

17th INTERNATIONAL CONFERENCE & EXHIBITION ON LIQUEFIED NATURAL GAS (LNG 17)



MEETING DEMAND CHALLENGES OF AN EMERGING LNG MARKET: INDIA

By:
A K Balyan,
Petronet LNG Limited
April 17, 2013



International Organizers



Host Association

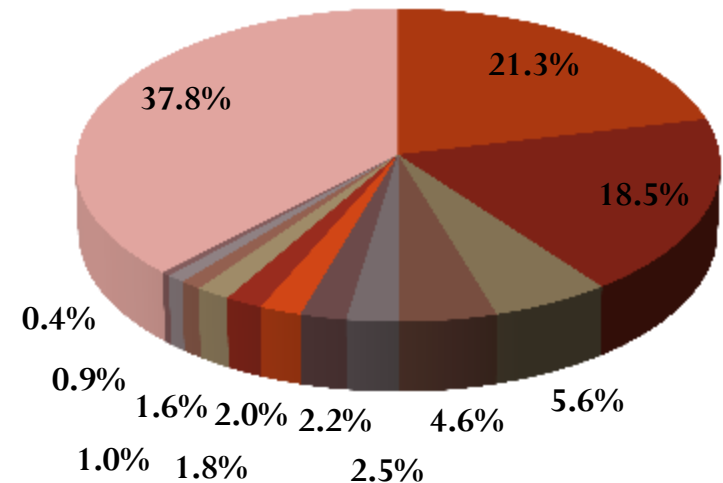
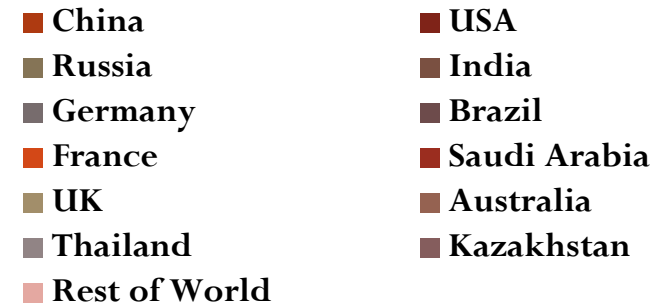


OVERVIEW

- India's Energy Consumption
- Natural Gas Demand Supply Balance
- Gas Infrastructure
- Role of LNG & Meeting Demand Challenges
- Petronet's Terminal

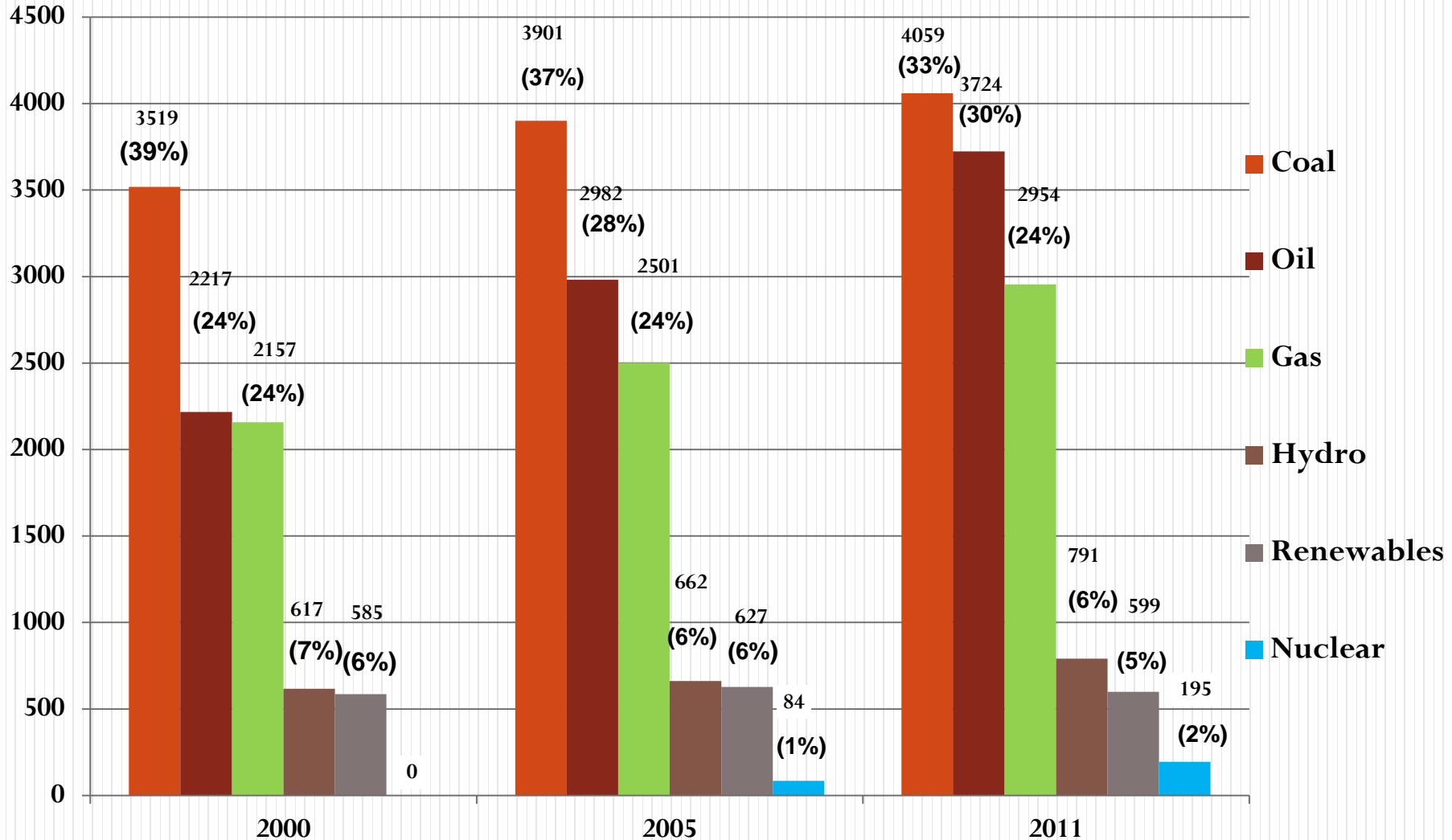
INDIA – A MAJOR ENERGY CONSUMER

- India is **the 4th largest consumer of energy** in the world after USA, China and Russia accounting for around 4.6% of world energy consumption
- The total energy requirement is projected to **grow at 6.5% per year** between 2012-13 and 2016-17
- While the per-capita energy consumption of India at present is almost half the global average i.e. **0.8 mtoe vis-a vis 1.8 mtoe**, with the rising income levels along with growth in Indian economy, the per capita energy consumption is likely to see a **two-fold increase in next 10 years**





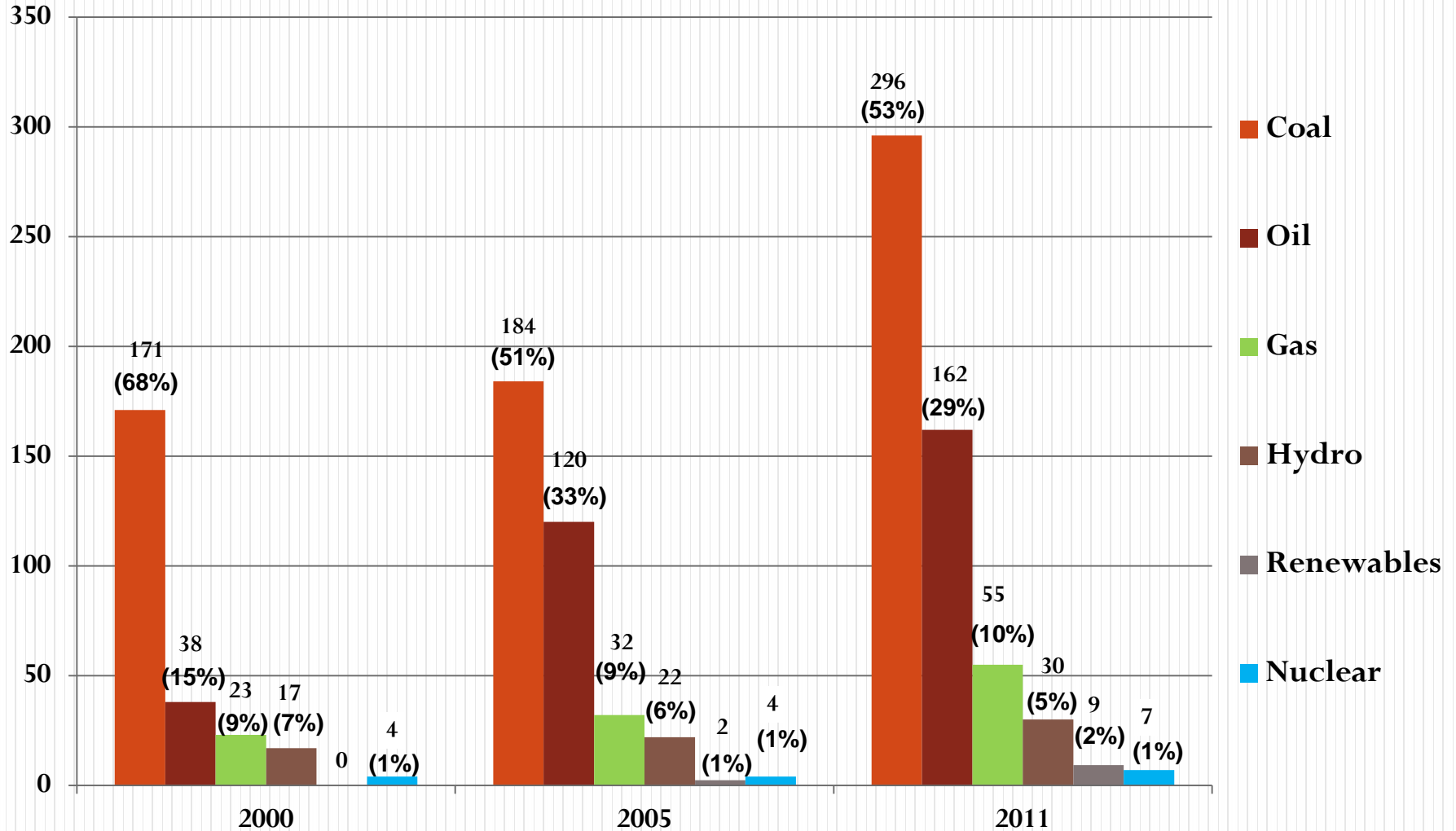
PRIMARY ENERGY CONSUMPTION (mtoe) - WORLD



Source : BP Statistical Review-June 2012

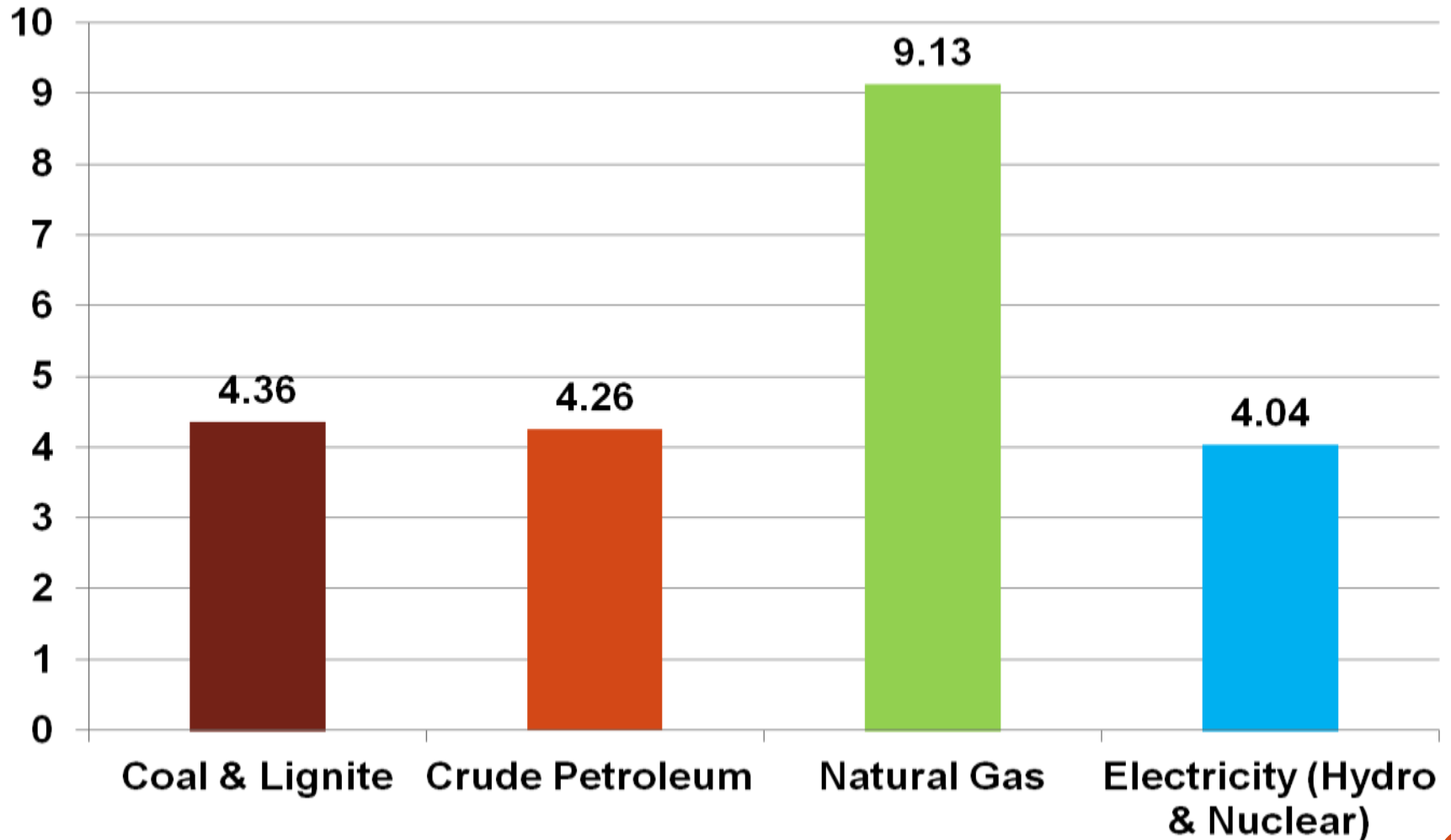


PRIMARY ENERGY CONSUMPTION (mtoe) - INDIA



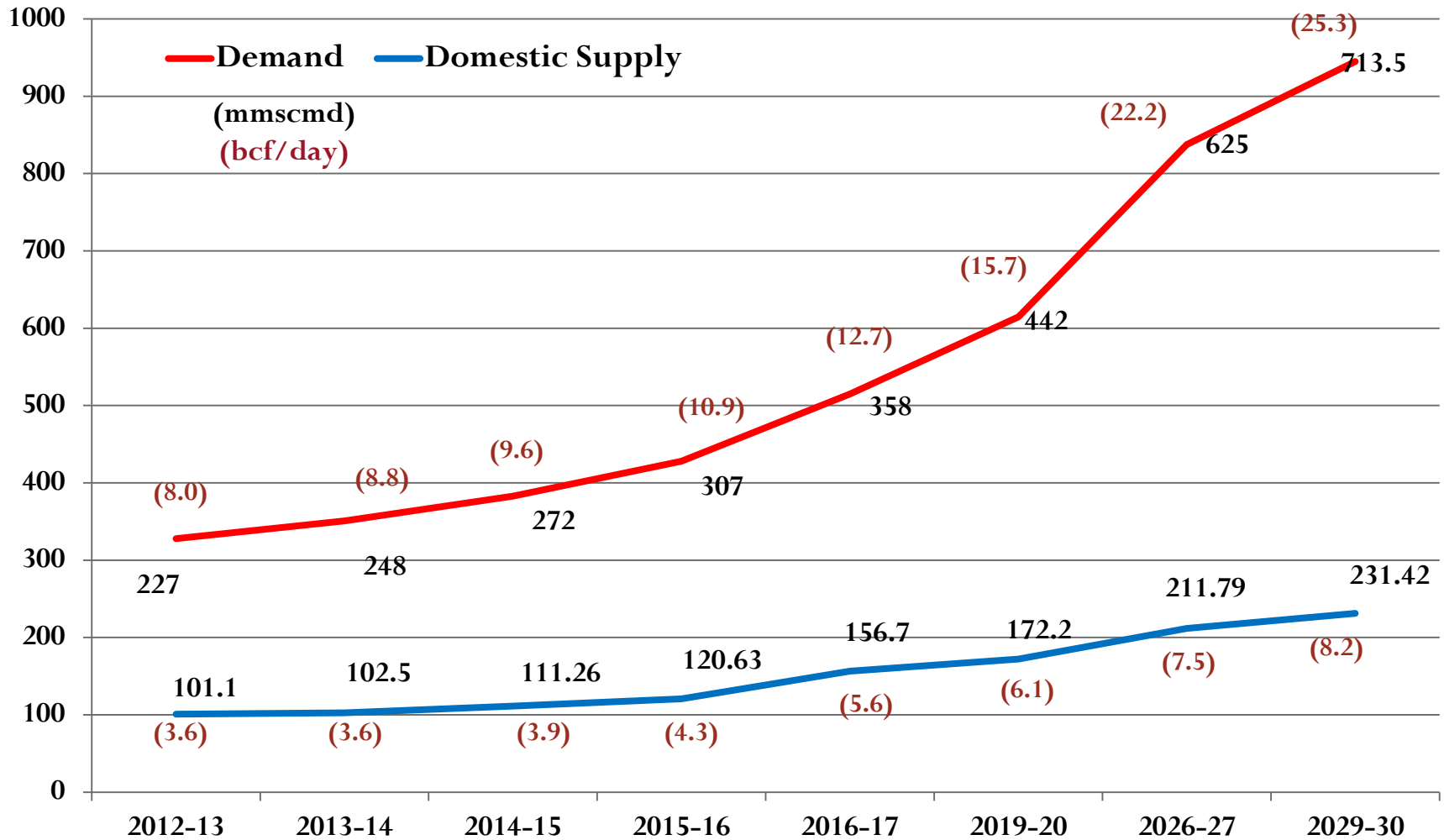
Source : BP Statistical Review-June 2012

PRIMARY ENERGY SOURCES PRODUCTION CAGR (1970-2011)



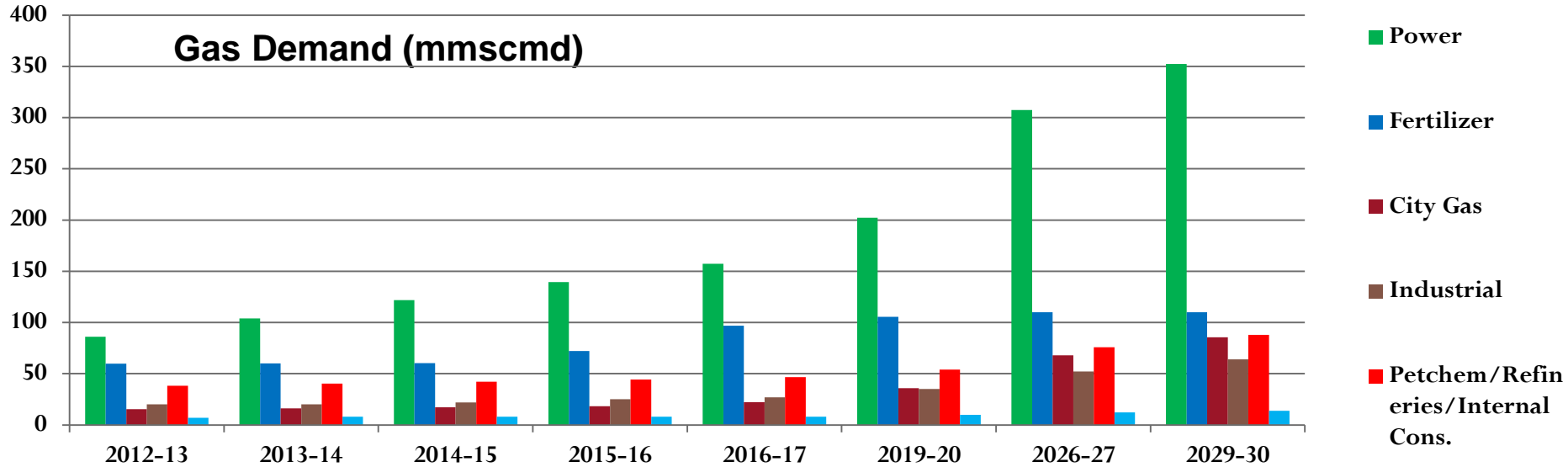
Source : Statistical Data 2012 , Ministry of Statistics

CURRENT GAS DEMAND & DOMESTIC SUPPLY SCENARIO



Source : Vision 2030, Natural Gas Infrastructure in India

SECTOR WISE PROJECTED GAS DEMAND



	2012-13	2013-14	2014-15	2015-16	2016-17	2019-20
Power	86	104	122	139	157	202
Fertilizer	60	60	60	72	97	106
City Gas	15	16	17	18	22	36
Industrial	20	20	22	25	27	35
Petchem/Refineries/Internal Consumption	38	40	42	44	47	54
Sponge Iron/Steel	7	8	8	8	8	10
Total Realistic Demand	227	248	272	307	358	443

Source : Vision 2030, Natural Gas Infrastructure in India

INDIA – A MAJOR GAS/LNG CONSUMER

- 13th largest gas consumer – 61 bcm (~165 mmscmd)
- 5th largest LNG importer– 17 bcm (~46 mmscmd ~13 mmtpa)
- Economy growing at CAGR of 6-7% with similar growth in Energy Consumption
- Share of Natural Gas in Indian Energy basket to increase from 10% to 20% by 2025
- Despite increase in domestic gas production-dependency on imported gas to increase substantially
- LNG which currently constitutes 30% of natural gas consumption in country to have a share of more than 50% by 2025

SNAPSHOT OF OPERATIONAL, UNDER CONSTRUCTION, PLANNED & POSSIBLE LNG TERMINALS IN INDIA

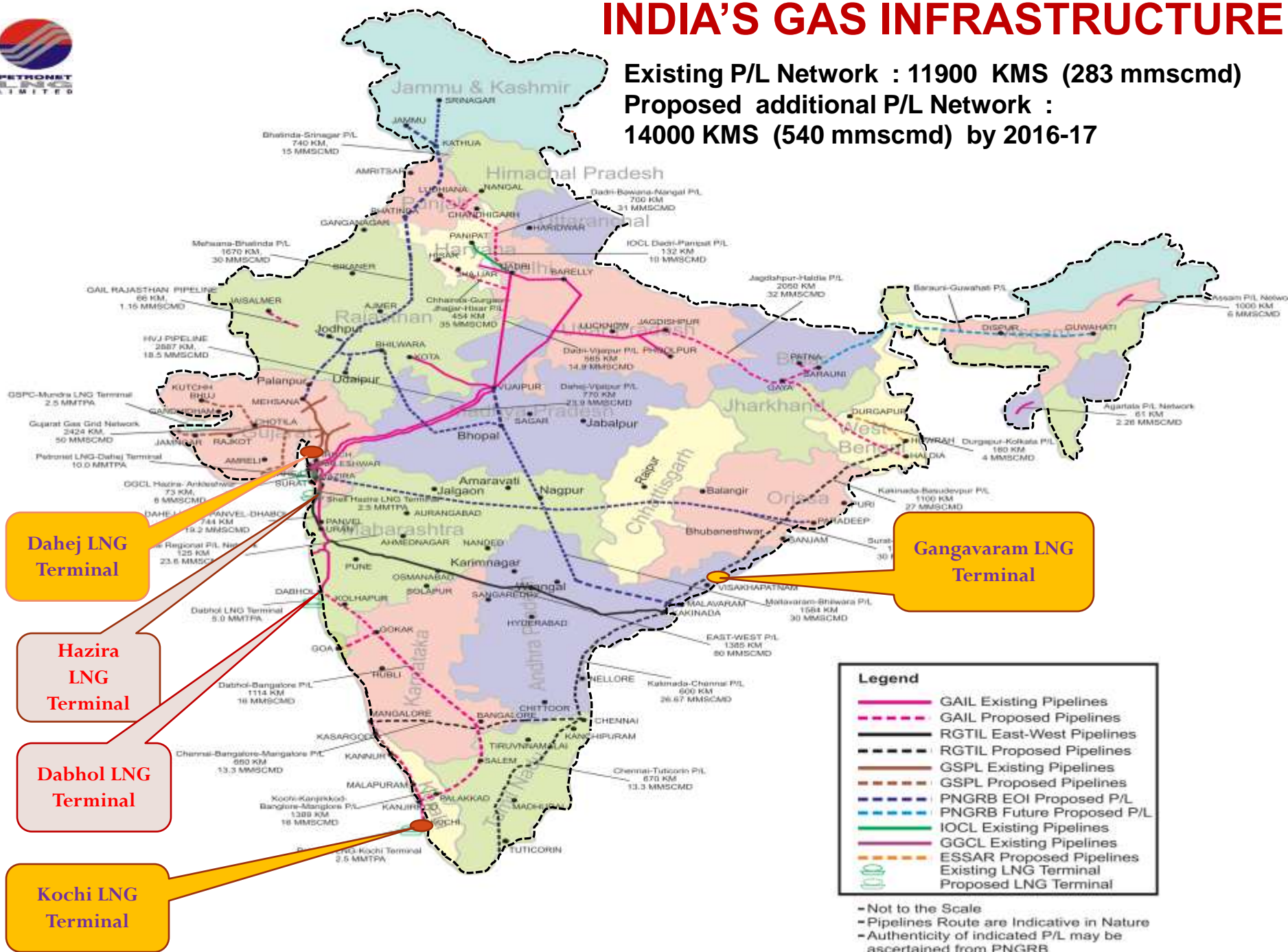
	2013	2016	2020	mmtpa
Existing				
Dahej	10.0	15.0	20.0	Petronet LNG
Hazira	5.0	5.0	5.0	Shell & Total
Dabhol	1.2	5.0	5.0	RGPPL (GAIL & NTPC)
TOTAL	16.2	25.0	30.0	
Under Construction				
Kochi	-	5.0	5.0	Petronet LNG
TOTAL	-	5.0	5.0	
Proposed				
Ennore	-	5.0	5.0	IOCL
Gangavaram	-	5.0	5.0	Petronet LNG
Mundra	-	5.0	5.0	Adani - GSPC
TOTAL	-	15.0	15.0	
Possible				
West Coast	-	-	2.5	Hiranandani
Jamnagar/Kakinada	-	-	5.0	RIL-BP
East Coast (FSRU)	-	2.5	5.0	Shell/GAIL
TOTAL	-	2.5	12.5	
Grand Total	16.2	44.5	60.5	



INDIA'S GAS INFRASTRUCTURE

Existing P/L Network : 11900 KMS (283 mmscmd)

Proposed additional P/L Network : 14000 KMS (540 mmscmd) by 2016-17



Dahej LNG Terminal

Hazira LNG Terminal

Dabhol LNG Terminal

Kochi LNG Terminal

Gangavaram LNG Terminal

Legend

- GAIL Existing Pipelines
- GAIL Proposed Pipelines
- RGTL East-West Pipelines
- RGTL Proposed Pipelines
- GSPL Existing Pipelines
- GSPL Proposed Pipelines
- PNGRB EOI Proposed P/L
- PNGRB Future Proposed P/L
- IOCL Existing Pipelines
- GGCL Existing Pipelines
- ESSAR Proposed Pipelines
- Existing LNG Terminal
- Proposed LNG Terminal

- Not to the Scale
- Pipelines Route are Indicative in Nature
- Authenticity of indicated P/L may be ascertained from PNGRB

LNG SOURCING FOR INDIA

- To ensure sustained and continuous availability of RLNG, 70-75% to be tied-up on long term basis , balance through mix of short term & spot
- Current Long Term contracts:
 - Petronet's Contracts
 - Petronet-RasGas 7.5 mmtpa supplies commenced in 2004
 - Petronet-Exxon Mobil(Gorgon) 1.5 mmtpa supplies to commence in 2015
 - Other Contracts
 - GAIL – Cheniere Energy 3.5 mmtpa supplies likely to commence in 2018
 - GAIL-GAZPROM 2.5 mmtpa supplies to commence in 2020/21
 - GSPC-BG 1.25 mmtpa with option of 1.25, supplies to commence in 2015
- Other Long Term Opportunities
 - Middle-East : Qatar, Yemen : Shipping advantage for West Coast of India
 - Australia : Large capacities: favourable for South & Eastern India
 - Mozambique : Price, Logistically favourable
 - Russia : Portfolio & price advantage
 - US : Price Advantage (indexation to HH etc), portfolio diversification



KEY CHALLENGES OF INDIAN MARKET- DOMESTIC

- Large appetite with high Price sensitivity and competition with alternate fuel
 - Regulated power and fertilizer end use prices
 - 5th largest coal reserves
 - Large consumption of liquid fuels like Diesel, FO
- Development of Infrastructure
 - LNG terminals
 - Domestic and transnational pipeline networks
 - Gas storage
 - Unbundling of transmission and marketing entities
- Consumers behavior
 - Long term / short term/ Spot – how much to be tied-up

KEY CHALLENGES OF INDIAN MARKET- EXTERNAL

- Competition from Global buyers :
 - Japan, Korea, Taiwan- high paying markets
 - New emerging markets like China, Singapore, Thailand
 - India becoming a fall back market on spot basis at right prices
- Large capital requirements for acquisition of upstream assets and formation of strategic partnership
- Multiplicity of index like JCC/Brent/Henry Hub with no specific index for emerging markets

LARGE DEMAND BUT SENSITIVE TO PRICE

McKinsey Analysis 2010

Gas demand and supply, 2015
mmscmd, At customer gate prices



Sectors with demand

- Industries
- CNG transport
- Refineries
- Industries
- Power cogen
- Peaking power plants
- Baseload power
- New fertilizer plants

- Imports
- Domestic supplies

Prices at Crude of \$ 100/Bbl

1 Based on estimated LNG supply of 8 mtpa in 2015 including RasGas (7.5 mtpa) and 1.5 mtpa from Gorgon LNG in 2015

SOURCE: Indianpetro; DGH; Company annual reports; Expert interviews; McKinsey analysis



LARGE DEMAND BUT SENSITIVE TO PRICE

Petronet Analysis-2013

Petronet Analysis 2013

Gas demand and supply, 2016

mmscmd, at customer gate prices



Sectors with demand

- Industries
- CNG transport

- Refineries
- Industries
- New fertilizer plants

- Peaking power plants

- Base load power
- Existing fertiliser plants

- Imports
- Domestic supplies

Prices at Crude of \$ 110/Bbl

WAY FORWARD

- Development of regional LNG/GAS index to cater growing demand of emerging economies/ Indian sub continent
- Robust growth in Infrastructure development
 - LNG Terminal
 - Gas Storage
 - Gas Pipelines on national & transnational basis
- Participation by global players in India's infrastructure development
- Government support & creation of Sovereign fund to handle stiff global competition enabling acquisition of overseas upstream assets in stiff competitive environment
- Consumers mindset in pricing, supply security needs to undergo change : Market driven

PETRONET TERMINALS

DAHEJ TERMINAL

- Commencement of Operations in 2004
- Capacity (mmtpa) : 5.0 → 10.0 → 15.0
- Truck Loading facility can handle 2500 loadings/ yr.
- LNG Cargoes unloaded: 1000+ cargoes

KOCHI TERMINAL

- Set up second LNG Terminal of 5.0 mmtpa capacity at Kochi, State of Kerala.
- Tied up 1.44 mmtpa LNG from Exxon Mobil's Gorgon Project
- Plant Mechanically completed, scheduled commissioning mid 2013

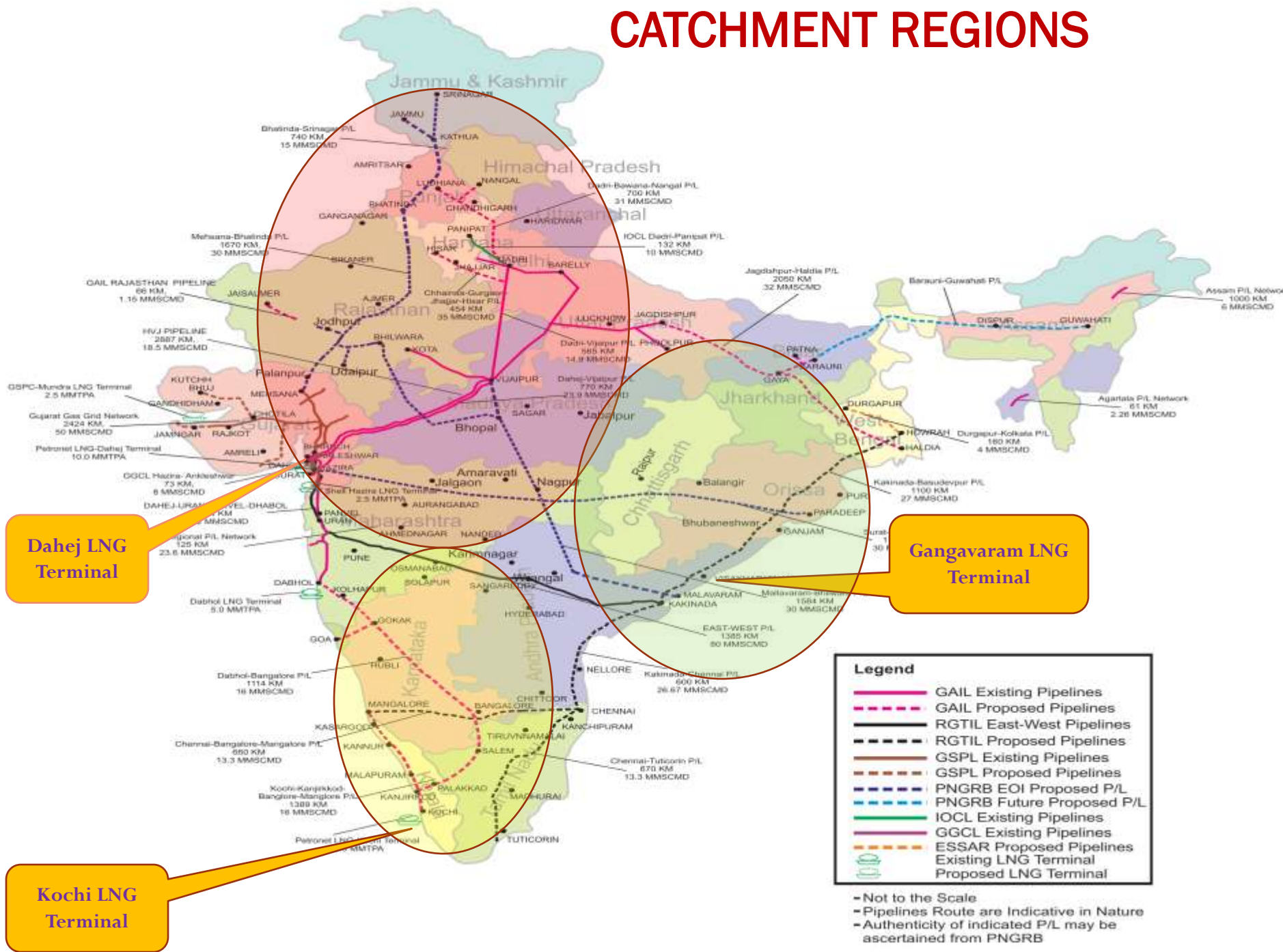
GANGAVARAM

- Pre Project activities started for the 3rd Terminal of 5 mmtpa capacity at Gangavaram, State of Andhra Pradesh with estimated investment of US\$1 Billion.

DAHEJ TERMINAL – FACILITIES



CATCHMENT REGIONS



Dahej LNG Terminal

Gangavaram LNG Terminal

Kochi LNG Terminal

Legend

- GAIL Existing Pipelines
- GAIL Proposed Pipelines
- RGITL East-West Pipelines
- RGITL Proposed Pipelines
- GSPL Existing Pipelines
- GSPL Proposed Pipelines
- PNGRB EOI Proposed P/L
- PNGRB Future Proposed P/L
- IOCL Existing Pipelines
- GGCL Existing Pipelines
- ESSAR Proposed Pipelines
- Existing LNG Terminal
- Proposed LNG Terminal

- Not to the Scale
 - Pipelines Route are Indicative in Nature
 - Authenticity of indicated P/L may be ascertained from PNGRB

THANK YOU



KOCHI LNG TERMINAL