

**Defying The Odds: Understanding the Critical Success  
Factors for Financing Independent Power Producers in  
Zimbabwe**

A Thesis  
presented to

The Graduate School of Business  
University of Cape Town

In partial fulfilment  
of the requirements for the  
Master of Commerce in Development Finance Degree

by  
Timisela Zunguze  
December 2016

Supervised by: Professor Anton Eberhard  
Co supervisor: Wikus Kruger

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

## **1 PLAGIARISM DECLARATION**

I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.

I have used the APA convention for citation and referencing. Each contribution to, and quotation in, this thesis from the work(s) of other people has been attributed, and has been cited and referenced.

This thesis is my own work.

I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

I acknowledge that copying someone else's assignment or essay, or part of it, is wrong, and declare that this is my own work.

**Signature:**

**Name:** **Timisela Zunguze**

**Date:** **4 December 2016**

## 2 ABSTRACT

*Since the introduction of legislation in Zimbabwe allowing private participation in generation, there has been significant investor interest in financing independent power producers (IPPs). However, this interest has not materialized into actual investment. Of the 29 IPPs licensed by the Zimbabwe Regulatory Authority (ZERA), only eleven have reached financial closure and are supplying the grid. This dismal performance in the IPP space is a major concern for policy makers, particularly in light of the persistent power shortages plaguing the country. Stop gap measures such as the imports of power and load shedding are not sustainable and have detrimental effects on economic productivity. Expansion of private power generation is the only viable long term solution. In light of this, it is imperative to understand the factors that contribute towards successfully financing IPPs.*

*The purpose of this study is to explore and identify the critical success factors (CSFs) for financing IPPs in Zimbabwe and specific strategies to improve the implementation of IPPs, to ensure as far as possible, a win-win scenario for all stakeholders. This thesis employs a mixed methods approach consisting of a qualitative first phase of expert interviews to identify a core list of success factors, followed by a quantitative second phase, in which a questionnaire survey is used to examine the relative importance and ranking of the factors and to determine whether the ranking of factors varies by stakeholder grouping.*

*A total of 40 success factors were identified, and 38 of the 40 were rated as critical for financing IPPs in Zimbabwe by stakeholders. The study also revealed that the expected debt paying ability of the project; a transparent and cost reflective tariff framework and upholding of contracts are the most critical factors for all stakeholders. The results indicated that there is low agreement in the the ranking of CSFs between the private sector and public sector.*

*This study provides a valuable reference for all stakeholders that are interested in developing IPPs in Zimbabwe.*

### 3 TABLE OF CONTENTS

1	PLAGIARISM DECLARATION .....	i
2	ABSTRACT .....	ii
3	TABLE OF CONTENTS .....	iii
4	LIST OF FIGURES .....	v
5	LIST OF TABLES .....	v
6	GLOSSARY OF TERMS.....	vi
7	ACKNOWLEDGEMENT .....	vii
1	INTRODUCTION .....	8
1.1	Research Area and Background.....	8
1.2	Problem Statement.....	10
1.3	Purpose and Significance of the Research .....	11
1.4	Research Questions and Scope .....	12
1.5	Summary.....	13
2	LITERATURE REVIEW .....	14
2.1	Introduction.....	14
2.2	Economic and Financial Characteristics of Energy Infrastructure.....	14
2.3	Investment under Uncertainty, Irreversibility and Real Options.....	16
2.4	Barriers and challenges to private financing of infrastructure .....	18
2.5	Project finance and risk mitigation for energy infrastructure investment .....	20
2.6	Definition and Characteristics of IPPs .....	22
2.7	Theoretical Explanations of IPP Investment Outcomes.....	25
2.8	Critical Success Factors for Independent Power Projects .....	26
2.9	A framework for exploring CSFs for IPPs.....	30
2.10	Research Context: IPPs and the Energy Sector in Zimbabwe.....	33
2.11	Summary .....	38
3	RESEARCH METHODOLOGY .....	39
3.1	Research Approach .....	39
3.2	Research Design .....	40
3.3	Qualitative Sampling, Data Collection and Analysis.....	41
3.4	Quantitative Sampling, Data Collection and Analysis.....	45
3.5	Reliability and Validity.....	51
3.6	Research Limitations .....	52
3.7	Summary .....	53

4	QUALITATIVE RESEARCH FINDINGS, ANALYSIS AND INSTRUMENT DEVELOPMENT .....	54
4.1	Description of Participants.....	54
4.2	Overview of Private Participation in Generation in Zimbabwe .....	55
4.3	Factors impeding investment in IPPs.....	55
4.4	Main risks to investment in IPPs.....	64
4.5	Strategies recommended by participants to increase the rate of investment in IPPs.....	64
4.6	Identified Success Factors.....	66
4.7	Development of Survey Instrument .....	71
4.8	Summary.....	71
5	QUANTITATIVE RESEASRCH FINDINGS AND ANALYSIS .....	72
5.1	Questionnaire Response Rate.....	72
5.2	Participant Demographics .....	72
5.3	Test of Reliability – Cronbach’s Alpha .....	73
5.4	Descriptive Statistics of Survey Data.....	73
5.5	Perceptions about IPPs and the energy sector in Zimbabwe.....	73
5.6	Significance Indices and Rank of Critical Success Factors.....	76
5.7	Agreement Analysis.....	79
5.8	Risk Factor Analysis .....	79
5.9	Summary.....	80
6	DISCUSSION AND CONCLUSION .....	81
6.1	Discussion of Results.....	81
6.2	Research Questions and Objectives .....	85
6.3	Research Conclusion.....	85
6.4	Recommendations for future research .....	86
7	REFERENCES .....	88
8	APPENDICES .....	102

## 4 LIST OF FIGURES

Figure 1: Typical Project Finance Structure for an IPP .....	21
Figure 2: Institutional Setting of the Zimbabwe Energy Sector .....	33
Figure 3: Exploratory sequential design for the research study.....	41
Figure 4: Interviewee Breakdown by Stakeholder Grouping .....	43
Figure 5: Population and sample for Phase 2.....	45
Figure 6: Respondent Experience with IPPs.....	72

## 5 LIST OF TABLES

Table 1: Benefits of IPPs .....	24
Table 2: Factors Contributing to Successful Independent Power Project Investments in Sub Saharan Africa .....	31
Table 3: IPPs in operation or construction in Zimbabwe .....	37
Table 4: Breakdown of respondents by stakeholder grouping.....	46
Table 5: Stakeholder Grouping of Respondents .....	54
Table 6: Main Risks for IPP investment in Zimbabwe.....	64
Table 7: Recommended Strategies by Respondents .....	65
Table 8: Success Factors for Financing IPPs in Zimbabwe.....	69
Table 9: Respondent Demographics .....	72
Table 10: Summary of Respondents Perceptions .....	74
Table 11: Significance Indices and Rank of Critical Success Factors for Total Sample.....	77
Table 12: Private and Public Sector RIIs and Ranking of Critical Success Factors.....	78
Table 13: Agreement Analysis of Ranking of CSFs between the Private and Public Sector..	79
Table 14: Risk Factor Ranking .....	80

## 6 GLOSSARY OF TERMS

<b>Critical Success Factor</b>	A critical success factor is a key factor in which success is necessary (Smith & Walker, 1994) or an area, in which things must be implemented right in order for a project to flourish and for each major stakeholders' goals to be achieved (Bullen & Rockart, 1981).
<b>Successful investment outcome</b>	We adopt for this study the definition of success adopted by Victor at al (2004) in their study of IPP experiences in developing countries. A successful investment outcome is one in which a project meets the investors' expectations at the time financial commitment is made.

## LIST OF ACRONYMS AND ABBREVIATIONS

CSF	Critical Success Factor
EMA	Environmental Management Authority
IPP	Independent Power Producer
MOEPD	Ministry of Energy and Power Development
MoF	Ministry of Finance and Economic Development
PPP	Public Private Partnership
PPA	Power Purchase Agreement
WB	World Bank
ZERA	Zimbabwe Energy Regulatory Authority
ZETDC	Zimbabwe Electricity Transmission and Distribution Company
ZPC	Zimbabwe Power Company

## 7 ACKNOWLEDGEMENT

First, I would like to thank my Heavenly Father, for His unwavering commitment to my well being and without whom, I can do nothing.

I would like to express my gratitude to my supervisor, Professor Anton Eberhard for his support, guidance and advice throughout the research. I would also like to thank my co-supervisor, Wikus Kruger, for his patience, motivation, commitment and all the hours spent helping me fine tune the writing of this report. I could not have asked for better advisors for my thesis.

I would also like to thank all the participants of the research, who willingly gave of their time to participate and freely shared their wealth of expertise and experience in the research area with me.

I especially want to thank my family, friends and colleagues for their constant support, patience and encouragement. In particular, I am grateful to Victor Utedzi for introducing me to the fascinating world of infrastructure development.

This thesis is dedicated to my parents, who have given me so many opportunities in life and to whom I am forever grateful.

# 1 INTRODUCTION

## 1.1 Research Area and Background

Despite a strong economic recovery between 2009 and 2014, economic headwinds in Zimbabwe are threatening to slow down progress gained since the introduction of dollarization and other stabilization measures (World Bank [WB], 2016). Like the other countries in the SADC region, Zimbabwe is facing significant energy challenges that are crippling economic development (Renewable Energy Policy Network for the 21<sup>st</sup> Century [REN21], 2015). The country's existing power generation assets, most of which were built and commissioned between 1940 and 1970 (Zimbabwe Power Company [ZPC], 2016), have reached the end of their economic life and urgently need to be replaced (Pushak & Briceño-Garmendia, 2011; Ringskog, 2013). The Government of Zimbabwe, through the power generation utility Zimbabwe Power Company (ZPC), has embarked on a refurbishment and expansion strategy to improve the country's power generation capacity, notably, amongst others, the 300 MW Kariba South Extension Project and the refurbishment of the 600 MW Hwange Thermal Power Station (ZPC, 2016). However, progress on these and the other expansion projects by the Government has been painstakingly slow. The development of the Kariba South Project, for example, began in late 2011 but financial close was only reached three years later in late 2014. To meet the current capacity demand shortfall, the country regularly imports power from neighbouring countries South Africa and Zambia, but this is not sustainable given the state utility Zesa Holdings' precarious financial position (Pushak & Briceño-Garmendia, 2011). Such delays, coupled with the prevalence of drought in the region, necessitate the development of independent power producers (IPPs), to augment supply and plug the power supply gap. Energy security is fundamental to maintaining the momentum of Zimbabwe's economic recovery, resuscitation of industry and job creation. IPPs will play an integral part in the energy mix of the country and securing power generation stability. Hence, a consideration of the IPP experience in Zimbabwe and what factors are critical for securing investment and the successful implementation of IPPs presents an opportunity to address the country's power challenges.

There is a growing body of literature focused on identifying the underlying success factors for the financing and implementation of IPPs. This literature has emerged out of the realisation that in most developing countries, public finances have been unable to meet the investment required for power generation and transmission (Eberhard, Gratwick, Morella & Antmann, 2016). Private sector participation, predominantly through IPPs, is needed to bridge the funding gap (Eberhard et al., 2016). Eberhard & Gratwick (2011) analysed the outcomes of 20 IPP projects across Africa and identified a set of factors that play a critical role in determining IPP success. Their study is unique in that the factors were identified directly from the observed outcomes of specific projects, whereas the majority of other studies relied predominantly on literature to generate their list of factors. They find that a favourable investment climate, clear policy and regulatory frameworks, favourable equity arrangements, the origin, experience and mandate of partners, credit enhancements and security arrangements are some of the factors that are critical to the success of an IPP (Eberhard & Gratwick, 2011). Other studies have used the critical success factor methodology to identify and rank the most important success factors for IPPs (Qiao, Wang, Tiong, & Chan, 2001; Chowdury & Charoenngam, 2008; Zhao, Zuo, Zillante, & Wang, 2010; Gupta, Gupta, & Agrawal, 2013). Their findings are consistent with those of Eberhard & Gratwick (2011) except that they use different factor groupings such as by phase of development (Qiao et al., 2001), project attributes (Gupta et al., 2013) and in the case of Zhao et al. (2010), a comparative analysis of success factors of IPPs by fuel type.

A key insight from the study by Eberhard & Gratwick (2011) and also one of the primary motivations for this research, is that the success of investment in IPPs is strongly influenced by the national context of the country in which the investment occurs. This implies any strategies to increase investment have to be adapted or tailored to fit the local context. The Program on Energy and Sustainable Development at Stanford University (PSED) in collaboration with the Management Program in Infrastructure Reform & Regulation at the University of Cape Town (MIIRR) conducted an in depth study of the experiences of IPPs in 13 developing countries (Victor, Heller, House, & Woo, 2004; Woodhouse, 2005), in order to identify the major factors that explain the variation in IPP outcomes across countries. The authors employed a two-step research protocol (Victor et al., 2004) that is instructive in how a study to explore the IPP experience of a country can be conducted. The first step in the research protocol entailed an identification of major hypotheses or independent variables that explain IPP outcomes from existing literature and key stakeholders (Victor et al., 2004). In the second step, they then studied specific countries and projects to “test whether (and under what conditions)” (Victor et

al., 2004, p. 7), the factors identified in step one actually explained the observed IPP outcomes. Their method of enquiry was qualitative and used in- depth interviews with key stakeholders to generate key insights.

Although studies have been conducted to explore the success factors of IPPs in other African developing countries (Eberhard & Gratwick, 2011; Eberhard et al., 2016) there has been no research to date on the success factors for IPPs in Zimbabwe and very limited research on the experience of IPPs in Zimbabwe in general. This study will be useful in not only helping to fill this gap but also adding to the body of knowledge of the experience of IPPs globally and to the literature on the determinants for success for IPP investment in developing countries.

Additionally, while empirical studies on the critical success factors for IPPs in developing countries have identified a comprehensive list of factors, these factors are not necessarily generalizable to all developing countries, because there is no uniformity in the political, social and macroeconomic contexts across countries. This research aims to strengthen the theoretical frameworks underpinning the literature on the success factors for IPPs by testing these theories in the Zimbabwean context and providing empirical evidence to support or reject the factors identified in previous studies. Importantly, this research will also provide useful insights for policy makers, developers and investors involved in the IPP sector in Zimbabwe

## **1.2 Problem Statement**

Since the introduction of the Electricity Act, Chapter 13:19 in 2002, that liberalised Zimbabwe's power sector and facilitated the entrance of private players in electricity generation (Zimbabwe Electricity Act, 2002), the total number of IPPs that have reached financial closure and are now in operation is disappointing (African Development Bank [AFDB], 2011; Ringskog, 2013). As of October 2016, Zimbabwe Energy Regulatory Authority (ZERA), the government body responsible for licensing IPPs, had issued a total of 29 generation licenses to IPPs since 2003. However only nine of those IPPs are operational (Zimbabwe Energy Regulatory Authority [ZERA], 2016a), which is roughly a 31 percent rate of realised investment. This dismal performance in the IPP space is a major concern for policy makers, especially in light of the persistent power challenges plaguing the country. Stop-gap measures such as the import of power from neighbouring countries are not sustainable. Expansion in private generation is the only viable long-term solution for the country.

Multiple reasons have been cited for the low investment success rate amongst IPPs. ZERA attributes the lacklustre performance of IPPs mainly to the severe liquidity challenges being experienced in the country and a lack of access to funding for project preparation by IPPs (“Zera licenses,” 2016). Ringskog (2013) points out that the challenges IPPs are facing in closing financing are in part due to the large arrears the country owes to international financing institutions blocking the flow of new capital. Although these reasons are valid, a complete understanding of the problem requires an in-depth look at the experiences of IPPs in Zimbabwe. Firstly, to understand what factors explain why investment has been so low in IPPs and secondly, to identify the key areas that need to be addressed to increase the rate of successful financings of IPPs.

### **1.3 Purpose and Significance of the Research**

The purpose of this research is an exploratory study to determine and understand what the critical success factors are for financing IPPs in Zimbabwe. Firstly, it will test qualitatively, whether the major hypotheses given in literature for the variation in IPP outcomes across countries explains the observed low investment rate in IPPs in Zimbabwe in order to orient the investigation of critical success factors. Secondly, it will identify through interviews, the critical success factors for financing IPPs in Zimbabwe and through a questionnaire instrument, identify which factors are most critical. These critical success factors will be used to develop recommendations and strategies to ensure successful IPP development.

This study is significant because it will add to the body of knowledge on IPP experiences and critical factors for success by studying the specific country and project level factors for financing IPPs in Zimbabwe. As the first study on IPPs in Zimbabwe to my knowledge, it will also provide a basis from which further research on IPPs in Zimbabwe can be done. For IPP developers and other stakeholders, this study will provide useful information and insights that could potentially provide solutions to financing and implementation challenges they may be facing, allowing the successful completion of their projects. For policymakers, this study will offer insights into what conditions are necessary to promote the proliferation of IPPs and identify areas which require adjustment or concentration of policy efforts in order to increase investment in IPPs. For the country, this study will offer insights into how to improve the low investment rate in IPPs in Zimbabwe in order to increase the number of IPPs

that are operational in the country, which would result in the delivery of much needed generation capacity to aid economic development.

## **1.4 Research Questions and Scope**

The study aims to answer the following research questions:

### **Research Question 1**

What are the critical success factors for financing IPPs in Zimbabwe?

### **Research Question 2**

What is the ranking of the critical success factors for financing IPPs in Zimbabwe and does this ranking vary by stakeholder grouping?

### **Research Question 3**

What strategies can be employed to improve the implementation of IPPs in Zimbabwe in order to increase the number of IPPs that reach financial closure

### **Research Objectives**

The objectives of the study are to

- To identify what the critical success factors are for financing IPPs in Zimbabwe
- To determine the ranking of the critical success factors for financing IPPs in Zimbabwe
- To explore whether the ranking of the critical success factors varies by stakeholder grouping
- To identify strategies that can be employed to improve the implementation of IPPs in order to increase the number of IPPs that reach financial closure?

### **Scope**

This study focuses on the experience of IPPs in Zimbabwe from 2003, the year private participation in generation was enacted, to date. The stricter definition of an IPP as a purely private owned electricity producer is applied for this study as there are currently no public private partnerships in electricity generation in Zimbabwe. By law, in order to develop

an independent power project in Zimbabwe, a developer must first be licensed by ZERA. Therefore, this study will look at the experiences of all licensed IPPs in Zimbabwe, both those that have reached financial closure and those that are yet to.

## **1.5 Summary**

This chapter has shown that IPPs play an important role in the provision of much needed power generation in developing countries and how the specific national context in which investment occurs is critical in determining the success of IPPs. It has also shown that this study will help fill the gap in literature on the experience and success factors of IPPs in Zimbabwe. This report will be structured as follows: Chapter 2 presents a comprehensive literature review on the drivers, mechanisms and barriers of energy infrastructure investment and empirical literature on the experiences of IPPs in developing countries to establish the conceptual framework for the investigation. Chapter 3 will describe the research methodology utilised in this study. Chapters 4 and 5 will present the research findings of the qualitative and quantitative phases of the research. Chapter 6 synthesises and discusses the findings in the previous chapters and provides conclusions based on those findings. Chapter 7 will give conclusions to the study and provide recommendations for future research.

## **2 LITERATURE REVIEW**

### **2.1 Introduction**

Understanding the critical success factors for investment in IPPs in Zimbabwe can be likened to solving a jigsaw puzzle, where each factor is a unique piece of the puzzle that fits together with the other “pieces” (factors) to complete the puzzle (successful IPP investment).

Understanding what influences and ultimately determines an investor’s final decision to invest or not invest is the natural starting point in identifying which specific pieces or factors are necessary to solve the puzzle. Investment theory and evidence from empirical studies on barriers to investment provide useful insights in this regard. However, an understanding of the factors that shape investors’ investment decisions only solves half of the puzzle and does not comprehensively explain why some countries have more success in attracting investment for IPPs than others. Varying investment success rates across countries underscore the importance of the characteristics of the environment in which investment is made on final investment outcomes. Therefore, an understanding of what constitutes an enabling environment for IPP investment essentially completes the puzzle.

This literature review begins with a discussion on the salient characteristics of energy infrastructure investments and how those features influence the decision to invest. A discussion of relevant investment theory, its predictions regarding infrastructure investment and key barriers to private investment then follows. Next, the benefits of project finance as a mechanism for financing energy infrastructure and the importance of risk identification and mitigation are discussed and the definition and main characteristics of IPPs. The next section involves a survey of existing empirical literature on success factors for IPPs and in particular we focus on the findings of the Management Program in Infrastructure Reform & Regulation at the University of Cape Town (MIR) of the experiences of IPPs in Sub Saharan Africa as a framework or lens through which this study’s empirical investigation into critical success factors for IPPs in Zimbabwe may be guided. The final section presents a description of IPPs and the energy sector in Zimbabwe to give context for this study.

### **2.2 Economic and Financial Characteristics of Energy Infrastructure**

Energy infrastructure investments have unique characteristics that distinguish them from

other types of investments (Ehlers, 2014). It is also these distinguishing characteristics that make matching energy infrastructure investment demand and the supply of finance difficult (Ehlers, 2014). Beeferman & Wain (2015) point out that these characteristics result in unique economic, political and financial arrangements for infrastructure that are not made for other types of investments (Beeferman & Wain, 2015). Although there is a wide array of opinions amongst investors on what constitutes the most salient characteristics of energy infrastructure investments (Beeferman & Wain, 2015), only those characteristics most cited in literature and relevant for IPPs, will be discussed.

Arguably, the most distinctive characteristic of energy infrastructure is its illiquidity. Infrastructure projects like power plants are illiquid because they are indivisible, cannot be converted to another use without significant cost and cannot easily be sold because there is no secondary market for such infrastructure. A second characteristic of energy infrastructure builds is that they are capital intensive, with a substantial portion of the total capital outlay for a build required at the beginning of the project. The construction period for infrastructure can also be quite long, often spanning a number of years in which no cash flows are generated. Any major disruptions during construction can have disastrous effects on an investor's ability to recover the full cost of their investment, let alone make returns. Another feature of infrastructure projects is the involvement of multiple stakeholders in project implementation. The interaction of these stakeholders is managed through extensive contractual arrangements between all the parties. Finally, energy projects tend to be highly scrutinized by both government and the general public, because of the social welfare implications of electricity provision. This makes these projects susceptible to undue political interference (Ehlers, 2014, Beeferman & Wain, 2015).

The characteristics mentioned above, and in particular the time gap in the outlay of capital and generation of cash flows, results in energy infrastructure investments having considerably higher risk and uncertainty than other types of investment. To compensate for this, investors normally demand a premium for investing in energy infrastructure (Ehlers, 2014). When the investment is being made in a developing country context like Zimbabwe, the level of risk and uncertainty is heightened, which can negatively impact the investor's decision to invest unless other mitigating conditions are present.

## **2.3 Investment under Uncertainty, Irreversibility and Real Options**

Investment theory is the body of knowledge on investment decision making (Goetzmann, 1996). Within investment theory, the theory of irreversible investment under uncertainty and real options theory are the most pertinent for investment in infrastructure and make predictions that shed some light on the low observed investment rate for IPPs in Zimbabwe.

The standard business fixed investment model is the neoclassical theory of investment (Mankiw, 2015) developed by Jorgenson (1963). The model's basic premise is that investment occurs whenever the present value of the expected returns to an investment exceed the initial capital outlay (Gordon, 1992) that is, investment occurs when the net present value or NPV is positive. In relation to long-lived fixed capital investment like energy infrastructure, the model assumes a completely risk neutral environment and perfect resale markets (Gordon, 1992; Crotty, 1993). This makes any investor uncertainty about the future irrelevant to the investment decision and investment mistakes costless (Crotty, 1993). Combining these assumptions of risk neutrality and reversible investment, the neoclassical model predicts that as long as the NPV of a project is positive, investment will certainly occur.

Empirical evidence has shown this prediction to be false as the NPV rule has failed to predict with certainty which projects will be undertaken (Anderson, 2013; Dixit & Pindyck, 1994). This is because the NPV rule fails to take into account two key elements of the real investment experience: specifically, the effect of uncertainty and irreversibility on investment. Anderson (2013) points out that a fundamental weakness in the NPV rule is that it ignores the value of the option to wait, when the ability to wait to make a decision is an integral part of business, financial markets and real markets. As a consequence, extensive literature emerged in the 80's towards developing a more realistic theory of investment.

### **2.3.1 Investment Under Uncertainty and The Irreversibility Effect**

The effect of irreversibility on investment under uncertainty was first studied by McDonald and Siegel (1986). Long term infrastructure projects like IPPs are irreversible. A project is economically irreversible if once it has been implemented, it cannot be "undone" or

converted to another use without significantly high costs or the scope for alternative use of that project is extremely limited (Claude, 1974; Bernanke, 1983). Because disinvestment is not possible, any expenditures made are unrecoverable sunk costs (Pindyck, 1988). The future prospects and profitability of long term projects is highly uncertain at the time the decision to invest is being considered. As a result of this uncertainty, there is value in postponing the investment until more information is known, to safeguard against loss. On the other hand, there are potential gains to early commitment to the project, particularly if future conditions turn out to be favorable. This creates a tradeoff for investors between the potential gains from early commitment and delaying investment (Bernanke, 1983; McDonald & Siegel, 1986; Pindyck, 1991; Dixit & Pindyck, 1994).

Assuming all investors are rational and risk averse, an investor would forego the potential gains from early commitment and choose to delay investment until they acquire more information about future prospects. Thus theory predicts that uncertainty will have a negative impact on irreversible investment (McDonald & Siegel, 1986; Pindyck, 1991; Dixit & Pindyck, 1994; Baddeley, 2002). The length of time the investment is delayed, known as “the optimal waiting period”, will depend upon the quality and precision of information about the future potential of the investment that is subsequently received (Cukierman, 1980).

### **2.3.2 Real Options Theory of Investment**

Pindyck (1991), in his seminal paper, “Irreversibility, Uncertainty and Investment”, was the first to highlight that investment opportunities have option-like characteristics that enable optimal investment rules to be derived from existing methods of option pricing (Pindyck, 1991). Dixit and Pindyck (1994) later conceptualised modeling investment as real options, where like a financial call option, the investment decision is the right but not the obligation to invest. They argue that once an investment can be postponed, the standard NPV rule no longer applies (Dixit & Pindyck, 1994), because the value of the option to invest is no longer solely the net present value of the investment but the opportunity costs of making the investment should also be factored in the option value calculation. The opportunity costs of investing are the benefits foregone by not taking the opportunity to wait and collect new information on the investment’s future prospects before investing (Dixit & Pindyck, 1994; Baddeley, 2002). This theory predicts investment will only occur if the value of the option to invest exceeds the required initial capital outlay (sunk costs) plus the benefits foregone by not delaying investment (Dixit & Pindyck, 1994; Baddeley, 2002). They motivate that under

uncertainty the value of additional information about future prospects increases when the investment to be made involves large sunk costs. An investor therefore will prefer to delay an irreversible investment when faced with high uncertainty.

Empirically, there is evidence in support of the negative impact of uncertainty on irreversible infrastructure investment. Dunne & Mu (2001), using a commodity futures construct as a proxy for uncertainty, found that an increase in uncertainty reduced the probability of investment in additional capacity by petroleum refineries in the United States (Dunne & Mu, 2001). Doan and Menyah (2013) undertook a case study investigation on the impact of irreversibility and uncertainty on the timing of a BOT toll road project. The results of their study showed that postponement of the project for a few years made the project viable. They found that if the investment had not been delayed, the project would not have been viable (Doan & Menyah, 2013). This evidence underscores the importance of strategies and incentives that reduce uncertainty in order to improve investment rates in irreversible projects like IPPs.

Sources of uncertainty include the macro environment, the political systems and the regulatory environment. Therefore, investment theory predicts that in the absence of mitigating factors, investment in IPPs will be delayed until more information is known. This study seeks to identify how uncertainty and risk have impacted IPP investment in Zimbabwe and to identify key success factors to effectively de-risk IPP investment, to increase the number of IPPs that are successfully financed.

## **2.4 Barriers and challenges to private financing of infrastructure**

There is a wealth of empirical and practitioner literature that details the specific challenges and barriers to private financing of infrastructure. These barriers include the level of political stability, governance, weak legal and regulatory environments, macroeconomic stability and underdeveloped financial markets (WB, 2013; Cambridge Economic Policy Associates [CEPA], 2015; World Economic Forum & Organisation for Economic Cooperation and Development [WEF & OECD], 2015). For energy infrastructure investment, the level of political stability and the nature of the legal and regulatory regimes are particularly important to investors. In a survey of investors conducted by Allen & Overy (2009), over 90 percent of respondents cited the attractiveness of the regulatory environment and the presence of robust

rule of law as very important factors in their choice of countries as investment destinations. The World Bank (2004) found that obstacles in relation to policies, institutions, and regulation are the major bottlenecks to private financing. This is because the complex contractual arrangements and long gestation periods of infrastructure projects necessitate a stable, transparent and predictable political and regulatory environment, to ensure full cost recovery and safeguard investment returns (WB, 2013).

Another critical barrier to private investment in developing countries often cited in literature is the lack of bankable projects (WB, 2013; CEPA, 2015). This is primarily the result of insufficient financial and technical resources in project preparation (MDB Working Group [MDB], 2011; WB, 2013). Good project preparation entails detailed economic, financial and technical feasibility studies (MDB, 2011) and for greenfield projects like IPPs, legal or guarantee frameworks are also required to sufficiently de-risk the project for potential investors (WEF & OECD, 2015). It is argued that development finance institutions can play a critical role in increasing the pipeline of bankable projects by giving financial and technical assistance to developing countries at the project preparation stage (International Finance Corporation, 2011).

Another important barrier to investment is that project returns to infrastructure in developing countries are perceived as too low and not commensurate to the level of risk being undertaken (WB, 2013; WEF & OECD, 2015). This is particularly pertinent for IPPs and other energy infrastructure projects, because electricity provision is highly politicized and the electricity tariffs charged by state utilities are in most cases below cost and controlled by government in the interests of maintaining affordability (WEF & OECD, 2015). The result is that for private power projects, which entail inherently higher investment risk, existing tariffs do not adequately cover project costs (WB, 2013), making projects unattractive from a cost recovery and risk return perspective.

Another important barrier to financing, which can easily be overlooked, is that in many cases private investors lack sufficient knowledge about the social, legal and political environment of the countries they invest in (WEF & OECD, 2015). A lack of sufficient market data, sector specific expertise and an in-depth understanding of local business practices (WEF & OECD, 2015), often prevent investors from accurately assessing the cost of investment and probable risks when making investment decisions. This can result in a disastrous investment experience or the decision to not invest at all. There is a very little literature or market data on

Zimbabwe and the investment experiences of investors in Zimbabwe, across all sectors. This study seeks to help fill this gap by providing information regarding sector specific policies, business and investment practices relevant for investment in IPPs in Zimbabwe. This information could be used to create a type of investment primer about investing in the electricity sector in Zimbabwe, which could be very useful for potential investors.

CEPA (2015) conducted a systematic review of literature on the barriers and challenges to private financing of infrastructure projects, including energy, in Sub Saharan Africa and South Asia. As part of their review, they identify that one of the gaps in existing literature on financing constraints is the absence of studies which focus on specific factors that have the most critical impact on securing private finance and will facilitate well timed and focused policy interventions to increase private investment in infrastructure. This study will contribute to filling this gap.

The impact of the issues highlighted in this section is that they individually and collectively increase the overall uncertainty and risk of infrastructure investment. As discussed in the preceding sections on investment theory, the impact of higher uncertainty surrounding an investment is a longer optimal waiting period before investment is made. This underscores the central role of risk and risk mitigation in determining investment outcomes. In the next section we discuss the importance of risk mitigation and project finance in relation to energy infrastructure investment.

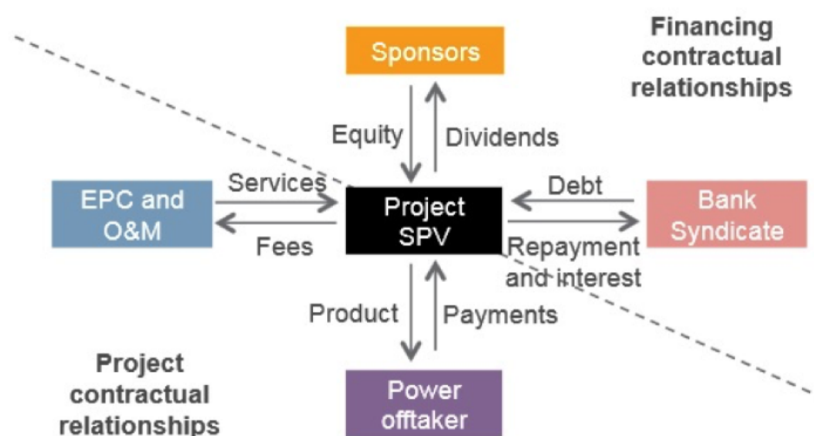
## **2.5 Project finance and risk mitigation for energy infrastructure investment**

### **2.5.1 The benefits of project finance**

The use of project finance to finance energy infrastructure projects in countries characterised by high political risk and weak institutional and legal systems has grown in popularity with financial investors (Hainz & Kleimeier, 2012). This is mainly because of three key features of project finance. Firstly, project finance enables the power project to be implemented through a newly created special purpose vehicle. The establishment of a separate SPV with a distinct legal personality allows the sponsoring company to raise financing for a project without increasing its debt burden (Finnerty, 2007) and gives the providers of finance protection should the sponsors face financial distress or bankruptcy, by isolating the project from financial risk contamination (PricewaterhouseCoopers, 2011). This cover is particularly

pertinent in developing countries like Zimbabwe where there is significant macroeconomic risk and financial market instability. Secondly, project finance is limited recourse or off balance sheet financing, which limits the legal liability of the sponsors in the event that the underlying project fails (Finnerty, 2007). The lenders' sole recourse is to the assets of the project company. This is important because it enables viable projects to be financed almost entirely on merit and not on the strength of the sponsors balance sheets, as most developers do not have the financial muscle to fund project on their own balance sheet. Finally, project finance consists of an extensive network of contracts that govern the behaviour of all the parties involved in the project and are critical to aligning incentives and coordinating activities, responsibilities and risk (Esty, 2002; Sorge, 2004; Finnerty, 2007). In particular, the non-financial contracts that make up part of the suite of project finance arrangements are an important risk management tool that enables project sponsors for IPPs to borrow funds at an affordable rate (Corielli, Gatti, & Steffanoni, 2010). Figure 1 below shows the contractual arrangements involved in a typical project financing of an independent power project.

**Figure 1: Typical Project Finance Structure for an IPP**



Source: Reprinted from *The Green Climate Fund and private finance: Instruments to mobilise investment in climate change mitigation projects* by S. Gray and N. Tatrallyay, p. 8. Copyright 2012 by Climate Change Capital Ltd.

### 2.5.2 The Importance of Risk and Risk Mitigation

Most IPP projects are greenfield, with no prior operating history at the time of initial investment making, making them risky investments for investors (Finnerty, 2007). The creditworthiness of the project to a financial investor depends not only on profitability from a

cash flow perspective, but also the sustainability of cash flows. Sustainability refers to the management and mitigation of the long-term risks to project revenues. A balance between profitability and sustainability is essentially what is referred to as “bankability” in the analysis of a project by investors. For lenders, in particular, bankability means two things: first, that their returns, which are typically capped in nature, should be sufficient to offset the long-term risks of the project in light of the revenue stream; and secondly that the overall elements of the deal add up to one that is sustainable with a minimal likelihood of default.

Bankability is of particular concern for investors in developing countries because of the higher risks inherent to those countries. For projects in Africa, the typical expected rates of return for equity are between 15% and 20% to compensate for those higher risks (WB, 1994). For Sub-Saharan African countries like Zimbabwe, a key requirement to attract private investment to the power sector is the availability of risk mitigation instruments (Eberhard, Gratwick, Morella & Antmann, 2016). Risk identification, allocation, management and mitigation are at the core of project finance. Bonetti, Caselli and Gatti (2010) emphasize that the utility and success of project finance hinges greatly on the accurate identification of risks relevant to a project and in structuring the contractual arrangements such that protection from those risks is airtight. It is rare for projects to be financed entirely on their own merit without any guarantees or form of sponsor support (Roberts, 1983). Nevitt and Fabozzi (1995) point out that the key to creating a project financing transaction that satisfies the lenders from a risk perspective is to structure the project such that it has as little recourse to the project sponsors but still provides credit support for lenders through guarantees and a government undertaking of support. However, the specific level of recourse required by lenders is determined by the type and magnitude of risks inherent in the project (Badissy, 2014).

Eberhard et al. (2016) point out that risk mitigation techniques need to be tailored to the country in which the investment is being made, as well as the sector specific characteristics. This underscores the relevance of this study in identifying the key risks to investment in IPPs in Zimbabwe, in order to tailor risk mitigation strategies for the specific context of IPPs in Zimbabwe.

## **2.6 Definition and Characteristics of IPPs**

The term independent power producer, abbreviated as IPP, originated in the United States, who were the pioneers of electricity generation by independent merchant power plant

operators (Jechoutek & Lamech, 1995). Besant–Jones (2006) defines an IPP as “an entity that owns facilities to generate electric power for sale to utilities and end users and that has no affiliation to a transmission or distribution company” (Besant-Jones, 2006, p.130). This definition explains the function of an IPP but gives no clarity on the ownership of the IPP. Traditionally, the defining characteristic of an IPP is generally understood to be private ownership and independence from government. Eberhard et al. (2016) adopt a broader definition of IPPs, pointing out that in practice, the ownership structures of IPPs are not uniformly private. In Sub-Saharan Africa, some IPPs are in the form of public private partnerships (Eberhard et al., 2016). However, for the purposes of this study, the stricter definition of purely private ownership will be applied.

IPPs can either be greenfield or brownfield projects (WB, 2016a). A greenfield project is the implementation of an entirely new power plant. A brownfield project is the expansion or rehabilitation of an existing plant. The World Bank PPI Database (WB, 2016a) classifies greenfield projects involving the participation of the private sector by the type of contract used to implement the project. The three most common project structures are Build-Own-Operate (BOO), Build-Own-Operate-Transfer (BOOT) and Build-Lease-Transfer (BLO). For the purposes of this study, only greenfield, BOO IPPs will be considered.

The sale of electric power by an IPP to the offtaker, typically a state owned utility, is achieved through a long-term power purchase agreement (PPA). The typical length of the PPA term is between 15 and 20 years (Woolf & Halpern, 2001), giving some measure of reliability of income to the IPP. The PPA is the central agreement around which the financing of an IPP occurs as it is from the stream of revenues that accrue to the IPP under the PPA that investors, both debt and equity, will realise a financial return.

### **2.6.1 Potential Benefits of IPPs**

An understanding of the CSFs to promote the development of IPPs is important because IPPs can provide many benefits for the host countries. Several benefits associated with IPPs are given in literature. The table below presents some of the major benefits of IPPs highlighted in literature

**Table 1: Benefits of IPPs**

<b>Benefit</b>	<b>Source</b>
1. Add much needed generation capacity where governments have been constrained to do so on their own	<i>(Besant-Jones, 2006)</i>
2. Enhance energy security by improving the diversity of the fuel mix in the electricity market	<i>(Woodhouse, 2005)</i>
3. Reduction in electricity prices due to efficiency gains from operation	<i>(Gardiner &amp; Montpelier, 2000)</i>
4. More efficient assignment of risks in the electricity sector	
5. Easing of strain on domestic finances by attracting outside capital	
6. Help improve government's fiscal position through an increase in revenues from the licensing or concession fees paid by IPPs and elimination or reduction of subsidies that may have previously been given by government as the sole generation provider	<i>(Harris, 2003)</i>

However, with regard to the benefit of reduced electricity prices, in reality, IPPs do not have competitive tariffs, because electricity tariffs charged by utilities are in most cases pegged far below cost and politically controlled due to social welfare considerations and priorities of the government (WB, 2013; WEF & OECD, 2015).

### **2.6.2 Criticism and Potential Pitfalls of IPPs**

Despite the many potential benefits of IPPs, many countries that have introduced private generation have run into significant challenges with IPPs (Hall & Bayliss, 2000). Hall & Bayliss (2000) conducted a review of the major problems that have arisen with IPPs in different countries. Some of these challenges highlighted are protracted political and economic battles over IPPs, protracted legal battles with IPPs, unduly favourable conditions offered to IPPs and the crippling of state utilities due to heavy payment obligations to IPPs (Hall & Bayliss, 2000). These challenges are largely attributable to corruption, the structure of the PPA, and the offtake arrangements available in a country. A major challenge with IPPs, particularly for the offtaker and government, is that the structure of the PPA structure is too rigid and does not promote sustained efficiency gains or promote competitive markets (Woolf & Halpern, 2001). The nature of the contract effectively locks in the contract terms, financing and security arrangements made at the inception of the contract for as long as 25

years, such that even if advancements in generation lead to cheaper power alternatives, the offtaker is obligated to purchase the now more expensive power secured under the PPA. Another major concern is the strain that cumulative obligations to buy power from IPPs places on the offtaker in a single buyer market (Besant- Jones, 2006). A challenge with IPPs that is pertinent to African electricity markets is corruption. Kashi (2015) found that in less developed countries, IPPs often overstate their investment costs to increase the returns on funds utilised, in order to offset the higher risks associated with greenfield projects. This underscores the importance of a strong regulatory body to disincentivise moral hazard on the part of IPPs. Furthermore, when non-competitive bidding processes are used to procure IPPs, there is also a high risk of corruption in the award of IPP generation licenses Besant- Jones (2006) points out that in many countries, non transparent processes in concluding initial IPP contracts led to calls for their renegotiation, after allegations of corruption emerged. Despite these criticisms, IPPs remain the predominant viable alternative for African countries (Eberhard et al., 2016). This reality underscores the importance of this study, to identify what critical factors prevent or mitigate the challenges with IPPs that are identified in literature, in order to promote successful investment in IPPs in Zimbabwe.

## **2.7 Theoretical Explanations of IPP Investment Outcomes**

In their study of the IPP experiences and outcomes in 13 developing countries, Victor et al. (2004) identified four key hypotheses or explanations as to what determines IPP outcomes. These are the obsolescing bargain, investment climate, electricity market structure and project management. Each of these explanations points to a cluster of key factors (independent variables) that explain IPP investment outcomes (dependent variable) observed in developing countries (Victor et al, 2004). An understanding of these hypotheses helps to orient and guide the exploration of the critical success factors for IPPs in Zimbabwe.

The obsolescing bargain, pioneered by Vernon (1971) posits that there is an inevitable shift in bargaining power over the lifecycle of large private infrastructure investment deals, which makes the deals susceptible to revisions by the government. In the initial bargain, private investors have the upper hand as they possess the capital and the host government needs the infrastructure but lacks the capital to provide it on its own. But once the infrastructure is built, the initial bargain becomes obsolete as the government has secured what it needed, the infrastructure asset (Vernon 1977; Moran, 1998; Woodhouse, 2006). This underscores the

importance of the perception that a country upholds contracts and the availability of government guarantees in attracting investment for energy infrastructure. The investment climate can broadly be defined as “the set of location-specific factors shaping the opportunities and incentives for firms to invest productively, create jobs, and expand.” (Smith & Hallward-Driemeier, 2005, p.40). This includes the macro environment, legal and regulatory context, public finances, the functioning of financial and product markets, institutions, management context and FDI experience (Smith & Hallward-Driemeier, 2005; Woodhouse, 2005; World Bank, 2005; World Bank 2007). The condition of the investment climate will determine whether investors have any incentives to undertake the project and also impacts financing by either discouraging or encouraging investment.

In relation to the electricity market structure, their study found that investment in IPPs occurred more in countries in which there was a higher the degree of electricity reform Other key elements of the electricity market structure that impact investment in IPPs highlighted by Victor et al. (2004) are electricity demand, the adequacy and condition of transmission infrastructure, the competency and independence of the regulator, and the existence of rapid payback mechanisms. With regard to project management, the authors highlight that the wide variation in investment outcomes across countries may not stem from investment environment characteristics, but rather on the ability of developers to negotiate financing and to carry out the necessary project development work to facilitate the actual investment Victor et al., 2004). For IPPs this implies investment outcomes are determined not only by the project environment or structural factors, but also how well project managers manage planning and implementation.

## **2.8 Critical Success Factors for Independent Power Projects**

The concept of critical success factors (CSFs) was first introduced by Rockart (1979) and elaborated on by Bullen and Rockart (1981) in their seminal contribution toward the design of management information systems. Bullen and Rockart (1981) define critical success factors as “the few key areas where 'things must go right' for the business to flourish and for the manager's goals to be attained” (p.3). This underscores the importance of an identification of CSFs in focusing the effort or actions of those responsible for a particular endeavour and in maximising the likelihood of the desired outcome being reached.

Although the potential benefits of IPP are widely understood, there has been a wide variation in the actual investment record and performance of IPPs within and across countries (Woodhouse, 2005; Eberhard et al., 2016). Some notable successes include the IPP programs in Egypt, Mexico and Thailand (Woodhouse, 2005). These countries have attracted a substantive amount of private sector investment and have to a large extent been able to maintain stable working relationships between the government and investors (Woodhouse, 2005). More recently, the Renewable Energy Independent Power Procurement Program (REIPPP) in South Africa is another noteworthy success. Since its inception in 2011, the program has in a relatively short period of time “delivered remarkable investment and price outcomes” (Eberhard et al., 2014, p.4). To date, a total of 92 projects have been awarded, of which 42 are operational. The combined generation capacity of all the projects is 6327 MW of renewable power and the total private sector investment amounts a \$20,5 billion. (Eberhard et al., 2016).

In sharp contrast to these positive experiences, IPPs in many other countries have not been as successful in attracting investment and have faced significant challenges in project implementation (Woodhouse, 2005). Notable examples include allegations of corruption in the award of IPP contracts in Indonesia, stranded cost problems for IPPs in Poland due to ongoing electricity market reform and severe pricing pressures facing thermal IPPs in Brazil and the very visible failure of the Enron Dabhol project in Maharashtra, India (Woodhouse, 2005). This wide variation in outcomes across countries, coupled with the need for massive investment in power generation in developing countries, has led researchers to investigate why some countries have had more success in attracting private investment and implementing IPP programs than others.

### **2.8.1 Previous Studies on CSFs for IPPs in Developing Countries**

A key element required for the success of IPPs and infrastructure projects highlighted in literature is the creation of an enabling or attractive environment for investment (Victor et al., 2004; Eberhard et al., 2016). This refers to the interrelated characteristics of a business environment or country, that impact the ability of project stakeholders to engage in project development effectively, such as the macro environment, legal and regulatory context, public finances, the functioning of financial and product markets, institutions, management context and FDI experience (Smith & Hallward-Driemeier, 2005; Woodhouse, 2005; WB, 2005; WB, 2007). In terms of investment, literature has shown that there is a positive link between

investment in developing countries and a good investment climate (Bleaney, 1996; Bhaduri, 2005; WB, 2005; WB, 2007; Beck, Fuchs, & Uy, 2009). In relation to IPPs, the investment climate will determine whether sponsors have any incentives to undertake the project and also impacts financing by either discouraging or encouraging investment. This suggests that the quality of the investment climate is a key determinant of investment in IPPs.

Some studies have focused on the CSFs for a specific element or component of the overall enabling environment for IPPs. For example, Chowdury and Charoenngam (2008) examined IPPs in Asia to determine the success factors for developing an appropriate legal framework for IPP project financing. They found that a competitive bidding framework is necessary to give credibility to IPPs and that government should provide payment guarantees to stand behind the state utilities' obligations (Chowdury & Charoenngam, 2008). With regards to risk, they found that government should initiate engagements with export credit agencies (ECAs) and Multilateral Banks to provide political and commercial risk coverage for IPPs (Chowdury & Charoenngam, 2008).

Other studies have used a case study approach to investigate the critical success factors for specific types of IPP projects. Zhao et al. (2010) employed the CSF methodology to investigate the critical success factors for BOT power projects in China. Their study was a comparative analysis between the success factors for thermal power projects versus wind power projects. This comparison is particularly useful given the growing concern globally of the sustainability and environmental effects of the use of fossil fuels in generation. A total of 64 factors were identified from literature to be tested using the CSF methodology. They found that for thermal projects, the level of economic development, degree of public recognition and environmental protection requirements are far more significant factors of success than in wind projects (Zhao et al., 2010). In another case based study, Ali, Sopian, Yen, Mat, and Zaharim (2008) investigated the key success factors for implementing a renewable energy program in Malaysia. The authors identified four key factors, namely: the establishment of programs to provide information services, raise awareness and build capacity in renewable technology; the use of demonstration projects to increase the acceptance and understanding of renewable technology; strengthening renewable energy policies and government led financial mechanisms to encourage investment in renewable energy; and enhancing the industry's R&D efforts (Ali et al., 2008).

Studies like Zhao, Zuo and Zillante (2013) and Gupta et al. (2013) have investigated the general key success factors that promote and facilitate greenfield investment in power generation. Zhao et al. (2013) identified 14 factors at both a macro and micro level that impact project success. At the macro level, they found that the level of local economic development, public acceptance, environmental regulations, political stability, legal landscape, economic policy and credit regulations are factors influencing the rate of investment in projects. At the micro level, they found that the capacity of key project stakeholders, namely the project developer, contractor and suppliers, had a significant impact on investment. A key insight from their findings is that successful investment in projects requires the combined efforts of all project stakeholders and not just policy makers (Zhao et al., 2013). Gupta et al. (2013) investigated the critical success factors for BOT power projects in India. Their methodology entailed an extensive literature review and focus group discussions to identify success factors and a questionnaire administered to sector experts to determine rankings for the factors (Gupta et al., 2013). They found that the top 5 critical success factors for investment were a concession agreement, a short-construction period, the concessionaire award procedure, adequate long-term demand and adequate net cash flows (Gupta et al., 2013).

Yusof & Salami (2013) explored the success factors for BOT power plant projects in Iran. They identified 33 factors through an extensive review of relevant literature and used a questionnaire survey to ascertain the relative significance of the factors. They further investigated whether there was agreement on the ratings of factors by the three groups of project stakeholders surveyed for the study, namely government officials, concessionaires and consultants. The results revealed differing perspectives amongst the three stakeholders. Government officials considered an 'attractive financial package' as the most critical factor, while concessionaires and consultants rated 'the capability to lead the project by government' and 'appropriate project identification' as the most important factors, respectively (Yusof & Salami, 2013). This seems to suggest that the successful investment in IPPs requires a full appreciation and understanding of the various needs and objectives of all the project stakeholders and the creation of an environment that adequately addresses them.

A commonality across most the studies surveyed for this study is the research methodology used to identify CSFs. Success factors were identified by conducting a comprehensive literature review and verified through semi structured interviews with practitioner experts or project stakeholders to generate a final list of critical success factors. A survey questionnaire

was then administered to key stakeholders to evaluate the criticality of the list of factors (Yusof & Salami, 2013). A similar methodology is employed for this study.

## **2.9 A framework for exploring CSFs for IPPs**

Researchers with the Management Programme in Infrastructure Reform & Regulation have for over a decade analysed the outcomes of approximately 20 IPPs in Sub-Saharan Africa. An important outcome of their seminal research is that they have identified and compiled a list of 12 factors that contribute to the creation of an enabling environment for sustainable IPP investment (Eberhard et al., 2016). This list of factors provides a first sketch for best practices in IPP development in Sub-Saharan Africa (Eberhard and Gratwick 2011) and provides a framework through which the CSFs for IPPs in other Sub-Saharan African countries can be explored. This framework makes a distinction between country level and project level factors (Gratwick & Eberhard, 2008).

### **2.9.1 Country Level Factors**

At the country level, they identify a favourable investment climate, clear policy and legal frameworks, coherent power sector planning, independent regulation and competitive procurement process as critical success factors (Gratwick & Eberhard, 2008). Noteworthy about these factors is that they are predominantly in the purview of government or policy makers (Gratwick & Eberhard, 2008). This suggests that the success of IPPs, in terms of investment and implementation requires adequate and intentional support from the government.

### **2.9.2 Project Level Factors**

Project level factors are the factors over which the project sponsors and investors have some measure of control and if carefully structured and managed, these factors contribute towards the successful implementation of IPPs and enable them to better weather any external shocks and stresses. These factors are favorable debt and equity arrangements, a creditworthy offtaker, adequate revenue security arrangements, credit enhancements, sound risk management and mitigation practices, strong technical performance and strategic relationship building and management by sponsors are the elements necessary to underpin sustainable investment in IPPs (Gratwick & Eberhard, 2008). The table below presents a summary of the country level and

project level factors identified by Gratwick & Eberhard (2008).

**Table 2: Factors Contributing to Successful Independent Power Project Investments in Sub Saharan Africa**

<b>Factors</b>	<b>Details</b>
<b>Country Level</b>	
Stable country context	Stable macroeconomic policies Legal system allows contracts to be enforced, laws to be upheld, arbitration Good repayment record and investment-grade rating Previous experience with private investment
Clear policy framework	Framework enshrined in legislation Framework clearly specifies market structure and roles and terms for private and public sector investments (generally for a single-buyer model, since wholesale competition is not yet seen in the African context) Reform-minded “champions” to lead and implement framework with a long-term view
Transparent, consistent, and fair regulation	Transparent and predictable licensing and tariff framework Cost-reflective tariffs Consumers protected
Coherent power sector planning	Power-planning roles and functions clarified and allocated Planning function skilled, resourced, and empowered Fair allocation of new build opportunities between utility and IPPs Built-in contingencies to avoid emergency power plants or blackouts
Competitive bidding practices	Planning linked to timely initiation of competitive tenders/auctions Competitive procurement process adequately resourced and fair/transparent
<b>Project level</b>	
Favorable equity partners	Local capital/partner contribution, where possible Risk appetite for project Experience with developing-country project risk Involvement of a DFI partner (and/or host country government) Reasonable, fair ROE Development-minded firms
Favorable debt arrangements	Competitive financing Local capital/markets mitigate foreign-exchange risk Risk premium demanded by financiers or capped by off-taker matches country/ project risk

	Some flexibility in terms and conditions (possible refinancing)
Creditworthy off-taker	Adequate managerial capacity Efficient operational practices Low technical losses Commercially sound metering, billing, and collections Sound customer service
Secure and adequate revenue stream	Robust PPA (stipulates capacity and payment as well as dispatch, fuel metering, interconnection, insurance, force majeure, transfer, termination, change-of-law provisions, refinancing arrangements, dispute resolution, and so on) Security arrangements where necessary (escrow accounts, letters of credit, standby debt facilities, hedging and other derivative instruments, committed public budget and/or taxes/levies, targeted subsidies and output-based aid, hard currency contracts, indexation in contracts)
Credit enhancements and other risk management and mitigation measures	Sovereign guarantees Political risk insurance (PRI) Partial risk guarantees (PRGs) International arbitration
Positive technical performance	Efficient technical performance high (including availability) Sponsors anticipate potential conflicts (especially related to O&M and budgeting) and mitigate them
Strategic management and relationship building	Sponsors work to create a good image in the country through political relationships, development funds, effective communications, and strategically managing their contracts, particularly in the face of exogenous shocks and other stresses.

Source: Reprinted from *Independent Power Projects in Sub-Saharan Africa Lessons from Five Key Countries* by A. Eberhard, K. Gratwick, E. Morella and P. Antmann, p. 42. Copyright 2016 by World Bank.

### 2.9.3 MIR Research on IPPs in Africa - Lessons from the South Africa's Renewable Energy Program

The spectacular success of the South African REIPPP has attracted much attention, both in the region and the rest of the continent (Brodsky & Matarirano, 2015). Using a case study approach, Eberhard et al. (2014) explored the South African experience in order to identify the key factors behind the program's success. They identified 19 success factors, such as a high level of political support for the program, the expertise of the REIPPP management team, the ad hoc institutional separation of the IPP Unit from the rest of the Department of Energy, multiple bidding rounds and donor and multilateral support for the program. Another important aspect of their research is that they outline some valuable lessons that other countries contemplating the procurement renewable energy infrastructure investments can glean from the South African experience. These include the need for credible and effective project

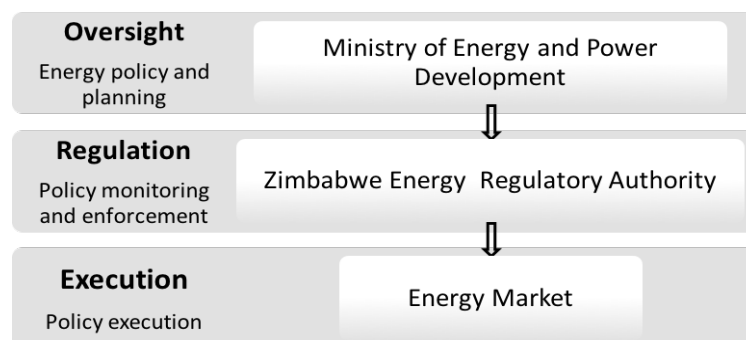
champions to interface with all project stakeholders, the potential for renewable energy programs to foster local social and economic development and that a well designed, transparent procurement process is key to unlocking private investment in energy infrastructure, both from sponsors and financiers (Eberhard et al., 2014). A unique insight of their research relates to the ongoing debate of which type of tender, competitive versus feed-in tariffs (FITs), yields better tariff investment outcomes. They found that competitive procurement provides better tariff outcomes, but regardless of the type of tender chosen, a clear procurement framework is what is necessary to unlock investment from private sector developers (Eberhard et al., 2014).

## 2.10 Research Context: IPPs and the Energy Sector in Zimbabwe

### 2.10.1 Institutional Setting

The institutional setting and governance structure of the energy sector in Zimbabwe is shown in the diagram below:

**Figure 2: Institutional Setting of the Zimbabwe Energy Sector**



Source: Author's compilation from National Energy Policy, 2012

The Ministry of Energy and Power Development is the government department with the overall responsibility for the energy sector in Zimbabwe. Its mandate includes formulation of policy, performance monitoring and regulation, promotion of renewable energy sources, energy conservation and research. It also supervises and oversees the performance of the energy utility, its subsidiaries and other specialized agencies in the energy sector (National Energy Policy, 2012). ZERA is a statutory body whose primary function is to regulate the energy sector and create an environment that promotes competition and efficiency in the sector. ZERA is responsible for licensing all players involved in electricity generation,

transmission, distribution, supply and regulating and approving the associated tariffs (ZERA, 2016b).

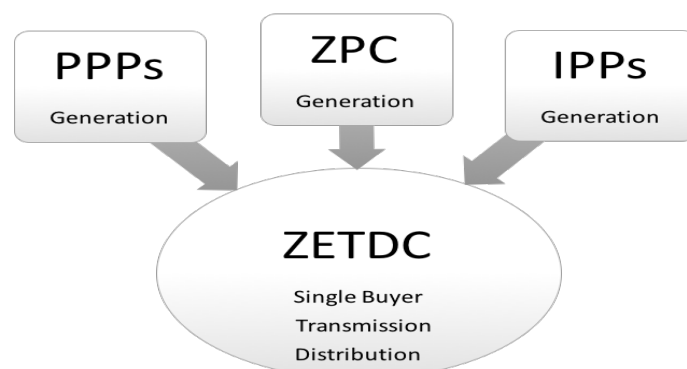
### 2.10.2 Policy Framework

There are three key pieces of legislation that govern the energy sector in Zimbabwe. These are the Electricity Act of 2002, the Energy Regulatory Authority Act of 2011 and the National Energy Policy of 2012. An overview of the main aspects of each can be found in Appendix A. With regards to private participation in the energy sector, the National Energy Policy states that government’s intent is for the private sector to become, “the engine for provision of energy services” (National Energy Policy, 2012, p. ix). It also states that government is committed to encouraging the participation of IPPs in the energy sector in order to improve the efficiency of the sector, diversify energy supplies and reduce the country’s reliance on energy imports. Notably, the policy states that the key to achieving the strategic goal of private sector led energy provision was to improve the governance and institutional framework of the power sector (National Energy Policy, 2012). Government is also currently formulating two key new policies, namely the Renewable Energy Policy (REP), to address gaps in the current energy policy, promote investment in renewable energy and increase the supply of environmentally friendly renewable energy sources; and a National Integrated Energy Resource Plan (NEIRP), to provide a long term resource plan for meeting the country’s energy demand.

### 2.10.3 The Electricity Market

The electricity market in Zimbabwe is a single buyer market, with competition in generation. The diagram below illustrates the electricity market structure:

**Figure 3: Zimbabwe Electricity Market Structure**



The electricity market is dominated by the state owned utility Zesa Holdings and its subsidiaries the ZPC and Zimbabwe Electricity Transmission and Distribution Company (ZETDC) (Climatescope, 2016). ZPC carries out power generation and operates five power stations. ZETDC is responsible for the transmission and distribution of electric power and for its sale, including meter reading, billing, cash collection, and credit control of the retail business. It buys generation from its sister company ZPC and independent power producers. ZETDC is also the system operator and trades power with other countries in the region through the Southern African Power Pool (SAPP).

#### **2.10.4 Power Generation Situation**

The country is heavily reliant on thermal and hydropower for electricity generation. The country's total installed capacity is 2.02 GW. Power generation is dominated by ZPC, which currently produces over 95% of the power used in the country. The bulk of that supply comes from two of its power stations, the 750MW hydroelectric Kariba South Power Station and 920MW Hwange Thermal Power Station (ZPC, 2016). Approximately 120MW of installed capacity comes from IPPs, namely small hydropower plants and biomass plants (Climatescope, 2016).

Zimbabwe has seen a very large reduction in power supply over the last decade. At present, only an estimated 45% is available for power generation. With peak demand at 2,2GW, this has created a national energy deficit of approximately 1GW (Ministry of Energy and Power Development [MOEPD], 2016). This is primarily because the country's fleet of thermal power stations experiences frequent technical faults as the equipment is aged and past its useful life. Furthermore, perennial droughts have resulted in declining water levels at Kariba Dam, restricting the hydropower station's generation capacity. To augment supply, the country has relied on demand side management initiatives and the imports of power from its neighbours to meet demand (MOEPD, 2016), but these are only stopgap measures. A long-term solution requires the procurement of new generation capacity. The Government aims to achieve this by undertaking several expansion projects, which are in the early stages of development, and procuring independent power producers.

## **2.10.5 IPPs in Zimbabwe**

### **2.10.5.1 Procurement**

The procurement of IPPs in Zimbabwe is done through ZERA, using an unsolicited bids framework. A generation license gives the holder the right to own, construct and operate a generation plant for a period of 25 years. This period is deemed sufficiently long to enable investors to recoup their investment and earn a sufficient return that is commensurate with the risk taken in investing in generation infrastructure in Zimbabwe. The license is conditional upon the achievement of certain conditions, mainly key project agreements, permits and timelines that are set at the time of licensing.

### **2.10.5.2 Requirements to reach financial closure**

In order to reach financial closure and begin construction, IPPs need to acquire various statutory permits and consents, such as the environmental impact assessment certificate (EIA), fuel supply agreements in the case of thermal and hydro, and land leases with government where the developer does not own the land. A list of the typical fees for the main permits required for IPPs can be found in Appendix A. The central agreement IPPs also need to negotiate and acquire is the PPA with ZETDC for the sale of power. The generation tariff however, is not negotiated directly with the offtaker. Once the main PPA document has been agreed with the offtaker, IPPs make an application for a generation tariff directly to the regulator. It is the regulator's responsibility to adjudicate tariff applications from IPPs and approve or disprove the tariff. The current methodology used to determine the tariff is a cost-plus methodology. In addition to the requirements stated above, potential financiers often require IPPs to procure certain guarantees from government, namely policy and sovereign guarantees, before making the investment.

### **2.10.5.3 Licensed IPPs**

To date, ZERA has licensed a total of 29 IPPs for various technologies. Details of the licensees can be found in Appendix A. The split by energy mix is ten solar, 11 mini hydros, one biomass, three coal fired, one gas fired and three cogeneration plants (ZERA, 2016a). Of the 29 licensed IPPs only 11 have reached financial closure, of which nine are operational and two in construction. Table 3 below gives details about the size and investment costs of

the IPPs that have reached financial closure.

**Table 3: IPPs in operation or construction in Zimbabwe**

Developer	Plant Name	Technology	Location	Capacity (MW)	Commissioned	Estimated Investment (US mill)
<b>A. Operational</b>						
Hippo Valley Estates	Hippo Valley Estates	Bagasse (co-gen)	Chiredzi, Masvingo	33	Jul 2001	19.10**
Triangle Estates	Triangle Estates	Bagasse (co-gen)	Chiredzi, Masvingo	45	Not available	36.81*
Nyangani Renewable Energy	Nyamingura Power Station	Mini-Hydro	Nyamingura river, Eastern Highlands	1.1	Dec 2010	6.78*
Green Fuel	Green Fuel	Bagasse	Chisumbanje, Chipinge	18.3	Oct 2011	10.59**
Nyangani Renewable Energy	Pungwe A Power Station	Mini-Hydro	Nyamombe river, Eastern Highlands	2.75	Jan 2013	4.47*
Nyangani Renewable Energy	Duru Power Station	Mini-Hydro	Duru river, Eastern Highlands	2.2	Apr 2013	2.97*
Nyangani Renewable Energy	Pungwe B Power Station	Mini-Hydro	Pungwe river, Eastern Highlands	15.25	Feb 2015	26.59*
Nyangani Renewable Energy	Pungwe C Power Station	Mini-Hydro	Chiteme river, Eastern Highlands	3.72	Mar 2016	7.00*
Border Timbers	Border Timbers	Biomass-Wood waste	Nyakamete, Mutare	0.5	Not available	0.29**
<b>B. Construction</b>						
Kupinga Renewable Energy	Kupinga Renewable Energy	Hydro	Rusitu River, Chipinge	1.6	T.B.A	4.43*
Nyangani Renewable Energy	Hauna Power Station	Mini-Hydro	Eastern Highlands	2.3	T.B.A	7.00*

Source: Author's compilation from Mtunzi, Mampwheli, Meyer, & Mungwena, 2012; ZERA, 2016; PGBI Group, 2016 and MOEPD, 2016.

Note: \* official estimates

\*\* researcher's estimates using figures from Mtunzi et al. (2012) where total investment cost for 20MW steam turbines is 11.58 million US dollars

Of the operational IPPs, one produces for own consumption, two produce for own consumption and offload their excess to the grid, while the rest supply the grid. This translates to 37,9% successful investment rate, which is very low given the size of the capacity shortfall. Understanding why this rate is so low and what needs to be done to improve the rate of investment in IPPs is the main objective of this research.

## **2.11 Summary**

Researchers have investigated the CSFs for various types of IPPs in developing countries in order to increase the incidence of successful projects in light of the urgent need for energy security and stability to promote economic growth in those countries. Country level and project level factors or attributes have been identified that promote investment in IPPs and the successful execution of projects. Gratwick & Eberhard (2008) have created a framework of exploring CSFs for IPPs in Sub Saharan Africa. The authors highlight that although their list of factors provides a first sketch of best practice in IPPs for the region, it is by no means exhaustive (Eberhard et al., 2016). Each country has its own unique set of circumstances that results in a new set of success factors necessary to navigate that specific environment and to ensure project success. This underscores the need for individual country analysis of the CSFs for IPPs in that country environment. This study seeks to do just that; to investigate the CSFs for IPPs in Zimbabwe using the framework developed by Gratwick & Eberhard (2008) to guide the investigation.

### **3 RESEARCH METHODOLOGY**

This chapter presents the research methodology and design that is used to explore the specific research questions of this study. This study is exploratory in nature as it seeks to provide a preliminary understanding of the IPP sector in Zimbabwe, which is still in its infancy and has not been previously researched. It also seeks to explore from the vantage point of key stakeholders, what the CSFs for IPP investment are, and to identify specific strategies to improve current outcomes.

#### **3.1 Research Approach**

There are three possible research approaches that can be employed in any study, namely quantitative (close-ended), qualitative (open-ended) and mixed methods, which is the combination or integration of qualitative and quantitative techniques (Creswell, 2003). For this study, a mixed methods research approach was adopted to explore the research problem.

##### **3.1.1 Mixed Methods Research**

The mixed methods approach developed out of the realisation by several scholars that the need and complexity of the phenomenon being investigated is such that a combination of qualitative and quantitative techniques address the research questions better than either techniques could independently (Newman, Ridenour, Newman, & DeMarco, 2003; Johnson, Onwuegbuzie, & Turner, 2007). Johnson et al. (2007) therefore define mixed methods as “the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration” (Johnson et al., 2007, p. 123).

There are two major reasons why the mixed methods approach was selected for this study: to handle threats to validity inherent in the use of one method by applying the alternative method as a way to enhance the validity of the research methods and study findings and to gain a multi-faceted view and deeper understanding of the phenomenon under investigation from the complementary findings generated from the use of both quantitative and qualitative methods (Johnson et al., 2007; Creswell, 2014). Victor et al. (2004) point out that existing

literature on IPP experiences and outcomes suffers from the classic trade-off in empirical research between overly broad conclusions of quantitative survey techniques and the overly specific and non-generalizable conclusions of qualitative techniques (Victor et al., 2004). The adoption of a mixed methods approach for this study aims to strike a better balance in the nature, quality and generalisability of the research findings from the investigation of the IPP industry in Zimbabwe.

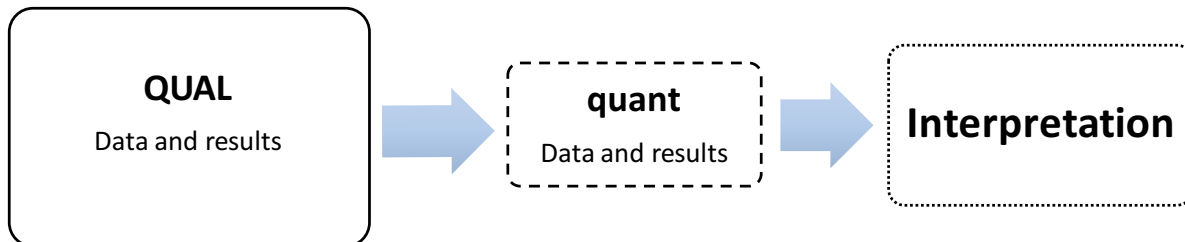
## **3.2 Research Design**

There are three primary research designs for conducting mixed methods research; convergent parallel, explanatory sequential and exploratory sequential (Creswell, 2003). A convergent parallel design involves the simultaneous collection of both qualitative and quantitative data and integrating the data to provide a comprehensive analysis of the research problem (Creswell, 2003). The explanatory sequential and exploratory sequential designs involve the sequential collection of data, where the findings of one method are explained, built upon or elaborated using another method. For this study, an exploratory sequential design was chosen.

### **3.2.1 An Exploratory Sequential Design**

The choice of design for this study was informed by the nature of the research questions as well as the overall objectives of the study. According to Hanson, Creswell, Plano Clark, Petska and Creswell (2005) the primary purpose of the exploratory sequential design is to explore relationships where little or no research or theory exists. Similarly, there has been little research on the IPP sector in Zimbabwe. The first two objectives of this study, which are to identify the CSFs and their relative rankings, cannot be answered very effectively using purely qualitative or quantitative methods. Grunert and Ellegaard (1992) in a seminal paper on the theory and method of CSFs, establish that an empirical analysis of CSFs requires a combination of both methods; qualitative to generate hypotheses about actual success factors and quantitative to test the hypotheses and establish the CSFs (Grunert & Ellegaard, 1992). Furthermore, previous studies exploring the CSFs for power projects such as Yusof & Salami (2013) and Gupta et al. (2013) have also adopted an exploratory sequential research design. The sequencing of research methods employed in this study is illustrated in the diagram below:

**Figure 3: Exploratory sequential design for the research study**



The first qualitative phase was used to gain an in-depth understanding of the IPP outcomes in Zimbabwe and to identify the success factors for financing from the perspective of key stakeholders. The success factors identified in the qualitative first phase were then used to create a survey instrument for the second quantitative phase to determine which factors were perceived as most critical, their rankings and whether the ranks assigned differed by stakeholder grouping. The main advantages of using the exploratory sequential design is that it helps generate more holistic overall study findings because the first qualitative phase yields a rich, contextual understanding of IPP investment in Zimbabwe, while the second quantitative phase gives more representative and generalizable findings (Green & Caracelli, 2003). Two major challenges in implementing an exploratory sequential design that relate directly to my study are to the composition of the samples in each of the phases and appropriately focusing qualitative findings to generate the instrument for the second quantitative phase.

### **3.3 Qualitative Sampling, Data Collection and Analysis**

The next section explains the sampling, data collection and data analysis techniques used for the qualitative first phase of the study.

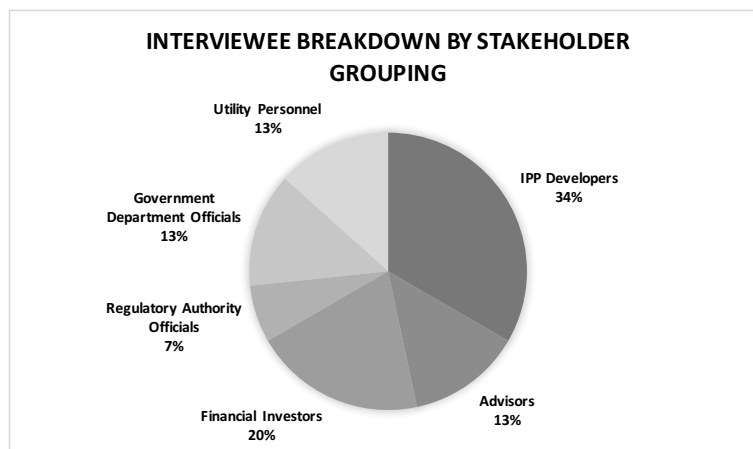
#### **3.3.1 Sampling**

The target population was all expert stakeholders involved in the development and implementation of IPPs in Zimbabwe, where expert is defined as individuals with known and demonstrable experience and expertise in IPP and energy infrastructure development. This

includes the project sponsors or developers, advisors (financial, legal and technical), financiers or investors such as banks and pension funds, officials at the regulator, ZERA, senior management of the national utility, ZETDC and officials in the two key line ministries, the MOEPD and Ministry of Finance and Economic Development (MoF). The sampling method used was non-probability sampling, namely criterion-based purposive sampling. Purposive sampling involves the selection of participants based on a study's specific objectives and research questions, rather than at random (Tashakkori & Teddlie, 2003; Teddlie & Yu, 2007; Palys, 2008). The criterion strategy is used to select participants based on a characteristic or trait that varies within the population (Teddlie & Yu, 2007; Palys, 2008). Moustakas (1994) emphasises that the selected participants should demonstrate the requisite knowledge and experience for the study and be able to adequately reflect upon the subject of investigation. In order to achieve this, interviews were conducted with the most senior representatives of each stakeholder grouping in terms of role in the organisation and years of experience in the industry.

A small sample was chosen for the interviews, partly due to constraints on time on the part of both the practitioners and the researcher. A total number of fifteen interviews were conducted. This was in line with the number of interviews conducted in other qualitative studies. Guest, Bunce and Johnson (2006) suggest that the number of interviews can range between 6 to 12 participants for a qualitative study while Baker and Edwards (2012) deem 15 participants to be sufficient to reach data saturation when participants are highly knowledgeable about the topic of inquiry. Interviewees were selected from each stakeholder grouping in order for the sample to be adequately representative of the population at interest, allowing the findings to be generalizable or applicable to the wider population (Krefting, 1991). All the interviewees had extensive experience in the energy sector and IPP related experience. The breakdown of interviewees by stakeholder groupings is shown in the diagram below.

**Figure 4: Interviewee Breakdown by Stakeholder Grouping**



### 3.3.2 Data Collection

Semi structured interviews were the data collection method used to identify success factors for IPP investment in Zimbabwe and recommendations from stakeholders as to how implementation might be improved in order to increase the number of IPPs reaching financial closure. There are two other forms of interviews that could have been used, namely structured and open-ended interviews. In structured interviews all questions are prepared beforehand, standardised and all respondents are asked exactly the same series of questions. Unstructured interviews entail no specific format or questions (Bryman & Bell, 2007). Semi-structured interviews were preferred for this study because they are less time consuming than unstructured interviews, offer more flexibility than structured interviews and allow responses across interviewees to be compared. A major criticism of interviews is that results are difficult to generalise as they are obtained from a limited number of people. In this study, the second quantitative phase of investigation mitigated by use of a larger sample and providing further validation of the interview findings.

Although the interviews were conducted as open discussions, an interview framework, comprising a series of questions derived from literature on the success factors for IPPs in Sub Saharan Africa by Gratwick and Eberhard (2008) was used to guide the discussions with stakeholders. The interview framework used in this study is presented in Appendix B. Two test interviews with work colleagues of the researcher in energy infrastructure development advisory were conducted prior to the actual interviews to refine questions and procedures to

ensure effective use of time. All interviews were conducted in Harare as face-to-face interviews. One interview was held at a coffee shop and for all the rest, the researcher travelled to the respondents' respective places of work. All but three interviews, with the prior consent of the respondents, were captured through audio recording and all fifteen interviews were transcribed on the day of the interview to mitigate recall bias. All interview data and related documentation has been stored electronically on a password protected hard drive to be kept for a period of five years.

Permission to conduct the study involving human participants was obtained from the University of Cape Town's Ethics Committee, prior to commencing the study, in order to ensure the ethical treatment and protection of the participants. Prior to the interviews, all prospective participants were sent a formal invitation to participate in the study and an informed consent form (see Appendix B) via email, that also explained the purpose of the study and how the findings would be and used. The form also highlighted that the participants were free to withdraw from the study at any time. This form was signed by each respondent before the start of the interview. Each respondent was assigned a pseudonym, specifically a number, in order to conceal their identity. Any direct quotes from participants will be identified only by those numbers for example: Respondent 2.

### **3.3.3 Data Analysis**

Qualitative data analysis entails “bringing order, structure and meaning to the mass of collected data” (Marshall & Rossman, 1990, p. 111). The interview transcripts and audio recordings were analysed using thematic content analysis, using the five step method developed by Mc Cracken (1988), with the aid of NVivo7, a software package that provides an avenue for flexible and rigorous analysis of qualitative data. The five steps involved were:

1. Reading and reviewing the interview transcripts with the primary goal of sifting out the important or pertinent material in the transcripts and making notes on their observations.
2. Creation of preliminary categories or themes, descriptive and interpretive in the software program, based on the interview transcripts and literature review used to guide the research.
3. Identification of patterns or connections within the preliminary categories or themes using the software program.

4. Determining the key basic themes that are common across all or most of the interview responses by examining the pertinent material in the transcripts and researcher's notes that were inputted into the software program in Step One.
5. Examination of themes from all interviews across groupings, to delineate predominant themes contained in the data. These predominant themes then formed the basis for writing up the data (Mc Cracken, 1988; Piercy, 2004).

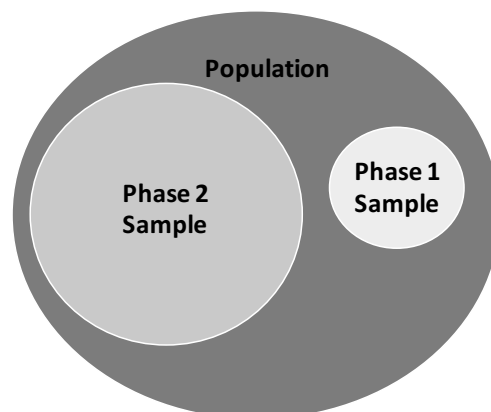
### **3.4 Quantitative Sampling, Data Collection and Analysis**

The next section explains the sampling, data collection and data analysis techniques used for the quantitative second phase of the study.

#### **3.4.1 Sampling**

The target population for the second phase was all the expert stakeholders involved in the development and implementation of IPPs in Zimbabwe. However, for sampling, the stakeholders that participated in the first phase of the study were excluded in order to avoid internal invalidity. Creswell (2014) points out that a good procedure for exploratory sequential designs is to draw the samples for both phases of the research from the same population, but to ensure the individuals are not the same for each sample. Surveying the interview respondents, who helped develop the survey instrument in the first place, “would introduce confounding factors into the study” (Creswell, 2014, p. 246). The target population and samples for both phases of this study are illustrated in the diagram below:

**Figure 5: Population and sample for Phase 2**



The sampling method used to select the survey candidates was purposive sampling, in order to obtain a sample that was as large and as representative as possible. Teddlie and Yu (2007) highlight that purposive sampling is advantageous where the goals of sampling are to achieve a sample that is as representative as possible of the population and to achieve comparability across a dimension of interest (Teddlie & Yu, 2007). In relation to the size of the sample, Kent (1993) points out that the sample size depends on the purposes of the research and the characteristics of the population. Being a nascent industry, the population of stakeholders with the requisite experience and expertise in the development of IPPs in Zimbabwe is small, therefore a target sample size of n equals 40 was chosen for this study. An equal representation of each stakeholder grouping was aimed at for representativeness and comparability. The breakdown of the actual number of respondents that participated in the study is shown in the table below:

**Table 4: Breakdown of respondents by stakeholder grouping**

<b>Stakeholder Grouping</b>	<b>Number of Respondents</b>
<b>IPP Developers</b>	5
<b>Investors</b>	6
<b>Advisors</b>	9
<b>Government Departments</b>	7
<b>Regulator</b>	5
<b>Government Institutions</b>	3
<b>Utility</b>	3
<b>Total</b>	38

### **3.4.2 Data Collection**

A self-administered semi structured survey questionnaire was the research instrument used to collect data. Survey questionnaires are frequently used as data collection instruments in exploratory research (Clarke & Dawson, 1999) and have been used in the majority of studies that explore critical success factors in projects (Tiong, Khim-Teck, & McCarthy, 1992; Akintoye, Li, Edwards, & Hardcastle, 2005; Zhang, 2005; Qiao et al., 2001; Zhao et al., 2010; Gupta et al., 2013). Survey questionnaires provide several advantages for the researcher, including being a cost effective way to collect standardised information from a

large number of people in as short period of time (Ackroyd & Hughes, 1981; McClelland, 1994; Clarke & Dawson, 1999), reduced researcher bias when compared to interviews (McClelland, 1994; Clarke & Dawson, 1999), anonymity and privacy for participants (Bird, 2009) and results that are easily quantified (Popper, 2004). A survey questionnaire was suitable in the context of the sequential exploratory research design of this study, to build upon the findings of the qualitative first phase (Creswell, 2003).

The findings from the qualitative phase of the research were used to develop the wording and categorisation of the survey questionnaire. The format of the questionnaire is found in Appendix C. In addition to asking general information about respondents' backgrounds, the questionnaire used a 5-point Likert scale to capture respondents' perceptions regarding the energy sector in general and the importance and ranking of the success and risk factors identified in phase one. The choice of using the 5-point scale over other scales with less or more items is because the 5-point scale is the most widely used form of Likert scales in applied social science research (van der Eijk & Rose, 2015). In relation to the investigation of CSFs for infrastructure projects, several studies have also employed the 5-point scale (Akintoye et al., 2005; Zhang, 2005; Gupta et al., 2013; Wai, Yusof, Ismail, & Ng, 2012).

Although questionnaires reduce the degree of researcher bias, weaknesses in questionnaire design and wording can introduce bias in the results and the possibility of misinterpretation of questions by participants (Meadows, 2003). The researcher mitigated this by testing the questionnaire with colleagues prior to administering it to respondents, to ensure clarity of meaning in the questions, non-ambiguity in wording and to assess the overall appearance of the questionnaire.

Due to budget and time constraints, the questionnaires were administered online as a web survey using Survey Monkey. Potential participants were invited to participate in the survey via an email containing a link to the survey. Some participants preferred to complete the survey offline so the researcher printed copies of the survey, delivered them to the participants, who then returned them to the researcher after a week. A covering letter, that provides an explanation of the purpose of the study and an invitation to volunteer to complete the questionnaire, was attached to the survey questionnaire. Completion of the questionnaire and submission of it to the researcher was considered informed consent by the participants

### **3.4.3 Data Analysis Methods**

The data analysis methods applied in this study are guided by the methods employed by Zhang (2005) and were chosen based on which methods most appropriately fit this study, firstly to answer the research questions, and secondly to ensure the validity and reliability of the results. The statistical software package SPSS was used to aid the analysis.

#### **3.4.3.1 Questionnaire Reliability Test - Cronbach's Alpha Coefficient**

Prior to conducting the data analysis, the reliability of the questionnaire was determined by computing Cronbach's Alpha for the collected survey data in SPSS. The results of this test are presented in Chapter 5. Cronbach's alpha is a coefficient that measures the internal consistency of a questionnaire (Burns, 2000). It measures how reliably the set of variables used in the analysis measure a single construct (Cronbach, 1951). There is no consensus among statisticians on what constitutes an acceptable value of alpha (Boyle, 1991; Nunnally & Bernstein, 1994; DeVellis, 2003), but by convention, an alpha value in the range of 0.65 and 0.80 is often considered an acceptable level of reliability (Nunally, 1978; Pallant 2001; Vaske, 2008).

#### **3.4.3.2 Descriptive Statistics**

The mean score, standard deviation, variance and coefficient of variation for the data were calculated in order to give a basic description of the survey data (Larson, 2006). The distribution of the data is of particular importance because it will determine what type of statistical analysis can be performed. Parametric analysis is used when the data is normally distributed. If the data is not normally distributed non-parametric analysis is appropriate. For this study, the Shapiro-Wilk test was used to test the normality of the data. It tests the null hypothesis that the data is normally distributed.

#### **3.4.3.3 Criticality Index**

Mean ranking and the relative importance index are the two primary methods used in previous studies on CSFs to determine the criticality and ranking of factors (Zhang, 2005; Shehu & Akintoye, 2009; Gupta et al., 2013; Muhwezi, Acai, & Otim, 2014). In this study, we use both the mean score and the relative importance index method to evaluate the

criticality of the success factors. The relative importance index (RII) is defined as the proportion of variation in the criterion variable that each predictor variable explains, taking into account both on its own direct effect and its effect in combination with other predictor variables (Johnson & LeBreton, 2004). For this study, the RII of each factor can be interpreted as the contribution of each of the factors to the successful financing of IPPs in Zimbabwe. The RII for each factor was computed based on equation (1) below that has been used in other CSF studies (Gupta et al., 2013; Muhwezi et al., 2014):

$$RII = \frac{\sum W}{A*N} \quad 0 \leq RII \leq 1 \quad (1)$$

Where,  $W$  is the weighting given to each factor by the respondents based on the Likert scale and ranges from 1 to 5.

$A$  is the highest weight, which is 5 for this study.

$N$  is the total number of respondents.

The closer the RII is to one, the more critical the factor. The RIIs for the success factors were calculated for the overall or combined responses, the private sector responses and the public sector responses.

#### **3.4.3.4 Rank Analysis**

The ranking of the success factors was determined by comparing the factors' respective RIIs. The factor with the highest RII ranked highest, and the factor with the lowest RII ranked lowest. The rankings were computed based on the overall responses, the private sector responses and the public sector responses.

#### **3.4.3.5 Agreement Analysis**

In this study, the level of agreement in the ranking of the CSFs between private and public sectors was measured in order to investigate whether significant differences exist between the perceptions of the public and private sectors on the critical success factors for IPPs in Zimbabwe. The Kendall (1955) coefficient of concordance, also known as Kendall's tau, evaluates the degree of concordance between two sets of ranked data. An alternative similar to Kendall's tau that could also be used is the Spearman rank correlation coefficient. However, Kendall's tau has certain advantages over Spearman's rho, namely that the former

is more easily interpreted and has a distribution with better statistical properties than the latter (Conover, 1980). Furthermore, should tied ranks be present in the data, a variation of Kendall's tau known as Kendall's tau b exists that can handle tied ranks in the data (Kendall, 1970). For this study we will use Kendall's tau b to study the degree of agreement between the private and public sector rankings of the CSFs. The null hypothesis is that there is no agreement in the rankings of CSFs by the private sector and public sector. The value of Kendall's tau has a range between -1 and 1, with 1 indicating very strong agreement between two sets of rankings and -1 indicating very strong disagreement.

Okpala & Aniekwu (1988) developed a method to measure the level of agreement in the ranking of factors between two groups known as the rank agreement factor (RAF). The RAF gives the average absolute difference in the ranking of factors between two groups.

The RAF is defined according to the following equation

$$RAF = \frac{\sum_{i=1}^N |R_{i1} - R_{i2}|}{N} \quad (2)$$

where the  $i$ th item in group 1 is  $R_{i1}$ , the  $i$ th item in group 2 is  $R_{i2}$  and  $N$  is the number of items.

The maximum RAF for any two groups is

$$RAF_{\max} = \frac{\sum_{i=1}^N |R_{i1} - R_{j2}|}{N} \quad (3)$$

where  $j = N - i + 1$ .

From the RAF and maximum RAF, the percentage disagreement (PD) can be calculated according to the following equation

$$PD = \frac{\sum_{i=1}^N |R_{i1} - R_{i2}|}{\sum_{i=1}^N |R_{i1} - R_{j2}|} * 100 \quad (4)$$

The percentage agreement (PA) is simply defined as

$$PA = 100 - PD \quad (5)$$

A RAF of zero corresponds to perfect agreement in the ranking between the two groups and the higher the value of RAF is, the lower the agreement between the two groups. Several other studies on CSFs (Zhang, 2005) have used this method to evaluate the level of agreement in the ranking of factors between distinct groups of respondents. For this study we use Kendall's tau to assess the overall level of concordance in the ranking of the factors between the private and public sector respondents and the RAF method to measure the actual level of agreement or disagreement between the two groups.

### **3.5 Reliability and Validity**

Due to the vital nature of this area of study to the economic development of Zimbabwe, the researcher was mindful to maintain the reliability and validity in the selection and use of the methods employed in each phase of the study. Reliability in qualitative research refers to the consistency of approach employed by a researcher (Gibbs, 2007). The use of the interview protocol helped to establish consistency across all the interviews. Secondly, the researcher documented the procedures used to carry out the research and report findings, which enables the research procedures to be duplicated or followed by another researcher (Moustakas, 1994; Gibbs, 2007; Frels & Onwuegbuzie, 2013). Validity in qualitative research refers to the accuracy of the research findings (Creswell & Miller, 2000; Gibbs, 2007). To ensure accuracy of the research findings, in addition to written notes, the interviews were recorded to enable content checking by the researcher after the interviews and transcribing was conducted within two days of the interview to reduce reporting error. Peer debriefing, in the form of the guidance provided by the researcher's academic supervisors, was also used to "enhance the accuracy of the account" (Creswell, 2014, p. 252). Researcher bias was mitigated by use of an interview framework that provided theory-guided structure to the interview process as opposed to the researcher's own ideas (Pannucci & Williams, 2001). With regard to respondent bias, the researcher practiced and refined her interview techniques prior to conducting the interviews in order to avoid the use of leading questions and to conduct the interviews in an objective manner that gave the respondents comfort and freedom to express their views truthfully. The researcher also explained to the respondents that anonymity in responses would be strictly adhered to, which gave the respondents comfort to express their views openly and freely (Cannel & Henson, 1974, Paulhus, 1991).

In quantitative research, reliability refers to the replicability of results (Kirk & Miller, 1986; Joppe, 2000) and the consistency or accuracy of the research instruments (Roberts, Priest, & Traynor, 2006; Heale & Twycross, 2015). The reliability of the survey questionnaire was determined using Cronbach's alpha (Burns, 2000). Validity refers to the accuracy of measurement of a concept or how truthful the research findings are (Joppe, 2000; Roberts et al., 2006; Heale & Twycross, 2015). Content validity is the extent to which the items in an instrument capture or represents what is being measured (Onwuegbuzie et al, 2007). In this study, the success factors included in the questionnaire were derived from the responses given by experts in the qualitative phase, enhancing content validity. External validity refers to generalisability of the study findings outside the setting of a study (Creswell, 2014). The nature of this study and the fact that the sample was purposively selected, precludes the generalisability of its findings to another setting.

### **3.6 Research Limitations**

One limitation of this study is the small sample sizes used for the interviews and survey questionnaire. This was due to difficulties in ascertaining the actual population size of IPP experts and key stakeholders and persuading practitioners with demanding work and life schedules to participate in the study. Larger sample sizes, particularly for the survey questionnaire, would be more representative and could enhance the quality of the research findings in investigating the CSFs for financing IPPs in Zimbabwe. A further limitation relates to the findings of this study. The CSFs identified are not robust but are dynamic and complex, in that they reflect the current country context of Zimbabwe. Should the macroeconomic and political context of Zimbabwe change, the CSFs will likely change as well. Therefore, the study's findings are not explicitly generalizable in a different context or even at a later point in time in the future of Zimbabwe. Another limitation of the study is the reliability of the data given by the experts in interviews. Although they possess the requisite experience and qualifications to speak authoritatively on the CSFs for IPPs, their opinions and responses cannot be independently verified and must be taken at face value by the researcher. The respondents might exaggerate or selectively remember or communicate certain information relative to the investigation, which can bias the research findings.

The major limitations the researcher faced in conducting this study were limitations on time and access. Qualitative data collection and analysis is often complex and time consuming.

The limited time frame in which to complete this study hindered a more in depth and comprehensive analysis of the CSFs for Zimbabwe. In terms of access, the researcher did not have access to some potential participants because of their demanding work and travel schedules. Consequently, this limited the sample size for this study.

### **3.7 Summary**

A mixed methods research strategy has been chosen for this study because a combination of the qualitative and quantitative techniques will address the research questions more accurately than either of the techniques independently. This chapter has also outlined and justified the study's two phase exploratory sequential research design, the data sources, sampling techniques, data collection and data analysis methods. Methods to maximise data reliability and validity have also been described and the limitations of the research clearly stated. The next chapter will focus on presenting and discussing the findings of the qualitative first phase of the study.

## 4 QUALITATIVE RESEARCH FINDINGS, ANALYSIS AND INSTRUMENT DEVELOPMENT

This chapter presents and analyses the findings from the semi-structured interviews conducted with experts on wide-ranging issues related to IPP financing and implementation. The first section focuses on respondents' overall perception of the IPP landscape in Zimbabwe. The following section highlights specific themes about country level, project level and risk conditions that respondents have identified as responsible for the current low rate of investment in IPPs. This chapter also presents strategies proposed by experts to improve the rate of investment in IPPs and overall project implementation. The chapter concludes with the presentation of a list of success factors identified by the experts for financing IPPs. The major output of this analysis is the development of a survey instrument to assess the criticality and ranking of those success factors by stakeholders in the broader IPP sector in Zimbabwe.

### 4.1 Description of Participants

A total of fifteen qualitative face-to-face interviews were successfully conducted. At least one representative from each stakeholder grouping was interviewed in order to obtain balanced and representative findings. Table 5 below shows the split by stakeholder grouping of the respondents interviewed.

**Table 5: Stakeholder Grouping of Respondents**

<b>Stakeholder Grouping</b>	<b>Classification Private or Public</b>	<b>Number of Respondents</b>
IPP Developers	Private	5
Advisors	Private	2
Investors	Private	3
Offtaker	Public	2
Regulator	Public	1
Public Officials	Public	2
<b>Total</b>		<b>15</b>

The respondents had on average 15 years of experience in the energy sector, experience with at least two IPPs and the majority of respondents held senior positions within their organisations. A more detailed description of the respondent profiles is in Appendix D.

## **4.2 Overview of Private Participation in Generation in Zimbabwe**

There was unanimous agreement amongst respondents that the level of private participation in generation in Zimbabwe is far below what it could potentially be given the capacity shortfall in the country. In commenting about the level of private participation in generation, Respondent 10 stated that:

*“It is grossly inadequate. Just looking at the proportion of power in the country that is contributed by the private sector versus the maximum demand of the country, it is very low. It is nowhere near even one percent”*

Interestingly, nearly all the interviewees claimed that the low level of investment in IPPs is not due to a lack of investor interest. On the contrary, many respondents pointed out that there is a high level of investor interest in independent power generation, particularly from foreign investors. Regrettably however, the reality is that the high level of investor interest has not translated into similarly high level of actual investment activity. As one respondent observed:

*“In terms of actual real participation, we are very far, but in terms of excitement we are there. We have excited a number of key investors as a country but as far as realising real progress on the ground, not much has been made.” (Respondent 6)*

As captured in the quotation above, the low investment rate in IPPs in Zimbabwe is not as a result of a lack of investor interest, but the problem appears to be on the conditions on the ground that are not conducive for the realisation of actual investment.

## **4.3 Factors impeding investment in IPPs**

This study makes a distinction between factors impeding investment and success factors. Factors impeding investment are the reasons identified by respondents as the underlying causes for the observed low rate of investment in IPPs. Success factors are those elements considered vital by respondents for creating an enabling environment for investment. The overlap between two is that some of the success factors are the mirror opposites of the factors impeding investment, while others are explicit, stand alone factors that have been identified. Respondents attributed the low rate of actual investment to a myriad of country level and project level factors. The major factors in each category are described below.

### **4.3.1 Country Level Factors**

#### **4.3.1.1 Investment Climate**

All 15 interviewees cited an unfavourable investment climate as the primary reason for the low investment rate in IPPs in Zimbabwe. Although the investment climate is comprised of several elements, the major challenges most mentioned by respondents related to the poor macroeconomic environment, the political situation, enforceability of contracts, security of property rights and the country's negative repayment record. With regard to the macroeconomic conditions, respondents pointed out that prevailing liquidity challenges, low industry capacity utilization and weak domestic demand have limited potential returns and the incentive for investment for local and foreign investors. A weak macroeconomic environment casts doubt on the security of investment and makes investors hesitant to invest.

*“Right now investors come in and look at the risk that they are taking and like everyone else they think twice and take the wait and see approach”. (Respondent 6)*

Many of the IPP developers and advisors interviewed also stated that they faced significant difficulties in accessing international financing because of the country's longstanding arrears to international lenders. Many lenders they have approached have taken the stance that until those arrears are resolved, no further financing would be released.

#### **4.3.1.2 Policy Uncertainty**

There was broad consensus amongst respondents that the policy framework governing private participation in generation is favourable. When asked about the impact of the indigenisation policy on investment in IPPs, the majority of interviewees responded that the policy had no material effect. *“As for policy there are not many IPPs that have hit hurdles on policy issues. Our anticipation was that the indigenisation policy would affect the level of excitement but it is not evident in our discussion with IPPs that it is an issue.” (Respondent 6)*

However, the major concern expressed by all the private sector respondents with regard to policy is that of policy inconsistency, in particular, the inconsistent application of policy or retroactive changes to existing policies. This is echoed in the following statement made by Respondent 1:

*“There have been a lot of knee-jerk reactions from government with regard to policy because some of the things they planned and anticipated have not been going according to plan. This makes policies very uncertain and makes it very difficult for us to plan for the future”*

*(Respondent 1)*

The private sector respondents highlighted that because of the long-term nature of IPP financing and the immovability of the physical assets once an IPP is established, policy certainty and continuity are critical to give investors comfort that the structural and contractual arrangements underpinning their investments will remain legally enforceable.

*“IPP investments are long term and a long term perspective on policy and development would go a long way in unlocking investment.” (Respondent 2)*

The general sentiment amongst respondents is captured well in this statement by Respondent 3: *“There is no need to change the current policy and legal framework, there is need to enforce it.” (Respondent 3).*

#### **4.3.1.3 Procurement Process**

There was universal agreement amongst the respondents that the current procurement framework of unsolicited bids had given rise to too many opportunists or speculators being awarded licenses as opposed to serious developers.

*“You do not get the best IPPs, you get the ones that you would not have ordinarily chosen. IPPs are sometimes awarded licenses based on the support they have and not on merit.”*

*(Respondent 3)*

The respondents point out that this is one of the primary reasons why very few licensed projects have reached financial closure or been successfully implemented. Another important negative consequence of the procurement framework that was highlighted by three private sector respondents is the growing incidence of “bed blocking”. This refers to where viable project sites remain undeveloped because the license to develop that site was awarded to a speculator. This was clearly articulated by Respondent 10 in the statement below:

*“The speculator has no real intention of developing the site, but holds on to it, effectively blocking that site from development even by serious developers, and often the speculator wants financial compensation to relinquish that site.” (Respondent 10)*

As a result, the project remains undeveloped and investment on a viable site is foregone.

#### **4.3.1.4 Regulatory Inefficiencies and Delays**

Many respondents noted that the turnaround times in the licensing, PPA and generation tariff approval processes by the regulator are far too long. One respondent pointed out that such delays significantly stall the investment approval processes by financiers, who require the generation tariff to make their final investment decision, resulting in projects taking much longer to reach financial closure. Respondent 2 pointed out that such delays are particularly costly in an environment like Zimbabwe, which is in a state of flux. When asked whether respondents attributed these inefficiencies to a lack of technical skill amongst the personnel at the regulator, most respondents stated that they felt the personnel were adequately skilled but that the regulator might need to be further capacitated in terms of adding to the number of personnel. Another concern regarding the efficiency of the regulator expressed by Respondent 10 was that the regulator has been inefficient in resolving the incidence of bed blocking by speculators.

*“This should be within the purview of the regulator to control and manage, but it has not been effective at all in this regard, possibly because they might have their hands tied due to political influence if the speculator(s) has strong political backing.” (Respondent 10)*

Many respondents also believed that the regulator is not immune from political interference in the licensing and tariff determination processes and that some inefficiencies such as the incidence of bed blocking and inconsistency in the application of the licensing and tariff framework are a result of political interference. One respondent pointed out that political interference is possible because the Energy Regulatory Act of 2011, that instituted the current regulator does not give the regulator full autonomy in the exercise of its role and function.

*“It was never structured to be independent. Section 35 of the Act reads “The Minister may give directions to the Commission relating to the policy the Commission has to observe in the exercise of its functions, including in particular relating to tariffs chargeable by licensees.” This particular clause does not make the regulator fully independent.” (Respondent 3)*

One respondent noted that one of the consequences of this political interference is that the regulator has the tendency to prioritise government projects over IPPs, with government

projects experiencing shorter turn around times in licensing and tariff approval processes and on average being awarded higher tariffs than IPPs, particularly for solar.

#### **4.3.1.5 Tariff Framework**

All 15 respondents noted the tariff framework as one of the major hindrances to investment in IPPs. The major issue with regard to the tariff for most respondents was political interference in the determination of the tariffs awarded. Respondent 10 points out,

*“In many cases IPPs are given a tariff that doesn’t adequately reflect the cost of the project – possibly due to political interference to keep tariffs at a particular level.”* (Respondent 10)

Another issue raised by respondents was the inconsistent application of the tariff methodology. The official tariff methodology is a cost plus methodology but some respondents noted that what the regulator applies is a hybrid of the cost plus methodology and Renewable Energy Feed-in Tariff (REFIT) methodology and in some instances, purely the REFIT methodology, even though the REFIT methodology has not yet been approved by government. As a result, the tariffs awarded are not fully cost reflective, which makes it difficult for IPPs to secure financing because the tariff is not bankable for investors. One criticism of the cost plus methodology raised by two public sector respondents was that they felt it fostered inefficiencies in the cost structure of IPPs because it leaves room for IPPs to simply pass costs on to consumers without interrogating ways to reduce costs further.

Nearly all respondents expressed concern over the fact that the final retail tariff was highly controlled by government. They highlighted that the final tariff is not reflective of the offtaker’s cost structure, which is a threat to the solvency of the offtaker that could hinder its ability to pay for the power it procures, including power from IPPs. They also highlighted that the final tariff reinforced the offtaker’s natural monopoly power, preventing IPPs from selling power directly to consumers like large intensive users, because IPPs cannot compete on price.

### **4.3.2 Project Level Factors**

#### **4.3.2.1 Quality of Developers**

All the respondents from the investor stakeholder grouping stated that one of the primary hindrances to investment in IPPs is the quality of IPP developers that approach their

institutions for funding. They highlighted two critical aspects with regard to the quality of developers. Firstly, that many of the developers lack the requisite technical and business skills and experience to execute the projects, which affects the ability of developers to *“convert their development work into a viable project.” (Respondent 1)*. Nearly all of the respondents acknowledged that in Zimbabwe, there are only a few development companies with solid teams and a strong track record. Secondly, respondents highlighted that many of the developers do not have the financial capability to contribute or raise the counterpart funding that may be required for the project. Consequently, as pointed out by one respondent, *“projects are not seeing the light of day because the developers cannot raise their end or share of the funding”.* (Respondent 1)

#### **4.3.2.2 Poor project preparation**

Poor project preparation was cited by all the respondents in the investor stakeholder grouping as a major factor hindering investment in IPPs in Zimbabwe. One respondent stated that in most cases, developers approach investors for funding with badly done feasibility studies, that are essentially just ideas and concepts, without any concrete technical and business fundamentals to form the basis for an investment decision by investors to invest in the project. One investor pointed out that in the very worst cases, some developers have approached them with just the generation license and no feasibility study at all!

*“We have seen more than 20 IPP projects looking for financing. They come through with their license and think that it is enough to secure investment. It is clear they do not understand what a financier requires or what conditions must be met before financing is released. When we then present them with the requirements we need prior to releasing financing such as a bankable feasibility study and an EIA certificate we lose each other. This to me highlights their insincerity, inexperience and incompetency to carry out the project.* (Respondent 1)

#### **4.3.2.3 High Development Costs**

Another significant factor hindering investment in IPPs highlighted by all the respondents in the developer stakeholder grouping is the high costs associated with developing the project to a bankable state that investors can consider investing in. As one respondent pointed out,

*“To get the project to a bankable state requires a significant amount of money – for the best lawyers, financial and technical advisors etc. An important element for financing is the financial model, and hiring a good corporate finance house is essential in order to get a decent model, which costs money” (Respondent 1)*

Besides advisory fees, developers face the cost of licensing and other statutory fees. In particular, the fees required to secure an environmental impact assessment (EIA) certificate from the Environmental Management Authority (EMA) were highlighted by most developers as being unreasonably high. Most developers do not have the financial resources to fund all the development costs on their own and face significant difficulties in raising the financing from banks and other financial institutions. Respondent 14 pointed out that for larger projects, development costs can stall a project completely because they increase in proportion to the size of the project. For very large projects, these costs can become quite significant, and as a result, none of the larger projects have gotten off the ground.

#### **4.3.2.4 Depth of local capital markets and lack of understanding about energy infrastructure investments**

There was consensus amongst respondents that the current liquidity challenges facing the country have significantly constrained the domestic market’s ability to finance energy projects. Energy infrastructure projects have long life spans and require long term money, that most commercial banks are currently unable to give. Institutional investors such as pension funds and insurance companies have the ability to go long, because their books are largely comprised of long term policy holders, but they too are limited with regard to the amount of financing they can avail for energy projects. This is clearly echoed in the statement below:

*“Power projects by nature require huge capital outlays in US dollars and because of the current macro environment dollars are in short supply domestically, therefore any development will require foreign partners. In most cases the domestic market does not have the ability to provide all the required financing on its own. The typical funding split by source for most projects is 70/30, 30 percent domestic, 70% percent foreign.” (Respondent 1)*

Most of the IPPs in Zimbabwe use project finance structures to finance their projects because of the high level of country risk, and the 70:30 debt equity ratio is the typical ratio used in

project finance transactions. Furthermore, most investors are not willing to go beyond seventy percent debt because the IPP industry is still in its infancy. This fact coupled with country risk, heightens repayment risk for investors.

Another reason for the low rate of investment in energy projects by local investors highlighted by Respondent 2, is that local capital markets have no prior experience with financing energy projects and as a result, do not fully understand energy infrastructure as an asset class. The majority of local investors are therefore hesitant to make any investments in IPPs.

#### **4.3.2.5 Inadequate Government Support**

There was unanimous consensus amongst all respondents that there is inadequate government support for IPPs. Respondent 4 explained that there are two stages in the development of an IPP where government support is critical: the licensing and permitting stage; and the financing stage. Most respondents agreed that for licensing and permitting stage, which is dictated by policy and the legal framework, government support was satisfactory.

*“In terms of policy, government has been very supportive. The policies around IPPs and IPP development are very good. Therefore, government has been very supportive in that respect.”*  
(Respondent 10)

For the financing phase, which is predominantly driven by investors’ perception of country risk, all the respondents acknowledged that government support falls incredibly short. Most developers do not have the resources to develop the projects on their own, nor can the domestic capital market provide all the financing required. As a result, IPPs will require foreign investment to execute their projects. In order to attract foreign investment, security of repayment is necessary. This is a critical issue because Zimbabwe’s negative economic situation causes investors to doubt the security of their investment and require significant guarantees for investment. Policy guarantees are available for IPPs but this has been on a case by case basis and has not been guaranteed to all IPPs. Moreover, policy guarantees do not adequately cover the other risks associated with investing in the country such as economic risk and political risk. Investors often require a sovereign guarantee to cover overall country risk, but this type of guarantee is currently not available for IPPs as government’s position is that sovereign guarantees are only given for public private partnership (PPP) projects, where private

investors partner with state owned institutions to carry out projects. One respondent from a government department explained the rationale behind this position:

*“Government does not give sovereign guarantees for purely private sector projects. The thinking is that as IPPs these projects are private sector driven and the private sector should have the requisite skills and know how to source financing for their projects” The role of government is to purely create an enabling environment, which it has through the policy and legal framework” (Respondent 15).*

A major concern related to government support highlighted by some private sector respondents was that in their interaction with some government authorities and in some instances the utility, there is a negative attitude towards the private sector. They highlighted that to a large extent, government views the private sector with suspicion and apprehension, even though with regard to IPPs, every aspect of their development is under the scrutiny of the regulator.

Respondents also highlighted that other forms of government support such as National Project Status, which is exemption from import duties and granting of certain tax exemptions, are not readily granted to all IPPs. As one respondent put it, *“Securing or being given this status is not easy or guaranteed, and is solely at the government’s discretion.” (Respondent 10)*

Although respondents acknowledged that government was constrained with regard to the form of support they can give, for example, no ability to give commercial guarantees, most respondents pointed out that more can be done by government to support IPPs and that government has not yet exhausted all their options.

#### **4.3.3 Summary of factors and risks that contribute to the low rate of investment in IPPs**

A full list of the factors that impede investment identified by respondents can be found in Appendix D.

#### 4.4 Main risks to investment in IPPs

During the interviews, respondents were also asked to identify the major risks for financing IPPs in Zimbabwe. Table 6 below highlights the identified risks, their descriptions and the number of respondents who highlighted a particular risk during the interviews.

**Table 6: Main Risks for IPP investment in Zimbabwe**

#	Risk Factor	No of mentions
1	<b>Climate</b> Loss as a result of an adverse change in the prevailing weather conditions.	6
2	<b>Offtake/Payment</b> The risk that the project will not generate expected or sufficient revenues to service debt and pay operational expenses due to the credit quality and the payment capacity of the off-taker.	15
3	<b>Developer/ People</b> The risk that the developer/development team lacks the technical and financial capacity to effectively execute the project.	9
4	<b>Country</b> Risk to investment arising from changes in the political and economic environment.	15
5	<b>Technology</b> Risk to investment caused by the choice of technology or defects, faults or incompleteness in the technology used.	5
6	<b>Currency and Transfer</b> Risk of loss resulting from changes in the currency/exchange rate regime and the inability to freely move investment earnings out of the country	15
7	<b>Repayment Risk</b> The risk of non- payment of debt service to lenders by the project company	15
8	<b>Policy Risk</b> Risk to investment arising from policy instability, changes in policy or other policy developments	4
9	<b>Regulatory Risk</b> Risk to investment arising from changes in regulatory rules or actions by regulatory agencies that negatively affect investment.	2
10	<b>Demand Risk</b> The risk to investment arising from a mismatch between power generated and actual market demand, can be either the oversupply or undersupply of power.	1

#### 4.5 Strategies recommended by participants to increase the rate of investment in IPPs

Respondents were asked what specific strategies, if any, they would suggest or recommend to increase the rate of investment in IPPs and improve the overall project implementation of IPPs in Zimbabwe. Table 7 highlights some of the strategies recommended by the

respondents. These strategies comprised of suggestions on how to overcome the current bottlenecks to financing and explicit recommendations of key success factors that could act as a catalyst for investment in IPPs.

**Table 7: Recommended Strategies by Respondents**

<b>Strategy</b>	<b>Description</b>	<b>Issue solved or mitigated</b>
<p><b>Competitive bidding Procurement</b></p> <p><i>Identified as a success factor</i></p>	<p>Must be based on based on international best practice. Suggestions for implementation included pure competitive bidding practices or a hybrid procurement method, entailing unsolicited bids for smaller projects and competitive bidding for larger projects, in order to maximise cost efficiency and simplify execution, standardised documentation and support agreements</p>	<p>Speculators Bed blocking Poor project preparation</p>
<p><b>Credit risk insurance from external credit insurers</b></p>	<p>Government does not give commercial guarantees but financiers often require commercial guarantees against offtaker risk. To get around this, IPPs can approach credit risk insurers such as Euler Hermes. However, there is a trade off because insurance will increase the total project cost.</p>	<p>No government support in the form of commercial guarantees</p>
<p><b>Letter of no intention for land allocated for energy projects</b></p>	<p>Security of tenure on land allocated for energy projects is critical and in Zimbabwe land is a very topical issue. In addition to a policy guarantees, government should issue a letter of no intention for the life of the project for land allocated for energy projects.</p>	<p>Policy uncertainty</p>
<p><b>Financial assistance from DFIs</b></p> <p><i>Identified as a success factor</i></p>	<p>Poor project preparation is largely the result of the developer lacking the financial resources to undertake the necessary project development to bring the project to a bankable state. DFIs are well placed to assist in funding some development costs such as the cost of undertaking feasibility studies.</p>	<p>Poor project preparation</p>

<b>Export oriented national energy plan</b>  <i>Identified as a success factor</i>	A national energy plan or a national energy framework that says one of the goals for the country is for Zimbabwe to be a net exporter by a specific year would greatly focus policy initiatives and attract investment.	Policy uncertainty Low rate of investment in IPPs
<b>A nodal agency to run the entire licensing and permitting process for IPPs</b>	An institution that is a “one stop shop” which handles all the licensing, permitting and issuing of standardised government support agreements for IPPs.	Regulatory inefficiencies Lack of coordination between government departments
<b>Use of concessional financing to provide guarantees for IPPs</b>	Government can use concessional financing from China to provide guarantees for IPPs that allows them to access financing from capital markets	Inadequate government support
<b>Amending the Energy Regulatory Act to give ZERA full autonomy</b>  <i>Identified as a success factor</i>	The crafting of the law needs to be made more airtight. Currently it is contradictory and leaves room for political interference	Political interference in the determination of the tariff

A more exhaustive list of the recommendations given by respondents can be found in Appendix D.

#### 4.6 Identified Success Factors

During the interviews, respondents were asked to identify success factors that they deemed important for the financing of IPPs. Other factors were identified by the researcher through thematic qualitative analysis of the interview transcripts. The majority of factors were broadly in line with literature on CSFs for power projects, but some factors were unique to the local country context, such as “reduction of country debt overhang”, “ability to export power regionally” and “financial education about energy infrastructure as an asset class for domestic investors”. A total of 40 individual success factors were identified. These factors can be grouped under six principal headings that relate to certain aspects of the development of IPPs, namely investment climate, power sector characteristics, project economic viability, strength of financial package, people factors and government support.

#### **4.6.1 Country Investment Climate**

As intimated in the literature review, a country's investment climate plays a key role in determining IPP investment outcomes. Respondents pointed out that stable macro economic policies and certainty about upholding of contracts were critical to unlocking both local and foreign investment in IPPs because any economic instability or uncertainty makes investors doubt the security of their investment and their ability to earn an adequate return. In light of the fact that domestic capital markets are highly constrained, many respondents emphasized the need for steps to be taken to improve international investor's perception of the country as an investment destination, namely reducing the country's debt overhang and steps towards a credit rating for Zimbabwe, in order to unlock much needed foreign investment.

#### **4.6.2 Power Sector Characteristics**

Respondents pointed out that certain characteristics of the country's power sector have hindered investment in IPPs and that to catalyse investment, changes to the status quo in the sector were critical. Respondents identified a total of 8 success factors related to the country's power sector arrangements that if introduced or implemented would attract more in investment in IPPs. These included a transparent, cost reflective tariff framework, the introduction of competitive bidding practices to procure IPPs to enhance cost efficiency, formulation of a comprehensive national energy strategic plan to focus policy initiatives and solidify the role of IPPs in the generation mix of the country, consistent and fair regulation to enforce policy and create certainty about tariffs and market access and further unbundling of the offtaker to increase competition in supply and lower cost and operational inefficiencies in distribution.

#### **4.6.3 Project Economic Viability**

Economic viability forms the basis of investment case and ultimately determines the success of the project. Prior to investment, investors assess the economic viability of a project and the sustainability of expected returns. If a project is not economically viable, no investment will take place. Several success factors that determine the economic viability of an IPP project were identified by respondents. These included a bankable feasibility study, which is essentially the business case for financing, the expected debt paying ability of project, a reasonable, fair expected return on equity, project size, an operationally efficient and solvent

offtaker and the quality of the technical partner. Respondents also highlighted the need for a solid risk allocation, management and mitigation plan to safeguard investment and promote the sustainability of returns. With regard to project size, respondents pointed out that because of the current challenging economic environment and the fact that the IPP industry is a nascent industry, the execution of medium to large projects is very difficult as they entail higher capital outlays, upfront fees, risk and more stringent financing conditions than smaller projects. Starting at a smaller initial capacity makes project execution easier and provides a valuable learning experience for developers. Notably, some respondents highlighted that the common factor amongst all the operational IPPs in Zimbabwe that are supplying the grid is that they started small and have since successfully scaled up their operations.

#### **4.6.4 Strength of Financial Package**

IPPs are predominantly financed using project finance, which is limited or non recourse financing. Because investors' recourse is limited to the cash flows generated by the project, securing those cash flows is critical for investors. Measures to secure project revenues identified by respondents were the use of escrow accounts and ring fencing of offtaker receivables. Another important consideration for successfully financing IPPs highlighted by respondents was the overall cost of financing, which is largely determined by quality and origin of investors. Respondents pointed out that domestic capital is often cheaper and easier to secure than foreign capital because local investors have a better understanding of country risk and more avenues to get around it. As a result, the use domestic capital in financing IPPs could lower the overall cost of financing. In order to unlock domestic capital for IPP investment, some respondents identified financial education about energy infrastructure as an asset class for local investors as a key success factor. Other success factors related to the strength of the financial package identified by respondents included project exemptions from tax and duties and a well functioning domestic financial markets and banking system.

#### **4.6.5 People Factors**

One of the major risks to financing IPPs highlighted by respondents was people or developer risk. Several success factors to mitigate this risk and to enhance the ability of IPP developers to successfully convert their development work into a viable project were identified by respondents. These included the experience and competency of the developer, the quality of local equity partners, skilled and experienced advisors and financial innovation and creativity

by development teams in structuring financing arrangements. Another critical success factor mentioned by all the respondents was the ability of the project sponsors to effectively manage and maintain good stakeholder relationships, particularly with government. One respondent pointed out that most politicians do not fully understand the business dynamics of IPPs or the challenges facing developers. As a result, any concessions IPPs may desire from government will depend largely on the ability of IPPs to lobby government and effective communication between the private sector and government.

#### **4.6.6 Government Support**

There was unanimous agreement amongst respondents that government support was a critical success factor for financing IPPs, and in particular, government support in the form of sovereign guarantee to mitigate country risk. Respondents highlighted that most foreign investors require sovereign guarantees as part of their conditions precedent to financing. Policy continuity was another major concern for investors and developers. Respondents also identified a policy guarantee agreement as another necessary success factor for financing IPPs, as it gives investors and developers alike comfort concerning policy continuity and the security of their investment with regard to no expropriation and currency conversion. Another success factor related to government support highlighted by respondents in the IPP developer stakeholder grouping was better coordination between the government departments responsible for the various permits and consents required for IPPs, in order to reduce inefficiencies and lengthy turn around times that can significantly delay the attainment of financial closure.

Table 8 below presents the full list of identified success factors.

**Table 8: Success Factors for Financing IPPs in Zimbabwe**

<b>Category</b>	<b>Identified Success Factors</b>
Investment Climate	<ul style="list-style-type: none"> <li>• Stable macro economic policies</li> <li>• Upholding of contracts</li> <li>• Reduction of country debt overhang</li> <li>• Credit rating for Zimbabwe and local companies</li> <li>• Clear policy on land for energy projects</li> </ul>

Power Sector Characteristics	<ul style="list-style-type: none"> <li>• Competitive bidding framework</li> <li>• Comprehensive national energy strategic plan</li> <li>• Competent, consistent and fair regulator</li> <li>• Transparent, cost reflective tariff framework</li> <li>• Ability to export power regionally</li> <li>• Program Champion for IPPS</li> <li>• Clear policy on decommissioning of PPAs</li> <li>• Further unbundling of the offtaker</li> </ul>
Project Economic Viability	<ul style="list-style-type: none"> <li>• Bankable feasibility study</li> <li>• Expected debt paying ability of project</li> <li>• Reasonable, fair expected return on equity</li> <li>• Project Size</li> <li>• Reasonable licensing and statutory fees</li> <li>• Technical and financial assistance from DFIs</li> <li>• Standardised PPA</li> <li>• Operationally efficient and solvent offtaker</li> <li>• Quality of technical partner and high technical performance</li> <li>• Solid risk allocation, management and mitigation plan</li> </ul>
Financial Package	<ul style="list-style-type: none"> <li>• Financial education about energy infrastructure as an asset class</li> <li>• Credit enhancements (escrow accounts, ring fencing receivables)</li> <li>• Project exemptions from tax and duties</li> <li>• Origin of investors (local versus external financiers)</li> <li>• Well functioning domestic financial markets and banking system</li> <li>• Cost of financing (WACC)</li> <li>• Experience of financiers with developing country risk</li> </ul>
People Factors	<ul style="list-style-type: none"> <li>• Experience and competency of the developer</li> <li>• Quality of local equity partners</li> <li>• Good stakeholder relationship management by project sponsors</li> <li>• Skilled and experienced advisors</li> <li>• Ability of IPPs to lobby government</li> <li>• Financial innovation and creativity in structuring financing arrangements</li> <li>• Open and effective communication between the private and public sector</li> </ul>
Government Support	<ul style="list-style-type: none"> <li>• Policy Guarantee Agreement</li> <li>• Government support in the form of sovereign guarantees</li> <li>• Coordination between government departments</li> </ul>

## **4.7 Development of Survey Instrument**

The identified success factors identified were used to create a survey instrument to quantitatively explore the criticality and ranking of those factors. The survey comprised five sections (see Appendix C). The first section was an introductory letter, explaining the research objectives and giving the researcher's contact details. The second section solicited demographic information about the respondents, namely their affiliation, years of experience and the type of energy projects they have been involved in. In section three, respondents were asked to indicate their level of agreement with general statements about the energy sector in Zimbabwe using a Likert-type scale with six options (not applicable, strongly disagree, disagree, neutral, agree and strongly agree). Section four required respondents to rate the importance of each of the 40 success factors identified in phase one using a five-point Likert scale, where one is 'not critical' and five is 'most critical'. The last section required respondents to rank seven risk factors identified in phase one according to degree of threat for IPP investments in Zimbabwe, where one represents the highest threat and seven the lowest threat.

## **4.8 Summary**

There was unanimous agreement amongst respondents that the level of investment in IPPs in Zimbabwe is far below its potential. A weak investment climate, policy uncertainty, the procurement process, inconsistent regulation and inadequate government support were some of the major factors identified as impeding investment. Respondents also identified 40 success factors for IPPs in Zimbabwe were identified. Most of the factors were in line with literature, but some factors were unique to national context such as "reduction of country debt overhang", "ability to export power regionally" and "financial education about energy infrastructure as an asset class for domestic investors". This chapter also outlines the development of the survey instrument to be used in the quantitative second phase of the study. Chapter 5 will focus on the presentation and analysis of the findings of the quantitative phase of the study.

## 5 QUANTITATIVE RESEASRCH FINDINGS AND ANALYSIS

### 5.1 Questionnaire Response Rate

A total of 45 questionnaires were sent out to target respondents. 38 completed questionnaires were returned, denoting a response rate of 84%. Of the returned questionnaires, two were incomplete and consequently excluded from the analysis, yielding an effective response rate of 80%.

### 5.2 Participant Demographics

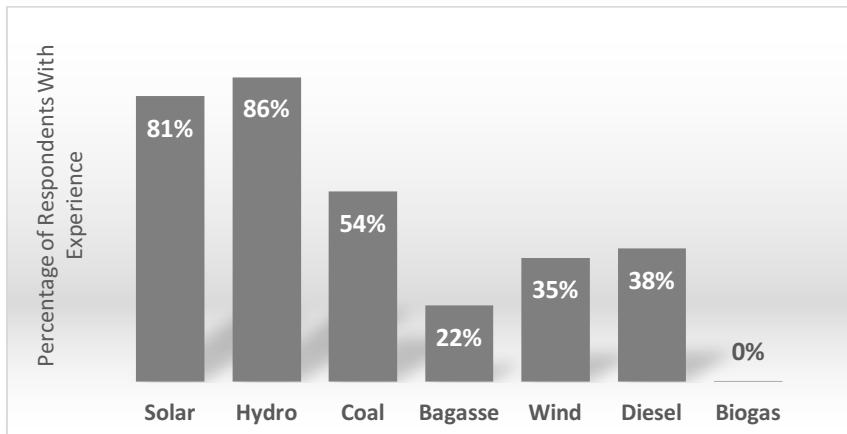
A summary of the demographic characteristics of the questionnaire respondents is shown in Table 9 below.

**Table 9: Respondent Demographics**

Measure	Sector		Position			Years of Experience		
	Private	Public	Executive	Senior	Junior	Less than 5	5 - 15	Above 15
Frequency	20	16	13	9	14	7	22	7
Percentage	56	44	36	25	39	19.5	61	19.5

The respondents were also asked to indicate the type of IPP projects that they had been involved in. The chart below gives a summary of the different types of IPP projects that the respondents have been involved in.

**Figure 6: Respondent Experience with IPPs**



### **5.3 Test of Reliability – Cronbach’s Alpha**

The value of Cronbach’s Alpha for the collected survey data is 0.896. This is greater than the conventional acceptable range of values for alpha of between 0.6 and 0.8, indicating that the questionnaire for this study is reliable and internally consistent (Nunally, 1978; Pallant 2001).

### **5.4 Descriptive Statistics of Survey Data**

SPSS was used to calculate key descriptive statistics for the data, namely the mean, standard deviation, variance, skewness and kurtosis. The summary of the statistics is in Appendix E. Based on mean scores, 38 out of the 40 CSFs were perceived as either ‘critical’ or ‘more critical’ for the successful financing of IPPs in Zimbabwe by respondents, with mean scores greater than or equal to 3. As explained in Chapter 3, a score of 3 on the Likert scale used in this study denotes a critical factor. The two factors not perceived as critical were “further unbundling of the offtaker” and the “origin of investors”.

The Shapiro-Wilk test for normality of the data was statistically significant for each of the 40 factors because the p-values for the tests on each factor were all less than 0.05 (See Output in Appendix E). This provides strong evidence that the data is not normally distributed and as a result, non-parametric statistical techniques are the most appropriate for analysing the data.

### **5.5 Perceptions about IPPs and the energy sector in Zimbabwe**

In the first part of the survey, respondents were asked to indicate their level of agreement or disagreement with ten statements about IPPs and the energy sector in Zimbabwe that capture some of the perceptions about the energy sector identified during interviews, in order to examine whether the perceptions held by the interviewees could be generalised to the broader IPP stakeholder community. A summary of their responses is given in Table 10 overleaf.

**Table 10: Summary of Respondents Perceptions**

<b>Statement on IPPs and energy sector in Zimbabwe</b>		<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
1. The laws and policy framework for private participation in generation are well crafted and sound		<b>28%</b>	<b>19%</b>	<b>53%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	80%	71%	42%
	<i>Public</i>	20%	29%	58%
2. Policy on licensing and required permits is accurately and consistently applied		<b>33%</b>	<b>25%</b>	<b>42%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	67%	89%	20%
	<i>Public</i>	33%	11%	80%
3. The unsolicited bid procurement framework is the most optimal for Zimbabwe		<b>58%</b>	<b>25%</b>	<b>17%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	48%	89%	50%
	<i>Public</i>	52%	11%	50%
4. The regulator is competent, efficient and well capacitated		<b>22%</b>	<b>31%</b>	<b>47%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	88%	82%	29%
	<i>Public</i>	13%	18%	71%
5. The current tariff methodology results in a tariff that is cost reflective		<b>39%</b>	<b>19%</b>	<b>39%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	50%	86%	57%
	<i>Public</i>	50%	14%	43%
6. Project development costs are unreasonably high		<b>17%</b>	<b>17%</b>	<b>67%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	50%	83%	54%
	<i>Public</i>	50%	17%	46%
7. There is a clear separation between the regulator and line ministry		<b>56%</b>	<b>17%</b>	<b>25%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	60%	100%	22%
	<i>Public</i>	40%	0%	78%
8. There is need to further unbundle the offtaker		<b>11%</b>	<b>22%</b>	<b>67%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	50%	100%	46%
	<i>Public</i>	50%	0%	54%
9. There is adequate government support for IPPs		<b>39%</b>	<b>25%</b>	<b>36%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	93%	56%	23%
	<i>Public</i>	7%	44%	77%
10. There is investor appetite for IPP projects		<b>17%</b>	<b>19%</b>	<b>64%</b>
	<i>Proportion of which:</i>			
	<i>Private</i>	67%	57%	57%
	<i>Public</i>	33%	43%	43%

As Table 10 shows, the majority of respondents were satisfied with the laws and policy framework for private participation in generation and were in agreement that there is investor appetite for IPP projects in Zimbabwe, which closely mirrors the findings of the expert interviews conducted in the first phase of the study. The highest level of agreement, for which 67% of respondents answered ‘agree’ or ‘strongly agree’, was tied on two statements, namely that project development costs are unreasonably high and that there is a need to further unbundle the offtaker. The result concerning the need to further unbundle the offtaker is a surprising because it was one of two factors that were not perceived as critical using the Likert scale. A closer look at the proportion of private and public sector respondents who were in agreement with the statement shows an almost even split, indicating consensus between the two sectors. This suggests that there is a need to further restructure the electricity market, that both the private and public sector acknowledge, but when considered with all the other elements that need to be implemented to encourage investment it ranks lower in priority.

The statement with the highest level of disagreement concerned the unsolicited bid procurement framework being the most optimal for Zimbabwe, with 58% of respondents disagreeing with the statement and 16% agreeing that the framework was optimal. Looking at proportion of private and public sector respondents who disagreed, the split is almost even: 52% versus 48% in favour of the public sector. This result lends weight to some of the criticisms of the framework highlighted by interviewees, one of which is that it has resulted in a high incidence of speculators as opposed to serious developers. The majority of respondents also disagreed that there is a clear separation between the regulator and the line ministry. Notably, of those who disagreed, the majority were private sector respondents. This indicates that the private sector in particular, does not perceive the regulator as independent, but susceptible to political interference in the discharge of its duties, which could result in suboptimal outcomes. The results concerning these two statements points to the need for further clarity and transparency in the procurement process for IPPs and the need for full autonomy of the regulator in the discharge of its duties.

Opinion was split almost evenly on three statements, that policy was accurately and consistently applied, that the current tariff methodology generated a cost reflective tariff and that there is adequate government support for IPPs. Notably, each of these statements relates to areas within the specific purview of government and over which IPPs have no control.

Analysis of the results by sector reveals some interesting results. With regard to policy being accurately and consistently applied, an overwhelming majority of respondents who agreed with this statement were from the public sector. On the other hand, an overwhelming majority of private sector respondents disagreed with the statement. This is in line with the perception of private sector interviewees in the first phase, who identified policy inconsistency as one of the factors impeding investment. Similar polarity is observed in the results for the statement that there is adequate government support for IPPs. 93% of the respondents who disagreed with this statement belonged to the private sector, while 77% of those that agreed that there was adequate support were from the public sector. This indicates a clear divide in perception between the private and public sectors regarding the implementation of policy and the form and magnitude of government support necessary for IPPs.

The only statement for which opinion is still split, even by sector, was that the current tariff methodology results in a tariff that is cost reflective. Analysing those who disagree, there was a 50:50 split between the private and public sectors. For those who agreed however, private sector respondents had a moderate majority. The qualitative findings may provide some explanation of the split in opinion on this statement. The official tariff methodology is a cost plus methodology, which all things equal, should be cost reflective, as it is a tariff derived from the actual costs of the project. However, interviewees pointed out that the regulator also uses a REFIT guideline in conjunction with the official methodology. This split in opinion is likely symptomatic of the negative impact on the tariff as a result of tension between the two methodologies being used.

## **5.6 Significance Indices and Rank of Critical Success Factors**

### **5.6.1 Overall Respondents Perception**

The relative importance index (RII) of each of the 40 CSFs was calculated based on the overall survey responses. The CSFs were then ranked according to their RIIs. Table 11 below presents the RIIs and ranking of the top five and bottom five CSFs for the successful financing of IPPs in Zimbabwe. The full list of rankings can be found in Appendix E.

**Table 11: Significance Indices and Rank of Critical Success Factors for Total Sample**

Code	Critical success factor	Number of Responses					Mean	RII	Rank
		1	2	3	4	5			
S5	Expected debt paying ability of project	0	0	4	12	20	4,44	0,889	1
S14	Transparent, cost reflective tariff framework	0	0	5	12	19	4,39	0,878	2
S33	Upholding of contracts	0	1	5	10	20	4,36	0,872	3
S6	Reasonable, fair expected return on equity	0	0	5	18	13	4,22	0,844	4
S1	Bankable feasibility study	0	1	12	6	17	4,08	0,817	5
S36	Ability of IPPs to lobby government	2	9	12	7	6	3,17	0,633	36
S19	Project exemptions from tax and duties	2	8	13	11	2	3,08	0,617	37
S35	Program Champion for IPPS	1	12	13	6	4	3,00	0,600	38
S21	Further unbundling of the offtaker	3	14	8	7	4	2,86	0,572	39
S25	Origin of investors (local versus external financiers)	8	11	10	4	3	2,53	0,506	40

Based on the RIIs, the top five most critical factors according to all the respondents are 1) “Expected debt paying ability of the project”; 2) “Transparent, cost reflective tariff framework”; 3) “Upholding of contracts”; 4) “Reasonable, fair expected return on equity” and 5) “Bankable feasibility study”. Four of these factors relate to the economic viability of the project. The five least influential factors according to respondents were “Origin of investors”, “Further unbundling of the offtaker”, “Program Champion for IPPs”, “Project exemptions from tax and duties” and “Ability of IPPs to lobby government”.

The results also reveal clustering of factors related to project economic viability (seven out of ten), the investment climate (three out of five) and government support (two out of five) in the top twenty CSFs as ranked by respondents. This suggests that project economic viability, the investment climate and government support are the three principal areas in which things should be got right in order to unlock investment in IPPs. The bottom twenty ranked factors showed a predominant clustering of factors related to power sector characteristics (5 out of 8) and people factors (5 out of 7). Clusters of factors related to the strength of the financial package can be seen both in the top 20 and bottom 20 ranked factors.

## 5.6.2 CSF Rankings by Sector – Private versus Public

Tables 12 below presents the RII and rank of the top five CSFs from the private and public sectors perspective. The full list of rankings by sector can be found in Appendix E.

**Table 12: Private and Public Sector RIIs and Ranking of Critical Success Factors**

Code	Critical success factor	Mean	RII	Rank
<b>PRIVATE</b>				
S33	Upholding of contracts	4,65	0,930	1
S5	Expected debt paying ability of project	4,50	0,900	2
S31	Operationally efficient and solvent offtaker	4,35	0,870	3
S6	Reasonable, fair expected return on equity	4,25	0,850	4
S37	Cost of financing (WACC)	4,25	0,850	4
<b>PUBLIC</b>				
S14	Transparent, cost reflective tariff framework	4,20	0,840	1
S5	Expected debt paying ability of project	4,10	0,820	2
S10	Competent, consistent and fair regulator	4,10	0,820	2
S3	Stable macroeconomic policies	4,00	0,800	4
S13	Comprehensive national energy strategic plan	4,00	0,800	4

The top three most critical factors according to the private sector are “Upholding of contracts”, “Expected debt paying ability of project” and an “Operationally efficient and solvent offtaker”. “Reasonable, fair expected return on equity” and “Cost of financing (WACC)” were tied at ranked four. For the public sector, the most critical success factor is “Transparent, cost reflective tariff framework”. Tied at rank two were “Expected debt paying ability of project” and “Competent, consistent and fair regulator”, while “Stable macroeconomic policies” and “Comprehensive national energy strategic plan” were tied at rank four. Comparing the two sectors top five rankings, the private sector ranked factors related to the economic viability of the project and the strength of the financial package as most critical, whereas the public sector ranked factors related to the power sector characteristics as most critical. The only factor for which there was agreement in the ranking between the two sectors was “Expected debt paying ability of project”.

## 5.7 Agreement Analysis

In order to determine the level of agreement in the perceptions of the private and public sectors regarding the importance of the CSFs, Kendall's concordance test is conducted using SPSS. The output of the test can be found in Appendix E. The Kendall's concordance test is appropriate because the data is not normally distributed as shown in section 5.4 above.

Kendall's tau is 0.305 suggesting weak concordance between the rankings of the private and public sector respondents. The p-value for Kendall's tau is 0.007. Because this value is less than 0.05, we can conclude that there is statistically significant concordance between the private and public sector rankings of the CSFs.

In order to determine the actual level of agreement or disagreement between the private and public sector respondents, the RAF, PD and PA for the CSFs were calculated. The results of the agreement analysis are shown in Table 13.

**Table 13: Agreement Analysis of Ranking of CSFs between the Private and Public Sector**

<b>Agreement Analysis Parameter</b>	<b>Value</b>
<b>RAF</b>	<b>9.825</b>
<b>RAF<sub>max</sub></b>	<b>16.375</b>
<b>PD</b>	<b>60%</b>
<b>PA</b>	<b>40%</b>

The percentage agreement (PA) for the CSFs between the two sectors is 40%. The percentage agreement is only 40%, there is low agreement in the ranking of CSFs indicating that there is a significant level of disagreement in the perception of the private and public sector ranking of the CSFs between the private and public sector.

## 5.8 Risk Factor Analysis

Respondents were asked to rank seven main risk factors identified during the expert interviews according to the degree of threat for IPP investments in Zimbabwe. The ranking of the seven risk factors according to their responses is illustrated in table 14 below.

**Table 14: Risk Factor Ranking**

Risk Factor	Overall Rank	Private Rank	Public Rank
Country Risk	1	1	1
Payment Risk	2	2	3
Repayment Risk	3	3	3
Developer Risk	4	5	2
Currency and Transfer Risk	5	4	3
Technology Risk	6	6	6
Climate Risk	7	7	6

Country risk, payment risk and repayment risk were rated as the top three risks for IPP investments in Zimbabwe. Analysing the rankings by sector, both the private and public sector ranked country risk as the biggest threat to IPP investment in Zimbabwe. This underscores the importance of risk mitigation strategies around country risk for unlocking investment. Similarly, payment risk and repayment risk were both in the top three ranked risks for both sectors. Where there was a significant difference in ranking was with regard to developer risk. The private sector respondents ranked this risk fifth, but for the public sector this was the second biggest threat to investment in IPPs after country risk. This is a significant result. It suggests that the public sector do not have confidence in the ability of licensed developers to effectively develop their projects to a bankable state. The low ranking of developer risk by the private sector might be indicative of the private sector's ability to mitigate this risk through the use of skilled advisors, which was also identified as a critical success factor.

## 5.9 Summary

38 of the 40 factors identified in the qualitative phase of the study were perceived as critical for financing IPPs by survey respondents. The most critical success factor was the expected debt paying ability of the project. The ranking of factors by the private sector differs from the rankings assigned by the public sector. Statistical analyses revealed 40 percent agreement between the private and public sector in the ranking of CSFs. Country risk was perceived as the most significant threat to investment in IPPs. These results have particular implications on the development of IPPs in Zimbabwe that are discussed in chapter 6.

## **6 DISCUSSION AND CONCLUSION**

This chapter will discuss the research findings and analysis presented in chapters 4 and 5 and discuss their implications on the development of IPPs in Zimbabwe. The chapter will conclude by presenting the conclusions to the study's research questions and objectives.

### **6.1 Discussion of Results**

The IPP industry in Zimbabwe is still very young and as with any nascent industry, teething problems can be expected. However, IPP developers in Zimbabwe are not only contending with the normal growing pains of a developing industry, but have also had to navigate an extremely challenging economic environment. Notwithstanding the challenges, there are a significant number of investors who want to invest in Zimbabwe and specifically in the energy sector. Despite this interest, however, actual investment in IPPs remains muted. The aim of this study was to understand why this has been the case and to identify factors that can contribute towards increased investment in IPPs.

As a starting point, this study explored the current IPP context and the findings have revealed several factors that have contributed to the status quo. These included a poor investment climate, policy uncertainty, the lack of experience of developers, poor project preparation, regulatory inefficiencies and inadequate government support. Analysed individually, these factors may seem disconnected, but viewed in tandem, the combined effect of these factors is that they have increased the uncertainty surrounding the sustainability and security of investment in IPPs for potential investors, causing investors to shy away from investing, resulting in the observed low investment rate in IPPs in Zimbabwe. This observation is consistent with literature on investment under uncertainty (McDonald & Siegel, 1986; Dixit & Pindyck, 1994), which predicts that when there is uncertainty, investors will choose to delay investment until there is more clarity about future prospects.

Drawing on the experience of expert stakeholders in the IPP sector in Zimbabwe, forty success factors that are important for successfully financing IPPs in the local context were identified. These factors related to six elements that are vital in creating an enabling environment for investment in IPPs namely: the need for a stable macroeconomic environment; the influence of the power market structure; the importance of project

economic viability; the strength of the financial package; the significance of having the right people; and the criticality of government support. Quantitative analysis showed that of the 40 factors, 38 factors were perceived as critical success factors by respondents. In terms of the ranking of factors, factors related to project economic viability, the investment climate and government support were the most critical for unlocking investment. The expected debt paying ability of the project was ranked the most critical factor for financing IPPs by all stakeholders. This finding is not surprising because debt financing is the predominant form of financing for greenfield IPPs and investors will only invest in a project with adequate cash flows to pay its debt service.

A transparent and cost reflective tariff framework was ranked the second most critical success factor. For energy projects like IPPs the tariff is the sole driver of revenue and the key determinant of the project's ability to repay its debt and investor returns. Linked to this is the importance of a transparent, competent and fair regulator, as the responsibility of formulating and enforcing the tariff framework lies squarely on the regulator. As pointed out by Eberhard et al. (2016), the quality of regulation and not merely the existence of regulation is what is critical for unlocking investment for IPPs. This study revealed significant stakeholder dissatisfaction with the the regulator's performance in the discharge of its duties. Ambiguity with respect to the independence of the regulator was cited as the possible root cause of observed regulatory inefficiencies. The importance of independent regulation cannot be overstated. Without independence, the regulator is susceptible to making arbitrary decisions as a result of political interference, that increase regulatory risk, reduce investor confidence and ultimately hinder investment. This strongly suggests that strengthening the capacity and independence of the regulator must be made a priority if meaningful progress is to be made.

A success factor identified in this study but not explicitly highlighted in other studies on CSFs for power projects was that of the influence of project size on investment outcomes. Due to the high risk perception of the country, execution of larger projects has been complex and requirements for financing difficult to meet. Phased implementation of IPPs, which begin with a small initial plant capacity, has a de-risking effect that enables developers to raise financing for expansion to a larger plant size, leveraging the already operational smaller plant. This finding is important because it provides a possible explanation as to why all the IPPs licensed for projects with large capacities in Zimbabwe have not reached financial

closure. It also suggests that phased implementation might be a faster method to develop IPPs and procure much needed generation capacity and reinforce long term energy security for the country. This strategy could have application not only in Zimbabwe but in similarly perceived high risk developing countries.

One of the objectives of this study was to determine whether there was agreement between the private and the public sector rankings of CSFs. The results showed low agreement between the private and public sector in the ranking of CSFs. The only ranking which was exactly the same was for the success factor “expected debt paying ability of the project”. For the rest of the success factors there was wide disparity in their perceived importance between the two sectors. This lack of accord and harmonization between the private and public sectors regarding what is important for realising investment is potentially a bigger risk for IPPs in Zimbabwe than any of the other risks highlighted in this study. Even concerning the factor “expected debt paying ability of the project”, the difficulties in securing debt financing that IPPs are currently experiencing highlight that even though both sectors are agreed on the relative importance of a project’s ability to pay back debt, there is likely no agreement on what constitutes the “expected debt paying ability of the project” and what is necessary from an enabling environment perspective for a project to achieve this. Moreover, if the air of suspicion and apprehension highlighted in the qualitative findings persists in the interactions between the private and public sector, no meaningful progress in towards catalysing investment in the energy sector will be made. This underscores the importance for effective dialogue between the two sectors.

Although this study’s results show that open and effective communication between the two sectors is perceived as a critical success factor for investment, in terms of ranking, both sectors do not perceive it as a priority. It is this researcher’s opinion that this factor should have been rated the most critical because it is the necessary first step towards the realisation of all the other success factors highlighted in this study. Effective communication between the private and public sector was one of the reasons behind the success of the SA REIPPP (Eberhard et a., 2016). As the authors point out, from the onset of the program, there was dialogue between the Department of Energy IPP unit and the private sector, particularly the lenders, on key issues concerning the program (Eberhard et a., 2016). It is this researcher’s opinion that similar dialogue between the private sector and government in Zimbabwe will

facilitate improved investment outcomes, and that the best placed agent to facilitate deeper discussion between the two stakeholders is the line ministry.

Notably, the most pronounced disparity in ranking was on the factors related to government support in the form of guarantees. Sovereign guarantees were perceived as a CSF for investment by the private sector and not the public sector. Similarly, policy guarantees were ranked as the 9<sup>th</sup> CSF by the private sector, but only ranked 32<sup>nd</sup> by the public sector. As highlighted in the qualitative findings, government's stance is that the private sector is adequately skilled to execute and finance the projects without the assistance of government. However, the private sector's request for government guarantees is merited. As pointed out in literature, it is rare for infrastructure projects to be financed entirely on merit without any form of guarantees due to the non-recourse nature of the financing and the irreversibility of investment (Nevitt & Fabozzi, 1995; Ehlers, 2014). Government may not be able to give the private sector all the concessions they request for, but what is important is that government listen to the private sector. Financiers always opt for sovereign guarantees but there are a host of other viable risk mitigation and credit enhancements that can be employed. One recommendation made by one of the respondents in this study was the use of concessional financing from friends of the country such as China by government, to provide guarantees against which IPPs can access debt financing in capital markets. However, without an open ear to the private sector, many viable suggestions as to how government support can be provided to the private sector cannot be brought forward.

Another interesting point of disparity between the perception of the private and public sector was concerning the importance of a competitive bidding framework as CSF for investment in IPPs. The private sector ranked this factor 39<sup>th</sup> out of the total 40 factors, whereas the public sector ranked it 9<sup>th</sup>. This result is surprising, given that inefficiencies in the current procurement framework was identified as one of the factors impeding investment by interviewees and that the merits of competitive bidding practices, particularly with regard to efficiency, price and transparency, are well documented in literature (Eberhard et al., 2016). There are several plausible explanations for this. One explanation is that private sector respondents, and in particular developers, dislike competitive procurement it would result in a reduction in tariffs. Other reasons highlighted in the qualitative findings were the risk of corruption in the award of projects and the risk that smaller developers will be unable to compete against larger well-established global developers. This suggests that in a competitive

procurement framework for Zimbabwe should be governed by rules that mitigate corruption and ensure no barriers to entry for smaller players. However, it is this researcher's opinion that the major reason is that there may be some concerns amongst private sector respondents that the introduction of a competitive bidding framework may result in the arbitrary cancellation of existing licenses or have other retroactive effects that may negatively impact current license holders, especially when a significant amount of capital has already been invested towards the development of these projects. This highlights the the need for careful transition planning if a competitive bidding framework is introduced.

## **6.2 Research Questions and Objectives**

The study's findings reveal that there are 38 critical success factors for financing IPPs in Zimbabwe that relate to six key aspects of IPP development namely, investment climate, power sector characteristics, project economic viability, strength of financial package, people factors and government support. The top five most critical success factors according to the ranking of respondents are the expected debt paying ability of the project, a transparent, cost reflective tariff framework, upholding of contracts, reasonable, fair expected return on equity and a bankable feasibility study. The rankings of success factors varied by stakeholder grouping, with the private sector rankings significantly different from the rankings assigned by the public sector. Several strategies can be employed to improve the implementation of IPPs in Zimbabwe in order to increase the number of IPPs that reach financial closure. These include improving the the investment climate through the formulation of sound economic policies and steps to reduce the country debt overhang, optimising the electricity market sector structure by introducing competitive bidding practices and government granting the regulator full autonomy in the discharge of its duties, creation of a nodal agency to run the entire licensing and permitting process for IPPs, phased project implementation, involving a smaller first phase that is leveraged on completion to finance a larger expansion phase and the collaborative effort between government and the private sector to formulate mechanisms to mitigate country risk.

## **6.3 Research Conclusion**

Reaching financial closure for IPPs in Zimbabwe requires a well thought-out and structured plan and the collaboration and input of multiple stakeholders for successful execution. The

overall aim of this study was to identify the contextual factors necessary to catalyse investment in PPs. While recognising the limitations of the investigation, this study has largely achieved this objective. As demonstrated by this research, in order to catalyse investment in IPPs, a suitably enabling environment for investment must be created. That enabling environment consists of several factors or elements that may be grouped into six categories relating to key aspects of the development of IPPs. These are: investment climate, power sector characteristics, project economic viability, strength of financial package, people factors and government support.

Many of the factors identified in this study relate to aspects of the development of IPPs that are out of the control of the IPP developers, but are within the purview of government to control and implement. This underscores the importance of government support in realising satisfactory investment in IPPs. The results have also shown that the major challenge IPPs are facing with regard to securing financing concerns adequately mitigating country risk to the satisfaction of potential financiers. Furthermore, the findings have revealed a disconnect between the private sector and public sector's understanding of what is required and important for successfully financing IPPs in the Zimbabwe country context. Given the critical role of energy supply and security for the development of the country, more open and effective communication between the two sectors is vital if any meaningful improvements in investment outcomes are to be realised. As part of this study, several strategies for policy and practice have been recommended. These include:

- The formulation of a national strategic energy plan oriented towards making Zimbabwe a key energy exporter;
- The creation of a nodal agency to manage and coordinate all aspects of the procurement and development of IPPs in Zimbabwe
- Amendment of the Energy Regulatory Act to resolve ambiguity concerning the independence of the regulator.
- Financial education about energy infrastructure as an asset class for local investors through road shows and workshops.

#### **6.4 Recommendations for future research**

The research findings have shown that several aspects of the development of IPPs in Zimbabwe require further fine tuning and in some instances, total revision. A thorough

interrogation of these aspects is warranted and would be most beneficial for the country.

Future research opportunities exist to:

- Investigate the experiences of other countries in transitioning from an unsolicited bid procurement framework to a competitive one for energy projects. As demonstrated by this research, the current framework is not optimal and a competitive tender is the alternative preferred by some stakeholders. However, concerns over the retroactive effects on current licensees, corruption and the crowding out of small players with the introduction of competitive practices, underscores the importance of research into how implementation of a new procurement method can be made as seamless and smooth as possible.
- Research on existing tariff methodologies and their respective impacts on investment outcomes in the countries in which they have been applied, in order to identify best practices to optimise the tariff framework in Zimbabwe. The use of a combination of REFIT and the cost plus methodology in Zimbabwe suggests that neither of the two methods are optimal.
- Research on mechanisms and alternative forms of government support other than guarantees, that have been used to promote energy infrastructure investment in other developing countries with similar risk characteristics to Zimbabwe. This research has demonstrated not only the necessity of government support but also the limitations upon government in regards to the extent of support they can give IPPs.
- Research on mechanisms that can be employed to catalyse investment in energy infrastructure projects by local institutional investors.
- Research on the impact of regulatory independence on investment and development outcomes in the electricity sector world wide and best practices on how regulatory independence can be achieved and entrenched.

## 7 REFERENCES

- Ackroyd, S., & Hughes, J. A. (1981). *Data Collection in Context*. London: Longman Press.
- Akintoye, A., Li, B., Edwards, P. J., & Hardcastle, C. (2005). Critical success factors for PPP/PFI projects in the UK construction industry. *Construction Management and Economics*.
- Ali, B., Sopian, K., Yen, C.H., Mat, S., & Zaharim, A. (2008). *Key Success Factors in Implementing Renewable Energy Programme in Malaysia*. Bangi Selangor, Malaysia: Solar Energy Research Institute, University of Kebangsaan.
- Allen & Overy.(2009). *Global infrastructure development and delivery: The stimulus for debate - Allen & Overy Global Survey*. Retrieved from <http://www.allenoverly.com/archive/Documents/Legacy/52624.pdf>.
- Anderson, P. L. (2013). *The Economics of Business Valuation: Towards a Value Functional Approach*. Stanford, California: Oxford University Press.
- Baddeley, M.C. (2002). Investment in an Uncertain World. *Zagreb International Review of Economics and Business*, 5(2), 1-21.
- Badissy, M. (2014). *Understanding Power Project Financing*. Power Africa, United States Department of Commerce.
- Baker, S. E. & Edwards, R. (2012). Introduction. In S.E. Baker & R. Edwards. How many qualitative interviews is enough. *National Centre for Research Methods Review Discussion Paper*, 3-6. Retrieved from <http://eprints.ncrm.ac.uk/2273>.
- Bayliss, K., & Hall, D. (2000). *Independent Power Producers: A Review of the Issues*. Retrieved from <http://www.psir.org/reports/independent-power-producers-review-issues.html>.
- Beck, T., Fuchs, M. J., & Uy, M. (2009). Finance in Africa - Achievements and Challenges. *Policy Research Working Paper Series*. Washington DC: The World Bank.

- Beeferman, L., & Wain, A. (2012). Infrastructure: Defining Matters. Harvard Law School.
- Bernanke, B. S. (1983). Irreversibility, Uncertainty and Cyclical Investment. *Quarterly Journal of Economics*, 98(1), 85-22.
- Besant-Jones, J. E. (2006). Reforming power markets in developing countries: What have we learned? *Energy and Mining Sector Board Discussion Paper*, 19, 1- 164. Retrieved from <http://siteresources.worldbank.org/INTENERGY/Resources/Energy19.pdf>.
- Bhaduri, S. N. (2005). Investment, financial constraints and financial liberalization: some stylised facts from a developing economy, India. *Journal of Asian Economics*, 16, 704-718.
- Blackman, A. & Wu, X. (1998). Foreign Direct Investment in China's Power Sector: Trends, Benefits and Barriers. *Energy Policy*, 27(12),695–711.
- Bleaney, M. (1996). Macroeconomic stability, investment and growth in developing countries. *Journal of Development Economics*, 48, 461-477.
- Bonetti, V., Caselli, S., & Gatti, S. (2010). Offtaking agreements and how they impact the cost of funding for project finance deals: A clinical case study of the Quezon Power Ltd Co. *Review of Financial Economics*,19(2), 60-71. doi: 10.1016/j.rfe.2009.11.002.
- Boyle, G. J. (1991). Does item homogeneity indicate internal consistency or item redundancy in psychometric scales? *Personality and Individual Differences*,12, 291-294.
- Brodsky, S., & Matarirano, G. (2015). South Africa's Renewable Energy Programme: An African Success Story. In Clean Energy Africa Finance Guide, London : VB Research Ltd. Retrieved from [http://www.cleanenergypipeline.com/Resources/CE/ExpertGuides/CleanEnergyAfricaFinanceGuide\(2015Edition\).pdf](http://www.cleanenergypipeline.com/Resources/CE/ExpertGuides/CleanEnergyAfricaFinanceGuide(2015Edition).pdf)
- Brink, H.I.L. (1993). Validity and reliability in qualitative research. *Curationis*, 16 (2). 35-38.

- Bryman, A. & Bell, E. (2007). *Research Designs. In: Business Research Methods*. New York: Oxford University Press.
- Bullen, C. V. & Rockart, J. F. (1981). *A primer on critical success factors*. Cambridge, MA: Center for Information Systems Research, MIT.
- Burns, R. B. (2000). *Introduction to Research Methods (4th ed.)*. Sydney: Pearson Education Australia.
- Byrne, J., & Mun, Y.M. (2003). *Rethinking reform in the electric- ity sector: Power liberalisation or energy transformation?* In N. Wamukonya (Ed.), *Electricity reform: Social and environmental challenges* (pp. 48-76). Roskilde, Denmark: UNEP-RISO Centre.
- Cannell, C. F. and Henson, R. (1974). Incentives, motives, and responses bias. *Annals of Economic and Social Measurement* 3, 307-317.
- Cambridge Economic Policy Associates.(2015). *Mobilising Finance for Infrastructure - Regional Infrastructure Study*. London, UK: Cambridge Economic Policy Associates.
- Chowdhury, A. & Charoenngam, C.(2008). Factors Influencing Finance on IPP Projects in Asia: A Legal Framework to Reach the Goal. *International Journal of Project Management*,27, pp.51–58
- Clarke, A. and Dawson, R. (1999). *Evaluation Research: an introduction to principles, methods and practice*. London: Sage Publications.
- Claude, H. (1974). Investment Decisions Under Uncertainty: The Irreversibility Effect *American Economic Review*. 64(5),1006 -1012.
- Climatescope.(2016). *Zimbabwe*.Retrieved from <http://globalclimatescope.org/en/country/zimbabwe/#/details>.
- Conover, W.J. (1980). *Practical Non-Parametric Statistics*. New York: John Wiley and Sons
- Corielli, F., Gatti, S., & Steffanoni, A. (2010). Risk shifting through nonfinancial contracts.

- Effects on loan spreads and capital structure of project finance deals. *Journal of Money, Credit and Banking*, 42 (7), 1295–1320. doi: 10.1111/j.1538-4616.2010.00342.x.
- Creswell, J. W. & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3), 124-131.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2014). *Research Design Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, CA: Sage Publications.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- Crotty, J.R. (1993). Neoclassical and Keynesian approaches to the theory of investment. Retrieved from <http://people.umass.edu/crotty/JPKE1993.pdf>.
- Cukierman, A. (1980). The Effects of Uncertainty on Investment under Risk Neutrality with Endogenous Information. *Journal of Political Economy*, 88(3), 462-75.
- DeVellis, R. (2003). *Scale development: theory and applications: Theory and application*. Thousand Okas, CA: Sage.
- Dixit, A. K., & Pindyck, R. S. (1994). *Investment under uncertainty*. Princeton, N.J: Princeton University Press.
- Doan, P., & Menyah, K. (2013). Impact of Irreversibility and Uncertainty on the Timing of Infrastructure Projects. *Journal of Construction Engineering Management*, 139(3), 331-338.
- Dunne, T., & Mu, X. (2010). Investment Spikes and Uncertainty in the Petroleum Refining Industry. *The Journal of Industrial Economics*, 58(1).190-213.
- Eberhard, A., & Gratwick, K. N. (2011). IPPs in Sub-Saharan Africa : Determinants of success. *Energy Policy*, 39, 5541–5549. <http://doi.org/10.1016/j.enpol.2011.05.004>

- Eberhard, A., Gratwick, K., Morella, E., & Antmann, P. (2016). *Independent Power Projects in Sub-Saharan Africa Lessons from Five Key Countries (Directions)*. Washington DC: The World Bank Group.
- Ehlers, T. (2014) Understanding the Challenges for Infrastructure Finance. *BIS Working Papers*, 454.
- Electricity Act of 2002, Zimbabwe. (2002)
- Environmental Management Authority.(2016). *Environmental Impact Assessment Fees Reduced*. Retrieved from <http://www.ema.co.zw/index.php/179-environmental-impact-assessment-fees-reduced.html>.
- Energy Regulatory Authority Act of 2011, Zimbabwe. (2011)
- Estache, A; Gomez-Lobo A., and Leipziger, D. (2000). Utility Privatization and the Needs of the Poor in Latin America: Have We Learnt Enough to Get it Right? *World Bank Policy Research Working Paper*, 2407.
- Esty, B. C. (2002). The economic motivation for using project finance. *Harvard Business School Mimeo*, January.
- Finnerty, J. D. (2007). *Project Financing. Asset-Based Financial Engineering*. New Jersey: John Wiley & Sons.
- Frels, R. K., & Onwuegbuzie, A. J. (2013). Administering quantitative instruments with qualitative interviews: A mixed research approach. *Journal of Counseling & Development*, 91, 184–194. doi:10.1002/j.1556-6676.2013.00085.x
- Gardiner, M., & Montpelier, V. (2000). *Best Practices Guide: Implementing Power Sector Reform*. Washington, D.C.: U.S. Agency for International Development
- Gibbs, G. (2007). *Analysing Qualitative Data, part of the Qualitative Research Kit*. London: Flick, Sage.
- Gillham, B. (2000). *Developing a questionnaire*. London: Continuum.

- Goetzmann, W. N. (1996). *An Introduction to Investment Theory*. New Haven: Yale School of Management.
- Gordon, M.J. (1992). The Neoclassical and a Post Keynesian Theory of Investment. *Journal of Post Keynesian Economics*, 14 (4), 425-443.
- Gratwick, K. N., & Eberhard, A. (2008). An Analysis of Independent Power Projects in Africa: Understanding Development and Investment Outcomes. *Development Policy Review*, 26, 309–338. doi:10.1111/j.1467-7679.2008.00412.x
- Gray, S., & Tatrallyay, N. (2012). *The Green Climate Fund and private finance: Instruments to mobilise investment in climate change mitigation projects*. London: Climate Change Capital Ltd.
- Greene, J., & Caracelli, V. (2003). *Making Paradigmatic Sense of Mixed Methos Inquiry*. In Handbook of Mixed Methods in Social & Behavioral Research, Tashakkori, A & Teddlie, C. (Eds) 2003, Sage, California.
- Grunert, K. G., & Ellegaard, C. (1992). The concept of key success factors: theory and method. *MAPP Working Paper*, 4.
- Guest, G., Bunce, A. & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(59).
- Gupta, A., Gupta, M.C., & Agrawal, R. (2013). Identification and ranking of critical success factors for BOT projects in India. *Management Research Review*, 36 (11), 1040-1060.
- Hainz, C., & Kleimeier, S. (2012). Political risk, project finance, and the participation of development banks in syndicated lending. *Journal of Financial Intermediation*, 21(2), 287-314. doi: 10.1016/j.jfi.2011.10.002
- Hanson, W. E., Creswell, J. W., Plano Clark, V. L., Petska, K. P., & Creswell, J. D. (2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology* 52(2): 224–35.

- Harris, C. (2003). *Private Participation in Infrastructure in Developing Countries: Trends, Impacts, and Policy Lessons*. Washington, D.C.: World Bank.
- Harper, M., & Cole, P. (2012). Member checking: Can benefits be gained similar to group therapy? *The Qualitative Report*, 17(2), 510-517.
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-Based Nursing Online*,0(0). doi:10.1136/eb-2015-102129 .
- International Finance Corporation. (2011). *International Finance Institutions and Development Through the Private Sector*. Retrieved from <https://www.adb.org/sites/default/files/publication/29108/ifi-development-private-sector.pdf>
- Jechouteck, K. G., & Lamech, R. (1995). *Private Power Financing – from Project Finance to Corporate Finance*. Note no. 56. Washington, D.C.: World Bank.
- Johnson, J. W., & Lebreton, J. M. (2004). History and Use of Relative Importance Indices in Organizational Research. *Organizational Research Methods*, 7, 238–257.
- Johnson, R.J., Onwuegbuzie, A. J., & Turner, A. (2007). Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research*, 1(2),112-133.
- Joppe, M. (2000). The Research Process. Retrieved February 25, 1998. Retrieved from <http://www.ryerson.ca/~mjoppe/rp.htm>.
- Jorgenson, D. (1963). Capital Theory and Investment Behavior. *American Economic Review*, 53(2),247-259.
- Kashi, B. (2015). Risk management and the stated investment costs by independent power producers. *Energy Economics*, 49, 660–668. Retrieved from <http://isiarticles.com/bundles/Article/pre/pdf/42307.pdf>
- Kendall, M.G. (1955). *Rank Correlation Methods*. New York: Hafner Publishing Co.
- Kendall, M. G. (1970). *Rank Correlation Methods* (4th edition). London: Griffin.

- Kent, R.A. (1993). *Marketing research in action*. London: Routledge.
- Kirk, J., & Miller, M. (1986). *Reliability, validity and qualitative research*. Beverly Hills CA: Sage.
- Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *The American Journal of Occupational Therapy*, 43(3), 214.
- Larson, M.G. (2006). Descriptive Statistics and Graphical Displays. *Circulation*, 114 (1), 76-81.
- Li, B. (2003). *Risk management of PPP projects*. PhD diss. Glasgow Caledonian University.
- Li, B. Akintoye, A.; Edwards, P. J., & Hardcastle, C. (2005). Perceptions of positive and negative factors influencing the attractiveness of PPP/PFI procurement for construction projects in the UK: Findings from a questionnaire survey. *Engineering, Construction and Architecture Management*, 12(2), 125–148.
- Mankiw, N. G. (2015). *Macroeconomics*. New York: Worth Publishers.
- Marshall, C., & Rossman, G. (2011). *Designing qualitative research* (5th ed.). Thousand Oaks, CA: Sage.
- McClelland, S.B. (1994). Training Needs Assessment Data-gathering Methods: Part 1, Survey Questionnaires. *Journal of European Industrial Training*, 18 (1), 22 – 26.
- McCracken, G. (1988). *The long interview*. Newbury Park, California: SAGE Publications.
- McDonald, R., & Siegel, D. (1986). The Value of Waiting to Invest. *Quarterly Journal of Economics*, 101, 707-727.
- MDB Working Group.(2011). *Infrastructure Action Plan*. Retrieved from [http://www.g20india.gov.in/pdfs/B-2011-MDBs\\_Infrastructure\\_Action\\_Plan.pdf](http://www.g20india.gov.in/pdfs/B-2011-MDBs_Infrastructure_Action_Plan.pdf)
- Meadows, K. (2003). So you want to do research? 4: An introduction to quantitative methods. *British Journal Of Community Nursing*, 8(11), 519-526.
- Ministry of Energy and Power Development. (2016a). *Investment Opportunities in the*

- Zimbabwe Energy Sector*. Retrieved from <http://www.energy.gov.zw/index.php/site-administrator>.
- Ministry of Energy and Power Development. (2016b). Official Statistics.
- Moran, T. H. (1998). *Foreign Direct Investment and Development: The New Policy Agenda for Developing Countries and Economies in Transition*. Washington: Institute for International Economics.
- Moustakas, C. E. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.
- Mtunzi, B., Mampwheli, N., Meyer, E., & Mungwena, W.(2012). Bagasse-based co-generation at Hippo Valley Estates sugar factory in Zimbabwe. *Journal of Energy in Southern Africa*, 23 (1), 15-22.
- Muhwezi, L., Acai, J., & Otim, G. (2014). An Assessment of the Factors Causing Delay on Building Construction Project in Uganda. *International Journal of Construction Engineering and Management*, 3(1),13-23. doi: 10.5923/j.ijcem.20140301.02.
- National Energy Policy, Zimbabwe. (2012).
- Nevitt, P. K. (1979). *Project financing*. London: Euromoney Publication.
- Nevitt, P. & Fabozzi, F. (2000). *Project Financing*. London: Euromoney Books.
- Newman, I., Ridenour, C. S., Newman, C., & DeMarco, G. M. P. (2003). *A typology of research purposes and its relationship to mixed methods*. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 167-188). Thousand Oaks, CA: Sage.
- Nunnally, J. O. (1978). *Psychometric Theory* (2nd edition). New York: McGraw-Hill.
- Nunnally, J.C. & Bernstein, I.H. (1994). *Psychometric Theory* (3rd ed). New York: McGraw-Hill.
- Okpala, D.C., & Aniekwu, A.N. (1988). Cause of high cost of construction in Nigeria . *Journal of Construction Engineering and Management, ASCE* , 114 (2). 785-794.

- Onwuegbuzie, A. J., Witcher, A.E., Collins, K.M.T., Filer, J.D., Wiedmaier, C.D., & Moore, C.W. (2007). Students' Perceptions of Characteristics of Effective College Teachers: A Validity Study of a Teaching Evaluation Form Using a Mixed-Methods Analysis. *American Educational Research Journal*, 44 (1), 113-160.
- Pallant, J. (2001). *The SPSS survival manual: A step-by-step guide to data analysis using SPSS for Windows (version 10)*. St Leonards, NSW: Allen & Unwin.
- Palys, T. (2008). *Purposive sampling*. In L. M. Given (Ed.) *The Sage Encyclopedia of Qualitative Research Methods*. (Vol.2). Sage: Los Angeles, pp. 697-8.
- Pannucci, C.J., & Wilkins, E.G. (2010). Identifying and Avoiding Bias in Research. *Plastic and Reconstructive Surgery*, 126(2), 619-625.
- Paulhus, D. L. (1991). *Measurement and control of response bias*. In: J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of Personality and Social Psychological Attitudes* (pp. 17-59). San Diego, CA: Academic Press.
- PGBI Group. (2016). *Turnkey Contract: Sugar Mill Upgrade Programme: Hippo Valley Estates*. Retrieved from <http://pgbi.co.za/content/turnkey-contract-sugar-mill-upgrade-programme-hippo-valley-estates>.
- Piercy, K. W. (2004). Analysis of semi-structured interview data. Retrieved from [http://konference.fdvinfo.net/rc33/2004/Data/PDF/stream\\_03-15.pdf](http://konference.fdvinfo.net/rc33/2004/Data/PDF/stream_03-15.pdf).
- Pindyck, R. S. (1988). Irreversible Investment, Capacity Choice, and the Value of the Firm. *The American Economic Review*, 78(5), 969-985.
- Pindyck, R.S. (1991). Irreversibility, Uncertainty and investment. *Journal of Economic Literature*, 29 (3), 1110-1148.
- Popper, K. (2004) *The Logic of Scientific Discovery* (1959), reprinted (2004) by Routledge, Taylor & Francis.
- Price Waterhouse Coopers. (2011). *The next chapter: Creating an understanding of Special*

- Purpose Vehicles*. Retrieved from <http://www.pwc.com/gx/en/banking-capital-markets/publications/assets/pdf/next-chapter-creating-understanding-of-spvs.pdf>.
- Pushak, N., & Briceno-Garmendia, C. (2011). Zimbabwe's Infrastructure: A Continental Perspective. *World Bank Policy Research Working Paper Series*, 5816, 1-63.
- Qiao, L., Wang, S.Q., Tiong, R.L.K. & Chan, T.S. (2001). Framework for critical success factors of BOT projects in China. *Journal of Project Finance*, 7(1), 53–61.
- REN21. (2015). *SADC Renewable Energy and Energy Efficiency Status Report*. Paris: REN21 Secretariat.
- Ringskog, K. (2013). Zimbabwe: Infrastructure Policy Review. *World Bank Policy Research Working Paper Series*, 103580,1-40.
- Roberts, M. J. D. (1983). Legal Issues in Energy-Related Project Finance. *International Finance Law Review*, 20 (2), 20-25.
- Roberts, P., Priest, H. & Traynor, M. (2006) Reliability & Validity in Research. *Nursing Standard*, 20(44), 41-45.
- Robson, C. (1993). *Real World Research: A Resource for Social Scientists and Practitioners-Researchers*. Oxford: Blackwell.
- Rockart, J. F. (1979). Chief executives define their own data needs. *Harvard Business Review*.
- Shehu, Z., & Akintoye, A. (2009). Construction programme management theory and practice: contextual and pragmatic approach. *International Journal of Project Management*, 27 (7), 703–716.
- Smith, W., & Hallward-Driemeier, M. (2005). *Understanding the investment climate Finance & Development, March 2005*. By International Monetary Fund. External Relations Dept.
- Sorge, M. (2004). The nature of credit risk in project finance. *BIS Quarterly Review*, 12 (6), 91 – 101. Retrieved from [http://www.bis.org/publ/qtrpdf/r\\_qt0412h.pdf](http://www.bis.org/publ/qtrpdf/r_qt0412h.pdf).

- Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.
- Teddlie, C., & Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research, 1*, 77-100.
- Tiong, R. L. K., Khim-Teck, Yeo & McCarthy, S. C. (1992). Critical Success Factors in Winning BOT Contracts . *Journal of Construction Engineering and Management, 118* (2), 217-228.
- Van der Eijk, C., & Rose, J. (2015). Risky business: Factor analysis of survey data – assessing the probability of incorrect dimensionalisation. *PLOS ONE, 10*.
- Victor, D.G., Heller, T.C., House, J. C., & Woo, P.Y. (2004). The Experience with Independent Power Projects (IPPs) in Developing Countries: Introduction and Case Study Methods. *PESD Working Paper No, 23*.
- Vernon, Raymond. (1971). *Sovereignty at Bay: The Multinational Spread of US Enterprises*. New York: Basic Books.
- Vernon, Raymond. (1977). *Storm over the Multinationals: The Real Issues*. Cambridge, MA: Harvard University Press.
- Wai S.H, Yusof A.M, Ismail S, Ng C.A (2012) Exploring Success Factors of Social Infrastructure Projects in Malaysia. *International Journal of Engineering Business Management, 5*(2), 1-9.
- Woodhouse, E. J. (2005). *The Experience with Independent Power Projects in Developing Countries: Interim Report*. Stanford, CA: Program on Energy and Sustainable Development, Stanford University.
- Woodhouse, E. J. (2006). The Obsolescing Bargain Redux? Foreign Investment In The Electric Power Sector In Developing Countries. *NYU Journal of International Law and Politics, 38*,121-219. Retrieved from <http://nyujilp.org/wp->

content/uploads/2013/02/38.1\_2-Woodhouse.pdf

Woolf, F., & Halpern, J. (2001). Integrating Independent Power Producers into Emerging Wholesale Power Markets. *Policy Research Working Papers*, 2703, 1-37.

doi:10.1596/1813-9450-2703

World Bank. (2003). *Philippines: An Opening For Sustained Growth. Country Economic* (No.11061-PH). Washington, D.C.: World Bank

World Bank. (2004). *Global Development Finance 2004* (Complete Edition). Washington, D.C.: The World Bank

World Bank. (2005). *A Better Investment Climate For Everyone. World Development Report*. Washington DC: The World Bank.

World Bank. (2007). *The Investment Climate in Africa from the Perspective of Private Investors. Background report for Africa Competitiveness Report 2007*. Washington DC: The World Bank.

World Bank. (2013). *Financing for Development Post-2015*. Washington, D.C.: The World Bank Retrieved from <https://www.worldbank.org/content/dam/Worldbank/document/Poverty%20documents/WB-PREM%20financing-for-development-pub-10-11-13web.pdf>

World Bank. (2016a). Glossary of Terms – Private Participation in Infrastructure (PPI) Projects Database. Retrieved from <http://ppi.worldbank.org/methodology/glossary>

World Economic Forum., & Organisation of Economic Cooperation and Development. (2015). *Blended Finance Vol. 1: A Primer for Development Finance and Philanthropic Funders*. Retrieved from [http://www3.weforum.org/docs/WEF\\_Blended\\_Finance\\_A\\_Primer\\_Development\\_Finance\\_Philanthropic\\_Funders\\_report\\_2015.pdf](http://www3.weforum.org/docs/WEF_Blended_Finance_A_Primer_Development_Finance_Philanthropic_Funders_report_2015.pdf).

World Bank. (2016). Zimbabwe Economic Update Report, World Bank Website.

- Yusof, A., & Salami, B. (2013). Success factors for build operate transfer (BOT) power plant projects in Iran. *International Journal of Modern Engineering Research*, 3 (1), 324-330.
- ZERA. (2016a). Official Statistics.
- ZERA. (2016b) *Home Page*. Retrieved from <http://www.zera.co.zw>.
- Zera licenses 24 independent power producers. (2016, June 13). The Chronicle. Retrieved from <http://www.chronicle.co.zw/zera-licences-24-independent-power-producers/>.
- Zhang, X. (2005). Critical success factors for public private partnerships in infrastructure development. *Journal of Construction Engineering and Management*, 131, 3–14.
- Zhao, Z., Zuo, J., Zillante, G., & Wang, X. (2010). Critical success factors for BOT electric power projects in China : Thermal power versus wind power. *Renewable Energy*, 35(6), 1283–1291.
- Zhao, Z.Y., Zuo, J. and Zillante, G. (2013). Factors influencing the success of BOT power plant projects in China: a review. *Renewable and Sustainable Energy Reviews*, 22(1), 446-453.
- ZPC. (2016). *Stations*. Retrieved from <http://www.zpc.co.zw/powerstations>.

## 8 APPENDICES

### APPENDIX A: ZIMBABWE IPP AND ENERGY SECTOR INFORMATION

#### OVERVIEW OF KEY ENERGY SECTOR LEGISLATION

##### **Electricity Act of 2002**

- Brought about the restructuring and unbundling of ZESA (a vertically integrated utility) into separate successor companies under ZESA Holdings responsible for generation, transmission and distribution and service.
- Led to the establishment of a regulator for the electricity sector.
- Liberalised the energy sector and allowed private participation in generation

##### **Energy Regulatory Authority Act of 2011**

- Led to the establishment of ZERA,
- Empowers the ZERA board to issue or withdraw licenses to all players in the entire energy sector not just the electricity sub sector (includes petroleum and renewable energy sub sectors).
- Mandates ZERA to regulate the procurement production, transportation, transmission, distribution, importation and exportation of energy derived from any energy source.
- Creates a legal framework to promote fair competition among both private and public players.

##### **National Energy Policy of 2012**

- Sets out a framework for measures that will aid in the development of the sector.
- Its objectives include
  - accelerating economic development
  - facilitating rural development
  - ensuring environmentally friendly energy development
  - ensuring efficient utilisation of energy resources.
- Speaks further unbundling and privatisation of the utility (which is yet to be implemented)

## SUMMARY OF LICENSED IPPS – CAPACITY AND ESTIMATED COSTS

	LICENSEE	TECHNOLOGY	CAPACITY	EST. COST
	<b>A. OPERATIONAL</b>		MW	USD
1	Border Timbers*	Biomass ( wood waste)	0,5	
2	Duru	Mini Hydro	2,2	2,969,604
3	Green Fuel	Bagasse	18,3	
4	Nyamingura	Mini Hydro	1,1	6 ,769 ,053
5	Pungwe A	Mini Hydro	2,75	4,474,576
6	Hippo Valley Estates	Bagasse (co-gen)	33	
7	Triangle Estates	Bagasse (co-gen)	45	36 814 167
8	Pungwe B Power Station	Mini Hydro	15,25	26 588 488
9	Pungwe C Power Station Pvt Ltd	Mini Hydro	3,72	7 000 000
	<b>SUB-TOTAL</b>		<b>121,82</b>	
	<b>B. NOT YET OPERATIONAL</b>			
1	Sengwa Power Station	Thermal(Coal- fired)	2400	4 400 000 000
2	Pan African Energy Resources (Pvt) Ltd	Thermal(Coal- fired)	2000	4 000 000 000
3	Southern Energy	Thermal(Coal- fired)	600	1 100 000 000
4	Great Zimbabwe Hydro Power (Pvt) Ltd	Mini Hydro	5	6 700 000
5	Manako Power (Pvt) Ltd	Mini Hydro	2,5	13 000 000
6	Kupinga Renewable Energy	Mini Hydro	1,6	4 434 500
7	GeoBase Klean Energy Africa	Solar PV	250	240 000 000
11	Yellow Africa	Solar PV	50	109 950 000
12	H.T.Gen	Mini Hydro	3,3	6 048 016
13	Plum Solar	Solar PV	5	6 723 000
11	Immaculate Technologies	Mini Hydro	1,7	2 962 000
12	Shilands Enterprises	gas fired	345	405 604 134
13	De Green Rhino Energy	Solar PV	50	100 000 000
14	Lueven Investments	Solar PV	10	20 000 000
15	Hauna Power Station Private Limited	Mini Hydro	2,3	7 301 835
16	Sinogy Power	Solar PV	175	489 760 000
17	Centragrid Private Limited	Solar PV	25	50 334 049
18	Utopia Power Company Private Limited	Solar PV	15	25 100 000
19	SolGas (Private) Limited	Solar PV	5	8 423 750
20	Richaw Solar Tech Private Limited	Solar PV	5	10 018 000
	<b>SUB TOTAL</b>		<b>6551,40</b>	
	<b>GRAND TOTAL</b>		<b>6673,22</b>	

## IPP PROJECT DEVELOPMENT COSTS

Type of Fee	Incidence	Fee	Sliding Scale Fee	Source
<b>Generation License Application Fee</b>	Upfront			(ZERA, 2016a)
<b>Greenfield Generation License</b> 1 -10 MW 11MW and above	Every 5 years* Every 5 years*	\$10 000 \$20 000	plus 10 000 per 25 MW***	(ZERA, 2016a)
<b>Brownfield Generation License</b> 1 -10 MW 11MW and above	Every 5 years * Every 5 years*	\$5 000 \$10 000	plus 5 000 per 25 MW***	(ZERA, 2016a)
<b>Environmental Impact Assessment (EIA)</b>	Upfront	0.8% -1.0%	of the project cost	(EMA, 2016)
<b>Land Lease Fee</b>	Annual **	\$20 000		
<b>Non-consumptive Water Use Permit</b> <i>For projects on:</i>  ZINWA infrastructure  Run-off river  Self built infrastructure	Annual Annual Annual	10% \$1.00/Kw \$0.50/Kw	of project revenues plus, a variable charge of \$0.001/Kw plus, a variable charge of \$0.001/Kw	(ZERA, 2016a)

\* till expiry of license, \*\* for duration of lease, \*\*\* or part thereof

## APPENDIX B: CONSENT FORM AND INTERVIEW FRAMEWORK

### INFORMED CONSENT FORM



**Researcher:** Timisela Zunguze

**Research Title:** *Defying The Odds – Understanding the Critical Success Factors for Financing Independent Power Producers in Zimbabwe*

#### **Project Overview and Purpose:**

This research study is being undertaken for a thesis that forms part of the requirements to complete a Master of Commerce in Development Finance at the Graduate School of Business, University of Cape Town under the supervision of Professor Anton Eberhard.

The purpose of the study is to investigate, identify and understand the critical success factors for financing independent power producers (IPPs) in Zimbabwe by examining the IPPs in the country that have been successfully implemented and in depth interviews with various stakeholders and practitioners. Specifically, the research seeks to explore the perceptions amongst practitioners and stakeholders, to ascertain their outlook of the IPP industry as a whole, their opinions of what the critical success factors are and insights and recommendations as to how implementation can be fine tuned to accelerate investment and completion of projects.

Due to the exploratory nature of the research a qualitative approach has been adopted, using interviews to learn more about the experiences, practices, assessments and aspirations of all the stakeholders and practitioners in the development of IPPs in Zimbabwe. The research will aid in expanding the knowledge about the successful implementation of IPPs in Zimbabwe and add to the body of literature focused on energy infrastructure development in Africa.

There are no known risks or dangers to you associated with this study. Unless you provide an explicit approval, the researcher will not attempt to identify you with responses given during the interview, or to name you as a participant in the study, nor will she facilitate anyone else doing so.

*I acknowledge that I am participating in this study of my own free will. I understand that I may refuse to participate or stop participating at any time without penalty. If I wish, I will be given a copy of this consent form.*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Please Print Name: \_\_\_\_\_

## INTERVIEW FRAMEWORK

### Defying The Odds: Understanding the Critical Success Factors for Financing Independent Power Producers in Zimbabwe

#### 1) General Questions

All participants will be asked this set of questions regardless of stakeholder grouping.

##### *A: General Information on Interviewee and Organisation*

1. What type of organisation do you work for?
  - a. Pension Fund
  - b. Private Equity
  - c. Asset Management
  - d. Commercial Bank
  - e. Public Utility
  - f. Independent Regulator
  - g. Development Finance Institution
  - h. IPP/Development Company
  - i. Legal Advisory/Law Firm
  - j. Financial Advisory
  - k. Other (specify)
2. What is your position/role and job function in the organisation?
3. How long have you worked for the organisation?
4. What is your educational background?
  - a. Accounting/Finance/Economics
  - b. Business Administration/Business Management
  - c. Natural Science/Engineering
  - d. Politics/Development Studies
  - e. Arts/History/Law
  - f. Other (please specify)
5. Briefly describe your experience with IPPs and energy infrastructure projects.

##### *B: General Questions on IPP Financing and Development in Zimbabwe*

###### Country Level Perspective

6. What is your view on the level of private participation in generation in Zimbabwe? Prompt: How do you think it compares to other countries in the region?
7. Has the introduction of a multi-currency regime/dollarization in 2009 aided or hindered the development and financing of IPPs?
8. What has been the impact of the Indigenisation laws on IPP development and financing in Zimbabwe?
9. What is your view on the current IPP licensing and tariff framework in Zimbabwe? Prompt: What are its strengths or shortcomings?
10. Do you think a competitive bidding framework for IPPs in Zimbabwe should be introduced?
11. Do you think there is adequate support for IPPs by government?

12. What institutional or regulatory changes, if any, would you suggest to increase investment and the participation of private players in generation?

Project Level Perspective

13. What stage of the project development process do you think is most critical for the success of an IPP – procurement, construction or operation.
14. How important do you think the scale/ size of a project (planned installed capacity) is for the success of an IPP?
15. What are the top three risks at the project level for an IPP developer in Zimbabwe?

.....

The following schedules contain questions that will be asked to each stakeholder grouping separately.

**2) Interview Schedule for IPPs**

*Project Details*

1. How many of your power projects have reached financial closure, are in construction, have been commissioned or are in operation?
2. What type of projects are they? Prompt: Hydro, solar or other
3. What is the installed capacity/ size of each project?
4. What is the total project cost for each project?
5. Did you have to construct transmission infrastructure for evacuation of power and connecting to the grid as part of the project? What percentage of the total project cost was the associated transmission infrastructure?
6. What is the procurement arrangement for each project? Prompt: Build, Own Operate (BOO) or Build Own Operate Transfer (BOOT)?
7. What was the duration of 1) planning 2) construction 3) operation?  
Prompt: (planning includes feasibility, design and negotiation)
8. What was the project finance structure in terms of what percentage of the total investment is equity?
9. Did you employ any advisors to assist you with project implementation?
10. Did you acquire any government guarantees for the project(s)?
11. Did you negotiate the generation tariff directly with ZETDC?
12. What security arrangements did you make with ZETDC for the project(s)?
13. How would you describe the negotiation process with government? Who was in the stronger position when bargaining for the PPA contract terms.
14. What has been your experience with the off-taker in terms of payment for electricity generated? Have you had any payment disputes to date?

*General Questions*

15. Is experience important in successfully developing an IPP? Did you have any prior experience in energy infrastructure projects before developing your own?
16. What influenced your decision on what project size to implement?
17. How would you rate the licensing and permitting process for an IPP in Zimbabwe -Easy, moderate, difficult or very difficult? What kind of costs are involved?
18. How accessible is debt financing, both local and global, for projects in Zimbabwe?
19. What is the most difficult stage of project implementation – planning, construction or operations?
20. Did you experience any significant delays in project implementation? What caused those delays?
21. What difficulties if any did you experience in arranging the finance and security arrangements

- for the project(s)?
22. Do you have any other remarks you would like to make?

### **3) Interview Schedule for Advisors**

1. What in your opinion are the major reasons why some licensed project developers fail to reach financial closure?
2. Are typical project development costs for IPPs prohibitively high?
3. What project characteristics do investors consider in assessing the financial feasibility of a project in Zimbabwe?
4. Does the domestic market have any capacity to participate in financing IPPs? What, if any, are those local financing sources?
5. What external financing sources are accessible to projects in Zimbabwe? What are the main barriers to accessing external financing for projects in Zimbabwe?
6. What is the level of involvement of DFIs in the development of IPPs and other energy projects in Zimbabwe?
7. What is the most common form /feasible financing structure for IPP projects in Zimbabwe? Prompt: project finance or corporate finance?
8. What are the typical financial and legal conditions precedent required by debt financiers or investors in Zimbabwe?
9. Is international arbitration possible for IPPs in Zimbabwe?
10. What are the key risks that financiers or investors need to be covered for in order to invest in Zimbabwe?
11. In your experience, what kind of government support/guarantees are available to cover these risks for IPPs in Zimbabwe?
12. The transmission utility is the sole off-taker for IPPs in Zimbabwe and the PPA is central to securing the revenue. Is this a hindrance to securing financing for IPPs? If so, how might this risk be mitigated in the Zimbabwean context?
13. What security arrangements are available to IPP developers in Zimbabwe? What are the conditions for successfully arranging this?
14. What credit enhancements or investment incentives are available in Zimbabwe for investment in private generation?
15. What market trends do you foresee for IPP space in Zimbabwe over the next 5 to 10 years?
16. What do you think are the top three enablers that must be established in order to increase investment in private generation in Zimbabwe? Prompt: conducive laws, regulations, fiscal measures, steps towards acquiring a credit rating etc.?
17. Do you have any other remarks you would like to make?

### **4) Interview Schedule for Investors**

1. What is your organisation's investment mandate? Does your organisation have an appetite for energy projects in Zimbabwe?
2. How many energy projects in Zimbabwe, if any, have your organisation invested in? How many of those were IPPs?
3. What is the typical investment size your organisation makes?
4. Do you use equity instruments, debt instruments or both? If equity, what is the minimum equity stake you look for?
5. What project characteristics do you consider in assessing the bankability of a project in Zimbabwe?
6. What is the hurdle rate your organisation targets for investments?
7. Briefly describe the key components of your organisation's investment appraisal process.
8. Briefly describe your organisation's investment approval procedures.
9. What are your key concerns when considering an investment in the energy sector in Zimbabwe?

10. What in your opinion are the major risks associated with investing in Zimbabwe?
11. What measures in your opinion would reduce the risk of financing projects in Zimbabwe?
12. What security arrangements do you expect, at the very minimum, when investing in Zimbabwe?
13. Do you have any other remarks you would like to make?

**5) Interview Schedule for the National Energy Regulator**

1. What is the total number of IPPs that have been licensed? What is the split by type of energy?  
Prompt: How many hydro, solar, gas etc.
2. Briefly outline the licensing adjudication process? How do you score/rate license applicants?
3. What are the typical generation license conditions?
4. Are you satisfied with the standard of feasibility studies submitted by generation license applicants in general?
5. So few prospective IPPs in Zimbabwe have reached financial closure. At what point in project implementation do most developers get stuck in the mud?
6. What is (are) the major challenges faced by IPPs in project implementation in Zimbabwe?
7. What kind of assistance, if any, do IPP developers request from the Regulator with regard to project implementation?
8. What are your thoughts on the current IPP procurement policy (unsolicited applications) versus competitive bidding?
9. Is there a national energy sector plan for Zimbabwe?
10. Do you have any other remarks you would like to make?

**6) Interview Schedule for the Off-taker**

1. How many IPPs are actively supplying the grid?
2. What is the total amount of power supplied to the grid by IPPs?
3. What has been the operational performance of those IPPs in terms of availability?
4. What is the average duration of the PPAs you have signed with IPPs to date?
5. What are the security arrangements IPPs have requested for security of revenue?
6. What changes if any would you make to the current regulatory framework for IPPs?
7. In your PPA negotiation with the IPPs, who has the most bargaining power. Does this power change or shift once the IPP starts supplying the grid?
8. Do you have any other remarks you would like to make?

## APPENDIX C: SURVEY QUESTIONNAIRE

### Defying the Odds – Understanding the Critical Success Factors for Financing Independent Power Producers in Zimbabwe

#### Part 1: General Information on Respondent

---

1. What type of organisation you work for:

- Pension Fund       Advisory Firm     Asset Management     Government Department  
 DFI                       IPP                       Commercial Bank     International investor  
 Insurance Company     Regulator             Utility                     Other: Specify

2. What is your position in the organisation? \_\_\_\_\_

3. How many years of industrial experience do you have? \_\_\_\_\_ years

4. Which of the following energy projects have you/your organisation been involved in?

- Solar                       Bagasse  
 Hydro                     Wind  
 Coal                       Diesel

#### Part 2: Perception of IPPs and Energy Sector

Please rate the degree to which you agree/disagree with the following statements about IPPs and the energy industry in Zimbabwe. You may give support or further clarification of your response(s) in the comments box provided below.

#	General Statements	Not Applicable	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The laws and policy framework for private participation in generation are well crafted and sound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Policy on licensing and required permits for IPP's is accurately and consistently applied.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	The unsolicited bid procurement framework is the most optimal for Zimbabwe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	The regulator is competent, efficient and well capacitated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	The current tariff methodology results in a tariff that is cost reflective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6	Project development costs are unreasonably high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	There is a clear separation between the regulator and the line ministry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	There is need to further unbundle the offtaker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	There is adequate government support for IPPs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	There is investor appetite for IPP projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Part 3: Success Factors for Financing IPPs

Please evaluate the degree of relevance or importance of each of the listed factors on the successful financing of IPPs in Zimbabwe, using a scale of 1-5, where 1 is “Not critical for financing IPPs” and 5 is “Most critical for financing IPPs”.

Should you wish to elaborate further on your assigned rating for any particular factor, please add your comments in the box provided.

#	Success Factor	1 Not critical	2 Less critical	3 Critical	4 More critical	5 Most critical
S1	Bankable feasibility study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S2	Competitive bidding framework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S3	Stable macro economic policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S4	Experience and competency of the developer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S5	Expected debt paying ability of project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S6	Reasonable, fair expected return on equity (ROE)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S7	Clear policy on land for energy projects (tenure and fair price)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S8	Policy Guarantee Agreement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S9	Technical and financial assistance from DFIs for project preparation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S10	Competent, consistent and fair regulator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S11	Standardised PPA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S12	Project Size (planned initial installed capacity and transmission infrastructure requirements)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S13	Comprehensive national energy strategic plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S14	A transparent, cost reflective tariff framework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S15	Financial education about energy infrastructure as an asset class for domestic investors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<b>S16</b>	Government support in the form of sovereign guarantees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S17</b>	Reduction of country debt overhang	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S18</b>	Credit enhancements –escrow accounts, ring fencing of off-taker receivables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S19</b>	Project exemptions from tax and duties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S20</b>	Credit rating for Zimbabwe and local companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S21</b>	Further unbundling of the offtaker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S22</b>	Quality of local equity partners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S23</b>	Good stakeholder relationship management by project sponsors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S24</b>	Clear policy on decommissioning of PPAs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S25</b>	Origin of investors (local versus external financiers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S26</b>	Skilled and experienced advisors (financial, legal, technical)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S27</b>	Solid risk allocation, management and mitigation plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S28</b>	Experience of financiers with developing country risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S29</b>	Coordination between government departments responsible for issuing project permits and consents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S30</b>	Reasonable licensing and statutory fees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S31</b>	Operationally efficient and solvent off taker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S32</b>	Well functioning domestic financial markets and banking system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S33</b>	Upholding of contracts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S34</b>	Ability to export power regionally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S35</b>	A Program Champion for IPPS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S36</b>	Ability of IPPs to lobby government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S37</b>	Cost of financing (WACC)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S38</b>	Quality of technical partner and high technical performance of equipment/technology chosen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S39</b>	Financial innovation and creativity in structuring financing arrangements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S40</b>	Open and effective communication between the private and public sector	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If there are any other factors you feel are important but not listed above, please add them in the area provided below.

<b>S41</b>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S42</b>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>S43</b>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Part 4: Major Risks for IPP Investments

Please rank the following risks according to the degree of threat for IPP investments in Zimbabwe. The definition of each risk is given in italics below the named risk.

One (1) represents the highest/greatest threat and seven (7) represents the lowest/least threat. Use each number once.

#	Risk Factor	Rank
1	<b>Climate Risk</b> <i>The risk of loss due to an adverse change in the prevailing weather conditions</i>	
2	<b>Payment Risk</b> <i>The risk that the project will not generate expected or sufficient revenues to service debt and pay operational expenses due to the credit quality and the payment capacity of the off-taker.</i>	
3	<b>Developer Risk</b> <i>The risk that the developer/development team lacks the technical and financial capacity to effectively execute the project</i>	
4	<b>Country Risk</b> <i>The risk to investment arising from changes in the political and economic environment</i>	
5	<b>Technology Risk</b> <i>The risk to investment caused by defects, faults or incompleteness in the technology used.</i>	
6	<b>Currency and Transfer</b> <i>Risk of loss resulting from changes in the currency/exchange rate regime and the inability to freely move investment earnings out of the country</i>	
7	<b>Repayment Risk</b> <i>The risk of non- payment of debt service to lenders by the project company</i>	

---

## APPENDIX D: QUALITATIVE PHASE - RESPONDENT PROFILES AND FINDINGS

### EXPERT INTERVIEWS RESPONDENT PROFILES

Interviewees	Stakeholder Grouping	Organisation Type	Position	Years of industry experience	Date	Approx. duration (mins)
<b>Respondent 1</b>	Domestic Investor	Pension Fund	Head of Select Equity Investments	7	22-09-16	50
<b>Respondent 2</b>	Domestic Investor	Pension Fund	Head of Interest Bearing Investments	15	26-09-16	47
<b>Respondent 3</b>	Offtaker	Utility	Director	18	30-09-16	35
<b>Respondent 4</b>	Foreign Investor	Investor and EPC Contractor	Head of Marketing Investments	10	30-09-16	46
<b>Respondent 5</b>	Advisor	Development Finance Institution	Principal Financial Analyst	3	04-10-16	42
<b>Respondent 6</b>	Offtaker	Utility	Electricity Trading Manager	22	07-10-16	37
<b>Respondent 7</b>	IPP Developer	IPP Development Company	Chief Design Engineer & Operations Manager	36	07-10-16	30
<b>Respondent 8</b>	IPP Developer	IPP Development Company	Managing Director	18	18-10-16	30
<b>Respondent 9</b>	Advisor	Financial Advisory Firm	Director	18	18-10-16	40
<b>Respondent 10</b>	IPP Developer	IPP Development Company	Managing Director	7	24-10-16	35
<b>Respondent 11</b>	Government Department	Energy	Director	19	26-10-16	30
<b>Respondent 12</b>	Regulator	Energy Regulatory Authority	Economic Analyst	20	27-10-16	45
<b>Respondent 13</b>	IPP Developer	IPP Development Company	Managing Director	18	27-10-16	30
<b>Respondent 14</b>	IPP Developer	IPP Development Company	Director	4	27-10-16	48
<b>Respondent 15</b>	Government Department	Finance	Technical Advisor	17	01-11-16	50

## SUMMARY OF FACTORS IMPEDING INVESTMENT

<p><b>Country Level</b></p>	<p><b>Unfavourable investment climate</b> Liquidity challenges, low industry capacity utilization, weak domestic demand and no certainty of security of property rights and upholding of contracts</p> <p><b>Country's negative repayment record</b> Country debt overhang, negative country perception by international lenders</p> <p><b>Policy inconsistency</b> Inconsistency and inaccuracy in the application and implementation of existing policies creates uncertainty</p> <p><b>Lack of clear policy on how to counter balance country risk</b> Lack of political will to provide support for IPPs in arranging security for financing e.g. sovereign guarantees</p> <p><b>No clear policy on land</b> Tenure of leases for energy projects shorter than life of projects</p> <p><b>Unfavourable electricity market structure</b> Government protectionism of non performing entities, politically controlled final retail tariff and natural monopoly power of offtaker uncompetitive</p> <p><b>Negative public perception of private players</b> Private players viewed with suspicion and seen as competitors not partners in development</p> <p><b>Regulatory inefficiency</b> Under resourced regulator, political interference, circularity in licensing procedures, lengthy turnaround times, inconsistent application of policy and prioritisation of government projects over IPPs</p> <p><b>Inefficient tariff framework</b> No clear methodology is being applied (cost plus or REFIT or both), cost plus methodology encourages inefficient cost structures for IPPs, political interference in tariff determination and non-cost reflective tariffs</p> <p><b>Lack of coherent energy sector planning</b> Absence of a national energy plan that specifies targets for each type of resource and timelines for attainment of targets</p> <p><b>Weaknesses of unsolicited bids procurement practice</b> Speculators, unsuitably qualified developers awarded licenses, possible misalignment of land resources (arable land used for projects) and bed blocking</p>
<p><b>Project Level</b></p>	<p><b>Shallow domestic capital markets</b> Liquidity challenges, severely constrained deposit taking financial institutions, lack of domestic investor capability and understanding of long term infrastructure investments, dependence on foreign borrowings which given country risk are much harder to secure and lack of financial engineering skills</p>

**Project Level****Insincere international investors**

Few genuine investors, high incidence of investors just looking for a bargain

**High cost of financing**

High country risk premium, new market, burdensome escrow arrangements (funding requirements and cost of housing escrows in banks outside the country)

**Limited credit enhancements**

No sovereign or commercial guarantees available

**Lengthy financing negotiations**

Stringent financing conditions and difficult to secure debt

**Poor project preparation**

None existent or poorly done feasibility studies and inability of developers to package project in a way that attracts investors

**Lack of creativity and financial innovation**

In arranging financing and security for IPPs

**Lack of initiative to lobby government**

IPPs not organised and hesitant to actively engage government

**Unskilled, inexperienced and under resourced developers**

Developers have no experience in developing projects and little or no financial capability to fund development costs or counterpart funding if required

**High project development costs**

High cost of advisory, feasibility studies, licensing fees and other statutory fees

**Challenges with the offtaker**

Poor creditworthiness, lengthy and bureaucratic PPA negotiations, operational inefficiencies, very long response times to address problems, limited scope for ring-fencing of receivables – availability of blue chip customers to ring fence is limited

**Inadequate government support**

Difficulty in acquiring national project status, incomplete support in providing guarantees required by investors, lack of coordination between government departments in issuing of supporting statutory requirements like EIA and land lease, long turn around times for issuance of permits and consents

## STRATEGIES RECOMMENDED BY RESPONDENTS TO INCREASE INVESTMENT IN IPPS

Strategy	Description	Issue solved or mitigated
<p><b>Competitive bidding Procurement</b></p> <p><i>Identified as a success factor</i></p>	<p>Must be based on based on international best practice. Suggestions for implementation included:</p> <p>1. Pure competitive bidding practices where The Ministry of Energy should identify potential sites for the various IPP technologies and the development of these sites as IPPs are put to tender. Joint venture partnerships with local companies as a pre-qualification requirement to bid in order to protect smaller local players from being pushed out by bigger global players. Standardised project documentation – key contracts and other support agreements</p> <p>2. Hybrid procurement method A combination of unsolicited bids for smaller projects and competitive bidding for larger projects to maximise cost efficiency and simplify execution, standardised documentation and support agreements</p>	<p>Speculators Bed blocking Poor project preparation</p>
<p><b>Credit risk insurance from external credit insurers</b></p>	<p>Government does not give commercial guarantees but financiers often require commercial guarantees against offtaker risk. To get around this, IPPs can approach credit risk insurers such as Euler Hermes. However, there is a trade off because insurance will increase the total project cost.</p>	<p>No government support in the form of commercial guarantees</p>
<p><b>Investment incentives</b></p> <p><i>Identified as a success factor</i></p>	<p>The provision of investment incentive for investments made in critical sectors like energy for local institutional investors, where government permits a certain percentage of the total amount invested in an energy project to be invested offshore. This effectively creates a hedge against country risk for some portion of the investment which encourages investment.</p>	<p>Currency risk Country risk Low rate of investment</p>
<p><b>Stricter adjudication of feasibility studies at licensing stage</b></p>	<p>The licensing framework should explicitly state the minimum acceptable standards for feasibility studies to be submitted by potential licensees and these standards should be enforced by the regulator in adjudicating license applications.</p>	<p>Speculators Poor project preparation</p>

Strategy	Description	Issue solved or mitigated
<p><b>Scalable projects that start small</b></p> <p><i>Identified as a success factor</i></p>	<p>Phased project implementation. Smaller projects are easier to execute than larger projects in this current environment. Once operational, developers can leverage the experience gained in executing the smaller project to scale up capacity. The risk is significantly reduced which should make financing the expansion phase easier</p>	<p>High cost of financing Execution risk Financing risk</p>
<p><b>Policy guarantees</b></p> <p><i>Identified as a success factor</i></p>	<p>Commitment from government on key policy issues affecting the implementation of IPPs such as no expropriation, land lease tenure, the right to export power, currency conversion and repatriation of profits.</p>	<p>Policy inconsistency and uncertainty</p>
<p><b>Letter of no intention for land allocated for energy projects</b></p>	<p>Security of tenure on land allocated for energy projects is critical and in Zimbabwe land is a very topical issue. In addition to a policy guarantees, government should issue a letter of no intention for the life of the project for land allocated for energy projects.</p>	<p>Policy uncertainty</p>
<p><b>Sovereign guarantees</b></p> <p><i>Identified as a success factor</i></p>	<p>Commitment from government regarding the survival and recognition of key project contracts such as the PPA, fuel supply agreements and land lease agreements should there be a change in government.</p>	<p>Country Risk Political Risk</p>
<p><b>Financial assistance from DFIs</b></p> <p><i>Identified as a success factor</i></p>	<p>Poor project preparation is largely the result of the developer lacking the financial resources to undertake the necessary project development to bring the project to a bankable state. DFIs are well placed to assist in funding some development costs such as the cost of undertaking feasibility studies.</p>	<p>Poor project preparation</p>
<p><b>Export oriented national energy plan</b></p> <p><i>Identified as a success factor</i></p>	<p>A national energy plan or a national energy framework that says one of the goals for the country is for Zimbabwe to be a net exporter by a specific year would greatly focus policy initiatives and attract investment. It should also make explicit targets for the mix of fuel technologies. It also removes uncertainty about where IPPs fit in the overall plan for the sector by government.</p>	<p>Policy uncertainty Low rate of investment in IPPs</p>

<p><b>A nodal agency to run the entire licensing and permitting process for IPPs</b></p>	<p>An institution that is a “one stop shop” which handles all the licensing, permitting and issuing of standardised government support agreements for IPPs.</p>	<p>Regulatory inefficiencies Lack of coordination between government departments</p>
<p><b>Financial education for domestic financial market</b> <i>Identified as a success factor</i></p>	<p>Raising awareness of infrastructure as an asset class and fostering an understanding of the modalities of long term energy infrastructure investments and its associated risks through conferences and workshops.</p>	<p>Shallow local capital markets Lack of understanding about energy infrastructure investments</p>
<p><b>Currency insurance</b></p>	<p>The creation of a form of insurance from regional banks or institutions, where IPPs pay premiums so that dollars will be made available when required should the monetary policy situation in the country change adversely.</p>	<p>Currency risk</p>
<p><b>Amending the Energy Regulatory Act to give ZERA full autonomy</b> <i>Identified as a success factor</i></p>	<p>The crafting of the law needs to be made more airtight. Currently it is contradictory and leaves room for political interference</p>	<p>Political interference in the determination of the tariff</p>
<p><b>Policy on decommissioning of PPA</b> <i>Identified as a success factor</i></p>	<p>A legal framework that governs how decommissioning of PPAs and renegotiating them for the remainder of the life of the plant is handled.</p>	<p>Offtaker risk</p>
<p><b>Seller’s Credit to finance projects</b></p>	<p>Contractor gets Seller’s Credit –a percentage of the total cost - loan agreement between contractor and banks - then another between contractor and project owner</p>	<p>Underinvestment in IPPs Financing Risk</p>

<b>Unbundling the offtaker</b> <i>Identified as a success factor</i>	Separating distribution and retail function. More offtakers to encourage competition and efficiency	Offtaker risk
<b>Alternative forms of Government Support</b>	<ul style="list-style-type: none"> <li>- Providing enhancements that encourage investment e.g. subsidies, guarantees</li> <li>- Providing land at no cost to developers to be repaid for downstream</li> <li>- Special economic zones</li> </ul>	Inadequate government support
<b>Local capacity building efforts in various fuel technologies spearheaded by Government</b>	Capacity building concerning the various technologies, Zimbabwe wants to implement with regard to power generation. Not just for the benefit of prospective local developers but also government itself. Either through specialised training or courses/degrees offered at local institutions	Technology Risk Execution Risk
<b>Creation of an IPP Regional Power Trading Mechanism</b>	In order to guarantee hard currency that is required to repay investors a viable avenue could be through exporting power to the region through organisations like SAPP. Currently this avenue is only available to the generation utility only but not to IPPs. IPPs need to partner with the utility to be able to export their power because most are not dispatchable (export requires consistent supply) and too small to be able to negotiate such agreements on their own.	Currency risk Offtaker risk
<b>Optimisation of tariff framework</b>	Several tariff models should be explored and interrogated to determine the best one, which could actually be a hybrid of existing models e.g. a long run marginal cost model. ZERA needs to do more work there.	

## APPENDIX E: QUANTITATIVE PHASE - FINDINGS

### SURVEY DATA DESCRIPTIVE STATISTICS

	N	Mean		Standard Deviation	Variance	Skewness		Kurtosis	
	Stat	Stat	SE	Stat	Stat	Stat	SE	Stat	SE
S1	36	4,08	0,16	0,97	0,94	-0,37	0,39	-1,44	0,77
S2	36	3,31	0,20	1,21	1,48	0,18	0,39	-1,21	0,77
S3	36	4,00	0,16	0,96	0,91	-0,42	0,39	-1,00	0,77
S4	36	4,06	0,14	0,86	0,74	-0,40	0,39	-0,83	0,77
S5	36	4,44	0,12	0,69	0,48	-0,87	0,39	-0,39	0,77
S6	36	4,22	0,11	0,68	0,46	-0,31	0,39	-0,76	0,77
S7	36	3,94	0,18	1,09	1,20	-0,44	0,39	-1,26	0,77
S8	36	3,72	0,16	0,97	0,95	-0,18	0,39	-0,93	0,77
S9	36	3,64	0,18	1,07	1,15	-0,24	0,39	-1,15	0,77
S10	36	4,06	0,16	0,98	0,97	-0,88	0,39	0,76	0,77
S11	36	3,53	0,18	1,06	1,11	-0,62	0,39	0,22	0,77
S12	36	3,39	0,19	1,15	1,33	-0,13	0,39	-1,07	0,77
S13	36	3,89	0,17	1,04	1,07	-0,42	0,39	-1,03	0,77
S14	36	4,39	0,12	0,73	0,53	-0,77	0,39	-0,68	0,77
S15	36	3,50	0,18	1,08	1,17	-0,14	0,39	-0,65	0,77
S16	36	3,33	0,22	1,33	1,77	-0,27	0,39	-1,02	0,77
S17	36	3,36	0,20	1,22	1,49	-0,25	0,39	-0,70	0,77
S18	36	3,75	0,14	0,84	0,71	-0,10	0,39	-0,58	0,77
S19	36	3,08	0,17	1,00	0,99	-0,17	0,39	-0,40	0,77
S20	36	3,25	0,16	0,94	0,88	-0,10	0,39	-0,11	0,77
S21	36	2,86	0,20	1,17	1,38	0,40	0,39	-0,80	0,77
S22	36	3,53	0,19	1,13	1,28	-0,45	0,39	-0,35	0,77
S23	36	3,64	0,16	0,96	0,92	-0,42	0,39	0,28	0,77
S24	36	3,31	0,18	1,06	1,13	-0,06	0,39	-0,75	0,77
S25	36	2,53	0,20	1,21	1,46	0,50	0,39	-0,46	0,77
S26	36	3,67	0,14	0,86	0,74	0,16	0,39	-0,78	0,77
S27	36	3,81	0,15	0,89	0,79	-0,11	0,39	-0,85	0,77
S28	36	3,69	0,16	0,98	0,96	-0,29	0,39	0,05	0,77
S29	36	4,03	0,14	0,84	0,71	-0,05	0,39	-1,61	0,77
S30	36	3,75	0,16	0,94	0,88	-0,12	0,39	-0,90	0,77
S31	36	4,03	0,14	0,84	0,71	-0,36	0,39	-0,77	0,77
S32	36	3,92	0,14	0,84	0,71	-0,14	0,39	-0,90	0,77
S33	36	4,36	0,14	0,83	0,69	-1,10	0,39	0,36	0,77
S34	36	3,47	0,20	1,21	1,46	-0,50	0,39	-0,46	0,77

S35	36	3,00	0,17	1,04	1,09	0,48	0,39	-0,46	0,77
S36	36	3,17	0,19	1,16	1,34	0,12	0,39	-0,79	0,77
S37	36	4,00	0,15	0,89	0,80	-0,51	0,39	-0,52	0,77
S38	36	3,83	0,14	0,81	0,66	-0,02	0,39	-0,77	0,77
S39	36	3,83	0,15	0,88	0,77	-0,19	0,39	-0,73	0,77
S40	36	3,61	0,17	0,99	0,99	-0,05	0,39	-1,00	0,77
Valid N (list wise)	36								

### SHAPIRO WILK TEST

Shapiro-Wilk							
Factor	Statistic	df	Sig.	Factor	Statistic	df	Sig.
S1	0,77	36,00	0,00	S21	0,89	36,00	0,00
S2	0,87	36,00	0,00	S22	0,90	36,00	0,00
S3	0,83	36,00	0,00	S23	0,88	36,00	0,00
S4	0,84	36,00	0,00	S24	0,91	36,00	0,01
S5	0,73	36,00	0,00	S25	0,90	36,00	0,00
S6	0,79	36,00	0,00	S26	0,86	36,00	0,00
S7	0,81	36,00	0,00	S27	0,87	36,00	0,00
S8	0,88	36,00	0,00	S28	0,86	36,00	0,00
S9	0,87	36,00	0,00	S29	0,79	36,00	0,00
S10	0,81	36,00	0,00	S30	0,87	36,00	0,00
S11	0,89	36,00	0,00	S31	0,84	36,00	0,00
S12	0,90	36,00	0,00	S32	0,85	36,00	0,00
S13	0,85	36,00	0,00	S33	0,75	36,00	0,00
S14	0,75	36,00	0,00	S34	0,90	36,00	0,00
S15	0,90	36,00	0,00	S35	0,88	36,00	0,00
S16	0,90	36,00	0,00	S36	0,91	36,00	0,01
S17	0,90	36,00	0,00	S37	0,85	36,00	0,00
S18	0,87	36,00	0,00	S38	0,85	36,00	0,00
S19	0,91	36,00	0,01	S39	0,87	36,00	0,00
S20	0,90	36,00	0,00	S40	0,88	36,00	0,00

## OVERALL RANKING OF SUCCESS FACTORS

Code	Critical success factor	Number of Responses					Mean	RII	Rank
		1	2	3	4	5			
S5	Expected debt paying ability of project	0	0	4	12	20	4,44	0,889	1
S14	Transparent, cost reflective tariff framework	0	0	5	12	19	4,39	0,878	2
S33	Upholding of contracts	0	1	5	10	20	4,36	0,872	3
S6	Reasonable, fair expected return on equity	0	0	5	18	13	4,22	0,844	4
S1	Bankable feasibility study	0	1	12	6	17	4,08	0,817	5
S4	Experience and competency of the developer	0	1	9	13	13	4,06	0,811	6
S10	Competent, consistent and fair regulator	1	0	10	10	15	4,06	0,811	6
S29	Coordination between government departments	0	0	12	11	13	4,03	0,806	8
S31	Operationally efficient and solvent offtaker	0	1	9	14	12	4,03	0,806	8
S3	Stable macro economic policies	0	2	10	10	14	4,00	0,800	10
S37	Cost of financing (WACC)	0	2	8	14	12	4,00	0,800	10
S7	Clear policy on land for energy projects	0	4	10	6	16	3,94	0,789	12
S32	Well functioning domestic financial markets and banking system	0	1	11	14	10	3,92	0,783	13
S13	Comprehensive national energy strategic plan	0	4	9	10	13	3,89	0,778	14
S38	Quality of technical partner and high technical performance	0	1	12	15	8	3,83	0,767	15
S39	Financial innovation and creativity in structuring financing arrangements	0	2	11	14	9	3,83	0,767	15
S27	Solid risk allocation, management and mitigation plan	0	2	12	13	9	3,81	0,761	17
S18	Credit enhancements (escrow accounts, ring fencing receivables)	0	2	12	15	7	3,75	0,750	18
S30	Reasonable licensing and statutory fees	0	3	12	12	9	3,75	0,750	18
S8	Policy Guarantee Agreement	0	4	11	12	9	3,72	0,744	20
S28	Experience of financiers with developing country risk	1	1	15	10	9	3,69	0,739	21
S26	Skilled and experienced advisors	0	2	15	12	7	3,67	0,733	22

<b>Code</b>	<b>Critical success factor</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Mean</b>	<b>RII</b>	<b>Rank</b>
S9	Technical and financial assistance from DFIs	0	7	8	12	9	3,64	0,728	23
S23	Good stakeholder relationship management by project sponsors	1	2	13	13	7	3,64	0,728	23
S40	Open and effective communication between the private and public sector	0	5	12	11	8	3,61	0,722	25
S11	Standardised PPA	2	3	11	14	6	3,53	0,706	26
S22	Quality of local equity partners	2	4	11	11	8	3,53	0,706	26
S15	Financial education about energy infrastructure as an asset class	1	5	13	9	8	3,50	0,700	28
S34	Ability to export power regionally	3	4	10	11	8	3,47	0,694	29
S12	Project Size	1	9	8	11	7	3,39	0,678	30
S17	Reduction of country debt overhang	3	5	12	8	8	3,36	0,672	31
S16	Government support in the form of sovereign guarantees	4	6	9	8	9	3,33	0,667	32
S2	Competitive bidding framework	1	10	11	5	9	3,31	0,661	33
S24	Clear policy on decommissioning of PPAs	1	8	11	11	5	3,31	0,661	33
S20	Credit rating for Zimbabwe and local companies	1	6	15	11	3	3,25	0,650	35
S36	Ability of IPPs to lobby government	2	9	12	7	6	3,17	0,633	36
S19	Project exemptions from tax and duties	2	8	13	11	2	3,08	0,617	37
S35	Program Champion for IPPS	1	12	13	6	4	3,00	0,600	38
S21	Further unbundling of the offtaker	3	14	8	7	4	2,86	0,572	39
S25	Origin of investors (local versus external financiers)	8	11	10	4	3	2,53	0,506	40

## RANKING OF SUCCESS FACTORS BY SECTOR

Code	Critical success factor	Private			Public		
		Mean	RII	Rank	Mean	RII	Rank
S33	Upholding of contracts	4,65	0,930	1	4,00	0,800	11
S5	Expected debt paying ability of project	4,50	0,900	2	4,38	0,875	2
S31	Operationally efficient and solvent offtaker	4,35	0,870	3	3,63	0,725	26
S6	Reasonable, fair expected return on equity	4,25	0,850	4	4,19	0,838	6
S37	Cost of financing (WACC)	4,25	0,850	4	3,69	0,738	24
S14	Transparent, cost reflective tariff framework	4,20	0,840	6	4,63	0,925	1
S1	Bankable feasibility study	4,10	0,820	7	4,06	0,813	9
S29	Coordination between government departments	4,10	0,820	7	3,94	0,788	13
S4	Experience and competency of the developer	4,00	0,800	9	4,13	0,825	7
S8	Policy Guarantee Agreement	4,00	0,800	9	3,38	0,675	32
S18	Credit enhancements (escrow accounts, ring fencing receivables)	3,95	0,790	11	3,50	0,700	29
S38	Quality of technical partner and high technical performance	3,95	0,790	11	3,69	0,738	24
S39	Financial innovation and creativity in structuring financing arrangements	3,90	0,780	13	3,75	0,750	21
S32	Well functioning domestic financial markets and banking system	3,85	0,770	14	4,00	0,800	11
S3	Stable macro economic policies	3,80	0,760	15	4,25	0,850	4
S7	Clear policy on land for energy projects	3,80	0,760	15	4,13	0,825	7
S10	Competent, consistent and fair regulator	3,80	0,760	15	4,38	0,875	2
S27	Solid risk allocation, management and mitigation plan	3,80	0,760	15	3,81	0,763	19
S23	Good stakeholder relationship management by project sponsors	3,70	0,740	19	3,56	0,713	28
S16	Government support in the form of sovereign guarantees	3,65	0,730	20	2,94	0,588	36

Code	Critical success factor	Private			Public		
		Mean	RII	Rank	Mean	RII	Rank
S28	Experience of financiers with developing country risk	3,65	0,730	20	3,75	0,750	21
S30	Reasonable licensing and statutory fees	3,65	0,730	20	3,88	0,775	15
S34	Ability to export power regionally	3,65	0,730	20	3,25	0,650	33
S13	Comprehensive national energy strategic plan	3,60	0,720	24	4,25	0,850	4
S36	Ability of IPPs to lobby government	3,60	0,720	24	2,63	0,525	39
S26	Skilled and experienced advisors	3,55	0,710	26	3,81	0,763	19
S22	Quality of local equity partners	3,45	0,690	27	3,63	0,725	26
S9	Technical and financial assistance from DFIs	3,40	0,680	28	3,94	0,788	13
S19	Project exemptions from tax and duties	3,40	0,680	28	2,69	0,538	38
S40	Open and effective communication between the private and public sector	3,40	0,680	28	3,88	0,775	15
S20	Credit rating for Zimbabwe and local companies	3,35	0,670	31	3,13	0,625	34
S11	Standardised PPA	3,25	0,650	32	3,88	0,775	15
S17	Reduction of country debt overhang	3,25	0,650	32	3,50	0,700	29
S15	Financial education about energy infrastructure as an asset class	3,20	0,640	34	3,88	0,775	15
S24	Clear policy on decommissioning of PPAs	3,15	0,630	35	3,50	0,700	29
S12	Project Size	3,10	0,620	36	3,75	0,750	21
S35	Program Champion for IPPS	3,05	0,610	37	2,94	0,588	36
S21	Further unbundling of the offtaker	2,75	0,550	38	3,00	0,600	35
S2	Competitive bidding framework	2,70	0,540	39	4,06	0,813	9
S25	Origin of investors (local versus external financiers)	2,55	0,510	40	2,50	0,500	40

## KENDALL'S CONCORDANCE TEST

			Private Rank	Public Rank
<b>Kendall's tau_b</b>	<b>Private Rank</b>	<b>Correlation Coefficient</b>	1,000	<b>.305**</b>
		<b>Sig. (2-tailed)</b>		<b>,007</b>
		N	40	40
	<b>Public Rank</b>	<b>Correlation Coefficient</b>	<b>.305**</b>	1,000
		<b>Sig. (2-tailed)</b>	<b>,007</b>	
		N	40	40
**. Correlation is significant at the 0.01 level (2-tailed).				

