STRATEGIES ADOPTED BY LIQUIFIED PETROLEUM GAS (LPG) COMPANIES TO DEAL WITH THE CHALLENGE OF CROSS-FILLING ACTIVITIES IN KENYA

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DECLARATION

I declare that this project is my original work and has not been submitted to any other university or institution of higher learning for examination purposes.

Sign: ………………………………. Date: ………………………

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D61/7300/2006

This project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I dedicate this work to husband Steven Mutuma, our daughter Jasmine Mutuma and unborn son Johari Mutuma for the sacrifice in terms of resources and time they made for me to complete this project. Their love, care, concern, support, encouragement and enthusiasm inspired me to achieve this goal.
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I take this opportunity to thank God for good health and for bringing me this far. I also want to extend special gratitude to my supervisor, for the great partnership we made. His guidance, encouragement and patience in reading, correcting, re-reading and refining this work is commendable.

I also thank my work colleagues and industry players for their invaluable insight into the LPG industry in Kenya.

Although it has not been possible to mention by name all those people that helped me in one way or another to make my work a success, to you all I say thank you and God Bless you abundantly.
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ACRONYMS

AGOL  - African Gas and Oil Company Limited
ERC  - Energy Regulatory Commission
KIPPPRA  - Kenya Institute for Public Policy Research and Analysis
KPC  - Kenya Pipeline Company
LPG  - Liquefied Petroleum Gas
PIEA  - Petroleum Institute of East Africa
RFID  - Radio Frequency Identification
ABSTRACT

The energy sector is considered a key enabler to achieving vision 2030 and LPG has been seen as a vital source of energy in response to growing concerns of urban air pollution and greenhouse gases. LPG is one of the few consumer products sold in a metal cylinder whereas in its distribution, many parties may handle this cylinder before it reaches the customer. Once the LPG cylinder is sold the cylinder owner may not have direct control over its subsequent use making it important to maintain the cylinder integrity throughout the distribution chain as an integral part of customer safety. However, some unscrupulous players elect to illegally fill the cylinders owned by others and pay little or no attention at all to the procedures for filling and handling LPG and related equipment. This exposes the cylinder owner to the risk that the misuse of the cylinder could result in injury, loss or damage to property ad loss of customer business which can expose the cylinder owner to severe liability claims, damage the reputation of the owner and that of the industry. This study sought to establish challenges, strategies and measures which have been taken to control cross-filling activities in the LPG market. The study collected data from the oil marketing companies which deal with LPG refilling in Kenya. The data was collected using semi-structured questionnaire and was analyzed using descriptive statistics. The study found that LPG companies face challenges such as loss of gas cylinders, cross filling, inability to trace movement of the cylinders, unfair competition from the illegal refillers who refill the gas cylinders at cheap prices, high costs of refilling, heavy taxation from the government, and safety threats to the end-users. Some strategies used to deal with the challenges include: use of self-sealing valves, RFID technologies to provide cylinder tracking solutions, frequent audits and monitoring of the licensed LPG dealers, assigning legal responsibility for cylinder maintenance and clear definition of the owners of the cylinders. Other measures taken to control cross-filling activities in the oil market are ban of cross-filling of different suppliers, registration of the companies that refill and inspect gas cylinders and enforcement of the penalties to companies using unsafe cylinders.
CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Organizations that engage in strategic management generally outperform those that do not. The attainment of an appropriate match or fit between an organization’s environment and its strategy, structure, and processes has positive effects on the organization’s performance. A firm cannot afford to follow intuitive strategies once it becomes large, has layers of management, or its environment changes substantially (Hunger & Wheelen, 2000). A host of external factors influence a firm’s choice of direction and action and ultimately its organizational structure and internal processes. These factors which constitute the external environment can be divided into three categories namely the remote environment, factors in the industry environment and factors in the operating environment (Pearce & Robinson, 1997).

It is possible to achieve one type of performance without the other, at least in the near term. A firm might reach its strategic goals without improving its financial condition by over-investing in its business activities or over-paying for incremental revenues. Financial goals can be met in such a way as to mortgage the firm's future through actions such as heavy quarter-end discounting, delaying maintenance expenditures, or limiting investments into new developments. Strategies are patterns of decisions that orchestrate an organization's activities and investments targeted at specific outcomes. A firm can have multiple strategies: one for customer retention, another for operational improvement, and another for development of its human resources, for example. Strategic management, during which an organization develops its strategies, begins with missions
and visions made tangible as firm-wide goals and objectives. After the firm's direction is set, strategic management proceeds through strategic analysis and planning, followed by implementation of the plans, concluding with evaluation of past results (Tim, 2006).

The global availability and popularity of LPG has driven widespread and increased usage resulted in it being used for the first time in many countries. The LPG consumption in Kenya has continued to grow over the years and has sent LPG companies on an expansion path as they seek to provide the commodity even to poor households leading to the mushrooming number of LPG companies. The number of LPG Marketers has more than doubled from the initial 8 LPG companies in 2009 to 22 LPG companies in 2012. Majority of the new entrants are local investors encouraged by the LPG draft Legal Notice No. 121 of 2009 that requires the industry to use unified cylinder valve established by the LPG exchange pool which means consumers can exchange gas cylinders with any brand thus increasing access.

Government incentives have also played a role in the growth of the industry for example LPG companies have enjoyed tax exemptions on the some of the fuel appliances since 2006. The ERC, the Ministry of Energy and other industry players have also worked closely to tackle various challenges that stand in the way of continued rapid growth of LPG consumption. One of the major challenges that the LPG companies are grappled with today is the cross filling activities. In order for these companies long term viability and achieve ongoing efficiencies within the industry, there is need for these LPG companies to adopt strategies to counter this challenge of cross-filling activities and enhance service to the consumer in terms of quality and cost.
1.1.1 Concept of Strategy

Management strategies have evolved from an early emphasis on planning to become a comprehensive management approach that helps organizations align organizational direction with organizational goals to accomplish strategic change. In one of the first works to discuss the use of management strategies in industry (Chandler, 1962, p.13) defined it as “the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals”.

Strategic planning must, in fact, be the backbone for management strategies. (Bryson, 1995) emphasizes planning when he suggests that organizations, in order to respond to the increasing turbulence and interconnectedness of their environments, must: think strategically; translate insights into the development of effective strategies to cope with changes; and develop the rationales which will enable them to adopt and implement their strategies. He argues that strategic planning is a mechanism which can help them achieve these objectives, however, management strategies do not consist of just planning and environmental analysis. While some, such as Porter (1980), have argued that environmental factors are the primary determinant of corporate strategy, others have increasingly insisted that an emphasis on aligning external and organizational factors is also important (Bartlett& Ghoshal, 1991). In other words, while planning and strategy are still considered to be the foundation of management strategies approaches, there has been a growing recognition that management strategies must also consider organizational structure, decision making processes, and management control systems.
(Steiss, 1985, p.1), for example, defined management strategies as the “process whereby goals and objectives are identified, policies are formulated, and strategies are selected in order to achieve the overall purposes or mission of an organization”. In this more contemporary view, management strategies includes all the activities that lead to the development of plans, actions and policies to accomplish the strategic objectives of an organization. In other words, management strategies are continuous process involving the “formulation and implementation of strategic plans, and the orchestration and carrying out of strategic activities of vital concern to the total organization” (Koteen, 1991, p. 21).

1.1.2 Cross-filling Activities

The global availability and popularity of LPG has made it a convenient, clean and highly efficient fuel and is used in many different applications in countries all over. Industry players in Kenya are investing strategically to tap into emerging opportunities in the LPG business as the region enters a new growth phase. One of the most destructive practices in the LPG business and in the distribution chain is the cross-filling of cylinders which entails someone else other than the authorized LPG cylinder owner illegally filling and using without permission the LPG cylinder owner. These illegally filled cylinders are a major threat to a company as these branded cylinders are issued into the market with no control over the cylinder condition (cylinders are due for recertification every eight years), the quality of LPG or the quantity of the product in the cylinder. In the event of an incident, the blame will unfairly come back to the authorized owner of the cylinder because the cross-filler may be difficult to trace. Cross-filling happens because barriers to entry into the LPG business are achievable (currently, only 5,000 cylinders are required for one to be registered as an LPG marketing company), these so called cross fillers do
have licenses to operate the LPG business, ERC has not been able to carry out regular inspection of facilities licensed in dealing with LPG, most of these cross-fillers have access to cheap bulk LPG imports compared to the genuine LPG marketers and the lack of awareness by the public as most of the customers may be unaware of the fact that they are buying illegally filled cylinders and other see it as an opportunity for buying cheaper product (World Bank, 2011).

Cross-filling can be prevented by having more powers given to the LPG Exchange pool, LPG companies investing in designs that make it difficult to cross fill for example investing in RFID based LPG tracking and management solutions, self-sealing valves/security seals, generating a concerted approach with the whole industry, frequent audits and monitoring for licensed LPG dealers, LPG costs coming down, clear definition of cylinder ownership; assignment of legal responsibility for cylinder maintenance, repair, and replacement; effective enforcement of the ban on cross-filling of cylinders by different suppliers where such a ban exists; proper training of operators throughout the supply chain; establishment of a registry of certified installers and inspectors; extensive education campaigns for end-users; and penalties for companies that refill unsafe cylinders and having an independent compliance inspector to inspect sites, premises and facilities where LPG business is carried out for compliance and capital requirements should not be easily achievable (Masami, 2011).

1.1.3 The LPG Industry in Kenya

LPG is a flammable mixture of hydrocarbon gases used as a fuel in heating appliances and vehicles. LPG is synthesized by refining petroleum or wet natural gas and is almost
derived entirely from fossil fuel. LPG is one of the most common alternative fuels used in the world today. In Kenya, there are currently 22 companies who are in the LPG market as at September 2012. LPG has been viewed as the ideal product that could replace the heavy use of wood. Presently, the demand as estimated by the government is double the annual consumption level of 30,000 metric tonnes (KIPRA, 2009). The satisfaction of this demand depends on the availability of an import handling and loading facility at the port in Mombasa because there is at present no capacity for such quantities but there are plans underway in Miritini in Mombasa with the AGOL project that is an upcoming LPG and oil products handling company that seeks to revolutionize supply of LPG in Kenya and the entire East African Region. LPG if made affordable, readily available and have sufficient quantities for use in Kenya, it has the advantage of being not only more environmentally friendly but is far more efficient than wood extracted fuels. Already, cooking gas is widely used in urban Kenya within households but has thus far not been characterized or conceived as an affordable alternative to wood fuel (KPC, 2006).

Use of LPG has also been constrained by the initial cost of acquiring equipment such as the cookers and gas cylinders. On their own, such equipment is not inordinately expensive but the modest use is due to the heavy taxation on the equipment itself. For instance, as at April 2000, about 30% of the total cost of the simplest equipment was comprised of direct taxation by the government. Impliedly, if the government could moderate the tax, then the immediate result would be that more Kenyans would be able to afford the equipment and eschew the use of wood fuel or charcoal (Onuonga, 2008). Though the cylinders are exempt from duty, the reduction of the tax could result in the increased use of the more efficient LPG with lots of spillover effects. As a policy issue,
the orientation of the government towards revenue generation from the equipment serves to hinder the acquisition and use of that equipment altogether. This is because it reduces substantially the amounts that could be raised if a more progressive approach were adopted. Government must therefore adopt an approach that encourages the acquisition of facilities such as cookers and regulators that enable Kenyans to use LPG by the removal of the tax impediment (KPC, 2006).

In addition, one of the key highlights of the Legal Notice No. 121, 2009 was the establishment of the LPG cylinder exchange pool which is charged with regulating the exchange of LPG cylinders among LPG companies after implementation of the universal cylinder valve. Independent LPG marketers who mooted the universal valve idea view the implementation as a major milestone in the LPG industry as it has thus encouraged fair competition and has not compelled consumers to purchase separate regulators as members of the LPG exchange pool have to standardize their valves (The Energy Act, 2006). LPG marketing companies in Kenya do insist that cylinders are potentially dangerous hence each company should take responsibility for the cylinders that bear its brand name. Taken forward, the argument implies that it would be difficult to determine responsibility for defects in the equipment where all retailers stocked a standardized form of cylinders. It is also contended that where standardization has been attempted, the effects were judged as too modest to justify the costs contingent to the imposition of standardization (KPC, 2006).
1.2 Research Problem

As Kenya aspires to be a middle income economy as envisaged in Vision 2030, it faces an enormous task of meeting energy needs due to the high expectations in growth to power the economy. The country therefore needs to come up with strategies and investment plans to secure sustainable supply of energy to meet the growing demand. The energy sector is considered a key enabler to achieving vision 2030. Electricity, petroleum and renewable energy are the most potential sub sectors. Even though wood fuels are the most consumed fuels in Kenya, petroleum and electricity are the most dominating fuels in the commercial sector. Other major energy consumption sectors apart from commercial sector, are transport, manufacturing and residential sectors (KIPPRA, 2010).

Cross filling activities results in no control over cylinder condition, no control over the quality and quantity of product, serious risk of damage and injury from leaking cylinders, injury and damage compensation claims difficult to process, inequitable and unhealthy competition, industry reputation being threatened and assets are degraded. Not having safety standards and the required legal muscle to enforce, poses a safety threat to customers. Additionally it creates conditions conducive to unfair competition. It may even direct the growth in the LPG industry to more or less chaotic situations with competitors cutting corners on safety in order to save costs. With any third party filling cylinders owned by a particular company there is no guarantee that the cylinder has been properly maintained, inspected for leaks, checked for re-qualification date and checked to determine the condition of the valve. There is no guarantee that the cylinder has been
filled to the correct quantity. An independent LPG regulator is imperative if one is to foster and promote a level playing field and thus attract health competition and growth in the LPG industry. Absence of an independent LPG regulator has resulted in there being no formal mechanism to bind competitors to adhere to industry safety standards, facilitate government- industry liaison and address issues of pricing. Absence of proper impact assessment of new regulations can most clearly be seen through the consumer affairs Authority directive on cross filing. These concerns measure the investment climate for new entrants into the LPG industry in the country and should therefore be resolved urgently.

Previous studies done in Kenya on energy consumption were dismal in explaining the strategies adopted by the LPG firms to deal with the challenge of cross filling activities in Kenya. For example Kahira, (2006) in a study on the strategic responses of petroleum importing and marketing companies in Kenya, found out that major environmental factors have impacted the industry and it was imperative that they respond accordingly with key strategies. Otieno, (2006) concluded in a study on strategic implementation by major petroleum companies in Kenya, that the industry was constantly adopting strategies that fit with the environmental changes which included marketing mix elements, product differentiation and new technologies. A study by Ochieng (2006) investigated the capacity management strategies: the case of KQ. Onserio, (2001) did a study on the operations strategies applied for the competitiveness of Kenyan large manufacturing firms.

There is no known study which has ever been done on the strategies adopted by the LPG marketing companies to deal with the challenge of cross-filling activities in the Kenyan
industry. It was against this background that this study was done to fill this gap in knowledge. This study sought to answer the questions; what cross-filling challenges are faced by LPG companies in Kenya, what strategies are adopted by LPG companies in dealing with challenges of cross-filling activities and what measures taken by LPG companies to minimize the practice of cross-filling activities?

1.3 Objectives of the Study

The objectives of this study were:

i. To establish the cross-filling challenges faced by LPG companies in Kenya.

ii. To determine the strategies adopted by LPG companies in dealing with challenges of cross-filling activities.

iii. To determine the measures taken by LPG companies to minimize the practice of cross-filling activities

1.4 Value of the Study

This study will add to the existing knowledge to a variety of stakeholders. These include the government, the ERC, the LPG marketing companies, Stakeholders and the scholars. To the ministry of finance and ERC, the study will provide useful information on the effect of the taxes, tariffs and policies on the market dynamics of the LPG product. This will help the in making sound polices which promote use of LPG in Kenya.

The findings of this study will highlight the most effective strategies used by the LPG marketing companies in Kenya to cross filling activities. This will be useful to the decision makers in the LPG companies in making their strategies. These LPG marketing companies will get helpful information on the marketing industry of the LPG industry
and will go a long way in helping them come up with policies which promote the industry and help to penetrate to the rural areas.

To the scholars this study will add value to the existing body of information on the LPG industry and act as future reference for scholars and academicians.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter covers the literature review on the concept of strategy, strategic management theories which include classical approach, human resource, quantitative approach, systems perspective, contingency approach and information technology approach. The literature also deeply covers environmental challenges facing firms, organizational strategy and the adaptation theory which cements the firm’s approaches and reactions to environmental challenges.

2.2 Concept of Strategy and Strategic Management

All organizations operate within an environment that influences its business operations positively or negatively depending on the nature of its business. Within the environment of the firm, there are many stakeholders that include clients and competitors. Many firms formulate strategies that help them meet the requirements of the stakeholders. Every organization has competitors who influence strategy process and consequently determine the organization’s purpose that result in terms of its achievement. The extent to which organizations competitors are interested in or are able to influence an organization’s purposes vary and their different powers and interests underscores these various variations. The survival and success of an organization is only possible when the organization creates and maintains a match between its strategy and the environment, and also between its internal capability and the strategy. The environment is not only dynamic but also turbulent, discontinuous and unpredictable (Grant, 2000).
Strategy is the unifying theme that gives coherence and direction to the decisions of an organization, while strategic management consists of the analysis, decisions, and actions an organization undertakes in order to create and sustain competitive advantages. Not until very large companies with the ability to influence the competitive environment within their industries did strategic thinking in the business world begin to be articulated. Strategy can help achieve success, but it doesn’t guarantee it—certain features of strategy directly contribute to success: i.e. goals that are simple, consistent, and long-term profound understanding of the competitive environment, objective appraisal of resources and effective implementation (Weick, 1979).

2.2.1 Concept of Strategy

Boyne and Walker (2004) present a model that conceptualizes strategy content in the public sector at two levels. First, *strategic stance* is the broad way in which an organization seeks to maintain or improve its performance. This level of strategy is relatively enduring and unlikely to change substantially in the short term (Zajac & Shortell, 1989). A broad range of management research supports this contention. For example, the literature on population ecology argues that structure and overall approach are set when an organization is established (Hannan & Freeman, 1977), and a range of evidence indicates that organizations are relatively inert. Once routines are established, they are difficult to change (Amburgey, Kelly & Barnett, 1993). The second level of strategy comprises the specific steps that an organization takes to operationalize its stance.
However, these strategic actions are more likely to change in the short term (Fox-Wolffgramm, Boal & Hunt, 1998). Together, stance and actions constitute an organization’s strategy content. The concept of strategy content refers to how organizations actually behave, in contrast to strategies that are merely rhetorical or intended but unrealized.

2.2.2 Concept of Strategic Management

The field of strategic management has rapidly evolved during the last four to five decades. In a general context, the focus of the field has rapidly moved from the initial financial budgeting in late 50s, towards the phenomena of globalization and the learning organization at present. In 60s, strategic management was more about corporate planning, and therefore about the formalization of the planning process. In 70s, market positioning became a core issue for companies facing greater competence in rapidly growing economies, thus studies and theories back then did broadly focus on market dynamics. A decade later, the focus shifted towards the analysis of acquisition and development of resources and capabilities in firms, and on the probably most common concept in contemporary management, the concept of competitive advantage. Since the year 2000, strategy management has broadly focused on the advent of a new economy supported by the increasing role of knowledge and communications (technology) in businesses, and therefore it has focused in issues such as innovation and technology change (Barney, 1995).

Today, French (2008) suggests, the focus is globalization underlines issues such as business ethics, standardization, international markets, and on what managers calls the global-scale strategies. Therefore, one can say that along the development of Strategic
management as a field of research and practice, its focus has move from specific intra-firm issues towards the broad and complex dynamics of systems beyond the organizational boundaries.

2.2.2.1. Strategic Management Theory

Strategic management is the process and approach of specifying an organization’s objectives, developing policies and plans to achieve and attain these objectives, and allocating resources so as to implement the policies and plans. In other words, strategic management can be seen as a combination of strategy formulation, implementation and evaluation (David, 2005). Based on the management theory it could be observed that the strategic management theories stem mainly from the systems perspective, contingency approach and information technology approach. In light of this background, following David & Mohd, (2005), among the common strategic management theories noted and applicable are the profit-maximizing and competition-based theory, the resource-based theory, the survival-based theory, the human resource based theory, the agency theory and the contingency theory. The profit-maximizing and competition-based theory, which was based on the notion that business organization main objective is to maximize long term profit and developing sustainable competitive advantage over competitive rivals in the external market place.

The industrial-organization (I/O) perspective is the basis of this theory as it views the organization external market positioning as the critical factor for attaining and sustaining competitive advantage, or in other words, the traditional I/O perspective offered strategic management a systematic model for assessing competition within an industry (Porter,
1981). On the other hand, the resource-based theory which stems from the principle that the source of firms competitive advantage lies in their internal resources, as opposed to their positioning in the external environment. That is rather than simply evaluating environmental opportunities and threats in conducting business, competitive advantage depends on the unique resources and capabilities that a firm possesses (Barney, 1995). The resource-based view of the firm predicts that certain types of resources owned and controlled by firms have the potential and promise to generate competitive advantage and eventually superior firm performance (Ainuddin et al., 2007).

However, the survival-based theory centers on the concept that organization need to continuously adapt to its competitive environment in order to survive. This differs to the human resource-based theory, which emphasizes the importance of the human element in the strategy development of organizations. In addition, the agency theory stresses the underlying important relationship between the shareholders or owners and the agents or managers in ensuring the success of the organizations. Finally, the contingency theory draws the idea that there is no one or single best way or approach to manage organizations. Organizations should then develop managerial strategy based on the situation and condition they are experiencing. In short, during the process of strategy formulation, implementation and evaluation, these main strategic management theories will be applicable to management of organization as tools to assist them in making strategic and guided managerial decision. These strategic management theories can best be depicted (Boyne, 2003).
2.3 Organizations and the Environment

The industrial market sector is made up of a few very large customers with large on-site storage capable of receiving full road tanker loads of LPG. These customers tend to see LPG purely as an energy source and as such are extremely price sensitive. This market has seen rapid growth over the last 12-18 months consistent with high prices for competing fuels such as fuel oil/diesel. LPG must compete either on price or some form of “clean fuel” advantage. Typically the customers are located in the North Island away from the natural gas pipeline network or in the South Island where they have a specific process need for a clean gaseous fuel. From a LPG producers perspective, these customers tend to prefer butane and that helps provide some balance to the increasing demand for propane from domestic customers. Current industrial demand is estimated to be 10% of total demand and the forecast for this sector again assumes static to negative growth at current oil prices (Bryson, 1995).

The commercial market sector includes hotels, restaurants, forklift operators and a wide variety of other users who typically receive their LPG in cylinders or may have a small bulk tank on-site. It also includes those customers who receive their LPG via a reticulated LPG or LPG/Air system. Several new LPG reticulation systems are being installed. These systems will add demand especially in the more heavily populated urban areas where town-planning restrictions may have previously prevented other forms of LPG storage. Customers in this sector tend to prefer propane for its ease of use and consistent properties rather than LPG mix or butane and are typically price sensitive. The main competing fuels are electricity and diesel. Recent increases in retail electricity prices are likely to have a positive impact on LPG demand (Meier, et al, 2002).
Domestic propane pricing is also likely to increase in the future to be more line with the LPG producers export opportunities and this may have a negative impact on potential demand growth. Current demand in this sector is estimated to be 30% of total with future demand forecast to keep pace with general growth rates in the domestic economy. The domestic/residential market which again comprises a very wide range of customer types ranging from the lower socio-economic households using 3 kg cylinders in cheap but effective portable cylinders, through to the more high tech customers with the latest remote controlled heating systems. The 3 kg-cylinder market developed as the automotive sales volumes declined with the cylinders normally being filled at the service station forecourt. This market is now seen as starting to mature. New customers in this sector also tend to purchase 13 kg cylinders and rely on a local distributor to supply and as demand requires.

Demand in this sector is becoming more seasonal consistent with the rapid growth in installed capacity. As in the commercial sector, the domestic/residential customers tend to prefer propane however the “high end” users are not as price sensitive and once they have chosen to install LPG heating/cooking systems would find it difficult to change energy forms at short notice. The main competing fuel in this sector is electricity and again the recent increases in electricity prices should have a positive impact on longer-term LPG demand. LPG’s clean burning properties may provide further opportunities for future demand growth. As an example, Christchurch’s Clean Air campaign may require existing wood and coal burning fires to be replaced in the near future with either LPG or electric fuelled heaters. Current demand in this sector is estimated to be 40% of total demand. This sector has the highest growth rate of any of the four sectors considered,
however the significant seasonal demand swings can make year on year comparisons difficult (Jacobs, 1974).

2.4 Environmental Challenges

Companies today are faced with a host of issues, which may cripple their functionality, or in some extreme cases render the organizations obsolete. These challenges are dependent on the nature of operations of the company but broadly, there are common challenges, which are faced by a majority of organizations. Technological advancements today are on the increase more than in the previous century. For an organization to offer services, which are relevant, cost effective and compatible with society's needs, modern technology has to be employed. The initial cost of acquiring it, maintaining and running operations using the acquired technology is inhibitive. This is worsened by the short lifespan of most technological innovation which imply that companies and or organizations have to reinvest in current technology frequently so as to sustain their relevance (Sethi, 1979).

Considering that today’s environment consists of the people, who are the recipients of a firm's services or goods, the fast changing nature of peoples likes, dislikes, preferences, opinions and lifestyles is thus a challenge facing organizations. Generational gaps have created a difficulty in determining consumer behaviors, yet most companies are investing heavily in customer behavior analysis to determine the most appropriate way of matching a customers’ needs. Coupled with competition, (both fair and unfair) the challenge of making profit has been pushed to only the top notch large scale organizations. Unstable economies and currencies are another factor causing constant instability in the running of corporations. This has of late been caused by other external factors such as exchange
rates, amount of exports and imports and political factors. There has been a relatively high incidence of economic instability in the recent past. Albeit, national economies are recovering from a global economic meltdown today, most organizations have been negatively affected by the meltdown leading to massive layoffs. Frauds and cases of fraudulent or questionable business operations and agreements have been on the increase in the recent past. The custodians of an organizations policy are increasingly bending the organizations guidelines creating loopholes in various systems. This has led to heavier investments in more secure operational systems, to avoid loses created by those who are meant to safeguard it. It is worthy to note that this has led to more stringent recruitment procedures, which attempt to assess the risk a company invites once it employs an individual. This trend is upcoming and most organizations are grappling with it today. In essence, factors both within and outside the corporation's environment are continually impacting negatively on the success hence there is need for more efforts to be applied if organizations are to meet their aim (Sharma et al., 1994).

2.5 Organizational Strategy and the Environment

One of the most pervasive and central arguments in recent treatments of organizational adaptation concerns whether it is managerially or environmentally derived (Astley & Vande Ven, 1983). At issue is a view of adaptation as a process reflecting choice and selection versus one in which it is a necessary reaction to peremptory environmental forces (Aldrich, 1979). In analogous terms, the issue is one of the prepotency of voluntarism or external determinism n the strategic change process (Hannan & Freeman, 1977). The present paper argues that classifying change as either organizationally or environmentally determined as misleading and diverts research inquiry away from the
critical interactive nature of organization-environment relationships in the adaptation process.

2.5.1 Adaptation

Astley and Van de Ven's (1983) recent exhaustive review suggests a major difference in current theory between a deterministic and a voluntaristic orientation in theories of organizational adaptation. One of the dimensions in their typology is a continuum ranging from determinism to voluntarism, which is divided to place major schools of organizational analysis into two mutually exclusive categories. While their placement of schools of analysis in one category or the other is intended solely to classify them, it clearly implies the either-or nature of the debate on the prepotency of voluntarism or determinism. Major approaches to the issue of strategic change or adaptation emphasize mutually exclusive and different ends of what is really a single continuum.

A related implication in the existing literature is the assumption that a binary distinction between choice and determinism captures the reality of organizational behavior and change. As popular and intuitively pleasing as these categories may be, a reliance on one or the other directs attention away from the fact that both are essential to an accurate description of organizational adaptation with individual interpretations of them, and the resultant decisions or actions. (Astley & Van de Ven 1983, p. 267), for example, concluded that the interesting research questions about complex organizations would one, admit to both deterministic and voluntaristic views and two, juxtapose those views to study their interactions and reciprocal interdependence over time. The same view is expressed by Weick (1979), who argued that construction of mutually exclusive categories, reliance on unidirectional causation, and focusing on origins and terminations
of variables such as "choice" are problematic and distorting for theorist and practitioner alike.

What is critical is the ability to "think in circles" (Weick, 1979: 52), to investigate the process of interaction or mutual causation, as a reciprocal relationship between two sets of variables unfolds. The important research issue of voluntarism versus determinism is the relationship between them and how their interactions and resultant tensions culminate in changes over time. The issue is how choice is both a cause and a consequence of environmental influences, as cause and consequence interact and conflict to result in noticeable organizational adaptations. A similar view is expressed in studies on power (Pfeffer and Salancik, 1978; Pfeffer, 1981), in which the underlying dependencies or relative vulnerabilities of organization and environment interact to create tensions and produce both organizational and environmental change. The implicit power model is one of influence and countervailing power, and the relative power of organization and environment, i.e., external stakeholders, over time is the key to explaining the prepotency of choice or determinism in the adaptation process. If high organizational power suggests greater choice, while higher power of stakeholders results in greater environmental determinism, the occasion of a powerful organization confronting equally powerful stakeholders indicates that high choice and high determinism may coexist.

Following the advice of Astley and Van de Ven (1983), Weick (1979), and others Jacobs, (1974), it is argued that: one, choice and determinism are not at opposite ends of a single continuum of effect but in reality represent two independent variables, and two, the interaction or interdependence of the two must be studied to explain organizational behavior which develops a typology of strategic decision making that facilitates the study
of the interactions between voluntarism and determinism. It also allows for a needed integration of the diverse and disparate literatures in organization theory, management, and economics, which currently focus on the prepotency either of choice or environmental determinism in the adaptation process.

2.5.2 Typology of Adaptation

The present argument is that organizational choice and environmental determinism can be positioned as independent variables in the adaptation process. Individuals and their institutions can choose in decision-making circumstances; they can construct, eliminate, or redefine their objectives. The term "adaptation "in the current literature is employed in a number of ways, ranging simply from" change, “including both proactive and reactive behavior (Mile & Snow, 1978), to a more specific denotation of "reaction “to environmental forces or demands (Astley & Van de Ven, 1983). The usage in this paper is more consistent with the former meaning, indicating change that obtains as a result of aligning organizational capabilities with environmental contingencies (Hrebiniak & Joyce, 1984). This view allows for proactive or reactive organizational behavior in, anticipation of or reaction to exogenous variables.

Organizational adaptation environment, thereby purposively creating their own measures of reality and delimiting their own decisions (Child, 1972; Weick, 1979). On the other hand, discernible features of the actual environment are also important; structural characteristics of industries or domains and various niches clearly exist, some of which are intractable to control by individuals and their organizations. At times the effects of these are peremptory (Hannan & Freeman, 1977; Aldrich, 1979; Porter, 1980); at other times they must at least be considered in the strategic decisions of organizations. Using
two separate, independent factors emphasizes that choice and determinism must interact or coalesce to define a causal fabric or context either nurturant of any given organizational variation or hostile to it (Emery and Trist, 1965). This approach follows logically from the open-systems theory of organizations (Bertalanffy, 1968).

An open system tends toward a state of dynamic equilibrium with its environment through the continuous exchange of materials, data, and energy. Both the system and its environment can affect this process of exchange and transformation, suggesting their independence and the importance of their interactive effects. More importantly, open systems are characterized by equifinality, that is, the same outcomes can be achieved in multiple ways, with different resources, diverse transformation processes, and various methods or means. Even if it is assumed that the environment of an open system is highly deterministic, controlling fully and precisely the ends or outcomes that are tolerated, organizational choice is still possible, due to the control over and selection of the means by which the prescribed outcomes may be achieved. Even in the most constraining and debilitating case of environmental determinism, equifinality indicates that organizational choice nonetheless exists as a separate, independent variable important to the development of a dynamic equilibrium with the external environment. Choice, then, can be separated from environmental determinism in a logical way, as a necessary defining characteristic of the organization as an open system.
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction
This chapter sets out the nature of the research design, the population of the study, the data collection techniques and data analysis method.

3.2 Research Design
The study adopted a descriptive research design. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 1984). This design is most appropriate since the aim of the study is to describe the current situation of the phenomenon of the study. This research design aided in making comparison of the strategies being used by the 22 LPG companies in Kenya to deal with the challenges of cross-filling activities.

3.3 Population of the Study
Mugenda and Mugenda (2003) describe population as, the entire group of individuals or items under consideration in any field of inquiry and have a common attribute. The population of this study was all the 22 LPG companies operating in Kenya. The reason for this is that it provided the most reliable picture of the strategies adopted by the LPG companies in Kenya to deal with the challenge of cross-filing activities.

3.4 Data Collection
Data collected was both from primary and secondary sources. Primary data was collected using a structured questionnaire framed to collect data from top management with supporting functional lines in operations, supply and planning, sales and marketing, finance and procurement in each of the twenty two LPG companies in Kenya. The
quantitative data was collected using the closed ended questions in the questionnaire while qualitative data was gotten from open ended questions. The questionnaire was divided into different sections. Section A collected general data. Section B touched on challenges and deals with supply and planning, operations and procurement. Section C collected data on the strategies adopted by the LPG companies and touches on the sales and marketing, finance and procurement functions. The last section D collected data on the measures being taken by the LPG companies to deal with the cross-filling activities.

The study collected data from these different business functions as to ensure correlation of information and are the helm of strategy formulation. The secondary data was obtained from the Petroleum Institute of East Africa and the LPG Exchange pool of Kenya articles and journals.

3.5 Data Analysis

Quantitative data was analysed using descriptive statistics. Inferential statistics such as correlations and multiple regressions were also done to determine how the variables relate with each other and the effect of the predictor variables on the dependent variable. The findings were presented in tables, figures, and pie charts. The qualitative data on the other hand was analysed using content analysis. The statements were read, collated and organised into meaningful statements and put in prose form.
CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the data findings of the study. The chapter presents the data analysis on the general information on the characteristics, profitability of the LPG companies, Challenges facing refilling of gas cylinders, strategies adopted by the LPG companies and measures which have been taken to deal with cross-filling in the LPG industry.

4.2 General Information

4.2.1 Name and services of the companies

The study collected data from several companies such as Addax Kenya Limited, Boc Gases, Hunkar Trading Co.Ltd, Kenolkobil Ltd, Kenya Shell Limited, Libya Oil Kenya Limited, National Oil Corporation Of Kenya, Pan African Petroleum Ltd, Total Kenya Limited, Quality Gas, Megtraco Ltd and Midland Energy Ltd. The study established some of the products and services offered by the companies include crude and refined petroleum products which include motor fuels, industrial oils, LPG, aviation fuels, lubricants and various other specialist oils.

4.2.2 Duration of the company

The study establishes that the Oil companies were established at different times as shown in figure 4.1.
The findings contained in figure 4.1 shows the duration of time the companies have been in operation. From the findings, majority (73.6%) were established about 6-10 years ago. About 23.4% of the companies were established more than 10 years ago while 3% were established less than 5 years ago.

4.3 Profitability of the LPG Companies

Profits are the major driving motives of a profit-making organization. Managers make the effort to ensure that their organizations make profits even under very competitive times. The study collected data on the profitability of the LPG companies. The results are shown in figure 4.2.
The findings contained in figure 4.2 shows that LPG is highly profitable in majority of the companies (64%). The sale of LPG is moderately profitable in 18% of the companies. Further the study established that 14% of the companies were less profitable. However, 4% of the companies cited that sale of LPG was unprofitable. This indicates that LPG is highly profitable to most of the oil companies.

4.4 Challenges Facing LPG Companies

The respondents were requested to provide information on the challenges which companies were facing when distributing and selling LPG. The data was collected using a five-point likert scale. Where 1 represents strongly disagree, 2 disagree, 3 neutral, 4 agree and 5 strongly agree. The data was analyzed using mean and standard deviation. Those variables which had a mean close to 4.0 represents ‘agree’, those which had a mean close to 3.0 represents ‘neutral’ and those which had a mean close to 2.0 represents ‘disagree’. Standard deviation was used to measure the extent of dispersion so as to know whether there was consensus.
Table 4.1 Challenges Facing LPG Companies

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of gas cylinders</td>
<td>3.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Pirate filling</td>
<td>4.3</td>
<td>0.7</td>
</tr>
<tr>
<td>Inability to trace the movement of your gas cylinders</td>
<td>4.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Lack of regular inspection by the ERC</td>
<td>3.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Illegal gas refillers are cheaper than yours because of existence of black markets</td>
<td>3.7</td>
<td>0.4</td>
</tr>
<tr>
<td>High costs of LPG refilling</td>
<td>4.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Lack of storage facilities</td>
<td>3.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Inadequate skills of the staff of the companies.</td>
<td>3.2</td>
<td>0.7</td>
</tr>
<tr>
<td>Heavy taxation by the government</td>
<td>3.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Destruction of company reputation</td>
<td>3.4</td>
<td>0.9</td>
</tr>
<tr>
<td>Unfair competition</td>
<td>3.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Safety threat to customers</td>
<td>4.2</td>
<td>0.7</td>
</tr>
</tbody>
</table>

The information contained in table 4.1 shows the findings on the challenges facing those companies which sale LPG. From the table, the LPG companies experience loss of gas cylinders (M=3.8). There is also a problem of pirate filling (M=4.3) which reduces the profits of the genuine LPG companies. The distribution framework of the LPG has also made the LPG companies unable to trace the movement of gas cylinder (M=4.1). The LPG companies also suffer the setback of losses since the illegal gas refillers are cheaper than their cylinders (M=3.7) given that their costs of refilling are very high (M=4.3).
Other challenges facing LPG companies include heavy taxation by the government (M=3.7) and low safety (M=4.2) of the customers due to the unsafe illegal refilling. The study established further that challenges such as lack of storage facilities (M=3.1), inadequate skills of the staff (M=3.2), unfair competition and destruction of company reputation and image affected the LPG companies.

4.5 Strategies Adopted by the LPG Companies

In order to improve their profitability, companies adopt some strategies to deal with the challenges they meet in the market. The study sought to establish the strategies which LPG companies have adopted to deal with the problem. The data was collected using a five-point. Mean and standard deviation were used to analyse the data. According to the scale those variables which got a mean of 4.0 were rated to a ‘great extent’, those which had a mean of 3.0 were rated as ‘moderate extent’ and those which had a mean close to 2.0 were rated to a low extent.

Table 4.2 Strategies Adopted by the LPG

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of self-sealing valves/security seals</td>
<td>4.4</td>
<td>0.8</td>
</tr>
<tr>
<td>Frequent audits and monitoring for licensed LPG dealers</td>
<td>4.2</td>
<td>0.7</td>
</tr>
<tr>
<td>Clear definition of cylinder ownership</td>
<td>4.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Training of the staff</td>
<td>3.4</td>
<td>0.9</td>
</tr>
<tr>
<td>Assignment of legal responsibility for cylinder maintenance</td>
<td>3.8</td>
<td>1.0</td>
</tr>
<tr>
<td>Use of unique gas cylinders</td>
<td>4.3</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Table 4.2 shows the strategies the LPG companies have adopted to deal with the problem of illegal filing in the market. From the findings, the LPG companies have started using self-sealing valves (M=4.4) while others have frequent audits and monitoring for licensed LPG dealers (M=4.2). The companies have made efforts to clearly define the owners of cylinders (M=4.3) to a great extent and use unique gas cylinders (M=4.3). The companies to a great extent have also assigned legal responsibility for cylinder maintenance (M=3.8). However, the study established that LPG companies moderately train their staff as a strategy to deal with cross-filling challenges.

4.6 Measures to deal with the Cross Filling activities in the Oil Marketing Industry

The study collected data on the measures which the companies have taken to deal with cross-filing in the oil marketing industry. The results are shown in table 4.3.

**Table 4.3 Measures to deal with the Cross Filling in the Oil Marketing Industry.**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPG has been empowered</td>
<td>2.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Enforcement of bans on cross filing by different suppliers</td>
<td>4.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Established registry of certified installers and inspectors</td>
<td>4.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Extensive education campaigns for end-users</td>
<td>3.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Enforcement of penalties to companies refilling unsafe cylinders</td>
<td>4.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Standardization of gas cylinders</td>
<td>3.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Strict checking for re-certification</td>
<td>3.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Established an independent LPG regulation body</td>
<td>3.6</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Table 4.3 shows the results on the measures which LPG companies have taken to deal with the problem of cross-filling in the oil marketing industry. From the findings, the respondents agreed that their companies enforce bans on cross-filling by different suppliers (M=4.1) as a way of dealing with cross-filing in the oil market. The LPG companies also have established registry of certified installers and inspectors (M=4.2) coupled with enforcement of penalties to companies refilling unsafe cylinders (M=4.1). There is also an effort to establish an independent LPG regulation body (M=3.6). Notably, the respondents cited that empowerment of LPG has not been done (M=2.3), also little has been done to educate the end-users of LPG (M=3.2), standardization of gas cylinders (M=3.3) and strict checking for re-certification (M=3.1).

4.7 Discussion of Findings

The study notes that oil companies in Kenya deal with the refined petroleum products such as motor fuels, industrial oils, LPG, aviation fuels, lubricants and various other specialist oils and most of the companies were established in the early 2000’s. However there are those that deal exclusively with LPG.

The study has established that LPG companies have challenges such as loss of gas cylinders, illegal/ pirate filling, inability to trace movement of the cylinders, unfair competition from the illegal refillers who refill the gas cylinders at cheap prices, high costs of refilling, heavy taxation from the government, and safety threats to the end-users. Some companies do not have enough storage for the cylinders, inadequate skills of the staff and others are struggling to rebuild their images after destruction due to the illegal refilling activities.
The study established some strategies which LPG companies have adopted to deal with the problem of the cross-filling activities which include: use of self-sealing valves, frequent audits and monitoring of the licensed LPG dealers, assigning legal responsibility for cylinder maintenance and clear definition of the owners of the cylinders.

The study noted some measures which have been put in place to deal with the challenges LPG market. There are deliberate efforts to ban cross-filling of different suppliers, registration of the companies that refill and inspect gas cylinders and enforcement of the penalties to companies using unsafe cylinders. There is also an independent LPG regulation body which is in the process of being established to oversee the LPG market operations. Other measures include standardization of gas cylinders, check and re-certification of the gas cylinders, education of the end-users and empowerment of the companies.
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents the findings of this study in summary. It presents the demographic of the LPG companies from which the data was collected and discussions of the study linked with previous studies and literature. This is followed by conclusions and recommendations of the study. Lastly there is a section on the suggested areas for further research.

5.2 Summary of the Findings

The study collected data from several oil companies which deal with crude and refined petroleum products such as motor fuels, industrial oils, LPG, aviation fuels, lubricants and various other specialist oils. Most of the companies (73.6%) were established about 6-10 years ago.

The study established that the sale of LPG gas is a profitable business. According to the findings of the study majority of the companies (64%) cited that the projects are very profitable. This attracts a variety of illegal refillers to the market.

Although the distribution and refilling of LPG is profitable, the business has had a share of problems. The study found that the LPG companies experience loss of cylinders and illegal filling. There is a problem with distribution since the companies cannot trace the movement of gas cylinders as the cylinders land in the hands of illegal refillers. The illegal refillers refill the gas cylinders at very cheap prices which provide stiff competition to the genuine dealers since they incur high costs than the illegal refillers.
There is also a safety threat to the customers since the illegal refilling guarantees no security to the customers. The companies also were found to be straining with heavy taxation from the government. Notably, other challenges such as inadequate storage facilities, inadequate skills, unfair competition and destruction of company image. The above challenges facing LPG companies in Kenya have weakened the stability of the market and increased safety threats to the customers due to the unsafe refilling of the gas cylinders.

The above challenges facing the refilling, sale and distribution of LPG undermine the progress of the LPG market and the profitability of the LPG. The study found that LPG companies have adopted some strategies to counter the losses and deal with the turbulent environment which they operate in. The companies use self–sealing valves which protect other refillers from using the company’s cylinders. There are frequent audits and monitoring for the licensed LPG dealers while others have assigned legal responsibility for cylinder maintenance so as to ensure that cylinders circulate within their hands. Other companies have clearly defined the owners of the cylinders. Training of the staff is another strategy of dealing with the challenges facing LPG companies although it is not very commonly used by the companies. RFID was also suggested as a means of tracking the cylinders once in the market.

To deal with the current turbulent environment of gas market, some measures are being to ensure fair competition and safety in the LPG market. From the study results, the companies have tried to enforce bans on cross-filing of different suppliers. The companies that refill and inspect the gas cylinders have been registered to make
monitoring of the LPG operations smooth. There is also enforcement of penalties to companies who refill gases using unsafe cylinders to ensure customer safety. An independent LPG regulation body is being established to monitor and regulate the activities of the LPG companies in Kenya. Other measures which have been effected well to deal with cross-filling in oil market include standardization of gas cylinders however; strict checking for re-certification, education of the end-users and empowerment of the LPG companies are measures that need to be effected well.

5.3 Conclusion

To effectively ensure fair competition and safety of the end-users in the market of the LPG, the following recommendations should be undertaken:

The study has established that companies are facing unfair competition in the market of the LPG. This has discouraged small and other investors from investing in the industry because of fear of failure. It is thus recommended that Government puts in place policies and regulations which will govern the marketing of LPG in market.

The study found that companies are facing heavy taxation from the government on LPG cylinders. This has made companies to pass the burden onto the end-users. This has in turn increased the prices of refilling making it unaffordable for the low income earners. It is recommended that taxation be rated at friendly rates to enable public members to afford it.

The findings of the study show that the market of LPG has so many illegal refillers and unauthenticated companies. This creates unfair competition and threatens the safety of
the end-users. It is recommended that stricter rules and penalties be enforced to prevent illegal refilling and ensure the safety of the customers.

The study has found that companies have initiated frequent audits and monitoring of licensed LPG to ensure that only legal refillers operate in LPG market to ensure safety of the end-users. The study recommends that companies partner with the government to increase the effectiveness of auditing and monitoring activities.

The study noted that little is being done to educate the end-users on the use of the LPG. This has increased the chances of accidents caused by careless handling of the gas cylinders. The study recommends that more education and awareness be created to the masses to make them safe when using gas cylinders.

5.4 Limitations of the study
The research findings noted that in as much as the population was less than twenty five members, not all of them responded as some of the bureaucracy in the different LPG companies proved to be a challenge with the need of continuous follow-up by researcher.

5.5 Recommendations for further studies
The study was conducted on some oil companies which deal with LPG. The prevailing positive economic projection for Kenya has led to a growing number of oil marketing companies setting up shop; however with the introduction VAT on LPG, the growth may stagnate. The lubricants business is one of the sectors that have attracted new entrants angling for business in this market hence the effects of counterfeit/ illegal sale of fake lubricants is also on the increase. It is therefore recommended that similar study be done on how these companies are adopting relevant strategies to deal with this challenge.
REFERENCES


www.petroleum.co.ke/index.php?option=com_content&view=category&layout=blog&

APPENDICES

Appendix 1: List of LPG companies in Kenya

1. Addax (K) Ltd
2. BOC Gases
3. Fossil Fuel Ltd
4. Galana Oil (K) Ltd
5. Green Energy Ltd
6. Hashi Energy Ltd
7. Hass Petroleum (K) Ltd
8. Hunkar Trading Ltd
9. Kenol-Kobil
10. Kenya Shell
11. Libya Oil Kenya Limited
12. Megtraco Ltd
13. Midland Energy Ltd
15. Oilcom (K) Ltd
16. Pan African Petroleum Co. Limited
17. Premier Gas Limited
18. Quality Gas Ltd
19. Servant hood and Lighthouse development
20. Tex Trading Ltd
21. Total Kenya Limited
22. Tuangaze Ltd

Source: PIEA
Appendix 2: Study Questionnaire

Section A: General Information

1. What is name of your company?

..............................................................................................................................................................

2. What products and services does your company render in the oil industry?

..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................

3. How long has your company been in existence?

   Less than 5 years [ ]
   6-10 years [ ]
   Above 10 years [ ]

Section B: Challenges Facing LPG Companies

4. Rate the profitability of the LPG in your company compared to other oil products.

   Highly profitable
   Moderately profitable
   Less profitable
   Unprofitable

5. Fill the following table regarding the challenges facing LPG companies in Kenya.

   *(Tick appropriately in the blank spaces)*

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of gas cylinders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pirate filling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inability to trace the movement of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>your gas cylinders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of regular inspection by</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
the ERC

| Illegal gas refilers are cheaper than yours because of existence of black markets |
| High costs of LPG refilling |
| Lack of storage facilities |
| Inadequate skills of the staff of the companies. |
| Heavy taxation by the government |
| Destruction of company reputation |
| Unfair competition |
| Safety threat to customers |

6. Apart from the above mentioned challenges, what other challenges affect LPG activities in your company?

…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………

Section C: Strategies Adopted by the LPG

7. In order to improve the performance of LPG to what extend has the company adopted the following strategies to deal with the challenges of the cross filing. Tick appropriately using a likert scale of 5 where 5= Very great extent, 4= Great extent 3= Moderate extent and 2= Low extent and 1= No extent at all
8. Apart from the above mentioned strategies to deal with the problem of cross filing. Are there other strategies adopted by your company to deal with the same challenges.

……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………

Section D; Measures to Deal with the Cross Filling in the Oil Marketing Industry.

9. The table indicates the measures which have been adopted by the government and other organizations to deal with cross filing. Indicate whether they have been implemented. Tick appropriately using a likert scale of 5 where 5= Strongly agree, 4= Agree 3= Neutral 2= Disagree and 1= No extent at all

<table>
<thead>
<tr>
<th>Measure</th>
<th>Very Great extent</th>
<th>Great extent</th>
<th>Moderate extent</th>
<th>Low extent</th>
<th>No extent at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of self-sealing valves/security seals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent audits and monitoring for licensed LPG dealers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear definition of cylinder ownership</td>
<td></td>
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<td></td>
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<tr>
<td>Training of the staff</td>
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<tr>
<td>Assignment of legal responsibility for cylinder maintenance</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of unique gas cylinders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly disagree</td>
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<td>LPG has been empowered</td>
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<td>Enforcement of bans on cross filing by different suppliers</td>
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<tr>
<td>Established registry of certified installers and inspectors</td>
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<td>Extensive education campaigns for end-users</td>
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<tr>
<td>Enforcement of penalties to companies refilling unsafe cylinders</td>
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<td>Standardization of gas cylinders</td>
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<td>Strict checking for re-certification</td>
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<td>Established an independent LPG regulation body</td>
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10. Apart from the above mentioned measures taken by the government to deal with cross filing among the LPG companies, what other ways can or has been used to deal with the same problem?

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11. How can the LPG activities be improved in Kenya?

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