The role of LPG in supporting African Development

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Energy poverty is a reality for billions every day.
Energy is wasted through inefficient transmission or appliances
Carbon intensive energy usage is damaging our environment...
...potentially changing our climate...
Our cities are becoming unbearable due to outdoor pollution.
Our homes are not much better
Urbanisation is accelerating
But so is deforestation
Opportunity

“a favorable combination of circumstances, time, and place”
1. The WLPGA
2. The LPG industry
3. LPG and Natural Gas – “Further together”
4. Focus on Africa
5. Conclusions
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Who are we?

225 Member companies

125 different countries

Serving the full LPG value chain:

- Production
- Shipping & trading
- Storage
- Distribution and retail
- Service
A powerful Industry Association
What are we?

The only association that represents the full LPG global value chain

Market Development and Support

Good industry Practices

Innovation

Outreach and Advocacy

World Forum and Regional Summits
Campaign Goals

• Transition 1 BILLION people to cooking with LPG by 2030

• Prevent 1,000,000 premature deaths per year, primarily women and children

• Save 2.65 million hectares of forest, or 51% of annual global net deforestation, with every 268 million households converted to LPG
Target countries

20 countries represent 2.3 billion people who lack access to modern fuels.

Many are in Africa.

Cooking For Life will be active in countries that have populations in need, supporting governments and WLPGA members.

Source: http://www-wds.worldbank.org
Agenda

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What is LPG?

LPG is a co-product of natural gas production and crude refining. It consists of propane and/or butane.

Consumption

275 million tonnes/yr in 2014; up 4% on 2013

In context:
Annual consumption (on energy content basis) equivalent to 7% of annual oil consumption or:
40% of annual hydroelectric consumption or,
>100% of global LNG consumption

>2,000,000 employees

3 billion consumers

Global value of the business > $300 billion/yr
Why LPG?

- Portable ("natural gas in a bottle")
- It burns cleanly
- Bottles can be stored indefinitely
- Easily transported
- Minimal investment in infrastructure
- Used virtually anywhere - from urban centres to remote regions
- Flexibility in applications
LPG volume outpacing LNG...still

LPG volume consumption globally remains higher than LNG
Trade flows are changing...

Total LPG exports from major regions

Million tonnes

Source: IHS inc.
and price is decreasing

Propane Price

Saudi CP /US$/tonne

des.13  apr.14  aug.14  des.14  apr.15  aug.15  des.15  apr.16  aug.16  des.16
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LPG and Natural Gas - Complementary fuels

LPG and natural gas share many similar attributes:

- Both are clean and efficient sources of energy
- They can share end-use appliances interchangeably
- To the end user, they can be indistinguishable
- They can contribute to regional socio-economic development
LPG can be used as a precursor fuel in new areas
  - Allowing market development at lower cost / risk
  - Increases demand prior to introducing grid

Provides an alternative in off-grid areas
  - e.g. mountainous / remote regions

Is an option in regions of declining natural gas supply or in areas no longer served by grid
  - e.g. areas of natural / man-made disasters

Provides flexibility to industrial customers
  - Interruptible contracts / peak shaving / back up supply.
Synthetic Natural Gas (SNG) is a propane:air mixture, effectively interchangeable with natural gas.

Many case studies of complementary SNG / NG projects exist:

- In Korea during the 90’s, a series of SNG fuelled city gas systems were built to support economic growth (and to replace cylinder LPG). Later connected to LNG as it became available.

- In China > 30 cities developing natural gas with SNG as a precursor fuel

Similar projects could be considered for Africa
LPG allows for incremental development

**Stage 4:** Grid-based system (SNG or natural gas) replaces tank

**Stage 3:** LPG bulk tank, fuelling stove, refrigerator, water boiler and generator

**Stage 2:** LPG cylinder outside, piped in to fuel stove, refrigerator and light

**Stage 1:** LPG cylinder inside feeding stove
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Focus on Africa

• Africa has abundant LPG resources (6.2% of world production)
• 5 countries* account for 93% of the African production
• African production is high but local demand is low

• African GDP growing by c. 5% since economic crisis
• Up by a factor of 6 by 2050
• Population to exceed that of China by 2025 and greater than China EU and USA by 2050
• GDP per capita expected to double by 2050

All the ingredients are present for LPG growth

* Algeria, Egypt, Nigeria, Angola, Libya
LPG consumption in Africa

- 4.2% growth per year since 2003
- **11kg per capita** per year average consumption in Africa
- The demand is concentrated on the Northern border of the Mediterranean sea (55kg/cap/y) compared with Sub-Saharan (2.3kg/cap/y)
- But growth is not even by country or by end-use

Average **55 kg/cap/yr**

Average **2.3 kg/cap/yr**

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Africa is dominated by domestic demand

African LPG consumption by sector 2014
- Domestic: 84.3%
- Agricultural: 4.0%
- Industrial: 5.6%
- Transport: 1.3%
- Refining: 0.6%
- Chemical: 4.1%

Global LPG consumption by sector 2014
- Domestic: 45.5%
- Agricultural: 11.4%
- Industrial: 9.7%
- Transport: 6.7%
- Refining: 1.6%
- Chemical: 25.1%

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LPG vs electricity for cooking?

- LPG can displace electricity for residential, thermal needs
- Cooking demand can lead to significant peak loads if using electricity
- Direct use of gas for thermal use if far more efficient than electricity
- In OECD countries alone LPG use in residential demand represents c. 600 gas-fired power generation plants

Source: “Electricity and demand side management”, WLPGA, 2014
Where are the biggest opportunities...

Nigeria is the real standout, especially considering its production and export volumes.

Kenya and South Africa are very low considering their status as economic hubs.
The latent market potential in Africa

In Nigeria, an increase to 20kg per capita would give a market of 3 million tonnes / yr

An increase to 30kg pp would give a market of 4.5 million tonnes/yr
Case Study Ghana

• National government driven LPG promotion programme started in 1990
• Based on refinery upgrades and cross subsidies
• Limited success due to several factors:
  – misdirected subsidies
  – bad business and regulatory practices stifling investment
Case Study Ghana

- Today high dependence still on wood and charcoal in rural areas.
- Around 20% of the population use LPG.
- Policy objective is to reduce the dependence on wood fuels arresting deforestation and improving health.
- Current policy target of increasing LPG penetration from to 50% of the population by 2020.
Case Study Senegal

• ‘Butanisation’ policy introduced in 1974 with heavy subsidies and tax exemptions
• Goal was to increase LPG consumption and decrease reliance on biomass
• At that time wood and charcoal represented around 60% of total energy consumption
Case Study Senegal

- ‘Butanisation’ led to a remarkable increase in LPG consumption. Nearly 85% in Dakar, and 66% in other urban areas.
- The phasing out of the LPG subsidy began in 2010.
- Consumption steady as private sector gets more involved in industry.
Case study - Indonesia

- **Population:** 255 million; **GDP per capita:** $11,300
- **LPG Consumption:** 6 million tonnes (net importer)

- From 2006 – 2010, 48 million families converted to LPG
- Government net kerosene subsidy savings of 1.5 billion USD
- Provided 38,000 jobs and drove 2.7 billion USD of investment
- Equivalent to 46.6 Million trees saved
- Equivalent to 2.8 Million cars taken off the road
Case study - Brazil

- Population: 200 million; GDP per capita: $15,800
- LPG Consumption: 7.6 million tonnes (net importer)

The LP Gas Industry:

- 100 million cylinders;
- 23 marketers companies; 37 thousand dealers;
- US$ 2,2 billion in taxes;
- 35 GLP primary supply terminals; 27 Cylinders maintenance shops;
- 350,000 direct and indirect jobs.
- Covers 100% of municipalities;
- Serves 95% of the population;
- 56 million homes / 181 million inhabitants;
Case study - India

✓ Population: 1,250 million; GDP per capita: $6,300
✓ LPG Consumption: 18 million tonnes (net importer)

The Indian LP Gas Industry:
• > 150 million cylinders;
• 70 million households consuming LPG
• 90% penetration in the urban areas
• 35% penetration in rural areas
• Projected consumption increase c. 1 million tonnes per year
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Conclusions

• Africa has significant future energy challenges
• Gas can address many of them NOW
• LPG supply is increasing; price is easing
• Opportunities for gas development will start with LPG
• To thrive, the LPG industry in Africa needs proper regulation, enforcement and investment
• Together the gas industry can realise these opportunities
• WLPGA stands ready to help
Want to know more about LPG opportunities?

Want to understand how LPG and natural gas can go further together?

Join us from September 27th 2016 in Istanbul
Thank you
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Case Study South Africa

• 14% of households have no access to electricity

• 32.3% of population live in informal dwellings, utilising primarily solid fuels and paraffin as energy sources

• Cost of electricity expected to rise (≥8% for the next 4 years), coupled with expected service delivery interruptions

• LPG penetration for SA households as primary energy for cooking is 3.2%  (Source: StatsSA 2013)
Case Study South Africa

- Oryx Oil South Africa conducted Consumer research in 2014 – it was found that LPG as a category failed to land credibly within the energy consideration set for low end SA consumers*

- Consumers wanted an affordable and accessible energy source:
  - Affordable in terms of absolute price point
  - Accessible in terms of location and relevance

- Oryx Energies utilised this insight to develop the concept of LPG spaza container outlets

Case Study South Africa

- Spaza outlets enable greater accessibility of LPG in peri-urban and rural areas, and reduce associated transport costs for consumers (absolute price point).

- These outlets are standalone and require minimal infrastructure to operate.