for FIPI)

CO2

22% lower emissions
than diesel fueled truck*

NOx

90% lower emissions
than diesel fueled truck*

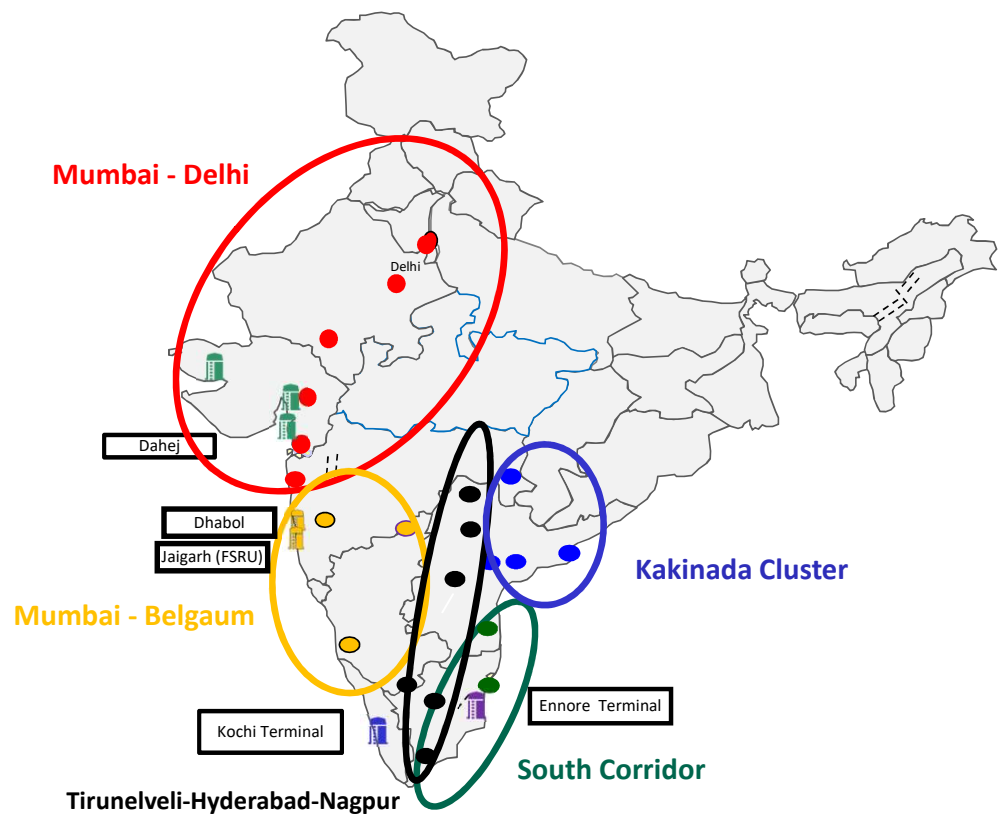
SOx

100% lower emissions
than diesel fueled truck*

* Before After –treatment technologies

Fewer emissions of nitrogen oxides (N2O and NOx), particulate matter (PM), sulphur oxides (SOx), and carbon

Offer LNG along key demand corridors linked to LNG terminals



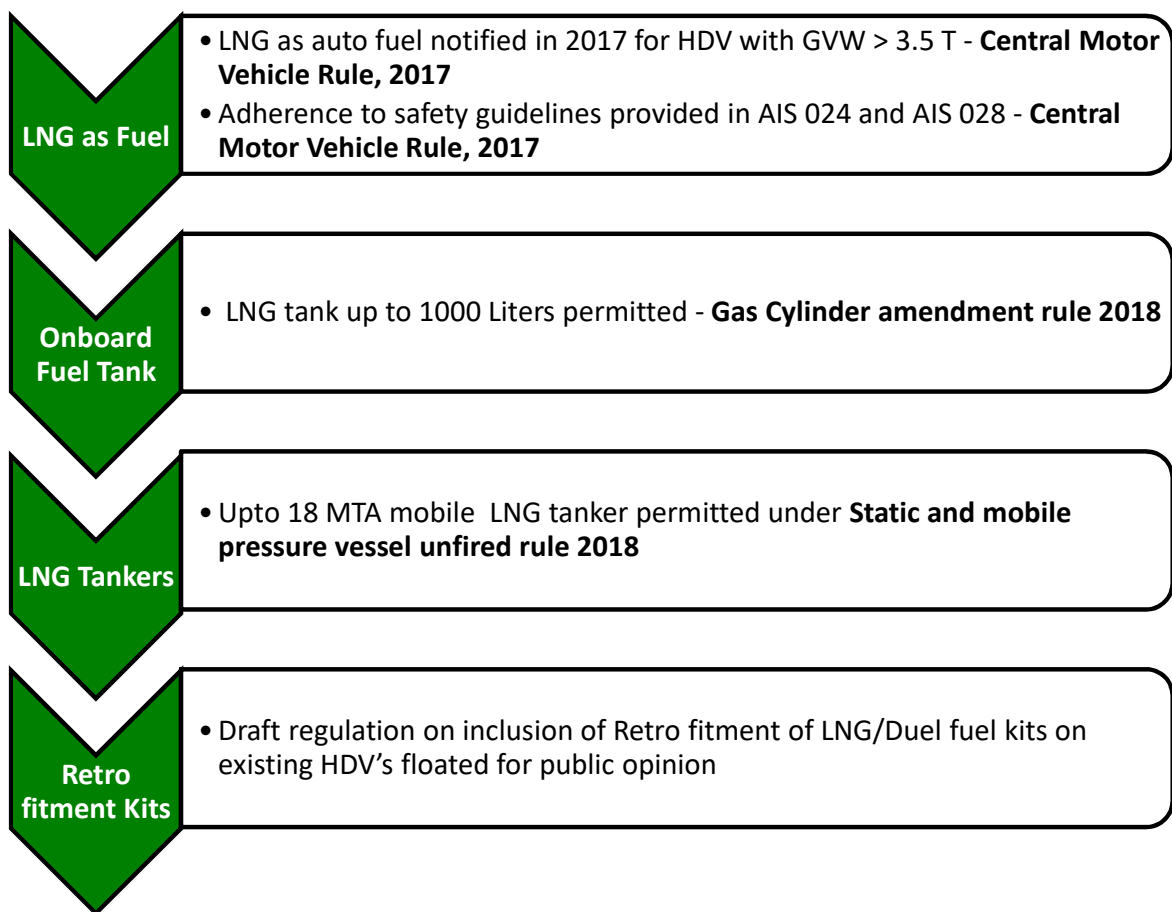
Tanker loading infrastructure to be available...

Terminal	No of truck loading bays	Target Corridors	Status
Dahej	5	Mumbai Delhi	●
Kochi	1	South Corridor Tirunelveli-Hyderabad-Nagpur	●
Hazira	1	Mumbai Delhi	●
Jaigarh (FSRU)	2	Mumbai Belgaum	●
Ennore	2	South Corridor Tirunelveli-Hyderabad-Nagpur	●

Source – PWC Report for FIPI

Existing and future terminals can cater to the LNG autofuel demand

Regulatory framework enables use of LNG as a fuel for M&HCVs

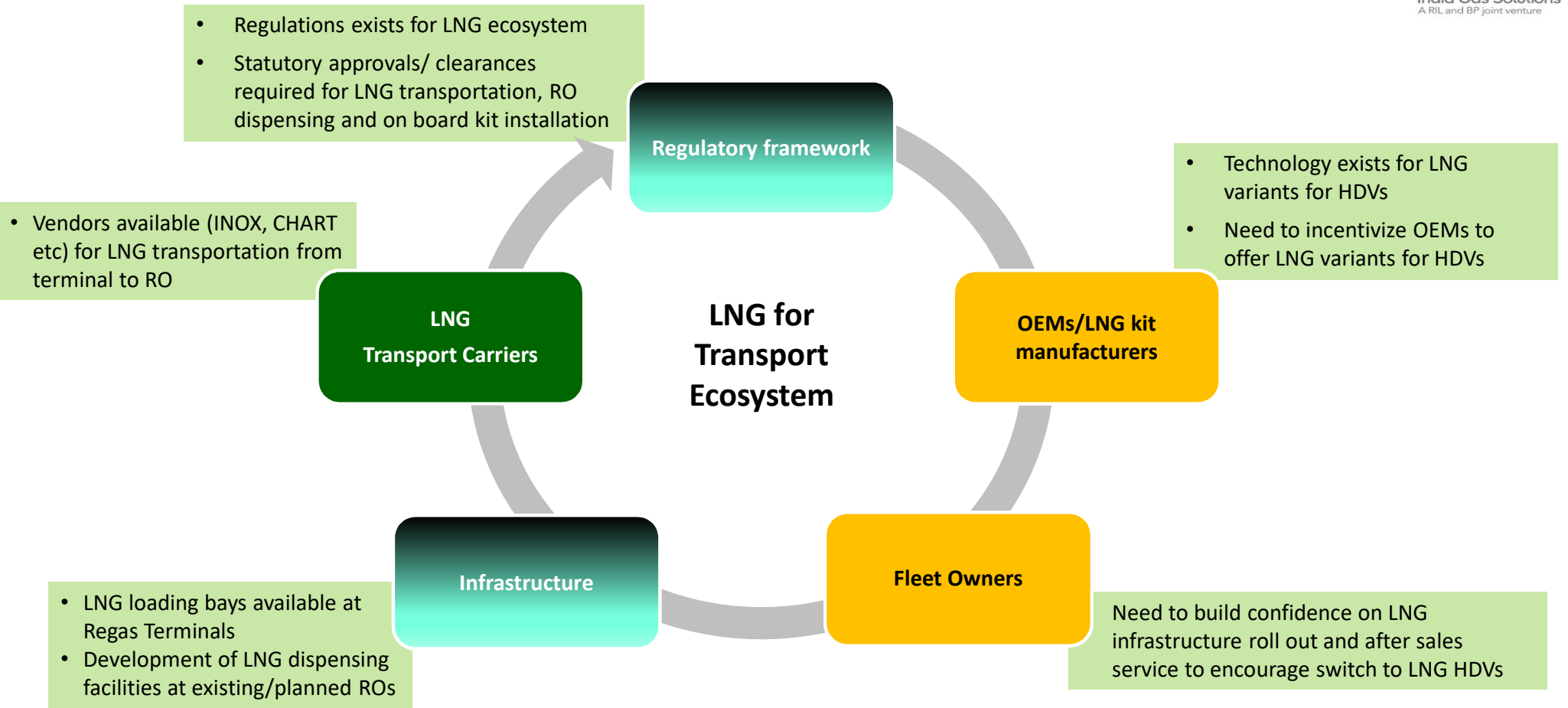


Key stakeholders – Policy and Regulations

- Government of India
 - Ministry of Petroleum & Natural Gas
 - Ministry of Road Transport and Highways
 - Petroleum and Explosives Safety Organization
- Independent
 - **ARAI**: Automotive Research Association of India

Enabling regulatory changes are being made to assist HDV conversion to LNG

LNG Ecosystem is under development

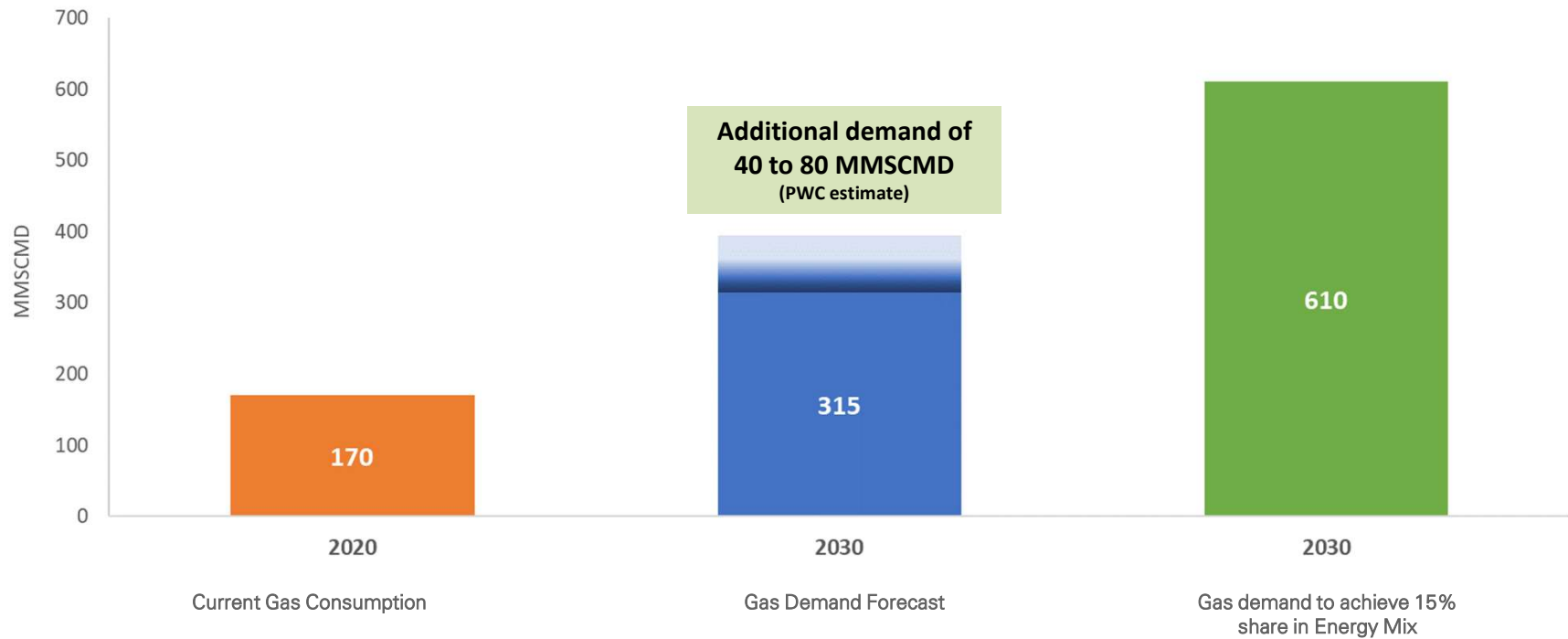


A phased approach is required to grow the business in sync with the ecosystem

Key Enablers for LNG Adoption

- **Encourage adoption of LNG as fuel for M&HCVs**
 - Enforcement of CAFÉ (Corporate Average Fuel Economy) norms for M&HCVs
 - Inclusion of LNG vehicles in Government's incentive program (similar to FAME)
- **Taxation benefits for LNG as a Cleaner Fuel**
 - Provide tax rebates for LNG trucks (purchase/ conversion) to motivate fleet owners to shift to LNG
 - Maintain differential between LNG and Diesel taxation to promote LNG as clean fuel; include natural gas in GST
- **Enabling Regulations:**
 - Develop regulations for LNG retro-fitment stations (similar to CNG retro-fitment stations)
 - Allow one time certification for kit (instead of the current practice of every three years)
- **Facilitate pan-India infrastructure development:**
 - Develop LNG corridors to aid development of LNG based variants by OEMs and drive further penetration
 - Ensure regulatory clarity for authorization for LNG dispensing infrastructure

Adoption of LNG as auto fuel will help increase share of gas in fuel mix



An important lever to meet aspiration of 15% gas share in primary energy consumption