SASI CHEMMENKOTTIL
CEO & EXECUTIVE DIRECTOR, LPG DIVISION
TOTAL OIL INDIA P LTD

LPG possibilities in India……
TOTAL IN BRIEF

Exploration & production

Trading & Shipping

Gas Renewables & Power

Refining & Chemicals

Marketing & Services
Total is the world’s 4th-ranked international oil and gas company and a global leader in low-carbon energy.

WITH OPERATIONS IN MORE THAN 130 COUNTRIES we have 98,277 employees who are COMMITTED TO BETTER ENERGY

* Based on market capitalization in U.S. dollars at December 31, 2017
OUR CHALLENGES FOR THE NEXT 20 YEARS

Meet the energy needs of a growing global population

Protect the planet and limit global warming

Adapt to new consumer practices and changing customer expectations

Helping provide tangible solutions to these challenges means supplying affordable, reliable, clean energy.
OUR AMBITION: TO BECOME THE RESPONSIBLE ENERGY MAJOR

Produce, process and supply affordable energy while meeting the highest HSE standards

Supply a responsible energy mix consistent with the IEA’s 2°C scenario

Introduce solutions that promote responsible energy use by our customers

Be recognized for our convenient, quality local service

This is what it means to be Committed to Better Energy
Total Oil India At a Glance

- **Largest private sector importer of LPG**
  - State-of-the-art LPG import terminal setup in 1996 in Mangalore
  - TOIPL along with SALPG (JV with HPCL) handles 17% of import volume in India

- **Commenced operations in 1998**
  - Dominant player in non-subsidized LPG (No:2 by volume in Auto LPG)
  - Developed a reputation as being an innovative company in LPG

- **Exponential growth in business**
  - Acquired Mobil Gas business in 2002 and successfully integrated
  - First private sector company to start marketing Auto LPG in India
  - Consistently innovated new solutions within LPG such as Quantaz

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Import Terminal</td>
</tr>
<tr>
<td>12</td>
<td>Bottling Plants</td>
</tr>
<tr>
<td>69</td>
<td>ALDS Stations</td>
</tr>
<tr>
<td>&gt;100</td>
<td>Dedicated customer facilities</td>
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</table>
Total SA and HPCL JV – ‘South Asia LPG’ – First & only LPG cavern

➢ 1st and only LPG Cavern Terminal in Asia
   • Largest single storage for LPG in the country
   • One of the deepest caverns in the world

➢ Incorporated: November 1999
   • Construction: 2004-2007
   • Commissioned: Jan 2008

➢ 50/50 JV
   • Business: Rendering LPG cavern services to state owned LPG marketing companies
   • Storage of 60,000 MT

Biggest single LPG storage – Safest storage for India
LPG has one of the **lowest** greenhouse gas emissions among fossil fuels – 50% less than coal – one of the biggest polluter.

LPG has the **highest** calorific value in comparison with its peer fuels like coal, petrol and diesel.

It burns **cleanly** and does not produce any soot, smoke or smell.

...and most of all it is versatile with multiple applications.

LPG consumption doubled in the last decade.
Yet - Our country’s relationship with LPG is one-dimensional…

<table>
<thead>
<tr>
<th>Sector/ Sub-Sector</th>
<th>2016-17</th>
<th>% mix</th>
<th>7-Yr CAGR</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Distribution</td>
<td>18,871</td>
<td>97</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Non-Domestic/Commercial</td>
<td>1,776</td>
<td>8</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Transport - Auto LPG</td>
<td>350*</td>
<td>2</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Transport - Railways</td>
<td>0</td>
<td>0</td>
<td>-2%</td>
<td></td>
</tr>
<tr>
<td>Power Generation</td>
<td>2</td>
<td>0</td>
<td>74%</td>
<td>Base is ~0</td>
</tr>
<tr>
<td>Agriculture Sector</td>
<td>8</td>
<td>0</td>
<td>22%</td>
<td>Base is ~2</td>
</tr>
<tr>
<td>Mining</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Bulk LPG - Chemicals</td>
<td>12</td>
<td>0</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Bulk LPG - Engineering</td>
<td>2</td>
<td>0</td>
<td>24%</td>
<td>Base is ~0</td>
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<tr>
<td>Bulk LPG - Electronics</td>
<td>4</td>
<td>0</td>
<td>-17%</td>
<td></td>
</tr>
<tr>
<td>Bulk LPG - Mechanical</td>
<td>13</td>
<td>0</td>
<td>-2%</td>
<td></td>
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<tr>
<td>Bulk LPG - Metallurgical</td>
<td>139</td>
<td>0</td>
<td>7%</td>
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<tr>
<td>Bulk LPG - Textiles</td>
<td>2</td>
<td>0</td>
<td>-3%</td>
<td></td>
</tr>
<tr>
<td>Bulk LPG - Other Consumer/ Industrial Goods</td>
<td>46</td>
<td>0</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Resellers/Retail</td>
<td>67</td>
<td>0</td>
<td>NA*</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous (Bulk)</td>
<td>67</td>
<td>1</td>
<td>-13%</td>
<td></td>
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<tr>
<td>Other Imports</td>
<td>358</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL CONSUMPTION (in thousand MT)</td>
<td>21,720</td>
<td>100</td>
<td></td>
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</tr>
</tbody>
</table>

Source: data.gov.in – Sector-wise consumption of LPG
*From updated source

There remain large pockets of demand which are unfulfilled, and un-incentivized at 0% – in a growing industrial economy?
2019 – 2040 Ahead at a Glance

- India, along with China is poised to be the single largest growth of energy demand in the next two decades. – BP Energy Outlook Report
- Commercial and Transport are poised to make up almost 80% of all energy demand by 2047
- Cooking is poised to only make up 3% of total energy demand by 2047.

Therefore, as domestic growth will taper off, are we as a country on track to really see the fruits of our efforts in converting to LPG??
Can India be a global leader in Innovating LPG Solutions across various sectors?

To reverse the stagnancy of the LPG sector mix, we will need to turn our focus towards diversifying our LPG end-use cases.

- The **focus** will have to be on innovation in new sectors.

- Natural Gas and LPG are **no longer** considered ‘bridge fuels’ especially with the success of LPG penetration in rural markets.

The question becomes – what can we invest in?
THE FUTURE OF LPG

If we can replace wood/charcoal with LPG

Then why not extend its usage even more?

Power Generation

Replacing Diesel

Internet of Things
LPG APPLICATIONS IN INDUSTRIES

Metallurgy Industries

Heat Treatment for Metals: Melt metals/ alloys at 900-1200 °C (degrees Celsius)

Metal Surface Treatment: Prevent Oxidation: Painting, Plastic coating, Enameling...

Galvanization: Immersing Steel parts on Molten Zinc to form an alloy (450 °C)

Oxy Fuel Cutting: Fuel with pressured Oxygen used to cut thick metals

Minerals Processing

Plaster making: Heat is used for Baking Gypsum & Drying Plaster block/ Plaster boards

Glass & Crystal Glass: Melting (1500 °C), Processing (1200 °C), Heat treatment (600°C), recycling
CERAMIC INDUSTRIES

Tiles, Slabs & Brickworks: Energy is used for drying, Firing & Enameling (Tiles)

Potteries: The clay pots are dried and fired at different temperature basis clay used

TEXTILE INDUSTRIES

Textile Manufacturing: washing, bleaching, Thread gassing, singeing, ironing…

Tanneries: Hot water for tanning and Drying for dehydration of Skin

PAPER INDUSTRY

Paper Card board: Sheets are dried on hot metallic rollers, hot water bath used for de-inking

Printing: INK Drying for fast depositing & enhanced throughput, Treatment of VOCs
**Chemical Industries**

- Pharmaceutical
- Rubber Industry

**Chemicals:** Major Chemical industries are consumers of steam generators

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**Agriculture**

- **Poultry Farming:** Ambient air Temperature has huge impact of growth of poultry
- **Green Houses:** used for CO2 production and heating water & Air to maintain temperature
- **Drying Cereals:** Removing water content from Cereals by drying
- **Drying Wood:** A drying needs a temperature of 60 to 90 °C for days to reduce humidity
LPG APPLICATIONS IN FOOD INDUSTRIES

Food Industries

Dry Fruits: removing water vapor content from fruits/vegetables

Making Drinks: washing & rinsing bottles, sterilization, distillation & brewing

Meat Curing & salting: Dehydrating fresh meat for food preservation

Bakeries, Biscuit & Cracker factories: pre-baking, Baking, toasting in Ovens

Canning & bottling: Sterilization of Packaged food for long shelf life

Dairy & Cheese Making: Sterilization, Pasteurization of milk & cream, Atomizing
CHALLENGES

Safety in Transportation

Huge cost of conversion to LPG

Finding right technology

Price Variations

Competition from CNG/PNG

Educating Potential Customers
What can we do together

At least few of these …… if not all

- Tighten environmental norms – no diesel / no coal please
- Developing “Blue ocean market” instead of fighting for the same pie
- Industry cooperation & collaboration …… joint research for technology???
- WLPGA support????
- Tax concessions…………… not a bad idea
- Subsidizing conversion from environmental cess?
- Any other innovative way of funding????

Time is running short …… the clock is ticking
Our generation is the first one to face consequences of Global Warming,
&
Ours will also be the last generation who could do something about it.

Let’s act before it’s too late!

Thank You!