

An Inquiry into Liquefied Petroleum Gas (LPG)

The Case of Botswana

Presented by Ernest Bagopi¹



2018

¹ Manager Investigations and Research Analysis. Competition Authority of Botswana. A Chartered Marketer South Africa (CMSA 20011) by Profession. Holds a Post Graduate Diploma in Economics for Competition Law, MBA and BBA in Marketing.

Research Provision in the Competition Act

According to Section 49 (1) of the Competition Act (Act), the Competition Authority (the Authority) can initiate market inquiries in particular sectors of the economy. These inquiries refer to conducting market research in identified sectors of the economy. Such research is the means to provide relevant, valid and up-to-date information, mainly for decision making on competition matters by the Competition Commission (Board of Directors). The research also enables the Authority to advise Government on the actual or likely anti-competitive effects of current or proposed policies (and how to avoid those effects).

In that respect, this inquiry in the LPG sector required a field survey, mainly because there was no data readily available to address the set objectives.

RESEARCH TEAM:		LOGISTIC SUPPORT:
	Data Collection	
Mr. Ernest Bagopi (Team Leader) Christson Daman (Research Coordinator)	Ms. Goitseone Modungwa Ms. Thabiso Mbongwe Mr. Thabang Tlhalerwa Mr. Setso Sikwane	Department of Corporate Service CA

Table of Contents

1. Introduction	6
2. Research objectives.....	6
3. Methodology.....	6
4. The market inquiry	7
5. Government involvement.....	7
6. Customary business practices	8
7. Employment	9
8. Findings.....	9
8.1. Market structure	9
8.2. The supply value chain	10
9. Industry practice.....	15
10. LPG usage.....	17
11. LPG pricing	20
12. Trade characteristics	26
Conclusion	29
13. Recommendations	30

a. List of Abbreviations Used

ACF:	African Competition Forum
LPG:	Liquefied Petroleum Gas
PHC:	Population and Housing Census
CA:	Competition Authority
DEA:	Department of Energy Affairs
HHI:	Herfindahl-Hirschman Index
BURS:	Botswana Unified Revenue Service
BOBS:	Botswana Bureau of Standards
BERA:	Botswana Energy Regulatory Authority
BPC:	Botswana Power Cooperation
IPPs:	Independent Power Producers
NPF:	National Petroleum Fund
SACU:	Southern African Customs Union
DEA:	Department of Energy Affairs

b. List of Tables and Figures Used

Table 1: Level of Inter-connectivity of firms in the market	12
Table 2: Concentration ratio and HHI	15
Table 3: LPG compared with other energy sources used for cooking ..	19
Table 4: Change in cost between 2012 and 2016.....	21
Table 5: Price change between 2012 and 2016.....	21
Table 6: Price distribution across the country by the region.....	22
Table 7: Regional market characteristics comparison.....	23
Table 8: Importer capacities	27
Table 9: Imports	28
Table 10: Re-exports to country of origin	28

Figure 1: Supply value chain	9
Figure 2: Distribution of LPG importers.....	11
Figure 3: Location of LPG distributors	13

Chart 1: LPG importers market share	14
Chart 2: Distribution of households by energy for cooking	17
Chart 3: Price determinants	20
Chart 4: Rural retailers' barriers to entry.	25

Graph 1: LPG usage by region	18
Graph 2: Regional country comparison: LPG price in Pula/Kg.....	24

Abstract: This report presents an overview and descriptive analysis of the Liquefied Petroleum Gas (LPG) sector in Botswana. In Botswana, LPG's main end-users are households (in cylindrical canister form) that use it for cooking purposes. Though there is consumption of LPG in bulk form, this is minimal in comparison with household use. Furthermore, household consumption of LPG represents a larger demographic and as such has more societal impact. According to the 2011 Botswana Population and Housing Census; the usage of LPG for cooking rose significantly at a national level from 5.4 to 40.6 percent between 1981 and 2001; but remained the same in the period 2001 to 2011. It is on this basis that the focus of this paper shall be on the usage of LPG at household level. Market prices in this sector are highly dependent on dynamics prevalent in the South African market, which is Botswana's main trade partner (supplier) in this case. This market's oligopolistic nature presents characteristics that make it vulnerable to anti-competitive behaviour; an indication of a great need to cushion against these cross border forces. Therefore, the paper highlights the need for effective regulation of this market.

1. Introduction

- 1.1. The Authority is a statutory body established under section 4 of the Act. Amongst its functions, the Authority is expected to undertake general market studies. LPG, commonly known as 'household gas' or 'domestic gas', is an essential commodity in developing countries where there is shortage of alternative fuels for cooking, heating and lighting. In Botswana, LPG is primarily used for cooking. According to the 2001 and 2011 PHC, wood and gas were the principal energy sources used for cooking in Botswana. With 77 percent of the rural population found to be using wood as the main energy source for cooking and LPG predominantly used in urbanised regions of the country. The implication here is that there might be latent demand for LPG as the country gradually urbanises. That is, the use of LPG in Botswana is yet to increase. Therefore, a sentinel view of the LPG sector in terms of competition was deemed necessary. This market inquiry was therefore initiated by the Authority.

2. Research objectives

- 2.1. In an effort to identify competition issues that need to be addressed in the LPG sector within Botswana, the following were the objectives of the research:
 - 2.1.1. To understand the landscape of the LPG sector in order to identify competition issues that need to be addressed;
 - 2.1.2. To understand relationships and trade characteristics between stakeholders within the LPG sector; and
 - 2.1.3. To assess potential barriers to entry that exist along the LPG sector supply value chain.

3. Methodology

3.1. Method of data collection

- 3.1.1. The data collection method was through direct interview, utilising structured questionnaires. Two sets of questionnaires were administered: one specifically for LPG importers; and another for LPG retailers. Both tools were supplemented by a price collection schedule at both levels of the supply chain.

3.2. The geographic coverage

- 3.2.1. The inquiry focused wholly on major villages and towns located in the south, south west, central and north east districts (of Botswana).
- 3.2.2. All LPG importers in the country are located along the eastern region, with most head offices located in the capital city Gaborone.

3.3. Limitations of the study

3.3.1. Due to financial and personnel constraints, the Authority only directly interviewed LPG importers, distributors and approximately 60% of retailers.

3.3.2. Consumers and informal mobile operators were not directly interviewed.

4. The market inquiry

4.1. Regulations and legislation underpinning the sector

In Botswana, distribution of LPG is licenced through the Trade and Liquor Act. Trading licences can be obtained at the Commercial Department of District/City/Town Councils (currently with BERA's vetting (standards))

The licensing criteria is quite liberal and places minimal burden on prospective entrants into the market. Therefore the market experiences minimal legislative barriers.

5. Government involvement

5.1. The local LPG sector was initially not regulated. However, in August 2016 the Government introduced regulation of the sector through BERA under the Ministry of Mineral Resources, Green Technology and Energy Security.

BERA is responsible for, amongst other things:

5.1.1. Ensuring sustainable and secure supply of LPG;

5.1.2. Setting and maintaining service standards;

5.1.3. Ensuring that tariffs in the regulated sector are fixed on the basis of a tariff methodology that has been set up in a transparent manner taking into account Government policy on cross subsidies between classes of consumers;

5.1.4. Ensuring that interests between distributor, customer and licensee are adequately balanced;

5.1.5. Protecting and preserving the environment; and

5.1.6. Ensuring that the regulation of the energy sector is done in accordance with the best international regulatory practice.

5.2. The energy regulator will take over some functions of the DEA (within the Ministry of Mineral Resources, Green Technology and Energy Security), which was established to formulate, give direction, and coordinate the National Energy Policy. The mandate of the department was to provide affordable, environmentally friendly, and sustainable energy services in order to promote social and economic development. Unfortunately the department's mandate excluded some energy sources such as the LPG.

- 5.3. BERA expands on the department's mandate to include sectors dealing with electricity, petroleum products, coal, natural gas, bio-energy, solar energy, renewable energy resources and other energy resources. Currently, the sector is not subjected to any Government subsidies, but Government policy reserves licensing for retailing gas for citizens.
- 5.4. The DEA reported that the only energy source that receives Government subsidies is electricity. Other energy sources such as petroleum products, renewable fuels, solar energy and LPG are not afforded any subsidies. However, petroleum products prices are cushioned by National Petroleum Fund (NPF).

6. Customary business practices

- 6.1. In Botswana, importers primarily own, distribute and refill cylinders. Customers only lease gas cylinders from retailers and get refund for deposit when handing them back. This range between P304.00-P395.00 irrespective of size.
- 6.2. The sale of larger quantities of the product, that is bulk gas, is largely prevalent in the mining and industrial sectors of the economy. The market in Botswana is characterised by a small number of importers, which are housed in 'gas plants'. Therefore, the LPG is supplied around the country to either major clients² or LPG distributors.
- 6.3. The practice is that, importers own the LPG storage and refilling equipment that is housed in the distributor's property. This means that importers are connected to the distributors' information networks and are able to monitor gas levels and pay regular visits to inspect the equipment.
- 6.4. Bulk gas is delivered by road (trucks) around a radius of 500km of the importers gas depots. Due to population concentrations and LPG usage, there are only two distributors located in the North West region (Maun) of the country. These are subsidiaries of the two main importers of LPG in the country being, EasiGas and Afrox gas, respectively.
- 6.5. The end of the supply value chain comprises a large number of LPG retailers (approximately 450 licenced enterprises, though not all are operational). There are an undocumented number of unlicensed mobile distributors who have their own clientele and aid distributors and retailers in the resale of LPG.
- 6.6. Currently, all enterprises use the standard gas nozzle, compliant with BOBS standard (BOS 3-7 of 2011). This standard is aimed at ensuring safety for consumers, and accountability for LPG traders. The custom is that distributors are not supposed to refill competitor gas cylinders without written consent from the owner. This is common practice in the region, as it was discovered to be the case in South Africa³.

² Government institutions, private businesses and the mining sector.

³ Competition Commission LPG market inquiry <http://www.compcom.co.za/lpg-inquiry/> Market Inquiry Into the LPG Sector Final Report (Non-Confidential)

7. Employment

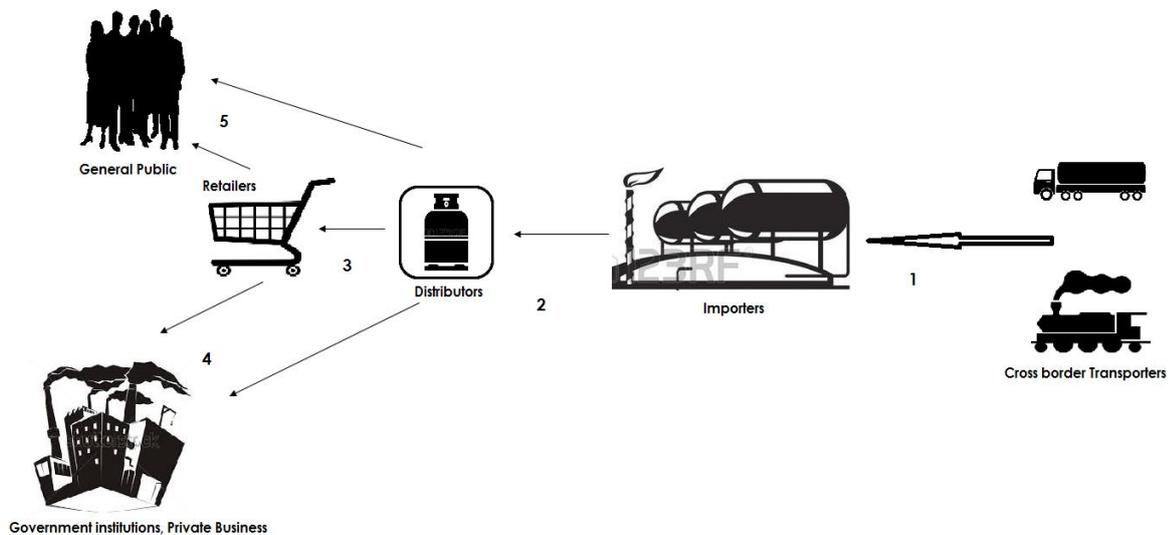
- 7.1 LPG importers are reported to employ an average of 50 employees (ranging from 20 to 55), while the distributors reported an average of nine (9) employees. Retailers employ an average of three (3) people specifically dedicated to gas sales. In total, the market employs an average of 400 Batswana⁴ across the country.
- 7.2 Employees and enterprises in this sector do not fall under any association, but apparently in the past, there was an LPG Safety Association of Botswana which collapsed when British Petroleum (BP) [now Puma energy] pulled out.

8. Findings

8.1. Market structure

- 8.1.1 The LPG market in Botswana comprises of: importers; distributors; retailers; Government institutions; private businesses; and the general public. Due to budget and human resource constraints, the scope of the study was narrowed to focus on LPG importers; distributors; and retailers. This market is import centric, as there is no production of LPG in Botswana. The following Figure 1 shows the supply value chain.

Figure 1: LPG supply value chain



Source: CA data collection, 2016

⁴CA data collection, 2016

8.2. The supply value chain

This is made up of: five main LPG importers that primarily source LPG from South Africa; ten LPG distributors that are in place to ensure LPG distribution; and approximately 450 retailers that supply end users.

The following is a summary of how the local supply chain of LPG works:

8.2.1. **Stage 1** - bulk imports are secured from suppliers abroad mostly by road or sometimes rail.

Stage 2 – Importers unload products into the market through LPG distributors which they (importers) mostly own. Some importers sell directly to the end users from their depots, thus playing dual roles in the supply value chain

Stage 3 - Some importers have long standing agreements with specific distributors that own numerous retail points.

Stage 4 – Most distributors are vertically integrated with retailers are owned by compete with independent retailers.

8.2.2. The supply value chain in this sector comprise, importers and distributors selling directly to the public. This may lead to competition between them (importers and distributors) and retailers in the downstream market. This phenomenon can also be seen at retail level, since some distributors also own retailers. With the market being highly concentrated and dominant firms being integrated along the supply value chain, this may facilitate infringements, such as margin squeeze⁵, refusal to deal⁶, excessive pricing⁷ and price fixing⁸.

8.3. Importers

Importers in this market are mainly congregated along the eastern region of the country, and this is to enable easy access to Botswana and South African borders. Importers handle gas in bulk and trade an average of 500 metric tonnes of the LPG in a month. Importers are critical in the supply chain, as they influence the retail price subject to import price. This means that the LPG price in Botswana is highly dependent on dynamics (availability) in the South African market. Shortage of LPG in South Africa translates into high gas prices locally. Therefore, it is prudent to monitor LPG trends in South Africa to ensure that local market reactions are warranted and not caused by firms distorting market forces with the intent to escalate the price.

⁵ A margin squeeze occurs when there is such a narrow margin between an integrated provider's price for selling essential inputs to a rival and its downstream price that the rival cannot survive or effectively compete:
<http://www.oecd.org/regreform/sectors/46048803.pdf>

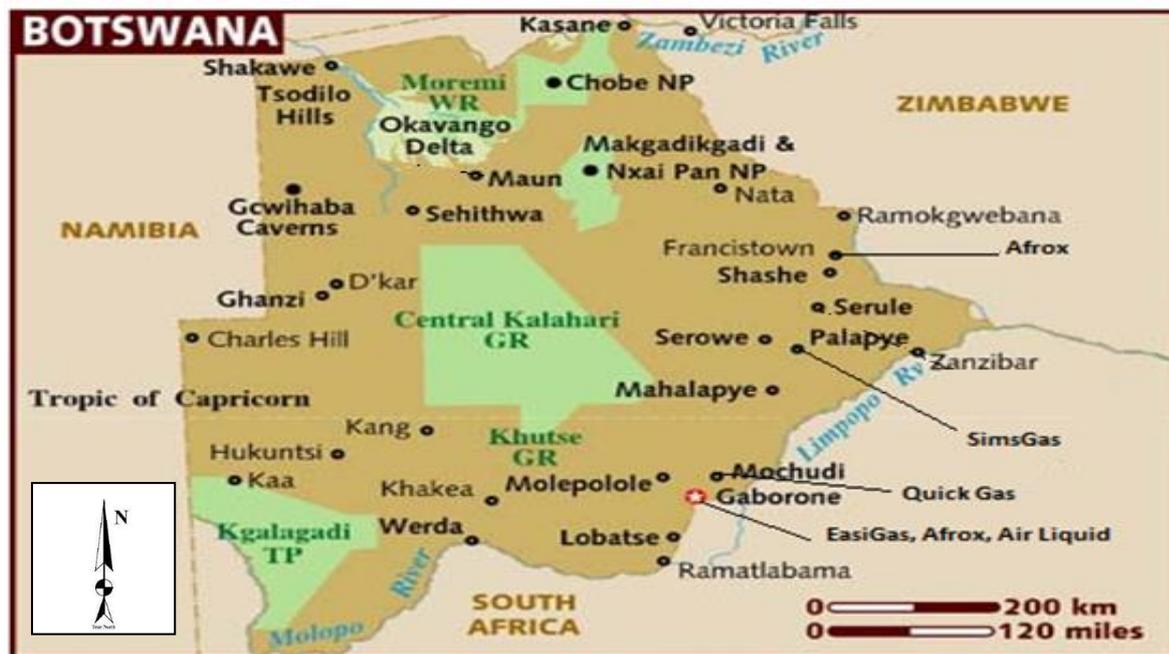
⁶ The practice of refusing or denying supply of a product to a purchaser, usually a retailer or wholesaler.
<https://stats.oecd.org/glossary/>

⁷ Excessive price refers to prices set significantly above competitive levels as a result of monopoly or market power.
<https://stats.oecd.org/glossary/>

⁸ A price fixing agreement is an agreement between sellers to raise or fix prices in order to restrict inter-firm competition and earn higher profits. Price fixing agreements are formed by firms in an attempt to collectively behave as a monopoly.
<https://stats.oecd.org/glossary/>

Figure 2 shows the distribution of LPG importers along the eastern region of the country.

Figure 2: Distribution of LPG importers



Source: CA data collection, 2016

8.4. Distributors

8.4.1. These are entities that effectively distribute LPG to various locations around the country. They trade an average of 120 metric tonnes of LPG monthly. The practice is that a distributor provides the land (space), while the importers provide, install and maintain the gas refilling equipment. This gives importers some level of control at the distribution level due to the fact that initial capital investment is quite high for one to consider changing suppliers (importers). As such, this creates an entry barrier and the arrangement may facilitate anti-competitive practices, e.g., limiting market access to new entrants or promoting exclusive dealings⁹.

8.4.2. As already outlined, some distributors have subsidiaries at the retail level. This intensifies the level of inter-connectivity, and makes it easy for firms to engage in anti-competitive business behaviours such as: margin squeeze¹⁰, refusal to deal¹¹, and excessive pricing¹².

⁹ Anti-competitive foreclosure may arise through exclusive dealing – preventing competitors from selling to customers through the use of exclusive purchasing obligations and rebates. (CA guidelines on Abuse of Dominance 2013).

¹⁰ A margin squeeze occurs when there is such a narrow margin between an integrated provider's price for selling essential inputs to a rival and its downstream price that the rival cannot survive or effectively compete. <http://www.oecd.org/regreform/sectors/46048803.pdf>.

¹¹ The practice of refusing or denying supply of a product to a purchaser, usually a retailer or wholesaler. <https://stats.oecd.org/glossary/>.

¹² An excessive price refers to a price set significantly above the competitive level as a result of monopoly or market power. <https://stats.oecd.org/glossary/>.

8.4.3. It should be noted that during the completion of the study, a new citizen owned LPG importer named Tswana Gas entered the market. The LPG import market incumbents (EasiGas, Quick gas, Afrox) reacted to the new entrant by dropping the gas price. However, it is reported that unregistered mobile distributors (primarily) and some other retailers enjoy the price cut but do not pass it on to the consumer.

The following Table 1 shows the level of inter-connectivity between importers, distributors and retailers in Botswana:

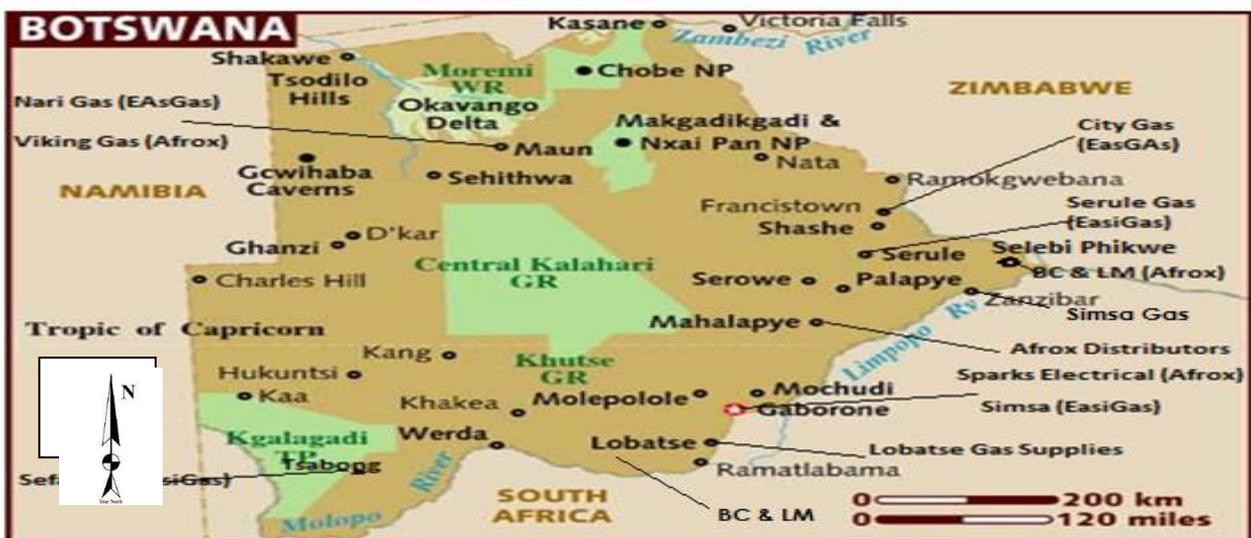
Table 1: Level of inter-connectivity of firms in the market

Importer	Distributors	Retailers
Easi Gas (Gaborone)	Lobatse Gas Supplies	Independent Retailers
	Serule Gas (Serule)	Independent Retailers
	City Gas (Francistown)	Independent Retailers
	Nari Gas (Maun)	Independent Retailers
	Sefalana Tsabong	Independent Retailers
	Simsa Gas t/a Shana Gas	Geo Gas (Tlokweng)
		Sona Gas (Gaborone)
		Shona Gas (Mochudi)
		Home Gas (Kanye)
		Kwena Gas (Molepolole)
		Smart Gas (Phikwe)
	Sun Gas (Francistown)	
Simsa Gas (Palapye)	Simsa Gas (Palapye)	Independent Retailers
Afrox (Gaborone)		BC & LM retail point (Gaborone)
	BC & LM (Kanye)	Phuti Gas (Serowe)
	BC & LM (Selebi-Phikwe)	Northern Gas (Francistown)
	Mahalapye Afrox Distributor	Independent Distributors
	Vikings Gas (Maun)	Independent Retailers
	Sparks Electrical & Gas Works (Gaborone)	Independent Retailers
	Calvin Technologies	Independent Retailers
Air Liquide (Gaborone)	Own Depot (Gaborone)	Independent Retailers
Quick Gas	Own Depot (Gaborone)	Independent Retailers
Tswana Gas (<i>New</i>)	Own Depot (Mamashia <i>in the outskirts of Gaborone</i>)	Independent Retailers
	Own Depot (Francistown)	Independent Retailers

Source: CA data collection, 2016

- 8.4.4. Importers wholly or partly own distributors plants, and in-turn distributors own retail plants. This creates conducive conditions for anti-competitive behaviour.
- 8.4.5. Figure 3 shows that most of the distributors around the country are located in the more urbanised eastern region of the country where household the use of LPG is higher. The location of distributors and their catchment areas suggest possibilities of market allocation.
- 8.4.6. In the more populated regions of the country such as the southern and central region, it is found that EasiGas and Afrox distributors are located in different towns (within these regions).
- 8.4.7. In the southern region, BC&LM's (Afrox) main depot is located in a major village within a hundred kilometer radius of the Gaborone (capital city). This is ostensibly not a viable location, since BC&LM sources gas in bulk from Afrox in Gaborone, and then from its depot in the major village, it resupplies its retail points back in Gaborone. Their target markets (EasiGas and Afrox) in these areas do not overlap and this suggests possible market allocation.

Figure 3: Location of LPG distributors



Source: CA data collection, 2016

8.5. Retailers

- 8.5.1. The end of the supply chain comprises retail entities, which trade an average of five metric tonnes of gas a month supplied to end users. Although some importers and distributors supply end users, originally this is the primary task of retailers. Most retailers are found to be integrated backwards with their distributors. This integration, as much as it is not an infringement, provides a favourable environment for anti-competitive behaviour. There are a number of undocumented mobile distributors that assist distributors and retailers through the delivery of LPG to customer premises.

8.5.2. Although it is easy to obtain a licence to trade in LPG products, the level of integration (market structure) makes market entry by new firms relatively difficult. This apparent barrier requires some level of assessment.

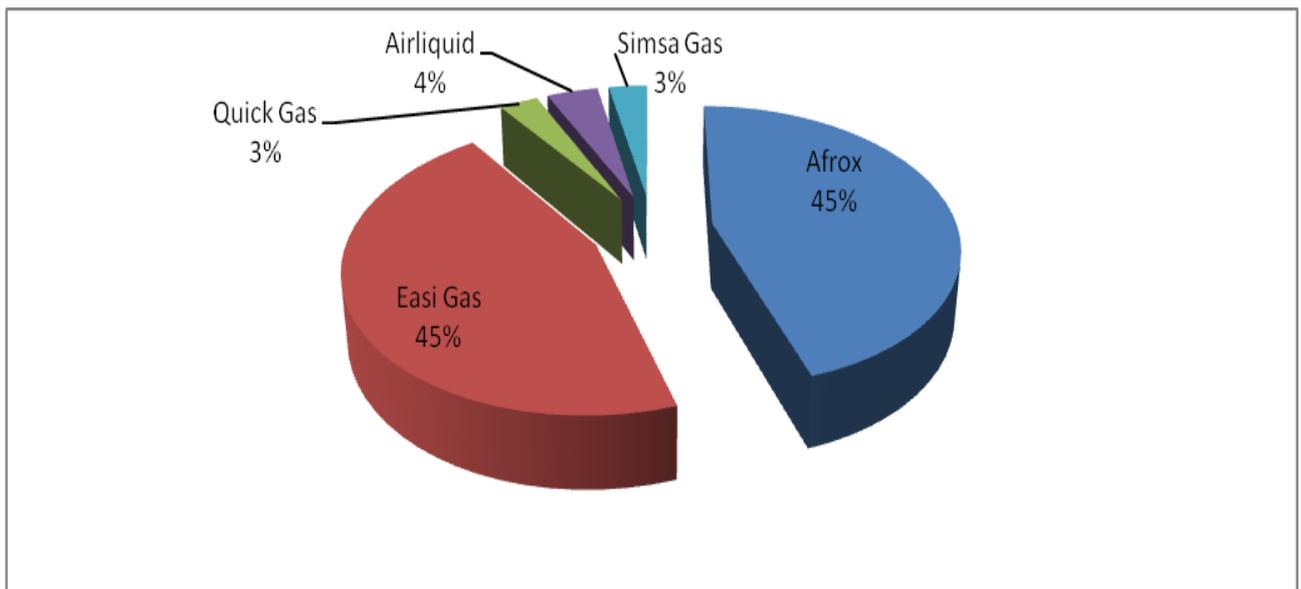
8.6. Market Share

8.6.1. The market is primarily dominated by two large importers, namely: Afrox Botswana; and EasiGas, whom each commands 45% market share. These importers' footprint is apparent around the country through the number of distributors they supply.

8.6.2. Each importer has a distribution point or distributor in the two cities and some towns and major villages (i.e., Francistown; Gaborone; Maun; Serowe; Selebi-Phikwe; and Palapye). The exception being the southern region, which is solely occupied by EasiGas.

8.6.3. The other three importers are yet to increase their market share and as such are still generally localised around their bases in the central region of the country. The following Chart 1 shows the market shares.

Chart 1: LPG importers market share



Source: CA data collection, 2016

8.7. Concentration ratio and HHI

8.7.1. Table 2 indicates that the market is highly concentrated. A concentration ratio of 94% by the top three firms is significantly higher than the international threshold for a high market concentration, which is **70%**¹³.

8.7.2. Furthermore, an HHI of 4 066 which is well beyond the international threshold of 1 800 indicates that the LPG import market in Botswana is highly concentrated. This is a

¹³ Merger Assessment Guidelines: CA Botswana

result of a highly oligopolistic market, which has an indication of possible high barriers to entry. There may be some level of co-ordination between firms as a result of low levels of competition.

Table 2: Concentration ratio and HHI (2015)

Importer	Market Share (%)	Cr3	HHI
Afrox	45%	45	2 025
EasiGas	45%	45	2 025
Quick Gas	3%	4	9
Airliquid	4%		16
Simsa Gas	3%		9
	Total	94	4 084

Source: CA data collection, 2016

9. Industry practice

9.1. Cylinder exchange

9.1.1. The cylinder exchange is a process whereby LPG retailers or distributors swap a consumer's empty cylinder (different brand) for a refilled one (of the exchanging company's brand).

9.1.2. The BOBS standard (BOS 3-7 of 2011) prescribes that distributors are not permitted to fill a foreign gas cylinder without written consent from its owner.

9.1.3. The standard practice is that LPG distributors and retailers supply cylinders to the market on a loan basis, which attracts a refundable deposit.

9.1.4. In the past, an enterprise (Pula Energy Gas Botswana) in the sector attempted to differentiate itself from the rest of the market by using specialised gas nozzles and this proved to be an ineffective business strategy that led to the enterprise exiting the market due to the lack of exchangeability with other cylinders¹⁴.

9.1.5. In terms of competition, the cylinder exchange exercise may have effects of compromising smaller firms. Firms may retain competitors' cylinders obtained through the exchange for long periods, and this can have substantial harm on competitors. Other effects may be increasing competitor costs, if eventually the withheld cylinder canisters have to be replaced by competitors.

9.1.6. Cylinder exchange allows easy interaction between competing firms in the market, which could afford competitors an opportunity to engage in anti-competitive business strategies.

¹⁴ Reported during CA data collection, 2016

9.2. **Cylinder hoarding**

9.2.1. The study yielded no instances of cylinder hoarding and the importers reported positive cooperation in the market. Although the absence of hoarding may be good, a positively cooperative market may infer minimal competition or collusive tendencies.

9.2.2. Importers reported a growing tendency of cross border cylinder theft. They stated that the depletion of cylinder volumes hindered cost recovery capability per cylinder. These factors may lead to importers passing the cost burden on to consumers' and this may result in high price.

9.3. **Cost of switching supplier by distributor**

9.3.1. The most prevalent partnership agreement that is found in the local market, in terms of distribution depots, as highlighted in paragraph 8.4.1. This arrangement makes it costly for distributors to change or switch suppliers. The arrangement may also have connotations of exclusivity, and pose a barrier to potential entrants.

9.4. **Cross filling**

9.4.1. The incidence of cross filling¹⁵ was reported in remote locations of the country, where access to alternative supply by consumers required some level of expense. Cross filling was not done with any consent by competitors. Instead firms' take advantage of the fact that the local authorities responsible for monitoring compliance do not have capacity.

9.4.2. Cross filling can be a remedy for cylinder hoarding, which is subject to the cylinder exchange process. It can also minimise interactions by firms in the market. However, cross filling has the potential of tempting firms to depend on competitor's cylinder volumes and therefore may encourage cylinder theft. It presents standards and quality assurance related risks, such as overfilling or under filling of cylinders through negligence or in attempts to cheat customers.

9.4.3. Importers reported that there were rogue gas re-fillers who cross fill their cylinders. They expressed that this was a huge safety risk for them in that they do not have control over the safety inspections and procedures used when refilling their cylinders.

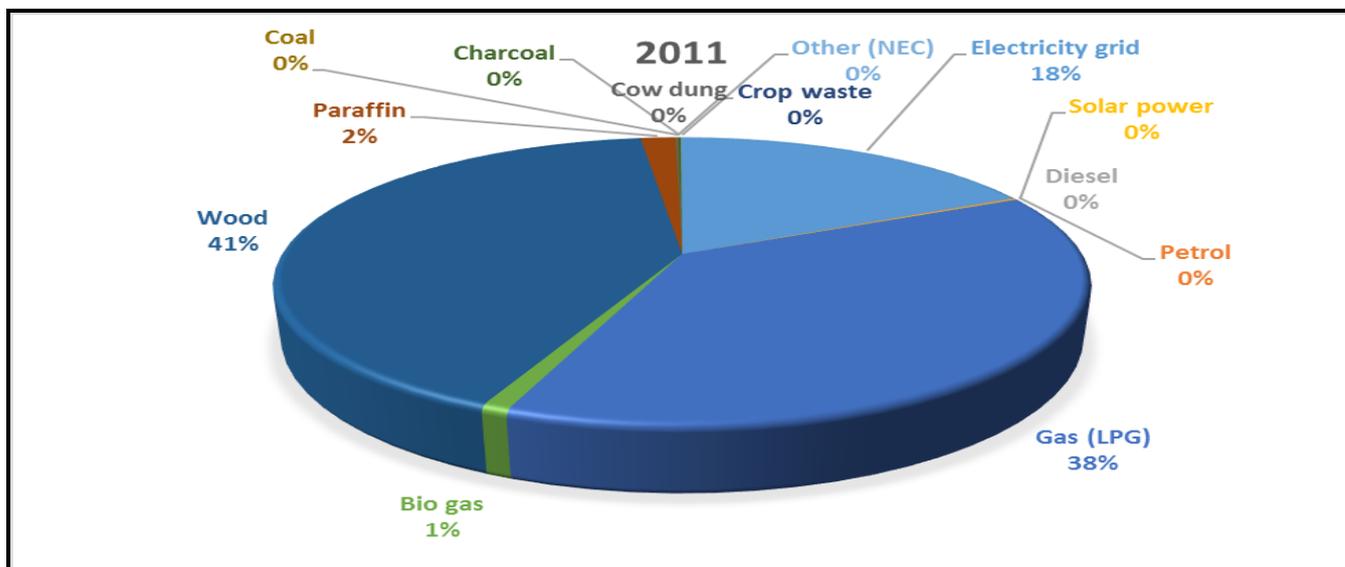
¹⁵ The process of refilling different brand or competitor cylinders as reported during data collection: CA data collection, 2016.

10. LPG usage

10.1. Distribution of households by energy for cooking

10.1.1. According to the PHC 2011, households in Botswana predominantly use LPG for cooking. The chart below highlights distribution of households by energy for cooking.

Chart 2: Distribution of households by energy for cooking.



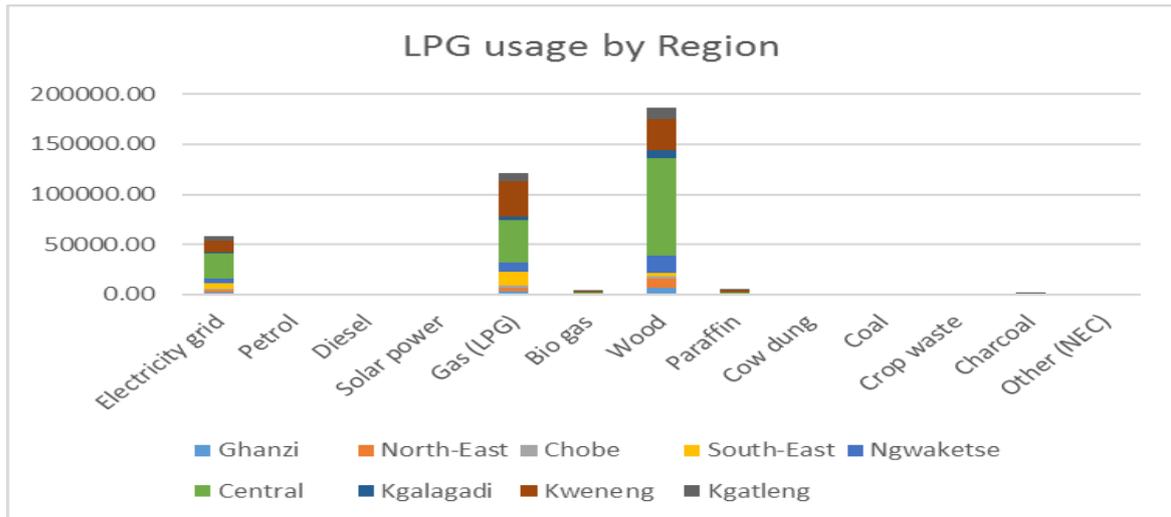
Botswana Population and Housing Census 2011

As shown in Chart 2 above, 38% of households use LPG, and this makes it the second most used source of energy for cooking.

10.2. LPG usage by region

10.2.1. In terms of usage by region, PHC 2011 revealed that LPG is predominantly used in the Central and Kweneng districts. Generally LPG usage is more prevalent in the larger villages, towns and cities, while wood is more widely used in rural areas.

Graph 1: LPG usage by region



Botswana Population and Housing Census 2011

10.3. Perceptions of cost by the consumer

10.3.1. Complaints (from consumers) through the Department of Trade and Consumer Affairs (under the Ministry of Investment, Trade and Industry) reveal two consumer perceptions: cooking by LPG is cheaper than electricity; and prevalence of excessive pricing in this market. Firms in the market attribute price hikes to instances of LPG shortage in South Africa.

10.4. Perception of cost of other energy sources

10.4.1. LPG price is higher than other sources of energy used for cooking. The following Table 3 shows the cost of using LPG for cooking in comparison with two other energy sources (electricity and fire wood).

Table 3: LPG compared with other energy sources used for cooking.

Item	Gas stove	
A	Gas consumption per hour (g) ¹⁶	107
B	Hours ¹⁷	1.5
C	Gas consumption per day (g) ¹⁸	160.5
D	Gas consumption per month (g) ¹⁹	4 975.5
E	9 kg LPG price ²⁰	175
F	LPG price per g ²¹	0.019
G	Energy costs (BWP per month) ²²	94.53
Electric stove		
H	Energy rating (kW) ²³	1.5
I	Hours ²⁴	1.5
J	Energy consumption (kWh) per day ²⁵	2.25
K	Energy consumption (kWh) per month ²⁶	69.75
L	Energy tariff (Botswana 2016) (R/kWh) ²⁷	0.77
M	Energy costs (BWP per month) ²⁸	53.71
Fire Wood		
	Free	

Source: CA data collection, 2016

Please note that 1 KWH costs BWP0.77 (BPC tariff rate 2016) and 1 kg of gas costs BWP19.44 (Data collection 2016), and 1.5 Kw is equivalent to 107g²⁹. Further note that the period is an hour and a half each, daily for a month.

10.4.2. The comparison shows that for such a similar period of time LPG costs BWP94.54 whereas electricity costs BWP53.71, a difference of BWP40.83. On the other hand, wood is relatively free per unit. This huge difference may explain why LPG usage in Botswana has remained relatively the same for the past 16 years (since 2001³⁰).

¹⁶ A= It is assumed a standard (100% efficient) stove uses 1 500w of energy per hour. Note that 1.5Kw is equivalent to 1gram of LPG as per <http://www.lpg-solutions.co.uk/how-will-a-supplier-calculate-the-cost-of-lpg-to-an-end-user/>.

¹⁷ B=Assumption is that, cooking is for 1.5 hours/day for the month

¹⁸ C=A*B. That is, gas consumption per day for 1.5 hours of cooking. Assuming 100% gas stove efficiency.

¹⁹ D=C*31 days in a month

²⁰ E=Average price of a 9kg cylinder to a customer

²¹ F=E/9kg (divided by 1 000g) or 175/9kg=19.44 per kg, therefore, 19.44/1 000grams=0.019

²² G=D*F. That is, 2 790*0.019=53.01.

²³ H= It is assumed a standard (100% efficient) stove uses 1 500w of energy per hour. Note that 1.5Kw is equivalent to 1gram of LPG as per <http://www.lpg-solutions.co.uk/how-will-a-supplier-calculate-the-cost-of-lpg-to-an-end-user/>.

²⁴ I=Assumption is that, cooking is for 1.5 hours/day for the month

²⁵ J=H*I. That is, electricity consumption per day for 1.5 hours of cooking. Assuming 100% electric stove efficiency.

²⁶ K=J*31 days in a month

²⁷ L= Energy tariff in 2016

²⁸ M=K*L. That is, 69.75*0.77=53.71

²⁹ <http://www.lpg-solutions.co.uk/how-will-a-supplier-calculate-the-cost-of-lpg-to-an-end-user/>

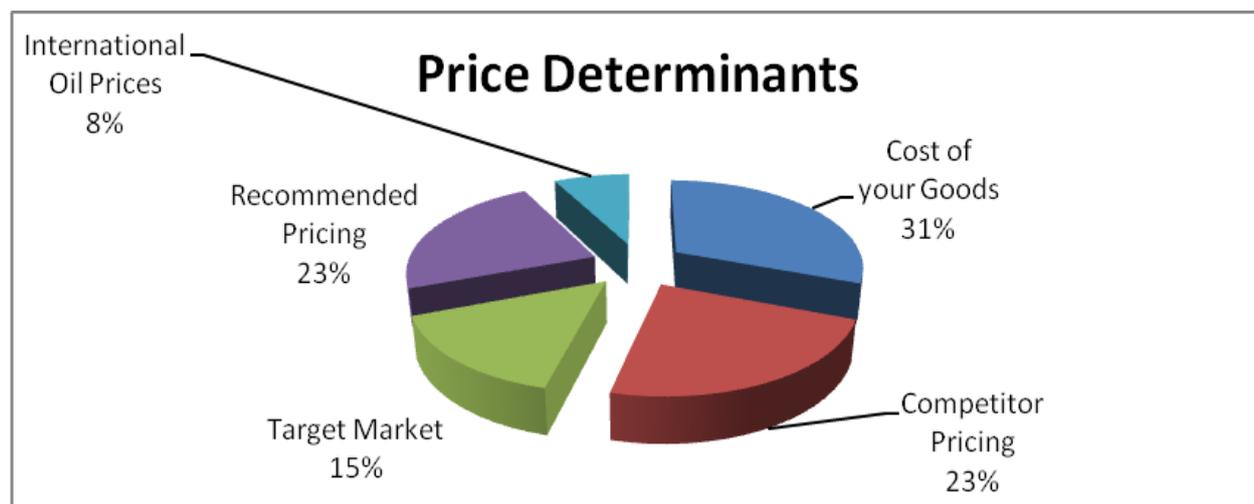
³⁰ The Botswana Population and Housing Census 2011

11. LPG pricing

11.1. Price determinants.

11.1.1. When it comes to price, the participating enterprises were asked to list the top 3 factors that influence pricing. Chart 3 below summarises.

Chart 3: Price determinants



Source: CA data collection, 2016

11.2. Chart 3 shows that the price of LPG is influenced by the following indicators: cost of goods (prevalence of 31%); competitor pricing at 23%; recommended pricing at 23%; target market at 15%; and international oil prices at 8%.

11.3. Enterprises consider cost of LPG rather than competitor pricing. This may be due to the fact that the market comprises of two dominant firms. This could be a result of three possible scenarios:

11.3.1. either the cost of goods is high, hence the main determinant of price;

11.3.2. the two dominant firms have agreed not to compete through price; or

11.3.3. the two dominant firms setting their prices independently and not threatened by the smaller competitors.

11.4. The second main determinants are recommended pricing and competitor pricing. Recommended pricing may be of more importance since it may indicate resale price maintenance.

11.5. Price change between 2012 to 2016

11.5.1. The following Table 4 shows increase in cost of LPG over the period, from 2011 to 2016. The table shows that initially prices were low (before and during the first half of 2011). Data analysis depicts that the second half of the year (2011) experienced a shortage of LPG due to the closure of three (3) refineries in South Africa³¹. This led to the local price of LPG increasing by approximately 39%. Table 4 shows that since the supply market recovered, the percentage change in product cost has been much lower than that of the retail price. That is, the cost dropped by a higher percentage when compared to the selling price. This indicates a possibility of local LPG being excessively priced. However, local selling prices are gradually stabilising and this may be due to the recent introduction of the regulatory body BERA.

Table 4: Change in cost between 2012 and 2016

Year	Imports - BWP	Net weight(kg)	cost per kg	% change
2011			5.76	
2012			8.00	38.7
2013			6.14	-23.2
2014			6.46	4.9
2015			4.80	-25.6
2016			6.21	29.5

Table 5: Price change between 2012 and 2016

Year	Price - BWP	Net weight(kg)	Price per kg	% change
2012	250	9 Kg	27.77	
2013	200	9 Kg	22.22	-20
2014	210	9 Kg	23.33	5
2015	174	9 Kg	19.33	-17
2016	165	9 Kg	18.33	-5

Source: CA data collection, 2016

11.6. Local price comparison by region

11.6.1. Through observation, local LPG prices across different regions were justified by proximity to suppliers. Regions along the eastern side of the country experienced low prices while prices in the western and southern region were much higher (approximately 11 %).

11.6.2. Table 6 shows that price was lower in the eastern region including Gaborone and the surrounding areas. The price gradually increases in the eastern to the north eastern region, but it was highest in the northern region.

³¹ CA data collection, 2016 (Importers)

Table 6 shows retail price around the country (by region).

Table 6: Retail price across the country (by the region)

District	Areas	Region	BWP Price/Kg
Ghanzi	Ghanzi and surrounding	Western	19.48
Ngamiland	Maun and surrounding	North West	20.79
Chobe	Kasane and surrounding	North	21.95
Central and North East	Palapye and Francistown and their surrounding	North East	18.50
South East, Kgatleng and Kweneng	Gaborone and surrounding	Eastern	17.00
Southern	Kanye, Good Hope	Southern	18.00
Kgalagadi South	Tsabong and surrounding	South Western	19.80

Source: CA data collection, 2016

11.7. Regional market characteristics comparison

- 11.7.1. Regionally, there are common LPG importers, mostly originating from South Africa, for example, Afrox, EasiGas, and Total Gas. These exist in their own capacity or in partnership with local enterprises in different jurisdictions. Most of the supply of LPG in the region comes from South Africa.
- 11.7.2. In terms of regulation, almost all countries in the region are either at the commencement or a semi-regulatory stage. The only fully established LPG regulated market is South Africa.
- 11.7.3. Business practices in the region are similar, whereby cross filling and cylinder hoarding are not prominent. Cross filling will rarely occur subject to expressed consent by cylinder owner.
- 11.7.4. With such homogeneity of market characteristics, the only pertinent variable will be transport costs. Therefore, if a country is much further than the primary supplier (South Africa) and has average prices that are lower than in Botswana, then there is a reasonable indication of excessive pricing in Botswana. Please refer to table 7.

Table 7: Regional market characteristics comparison

QUESTION	ZIMBABWE	NAMIBIA	ZAMBIA	SOUTH AFRICA
Is LPG being regulated	The LPG is a fairly new market and it is regulated	Not regulated	The market is partially regulated. The regulator does not have full powers over the market and therefore is not given full control over the market	The market is regulated by Department of Energy, and National Energy Regulator of South Africa
Who are the main players in the market	Zuva Petroleum, Quality Gas, Kensys Gas, Gas & Gear, Lindi/Afrox	Afrox, JJJ Trading, EasiGas, Central Gas	Linde/Afrox, Ogaz-Zambia, Cadac Zambia, Kulani Africa Gas, Oxyzam	Afrox, EasiGas, Oryx, Totalgaz, Top Gas, Wasaa, Reatile, Camel Fuels
Is there cross-filling of LPG cylinders	As many players came into the market, the cross filling practice faded away and in the current market set up, consumers are able to fill at any supplier except Linde/Afrox, which do not fill cylinders belonging to other companies	No cross-filling	Not allowed mainly for safety precautions	Cross-filling of cylinders is present in this market and it occurs within the confines of the law, which requires written consent prior to a wholesaler filling LPG cylinders of another wholesaler
Is there Cylinder Hoarding	There is no cylinder hoarding	There is cylinder hoarding	There is no cylinder hoarding, but the Energy Regulator is in the process of establishing an exchange pool to facilitate for cylinder exchangeability	Cylinder exchange exists in the market.

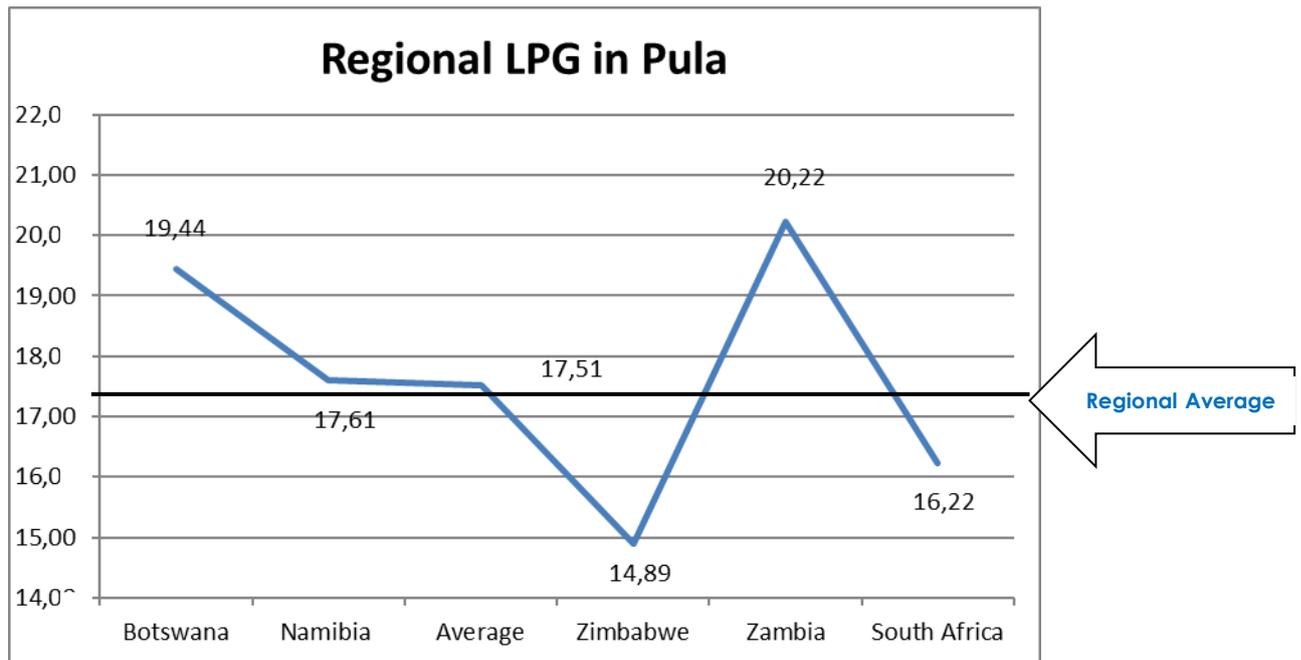
Source: CA data collection, 2016

11.8. Regional price comparison

11.8.1. Data used to compare regional price/kg was done Botswana, Namibia, South Africa, Zimbabwe and Zambia³². The prices were converted to Botswana Pula. Graph 1 shows that Botswana's price is higher than the regional average. The data shows that Botswana is the second most expensive country in the region after Zambia.

³² CA Botswana data collection from Ministry of Mines and Energy Namibia, Department of Energy, South Africa, Zimbabwe Energy Regulatory Authority and Oryx Energies and Afrox Gas Zambia.

Graph 2: Regional country comparison: LPG price in Pula/Kg



Source: CA data collection, 2016

11.9. Potential barriers (essential inputs (if any), start up costs)

11.9.1. There were noticeable differences in the barriers reported and they are subject to: firm levels on the supply value chain; and the area of operation (urban and rural).

11.10. Importers (urban areas)

11.10.1. With a firm concentration ratio of 94% at the importer level, one may infer that there are strong market structure operational barriers to entry (since regulatory barriers are very low). The two most prevalent barriers to entry, which were reported at importer level, were the initial capital investment, and securing a supplier of LPG in South Africa. The importers explained that starting up an LPG import business required land, storage equipment, vehicles for distribution, office buildings, cylinder canisters and trained staff. It is reported that, the initial capital investment required to set up a depot ranges between BWP4 – BWP6 million. To obtain gas and cylinder canisters requires approximately BWP20 - BWP26 million for a large scale operation, BWP10 – BWP15 million for a medium scale operation and BWP5 million for a smaller scale operation. The other barrier indicated was securing an LPG supplier in South Africa. It was indicated that because of the small size of the local market (Botswana), suppliers in South Africa were not very keen to do business with multiple customers from Botswana.

11.11. Distributors (both rural and urban areas)

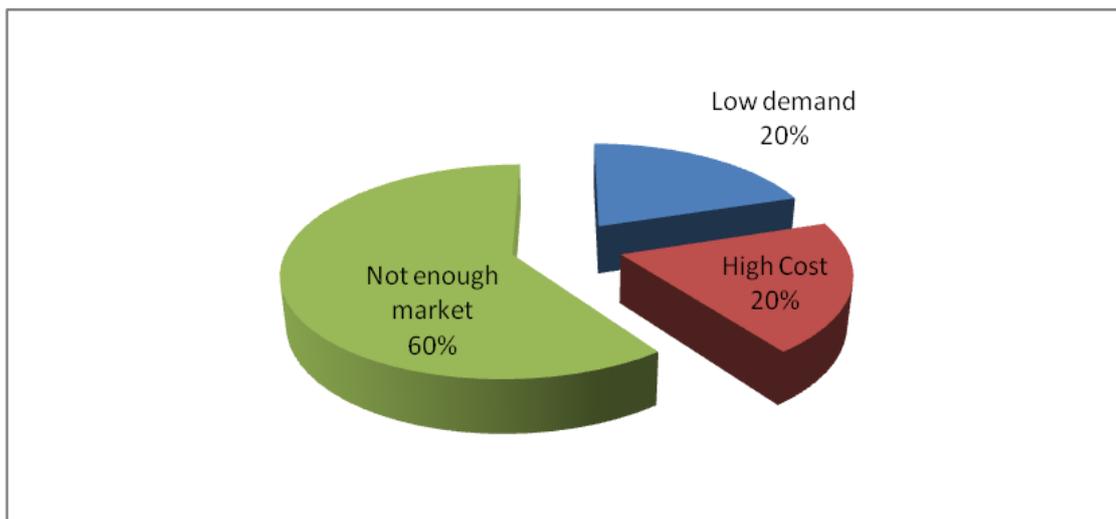
11.11.1. The pertinent barrier highlighted by most distributors was the inability to switch suppliers easily. Since with most local distribution depots, importers own the equipment, while the distributors provide the land. This arrangement has connotation of exclusive supply and may pose a risk of harm in the market. The sector is characterised by vertical integration. Since the importers own the equipment used by the distributors, and, in-turn 70% of the distributors own or are somehow affiliated with retailers' country wide, this could make market entry by new firms difficult, and could facilitate a culture of anti-competitive behaviour.

11.12. Retailers (rural areas)

11.12.1. Retailers in the rural areas indicated that lack of demand or market for LPG by consumers in the rural areas was the most pertinent market entry barrier. They further reported that the distance customers have to travel to reach points of sale was too much, and this discouraged prospective buyers (accessibility of LPG).

Chart 4 below shows barriers to entry as reported by potential LPG retailers in rural areas.

Chart 4: Rural retailers' barrier to entry



Source: CA data collection, 2016

11.12.2. Distributors reported market saturation in the urban areas, and almost all viable locations were occupied. This was cited as the main barrier to entry for new distributors.

12. Trade characteristics

- 12.1. The main import partner in this market is South Africa where 99% of LPG (bulk or cylinders) comes from. Data collected from Statistics Botswana suggests that approximately 17 600 metric tonnes of LPG, (valued at approximately BWP108 400 000) was imported in the year 2016.
- 12.2. Negligible quantities of LPG enter the market from United Arab Emirates, China, Hong Kong and Mozambique. Botswana and South Africa being members of the Southern African Customs Union (SACU), adhere to the Customs Unions policy on free trade. Therefore, no customs duties are imposed on the importation of LPG into Botswana from other members of SACU. The only levy imposed is Value Added Tax (VAT), currently at 12%. Transport cost is estimated at 6% of the truck load.
- 12.3. The importation unit costs as reported by the market stands at approximately BWP8.00/kg³³ (including transport). However, data from BURS shows that LPG comes into the country at a cost of BWP4.78/kg³⁴. This leaves a cost difference of P3.22/kg that is not accounted for. [REDACTED]
[REDACTED] The effect is felt along the supply value chain, since distributors are subsequently supplied at an average price of BWP13.50/kg. They then sell at an average of BWP19.44/kg (average mark up of BWP5.94/kg which translates to a mark-up of approximately 44%).

Cost price ratio (as reported by importers)³⁵

Total Cost	8.00	=	0.41
<hr/>	<hr/>		
Total Price	19.44		

Cost price ratio (BURS information)³⁶

Total Cost	4.78	=	0.25 (2015)
<hr/>	<hr/>		
Total Price	19.44		
Total Cost	6.22	=	0.32 (2016)
<hr/>	<hr/>		
Total Price	19.44		

³³ Submission by the importer to CA

³⁴ 2015 import figures by BURS show that LPG comes into the country at a cost of BWP 4.78 (\$ 0.47)/Kg. However, importers report that they import LPG at an average of BWP 8.00/Kg. [REDACTED]

³⁵ Cost price ratio basing on submission by importers to CA.

³⁶ Cost price ratio basing on what importers declare to BURS in the years 2015 and 2016.

Table 9: Imports

	Imports from country of origin (2016)			
Country of Origin	Quantity (Kg)	Quantity (%)	Value (BWP)	Value (%)
United Arab Emirates	300	0.00%	2 736	0.00%
China	466	0.00%	6 549	0.01%
Hong Kong	15 966	0.09%	622 768	0.74%
Mozambique	26 894	0.15%	249 417	0.30%
South Africa	17 449 336	99.75%	83 003 977	98.94%
	174 929 64		83 887 978	

Source: CA data collection, 2016

12.7. Re-exports to country of origin

12.7.1. LPG exports appear to be quantities that are re-exported back to South Africa. These may be damaged cylinders being returned to suppliers for repair.

Table 10: Re-exports to country of origin

Re-exports to country of origin (2016)				
Country of Origin	Quantity (Kg)	Quantity (%)	Value (BWP)	Value (%)
Namibia	95	48%	2 310	81%
South Africa	96	48%	386	14%
Zimbabwe	9	5%	140	5%
	200		2 836	

Source: CA data collection, 2016

Conclusion

- 12.8. The general licensing conditions (done by local councils) and lack of regulation (before formation of BERA) in this market created favourable conditions for possible numerous competition infringements. The concentration ratio, Herfindahl-Hirschman Index and Cost to Price ratios show an oligopolistic market that is characterised by low levels of competition. Through this study, the Authority would like to highlight the following possible harm on competition and the proposed remedies.
- 12.8.1. The practice of cylinder exchange provides a good platform for anti-competitive behaviour (e.g., hoarding). Practice such as cylinder exchange could potentially exacerbate collusion at distribution and retail levels.
- 12.8.2. Generally exclusive supply agreements between importers and distributors are long and this makes it difficult for new entrants (at distribution level) to venture into the market.
- 12.8.3. As the market expands, the shortcomings of cylinder exchange could be alleviated by cross filling. However, cross filling presents standard related risks, such as overfilling or under filling of cylinders through negligence or in attempts to cheat customers. Importers would face less accountability in terms of safety and standards, and this would require intense compliance monitoring by the regulatory body.
- 12.8.4. The cost and price structures in this market show possibilities of excessive pricing and resale price maintenance. The market structure and behaviour of enterprises along the supply value chain indicate possible prevalence of margin squeeze, as well as refusal to deal. There is need to ascertain the pervasiveness of these infringements in order to address or redress them accordingly.
- 12.8.5. Costs of imports declared at the border compared to submission to the Authority show some discrepancy. That is, the cost of product declared by importers at BURS/ border is completely different from the actual figure that they reported to the Authority. [REDACTED]

13. Recommendations

- 13.1. An investigation into the market to determine if there is prevalence of abuse of dominance by firms through margin squeeze, refusal to deal, and excessive pricing. Collusive practices such as market allocation and price fixing very much warrant an investigation.
- 13.2. There is need for assessment and monitoring of the contractual agreements between importers and distributors in order to ensure that agreements do not translate into any anti-competitive behaviour and or create entry or exit barriers.
- 13.3. There is need for regulation of cylinder exchange in order to maintain safety and minimise hoarding.
- 13.4. There is need to inform other relevant regulators about findings of the study that may impede on their Acts.

Stakeholders Contacted

LPG Importers	
EasiGas Botswana (PTY) Ltd	Gaborone
Simsa Gas Botswana	Palapye
Afrox Botswana	Gaborone
Air Liquide Botswana (PTY) Ltd	Gaborone
Quick Gas Botswana (PTY) Ltd	Pilane
Tswana Gas	Gaborone
LPG Distributors	
Lobatse Gas Supplies	Lobatse
Serule Gas	Serule
City Gas	Francistown
Nari Gas	Maun
Sefalana Cash and Carry	Tshabong
Simsa Gas t/a Shana Gas	Phakalane
Simsa Gas	Palapye
BC & LM	Kanye
BC & LM	Selebi-Phikwe
Mahalapye Aprox Distributor	Mahalapye
Vikings Gas	Maun
Sparks Electrical & Gas Works	Lobatse
Calvin Technologies	Mogoditshane
Retailers	
Eleven (11) interconnected retailers	Serule
Thirteen (13) Independent Retailers	Francistown
Regulators	
Botswana Unified Revenue Service	Gaborone
Botswana Bureau of Standards	Gaborone
Botswana Energy Regulatory Authority	Lobatse
Department of Energy	South Africa
Zimbabwe Energy Regulatory Authority	Zimbabwe
Ministry of Mines and Energy	Namibia
Other	
Botswana Power Corporation	Gaborone
Statistics Botswana	Gaborone
Oryx Energies	Zambia
Afrox Gas.	Zambia

Reference List

1. Botswana Bureau of Standards Catalogue April, 2017.
2. Competition Authority Data collection, country wide survey of LPG Importers, Distributors and Retailers 2016.
3. Competition Authority Botswana, 'Guidelines on Abuse of Dominance', 2013.
4. Competition Authority Botswana, 'Merger Assessment Guidelines', 2013.
5. Combs J, Kings College, 'Refusal to Supply, Essential Facilities and Margin Squeeze. Module 2 to 6. Economics for Competition Law', Kings College London. University of London. 2012-2013.
6. Dwivedi Dr. V. K, 'Household Energy Use for Lighting, Cooking and Heating in Botswana: The 2011 Population and Housing Census Perspectives, Botswana Population and Housing Census, 2011', University of Botswana.
7. Glynn D, 'Vertical Restraints and Cartels. Module 2 Unit 8. Economics for Competition Law'. Kings College, London. University of London. 2013-2014.
8. Government of Botswana, Botswana Energy Regulatory Authority Act, 2016.
9. Kerekang M, Operations Manager, Tswana Gas, interview 2016.
10. Lekaunyane K. J., Compulsory Standards Engineer: Mechanical, Botswana Bureau of Standards, interview 2016.
11. Lewanika N., Gaborone City councils and Francistown City Councils, interview 2016.
12. Mabipe M, Sales Manager, Afrox Botswana, interview 2016.
13. Mooketsane Mr. M., Botswana Power Cooperation (Gaborone), interview, 2016.
14. Motlaleng D, Principal Customs Officer, Botswana Unified Revenue Services, interview 2016.
15. OECD. Org, OECD glossary, 2016, <https://stats.oecd.org/glossary/>
16. OECD. Org, OECD glossary, 2016, <http://www.oecd.org/regreform/sectors/46048803.pdf>
17. Proctor M, Managing Director, EasiGas Botswana (PTY) Ltd, interview 2016/.
18. Singh Dr. R, 'The 2011 Population and Housing Census Perspectives, Botswana Population and Housing Census', 2011, UNDP & Statistics Botswana.

- 19.** Tautona M, Petroleum Product Tracing Specialists, Botswana Energy Regulatory Authority, 2017.
- 20.** Walker Dr. M. 'Market Power. Module 1 Unit 2. Economics for Competition Law'. Kings College London. University of London. 2013-2014.
- 21.** Milliamd Dr. M. 'Predation and Excessive Pricing. Module 2 unit 4. Economics for Competition Law'. Kings College London. University of London. 2013-2014.