



The impact of high electricity tariffs on small, medium and micro enterprises in the Rustenburg Area

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DECLARATION

I, the undersigned, declare that the content of this dissertation, **the impact of high electricity tariffs on small, medium and micro enterprises in the Rustenburg area**, represents my own work, and that all the sources I have used or cited have been indicated and acknowledged by means of complete references.

C T Moseki

07/12/2018

Signature

Date

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DEDICATION

This work is dedicated to my family

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ABSTRACT

Historically, South Africans have benefited from relatively cheap electricity where tariffs have not been cost-reflective. However, since early 2008 the average electricity tariffs have continued to increase considerably. The continuous increase in electricity tariffs in South African has been a topic of debate over the recent years. The tariff increase did not only increase household spending, but as well threatens the sustainability and has negatively affected firms' performance and profitability. In addition, the increases have also raised concerns around affordability for end users, especially Small, Medium and Micro Enterprises (SMMEs). To this end, this study investigates the negative impacts of increase electricity tariffs on the operations and performance of SMMEs operating in the Rustenburg area in the North West province of South Africa.

A descriptive survey research designed with a quantitative approach was used to collect and analysed empirical data from 29 SMMEs in various business sectors in Rustenburg, the North West province of South Africa. The results revealed that an increase in electricity tariffs has indeed negatively affected firms' performance (profitability). In addition, it was further realised that an increase in electricity tariffs severely affects SMMEs located in the Rustenburg area than those located elsewhere in the country.

From these findings, recommendations were made to electricity stakeholders as well as for future research.

Keywords: Small, Medium and Micro-Enterprises (SMMEs); Electricity Tariff; Rustenburg area, performance; profitability.

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LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviations and acronyms	Meaning
DME	Department of Minerals and Energy
DoE	Department of Energy
DTI	Department of Trade and Industry
ESKOM	Electricity Supply Commission
GDP	Gross Domestic Product
IEA	International Energy Agency
kWh	Kilowatt
MW	Megawatt
NERSA	National Energy Regulator of South Africa
NWU	North-West University
RSA	Republic of South Africa
SARB	South African Reserve Bank
SMMEs	Small, Medium and Micro Enterprises
SPSS	Statistical Package for Social Sciences
Stats SA	Statistics South Africa
USA	United States of America
USD	United States Dollar
ZAR	South African Rand

CHAPTER 1

ORIENTATION OF THE STUDY

1.1 INTRODUCTION

Electricity tariffs in South Africa have historically been kept low and declining in real terms between 1980 and 2007 (Deloitte, 2017:8). However, in early 2008 the trend in electricity tariffs took a dramatic turn beyond expectations with a 78% increase between 2008 and 2011. A comparison of the ZAR0.25 per kilowatts (kWh) tariff in 2008 and the potential R1.06 per kWh in 2018 indicate a 324% relative increase in electricity tariffs (NERSA, 2017:20). The tariff increase did not only increase household spending but threatens the sustainability and has negatively affected firms' performance and profitability (Nyanzu & Adarkwah, 2016:1). In addition, the increases have also raised concerns around affordability for end users, especially Small, Medium and Micro-Enterprises (SMMEs) notwithstanding the immense energy potential in South Africa (Eskom, 2012; Karekezi & Kimani, 2008; Khobai, Mugano & Le Roux, 2017:108). However, despite the increase in real electricity charges since 2008, electricity tariffs in South Africa are still the lowest compared to international standards (Peters, 2016:271).

Given the increased demand for electricity and increasing electricity prices in South Africa, the present study aims to investigate the impact of the recent increases in electricity tariffs on SMMEs operating in the Rustenburg area in the North West province of the Republic of South Africa. Following this introduction, this introductory chapter provides a background to the study in an effort to clarify the context under investigation. Followed by the rationale for the study, the problem statement and research questions, the objectives as well as a brief discussion of the research design and methodology of this study are provided. Consideration regarding ethical issues was also highlighted. Finally, an outline of the chapters making up this study and the chapter conclusion were presented.

1.2 BACKGROUND TO THE STUDY

The Rustenburg area of South Africa is dominated by the services sector but the contribution of SMMEs and other relatively energy-intensive sectors remains significant (Deloitte, 2017:8). The Rustenburg municipality is among the top 20 municipalities in South Africa with the highest electricity charges as shown in Figure 1.1 (Deloitte, 2017:56; Stats SA, 2015).

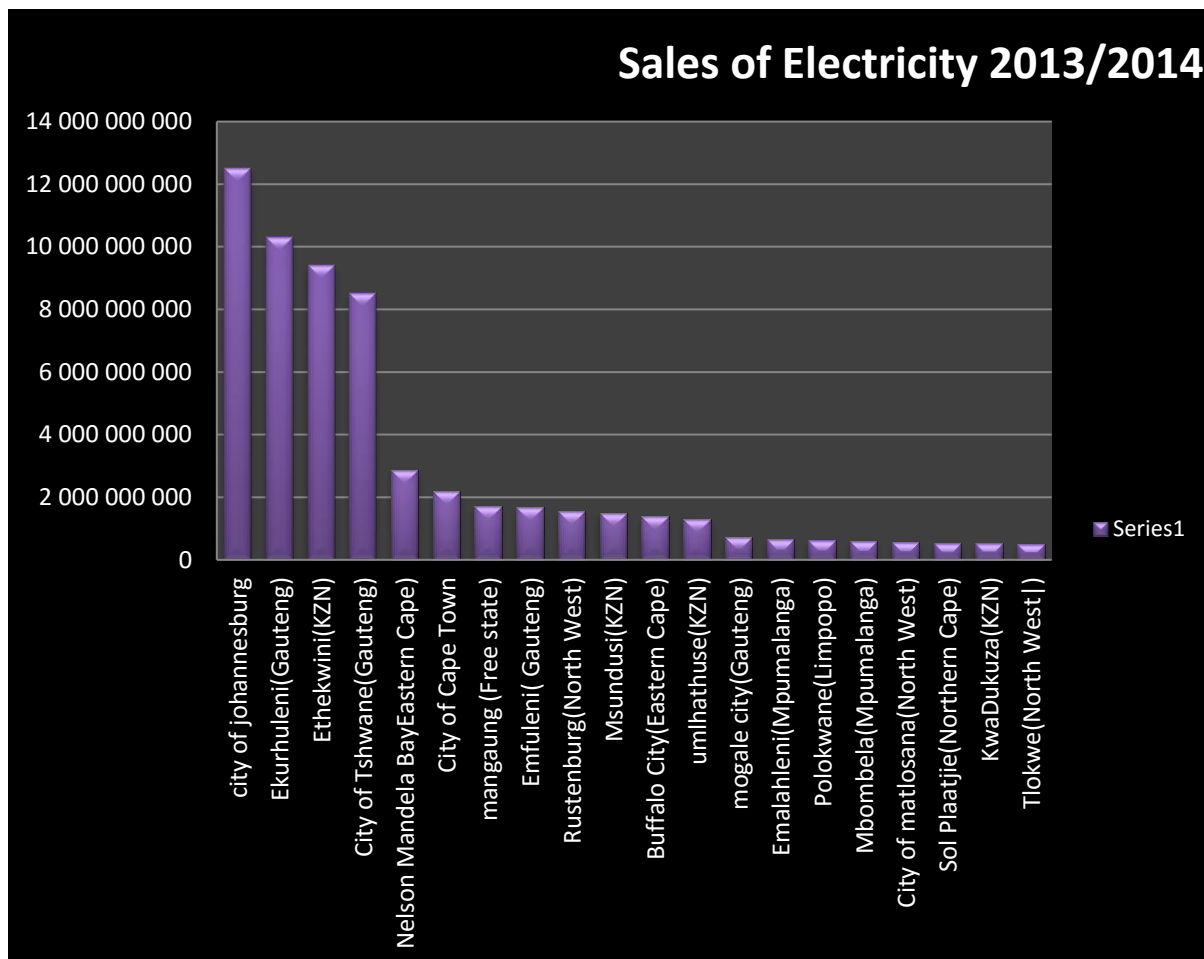


Figure 1 1: Top 20 Municipalities with highest contribution of electricity charges

Source: Stats SA (2015)

The continuous increases in electricity tariffs as shown in Figure 1.1 have been attributed to energy intensive sectors such as mining, electricity, gas, water and agriculture, which are large consumers of electricity in South Africa, and these sectors

make a direct contribution of 26% to Gross Domestic Product (GDP) (NERSA, 2017:11). Research has supported that the mining sector is the most reliant of all the major sectors of the economy on electricity as an input but some mining activities such as coal have relatively low exposure to electricity costs (Deloitte, 2017:13). Furthermore, electricity losses and theft have exacerbated the situation resulting in the Rustenburg Municipalities to overprice electricity, charging high tariffs and earning large surpluses. However, the impacts of increasing tariffs are not only felt by the mining companies but as also SMMEs in this area. In this regard, small businesses in the Rustenburg area are experiencing high fixed costs compared to other businesses in other parts of South Africa. Furthermore, the impacts of high cost electricity have resulted in most firms relocating their businesses to other suitable areas in the country with lower electricity costs.

Electricity serves as an indispensable input in virtually all business activities, especially industrial units that require a constant and effective flow of electricity. Apart from its necessity for running many industrial machines, its role in the productivity of human capital is enormous and similarly, serving as an input in production processes and contributes greatly to product marketing (Nyanzu & Adarkwah, 2016:2). However, the poor quality of electricity supply in South Africa is perceived by SMMEs to affect their operating profits negatively (Khobai *et al.*, 2018:108). Voltage fluctuation and electricity outages can halt production, damage equipment and affect product quality. Environmental constraints, a lack of availability of low priced primary energy sources, and increased construction costs for new electricity stations are all adding pressure to electricity prices (Khobai *et al.*, 2018:108; Von Ketelhodt, 2008:4). Real electricity prices have sharply increased from 2008, following a progressive decline between 1978 and 2008. As illustrated in Figure 1.1, the real average price of electricity fell by more than 40% from ZAR 39.7 cents per kilowatt-hour (kWh) in 1978 to ZAR 22.7 cents/kWh in 2008. In contrast, real prices increased by 75% from ZAR 22.7 cents/kWh to ZAR 40.3 cents/kWh between 2008 and 2011 and the average standard prices are expected to treble from 2009 to 2017 as shown in Figure 1.2.

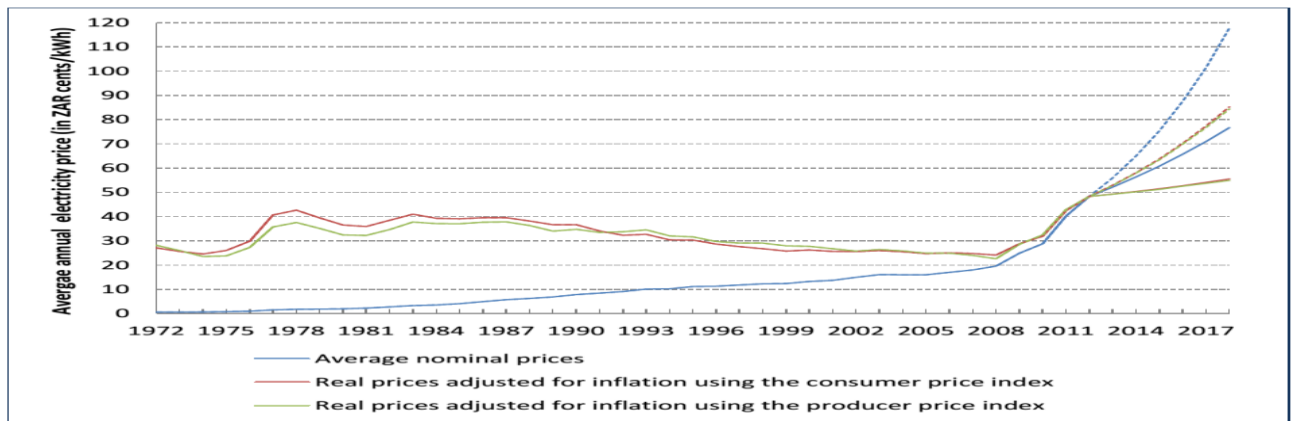


Figure 1 2: Average annual electricity prices between 1972 and 2018 (in ZAR cents per kWh)

Source: Department of Trade and Industry (2018:8).

Figure 1.1 reveals that electricity prices were stable from 1972 to 2008. As from 2008, the prices have increased beyond reasonable limits. This increase might magnify in the future if care is not taken. As no single policy instrument or price signal is sufficient to trigger a meaningful transformation, a varied business environment and the South African Government, in collaboration with business and labour partners (Department of Trade and Industry [DTI], 2014:9), must implement a complementary set of measures.

Despite South Africa having the cheapest electricity tariffs, the country's use of energy has not been particularly efficient and sufficient. The demand for electricity is likely to outstrip supply soon and Eskom, the state own electricity utility, is facing problems with supplying electricity at peak times (Peters, 2016:271; Von Ketelhodt, 2008:4). According to the International Energy Agency (IEA) World Energy Outlook 2015 report, global energy demands will increase by one-third between 2017 and 2040 (IEA, 2016). The increase can be attributed to climate change concerns that are creating imperative pressures for increasing energy prices in South Africa's energy policy. However, Eskom has embarked on a journey to install 17.8 Giga Watt (GW) of renewable energy-based generation capacity from the year 2010-2030, accounting for 42% of the new additional capacity over the period or 9% of the total electrical energy in 2030

(Department of Energy [DoE], 2011). This project was initiated after a loss of nine billion South African Rand (ZAR) threatened the sustainability of the electricity sector, when Eskom received a bailout from the South African Government (Peters, 2016:271). Since then, there has been a concerted shift towards tariffs that are more closely aligned to costs.

Electricity prices were generally a relatively small proportion of a firm's overall operating expenditure, for the operation of machinery, running of lights and appliances (Khobai *et al.*, 2018:109). However, after the global financial crisis followed in 2008 and 2009, pulling the South African economy into recession, a significant electricity tariff increases, coupled with the poor economic environment impeded the ability of firms to operate sustainably and impact negatively on profitability. Unlike Eskom who is a price setter, SMMEs are price takers. Scholars have argued that the overall effect of electricity price increases has not been sufficient to change firm behaviour and processes substantially, although some firms were reported to have already explored more energy efficient technologies, co-generation and renewables (Khobai *et al.*, 2018:110). One of the reasons for the increase is due to the response to serious electricity supply shortages when Eskom embarked on a massive build programme to increase electricity generation capacity. This increase has implanted a negative impact on the profitability of most if not all Small, Medium and Micro Enterprises referred to as small business, around the Rustenburg area and countrywide.

In 2008, the DTI published a comprehensive report on the SMME sector of South Africa (DTI, 2008). SMMEs play an important role in an economy. They can be key drivers of economic growth, innovation and job creation. However, limitations of access to finance for SMMEs are very common, given their highly conservative nature. South African banks and lenders are more inclined to put resources in small businesses in their later stages of development. Moreover, the high cost of electricity has added to the many challenges face by small businesses and threatens their existence as a going concern.

1.3 RATIONALE FOR THE STUDY

The purpose of this study is to investigate the impact of increasing electricity tariffs on SMMEs. High electricity costs have been identified as significant problems across South Africa. While much attention has been focused on the negative impacts of load shedding on the economy, fewer studies have focused on the impacts of rapidly rising electricity tariffs on SMMEs (Khobai *et al.*, 2017:110; Peters, 2016:274). Furthermore, over the past two decades, academic research has predominantly focused on electricity consumption in South Africa, the impact of the increasing electricity tariffs on business, but especially in the Rustenburg area has been negligible in academic discussions. The researcher's awareness of these neglects prompted an empirical investigation into the impacts of increasing electricity tariffs on the performance of small businesses. Through this understanding, the researcher intends to fill the gap in the existing body of knowledge regarding the impacts of increasing electricity on SMMEs in the Rustenburg area.

1.4 STATEMENT OF PROBLEM

It is commonly agreed that for Eskom to become sustainable, real electricity tariffs will have to rise further if other funding alternatives are not explored (Khobai *et al.*, 2018:110). However, electricity prices cannot continue to rise without affecting firms' profits and competitiveness. Tariff increases have significant impacts on end users of electricity such as SMMEs as this is a major expenditure item to most entities (Peters, 2016:271). SMMEs vulnerability in terms of rising electricity prices depends on its reliance on electricity as an input to production and on the extent to which it can mitigate against the impact of rising electricity prices (Deloitte, 2017:13). Deloitte (2017) further highlighted that Rustenburg has some of the highest electricity tariffs in the country compared to other areas. In this regard, businesses in the Rustenburg area are experiencing high costs and decreasing profitability. Although the National Energy Regulator of South Africa (NERSA) imposes regulatory restrictions that limit the extent to which tariffs can be increased, effectively limiting how much of the increased costs can be passed on to end users, the Rustenburg municipality does not

adhere to this limit entities (Peters, 2016:271). This is a particularly important limitation in the context of SMMEs in the Rustenburg area and in South Africa as a whole.

1.5 RESEARCH QUESTION

1.5.1 Main research question

The following research problem was therefore set to be solved:

- To which extent do increasing electricity tariffs affect the performance of SMMEs in the Rustenburg area?

1.5.2 Sub-research question

From this central research problem statement, the following sub-questions emerged:

- To what extent does an increasing electricity tariff affect operating profits of SMMEs in the Rustenburg area?
- To what extent does increasing electricity tariffs affect the sustainability of SMMEs in the Rustenburg area?

1.6 RESEARCH OBJECTIVES

In the context of increasing electricity prices in South Africa, the objectives of this study are:

- To investigate the impact of electricity tariff increases on the SMMEs in the Rustenburg area in the North West province of South Africa; and
- To establish a better understanding of the potential impact that further electricity tariffs increases could have on the various business sectors in the South African economy.

The above-mentioned objectives will be investigated through empirical research in the form of questionnaires administered to selected SMMEs in the Rustenburg area

1.7 RESEARCH DESIGN AND METHODOLOGY

According to Creswell (2014:12), a research design is simply a type of enquiry within any of the three approaches namely; quantitative, qualitative, and mixed approach to help provide direction for the study. The design adopted for this study is a quantitative survey design. The researcher selected this design because it enabled the researcher to use the quantitative data to explain in more detail the quantitative impact of increasing electricity tariffs on operating results of selected SMMEs in the Rustenburg area (Creswell, 2014:231). This enabled the researcher to have a more in-depth understanding of the research questions posed in this study to achieve the objectives of the current study.

1.7.1 Unit of analysis

The unit of analysis for this study consist of all SMMEs in various sectors in the Rustenburg area. A sample of 30 SMMEs will be selected using a simple random sampling method. According to Maree (2014:173), simple random sampling is a process whereby each element of a population must be numbered sequentially such that each element can uniquely be identified. This implies that each member of the entire population of SMMEs has a known probability and an equal chance of being selected.

1.7.2 Data collection

For the purposes of this study, which is a quantitative study, a Likert-type closed - ended questionnaire was the main research instrument used to collect primary data from the 30 selected SMMEs in the Rustenburg area. The use of closed-ended questions encourages respondents to choose from a range of predetermined responses, which are generally easy to encode and analyse (Wilson & Abibulayeva, 2009:210). The researcher personally administered the questionnaire to all the selected participating SMMEs. The researcher then followed a systematic procedure in analysing data by recording data, transcribing data, coding data into themes and categories, analysing, and discussing findings (cf. Creswell, 2014:197).

1.8 ETHICAL CONSIDERATIONS

The researcher is aware of obligations to be sensitive and respectful of research participants and their basic human rights and fully endorse the ethical code of the North-West University (NWU). The researcher obtained permission to conduct research in the selected SMME from the ethics committee of the NWU graduate School of Business and Governance. Letters were written to the management of the selected SMMEs to seek their cooperation and consent concerning administering the questionnaire in their companies.

1.9 CONTRIBUTION OF THE STUDY

Revising the impact of increasing electricity tariffs on SMMEs cannot be achieved in isolation. It will require creativity and cooperation among all stakeholders in the country. While the research findings of this study could assist in breaching the gap in the evidence regarding the impact of increasing electricity tariffs on SMMEs, it could:

- Also, be used as valuable information by academic institution and other electricity to address concerns of increasing electricity tariffs in South Africa.
- Provide insights for policy options to the South African government and policymakers in formulating strategies to mitigate the electricity prices in South Africa.

1.10 DEFINITION OF KEY CONCEPTS

Electricity grid: An electricity grid is an interconnected network for delivering electricity from producers to consumers. It consists of generating stations that produce electrical, high voltage transmission lines that carry electricity from distance sources to demand centres, and distribution lines that connect individual customers.

Electricity: For the purposes of this study, electricity is considered a form of energy used by businesses in their day-to-day operations.

Network charges: Charges designed to recover costs (including capital, operations, maintenance and refurbishment) for the provision of network capacity required by and reserved for the customer.

Quality of supply: Technical parameters that describe the electricity supplied to customers according to standard (NRS048) and any other NERSA prescribed requirements.

Small, Medium and Micro Enterprises (SMMEs): In the context of this study, SMMEs in South Africa range from small and medium-sized enterprises, such as established traditional family businesses employing fewer than fifty to two hundred staff, to informal micro-enterprises.

Electricity Tariff: Electricity tariff is the price that the municipality is charging end users for the consumption of electricity. In academic literature, electricity tariff and electricity prices have been used interchangeably. For the purposes of this study, the term ‘electricity tariff’ will be used when referring to either electricity tariff or electricity prices.

1.11 CHAPTER LAYOUT

The study is structured around four chapters:

Chapter 1: Orientation of the study

This chapter addresses a brief overview of the study, which includes an introduction and background to the study. It also includes the rationale, research problem, research questions, and objectives of the research. It also describes the research design by means of which the research was conducted.

Chapter 2: Literature review

Based on a literature study, this chapter reviews the impact of increasing electricity tariffs on SMMEs

Chapter 3: Research design and methods

This chapter discusses the research design and methods used in the study and the data-collection techniques as well as the procedures used to collect information. Ethical considerations and contribution of the study were also covered.

Chapter 4: Data analysis and interpretation

This chapter deals with analysis and presentation of findings

Chapter 5: Findings, conclusion and recommendations

This chapter discussed the findings made by answering the research questions stated above. A summary of the entire research work will be presented, and the conclusion drawn from the study. The limitations and recommendations for further research are provided.

1.12 SUMMARY

This introductory chapter provide the road map through which the study was conducted. The chapter elaborated the background to and rationale for the study. The problem statement provided enough evidence that the increase demand for electricity and increasing electricity prices in South Africa have a significant impact on the operating cost of businesses.

The next chapter will critically review related literature regarding the impact of increasing electricity prices in South Africa on SMMEs.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter provided the road map through which this study was conducted. This chapter undertakes a review of the existing body of knowledge of relevance relating to the impact of increasing electricity prices on SMMEs in the South African context. The chapter starts by looking at the role of Eskom as sole electricity provider in South Africa. Next, the role of municipalities as the intermediary between end users and Eskom is dealt with and finally, the impact of increase electricity tariff increases on SMMES in South Africa is considered.

2.2 THE ROLE OF ESKOM IN INCREASED ELECTRICITY TARIFFS

In past years, several studies on electricity prices have been published. However, most of the early studies deal with increase electricity rates in the context of vertically integrated mechanisms (Fan & Hyndman, 2010:2). Considering that the government utility Eskom has a monopoly on the generation and transmission of electricity in South Africa (Peters, 2016:271), it is vital to review literature relating to the role of Eskom in the ever-rising electricity tariffs in South Africa. An extensive literature review on the multiple aspects of the role-play by Eskom in pricing of electricity has not been done earlier (Dutta & Mitra, 2017:1131).

Through its state-owned entity, Eskom, the national government of South Africa is responsible for the bulk (96%) of electricity generation and all transmission in South Africa (Department of Minerals and Energy [DME], 2008; Peters, 2016:272). However, Eskom distributes 58% of this generated national electricity directly to end users, while local municipalities distribute the remaining 42% (Deloitte, 2017:56). Concerns have been raised as to why these two main distributors of electricity in South Africa are charging different tariffs to end users. Studies have shown that the rate charge to different users depends on the nature of the business carry out by the firms. According to Fan and Hyndman (2010:2), holding all other factors constant and considering economics theory, electricity demand will fall as the energy price increases. However,

this is not the case in South Africa. Altman *et al* (2008:20) rejects that in South Africa electricity price changes are essentially based on negotiations between Eskom and NERSA and does not result in prices that respond to market conditions. The authors further reasons that the regulator only consider cost-side issues, it cannot consider those on the demand side thereby transferring the increasing cost to end users especially SMMEs.

Research has shown that the rising electricity price in South Africa remains a politically sensitive issue particularly after the 2008 global financial crisis (Sato, Singer, Dussaux, & Lovo, 2015:2). An empirical evaluation of the historic South African electricity prices from 2008 to 2018 reveals that electricity prices has increase beyond expectations. However, there is uncertainty surrounding the long-term effects of these dramatic increases on all electricity stakeholders. South Africa's energy generation surplus is set to rise in the next decade and energy intensive sectors are already lobbying for special pricing agreements (Dutta & Mitra, 2017:1131). Concern are widely shared and the single most significant consequence of this will be the end users of electricity especially SMMEs.

Research has pointed that the ever-increasing rate is due to the inappropriate scheduling of electrical load which enhances end-users especially SMMEs response to dynamic tariffs (Dutta & Mitra, 2017:1131). This allows different forms of dynamic pricing policies by Eskom and municipalities, the two main electricity distributors to different markets and customers depending on customers' willingness to pay. Dutta and Mitra (2017:1131) contend that firms' willingness to pay for electricity services is also necessary in setting price limits depending on the demand and demand response curve. Conversely, Eskom argue that retail electricity markets generally offering a flat pricing or block pricing to earn users as prices remain unchanged irrespective of demand. On the other hand, the per unit rate of electricity either increases or decreases with increasing slabs of electricity consumption (Eskom, 2007).

Moreover, climate changes imperatives have accordingly commanded significant changes in South Africa's energy policy. Eskom has embarked on a journey to install 17.8 GW of renewable energy-based generation capacity from 2010-2030, accounting

for 42% of the new additional capacity over the period or 9% of the total electrical energy in 2030 (DTI, 2011). Concerns are raised as to if this initiative will help reduce the electricity price to acceptable rate. In this regard, Peters (2016:272) debated that unstable electricity prices severely threaten the survival of SMMES in South Africa.

In terms of the Electricity Regulation Act, NERSA imposes regulatory restrictions that limit the extent to which tariffs can be increased, effectively limiting how much of the increased costs can be passed on to end users (Peters, 2016:271). NERSA is central in setting the tariffs charged by Eskom to municipalities for generating electricity, and charged by municipalities to end users. However, according to Eskom, several new trends contribute to this increase: the slow economic recovery since the 2008 financial crisis, the shale gas boom in the US with the consequent fall in energy prices, the costly transition from fossil fuel and nuclear to renewable energy sources. Given the variety of components making up an energy bill, price regulation can protect end users from rapid supply price increases, but not from any rise in the other electricity bill components (Dutta & Mitra, 2017:1131).

2.3 GLOBAL PERSPECTIVES

By international standards, the economy of South African is extremely energy intensive. The most recent Energy Outlook 2017 report projected a 30% increase in global energy demand. Despite the immense energy potential Africa possesses, energy consumption particularly electricity consumption is very low with higher prices (Dutta & Mitra, 2017:1131; Karekezi & Kimani, 2008). Thus, Dutta and Mitra (2017) further argue that the abovementioned electricity prices do not reflect the true costs of generation and distribution. According to World Bank (2010), nations should develop effective approaches that could help strengthen and standardise tariff systems and subsidisation schemes could as well be designed and implemented including efficient operation of the utilities in charge of service provision.

However, research has pointed out that most countries have policies in place to protect industries from rising electricity prices in one way or another (Sato *et al.*, 2015:2). This is not the case in South Africa. In the year 2016, Turkmenistan households and firms

have free electricity, while consumers in several other countries such as South Africa face significantly high utility bills as shown on Figure 2.1 below. However, it is argued that global electricity prices are, on average, significantly higher than the underlying electricity tariff rate in South Africa. In that regard, Scott, Darko, Lemma and Rud (2014:1) recommend that policymakers can help to mitigate the impact of increase electricity prices and insecurity on SMMEs by ensuring that outages are planned and by facilitating access to alternative supplies of electricity, including generators and renewable energy. Conversely, studies have argued that electricity cost does not affect the cost-competitiveness of manufacturing SMMEs, partly because electricity costs are usually a very small proportion of total costs.

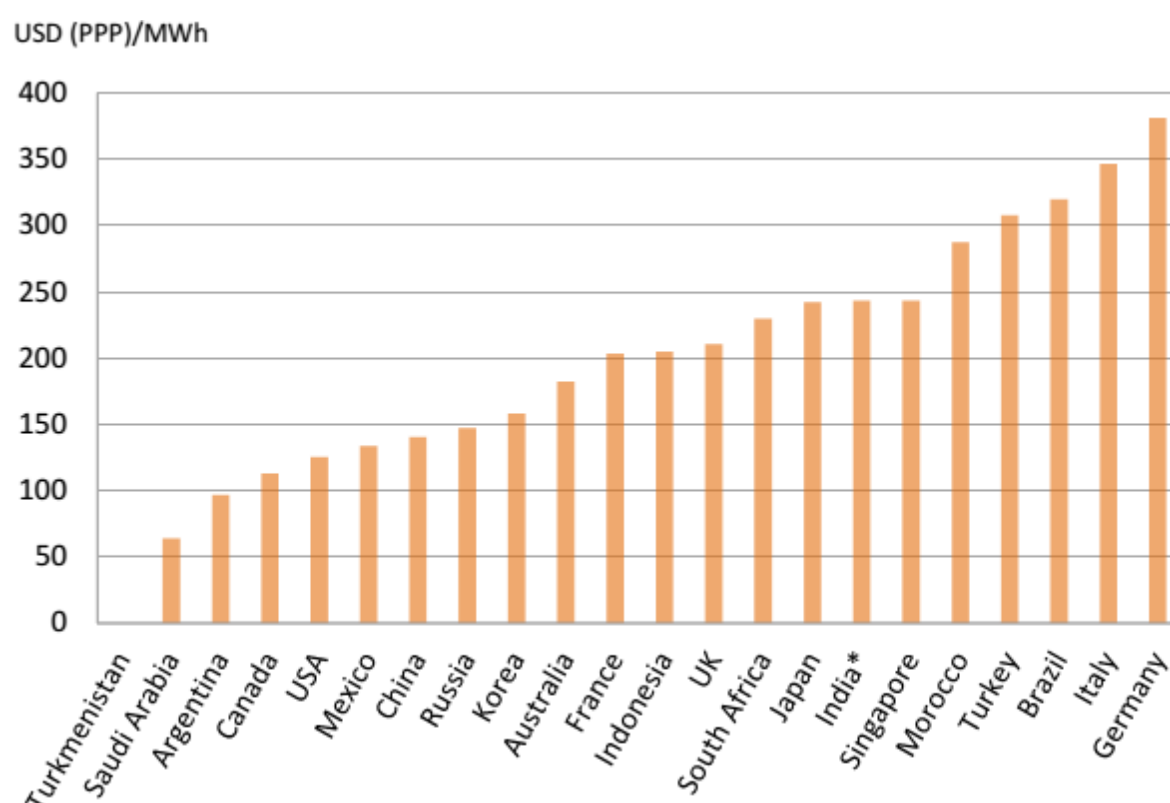


Figure 2.1: Electricity prices in selected economies in 2016

Source: World Energy Prices (2018:7)

Figure 2.1 reveals that, although the average price of electricity in South Africa is lower than that of Germany but it is higher than that of energy intensive economies such as

the United States of America (USA) and France. Research has shown that this trend is partially because of the use of low-grade coal and partially because of the present pricing policy and practices (Republic of South Africa [RSA], 2008). However, with the coal-based electricity supply in South Africa, the sector remains a constraint to the country's transition to a green economy (DTI, 2014:9).

2.4 THE ROLE OF LOCAL MUNICIPALITIES ON THE INCREASE OF ELECTRICITY TARIFFS

One of the economic roles of municipalities in South Africa is to continue enhancing communities to participate on the process of production to uplift the economy within the local sphere (Sintu, 2012). Furthermore, municipalities are constitutionally mandated to deliver basic services, including electricity (RSA, 1996; Peters, 2016:271). In order to fulfil their constitutional mandate of electricity distribution to end users, municipalities purchase bulk electricity from Eskom at the given price and then resell the electricity at a high tariff to end users. However, movements in commodity markets as well as policy decisions affect end-use prices paid by final consumers. This means that prices or end-user tariffs, in the case of electricity are determined through a regulated framework, not through market supply and demand forces (Peters, 2016:271).

Around 180 municipal electricity departments distribute the 42% of electricity to end users (Deloitte, 2017:56). NERSA (2017) acknowledges that municipal electricity tariffs are higher than the equivalent tariff offer to end users by Eskom. One of the major reasons, especially in the Rustenburg area is that only a few end users of electricity are paying for electricity.

Although the provision of electricity is a significant source of revenue, in other words electricity tariffs represent approximately a third of total municipal revenue, Peters (2016:271) argued that tariff increases affect not only end users of electricity, but it is also a major expenditure item for municipalities. However, municipalities have historically overpriced electricity, charging high tariffs and earning large surpluses. Furthermore, significant tariff increases, coupled with the poor economic environment,

present a dilemma for municipalities because the electricity sector is subject to administered prices. Peters, (2016:271) agrees that electricity losses and theft further, coupled with the fact that municipalities wishing to exceed the tariff increases charged to their end users are allowed to apply and motivate to NERSA for an above-guideline increase for which is in most cases permission is granted have exacerbated the situation.

2.5 IMPACTS OF INCREASE ELECTRICITY TARIFFS ON OPERATING PROFITS

Several studies support the conclusion that electricity enhances productivity at the economy-wide and the firm level (Fedderke & Bogetic, 2006; Grimm *et al.*, 2011; Kirubi *et al.*, 2009; Scott *et al.*, 2014:3). Many small manufacturing firms use electricity predominantly for lighting and communications (Mayer-Tasch *et al.*, 2013; Scot *et al.*, 2014:3). Energy prices are a significant part of operating expenditures and play an important role for industrial competitiveness in every business. In South Africa, a structural change in operating activities is expected in most businesses every year due to the ever-increasing electricity tariffs. The major impacts on sustainability are the loss of revenue and customers during downtime, the failure to complete contracts on time, and an increase in overhead and unanticipated loss of productivity (Von Ketelhodt & Wöcke, 2008:10). Markis (2006) contended that majority of SMMEs in South Africa fail to adopt energy conservation measures for reasons related to lack of information, their organisational structure and technical and financial reasons that hinder enterprises.

Whether the net effect is negative or not, will depend on the importance of electricity as an input and the size of any price-reducing impacts and most importantly, these impacts show expenditure on electricity, rather than physical use (that is, kWh) (Altman *et al.*, 2008:22). Von Ketelhodt and Wöcke (2008) surveyed 250 SMMEs in Cape Town and found that the prevailing policy methods of increasing electricity prices was one of the influential factors negatively affecting the profits of majority of the SMMEs in that area. Mtapuri (2014:554) agrees with Von Ketelhodt and Wöcke (2008) but argued that the increasing electricity prices and down drops in SMMEs operating

profits is as a result that the global economy is experiencing weak growth and high volatility because of the financial crisis that began in 2008.

An analysis of practical electricity data and pilot projects on electricity prices indicates that there is a significant negative relationship between electricity cost and operating profits in the context of SMMEs. However, prior research offers mixed evidence on the association between electricity cost and operating profits. Altman et al, (2008:14) attribute this to three main problems, namely: capacity problem, supply problem and reserve margin problem. Verhoef (2011:19) highlighted that one important element of the new South Africa economic is the differential pricing of electricity between Eskom and the municipality charge to end users. Altman et al, (2008:19) comments that since end users are charged different prices, physical use and expenditure are not perfectly correlated and to a certain extent, there is a tendency for big users such as mining companies to be charged lower prices than small users especially SMMEs. However, big users such as Sasol have also claimed that rising electricity prices have had a negative impact on the economic viability of its capital investments (DTI, 2014:13). As a result, these impacts are not only felt by SMMEs but also almost every end user in South Africa.

2.6 IMPORTANCE OF SMMEs IN SOUTH AFRICA

SMMEs are regarded as particularly important to South Africa as they play a key role in future economic and social strategy in South Africa (Von Ketelhodt & Wöcke, 2008:4). The growth in the number of SMMEs from the year 2008 to 2015 was lower than the economic growth rate, although the contribution of SMMEs to the national GDP increased over the same period. Most SMMEs in South Africa are still operating in the informal sector. In 2014, Scott *et al.* (2014) estimated that around 90 million formal SMMEs provide over two-thirds of all jobs in the developing world. SMMEs vary widely in terms of size, sector and level of sophistication. However, the poor quality of electricity supplies in many of these developing countries especially South Africa is perceived by SMMEs to affect their operations negatively. The size of any impact of a shock to the economy will depend in part on the period, over which it is measured, for several obvious reasons.

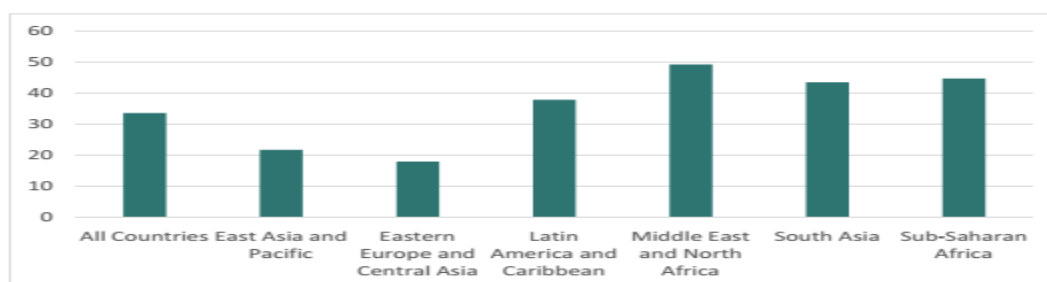


Figure 2.2: Proportion of firms identifying electricity as a major constraint by continent

Source: World Bank Enterprise Surveys (2010)

From Figure 2.2, it can be seen that sub-Saharan Africa is the second largest continent in the world with the proportion of firms identifying electricity tariffs as a major constraint to their day to day business operations. Scott *et al*, (2014:3) argue that empirical evidence of the impacts of increase electricity prices on SMMEs indicates that it is not as big a constraint as perceptions suggest. The authors further elaborated that this may be due to the on/off nature of the supply and the considerable stress and frustration of coping with electricity high prices, magnifying its actual impact on firm performance. Literature has also revealed that over the past few years, there has been a significant increase in electricity prices and insecurity thereby affecting the productivity of manufacturing SMMEs negatively (Scott *et al*, 2014:1). However, electricity providers and policy makers as statistically insignificant often regard these impacts and they can at times be positive.

2.7 THE ROLE OF ELECTRICITY IN SMMEs ACTIVITIES

Electricity price increases have had a varying impact on SMMEs value chains in the country and, overall, have not been sufficient to trigger substantial changes in behaviour and processes (DTI, 2014:9). On the one hand, business activities, which rely less on electricity, have been less affected. However, the importance of electricity supply to economic development of any nation cannot be overemphasised. Overall, recent electricity price increases have thus only marginally impacted coal mining companies. Electricity does not account for a larger share of companies' operating costs in order for price escalations to have a notable impact on the competitiveness of

the sector (DTI, 2014:10). Booming economic conditions have moreover enable companies to absorb any marginal impact without disruptions. Availability and access to reliable electricity supply has a rippling effect on productivity and welfare of society. To SMMEs electricity supply serves as an indispensable input in their activities, apart from its necessity for running many industrial machines, its role to the productivity of human capital is enormous.

2.8 POSSIBLE CAUSES OF HIGH ELECTRICITY TARIFFS

Eskom is suffering from a considerably bloated staffing complement, believed to be at least 30,000 more than necessary when compared with overseas utilities of similar electricity output (DTI, 2014). This overstaffing, together with high productivity and cost controls, has seen Eskom's tariffs escalate by over 500% in the past 10 years and a capital build programme overspend of more than 500% with six-year delays. NERSA has moved public hearings forward by about two weeks, providing objectors with substantially less preparation time.

NERSA grant Eskom the ZAR66billion claimed for past losses, it will immediately translate to a 30% hike over and above the 20%-30% hike Eskom is believed to be targeting through their mid-year tariff increase application, before the end of 2018. Eskom had a massive and growing surplus of electricity, which was being compounded by the forced implementation of additional, more expensive and subsidised renewables. The increase would be over and above the increases required to liquidate the ZAR32.7 billion. NERSA earlier awarded to Eskom to compensate it for lower than expected sales and higher than expected costs in previous years. This was done in terms of the regulatory clearing account methodology.

If the regulatory clearing account methodology award is recovered over the same three years that the tariff application covers, and if Eskom's application is successful, consumers could pay about 20% more for electricity in 2019/20, and not much less in the two subsequent years, says economist Mike Schüssler. He adds that this would add almost one percentage point to inflation and further decrease the spending power of struggling South African consumers. The South African Reserve Bank (SARB)

would not lower interest rates due to the inflationary effect, and any economic recovery would be unlikely. NERSA has in the past consistently awarded Eskom substantially less than it has applied for. The tariff application is essential for the recovery of its prudently incurred cost plus a reasonable return from tariffs, and the basic decision is for allowable revenue.

2.9 MUNICIPALITY ELECTRICITY TARIFFS ARE HURTING THE ECONOMY

Falling demand after the 2008 financial crisis and rising energy costs have harmed the sector. These trends are concerning as the sector employs 10% of the country's total manufacturing workforce. Eskom distributes 58% of national electricity to end users. Around 180 municipals distribute the remaining 42% of the national electricity (Deloitte, 2017:56). Municipal tariffs differ widely, and many are much higher than the equivalent tariff an Eskom customer pays. A medium size foundry pays 30% more for electricity per kWh of output than a similar foundry sourcing electricity directly. Municipal finance system lies at the heart of this problem. They must raise their own revenue, even though central government partly funds them. NERSA regulates tariffs they use a published methodology based on cost of supply. Municipalities' purchases electricity from Eskom at wholesaler price. To this, they add the municipal distribution infrastructure cost and an allowable profit margin. Municipalities lack the capacity to produce accurate electricity distribution cost data and unable to plan and manage infrastructure budgets and operations system. Often inadequate funding has been allocated to repairs and maintenance. The financing system is being reformed but the process is slow, suggesting that parts of the system of the national government of South Africa are blind to the damage being inflicted on the manufacturing sector by municipal electricity distribution inefficiency.

Solutions as per Kaziboni (2018) focus on ensuring municipal tariffs are cost reflective and do not reward poor planning and inefficiency. Municipality infrastructure and maintenance investment should be better funded, the national treasury budget conditional grant and other policy instruments should be applied to speed up a more to municipal cost-based tariff setting, policy custodians involve in administering

investments only in those municipalities with more reliable, sustainable and competitive electricity distribution infrastructure.

2.10 SUMMARY

In this chapter, a review of related literature has revealed that despite electricity cost only accounts for a small proportion of operating costs of SMMEs, increases in electricity costs have impacted most of this SMMEs negatively.

The next chapter will discuss the research design and methods used to investigate the research problem.

CHAPTER 3

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

The previous chapter reviewed literature relating to the subject under investigation to formulate the platform upon which this study was grounded. This chapter provided an account on the research design, methods as well as analysis and interpretation of the empirical data that emerged from the quantitative assessment of the impacts of increasing electricity prices on SMMEs. This assessment was directed towards attaining the objectives of this study, which were to answer the following research questions:

- To which extent do increasing electricity tariff affect the performance of SMMEs in the Rustenburg area?
- To which extent does increasing electricity tariffs impact operating profits of SMMEs in the Rustenburg area?
- To which extent does increasing electricity tariff affect the sustainability of SMMEs in the Rustenburg area?

This chapter commence with a description of the research scope and philosophical setting applicable to this study. Next, the research design and methods of data collection and analysis strategies most appropriate to answer the research questions are explained.

3.2 SCOPE OF THE STUDY

This study was necessitated by the recent debates on the increase in electricity tariffs in South Africa. The objective of this study was to investigate the effect of increased electricity prices on SMMEs, and more specifically, to evaluate the extent to which this phenomenon affects operating profits.

3.3 RESEARCH PARADIGM

A research paradigm is a set of assumptions and perceptual orientations shared by members of a research community and determines how these members view both the phenomena and the research methods that should be employed to study those phenomena (Given, 2008:591). Paradigm as described by Creswell (2014:6) is a basic set of beliefs and philosophical orientation that guide a researcher's action to a study, which could arise based on a researcher's discipline orientation, and past research experiences. The regularly reported cases of increasing electricity tariffs in South Africa is a situation that calls for continuous research in the drive towards a better solution. The objective view of this phenomenon according to quantitative researchers is 'realist' or sometimes 'positivist'.

This study adopted a positivist paradigm, which aims to evaluate the social world objectives and predict the effects of increase electricity tariffs on SSMEs, as well as analyse whether or not the predicted generalisation of the phenomenon being study would prove to be true. In this regard, the researcher was able to obtain an in-depth understanding of the phenomenon being studied. Positivism holds the central belief that an objective reality exists that is independent of any individuals' objective experience and value (Given, 2008:592). The positivist researcher prefers working with an observable social reality and such research would produce generalisations like those produced by the natural scientists. Based on the above this study seeks to draw on it to develop systematic investigations into the effect of increased electricity prices on SMMEs. The aim is to gain a greater knowledge and understanding of a phenomenon.

3.4 RESEARCH DESIGN

A research design addresses important issues relating to the project such as location of the study, purpose, type of investigation, unit of analysis in line with fixed, standard arrangements of research conditions and methods that have their own coherence and logic to answer possible questions (McMillan & Schumacher, 2010:66). In line with this, William (2005:395) asserts that a research design is not just about gathering facts

without purpose or presenting information or data without interpretation. Research design however; vary from simple to complex depending on the nature of the study and the specific hypotheses formulated for testing (Khalid, Hilman & Kumar, 2012:19). Research design sets the scope of the study specifying whether it needs to be descriptive, explanatory (or causal) or predictive (Khalid *et al.*, 2012:19). For the purposes of this study, a descriptive survey research design was adopted.

The objective of descriptive studies is to represent the accurate profile of an event or situation. Anderson and Widener (2007:322) believe that a descriptive study is an application whereby the researcher has no stake in the merits or flaws of the practice in question. A descriptive research design was appropriate for this study as the researcher attempted to represent the accurate and current effects of increasing electricity prices on SMMEs. Confirming this assentation of research design, Salkind (2014:269) indicates that the main advantage of a descriptive research design is that it describes the current state of affairs at the time of the study using a survey research. Surveys are a quantitative method involving the use of questionnaires and aim to generalise the findings from a representative sample population to a larger population of interest. Surveying involves gathering information from individuals using a questionnaire. Surveys can be descriptive or explanatory and involve the entire population or a sample of the population. Another advantage is that this survey research offers a degree of confidentiality and privacy to the participant taking part in the research. Using a survey means that the researcher can reach a large number of respondents and generate quantifiable empirical data in the research process (Wilson & Abibulayeva, 2009:210). A survey research method was vital for this study as a quantitative approach was adopted for this study.

3.5 RESEARCH METHODS

It is vital for the researcher to be completely certain as to which approach or method would provide the information required (Druckman, 2005:46; Clough & Nutbrown, 2010:29; Vosloo, 2014:316). This would assist the researcher in identifying a possible gap (Vosloo, 2014:316) with regards to the impact of increase electricity tariffs on SMMEs. Keeping in mind the nature of the research question, objectives and

grounded on the theory of, an empirical research based on quantitative research approach was undertaken.

3.5.1 Research approach

A quantitative research approach means using measurements and numbers to help formulate and test ideas (Wilson & Abibulayeva, 2009:425). It usually involves summarizing numerical data and/or using them to look for differences and associations between sets of numbers. A quantitative research helps to approach and determine what is there and trying to make sense of how different variables may affect each other (Wilson & Abibulayeva, 2009:429). Kumar (2011:38) offers that quantitative research approach seeks to explain and quantify prevalence, incidence, extent, nature of issues, opinions and attitudes, behaviours, discovers regularities and formulated theories and find out how the whole population should be. Quantitative research generally focuses on measuring social reality.

3.5.2 Research site

The Rustenburg area was chosen as a suitable and feasible research site for this study as it has some of the highest electricity tariffs in the country compared to other Municipalities. This makes the businesses in Rustenburg uncompetitive compared to other industries in the same sector at different municipal areas in South Africa. In addition, the Rustenburg area is one of the largest mining zones in South Africa and as such, multiple SMMEs are located in this area to provide services to these larger mining companies.

3.5.3 Population

Population as a concept in research methods refers to every individual who fits the criteria that the researcher has laid out for research participants (Given, 2008:644). The population for this study comprises of all SMMEs in the Rustenburg area.

3.5.4 Sample and sampling technique

A sample is a proportion of a population or is the element of the population considered for actual inclusion in the study (De Vos, 2005:146). A sampling as the selection of

some part of the total population on the basis of which a judgment or inference about the aggregate or totality is made. For the purposes of this study, a simple random sampling was used to select the unit of analysis. A simple random sampling technique offers an equal chance that each SMME of the entire population of SMMEs in the Rustenburg. In this regard, including one individual in the sample has no influence on whether another individual is included (Wilson & Abibulayeva, 2009:428). A total of 30 SMMEs were selected for inclusion for this study. The selection of the population was limited because of time constraints, limitation of funds and effort expended.

The ever-increasing demand for research has created a need for an efficient method of determining the sample size needed to be representative of a given population. In this sense, a representative sample of the population was selected using Krejcie and Morgan's (1970:607) work on sample size determination. The required sample response size was determined based on an unknown proportion that could be estimated with accuracy, at a 95 per cent confidence level and a margin of error of ± 0.5 . A larger sample size was selected to attempt to get the accurate picture of the aim of the study. In its simplest terms, the more representative a sample is the more likely it is that a quantitative analysis will accurately and precisely reflect the results needed.

3.6 DATA-COLLECTION TECHNIQUES.

Secondary data were collected through a literature review. A review of literature helps to determine whether the topic is worth studying and it provides insight into ways in which the researcher can limit the scope of this study to a needed area of enquiry (Creswell, 2014:27).

Primary data is most generally understood as data gathered for the first time from information sources and which has not undergone analysis. Primary data is information that you collect specifically for your research project. An advantage of primary data is that it is specifically tailored to your research needs. A disadvantage is that it is expensive to obtain primary data were collected through self-administered pencil and paper survey. A total of 29 valid surveys were used in the data analysis.

3.6.1 Questionnaire

To achieve the objectives of this study, an investigation was carried out through empirical research in the form of questionnaires administered to SMMEs in the Rustenburg area of the North West, a province of the Republic of South Africa. According to Siniscalco and Auriat (2005:4), questionnaires are a good survey instrument used to collect data from individuals about a social unit.

The basic objectives of the questionnaire were to obtain, assess, evaluate and quantify the effects of increase electricity tariffs on SMMEs. A five-point Likert type closed-ended questionnaire was designed to obtain respondents opinions on the effects of increasing electricity prices on SMMEs. The use of closed questions permits respondents to choose from a range of predetermined responses, which are generally easy to code and analyse. Another advantage is that this approach offers a degree of confidentiality and anonymity to the person taking part in the research.

3.7 DATA ANALYSIS

Once the data is entered, analysis, which has two distinct phases, can be conducted. The first phase is to describe the data that has been gathered, which involves the calculation of descriptive statistics and the graphical presentation of the data. The second phase is to interrogate the data to answer the research questions posed, which entails calculating inferential statistics (Wilson & Abibulayeva, 2009:487).

When the researcher is finished with the data collection, the data should be accurately arranged in a suitable manner for further analysis (Sekaran & Bougie, 2010). Statistical Package for Social Sciences (SPSS) was used to prepare sufficient analysis to provide required interpretations and conclusions as required by study objectives, after which the data will be presented using descriptive statistics, which include means, standard deviations, frequency counts, percentages and various correlation coefficients.

Saunders et al. (2009) endorse the view that the researcher has to record the data and then apply various descriptive and inferential statistics or econometrics concepts to explain the data and draw inferences. In this regard, Bowen (2005:208) believes

that quantitative research is concerned with descriptive statistics, t-test procedures, unilabiate and multivariate analysis of variance, chai-square test, regression analysis and structural equation modelling. Selection of inappropriate statistical technique may lead to wrong interpretations. This may in turn result in failure to solve the research problem and answer research questions. The researcher's task is incomplete if the study objectives are not met (Khalid *et al.*, 2012:24). Therefore, the results of the questionnaires were analysed by means of frequency analysis, descriptive statistics and contingency tables with chi-square analysis.

3.8. VALIDITY AND RELIABILITY

The validity and reliability of this study depend to a large degree on the appropriateness of the questionnaire. Validity concerns the degree to which a question measures what it was intended to measure, while reliability concerns the consistency of the measure or the tendency to obtain the same result if the measure was to be repeated by using the same subjects under the same conditions.

Validity is about generalisation and is very important in quantitative study as the sample selected randomly was sufficient to ensure generalisability. To improve the validity for the study, the empirical data was collected during a real-time setting. Reliability is the consistency and repeatability of data collected over time, across different samples, and across different measures of the same underlying construct. A pilot study was performed with two SMMEs to assess the reliability of the questionnaire variables (Wilson & Abibulayeva, 2009:427).

3.9 ETHICAL CONSIDERATIONS

Most ethical issues fall into one of the four categories namely; protection from harm, informed consent, the right to privacy and confidentiality and honesty with professional colleagues (Leedy & Ormrod, 2005:101).

Participants have the right to know what the research is about, how it will affect them, the risks and benefits of participation and the fact that they have a right to decline to participate if they choose to do so. After being granted permission by the top

management of the sample SMMEs, the researcher visited the various SMMEs on agreed dates. Each participant was then asked to sign an informed consent form, which is an indication that they indeed understood what has been done (Bless, Smith & Kagee, 2006:142-143). The researcher then administered questionnaires to the applicable personnel who consented to participate in the study. Furthermore, individual firms were represented only by a number, thus encouraging frankness where sensitive issues are involved.

3.10 SUMMARY

This chapter explained in detail the research scope and philosophical setting applicable to this study. The research design and methods of data collection and analysis strategies most appropriate to answer the research questions were explained.

In order to answer the research questions, the next chapter presents and interprets the data that was analysed using the SPSS computer-based programme using frequencies table and graphs.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

In chapter 3, the focus was placed on the research design and methods used for this study. This chapter focuses on the presentation, analysis and discussion of findings. In this chapter, the research findings from the empirical investigation were presented. The findings were based on addressing the research problem, main research and the sub-questions as outlined in chapter 1 (refer section 1.5). The analysis and interpretations are presented with headings crafted to reflect the various research questions of the study. This chapter is organised in two main sections. The first section analyses the potential economic impact of electricity tariff increases on SMMEs. The second section analyses the descriptive statistics.

4.2 RESPONSE RATE

Since the study was limited to a geographical area, 30 questionnaires were distributed to the target population, 29 completed questionnaires were returned, representing a response rate of 96.7%. No missing data was identified.

4.3 THE IMPACT OF HIGH ELECTRICITY TARIFFS ON OPERATING PROFITS OF SMMEs

The main objective of the current study was to investigate the impact of high electricity tariffs on the operations of SMMEs in the Rustenburg area in the North West province of South Africa. To get a better understanding of the impact the following were considered:

- the Business sector on which the SMMEs is trading,
- duration in business operations,
- approximate units of electricity consumed per month, and
- electricity cost as a percentage of business operating costs.

Investigating these variables assisted the researcher in understanding the impacts of high electricity tariffs on the operations of SMMEs as the findings unfolded.

4.3.1 Business sector

The first section of the questionnaire was to determine the various business sectors in which SMMEs are operating as presented in figure 4.1.

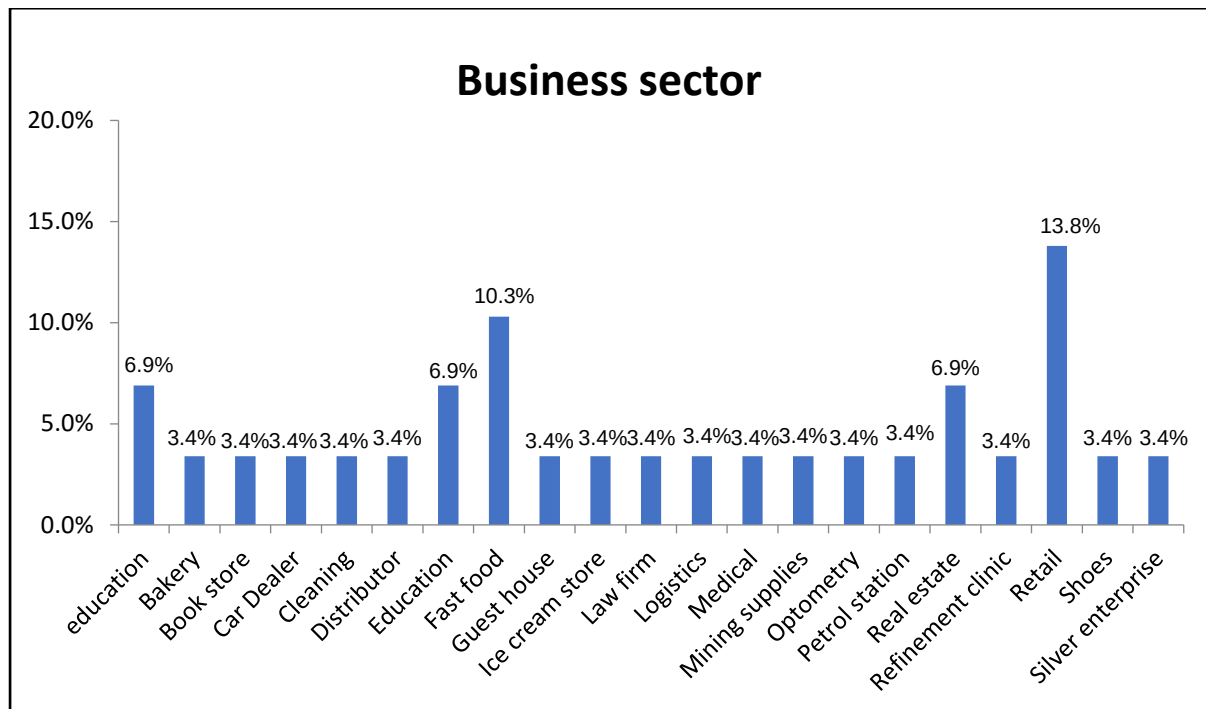


Figure 4 1: Business sector (N=29)

Figure 4.1 reveals that the majority (13.8%) of the SMMEs survey are operating in the retail sector, while the second majority (10.3%) of the SMMEs in the Rustenburg are operating in the fast food sector. Retail and fast food business need constant electricity supplies to run equipment such as refrigerators and others related to light bulbs or temperature control in air conditioning. The critical problem arises where stocks are damaged due to loss of refrigeration. This can have uncertain knock-on effects on every area of the business (Altman *et al.*, 2008:8).

4.3.2 Duration in business operations

It was important to determine the duration in which the SMMEs had been operating in the Rustenburg area to ascertain whether the increase in electricity prices might affect the future viability and sustainability of the business.

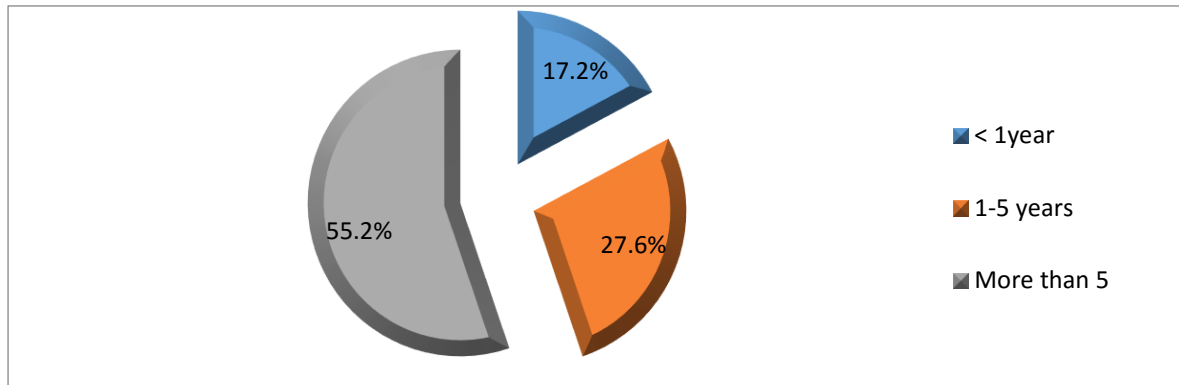


Figure 4 2: Duration in business operations (N=29)

Figure 4.2 indicates that more than a half (55.2%) of the SMMEs had been operating in the Rustenburg area for more than five years.

4.3.3 Monthly consumption and electricity cost as a percentage of business operating costs

It was important to examine the monthly consumption and electricity cost as a percentage of business operating costs so as to identify trends in the impact of high electricity tariffs on operating profits of SMMEs. In the current study, the researcher categorised SMMEs according to their average levels of consumption into three broad categories based on their average monthly electricity purchases:

- Low-purchase customers, purchases up to 100kWh -400kWh
- Medium-purchase customers, 500kWh – 900kWh
- High-purchase customers, more than 1000kWh

Findings in this regard are consolidated in Figure 4.3 and 4.4.

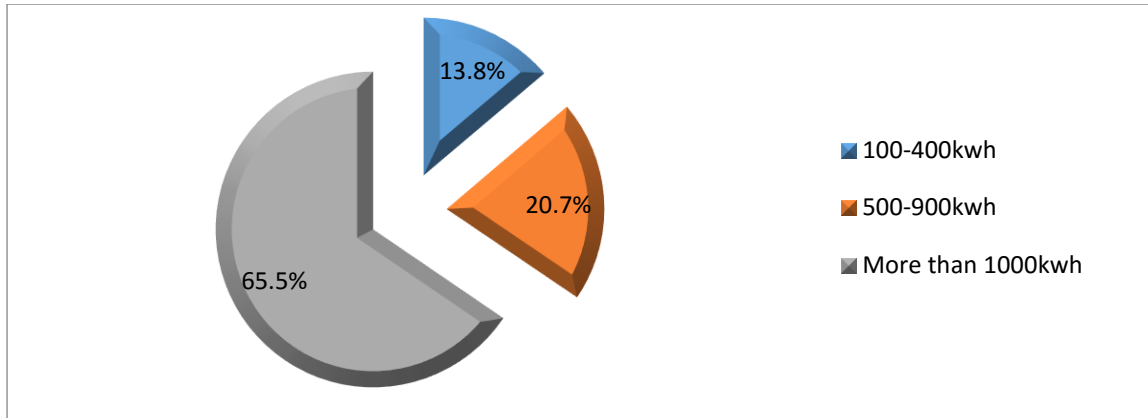


Figure 4 3: Approximately units of electricity being consumed on monthly bases (N=29)

Figure 4.3 reveals that the majority (65.5%) of SMMEs are consuming more than 1000kWh of electricity per month, therefore are classified as high-purchase customers. This trend indicates that the majority of the SMMEs surveyed are highly dependent on constant electricity for their survival.

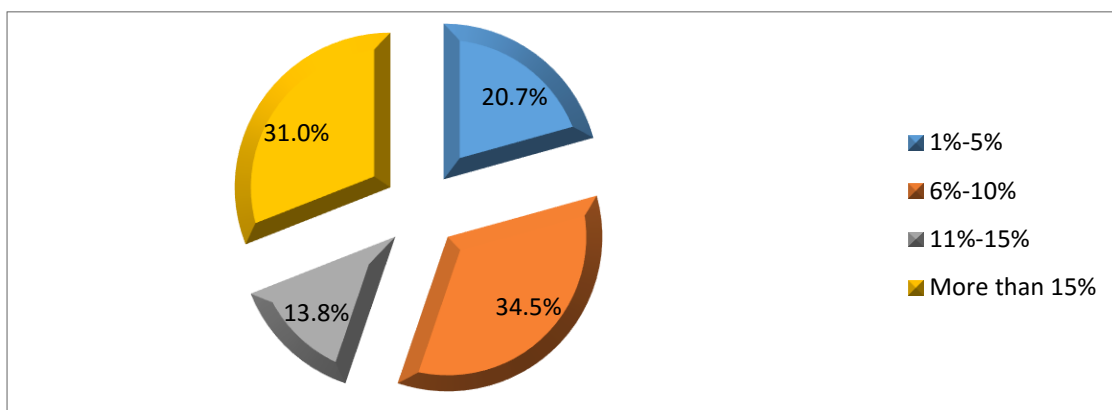


Figure 4 4: Electricity cost as a percentage of business operating costs (N=29)

Figure 4.4 clearly indicates that more than a third (34.5%) of the SMMEs indicated that electricity cost was approximately more than 15% as a percentage of business operating costs. This finding clearly indicates that a 15% operating cost can negatively influence the SMMEs as a going concern.

4.3.4 Impact on the future viability and sustainability of SMMEs

The second objective of this study was to determine whether increasing electricity tariffs have a major impact on the future viability and sustainability of SMMEs. This section reports on data relating to various factors influencing the survival of SMMEs. For each of the factor identified, respondents were asked to rate their responses using a five-point Likert-type response as presented below: SA = strongly agree, A = agree, N = Neutral, D = disagree, SD = strongly disagree. The results of the data gathered in this direction are consolidated in Table 4.1.

Table 4 1: The impact of high electricity tariffs on operating profits of SMMEs

Variables	A	N	D
My business heavily dependent on a stable and secure electricity supply.	93.1%	-	6.9%
My business is financially impacted by the recent increases in electricity tariff.	75.9%	13.8%	10.3%
The ever-increasing electricity tariff has resulted in my company having to reconsider future investments in South Africa.	37.9%	27.6%	34.5%
The future of my business growing in the Rustenburg area.	55.1%	20.7%	24.2%

(SA+A = Agree; D+SD = Disagree)

Table 4.1 reveals that almost all (93.1%) of the businesses are heavily dependent on a stable and secure electricity supply. It was also found that three-quarters (75.9%) of the businesses are financially impacted by the recent increases in electricity tariffs. Although majority (37.9%) of the respondents agree, however more than a third (34.4%) of the respondents disagree that the ever-increasing electricity tariff has resulted in my company having to reconsider future investments in South Africa. This result indicates that despite the impact of high electricity tariffs on their business operations they are still willing to continue their businesses as a going concern in South Africa. More than half (55.1%) of the respondents agreed that high electricity prices have affected the future of their business growing in the Rustenburg area.

4.3.5 The impact of high electricity tariffs on performance and operating profit

The third objective of the study was to investigate the impact of high electricity tariff on performance and operating profit of SMMEs. For each of the factors identified, respondents were asked to rate their responses using a four-point Likert-type response as presented below: 1 = Severe, 2= Moderate, 3 = little and 4 = No Impact. The results of the data gathered in this direction are consolidated in Table 4.2.

Table 4 2: The impact of high electricity tariff on performance and operating profit

Variables	1	2	3	4
Rate your performance and competitiveness in the Rustenburg area due to high electricity tariff.	44.8%	6.9%	31.1%	17.2%
Rate the impact of electricity price increases on your operating profit	37.9%	27.6%	20.7%	13.8%

Table 4.2 above clearly indicates that high electricity tariffs have a severe impact on the performance and competitiveness (44.8%) as well as operating profits (37.9%) of the majority of SMMEs in the Rustenburg area. However, almost a third (31.0%) of the respondents argued that increased electricity tariffs did not have any impact on their operating profits.

4.3.6 Communications with stakeholders

This section considers how SMMEs in different business sectors might respond to increase electricity tariff by communicating with different stakeholders involved. Respondents were also asked if they usually communicated the consequences of the increase electricity prices to the Rustenburg municipality. For each of the factor identified, respondents were asked to rate their responses using a three-point Likert-type response as presented below: F = Frequent, S= Seldom and N = Never. Results in this regard are shown in Table 4.3.

Table 4 3: Communications with the municipality

Variable	F	S	N
How often do you complain to the municipality regarding increased electricity tariff?	65.5%	27.6%	6.9%

Table 4.3 reveals that majority (65.5%) of the SMMEs frequently communicate with the municipality on the impacts of increasing electricity on their businesses.

4.3.7 Alternative power supply.

The urgency of SMMEs introducing alternative sources of power cannot be over-emphasised. Respondents were also asked about alternative power supplies as well as the impact on their customer satisfaction. A result in this instance is provided in Table 4.4.

Table 4 4: Alternative power supply

Variables	Yes	No
Would you be able to run your business effectively using alternative power supply such as generator?	51.2%	44.8%
Did you encounter poor customer satisfaction due to the delay of your orders due to power cuts	65.5%	34.5%

Table 4.4 indicates that more than half (51.2%) of the SMMEs agrees that they would run their businesses using alternative power supply such as generators. However, a majority (65.5%) of the SMMEs are currently encountering poor customer satisfaction due to power cuts because of load shedding.

4.4 DESCRIPTIVE STATISTICS OF THE VARIABLES

Descriptive statistics was calculated based on the variables included in the questionnaire and deemed to adequately throw more light on the research phenomenon for this study. The mean measures the average values of a group of values. The standard deviation measures how the values are spread around the mean. The minimum and maximum values capture the range of variables.

From Table 4.6 (refer Appendix A), it can be concluded that there is less variability among the relevant variables used in this study. All the relevant explanatory variables indicate a lower standard deviation as compared to their means. Standard deviations indicate that the responses are slightly closer to their respective means. Positive skewness values show that the respondents tend to agree with the items listed in Table 4.6.

A simple guideline to decide whether a variable is at approximately normal is that the absolute skewness is less than plus or minus one ($< \pm 1.0$) (Morgan, Gliner & Leech, 2009). The majority of the respondents were in agreement with the items with positive skewness values and disagreed with items indicated with negative skewness values. Values of skewness that are closer to zero imply that the respondents are unsure with the items mentioned in Table 4.6. Most of the variables have skewness values between -1 and 1, meaning that they are approximately normally distributed therefore inferential statistics will be performed to determine the correlations between variables.

Values of the mean above or closer to 2 shows that the respondents tend to agree, while values of the mean that are closer to 1 indicate that the SMMEs tend to disagree with the items listed in Table 4.6.

4.5 CORRELATION ANALYSIS

Spearman's rank correlation coefficient test was performed to analyse the correlation between increased electricity tariffs and items listed in Table 4.5 using an alpha of 0.05, reflecting a 95% confidence interval for the coefficients (limit for lower bounds and upper bounds).

Table 4 5: Spearman's rank correlation coefficient electricity cost and perceptions of respondents regarding the impact on SMMEs

Relevant variables	Coefficient (r)	P < 0.05
Duration in business operations	-.242	.223
Monthly consumption	-.477*	.012
Electricity cost as a percentage of operating costs	.335	.088
Dependent on a stable and secure electricity supply.	-.182	.365
Impact on company financials	.403*	.037
Impact on future investment	.554*	.003
Impact on the future viability and sustainability	.479*	.012
Impact on performance and competitiveness	.431*	.025
Impact on operating profit	.782**	.000
Communications with the municipality	.649**	.000
Alternative power supply	.219	.272
Customer satisfaction	.024	.905

***. Correlation is significant at the 0.01 level (2-tailed)*

**. Correlation is significant at the 0.05 level (2-tailed)*

The figures flagged with stars are statistically significant coefficients, conventionally, using an alpha of 0.05 reflecting 95% confidence intervals for the coefficients (limit for lower bound and upper bound). All the correlation scores were less than 0.8, showing that the problem of multicollinearity did not exist (Cooper & Schindler, 2008).

Table 4.5 indicates that there is a negative inverse relationship between increased electricity tariffs and duration in business operations ($r = -.242$, $p = .223$), monthly electricity consumption ($r = -.447$, $p = .012$) as well as dependent on a stable and secure electricity supply ($r = -.182$, $p = .365$).

Increase electricity tariffs were found to have a positive significant relationship and negative impact on company financials ($r = .403$, $p = .037$) future investment ($r = .554$, $p = .003$), future viability and sustainability ($r = .479$, $p = .012$) and performance and competitiveness ($r = .431$, $p = .025$).

There was a very strong positive correlation between increased electricity tariffs and impact on operating profit ($r = .782, p = .000$) as well as communications with the municipality ($r = .649, p = .000$). Increased electricity tariffs moderately correlated with the electricity cost of electricity as a percentage of total operating costs, ($r = .335, p = .088$).

There was no relationship between increased electricity tariffs with respect to alternative power supply ($r = .219, p = .272$) and customer satisfaction ($r = .024, p = .905$).

4.6 SUMMARY

The study investigated the potential economic impact of high electricity tariffs on SMMEs in the Rustenburg area of South Africa. An indication of assessing the impact of high electricity tariff and its effects on the SMMEs performance reveals that there is actually a significant negative impact in almost all aspects of the SMMEs operations.

Based on these findings, conclusions and recommendations will be made in the next chapter.

CHAPTER 5

FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The objectives of this study were to investigate the impact of electricity tariff increases on SMMEs in the Rustenburg area in the North West province of South Africa; and to establish a better understanding of the potential impact that further electricity tariffs increases could have on the various business sectors in the South African economy. This chapter discusses the findings of the empirical study carried on the effect of increase electricity tariffs on SMMEs day to day operations. From these findings, conclusions and recommendations are made.

The following research questions were posed:

- To what extent do increasing electricity tariffs affect the performance of SMMEs in the Rustenburg area?
- To what extent do increasing electricity tariffs impact on the operations of SMMEs in the Rustenburg area?
- To what extent do increasing electricity tariffs affect the sustainability of SMMEs in the Rustenburg area?

5.2 OVERVIEW OF THE STUDY

Chapter 1 provided a description of the problem and a motivation for this research. It presented the general aim of the research, which was to explore the impact of increased electricity tariffs on the performance of SMMEs.

In Chapter 2, a review of the literature was done in order to explore the impact of high electricity tariffs on SMMEs performance.

In Chapter 3, the research design and methods employed to find answers to the research questions were presented in a clear and coherent manner. This study engaged primarily in a descriptive survey research design with a quantitative approach.

Chapter 4 provides the presentation, interpretation and discussion of findings of the empirical data as obtained from the questionnaires

In Chapter 5, an overview of the entire chapters of the dissertation was provided. A summary of findings from the research questions was also presented. Recommendations were then made for this study and for any future study on the theme of this study.

5.3 SUMMARY OF MAIN FINDINGS

The main findings of this study are:

- i. The research revealed that majority of the SMMEs in the Rustenburg area are operating in the retail and fast food sector and had been operational for more than five years. The fast food industry needs constant electricity supply to run its equipment. Increased electricity costs may hinder their day-to-day operations, as they will not be able to raise enough revenue to cover the cost.
- ii. Electricity is fundamental to businesses' ability to function well and without it essential services such as lighting and virtually anything electronic, will be negatively affected. It was found that the majority of SMMEs operating in the Rustenburg area are highly dependent on constant electricity for their survival and are therefore classified as high purchase customers.
- iii. The research indicates that electricity cost represents more than 15% of the business' operating revenue, exposing them to consequences that are more drastic. While the majority of the SMMEs are already facing difficult market conditions in the Rustenburg area, these findings point out the effects of continuous increases in electricity tariffs, which could potentially cause SMMEs to increase their operating expenses to maintain operating profits and competition.
- iv. All the SMMEs operating in the Rustenburg area depend on electricity for their day-to-day operations. As such, they are facing financial difficulties due to the ever-increasing electricity tariffs. This has also led many investors withdrawing

their decision to invest in the Rustenburg area because of the consistent uncontrollable and unreliable electricity tariff increases in the country.

- v. Although almost all of the SMMEs are financially affected by the recent increases in electricity tariff, a significant number of SMMEs are still willing to continue their businesses operations in the Rustenburg area. This is an indication that if electricity cost become enormous, firms end up devising strategies to mitigate the negative effect of high electricity tariffs and to make profit as well.
- vi. With all the electricity constraints most of the SMMEs are already, switching to alternatives power supplies such as solar panels linked to batteries.

The empirical findings for this study are consistent with the prior study by Nyanzu and Adarkwah (2016) whose findings confirmed that there was a significant relationship between electricity cost and business firms' performance.

5.4 LIMITATIONS OF THE STUDY

This research focuses on the impact of increased electricity tariffs on SMMEs operating in the Rustenburg area, and as such, the study was limited to a particular area in the North West, a province of South Africa. For this reason, the unit of analysis was also limited to 29 SMMEs. This study was also limited in terms of research design and methodology as well as methods of data analysis due to time constrain and the purpose of the study was not to generalise the findings to the entire South African SMMEs and therefore only applied to the Rustenburg area.

5.5 SIGNIFICANCE OF THE STUDY

The findings from this study could assist in developing unique strategies that could assist SMMEs in South Africa to be at the forefront of transformation and as well reap the long-term benefits of turning to a sustainable energy path such as increasing competitiveness, reduced energy costs, diminished exposure to price volatility and supply interruptions, as well as increased national governmental support.

5.6 RECOMMENDATIONS

For electricity stakeholders

- The study recommends that the national government of South Africa should implement policies and programs such as a power mix approach and renewable energy and bring in private sector participation to launch competition and efficiency in the electricity industry. This is in the interest of mitigating the unreliable electricity supply and constant increases in electricity tariffs.
- The empirical results emanating from this study give policy makers a better awareness on the potential loss in economic growth caused by increases in electricity prices. Therefore, it is crucial that in finding the balance between high electricity demand and low supply, policy makers should allow more players into the electricity supply industry to help boost supply instead of resorting to increasing the electricity prices (Khobai *et al.*, 2017:115).
- In addition, SMMEs should consider alternative sources of power and renewable energy technology such as solar power, inverter, biogas, generators, which would help curb the cost power outage brings to their production and to boost output.

For future research

Overall, the impact of electricity price increases on SMMEs has not been sufficient to trigger substantial changes in behaviour and processes of these SMMEs. In this regard, future research should be extended to investigate the effects of increased electricity prices in major companies such as manufacturing and mining-related companies.

5.7 SUMMARY

SMMEs constitute a critical pillar of the South African economy and society both in terms of revenue and employment creation and will continue to do so in the near future. However, the continued increases in electricity tariffs in South Africa remain a

constraint to the growth and transition of SMMEs. However, the operations, growth and sustainability of these SMMEs are hindered by many constraints among which is the high cost of electricity tariffs that has been experienced since early 2008. In this regard, the study was initiated mainly to address concerns that Eskom's and municipal electricity tariff increases may affect the access and long-term affordability of electricity for SMMEs operating in the Rustenburg area.

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APPENDIX A
DESCRIPTIVE STATISTICS OF THE VARIABLES

Table 4 6: Descriptive statistics of the variables (N=27)

Relevant variables	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
Duration in business operations	1	3	2.37	.742	-.739	-.739
Monthly consumption	1	2	1.85	.362	-2.099	2.594
Electricity cost as a percentage of operating costs	1	4	2.07	1.357	.555	-1.655
Dependent on a stable and secure electricity supply.	1	2	1.41	.501	.399	-1.994
Impact on company financials	1	4	1.70	.869	1.023	.241
Impact on future investment	1	2	2.85	1.134	-.201	-.873
Impact on the future viability and sustainability	1	4	2.63	1.006	.106	-1.121
Impact on performance and competitiveness	1	4	2.70	1.203	-.092	-1.635
Impact on operating profit	1	3	1.74	.813	.528	-1.268
Communications with the municipality	1	4	2.52	1.282	-.163	-1.726
Alternative power supply	1	2	1.48	.509	.079	-2.160
Customer satisfaction	1	2	1.30	.465	.946	-1.201

APPENDIX B
QUESTIONNAIRE
PARTICIPANT INFORMATION SHEET

Dear Prospective Participant

My name is **Constance Tumisang Moseki** and I am currently doing research as part of my Masters' in business administration (MBA) under the supervision of **Mr Theo Venter**. We are inviting you to participate in a study entitled ***the impact of high electricity tariffs on small, medium and micro-enterprises in the Rustenburg area***. The purpose of the study is to investigate the impact of electricity tariffs increases on the SMMEs in the Rustenburg area in the North West province of South Africa.

You have been chosen to take part in this survey because your company is operating in the Rustenburg area. There are no foreseeable risks involved in taking part in this research beyond those experienced in everyday life. There is no financial or other direct benefit accruing from participating in this survey. It will take approximately 10 to 15 minutes of your time to complete the questionnaire.

Your response is used only for the purpose of this study. However, data may be used for other purposes, such as a research report, journal articles and/or conference proceedings. Your participation in this study is completely voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. In addition, if you do not wish to answer any of the questions, you may skip them and move on to the next question. The information recorded is confidential; the name of your business is not being included in the study. No identifying information of the participants will be shared with anyone who is not directly connected with the project.

The researcher will store hard copies of your answers for a period of five years in a locked cupboard/filing cabinet in the researcher's private home or the research supervisor's office for future research or academic purposes. Electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. Hard copies of

your answers will be shredded, and/or electronic copies will be permanently deleted from the hard drive of the computer with a relevant software programme after a period of five years.

This study has received written approval from the Research Ethics Review Committee of the North-West University. A copy of the approval letter can be obtained from the researcher if you so wish.

Should you have concerns about the way in which the research has been conducted, you may contact **Mr Theo Venter, email address: theo.venter@nwu.ac.za**

Thank you for taking time to read this information sheet and for participating in this study.

QUESTIONNAIRE

SECTION A

Q1. Business sector (e.g. Agriculture): _____

Q2. Approximately how long has your business been operating in the Rustenburg area?

1	Less than 1 year	
2	1 – 5 years	
3	More than 5 years	

Q3. Approximately how many units of electricity are consumed by your business on a monthly basis?

1	100kwh- 400kwh	
2	500kwh-900kwh	
4	More than 1 000kwh	

Q4. Approximately what is the cost of electricity as a share of business operating costs?

1	1% - 5%	
2	6% - 10%	
3	11% - 15%	
4	More than 15%	

SECTION B

THE IMPACT OF HIGH ELECTRICITY TARIFFS ON OPERATING PROFITS OF SMMES

We are interested in learning on how the increases in electricity tariffs have affected your business operations. Listed below are several items, each anchored by a five-point Likert-type response. Using the scale below, please indicate the extent to which you disagree or agree with each of the statements. In responding to the items, please mark with an 'X' the number that best characterises your response. 1= Strongly agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly disagree.

		1	2	3	4	5
Q5	My business is heavily dependent on a stable and secure electricity supply					
Q6	My business is financially impacted on by the recent increases in electricity tariffs					
Q7	The ever-increasing electricity tariff has resulted in my company having to reconsider future investments in South Africa					
Q8	The future of my business growing in the Rustenburg area					

In responding to the items below, please mark with an 'X', the number that best characterises your response: 1 = Severe, 2= Moderate, 3 = Little and 4 = No Impact

		1	2	3	4
Q9	Rate your performance and competitiveness in the Rustenburg area due to high electricity tariff.				
Q10	Rate the impact of electricity price increases on your operating profit				

In responding to the items below, please mark with an 'X', the number that best characterises your response: 1 = Frequent, 2 = Sometimes, 3 = Seldom and 4 = Never

		1	2	3	4
Q11	How often do you complain to the municipality regarding increased electricity tariff?				

Rate your responses using the following: 1 = Yes and 2 = No

		1	2
Q12	Would you be able to run your business effectively using an alternative power supply such as a generator?		
Q13	Have you encountered poor customer satisfaction due to the delay of your orders due to power cuts?		

Thank you for your corporation

APPENDIX C
LANGUAGE EDITING

Declaration

This is to declare that I, Annette L Combrink, accredited language editor and translator of the South African Translators' Institute, have language-edited the dissertation by

by

CT Moseki

with the title

**The impact of high electricity tariffs on small,
medium and micro enterprises in the
Rustenburg Area**



Prof Annette L Combrink

Accredited translator and language editor

South African Translators' Institute

Membership No. 1000356

Date: 26 November 2018

APPEDIX D

ETHICS CLEARANCE APPLICATION

2. DECLARATIONS

I, the undersigned, hereby apply for approval of the research as described in the preceding application and declare that:

- 2.1. The information in this application is, to the best of my knowledge, correct and that no ethical codes will be violated with the study;
- 2.2. In the case of human participants;
 - 2.2.1. I will put it clearly to all participants that participation (including assent) in any research study is absolutely voluntary and that no pressure, of whatever nature, will be placed on any potential participant to take part;
 - 2.2.2. I will put it clearly to all participants that any participant may withdraw from the study at any time and may ask that his/her data no longer be used in the study, without stating reasons and without fear of any form of prejudice;
 - 2.2.3. every participant who takes part in the study will receive the indicated form for informed consent and it will be ensured that every participant understands the information (including the process and risks) fully;
 - 2.2.4. every participant will provide informed consent before the study commences, or a witness will stand in on behalf of the participant when the participant cannot provide permission, but agrees to it;
 - 2.2.5. any foreseeable risk is restricted to the minimum, any permanent damage is avoided as far as possible and appropriate precautions and safety measures are in place;
 - 2.2.6. confidentiality of all the information of all participants will be respected and ensured;
- 2.3. I and all co-workers/assistants/fieldworkers are appropriately qualified, capable and legally competent to implement the proposed studies/procedures/interventions;
- 2.4. I will not deviate from the approved proposal and I understand approval for the study will be cancelled if I deviate from the proposal without the approval of the Ethics in Commerce Research Committee;
- 2.5. the study is scientifically justifiable;
- 2.6. where necessary, all contracts, permits and the applicable documents of relevance will be obtained before the research commences;
- 2.7. I will ensure that all data are stored safely and remain in the possession of the North-West University;
- 2.8. I will report in writing any incidents or adverse events that occur during the study without delay to the Ethics in Commerce Research Committee;
- 2.9. I undertake to respect the intellectual property rights of the North-West University throughout and undertake to avoid any form of plagiarism and academic dishonesty;
- 2.10. I will notify the Ethics in Commerce Research Committee should the study be terminated.

CT Maseki

12-Nov-2018

Signature of applicant

Date

TP Venter
Digitally signed by TP Venter
Date: 2018.11.12
11:18:14 +02'00'

12-Nov-2018

Signature of supervisor

Date