Presentation on

“Supply Chain Management of LPG in India”

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Indian Oil Corporation





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LPG SUPPLY CHAIN

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Bulk Movement

Packed Cylinder Movement

LPG Distribution Network

LPG Distribution Network

22 Refineries (9.8 MMTPA)	10 Gas Fractionators (2.1 MMTPA)	14 Import Terminals (12.1 MMTPA)

	IOCL	BPCL	HPCL
191 Bottling Plant	91	51	47
22654 Distributors	9911	4868	4690
256.7 Million Customer	124.3	65.2	67.3

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LPG growth in India……..

- Year 2016 is declared as Year of LPG by Government of India.
- Till 01.01.2016, the LPG penetration was only 56% of the population of the country .
- There was a total of 148.6 Million customers.
- As on 01.01.2019, the LPG penetration is 89% of population .
- Today there is 256.7 Million customers.
- Key growth drivers are
  - Govt thrust to provide clean cooking fuel.
  - Ease of availability.
  - Increase in awareness level .

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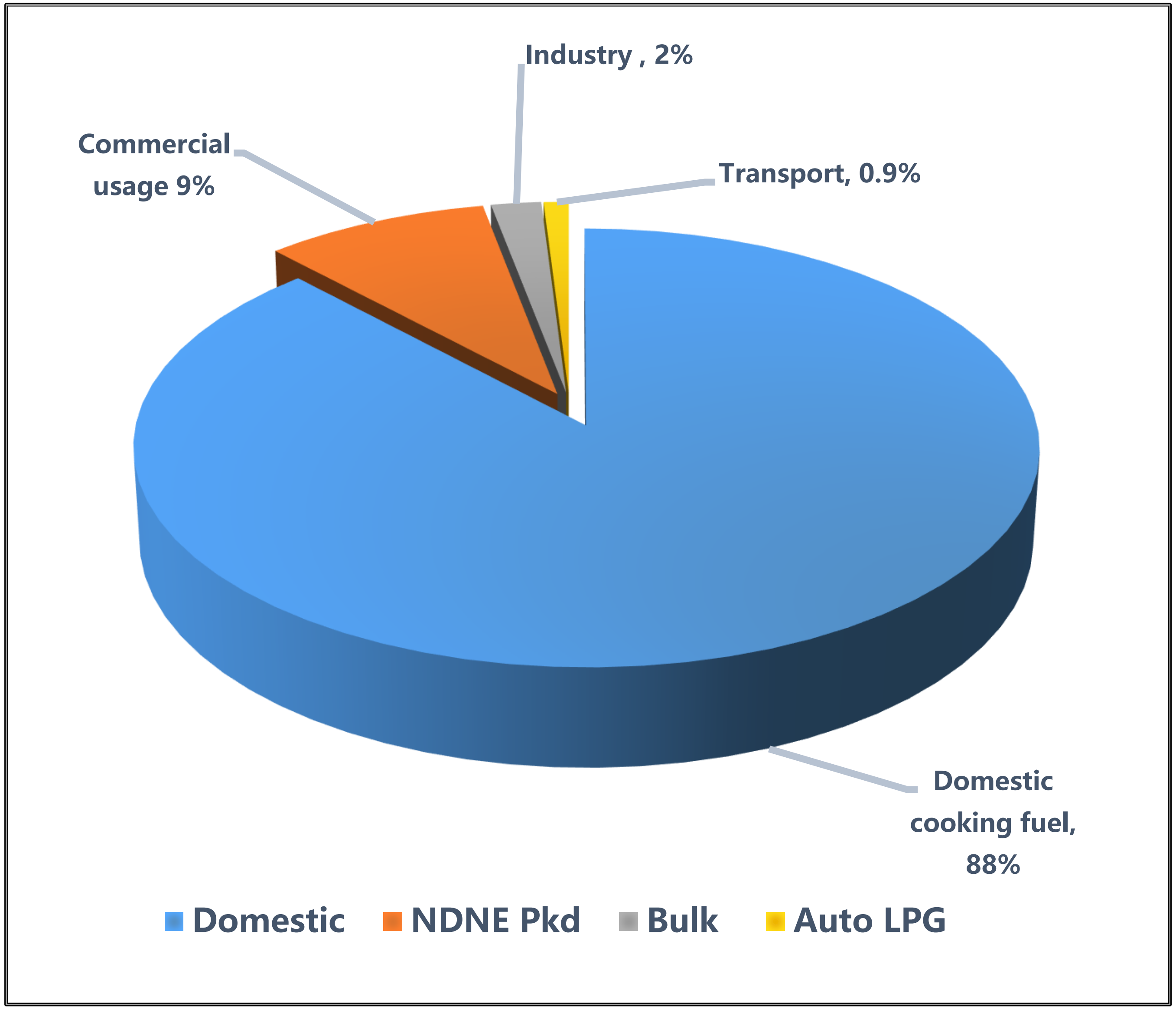
A Few Facts ……..

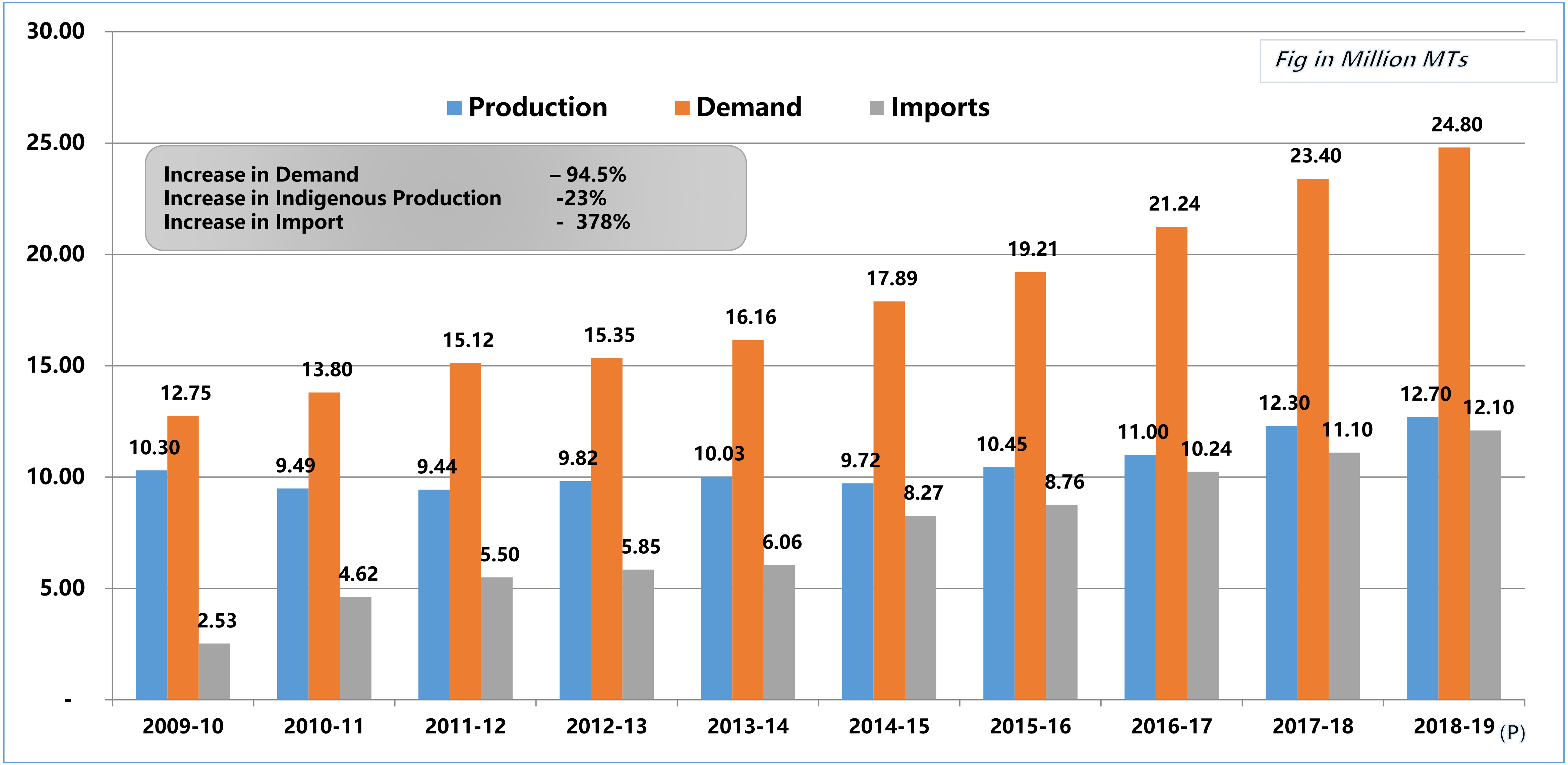
- ✓ About 4.5 Million cylinders bottled and delivered to customers house everyday
- ✓ 256.7 Million customers serviced by 22654 distributors across the country in 9088 markets
- ✓ 28 Million connections released during 2017-18 including 1.6 Crores PMUY connections
- ✓ 23.02 MMT LPG consumed during 2017-18 which included 20.3 MMT in domestic sector (88%)
- ✓ LPG constitutes about 11% of the Petroleum Product consumption in 2017-18

Segments of Indian LPG Industry – 2018-19 (p)

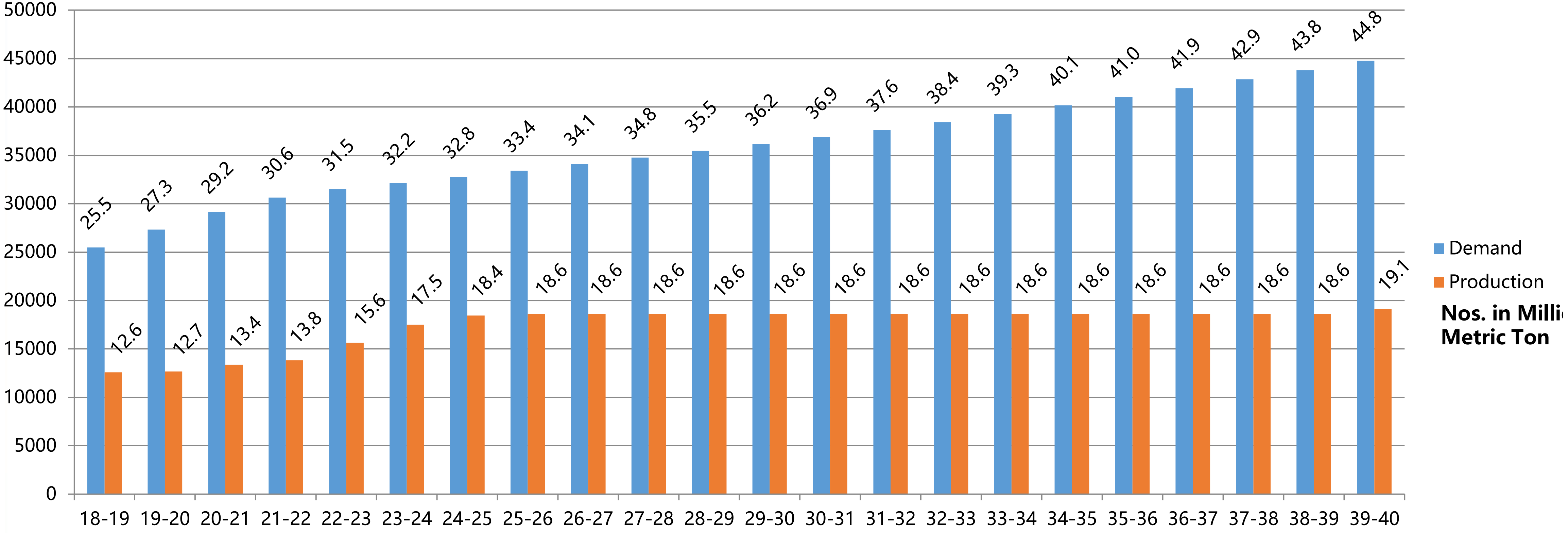
- **Domestic cooking fuel**
  - ✓ 14.2 Kg & 5 Kg Cylinders, home delivered through distributors.
- **Commercial usage**
- 5 Kg, 19 Kg, 35 Kg, 47.5 Kg & 425 Kg delivered supply through distributors.
- **Industrial**
  - ✓ Delivered to Storage Tanks of Customers in bulk Tank Trucks.
- **Transport (Auto LPG)**
  - ✓ Through Retail Outlets Standalone or along with Gasoline/Diesel.



LPG Supply Demand – Last 10 Years



LPG *Demand* and *Production* – Projected

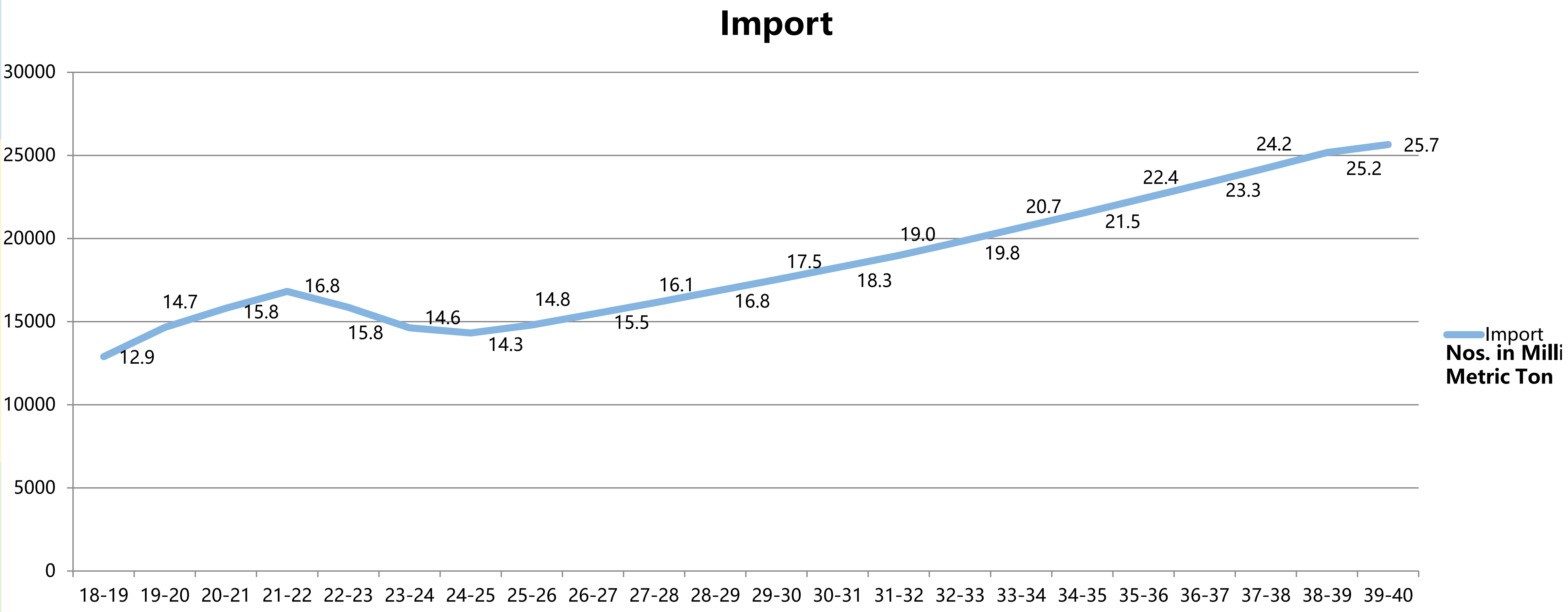


2018-19 to 2023-24
Demand increase projected by 26%
Production increase projected by 39%

2024-25 to 2039-40
Demand increase projected by 37%
Production increase projected by 3.5%

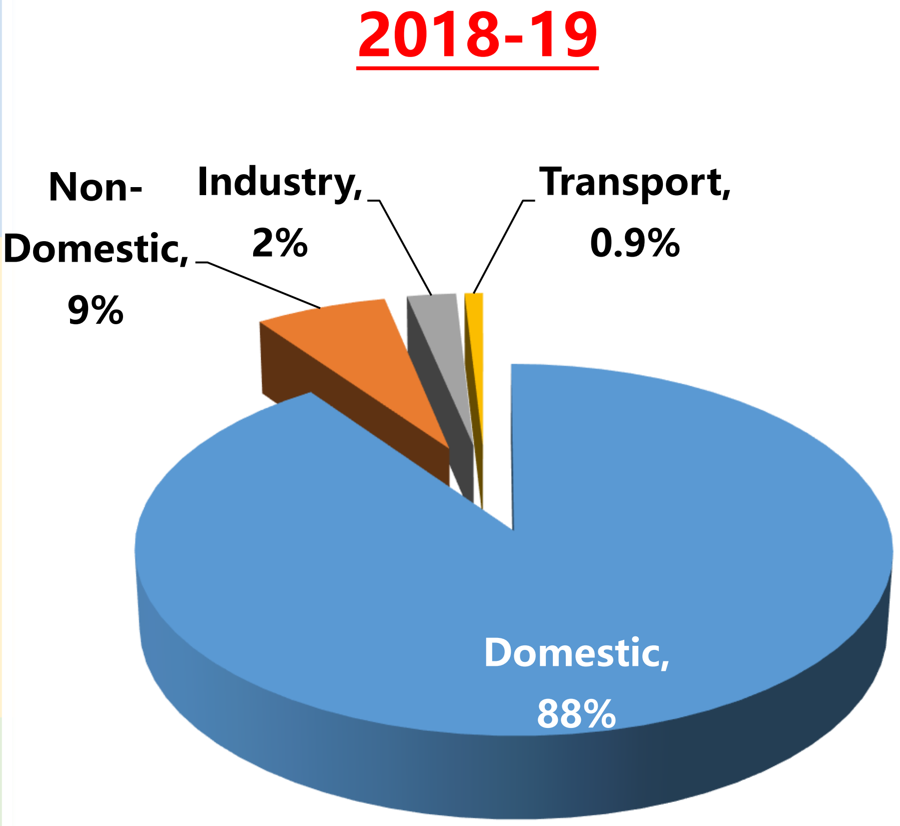
Almost 50% demand to be met by Imports

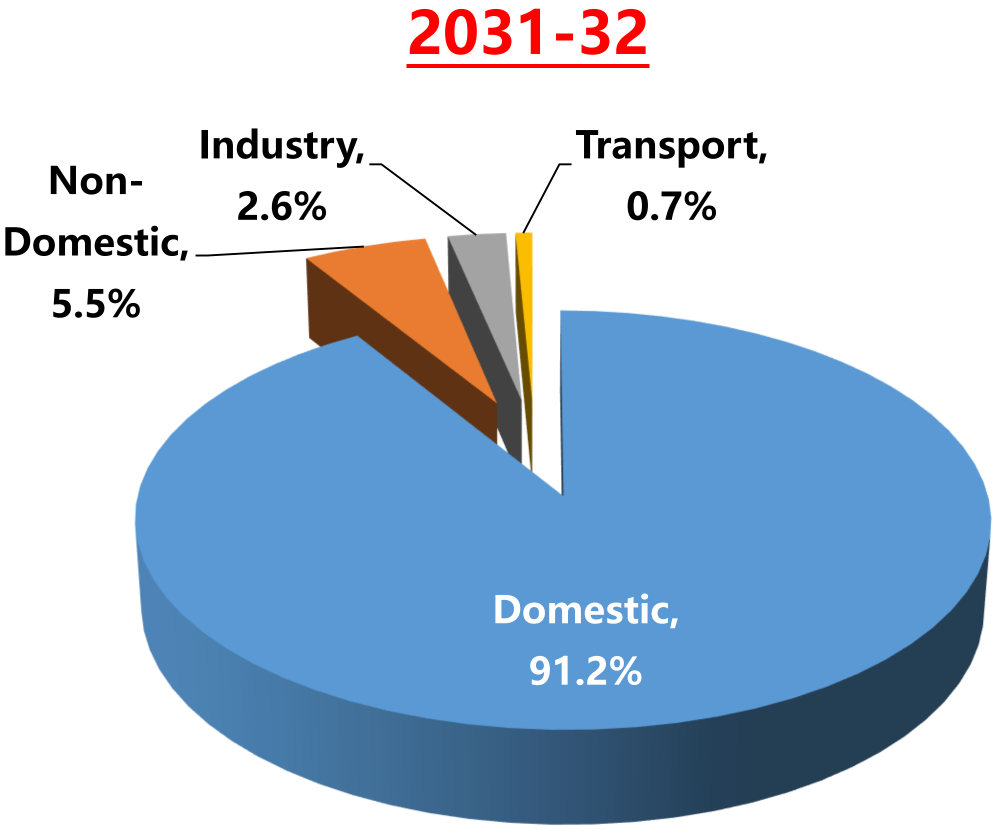
LPG Import - Projected



2018-19 to 2039-40
Import projected to increase by 98%

Segments of Indian LPG Industry





Segment-wise Constant Growth

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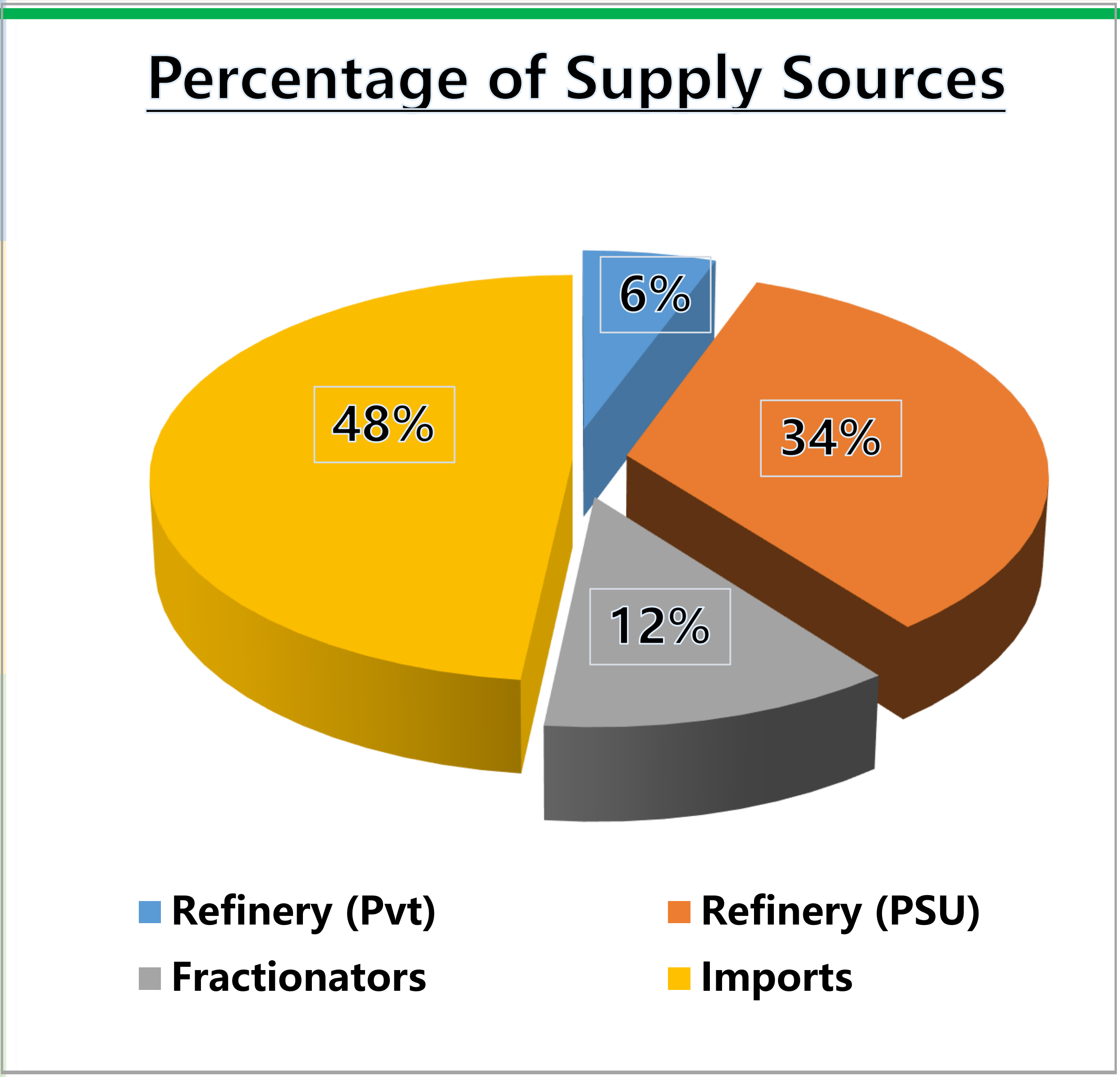
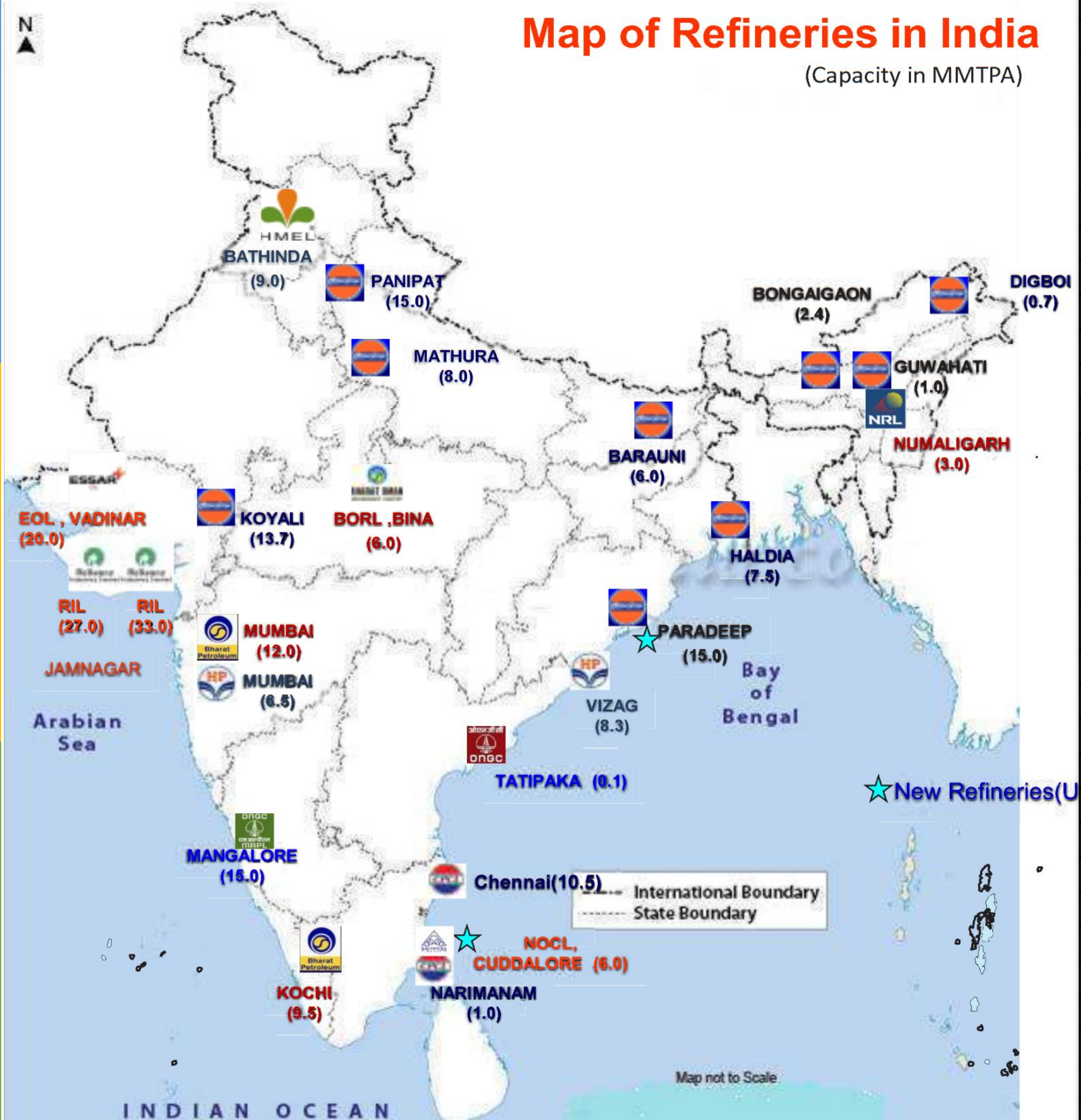
Bulk LPG Sources



- Indigenous Supplies from 23 Refineries & 11 Gas Fractionators
- Propane, Butane (50:50) & LPG Mix from Imports received at 11 Import Locations
- Road/Rail/Pipelines modes for moving bulk LPG from sources to Plants
- 747 TMT imported by Private Marketers in 2017-18 (6.4% of OMC imports)

Map of Refineries in India

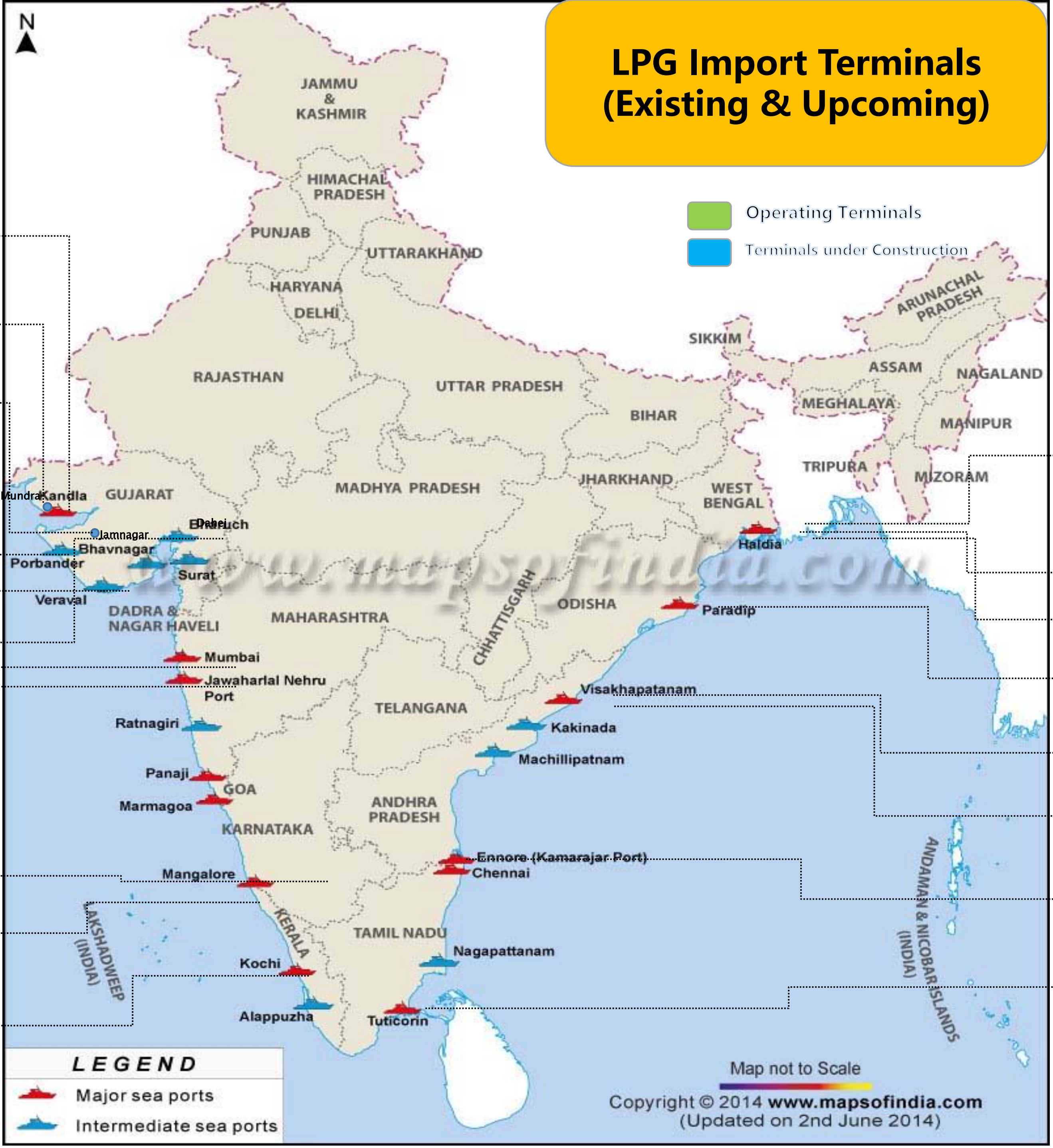
(Capacity in MMTPA)



SN	Oil Company	Location	Capacity
1	IOC	Barauni	0.37
2		Koyali	0.44
3		Haldia	0.26
4		Mathura	0.38
5		Panipat	0.72
6		Guwahati	0.05
7		Digboi	0..02
8		Bongaigaon	0.06
9		Paradip	0.9
			3.3
10	HPC	Mumbai	0.38
11		Vizag	0.40
12		Bhatinda	0.88
			1.66
13	BPC	Mumbai	0.45
14		Kochi	0.99
15		Bina	0.22
			1.66
16	CPCL(IOC)	Manali	0.34
17		Cadalur	0.01
			0.35
18	NRL	Numaligarh	0.05
	ONGC	Tatipaka	0.1
19		Mangalore	0.9
			1.05
	PSU Refineries		7.3
20	RIL	Jamnagar (DTA)	0.5
21		Jamnagar (SEZ)	1
			1.5
22	NEL	Vadinar	1.0
	Private Refineries		2.5
	All India		9.8

LPG Import Terminals (Existing & Upcoming)

Exiting Capacity – 10.70 MMTPA
Proposed Capacity - 4.96 MMTPA
Total Capacity - 15.66 MMTPA
(by 2020-21



LPG Supply Demand – Import Trend

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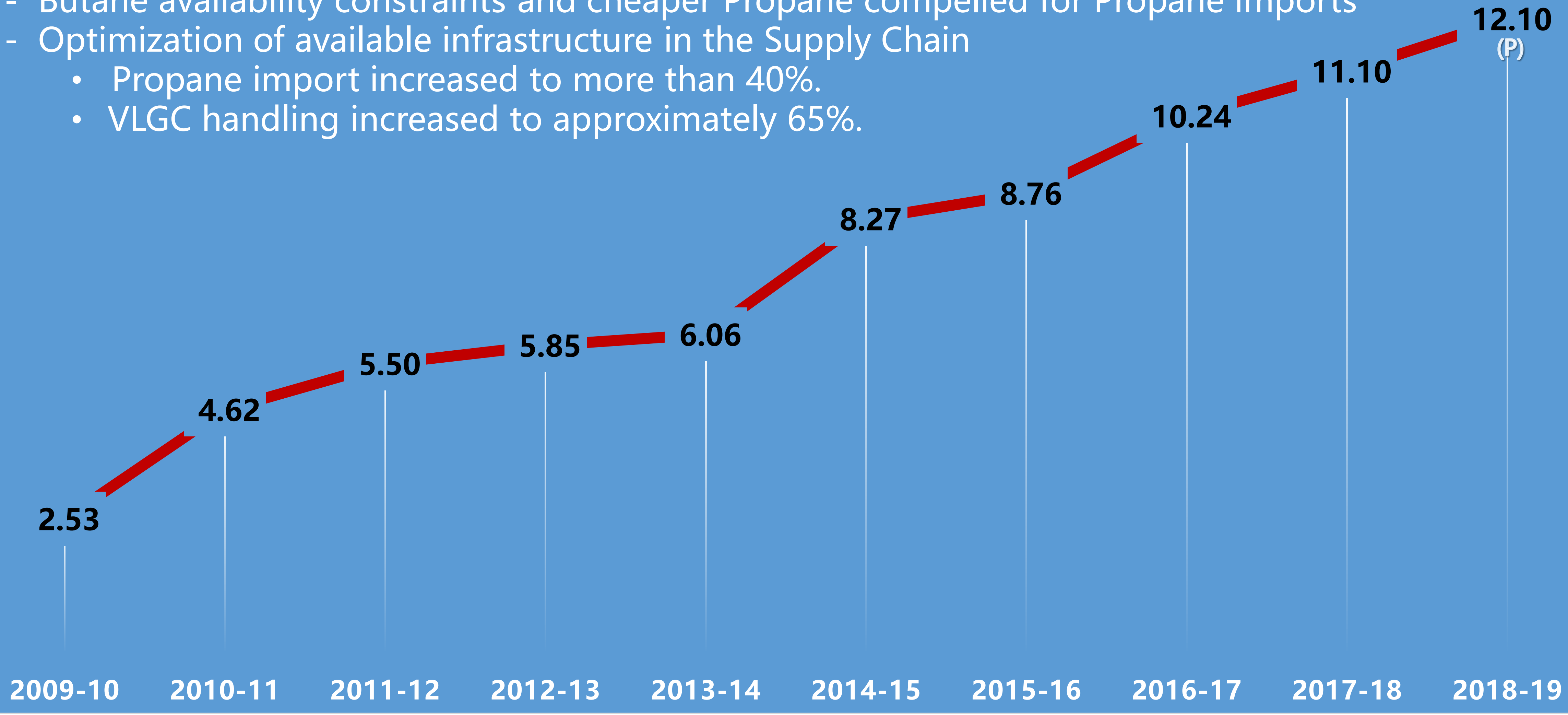
- Only Butane imports till 2004-05
- Butane availability constraints and cheaper Propane compelled for Propane imports
- Optimization of available infrastructure in the Supply Chain
    - Propane import increased to more than 40%.
    - VLGC handling increased to approximately 65%.



LPG Import Capacity

All Nos. in MMTPA

Year	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**
Import requirement	12.1	12.9	14.6	15.8	16.8	15.9	14.6	14.3	14.8	15.5
Import capacity										
West: Total	4.7	5.1	7.44	8.94	8.94	8.94	8.94	8.94	8.94	8.94
South: Total	4.8	4.8	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
East: Total	2.8	3.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Grand Total	**12.3**	**13.7**	**18.64**	**20.14**	**20.14**	**20.14**	**20.14**	**20.14**	**20.14**	**20.14**
Import Capacity Surplus	**0.0**	**0.80**	**4.04**	**4.34**	**3.34**	**4.24**	**5.54**	**5.84**	**5.34**	**4.64**

Adequate LPG Import Capacity

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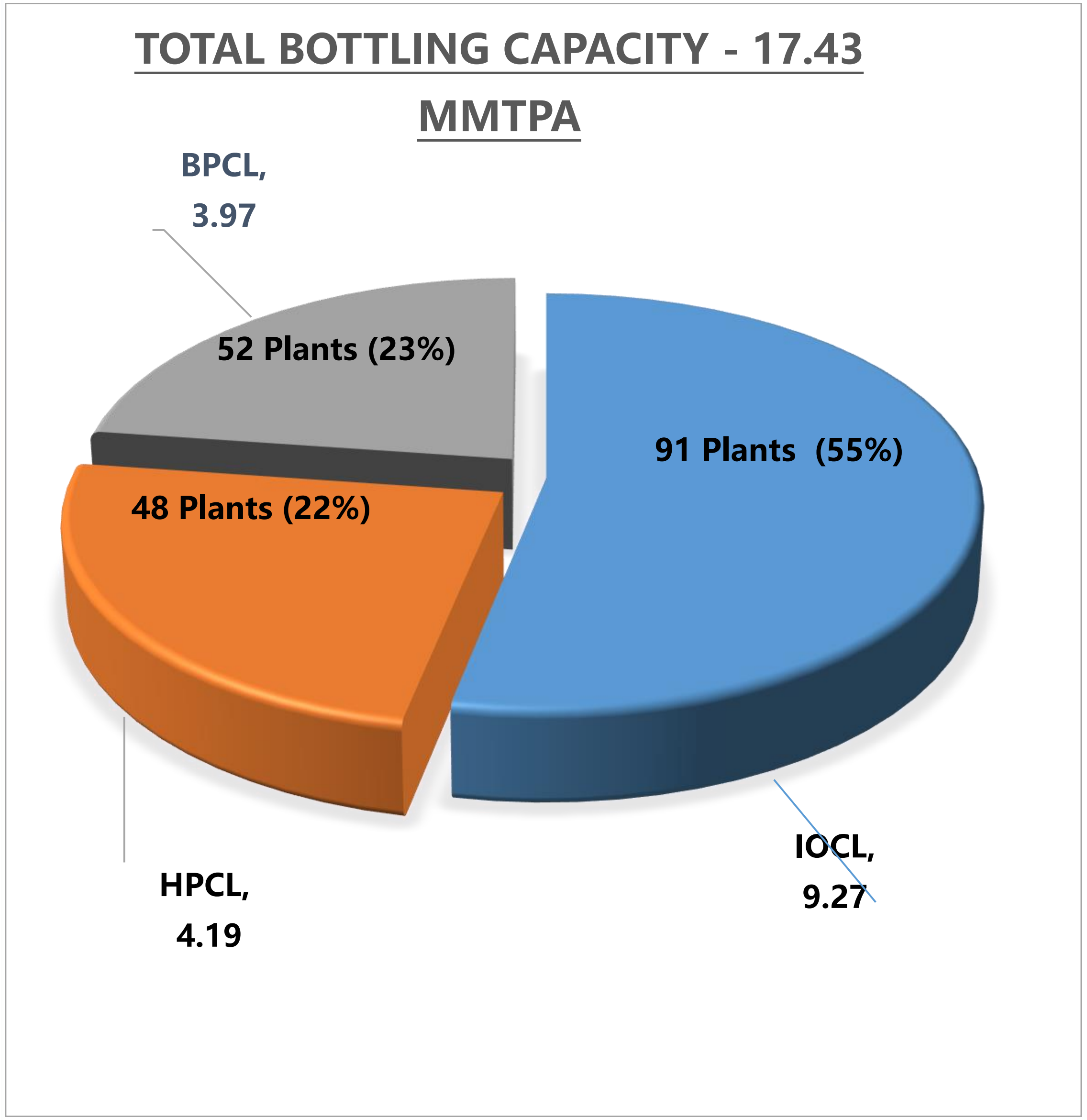
Bottling Infrastructure

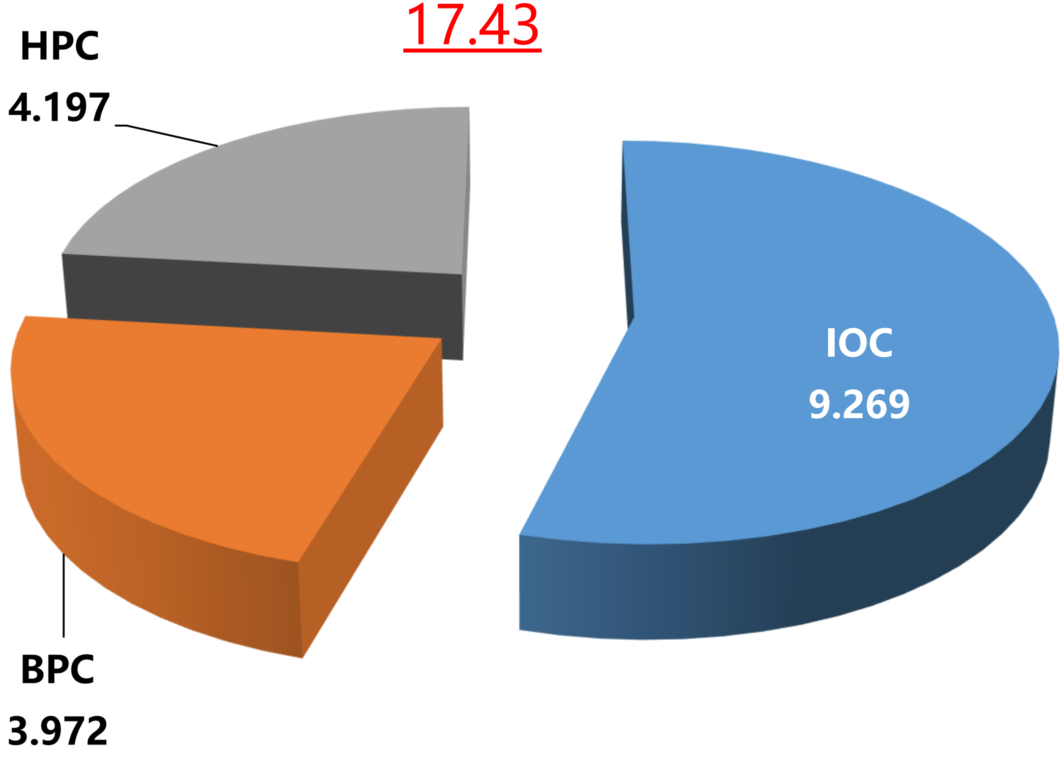


- Bottling Plants planned and constructed nearer to demand centres & on logistic considerations.
- Excess capacity planned in the initial stage itself & cap. augmentation as per market demand / growth.
- Packed assistance from other PSU OMCs and private Bottlers on economic considerations.
- 2.8 MMTPA bottling capacity under construction by OMCs and PMs to come up by 2019-29.
- Bottling capacity of about 950 TMTPA (4% of OMC) by Private Marketers (PM).

LPG Bottling Infrastructure

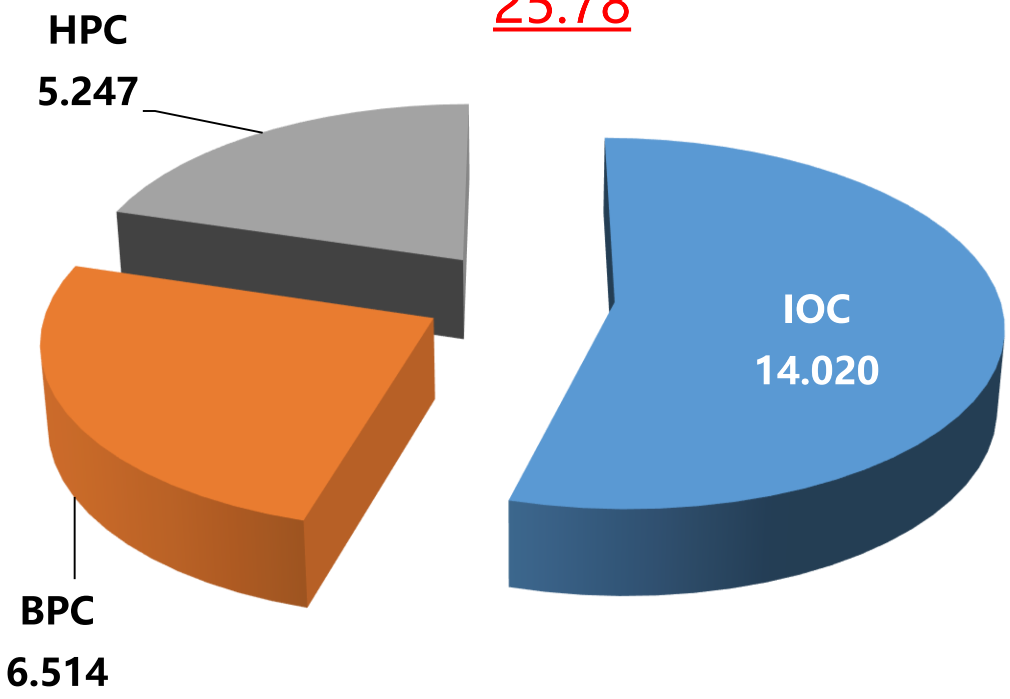
As on 01.01.2019

Bottling Capacity in MMTPA
17.43



As on 01.04.2021

Bottling Capacity in MMTPA
25.78



54% Bottling Capacity Addition

Storage Infrastructure

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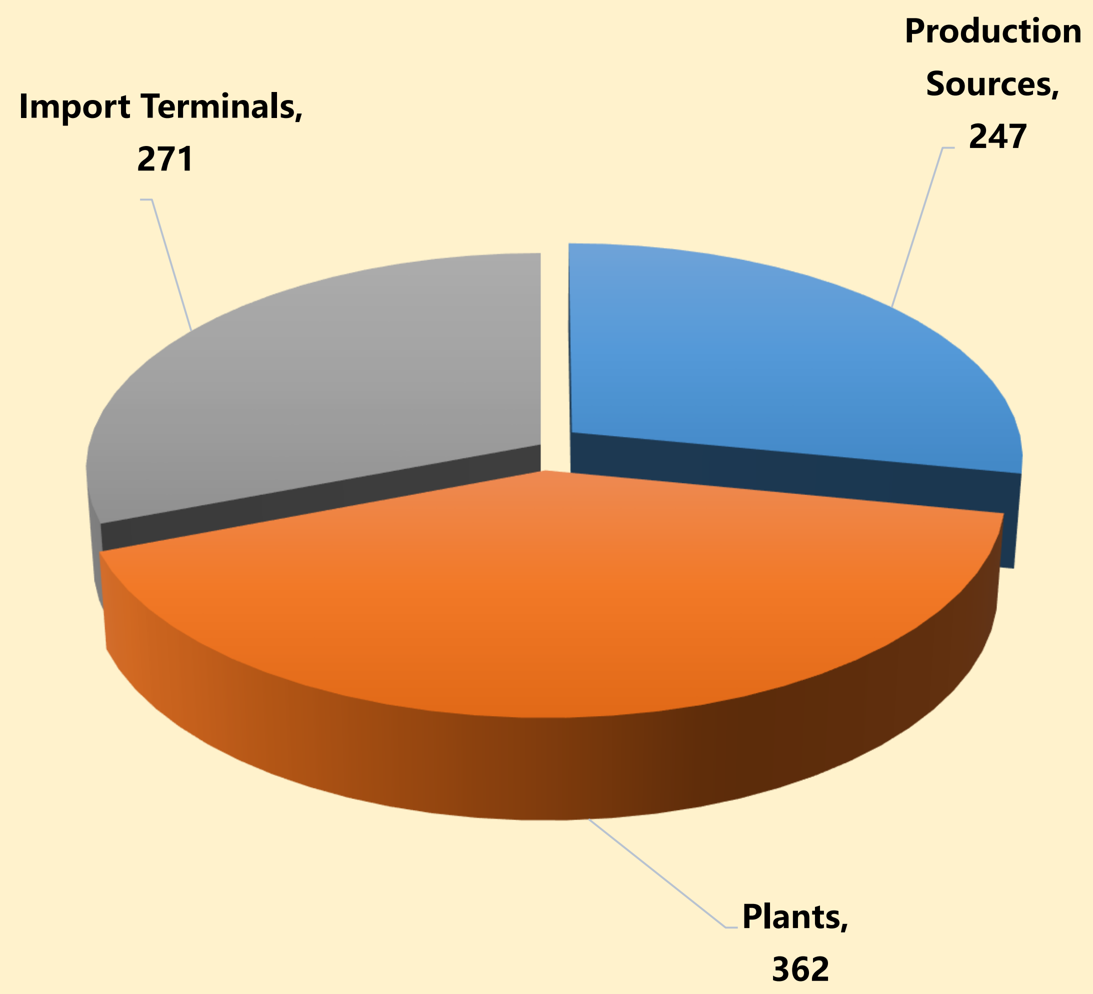
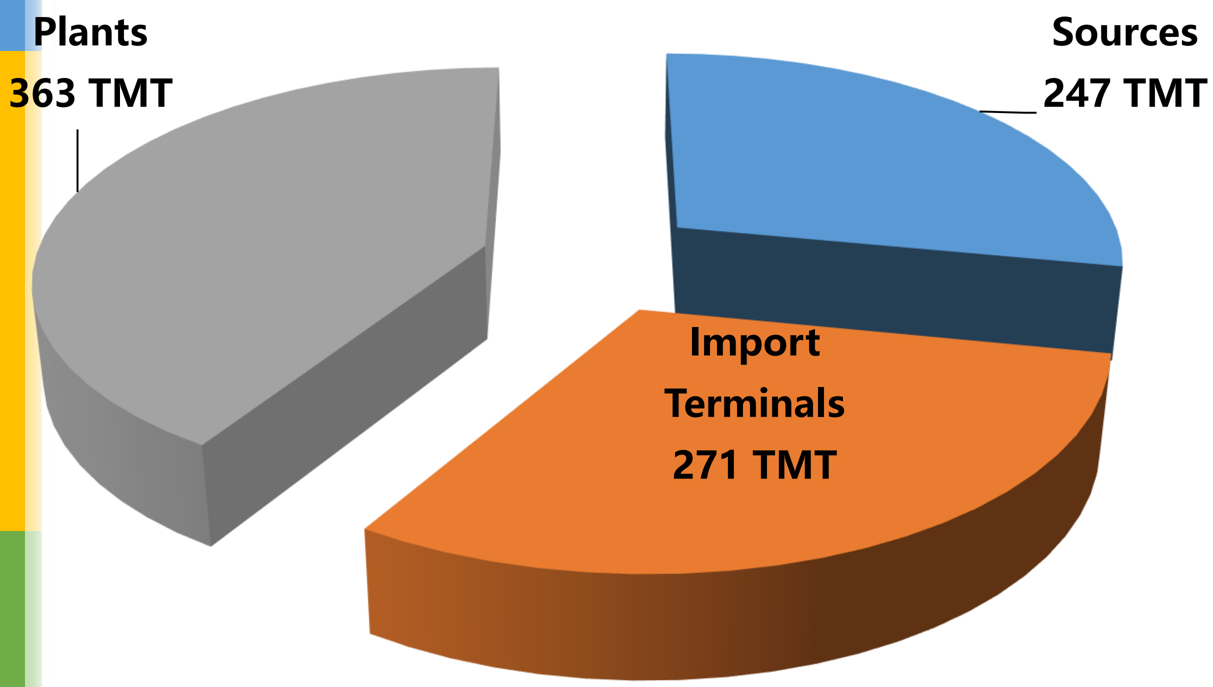
Total LPG Tankage is 880 TMT



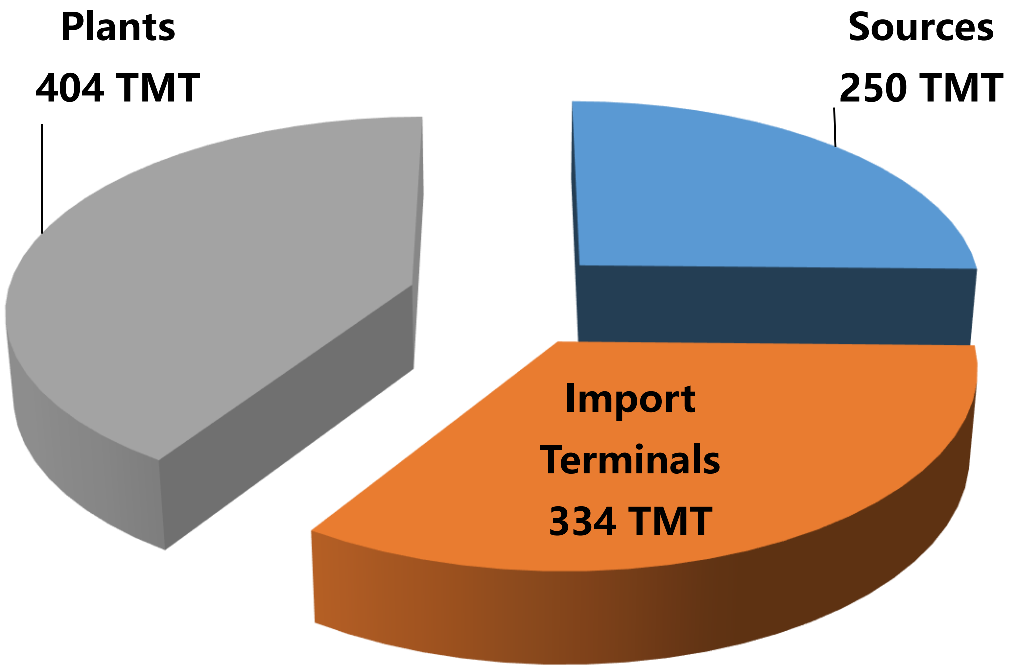
- Average bottling of 55 TMT/day.
- Average of 16 days coverage from Total Tankage
- Average of 7 days coverage at Bottling Plants.
- About 33 TMT Augmentation undertaken at Bottling Plants.

LPG Storage Infrastructure

LPG Tankage as on 01.01.2019
880 TMT



LPG Tankage as on 01.04.2021
980 TMT



Average 7 days cover at Bottling Plants & 7 days import tankage at import terminals

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Transportation & Logistics

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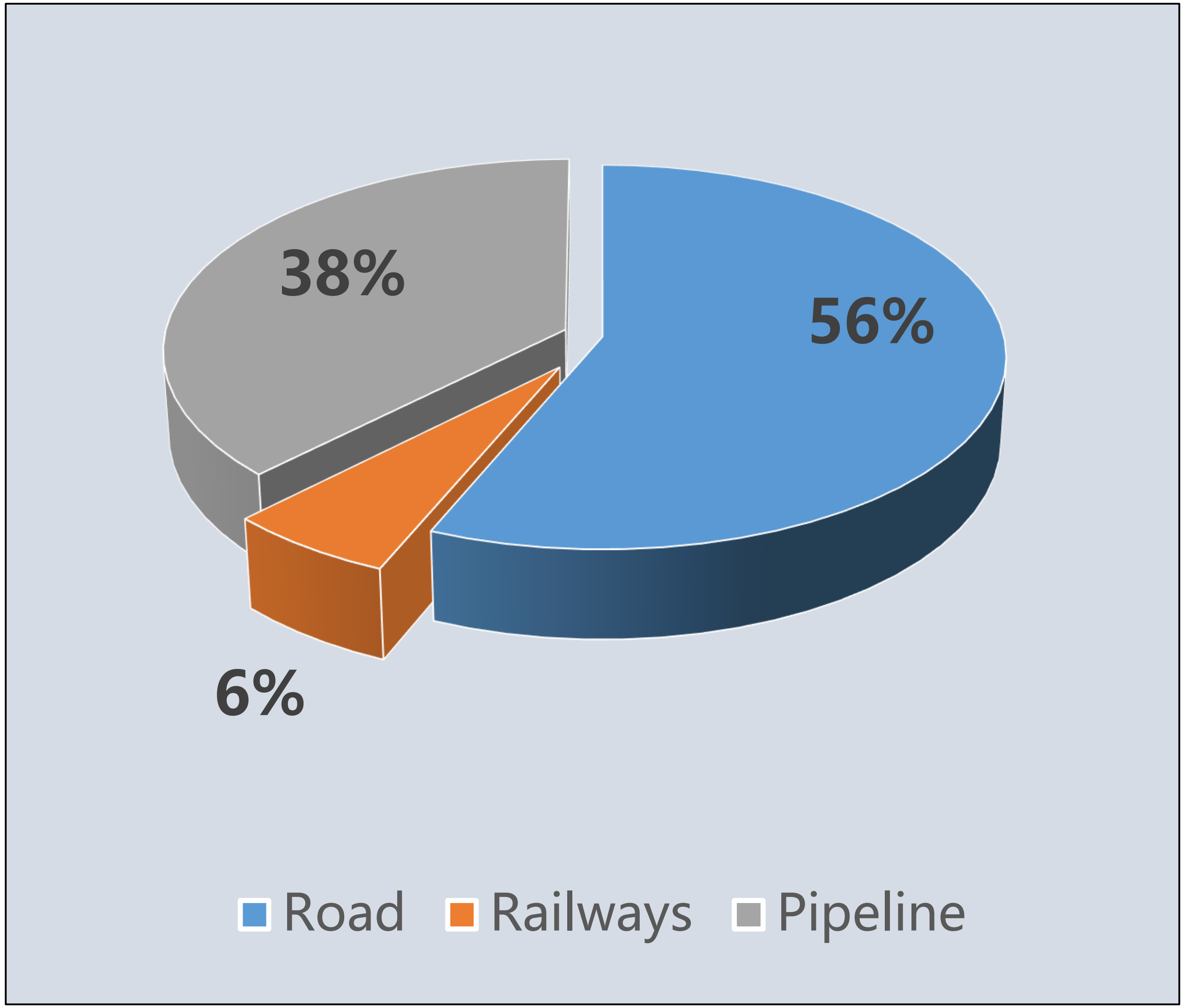
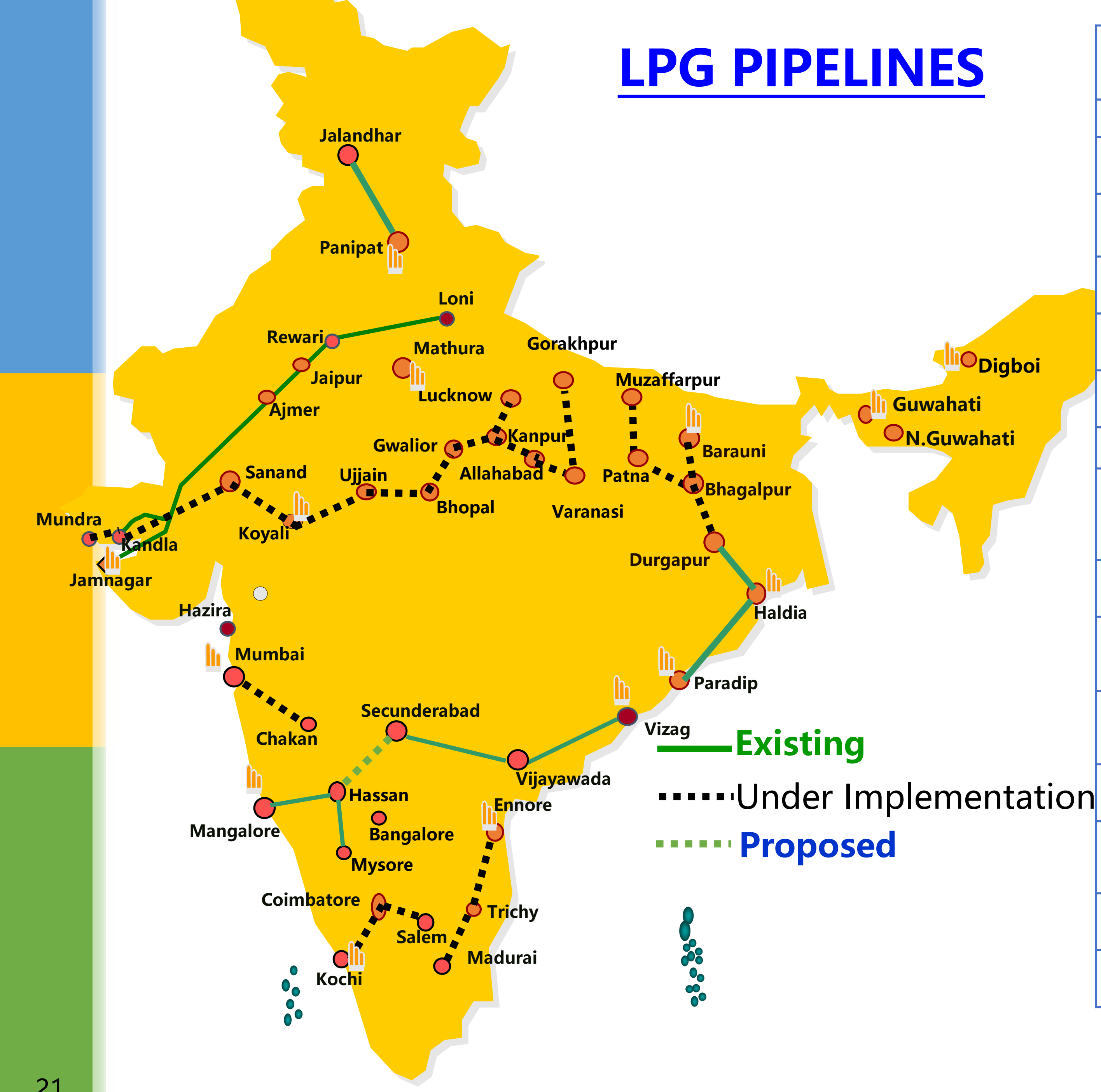
Modes of Transportation of Bulk LPG (2017-18)



- 14.2 MMT moved through trucks of different capacities (18MT / 7MT / 21MT / 12 MT
- 1.5 MMT transported through Railway wagons.
- 9.5 MMT transported through pipelines of about 2000 KM length.
- New pipelines planned to increase the pipeline utilization to 60% by 2021-22.
- > 20000 trucks of different capacities (300/306/450/525) running on contract for packed LPG movement.

LPG PIPELINES



SN	Pipelines	OMC	Length (KMs)	Rated Capacity (MMTPA)
Existing Pipelines				
1	Jamnagar – Loni	GAIL	1201	2.50
2	Visakapatnam – Secunderabad	GAIL	589	1.13
3	Panipat – Jallundhar	IOC	273	0.70
4	Mangalore-Hassan – Mysore	HPC	356	3.10
5	Paradip-Haldia-Durgapur	IOC	710	1.35
Under Implementation Pipelines :				
1	Durgapur – Barauni – Patna – Muzzafarpur	IOC	568	2.00
2	Uran – Chakan	HPC	168	1.00
3	Kochi – Coimbatore – Erode – Salem	IOC & BPC JV	458	1.53
4	Kandla – Gorakhpur	IOC/HPC /BPC JV	2400	6.00
Proposed Pipelines :				
5	Mundra – Kandla	IOC/HPC /BPC JV	90	4.00
6	Hassan - Cherlapally	HPC	350	1.50
7	Ennore – Trichy – Madurai	IOC	615	0.90

Contents

- Demand & Supply
- Sourcing of Product
- Storage & Bottling
- Transportation & Logistics
- **Secondary Distribution Network**
- Future Plans
- Issues and Constraints

LPG secondary Distribution

- **Packed Cylinders – Domestic & Non-Domestic**
  - ✓ Delivered through Distributors appointed by OMCs
  - ✓ LPG retailers for exclusive non-domestic cylinders
  - ✓ Business associates
- **Bulk LPG to Commercial & Industrial Customers**
  - ✓ Directly by the OMCs or through Business Associates.
- **Automotive LPG**
  - ✓ Through existing Retail outlets

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Future Plans

Major Ongoing Projects:

- ✓ Up-gradation of Refineries for improving yield of LPG
- ✓ Greenfield LPG Import Facilities at Kochi (0.6 MMTPA), Paradip (2.0 MMTPA), Haldia (2.0 MMTPA) & Mundra (1.36 MMTPA)
- ✓ Brownfield expansion of Kandla LPG Import facilities from 0.6 to 2.5 MMTPA
- ✓ >1500 TMTPA new Bottling capacity added at 25 locations – ready by 2019-20
- ✓ Close to 33000 MT additional storage capacity coming up in 21 bottling plants
- ✓ 2000 KM Central India LPG Pipeline Plan from Kandla / Mundra to Gorakhpur
- ✓ Study in Progress for Feasibility of Strategic Storage under PPP Model for maintaining at least 15 Day's LPG Cover on Industry basis.

Contents

- Demand & Supply
- Sourcing of Product
- Storage & Bottling
- Transportation & Logistics
- Distribution Networks
- Future Plans
- **Issues and Constraints**

Issues & Constraints

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- ✓ Actual Demand vary with Forecast
- ✓ Feast and Famine situations at times
  - Unplanned shutdowns at sources
  - Surplus product availability from Refineries
  - Port congestion at Import locations
  - Disruptions in road movements due to strike, bandh, etc.
- ✓ Difficulty in last mile connectivity
  - Hilly and Far Flung areas.
  - Islands – Cost of delivery
- ✓ Rapid growth in demand – Rural penetration through Govt. initiatives
- ✓ Long gestation period for LPG infrastructure development

Opportunities for the World

- Export of Butane, Propane and LPG-Mix
- Construction of Import Terminal
- LPG Terminalling and Storage
- Collaboration with OMCs / Port Authorities for Development of LPG Jetty
- Development of LPG Pipelines and other transport networks

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Thank You