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ELECTRICITY DEMAND AND LOADSHEDDING: IMPACT ON ZAMBIAN BUSINESS. A CASE STUDY OF SELECTED SOLWEZI BASED BUSINESSES

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ABSTRACT

The ability of a country to meet its wider development objectives is largely affected by access to reliable energy. In Zambia, demand for energy, in particular electricity, has been rising due to economic activity in the country, particularly in the Mining, Manufacturing, Agriculture sectors and in all other businesses in general. As a result, load shedding and unannounced power-cuts have characterized Zambia's economy. Zambia`s business sector, both formal and informal, has not been spared and has been crippled and hit hard by electricity load shedding which is seen as a solution to the inability of the power utility to supply electricity to meet demand.

Businesses and entrepreneurs are relied upon as the future engines of growth for the economy. It was therefore critical to understand the extent to which load shedding had affected this sector and how this could have affected the country`s economic development. The general objective of the study was to investigate the impact of electricity demand and load shedding on Zambian businesses and entrepreneurship. The specific objectives of the study were: (a) To establish the effects of load shedding on the Zambian business in terms of productivity and profitability. (b) To assess the measures employed and available energy alternatives the businesses depend on as the replacement to ZESCO electricity. (c) To find out how these measures have affected profitability and productivity. (d) To increase knowledge on the relationship between affordable and reliable energy sources and business growth. (e) Find out the options to mitigating the effects/ ending load shedding.

The research was done in Solwezi district of North Western province. A non probability purposive sampling approach was used, in particular the judgment sampling technique. One hundred (100) firms/ businesses falling in any of the five (5) sub-sectors categorized below were sampled. The firms or businesses that were included had to satisfy the following sampling objectives: (1) had to be a firm that use electricity and relied on ZESCO supplied electricity for its business operations or processes (2) experienced power rationing/load shedding/power cuts (3) selected out of the sub-sectors categorized in: (1) service provision (water supply, Banks and internet services/ IT Enabled Services), (2) manufacturing/welding shops/Iron & Steel, (3) food and Beverage/restaurant/tourism sector/Hotels business, (4) salons/barber shop, (5) Poultry/grain milling. The study was conducted by using self administered questionnaires containing both closed and open questions, along with personal observation to take responses from targeted business houses. The approach relied on the individual respondent's self assessment method of valuing for example, the cost of electricity outage.

The study demonstrated that the power rationing and load shedding embarked by ZESCO to manage the power deficit had impacted negatively on both firm`s productivity and profitability. The study also revealed that very few business firms resorted to using alternative energy sources, and employed measures in order to mitigate the effects of load shedding. The study however, established that the measures put in place to mitigate load shedding resulted in mixed effects on productivity and profitability. It was also established that lack of affordable and reliable energy sources resulting from load shedding impacted on business growth and entrepreneurship negatively.

The study recommended the implementation of energy efficiency policies and measures, improved notification and strict adherence to schedules by ZESCO, ZESCO also to consider excluding business/town centre from load shedding especially during day time and instead load shed business centres at night, investment in generation capacity, need for diversification in energy, and needs concerted efforts from all stakeholders.

DEDICATION

I would like to dedicate this project to my family for their love, guidance, encouragement, support, patience and prayers during the time of my study.

ACKNOWLEDGEMENT

This study would not have been possible without the support and valuable contributions of many individuals and organizations who contributed to it in different ways.

I would thus like to express my gratitude to my family and friends for the continuous physical and spiritual support and encouragement they have rendered to me throughout this course and programme of study at the Information and Communications University (ICU) and throughout my career. I would also like to express my gratitude to my wife Brenda Bukama Phiri for having been my encouragement throughout my course. Also, it would be incomplete to appreciate the payers rendered on my behalf by my fathers, mothers, brothers and sisters in the load.

I also acknowledge the advice, direction and guidance of Mr. Marvin Kabubi and Mr. Fred Mukonda in the entire process and all aspects of the research.

To you all, I will remain forever grateful.

TABLE CONTENTS:

ABBREVIATION AND ACRONYMS

CEC:	Copperbelt Energy Corporation
DAZ:	Dairy Association of Zambia
ERB:	Energy Regulation Board.
HDI:	Human Development Index
ICU:	Information and Communications University
OPPPI:	Promotion of Private Power Investors
PAZ:	The Poultry Association of Zambia
PMRC:	Policy Monitoring and Research Center
REA:	Rural Electrification Authority
ZEMA:	Zambia Environmental Management Agency
ZESCO:	Zambia Electricity Supply Corporation.
ZRDC:	Zambia Research and Development Center

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CHAPTER 1: INTRODUCTION

1.1.Introduction

This chapter looks at the background of the study of electricity demand and impact of load shedding on Zambian business. It addresses the current situation in terms of electricity demand. The reasons for the power crisis are also addressed including measures put in place to meet demand.

1.2.Background of the Study

Energy and its accessibility is at the core of social, economic and, environmental concerns facing all nations. Electricity has provided a safe and efficient energy source for residential and public lighting, pumping drinking water, irrigation, refrigeration, rural industries, and many others. It is particularly critical in developing countries such as Zambia as the implications to reduced poverty are significant. Numerous studies on the correlation of access to reliable energy and The Human Development Index (HDI), demonstrate that access to reliable energy has positive effects on human development. This is predominantly applicable in rural clinics and schools.

Furthermore, the ability of a country to meet its wider development objectives is largely affected by access to reliable energy. Economic growth is synonymous with energy access (Policy Monitoring and Research Center (PMRC) 2013).

In Zambia, demand for energy, in particular electricity, has been rising due to economic activity in the country particularly in the mining, manufacturing, agricultural sectors and in all other businesses in general. According to the Ministry of Finance, Zambia's economy has been growing at an average of 5% per annum over the past 10 years, the situation that is exacerbating the demand for power in the country.

The Zambia Electricity Supply Corporation (ZESCO) reported in its publication (ZESCO Newsletter January-April 2013), that "The power deficit is not a myth, it is real (Policy Monitoring and Research Center (PMRC) 2013). This is however despite Zambia possessing vast water resources in the Southern Africa (SADC) region.

The national demand of power is far above 1,780 MW at peak; however, ZESCO Limited has the capacity to generate around 1,700MW giving a power deficit of about 165 mw at peak time which leads to load shedding and prolonged power cuts, which have affected trade and production. According to The ZESCO Load Profile in 2008, 450 MW (megawatts) were unavailable from the country's generating infrastructure, leading to a peak period deficit of 280 MW (Policy Monitoring and Research Center (PMRC) 2013). Load-management has been practiced since, in order to maintain the balance of supply and demand. Load shedding was seen as a solution to the inability of power utility to supply electricity to meet demand in the country.

The expected demand growth in the next few years is estimated between 150 to 200MW per annum. Evidence shows that the power deficit in the country will increase if new capacity is not generated. Zambia's power demand forecast by ZESCO, shows a severe and immediate shortfall in supply, if the new mining and industrial loads begin to occur at the pace ZESCO currently expects. The inability to meet this projected demand growth that is expected to greatly outstrip supply would surely have an effect on the businesses and the Zambian economy in general as the country will fall into the unbearable power cuts.

Electricity supply problems have so many causes and some of which are; inability to expand generation capacity, aging equipment, droughts and vandalism. Inadequate investments in the generation and transmission infrastructure have led to the current drop in the energy generation capacity and infrastructure (Policy Monitoring and Research Center (PMRC) 2013). The challenge for Zambia is managing the inefficiencies of generation and transmission infrastructure to ensure a viable business environment that supports sustained economic growth and industrial expansion.

It was therefore, important to carry out a study that would bring out other salient features, challenges and costs that go along with electricity demand, load shedding and power cuts to business in Solwezi district. Also to provide mitigation measures that could be taken in the same respect. The research collected information from both small and large business firms and entrepreneurs. This provided primary information from the actual business people that brought out issues as faced on the ground.

1.3. Statement of the Problem

The businesses worldwide are recognized as a key contributor to economic growth. The case for fostering business growth in the world and in Zambia in particular is of high significance since it offers diversified areas of contribution. There are few factors found to be critical for accelerating businesses in the country. Electricity is one of those key factors.

Electricity is used not only for lighting and household purposes, but it also allows for mechanization of many farming operations, such as threshing, milking, and hoisting grain for storage. It also allows for greater productivity at reduced cost.

However, load shedding, unannounced power-cuts and fuel shortages have characterized Zambia's economy. Zambia`s business sector, both formal and informal, has been crippled and hit hard by electricity load shedding which is seen as a solution to the inability of the power utility to supply electricity to meet demand. This surely has significant changes on the production costs, profit margin, development and modernization of businesses.

The power sector of Zambia has been scrutinized immensely in the recent past but not many studies have captured the impact the power cuts/ load shedding have on the country`s industry and business sectors.

This study therefore aimed to establish to what extent the selected categories of business firms in Solwezi had been affected by ZESCO`s load shedding. In this view, this research therefore attempted the following i

(a) Find out the effects of load shedding on firm's production/operations and profits.
(b) Find out the measures put in place by business firms if any, to mitigate the impact of load shedding.
(c) Find out how such measures have affected productivity and profitability.
(d) Find out the relationship between affordable and reliable energy sources and business growth
(e) Find out the options to ending load shedding.

1.4. Purpose of the Study

The purpose of this study was to investigate the impact of electricity demand and load shedding on Zambian businesses. The business sector worldwide is recognized as a key contributor to economic growth. Therefore, the case for fostering the growth of the sector in Zambia is of high significance since it offers and would offer diversity contributions to national development. There are few factors found to be critical for accelerating the growth of the business sector of the country. Electricity is one of those key factors. It is well recognized as one of the important pre-requisites in uplifting living standards of the geographically and economically disadvantaged communities in developing countries. It also assists the business conduction of diversified types of businesses and processes.

1.5. Research Objectives

In order to make sure that the study or research was focused and remained on track, it was very important to state both the general and specific objectives of the problem of study.

1.5.0 General Objective

(a) To investigate the impact of electricity demand and load shedding on Zambian businesses.

1.5.1 Specific Objectives

I. To establish the effects of load shedding on the Zambian business in terms of productivity and profitability.

II. To assess the measures employed and available energy alternatives the businesses depend on as the replacement to ZESCO electricity.

III. Find out how these measures have affected profitability and productivity.

IV. To increase knowledge on the relationship between affordable and reliable energy sources and business growth.

V. Find out the options to mitigating the effects/ ending load shedding.

1.6. Research Questions

1.6.1 What are the effects of load shedding on firm's production and profits?

1.6.2 What are the measures put in place by business firms if any, to mitigate the impact of load Shedding?

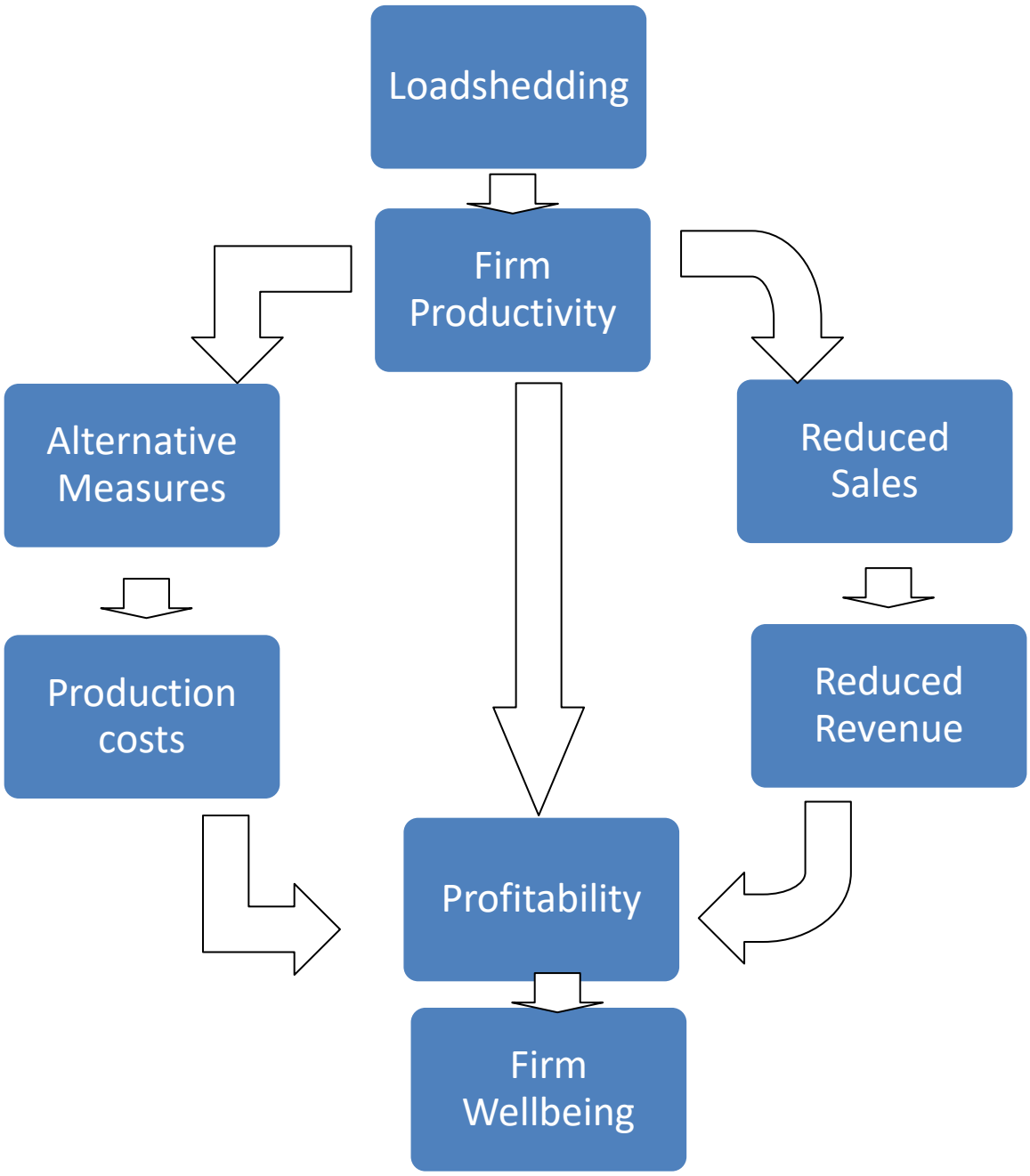
1.6.3 How have such measures affected productivity and profitability?

1.6.4 What is the relationship between affordable and reliable energy sources and business growth?

1.6.5 What are the options to mitigating the effects/ ending load shedding?

1.7. Conceptual Framework of the study

A model of the Conceptual Framework for this study is as shown below



1.8. Conceptual and Operational Definition of Variables

In many cases, research questions contain variables which may be very abstract in their meanings. That is, they may mean something different from another person. Therefore, to make it easy for people to understand what they mean in this context, they needed to be defined in simple terms. From the above, the following variables were identified, conceptualized and operationally defined.

variables	Conceptual definition	Operational definition
Load shedding	• Cutting off electricity supply for a given period of time • Power rationing	• Non availability of electricity at certain times
Profitability	• Surplus income when costs are deducted from revenues.	• Firm`s performance in relation to productivity in (%) and production cost • Revenue realized after sale of product or service
Productivity	• Quantity of a product a firm produces in a given period of time. • Quantity of service provided in a given period of time.	• Production/ service provision in percentage terms per month.
Wellbeing	• The state of being comfortable, happy, secure and healthy.	• Improvement in economic and social status/welfare • Being able to compete favorably
Business	• Business house/Firm company/organization/venture	• Any business operation be it small, medium and large scale.
Impact	• Effect of something. • Force of something.	• Positive or negative effect of electricity load shedding. • Positive or negative cause of load shedding.
Energy	• Power • Fuel.	• Electricity. • Source of power

1.9.Independent and dependent variables

In this study, the independent variable is load shedding while profitability, productivity and firm wellbeing are dependent variables.

1.10. Rationale

This study was important because it would expose the real experiences that the Zambian business sector is exposed to in the event of load shedding and power cuts. It was hoped that policy makers and ZESCO including other stakeholders would understand the effects of load shedding and power cuts on the business sector and how it might impact on the general economy of the country.

Its findings would help stakeholders in a number of areas including developing and putting up measures to mitigate the impact of load shedding, supporting investment programs in the electricity company, to call upon Government to accelerate policy formulation and investments in renewable energy and infrastructure and developing the updated framework for business/enterprise development and also overall employment creation in Zambia. In other words, care will be taken to avoid the situation where load shedding and power cuts result in increased costs for the business sector and consequently employment cuts.

Importantly, this study was important to me, as a researcher in that it is an academic requirement for the partial fulfillment for the award of the Masters Degree in Business Administration in Economics at the Information and Communications University. In addition, findings of this study or research would be put in the Information and Communications University library for the university and other students to use. It may be used for reference and for further research in the same field thus contributing to the body of knowledge.

1.11. Justification of the Study

The business sector is regarded as particularly important to Zambia at its current stage of development. Businesses and entrepreneurs are relied on as the future engines of growth for the economy. It is therefore critical to understand the extent to which load shedding had affected this sector and how this might affect the country`s economic development, and thereby come up with effective measures to go round severe effects.

1.12. Motivation of the Study

I work for a water company, North Western Water Supply and Sewerage Company Limited Company in Solwezi. The time I have worked for this company, I had observed and noticed the trouble we had been going through as a business and how service delivery had been affected since ZESCO started the program of load shedding.

It was against this background that I felt the need and urgency to carry out this study concerning electricity demand and to get a clear picture of the issues the business firms face in their businesses as a result of ZESCO load shedding.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This chapter presents background information on the topic of study. It is a review of the literature available on the on the topic under investigation or study. It later acted as the basis for confirming the research findings from primary sources.

2.2. Background literature

2.2.1 Global Perspective

Generally, power sector plays a key role in economic development. Many scholars have stated and others have found the electricity sector to be a key driver of economic growth of any given country, Zambia in particular. Each segment of modern society is dependent heavily on power, from domestic, agriculture and industrial to service and governmental operations, all require electricity and energy to function, without which the world, regardless of a specific sector, would come to a standstill (Federation of Indian Chambers of Commerce & Industry 2012).

Literature further adds that access to reliable, affordable energy is an essential input to economic growth. Agriculture, manufacturing, shops, transportation, and construction including SMEs are all engines of economic growth and all require energy such as electricity to function efficiently.

Electricity is also an essential building block for fighting poverty and promoting sustainable development. In Zambia, electricity has been accorded prominence in the country's poverty reduction strategy (Wang, 2007).

2.2.2 Zambian Perspective and Previous Studies

Zambia has abundant renewable and non-renewable energy resources, these Include Vast water reserves for hydro power generation, Industrial minerals such as coal, Agricultural land to support bio-fuels, Ample forest for biomass, Abundant wind for wind energy, Zambia also has long and intense hours of annual sunlight to support solar energy generation. *All which are not yet fully exploited if at all even exploited at any level*. For example, literature has it that Zambia has the potential to generate 6,000 MW of hydro-electricity and holds up to 28% of the water supply of the SADC region. Yet up to 70% of its hydro-generation capacity has not yet been exploited.

The Zambian electricity power system is operated as part of an interconnected power system linking South Africa, Zimbabwe, and Democratic Republic of Congo (DRC). The Zambia Electricity Supply Industry was predominantly a market run by a single state owned company, the Zambia Electricity Supply Corporation prior to the liberalization of the sector through an Act of Parliament in 1995 so as to attract private sector companies to participate in the generation, transmission and distribution of electricity in the country. In order to promote this policy the

Government set up two new institutions; Energy Regulation Board (ERB) and the Office for the Promotion of Private Power Investors (OPPPI) to regulate operations and pricing, and promote new players to the electricity market respectively (Zesco Limited 2009).

Currently, power supply is dominated by the Zambia Electricity Supply Corporation (ZESCO), the vertically integrated state-owned utility. The principal activity of the company is to generate, transmit, distribute and supply electricity to local and international markets. It has an installed hydro-based generation capacity of 1,800 MW and its main generation stations are Kafue Gorge Power Station with about 990 MW capacity; Kariba North Bank Power Station with about 660MW capacity and Victoria Falls Power Station with 108 MW capacity. It also has mini-hydro power plants with total capacity of 24MW and nine diesel power plants with a capacity of 6.3MW, which serve isolated mini grids in rural areas (Zesco Limited 2009).

Another important sector participant is Copperbelt Energy Corporation (CEC), a private company based in Kitwe that purchases bulk power from ZESCO and supplies the copper mines and neighboring population. Another is Lunsemfwa Hydro Power Company based in Kabwe which is an independent power producer generating about 48 MW of power that it sells to ZESCO Limited under a Power Purchase Agreement. There is also the Rural Electrification Authority (REA) which deals with the cause for increasing access to electricity in the rural areas and the Energy Regulation Board which is the regulator of the energy sector in Zambia. Other participants in the industry include small-scale generators and solar based energy services companies supplying power to some rural areas. Other participants in the industry include small-scale generators and solar based energy services companies supplying power to some rural areas. More than 50 percent of electricity generated in Zambia serves the mining sector and the rest is shared among different sectors.

However, many countries including Zambia and many other parts of the world are being faced with the challenge of generating enough electricity to meet demand. In Zambia, the increase in demand for electricity has been rising due to rise in economic activity in the country particularly in the mining, manufacturing and agriculture sectors (Policy Monitoring and Research Center (PMRC) 2013). This increase in economic activities has resulted into a corresponding and indeed overwhelming increase in demand for electricity services, which has ultimately put a strain on the existing electricity supply capacity. The Zambia Electricity Supply Corporation (ZESCO) reported in its publication (ZESCO Newsletter January-April 2013), that “The power deficit is not a myth, it is real”.

The Zambia Electricity Supply Corporation (ZESCO) has attributed the increased load shedding currently being experienced in the country to a power generation deficit. Zambia’s current generation capacity is about 1,800 MW of power, which is almost solely generated from hydropower through state-owned Zesco (ERB, accessed at http://www.erb.org.zm/content.php?viewpage=erips on 29/10/14). However, the current available capacity has been brought down to 1,300 MW due to maintenance and upgrading leading to a shortage of around 200 MW during peak times and this is causing power outages and necessitating load shedding (Anita Kruger 2013).

In the year 2012 during a press brief, the Acting Managing Director then, Mr. Victor Mundende, said that the deficit was being caused by increased mining, industrial and agricultural investments that were not supported by investment in the company's transmission and distribution systems (http://www.lusakatimes.com/2012/06/16/zesco-explains-increased-loadshedding-country/).

As Mr. Victor Mundende added, load shedding management is being carried out to protect the generation equipment, which would automatically shut down should there be an overload, a situation he said would be costly (http://www.lusakatimes.com/2012/06/16/zesco-explains-increased-loadshedding-country/). In the same year 2012, the then Managing Director, Mr. Cyprian Chitundu said that load-shedding was unavoidable as the growing economy puts pressure on the power utility company (http://geraldopearson.typepad.com/blog/2012/08/load-shedding-worries-business-houses-zambia-daily-mail.html). *It is therefore right to think that load shedding is here to stay and is part of us especially that new capacity is not to be generated soon as things look.*

One other reason for sure to this load shedding is poor planning & lack of maintenance on the part of the power utility and to a larger extent on the part of Government. According to Collin Wood (Business Report, 14 January 2008) cited by Calldo (2008), he also suspected that a lack of planning is the real reason for the crisis in South Africa with the Eskom in the later months of 2007. During this period, South Africa started experiencing widespread rolling blackouts as supply fell behind demand, threatening to destabilize the national grid.

As cited by Kaseke & Hosking (2012), Load shedding is an organized form of electricity outages. *However, the load shedding of Zambia, in particular Solwezi, does not seem to be organized as power is switch on and off by the power company without any time table developed and communicated to stakeholders.*

Consequently, Zambia`s business sector has been hit hard by electricity load shedding which is seen as a solution to the inability of the power utility to supply electricity to meet demand. This is because the current power deficit has resulted in prolonged load shedding and power cuts, and has occasionally affected trade and production, and business in general.

A manifestation of this problem can be seen in the large number of reports in the popular press of high incidence of outages/load shedding and protests, by not only the domestic and commercial, but also industrial consumers. We have also seen such protests and complaints by the various chambers of commerce and industry and other industrial associations in the country that the level of production in a number of industries and sectors has been reduced and adversely impacted due to the persistence of outages which apparently have fundamentally disturbed the normal rhythm of the production cycle in a large number of industrial units and sectors, especially in electricity-intensive sectors like leather products, Mining, rubber and plastic products, paper and paper products, water supply, Banks and internet services/ IT Enabled Services), Manufacturing/Iron & Steel, food and Beverage/restaurant/tourism sector/Hotels business, and salons/barber shops.

As Attigah & Mayer-Tasch (2013) identified, quality and reliability of electricity supply is an important factor both for the decision to connect and for the impact on business performance.

They argue that in some countries, the reliability is so low that electricity-reliant businesses have no choice but to invest in diesel generators if they want to maintain business operations at a minimum level of steadiness. *A move I personally feel results in a huge cost for the business to sustain, especially for small businesses. In today`s market, businesses are striving to remain competitive by lowering the cost of production and general operational cost and in turn maximizing profits that hold the heart of the business. High costs such as operational costs for the business are a good sign of a business that would never grow and instead disappear from competition.*

However, one would argue that why businesses not invest in cheaper energy sources as opposed to diesel generators in this era of load shedding? The most likely reason is that most energy sources such as wind and solar remains untapped in Zambia, and also because most business houses generally lack the resources necessary to invest in alternative sources of energy.

According to the World Bank's Doing Business report (Attigah & Mayer-Tasch 2013), firms in low-income countries are affected by electricity supply interruptions on average 18 times in a typical month. Business managers interviewed for the Doing Business project in the various countries estimated that losses due to electricity outages amount to an average of 3.2 % of annual sales and as much as 22.6 % in Malawi. These resulting workflow interruptions and the combined damage of sensitive electrical equipment such as computers caused by voltage fluctuations can surely curtail profits significantly.

In an analysis of investment climate surveys from 26 African countries by Escribano et al. (2009) as reviewed by Attigah & Mayer-Tasch (2013), found that in low-income countries, a low infrastructure quality has a significant negative impact on total factor productivity, which is at least as important as other factors such as crime, red tape and access to finance. More importantly the analysis indicated that poor-quality electricity supply is the infrastructure element that has the strongest negative effect on enterprise productivity, especially in poor African countries such as Eritrea, Ethiopia, Mali, Senegal, Uganda and Zambia.

Numerous studies state that access to electric light by small businesses leads to longer operating hours which in turn leads to increased income by these businesses (Attigah & Mayer-Tasch 2013). However, as Attigah & Mayer-Tasch (2013) observed, while the link between access to electric light, longer operating hours and increased income is often taken for granted, an overall positive impact cannot always be proven. For many small businesses in rural areas, it does not make sense to operate at night, if there is no specific demand for their products/services during evening hours and the market cannot absorb an increased output.

What is critical with the Attigah & Mayer-Tasch (2013) study is the fact that the study exploits the role electricity plays in business and in particular in increasing business incomes and more importantly contributing to economic growth and development.

During what Ketelhodt &Wöcke (2008) called "The Cape Town electricity crisis", due to an electricity crisis in 2005-2006 periods, which was compounded by the economic growth in the region and resulted in demand outstripping supply, it was estimated by the Cape Town Chamber

of Commerce and Industry, following a survey of members, that the blackouts cost the Cape Town economy about $900 million directly. Other consequences of the blackouts were a loss of 12 days of production at the Chevron refinery. It caused Multinationals that were considering investing in South Africa to openly question South Africa as a destination for their investments (Ketelhodt &Wöcke 2008). *Multinationals usually put their investments in a particular country in order to either gain access to that country`s domestic market or to maximize profits by way of reducing production cost and on the other hand increase productivity by taking advantage for example, of cheap raw material, energy and cheap labour and just the general business environment (Government policies). Indeed it can be worry some for any meaningful business to lose production due to electricity cuts/load shedding as this would mean fewer sales, high production and consequently low profit or no profit at all.*

For instance, Daily Mail News paper published a story in titled "Load-shedding worries business houses". It read in part that "various stakeholders have expressed concern over the ripple effects of load-shedding citing loss of business amounting to millions of Kwacha daily, among others" (http://geraldopearson.typepad.com/blog/2012/08/load-shedding-worries-business-houses-zambia-daily-mail.html). The Poultry Association of Zambia (PAZ), Dairy Association of Zambia (DAZ), small medium enterprises such as restaurants and salon owners all complained of losing business due to what they term the indiscriminate and inconsistent load-shedding by Zesco.

Coming back to what Ketelhodt &Wöcke (2008) called "The Cape Town electricity crisis", Ketelhodt &Wöcke (2008) reported that there were various reports covering the extent of the damage to businesses and households. Examples of this include damaged computers, traffic congestion, perishables damaged in refrigerators, non-delivery to clients, and an oil refinery unable to operate. *This investigation was important as it brought a variety of business firms into the picture. This is because load shedding can impact different businesses or sectors differently. It is however important to note also that businesses can be impacted differently depending on the business size and level.*

This was similar to what was contained in the Daily Mail News paper published story, in titled "Load-shedding worries business houses". The Daily Mail story reported that DAZ said farmers are losing about K12.5 million per day because of power outages, especially that they deal in fresh products, PAZ said that the poultry industry has also been adversely affected as it is one sector that is centered on power and water with regards hatching, breeding, processing and storage, while the Zambia Environmental Management Agency (ZEMA) expressed concern at the impact that load shedding has on the environment (http://geraldopearson.typepad.com/blog/2012/08/load-shedding-worries-business-houses-zambia-daily-mail.html). ZEMA spokesperson Irene Chipili said apart from industries, households and restaurants are using charcoal as a source of energy because generators are not affordable for most. She added that the dependency on charcoal as a source of energy would in the long term have adverse implications on the overall state of the environment.
SABC News in January 2008 also reported that South African economy was losing millions of Rands then as a result of the rolling power cuts. Energy sapping industries like mining and steel

were the hardest hit. The steel industry surveyed only a few of its companies which lost about R40- million in production while the mining industry also confirmed this and estimated its losses at about R250 million a day. The broadcasting company added that Economists believed the country's targeted 6% growth by 2010 was a pipedream. (28 January 2008) (http://www.sabcnews.co.za/south_africa/general/0,2172,163237,00.html).

In a study carried out in Zimbabwe, Chinhoyi Residential Urban areas to be specific, to establish the effects of load shedding through a questionnaire survey, the survey established that 60% of residence experienced losses in perishable food stuffs due to refrigeration failure, 15% reported production downtime in their home industries with 10% having their electrical appliances such as television sets being damaged as a result of the power surges fashioned by the power outage. Critically, a number of enterprising urban dwellers that generate revenue from their backyard home industries which require the service of electricity are being starved of the prospect due to load shedding (Musademba et al 2012).

This investigation despite concentrating on households, we can still draw some lessons from this study that if load shedding can affect households in such a way, what more of business houses that dream, eat, speak, walk, think etc, how to make profits, how to grow the business, how to be productive, competitive and so on. It can be very interesting indeed to find out the extent of the impact of load shedding on the business houses.

The Zimbabwe survey also established that income for the residents was disproportionately eroded as a result of load shedding. The fraction of energy cost to income was found to increase from 16% without load shedding up to 64% for those in the low density and up to 49% for those in the high density areas. This has consequently impoverished the residents. Load shedding was also found to have coined household thieves with 65% of these being women who harvest wood illegally from farms and forests. This form of harvesting is uncontrolled and therefore unsustainable. The survey found that people particularly those in the high density areas rely more on the use of less efficient traditional fuels and inefficient stoves which proved to be expensive and add misery to their lives. The survey concluded that women are unduly burdened by the power outage exercise and people in general have been reduced to poverty levels as they are left with dwindled income (Musademba et al 2012).

It can therefore be interesting to establish how incomes are being affected in the event that the business houses have to adjust their way of doing business by adopting new energy sources if at all other sources are adopted.

In another investigation by Kaseke & Hosking (2012), carried out in Zimbabwe on the Mines to estimate the cost of load shedding, it was concluded that electricity load shedding resulted in high cost to mining sector in Zimbabwe. It was observed that Mines flooded as a result poor pumping of water outside the tunnels and mine shafts, and also lost productive hours of production. The results also revealed that low capacity mines incurred higher load shedding cost compared to high capacity mines. It was also seen that high valued mineral mines (gold,

diamond and platinum mines) incurred high outage cost as compared to low valued mineral mines (vermiculite, graphite and phosphate).

The Bangladesh study by Bose et al (2013) that was intended towards evaluating the impact of electricity availability on the operation and performance of SMEs in the rural areas of Bangladesh, detected favorable changes on the production costs, profit margin, development and modernization of business, women empowerment, quality of life, and human development due to the electrification. It was observed that organizations produce more products, opened more hours, sold more products and in turn earned higher profit. It was concluded that as the earnings increased then it ultimately impacts quality of life such as improving health and literacy levels, raising household income, providing employment, preserving the environment, curbing rural-urban migration and stemming population growth, empowering women and many more.

The electricity outages (load shedding) have attracted interest from various stakeholders including government.

The Zambian government in its quest to improve the well being of its citizens as outlined in the Vision 2030 and the Poverty Reduction Strategy Paper (2002) documents outline various objectives and targets that should be realized. Among them are: reducing head count poverty, develop economic structures that are resilient to external shocks, improve national productivity, have reliable transport and communication that connects the entire country.

The government of Zambia has re-affirmed its commitment to promoting small and medium enterprises in the country due to their significant contribution to the national GDP and employment. The government is commitment to enhancing the growth of SMEs in Zambia and this include the strengthening of financial and nonfinancial markets to meet the demand of SMEs, strengthening institutional support for employable skills and business and reducing critical investment constrains on SMEs. This is evidenced by the major strides that the government has taken to invest in electricity, water and roads in various parts of the country.

Development of any country requires a favorable macroeconomic environment that supports various economic activities (Prest 1985). Key sectors that are involved in production and manufacturing should be supported. Prest (1985) and the Zambian Economist (2012) emphasize the need for government to foster development plans that holistically provides general guidance and policies for economic development to be a reality. *In my view, such policies include deliberate policies to encourage more investments in the electricity and energy sector in general.*

In the same line, given the cardinal role electricity plays in socio-economic development, the ERB is working closely with all industry stakeholders to promote investment in power infrastructure (Anita Kruger 2013)

Zesco claims that the country needs an investment of over $5 billion to fund the supply shortage, yet Zambia offers some of the region's lowest electricity tariffs and is the main reason why funding for generation capacity upgrades and new projects have been hard to come by (Anita Kruger 2013). This is made worse has any hike in tariff excludes mining tariffs that have

been negotiated through contracts, some of which date back as far as the 1990s with the onset of privatization.

Tariff re-negotiations between the Zambian government and the mining companies are dependent on the willingness of the mining companies to engage in such efforts, however in the face of declining copper prices, there is increased pressure on mining companies to minimize costs. This means that tariff hikes in the mining sector, the country's economic backbone, may lead to widespread job losses: a trade-off that will be hard for authorities to justify by.

Obviously, the cost of doing business in Zambia has increased as a result of load shedding. This is resulting in locally produced products being more expensive compared to products produced in other countries and hence Zambian products being less competitive on market.

CHAPTER 3: METHODOLOGY

3.1. Introduction

The research or study was done in Solwezi District. This district is in North Western Province of Zambia. Solwezi District is a district that is developing fast because of the growing mining sector in the province. The province houses three (3) of the biggest mines in the world (Kansashi, Lumwana and Kalumbila), two (2) of which are in Solwezi. Because of this, Solwezi and generally the whole province has become a destination to many businesses of different sizes and types. This chapter outlined the methodology the study used. It explains how data was collected and finally analyzed in order to achieve the objective of this study.

3.2. Research Design

The research design refers to the overall strategy that one is to choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring that the research problem is effectively addressed; it constitutes the blueprint for the collection, measurement, and analysis of data (William 2006).

In this research therefore, the design used was non experimental because the research was done or carried out in uncontrolled environment and natural setting. A survey of 100 business houses was conducted. The study was conducted by using self administered questionnaires containing both closed and open questions, along with personal observation to take responses from targeted business houses. The design looked at the frequency of answers and focused on answers given by all respondents. The approach relied on the individual respondent's self assessment method of valuing for example, the cost of electricity outage. The self assessment method is an economic appraisal tool that estimates the cost of power outages by allowing electricity consumers to express their losses in monetary terms (Bose et al 2006) as cited by Kaseke & Hosking (2012).

The data in this research was mainly primary in nature since this data was collected only for this study or research purpose at hand.

3.3. Sampling Frame

The sampling frame consisted of a representative of each business house or firm that was sampled in Solwezi district of North Western province of Zambia.

In this sampling frame, a particular business or firm was sampled and mainly, the research targeted the firm representative who was believed to have had some knowledge on the operations and background of the business or firm.

3.4. Sample Selection

The sample in this research consisted of businesses or firms in Solwezi. A non probability purposive sampling approach was used, in particular the judgment sampling technique. One hundred (100) firms/ businesses falling in any of the five (5) sub-sectors categorized below, were sampled. The firms or businesses that were included had to satisfy the following sampling objectives: (1) had to be a firm that use electricity and relied on ZESCO supplied electricity for its business operations or processes (2) experienced power rationing/load shedding/power cuts (3) selected out of the sub-sectors categorized in: 1) service provision (water supply, Banks and internet services/ IT Enabled Services), 2)manufacturing/welding shops/Iron & Steel, 3) food and Beverage/restaurant/tourism sector/Hotels business, 4) salons/barber shop, 5) Poultry/grain milling.

3.5. Target Units

The target group for this study was the business houses/ firms, small, medium or large which were utilizing ZESCO electricity as power and energy resource to run their businesses. In additional, they were experiencing load shedding/power rationing.

3.6. Data Collection

Both secondary and primary data was collected in this research. Both secondary and primary data was very important in this type of research. The secondary data was used in developing and coming up with the literature review and acted as the basis for confirming the research findings from primary sources. The secondary data for this research was collected from published books, published materials and mainly from the internet.

And as for primary data, it will be collected from the field by the researcher. And major sources of primary data will be from proper and right sources of information/key informants who will be identified and selected from selected business houses. The primary source will account for a larger percentage of the material used in the research. In this research, a total of 50 questionnaires will be administered to 50 respondents, 10 in each of the five (5) sub-sectors as categorized above.

3.7. Research Instruments

One instrument of data collection was used in this research or study. The questionnaire was administered by the researcher. The questionnaire included both open and closed type items. The respondents were guided to answer the questionnaire and those were not able to write had their answers or responses written for them by the researcher. Thus, some form of guide interview was used. The questionnaire was chosen in this research due to the following reasons:

i) It is an economical way of accumulating information. It is economical both for the researcher and for the respondent in time, effort and cost. It allows the researcher and respondents to perform other tasks other than conducting the research especially that in this case respondents were cautious with time considering that they are business people.

In addition, the researcher does not spend a lot of money to facilitate this kind of data collection.

ii) It is easy to compare the responses of the respondents.

iii) It permits self administration and helped cover many firms at the same time.

iv) And since the subjects or target groups of the study were somehow scattered, it was a better tool as compared to the tools like interview.

v) Once it is developed, the researcher may ask anybody to administer it on his behalf.

vi) It will also permit to obtain statements of facts.

vii) It is not concerned with knowing respondents' names hence positive collection of objective information.

viii) Its standardized form ensures some uniformity.

In this research, the questionnaire contained both closed and open types of questions. Closed ended aimed at facts about the impact of load shedding while the open ended questions aimed at obtaining the respondents' opinions as this allowed them to express themselves as they were not be restricted.

3.8. Data Analysis

The data that was collected was analyzed using quantitative and qualitative approaches. Responses to closed questions and open ended questions were analyzed normally to bring out frequencies of responses on the variable that guided the study. The quantitative variables and data from the study was analyzed and processed through the use of Statistical Package software - STATA software. Also Micro Soft Excel spread sheet was also used.

The responses that came from open ended questions were grouped according to similarities as judged by the researcher. The responses were then captured and analyzed using the statistical software in line with the objectives of the study.

3.9. Limitation

Time was one of the limiting factors to this study. In additional, the study was restricted to the five (5) sub-sectors and the 100 selected firms based in Solwezi district. Findings of this research may not be used to make conclusions on the impact of load shedding on the Zambian businesses or firms outside the five (5) sub-sectors or in other sectors apart from the five (5) sectors categorized. Therefore, the replication of the study in different areas of Zambia and with different sectors would enable better regulation of the findings of the study.

CHAPTER 4. DATA ANALYSIS

4.0 Introduction

Chapter 3 above outlined the methodology used in the research. The chapter covered research design, sampling frame, sampling selection, and target units and data collection. It also tackled the sources of data, data collection instrument and also highlighted the methods of data analysis. The analysis focused on the following key interest areas:

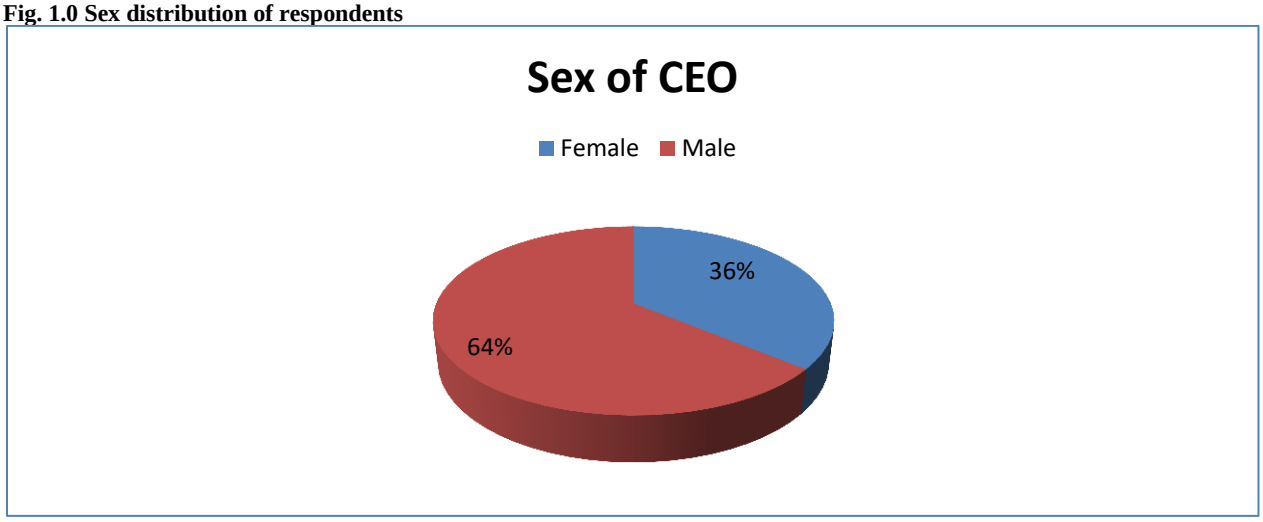
4.0.1 RESPONSES TO QUESTIONNAIRE

A total of 100 questionnaires were administered.

4.1 DESCRIPTION OF SAMPLES

4.1.1 Description of sample by sex

Fig. 1.0 Sex distribution of respondents

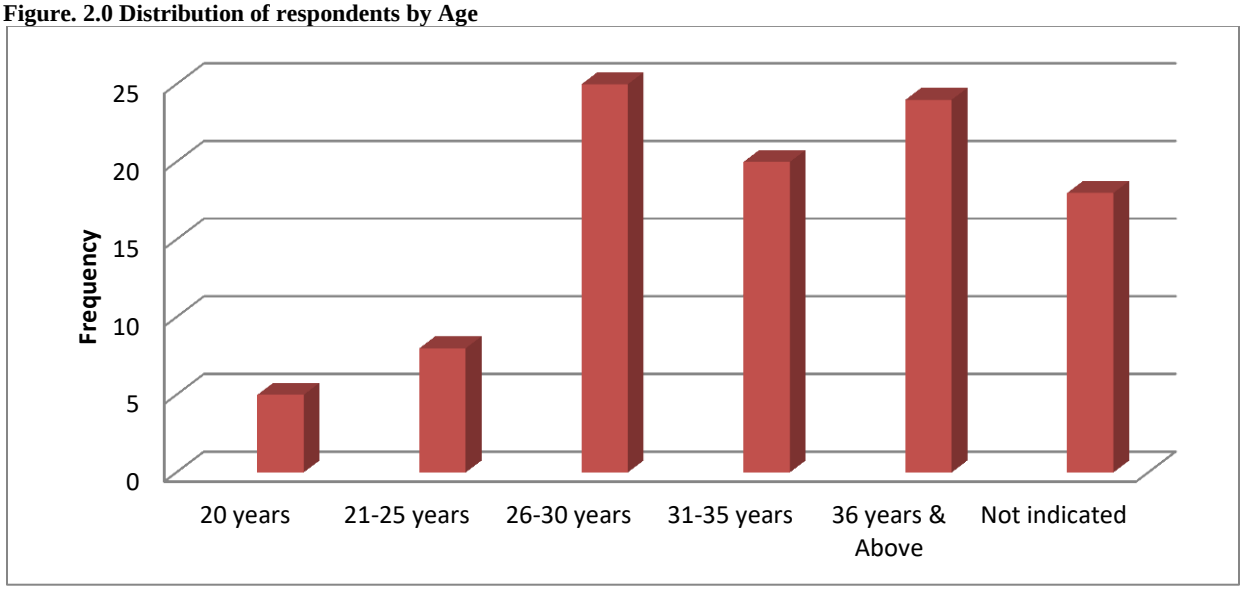


Source: Author (2016)

Sex is an important variable in the study as it shows the gender dimension of the sample. In this study, the distribution of the respondents according to sex was as indicated in the figure above (fig. 1.0). Out of the total number of 100 respondents involved in the study, 64 were males whilst 36 were females. Represented in percentage form, 64% were males and 36% were females.

4.1.2 Description of sample by Age

Figure. 2.0 Distribution of respondents by Age



Source: Author (2016)

As it can be observed in figure 2.0 above, the lager part of the respondents in the sample were in age group range 26-30 year followed by age group range 36 years and above. This is to say that the sample was mainly comprised of respondents in the ages between 26-30 years.

4.1.3 Description of sample by Type/category of Business

Table 1.0 Distribution of respondents by Type/category of business/SME

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE %
100	Service provision (Water Supply, Banks and Internet services/ IT)	13	13
	Enabled services (Manufacturing/ Welding shops/ Iron and Steel)	12	12
	Food and Beverage/restaurant/tourism sector/Hotels business	34	34
	Salons/barber shop	34	34
	Poultry/grain milling	7	7
Total		100	100%

Source: Author (2016)

The table above (table 1.0) shows that 13 respondents, representing 13% of the sample indicated that they were in the Service provision (Water Supply, Banks and Internet services/ IT), 12 respondents, representing 12% in Enabled services (Manufacturing/ Welding shops/ Iron and

Steel) while 34 representing 34% indicated that they were in Food and Beverage/restaurant/tourism sector/Hotels business. Another 34 of respondents, representing 34% indicated that they were in Salons/barber shop while 7 respondents, representing 7% of respondents indicated that they were in Poultry/grain milling. It was observed that the sample was manly comprised of the businesses in salons/barber shop and Food and Beverage/restaurant/tourism sector/Hotels business categories.

4.2 EXTENT OF LOAD SHEDDING

4.2.1 Number of times of load shedding in a week

Table 2.0 Distribution of respondents according to number of times they experience load shedding in a week.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	3 times	37	37%
	4 times	51	51%
	5 times	7	7%
	6 times	3	3%
	7 times	1	1%
	8 times	1	1%
Total		100	100%

Source: Author (2016)

The table above indicates that, of the total 100 respondents, 37 respondents, representing 37% of the total respondents said that they experienced load shedding 3 times in a week. 51 respondents representing 51% indicated that it was 4 times in a week while 7 representing 7% said it was 5 times a week, and 3 respondents representing 3% said it was 6 times in a week. The table also indicates that only 1 respondent, representing 1% each for 7 times and 8 times in a week. It was observed that on average, load shedding was experienced 3 to 4 times in a week.

4.2.2 Length in Hours of load shedding

Table 3.0 Distribution of respondents according to length in hours load shedding takes.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	5 hours	6	6%
	6 hours	63	63%
	7 hours	16	16%
	8 hours	15	15%
Total		100	100%

Source: Author (2016)

Table 3.0 shows that, of the total 100 respondents, 6, representing 6% of the sampled respondents indicated that the length of load shedding in hours was 5 hours. 63 respondents, representing 63% said it was 6 hours, and 16 respondents representing 16% said it was 7 hours while 15 respondents, representing 15% said it was 8 hours. It was found that on average, load shedding was lasting for 6 hours.

4.2.3 Length in Hours during Normal Operation (During Uninterrupted Power Supply)

Table 4.0 Distribution of respondents according to length in hours they operate when there is no load shedding.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	7 hours	4	4.08
	8 hours	36	36.73
	9 hours	35	35.71
	10 hours	8	8.16
	11 hours	1	1.02
	12 hours	2	2.04
	13 hours	1	1.02
	14 hours	2	2.04
	17 hours	1	1.02
	18 hours	1	1.02
	22 hours	1	1,02
	24 hours	6	6.12
Total		100	100%

Source: Author (2016)

As it can be observed in the table above, of the total 100 respondents, 4 respondents said they operated for 7 hours during normal day when they had no load shedding, 36 said it was 8 hours, 35 respondents said it was 9 hours, 8 said it was 10 hours while 6 respondents said it was 24 hours. Another 2 respondents each, said it was 12 and 14 respectively. The table further showed that 1 respondent each indicating 11, 13, 17, 18 and 22 hours. It was observed that on average, most of the businesses on a normal day that is, when there was no load shedding, operated for 8 to 9 hours.

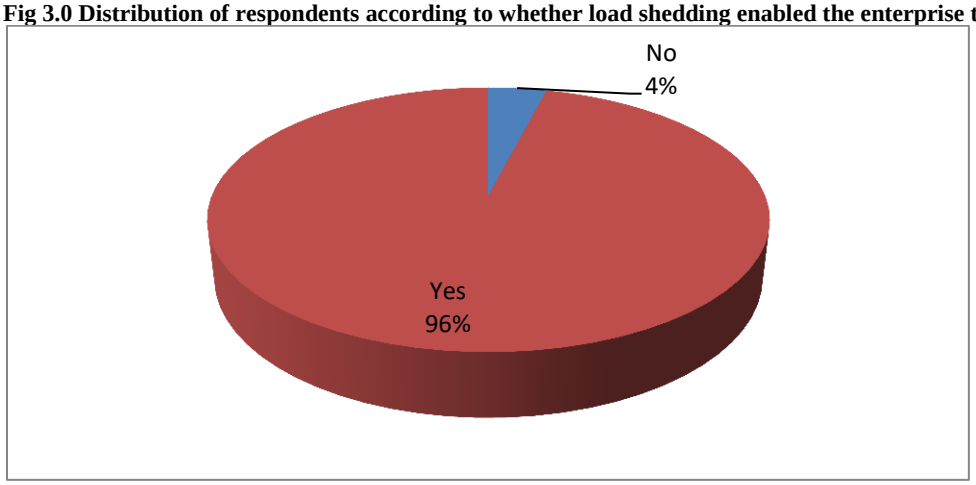
4.2.4 Whether Load Shedding Enabled the Enterprise to Operate for Fewer Hours or Not

Table 5.0 Distribution of respondents according to whether load shedding enabled the enterprise to operate for fewer hours.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	No	4	4
	Yes	96	96
Total		100	100%

Source: Author (2016)

Fig 3.0 Distribution of respondents according to whether load shedding enabled the enterprise to operate for fewer hours.



Source: Author (2016)

As it can be observed in table 8.0 and figure 3.0, of the 100 respondents sampled, 96 respondents, representing 96% of the respondents sampled said load shedding enabled them to operate for fewer hours while 4 respondents representing 4% said it did not enable them to operate for fewer hours.

4.2.5 Whether Advance warning arrangements are made

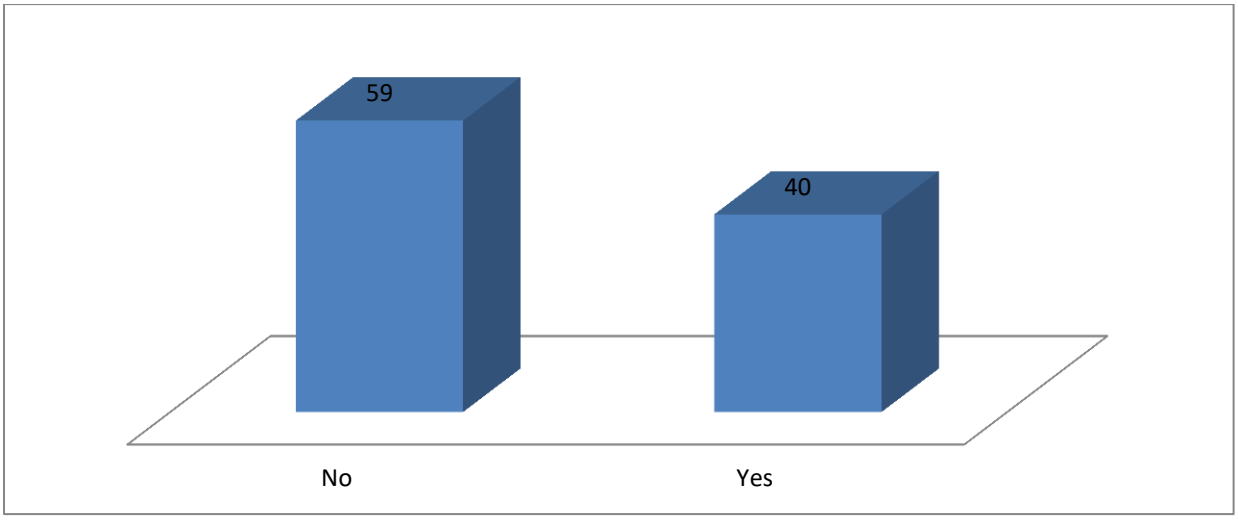
Table 6.0 Distribution of respondents according to whether advance warning arrangements were made between power utility and affected business houses.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	No	59	59%
	Yes	40	40%
	Not indicated	1	1%
Total		100	100%

Source: Author (2016)

Table 6.0 above and Figure 4.0 below shows that of the 100 respondents sampled, 59 respondents, representing 59% of respondents said there were no advance warning arrangements on load shedding while 40 respondents, representing 40% said there were advance warning arrangements put in place to make the business houses aware of the time and day they will be load shaded. However, 1 respondent, representing 1% of respondents did not indicate any option.

Fig 4.0 Distribution of respondents according to whether advance warning arrangements are made between power utility and affected business houses.



Source: Author (2016)

4.3 MEASURES EMPLOYED/ ENERGY ALTERNATIVES

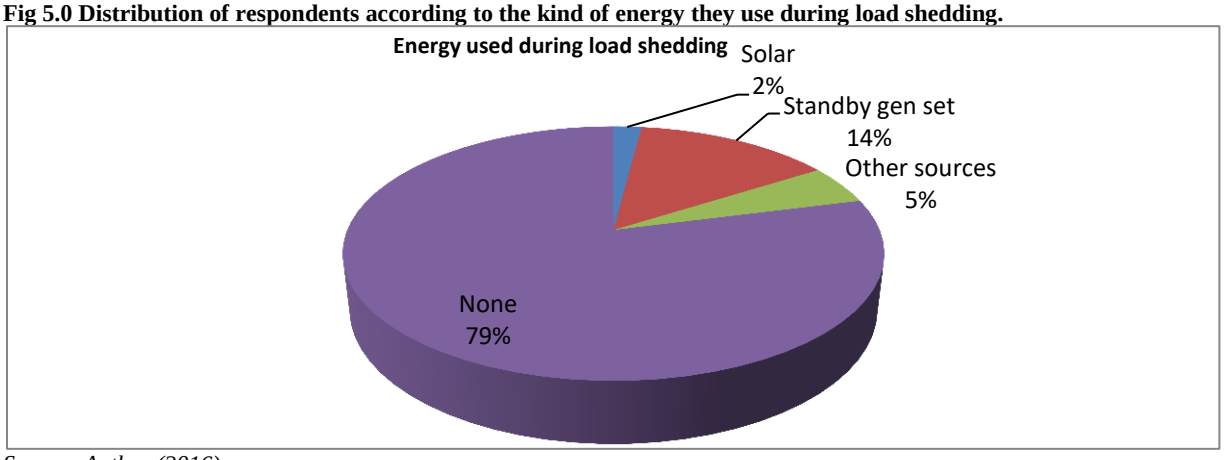
4.3.1 Type/ Kind of Energy used during load shedding

Table 7.0 Distribution of respondents according to the kind of energy they use during load shedding.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Solar	2	2%
	Standby gen set	14	14%
	Other	5	5%
	None	79	79%
Total		100	100%

Source: Author (2016)

Fig 5.0 Distribution of respondents according to the kind of energy they use during load shedding.



Source: Author (2016)

As it can be observed in table 7.0 and figure 5.0 above, 2 of the 100 respondents sampled said they used sola power as a replacement or substitute to electricity during periods of load shedding, 14 said they used gen sets, 5 indicated option "other sources" while 79 respondents, representing 79% of the sample said they did not use any sources of energy and instead waited until electricity was restored.

4.3.2 The effects of the use of substitute energy to business

Table 8.0 Distribution of respondents according to the effects of the use of substitute energy on business.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100 (21 used substitute energy)	Increased operation cost	12	57%
	Constant supply & production/ service provision	5	24%
	Drop in supply and production/ service provision	3	14%
	Not indicating	1	5%
Total		21	100%

Source: Author (2016)

The table 8.0 above shows that of the 21 respondents that said they used substitute energy sources during load shedding, 12 respondents, representing 57% said that as a result of using the substitute energy sources, their operation cost increased, 5 respondents representing 24% said that it resulted in constant supply and production/ provision of service while 3 respondents, representing 14% said it resulted in drop in supply and production/ service provision. However, 1 respondent, representing 5% did not indicate any option.

4.3.3 Other measures put in place to mitigate the effects of load shedding

Table 9.0 Distribution of respondents according to measures put in place to mitigate the effects of load shedding.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Preparing products e.g food in advance	8	8%
	No measure put in place	84	84%
	Preparing products only enough to be exposed in shortest period of time	1	1%
	Switching all appliances not in use to reduce demand at a given time	1	1%
	Use of substitute energy	1	1%
	Not indicating	5	5%
Total		100	100%

Source: Author (2016)

Table 9.0 above, shows that 8 respondents representing 8% of the sample said that they prepared their products, example food, in advance as a measure put in place to mitigate the effects of load

shedding, 84 respondents, representing 84% said they did not put any measure and waited until electricity was restored, 3 respondents, each indicating preparing products only enough to be exposed in shortest period of time, Switching all appliances not in use to reduce demand at a given time and Use of substitute energy as a measure put in place to mitigate the effects of load shedding respectively. However, 5 respondents, representing 5% of the sample did not indicate any opinion as it can be seen in the table.

4.3.4 What needs to be done to reduce on the negative effects of load shedding on business firms?

Table 10.0 Distribution of responses according to what respondents thought needed to be done to reduce on the effects of load shedding on business firms.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY
100	Promotion of the use of alternative energy	13
	Switching off all items not in use to reduce on demand	1
	Business firms to consider substitute energy sources	19
	Utility company ensure that illegal consumers are disconnected	1
	Empower business firms with loans to get alternative energy	6
	Exclude the load shedding of business/town centre	2
	Utility company to strictly follow load shedding schedule	2
	Utility company to be making advance arrangements/ informing business firms on load shedding times	2
	Load shedding of business/ town centre to be done at night	1
Total		47

Source: Author (2016)

As it can be observed in table 10.0 above, the three common responses to what the respondents thought needed to be done to reduce on effects of load shedding were that business firms needed to consider substitute energy sources, the government and concerned institutions needed to promote the use of alternative energy sources as opposed to relying only on electricity, and that the businesses firms need to be empowered with loans to get alternative energy.

4.3.5 The immediate term solutions to mitigate load shedding

Table 11.0 Distribution of responses according to what respondents thought were the immediate term solutions to mitigate load shedding.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY
100	Attend to faults/errors at Kariba station	27
	Build more reliable electricity generation station around the country	2
	Maintenance/recapitalize/modernize existing electricity infrastructure	20
	Constant power supply to businesses that depend on electricity	1
	Cut all illegal consumers- illegal consumer creates unnecessary demand	6
	Decentralization of power generation	1
	Importation of power from other countries	1
	Stop/ reduce power exportation to other countries	1
	Switching off electrical appliances not in use.	2
Total		61

Source: Author (2016)

Table 11.0 shows that the first two highest immediate term solutions to mitigate load shedding as viewed by the respondents were; Attend to faults/errors at Kariba station and Maintenance/recapitalize/modernize existing electricity infrastructure in the country.

4.4 EFFECTS ON PROFIT AND PRODUCTION

4.4.1 Loss/gain incurred as a result of load shedding

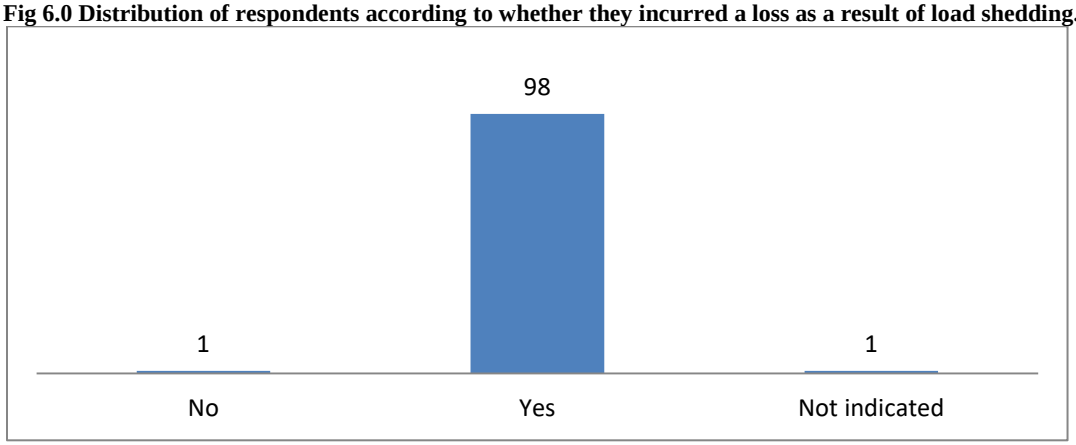
Table 12.0 Distribution of respondents according to whether they incurred a loss as a result of load shedding.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	No	1	1%
	Yes	98	98%
	Not indicating	1	1%
Total		100	100%

Source: Author (2016)

The table 12.0 above shows that 1 respondent, representing 1% of the sample said that they did not incur a loss as a result of experiencing load shedding while 98 respondents, representing 98% of the sample said they incurred a loss as a result of load shedding. However, 1 respondent, representing 1% of the sample did not indicate any option. This is also illustrated in figure 6.0 below.

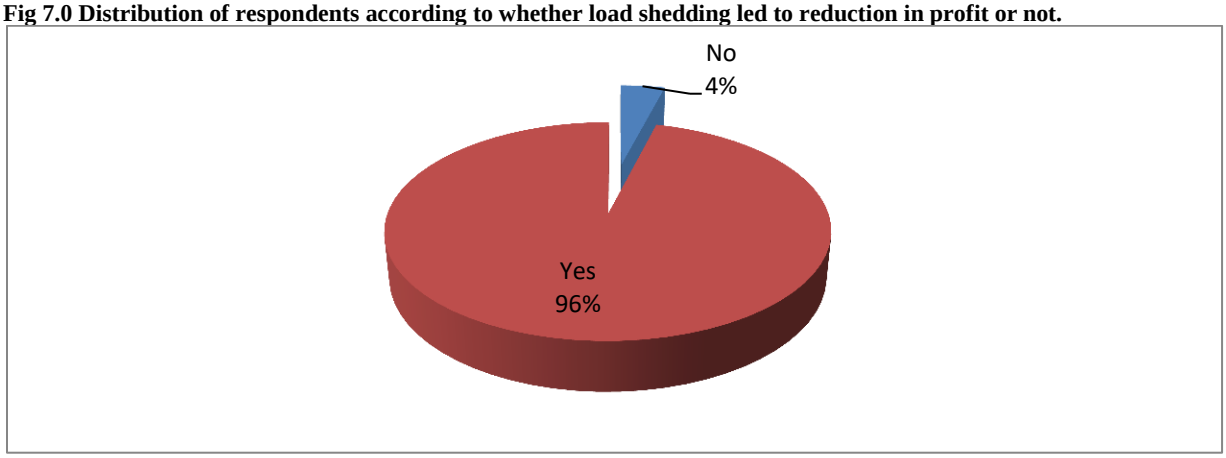
Fig 6.0 Distribution of respondents according to whether they incurred a loss as a result of load shedding.



Source: Author (2016)

4.4.2 Effect of load shedding on profits

Fig 7.0 Distribution of respondents according to whether load shedding led to reduction in profit or not.



Source: Author (2016)

Figure 7.0 shows the distribution of respondents according to whether load shedding led to reduction in profits to their firms of businesses. It shows that of the total 100 respondents, 4 respondents, representing 4% of the sample said that load shedding did not lead to reduction in profits while 96 respondents, representing 96% of the sample said that load shedding led to reduction in profits to the business. The reduction in profit could be attributed to loss in operation hours to especially to those who had not put in measures to mitigate the effects of load shedding as they were forced to close down and only resume once electricity was restored, and also increased operation cost to those that utilized expensive substitute energy sources as they need to pay for extra cost like buying fuel for gen sets.

4.4.3 Percentage of reduction on profits (if it led to reduction in profit)

Table 13.0 Distribution of respondents according to how much percentage in reduction in profit.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE (%)
100 (96 Who said reduction in Profits)	5%	1	1
	10%	4	4
	20%	7	7.2
	25%	5	5.2
	30%	18	19
	35%	3	3
	40%	10	10.4
	50%	6	6.2
	60%	4	4
	Not indicating	38	40
Total		96	100

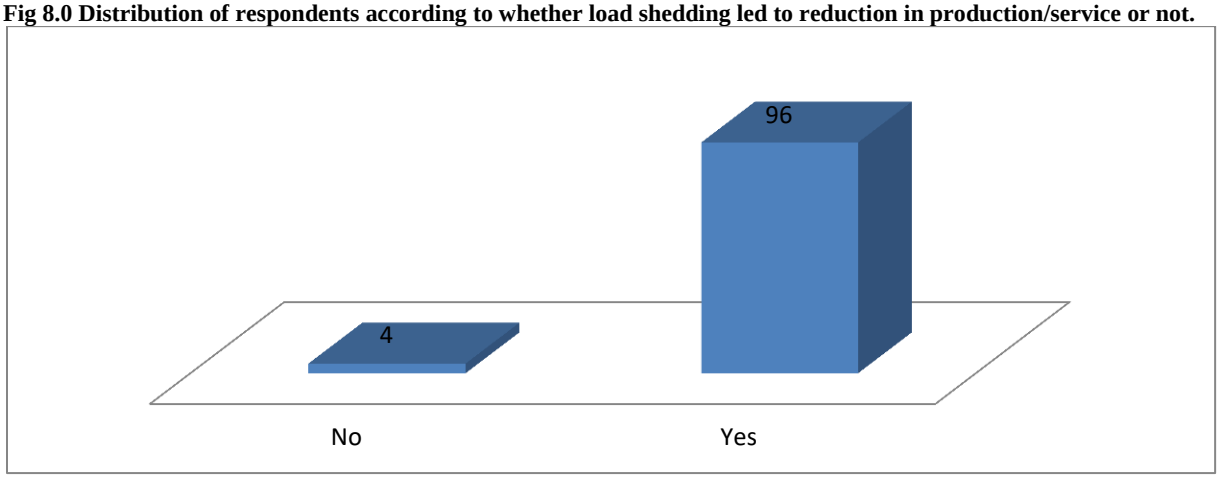
Source: Author (2016)

Table 13.0 shows that, of the 96 respondents that said load shedding led to reduction in profits, 1 respondent, representing 1% said the reduction of profits in percentage was 5%, 4 respondents,

representing 4% said it was 10% reduction, 7 respondents, representing 7.2% said it was 20% reduction in profits. 5 other respondents, representing 5.2% said it was 25% reduction, 18 respondents, representing 19% said the reduction in profit was by 30%, 3 respondents, representing 3% said it was 35% profit reduction. The table further shows that 10 respondents, representing 10.4% said it was 40% reduction in profit, 6 respondents, representing 6.2% said it was 50% while 4 respondents, representing 4% said it was 60% reduction in profits. The table also shows that 38 respondents, representing 40% of the respondents, did not indicate any option.

4.4.4 Effect of load shedding on production

Fig 8.0 Distribution of respondents according to whether load shedding led to reduction in production/service or not.



Source: Author (2016)

Figure 8.0 shows that of the total 100 respondents sampled, 4 respondents, representing 4% said that load shedding did not led to reduction in production while 96, representing 96% of the sample said that load shedding led to reduction in production or service provision.

4.4.5 Percentage of reduction on production (if it led to reduction in production)

Table 14.0 Distribution of respondents according to how much percentage in reduction in production.

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100 (96 Who said reduction in Production)	5%	1	1
	10%	4	4
	20%	8	8
	25%	5	5
	30%	15	16
	35%	4	4
	40%	11	12
	50%	5	5
	60%	4	4
	Not indicating	39	41
Total		96	100%

Source: Author (2016)

Table 14.0 shows that of the 96 respondents that said that load shedding led to reduction in production or service provision, 1 respondent, representing 1% said that load shedding led to 5% reduction in production and service provision, 4 respondents, representing 4% said the reduction in production or service provision was 10% while 8, representing 8% said it was 20% reduction. 5 other respondents, representing 5% said the reduction in production was 25%, and 15 respondents, representing 16% said the reduction in production was 30%. The table also shows that other 4 respondents representing 4% said the reduction in production was 35, other 11, representing 12% said it was 40%, and 5 others, representing 5% said it was 50% while other 4 respondents, representing 4% said it was 60%. 39 respondents, representing 41% did not indicate any option however.

4.5 RELATIONSHIP BETWEEN AFFORDABLE AND RELIABLE ENERGY SOURCES AND BUSINESS GROWTH (Respondents disagree/agree)

4.5.1 Hindrance on diversification of services

Table 15.0 Distribution of respondents according to whether load shedding hindered diversification

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Disagree	15	15%
	Agree	85	85%
Total		100	100%

Source: Author (2016)

As it can be observed above, table 15.0 shows that of the 100 respondents sampled, 15 respondents, representing 15% of the sample, disagreed with the statement that "load shedding hindered diversification" while 85 respondents, representing 85% of the sample agreed or said that load shedding hindered diversification.

4.5.2 Seen a reduction/disappearance of business firms services

Table 16.0 Distribution of respondents according to whether load shedding had resulted in reduction/disappearance of firms

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Disagree	14	14%
	Agree	86	86%
Total		100	100%

Source: Author (2016)

Table 16.0 shows that of the 100 respondents sampled, 14 respondents, representing 14% of the sample, disagreed with the statement that "load shedding had resulted in reduction or

disappearance of firms or businesses" while 86 respondents, representing 86% of the sample agreed or said that load shedding had resulted in reduction and disappearance of businesses or firms.

4.5.3 Resulted in inefficiency in processes

Table 17.0 Distribution of respondents according to whether load shedding led to inefficiency in processes

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Disagree	11	11%
	Agree	89	89%
Total		100	100%

Source: Author (2016)

The table, 17.0 shows that of the 100 respondents sampled, 11 respondents, representing 1% of the sample, disagreed with the statement that "load shedding led to inefficiency in processes" while 89 respondents, representing 89% of the sample agreed or said that load shedding led to inefficiency in processes in the businesses or firms.

4.5.4 Resulted in reduced quality of products/services

Table 18.0 Distribution of respondents according to whether load shedding led to reduced quality of products/services

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Disagree	7	7%
	Agree	93	93%
Total		100	100%

Source: Author (2016)

Table 18.0 shows that of the 100 respondents sampled, 7 respondents, representing 7% of the sample, disagreed with the statement that "load shedding led to reduced quality of products/ services" while 93 respondents, representing 93% of the sample agreed or said that load shedding led to reduced quality of products/services in the businesses or firms.

4.5.5 Enabled businesses/enterprise to operate for fewer hours

Table 19.0 Distribution of respondents according to whether load shedding led to reduced hours of operation

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Disagree	4	4%
	Agree	96	96%
Total		100	100%

Source: Author (2016)

As it can be observed, table 19.0 shows that of the 100 respondents, 4 respondents, representing 4% of the sample disagreed to the statement that " load shedding led to reduced hours of operation while 96 respondents, representing 96% agreed that load shedding led to reduced hours of operation.

4.5.6 Led to increase of operation cost

Table 20.0 Distribution of respondents according to whether load shedding led to increased operation cost

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Disagree	9	9%
	Agree	91	91%
Total		100	100%

Source: Author (2016)

Table 20.0 shows that of the 100 respondents, 9 respondents, representing 9% of the sample disagreed to the statement that "load shedding led to increased operation cost while 91 respondents, representing 91% agreed that load shedding led to increased operation cost.

4.5.7 Made communication with service providers inefficient

Table 21.0 Distribution of respondents according to whether load shedding made communication with service providers inefficient

SAMPLE SIZE	TYPE OF RESPONSE	FREQUENCY	PERCENTAGE
100	Disagree	24	24%
	Agree	76	76%
Total		100	100%

Source: Author (2016)

Table 21.0 shows that of the 100 respondents, 24 respondents, representing 24% of the sample disagreed to the statement that "load shedding made communication with service providers inefficient" while 76 respondents, representing 76% agreed that load shedding made communication with service providers inefficient.

5.0 FINDINGS AND DISCUSSION OF RESULTS

5.1 Introduction

This chapter presents the findings from analyzed data in chapter 4. Its focuses is on the main concepts covered in the conceptual framework, namely, load shedding, firm productivity, firm profitability, alternative measures and firm wellbeing. Additionally, it discusses the results in line with the research problem and research questions/objectives and attempts to provide possible solutions to the research problem.

5.2 Effects of load shedding on firm`s production and profit

The analysis on the effects of load shedding on firm`s productivity and profitability reveled that whenever load shedding is effected, business houses experience reduction in productivity as illustrated in figure 8.0. The analysis also established that this led to reduction in profits for firms as illustrated in figure 7.0. This was further supported as observed in table 12.0 that reveled that business houses incurred a loss as a result of experiencing load shedding.

The analysis established that the reduction in both production and profits in percentage was 30% as it can be observed in table 14.0 and 13.0 respectively. This reduction can be attributed to the following:

1. Reduced operation hours. It was established that load shedding enabled businesses to operate for fewer hours as it can be observed in table 5.0. It was found that load shedding was experienced 4 times in a week and lasted for 6 hours as illustrated in table 2.0 and 3.0 respectively. It was established that, on average, most businesses operated for only 2 hours during the days they experienced load shedding as most of the businesses on a normal day (day when there was no load shedding) operated for between 9 hours and 8 hours as can be observed in table 4.0. This thus meant that production and service provision was reduced and this in turn resulted in reduced sales which in turn affected revenues and profits negatively. It was observed that both large and small scale businesses slowed down on production as they had to work only when there was electricity.

2. Increase in operation cost. It was established that the use of substitute energy sources resulted in increased operation cost as can be confirmed in table 8.0 that showed that “increased operation cost” was the highest effects of using substitute energy sources. This is further supported by table 20.0 that reveled that load shedding led to increased operation cost. Increase in operation cost affected the businesses` profits. It was also observed that increase in operation cost forced some businesses to reduce on their operation hours as a way of cushioning the cost for using substitute energy sources, which led to reduction in production despite using alternative sources.

It was however observed that the decline in production/ service provision depended on the length of load shedding experienced and the type of business involved. It was also observed that the effects were even much severe to businesses that did not put any measures or use any substitute energy sources to mitigate the effects of load shedding.

5.3 The measures put in place by business firms to mitigate the impact of load shedding

The analysis established that very few businesses used alternative or substitute energy sources during load shedding. As can be observed in table 7.0 and figure 5.0, 79% of the business firms sampled, did not use any source of energy, and only resumed operation when electricity power was restored. It was however found that the majority of the business houses that used alternative energy sources relied on standby gen-sets as a measure to mitigate the impact of load shedding. A few others used sola power during load shedding.

It was also reveled that apart from not using alternative or substitute energy sources, many business firms still had not put in place other measures to mitigate the effects of load shedding as it can be observed in table 9.0. It was however established that some other business firms prepared their products, example food, in advance as a way of mitigating load shedding. It was also reveled that others prepared products such as perishables, only enough to be exposed or sold within the shortest possible period of time to avoiding wastage while others switched all appliances that were not in use at a given time to reduce demand on electricity that would have resulted in load shedding even on the days that were not to be load shaded. However, it was observed that such measures had their challenges, for example products going to waste on days when they had limited customers.

On the other hand, it was observed that the measures put in place to mitigate load shedding by business firms were frequently frustrated by failure by the electricity company to make advance warning arrangements, as it can be observed in table 6.0 and figure 4.0, and failure by it to follow communicated load shedding schedules.

5.4 How the measures put in place have affected productivity and profitability

It was reveled that the measures put in place to mitigate load shedding resulted in mixed effects on productivity and profitability. It was established that the following resulted from the measures put in place: in increased operation cost for the firms or business, constant supply and production/ constant service provision and drop in supply and production/ service provision. This is illustrated in table 8.0.

Operation cost increase affected the businesses` profits and production as some businesses reduced on their operation hours as a way of cushioning the cost for using substitute energy sources, which led to reduction in production and in turn reduced sales and subsequently reduced revenues. The same reasoning can also be attributed to the drop in supply and production/ service provision which was one of the effects of measures put in place to mitigate load shedding.

However, constant supply and production/ constant service provision was attributed to the fact that instead of operating for few hours and supply only for few hours for example, during load shaded days, firms at least after putting up measures, operated for a bit longer hours and continued supply for longer hours compared to the hours they could have been supplying had it not been for the measures put in place.

5.5 The relationship between affordable and reliable energy sources and business growth

It was revealed that lack of affordable and reliable energy sources resulting from load shedding impacted on business growth negatively. It was established that load shedding hindered diversification of services as it can be observed in table 15.0. Businesses filed to diversify into other services especially services that are electricity dependant.

It was further discovered that load shedding led to the reduction and disappearance of business firms. This is shown in table 16.0. It was observed that a good number of entrepreneurs, especially newer entrepreneurs, closed down there businesses following reduced production, service provision and profits due to load shedding, a situation which is not good for the country`s employment creation agenda.

Also, it was established that load shedding resulted in inefficiency in processes, both of doing business and within particular businesses. Table 17.0 confirms this. This was as a result of damage to machinery and stress on some equipment. It was observed that processes were taking longer than expected especially that we are in a computer and electronic world that is more reliant on energy, and businesses have modernized to suit the demands of modern business where energy drives their wheels of operations.

It was also found that load shedding resulted in reduced quality of products and services, table 18.0 confirms this. This is mainly due to inefficiencies in processes resulting from load shedding. It can also be attributed to the reduction and disappearance of business firms that in turn diminishes the idea of firms competing on the basis of quality as customers have limited variety goods and services.

Further, it was found that load shedding made communication with service providers inefficient, table 21.0. Being in a computer and digital era where almost everything including communication is driven by some form of energy, it meant that when there was load shedding, businesses could not communicate through for example internet, with service providers and clients and waited when power was restored to communicate the message which they could have communicated immediately. Therefore, communication being critical in any relationship including business, delayed communication and inefficiency in communication hamper business growth. Furthermore, it was also found as earlier mentioned, that load shedding resulted in firms operating for fewer hours and also that it led to increase in operation cost. This can be observed in tables 5.0 and 8.0 respectively. These in themselves impact negatively as we saw earlier, on the business and thus therefore, are impediments to the growth of businesses and entrepreneurship generally.

5.6 The options to mitigating the effects/ ending load shedding.

As it can be observed in tables 9.0, 10.0, and 11.0, it was established that the options to mitigate the effects of load shedding included the promotion of the use of alternative, switching off all electric appliances not in use to reduce on demand, business firms to consider using substitute energy sources and the government to consider empowering business firms with loans to acquire alternative energy. Other options included to exclude the load shedding of business/town centre especially during day time and instead load shed business centers at night, utility company to be making advance warning arrangements/ informing business houses of load shedding schedules and to strictly follow load shedding schedules that they communicate to business houses as this will enable business firms plan their operations and avoid costs associated with unexpected load shedding such as wasted raw materials already in the production process.

Further, it was established that options to end load shedding included attending to faults/ errors at Kariba station and other power generation stations, building more reliable electricity generation stations around the country to ensure constant power supply to businesses that depend on electricity, maintenance/recapitalize/modernize existing electricity infrastructure, cut and wipe out all illegal consumers- illegal consumers create unnecessary demand, decentralization of power generation per region, importation of power from other countries, stop/ reduce power exportation to other countries and switching off electrical appliances not in use so as to avoid unnecessary demand.

CHAPTER 6. RESEARCH CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

The research sought to investigate the impact of electricity demand and load shedding on Zambian businesses, a study carried out in Solwezi district. The research was guided by the following research objectives:

I. To establish the effects of load shedding on the Zambian business in terms of productivity and profitability.

II. To assess the measures employed and available energy alternatives the businesses depend on as the replacement to ZESCO electricity.

III. Find out how these measures have affected profitability and productivity.

IV. To increase knowledge on the relationship between affordable and reliable energy sources and business growth.

V. Find out the options to mitigating the effects/ ending load shedding.

The objectives guided the research to remain focused. From the results and findings of the research, the following conclusions have been formulated:

6.1 CONCLUSIONS

- There is a huge power demand as a result of increase in economic activities particularly in the mining, manufacturing, agriculture sectors and in all other businesses and entrepreneurship activities in general, which has resulted into electricity deficit of about 500MW and putting a strain on the electricity company. The power rationing and load shedding embarked by ZESCO to manage the deficit had impacted negatively on both firm`s productivity and profitability. It had led to significant reduction in production and profits.

- Although very few business firms used alternative energy sources during load shedding, in order to mitigate the effects of load shedding, firms were forced to resort to using alternative energy sources such as gen-sets and sola power. Others were forced to be preparing their products, example food, in advance, others prepared products such as perishables, only enough to be exposed or sold within the shortest possible period of time to avoiding wastage while others switched all appliances that were not in use at a given

time to reduce demand on electricity that would have resulted in load shedding even on the days that were not to be load shaded.

- The measures put in place to mitigate load shedding resulted in mixed effects on productivity and profitability. The use of alternative sources of energy resulted in increased production or operation cost for the firms or businesses which in turn impacted negatively on firm`s profitability. For many, procurement of gen sets was expensive and maintaining them was another challenge. On the other hand, the use of other measures such as preparing of products in advance, somehow boosted sales and revenue as it meant that firms were in constant supply and production/ constant service provision, as instead of operating for few hours and supply only for few hours for example, during load shaded days, they worked for a longer period. This however had its challenges, for example products going to waste on days that they had limited customers and thus resulted in lost revenue.

- Lack of affordable and reliable energy sources resulting from load shedding impacted on business growth negatively. It was found that lack of affordable and reliable energy sources acted as a hindrance to business and service diversification, resulted in businesses closing down, resulted in inefficiencies in processes, resulted in compromised quality of products and services, resulted in businesses operating for few hours, resulted in increased operation and production cost, and made communication with service providers and other partners inefficient. In this regard, lack of affordable and reliable energy sources acts as a barrier and disincentive to businesses growth and entrepreneurship.

- Load-shedding was unavoidable as the economy continues to grow and putting pressure on the power utility company ZESCO, to satisfy the ever increasing demand. However, the electricity deficit challenge can be better managed to mitigate the effects of load shedding and ending load shedding. Options to mitigate the effects of load shedding include the promotion of the use of alternative energy sources, switching off all electric appliances not in use to reduce on demand, business firms to consider using substitute energy sources and the government to consider empowering business firms with loans to acquire alternative energy. Other options include to exclude the load shedding of business/town centre especially during day time and instead load shed business centers at night, utility company to be making advance warning arrangements/ informing business houses of load shedding schedules and to strictly follow load shedding schedules that they communicate to business houses so as to enable firms to plan for their production and operation and avoid cost associated with unexpected interruptions.

  The options to end load shedding include attending to faults/ errors at Kariba station and other power generation stations in the country, building more reliable electricity

generation stations around the country to ensure constant power supply to businesses that depend on electricity, maintenance/recapitalize/modernize existing electricity infrastructure. This will demand massive increase in investments into electricity by both the Government and ZESCO. The other option is to cut and wipe out all illegal consumers as the illegal consumers create unnecessary demand. Other options include decentralization of power generation per region, importation of power from other countries although costly and not sustainable, stop or reduce power exportation to other countries and switching off electrical appliances not in use so as to avoid unnecessary demand and pressure on the electricity system.

6.2 RECOMMENDATIONS

Following the conclusions above, the following are the recommendations:

Short term Solutions:

- First and foremost, the implementation of energy efficiency policies or measures is recommended. Energy efficiency measures such as the use of energy-saving appliances, simple demand-side management measures, or energy conservation in buildings, would significantly reduce electricity demand on the immediate term. Encouraging energy efficiency, even through campaigns and sensitizations, can provide substantial cost savings to governments, businesses and households, while freeing up power for other more productive uses. The government should also consider empowering business firms with soft loans to enable them acquire alternative energy as one of the challenges businesses face is procurement of substitute energy sources such as gen-set.

- The other challenge with current load shedding is that schedules for the power-cuts are not consistent and not strictly followed. This has made it difficult for consumers to plan their activities. Improved notification and strict adherence to schedules is required from ZESCO. Improved communication with the public is essential as it would make power outages be more predictable and commerce and industry could plan to work round them.

- ZESCO should also consider excluding of business/town centre from load shedding especially during day time and instead load shed business centers at night as many businesses are expected to be closed during night time. However, this would mean increase of load shedding for other consumers who would not take it kindly as well, and hence would require some balance to be strike.

Long term Solutions:

- The current electricity deficit challenge in the country is partly due to unexploited hydro power potential. Therefore, investment in generation capacity would unlock this potential and assure self sufficiency. Thus, we should not only concentrate on maintaining the existing power generation infrastructure but also building new ones to increase generation capacity. Decentralization of power generation per region can also be helpful.

- There is need for diversification in energy especially that the country has substantial unexploited reserves of different forms of energy sources. As a country, we should seek to diversify the country's energy source away from ZESCO as the sole provider of energy. This would require more investments into unexploited energy potentials and sources. This would also need incentives such as waiver of tax on energy sources to encourage more private investments into the energy sector. This would require the government to develop legislations that can support the open market in the energy sector.

- All in all, the energy deficit that Zambia faces needs concerted efforts to address because it has caused major challenges on the local economy. It needs the government, the private sector, the general public and the international community to play its contributing part.

7.0 FURTHER RESEARCH:

The replication of the study in different areas of Zambia and with different sectors of the economy and different business sizes would enable better regulation of the findings of the study.

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APPENDIX A:

Introductory letter

INFORMATION AND COMMUNICATIONS UNIVERSITY
SCHOOL OF BUSINESS

PROGRAMME: Master of Business Administration in Economics

COURSE: Contemporary Issues

RESEARCH QUESTIONNAIR

Topic: Electricity Demand and Load Shedding: Impact on Zambian Business

Dear Respondent,

I am a student at the Information and Communications University carrying out a study or research project on the Electricity Demand and Load Shedding: Impact on Zambian Business.

I kindly ask for your co-operation by answering the questionnaire honestly and truthfully.

You are highly assured that information given shall be treated with the confidentiality it deserves. For this reason you are requested not to write your name or any other identity as the study guarantees the anonymity of your assistance.
Thank you for your co-operation.

NB: IF your response or answer cannot fit the space provided in the questionnaire, you are very free to attach a separate paper to fully express yourself.

APPENDIX B: Questionnaire

Questionnaire

This questionnaire is for the purpose of the research only and the information you give will be treated confidentially. Please answer all the questions provided as honestly as possible, to the best of your knowledge.

A: GEOGRAPHIC CHARACTERISTICS

1. District: .....

2. Constituency: .....

3. Enumeration Area (Section): .....

B: OTHER INFORMATION (Indicate the number of the appropriate option in the box).

1. What is your Sex?	1. Female 2. Male	
2. What is your Age?	1. 20 years 2. 21-25 years 3. 26-30 years 4. 31-35 years 5. 36 years & above	
3. What is the name of the business? State		
4. Type/category of business/ SME	1. Service provision (water supply, Banks and internet services/ IT 2. Enabled Services)…1 Manufacturing/welding shops/Iron & Steel 3. Food and Beverage/restaurant/tourism sector/Hotels business 4. Salons/barber shop 5. Poultry/grain milling	

C: EXTENT OF LOADSHEDDING

1. How many times (frequency) do you experience load shedding in a week?		
2. How long (length in hours) load shedding takes?		
3. During uninterrupted power supply, how many hours do you operate? (Normal hours of Operation)		
4. Has Load shedding enabled your enterprise to operate for fewer hours	1. No 2. Yes	
5. Are there advance warning arrangements made between you and the power utility company before load shedding?	1. No 2. Yes	

D: MEASURES EMPLOYED/ ENERGY ALTERNATIVES

1. What kind of energy do you use during load shedding?	1. Car Battery 2. Kerosene 3. Petrol 4. Diesel 5. Solar 6. Standby gen set 7. Other (s) 8. None	
2. If not none, how has the use of substitute energy to electricity affected your business?		
3. What other measures have you put in place to mitigate the effects of load shedding?		
4. Is there loss/cost that u incur as a result of load shedding?	1. No 2. Yes	
5. What do you think needs to be done to reduce on negative effects of load shedding on business firms?		
6. What do you think are the immediate term solutions to mitigate load shedding?		

E: EFFECT ON PROFIT AND PRODUCTION

1. Has load shedding led to reduction in profits?	1. No 2. Yes	
2. If yes, by how much percentage?		

3. Has load shedding led to reduction in production?	1. No 2. Yes	
4. If yes, by how much percentage?		

F: RELATIONSHIP BETWEEN AFFORDABLE ENERGY SOURCES AND BUSINESS GROWTH

(Where 1= disagree and 2 = agree) please indicate whether you disagree or agree with the following statement

1. Load shedding of power has hindered diversification of my services	
2. Load shedding of power in the town has seen a reduction/disappearance of business firms	
3. Load shedding of electricity has resulted in inefficiency in my processes	
4. Load shedding of electricity has resulted in reduced quality of my products/services	
5. Load shedding of electricity has enabled my business/enterprise to operate for fewer hours	
6. Load shedding of electricity has led to increase of operation cost	
7. In a technology era, load shedding of electricity has made communication with service providers inefficient	

G. What do you think are the long term solutions to the electricity deficit in the Country?

1)……

2)……

3)……

4)……

5)……

THANK YOU FOR YOUR TIME AND PARTICIPATION