LPG Demand Drivers for the Next Decade

January 2019

Panelists:
Martin Ackermann – BW LPG
Rob Donaldson – Targa Resources
Markus Dreier – UGI International
Bram Graber – SHV Energy
D Rajkumar – BPCL

Dr. Walt Hart, Vice President, NGLs
+1 832 679 7240
Walt.Hart@ihsmarkit.com
LPG Demand Drivers for the Next Decade

With US Shale Gas being a key disruptor of the decade, increased supply of LPG has been made available to the global markets, increasing product competitiveness. This is encouraging newer applications of the product, both on the wholesale and retail chain - from petrochemicals to usage as a marine bunker fuel.

This panel discusses new demand drivers.
With US Shale Gas being a key disruptor of the decade…

Global LPG production by major source

Source: IHS Markit
Increased supply of LPG has been made available to the global markets, increasing product competitiveness...

Total LPG exports by selected major exporters

Source: IHS Markit

© 2017 IHS Markit
This is encouraging newer applications of the product, both on the wholesale and retail chain

- **Traditional end use growth in emerging markets**
  - Examples of res/com:
    - Bangladesh
    - Myanmar
    - Cambodia
  - Example of olefins feedstock
    - China
  - Drivers:
    - Increased LPG availability
    - Downward pressure on LPG prices
    - Economic prosperity of consumers
    - Primitive fuels to displace

- **Emergence of relatively new end use markets**
  - Examples:
    - Power generation fuel
      - Driver: Power demand at a non-ideal scale for LNG
    - Bunker fuel
      - Driver: IMO regulations / slow rate of expensive scrubber adoption
    - Dehydrogenation feedstock
      - Driver: Trend toward light feeds to olefins crackers has created a shortage of propylene / butylenes that is efficiently met by dehydrogenation technologies
The greatest potential to replace biomass* with LPG is in Africa and Asia

Residential & commercial use of biofuels and waste in 2016; ~757 million tons oil equivalent

- **OECD Americas**: 3%
- **Non-OECD Americas**: 4%
- **Africa**: 39%
- **OECD Europe**: 6%
- **Non-OECD Europe/Eurasia**: 2%
- **OECD Asia Oceania**: 0%
- **Middle East**: 0%
- **non-OECD Asia Excluding China**: 35%
- **China**: 11%

*Includes charcoal

Source: IEA
The greatest potential to replace kerosene* with LPG is in Asia and the Middle East

Residential & commercial use of kerosene in 2016; ~32 million tons oil equivalent

- OECD Americas: 3%
- NonOECD Americas: 1%
- Africa: 7%
- OECD Europe: 9%
- NonOECD Europe/ Eurasia: 0%
- OECD Asia Oceania: 41%
- Middle East: 15%
- non-OECD Asia Excluding China: 20%
- China: 4%

Source: IEA “other kerosene”
The greatest potential to replace res / com coal* with LPG is in China

Residential & commercial use of coal in 2016;
~107 million tons oil equivalent

- China: 65%
- OECD Americas: 0%
- NonOECD Americas: 0%
- Africa: 5%
- OECD Europe: 15%
- NonOECD Europe/ Eurasia: 6%
- OECD Asia Oceania: 1%
- Middle East: 0%
- non-OECD Asia Excluding China: 8%
- non-OECD Asia Excluding China: 8%

Source: IEA *includes peat and coal byproducts

About a third of res/com coal is used in commercial applications

Confidential. © 2019 IHS Markit®. All rights reserved.
Where will the next wave of res/com LPG demand arise?

LPG market development versus GDP per capita in selected countries

- **Subsidized markets**: Countries with high LPG consumption but low GDP per capita.
- **High potential**: Countries with potential for LPG demand growth due to low LPG consumption and high GDP per capita.
- **Maturing**: Parts of Asia and Latin America, where LPG demand is maturing.
- **Natural gas displacement**: Eastern Europe, where natural gas is displacing LPG.

Source: IHS Markit, IEA

© 2019 IHS Markit
Thank You!

Dr. Walt Hart
Walt.Hart@ihsmarkit.com
+1 832 679 7240

IHS Markit Customer Care
CustomerCare@ihsmarkit.com
Americas: +1 800 IHS CARE (+1 800 447 2273)
Europe, Middle East, and Africa: +44 (0) 1344 328 300
Asia and the Pacific Rim: +604 291 3600

Disclaimer
The information contained in this presentation is confidential. Any unauthorized use, disclosure, reproduction, or dissemination, in full or in part, in any media or by any means, without the prior written permission of IHS Markit or any of its affiliates ("IHS Markit") is strictly prohibited. IHS Markit owns all IHS Markit logos and trade names contained in this presentation that are subject to license. Opinions, statements, estimates, and projections in this presentation (including other media) are solely those of the individual author(s) at the time of writing and do not necessarily reflect the opinions of IHS Markit. Neither IHS Markit nor the author(s) has any obligation to update this presentation in the event that any content, opinion, statement, estimate, or projection collectively, "Information," changes or subsequently becomes inaccurate. IHS Markit makes no warranty, expressed or implied, as to the accuracy, completeness, or timeliness of any information in this presentation, and shall not in any way be liable to any recipient for any inaccuracies or omissions. Without limiting the foregoing, IHS Markit shall have no liability whatsoever to any recipient, whether in contract, in tort (including negligence), under warranty, under statute or otherwise, in respect of any loss or damage suffered by any recipient as a result of or in connection with any information provided, or any course of action determined, by it or any third party, whether or not based on any information provided. The inclusion of a link to an external website by IHS Markit should not be understood to be an endorsement of that website or the site’s owners (or their products/services). IHS Markit is not responsible for either the content or output of external websites. Copyright © 2019. IHS Markit®. All rights reserved and all intellectual property rights are retained by IHS Markit.
LPG Demand Drivers for the Next Decade

Potential Questions for Panelists – p.1

• In what other countries are you seeing significant demand increases?
  • What are the major drivers?
  • Will these countries be sufficient to offset slowing or stagnation in China, India, US, Indonesia?

• How do you see the prospects for power generation and bunker fuel?
  • In what other end use markets are you seeing big growth?
  • What are the major drivers?

• What are some important “mega-trends” / issues that might be addressed with LPG demand / product solutions?
  • Example: Emergence of “crude oil to chemicals” to address potential shortage of feedstocks
  • Example: Crude oil demand peaking around 2030
  • Example: Climate change
  • Example: Slowing global economy
  • Example: Tariffs / trade wars
  • Example: Plastic waste
  • Example: Use of renewables
LPG Demand Drivers for the Next Decade
Potential Questions for Panelists – p.2

• Is infrastructure going to be a major impediment to demand growth?
  • Countries – especially India and in Eastern Europe (like Ukraine)
  • Types – such as pipelines or marine terminals or storage
• Infrastructure in India and Indonesia is largely being expanded to address the res/com market
  • Do you see other end uses benefitting / growing because of the increased access / availability?
  • What about other countries?
• Colombia recently approved the use of autogas
  • Any other new autogas countries?
  • How is autogas doing in the areas you serve?
• What are the biggest threats to new demand growth?
• How sensitive do you think the various elements of new demand are to pricing?
  • Will chemicals outbid res/com demand in Africa and other developing countries?
LPG Demand Drivers for the Next Decade
Potential Questions for Panelists – p.3

• We see lots of end use applications from WLPGA exhibitors and others. Any applications that you see with particularly good growth prospects?

• Examples: Mowers, outboard motors, pool heaters, patio heaters, patio grills, golf carts, generators, ag equipment…

• A recession would impact both supply and demand – speculate on how it might impact development of new demand markets.