



**ADDIS ABABA UNIVERSITY
COLLEGE OF DEVELOPMENT STUDIES**

**OPPORTUNITIES AND CHALLENGES OF PRIVATE SECTOR
INVOLVEMENT IN ELECTRIFICATION PROGRAM OF ETHIOPIA**

**BY
BELAYNEH GIZAW**

**OCTOBER 2019
ADDIS ABABA, ETHIOPIA**

Addis Ababa
University
(Since 1950)



COLLEGE OF DEVELOPMENT STUDIES
DEPARTMENT OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Opportunities and Challenges of Private Sector Involvement in
Electrification Program of Ethiopia

A Thesis submitted in- Partial Fulfillment of the Requirements for Degree
of Master of Arts(Environment and Sustainable Development)

Belayneh Gizaw

Advisor : Dawit Diriba(PHD)

October, 2019

Addis Ababa, Ethiopia

Addis Ababa University
College of Development Studies
Centre for Environment and Sustainable Development

This is to certify that the thesis prepared by Belayneh Gizaw entitled: “Opportunities and Challenges of Private Sector Involvement in Electrification Program of Ethiopia” submitted in- partial fulfillment of Master of Arts Degree in Environment and Sustainable Development complies with the regulation of the University and meets the accepted standards with respect to originality and quality.

Signed by the Examining Committee:

Examiner Atenu Armeraw Signature [Signature] Date 30 Oct. 2019

Examiner Belay Simane Signature [Signature] Date 30/10/19

Advisor Dawit Diriba Signature [Signature] Date 28 Feb 2020

Tamirat T. [Signature] 28 Feb 2020

Chair of Department or Graduate Program Coordinator

Abstract

The aim of this study is to explore opportunities and challenges of private sector involvement in electrification program of Ethiopia. Electricity service for basic needs, as well as for economic development in Ethiopia is a practical concern. Hence, Ethiopian Government aimed to reach modern electricity access up to the lower administrative units through its electrification program. To this end, it has become a necessity to involve the private sector. The study pursued through qualitative research methodology approach. Data has been collected through survey questionnaire and key informant interview. The results of the study among others; shows prospect to the private sector involvement in mini-grid and off-grid solar development, support to the off-grid solar development beyond 25 Km away from the utility grid access lines through minimum tender subsidy /MTS/. On the other hand the challenges noted are; the private sector involvement in grid connection is not clearly provided. The policy, legal and institutional framework coordination and accountability in place lack clarity for the private sector investment. The business model for electrification investment is not clearly for seen. The study recommends specific enabling environment like; clear policy, upfront capital subsidy, attractive tariff rate, easy license and permit procedure, and ABC business model placement as a preference to involve private sector investment under the program envision. In a nutshell the study pioneer to take note of the private sector opportunities under the program for investment and enabling environment as a means to withstand the challenges that prohibit the private sector interest to involve under the Electrification Program of Ethiopia.

Table of Content

Item Description	Page
Chapter one	
Background	1
Statement of the Problem	4
General Objective	5
Specific objectives	5
Significance of the study	5
Scope of the study	6
Limitation of the study	7
Chapter Two	
Theoretical Literature Review	8
Empirical Literature Review	13
Conceptual Framework	22
Chapter Three	
Methodology	25
Description of the study area	25
Research Approach and Design	25
Data Source	26
Methods of Data Collection	26
Sample of the study	27
Method of Data Analysis	28

Chapter Four

Data Presentation and Discussion	29
Challenges of Private sector Involvement in Electrification Program	29
Opportunities of Private Sector Involvement in Electrification Program	42
Business Model	48
Enabling Environment	54

Chapter Five

Conclusion and Recommendation	63
Conclusion	63
Recommendation	64
References	66
Bibliography	71
Figure	
Tables	
Annexes	

Acknowledgement

I would like to express my sincere gratitude to all who assisted me to finalize this work. Specially, I would like to thank my advisor Dr. Dawit Diriba for his invaluable advise and encouragement through out the whole process in this study.

My thanks also goes to officials and experts at the Ministry of Water, Irrigation and Energy, Ethiopian Electric Utility, Ethiopian Electric Power, Ethiopian Energy Authority, Ethiopian Investment Commission, Ministry of Finance PPP General Directorate, GIZ Ethiopia, for their being key informant respondent and Licensee's of the private investors in the electricity sector at the Federal Government level of Ethiopia, namely, Etho-Resources Group/ERG/ Plc, Rensys Engineering and Trading Plc, Lydetco Plc, Solar Development Plc, STM Solar Technologies Manufacturing S.C, TM Geothermal Operation Plc, OrPower inc12(ormate), Cluff Geothermal, Afar Geothermal Alternative Power, ENGIE, Green Scene Energy Plc, Alphasol Modulare Energy Plc, for their valuable information and support to the materialization of this study. Last but not least, I would like to thank my children Abkal, Arsema and Bethlehem for they have shared their love and encouragement to my effort.

Acronomys

AfDB	-	African Development Bank
AMES-E	-	Access to modern Energy Service
BOO	-	Built Own Operate
BOOT	-	Built Own Operate and Transfer
BOT	-	Built Operate Transfer
CO ₂	-	Carbondioxide
DFI	-	Direct foreign investment
DOE	-	Directorate of Electricity
CSiR	-	Carbon Trust
ECA	-	Economic Commission for Africa
EEA	-	Ethiopian Energy Authority
EEP	-	Ethiopian Electric Power
EEP-PPP/IPP	-	Ethiopian Electric Power- Public Private Partnership/ Independent Power Producer
EDRC	-	Energy and Development Research Centre
EEU	-	Ethiopian Electric Utility
FiT	-	Feed in Tariff
ERB	-	Electricity Regulatory Board
ERC	-	Energy Regulatory Commission
EPSRA	-	Electric Power Sector Reform Act
ERC	-	Energy Regulatory Commission
ESMAP	-	Energy Sector Management Assistance Program
EWURA	-	Energy and Water Utilities regulatory Authority of Tanzania

FDI	-	Foreign Direct Investment
FDRE	-	Federal Democratic Republic of Ethiopia
GDP	-	Gross Domestic Product
GIZ	-	German Development Agency
GoE	-	Government of Ethiopia
GTP I	-	Growth and Transformation Plan one
GTP II	-	Growth and Transformation Plan two
GSR	-	The Renewable Global Status Report
GW	-	Gega Watt
GWh	-	Gega Watt hour
HOPR	-	House of People Representative
IBCD	-	International Bank for Construction and Development
IDA	-	International Development Association
IEA	-	International Energy Agency
IPP	-	Independent Power Producer
IRM	-	Implémentation Road Map
IRENA	-	International Renewable Energy Agency
KenGen	-	Kenya Generation
KPLC	-	Kenya Power Light Company
KII	-	Key Informant Interview
MININFRA	-	Ministry of Infrastructure
MoF	-	Ministry of Finance
MoF- PPP	-	Ministry of Finance- Public Private Partnership
MW	-	Mega Watt
MWIE	-	Ministry o f Water Irrigation and Energy

NARUC	-	National Association of Regulatory Utility Commission
n.d	-	No date
NELF	-	National Electrification Forum
NEP	-	National Electrification Program
NEP-IRM	-	National Electrification Program Implementation Road Map
NERC	-	Nigerian Electricity Regulator Commission
NGO	-	Non- Governmental Organization
PAYGO	-	Pay as you go along
PPA	-	Power Purchase Agreement
PPP	-	Public Private Partnership
RDB	-	Rwanda Development Bank
REA	-	Rural Electrification Agency
REIPPP	-	Renewable Energy Independent Power Producer Procurement
RFP	-	Request for Proposal
RFQ	-	Request for Quotation.
SHS	-	Solar Home System
SDGs	-	Sustainable Development Goals
SE4All	-	Sustainable Energy For All
SSA	-	Sub Sahara Africa
SPP	-	Standard Power Purchase
UEAP	-	Universal Energy Access Program
WB	-	World Bank

Figure 2.1 : Conceptual Framework for Private Sector Involvement in Electrification
Program of Ethiopia

List of Tables

Table 2. 1 - Indigenous energy sources of Ethiopia

Table 4.1 - A summary of Key Informant Interviewee Response on Hindering Factors

Table 4.2 - A summary of Survey Questionnaire Respondents on main Hindering Factors

Table 4.3 - A summary of Key Informant Interviewee Response on Opportunities

Table 4.4 - A summary of Survey Questionnaire Response on Opportunities

Table 4.5 - A Summary of Key Informant Interviewee Response on Business Model Significance

Table 4.6 - A Summary of Survey Questionnaire Respondents on Business Model preference

Table 4.7 - Survey Questionnaire Respondent on Enabling Environment Relevance

CHAPTER ONE

1.1 Background

Electrification has a role to speed up socio- economic development of a country and closely relates to country's Human Development Index(Heinrich,2013). However, inadequate infrastructure to meet the demand for electrification sets aside the reliable supply to the socio-economic development of countries around the globe. Consequently, majority of people depend on traditional means of energy (biomass and kerosene) use. The dependence on traditional means of energy leads to impact of smoke inhalation from indoor cooking using biomass and kerosene causes more deaths than HIV/AIDS, malaria and tuberculosis (Heinrich,2013). Hence, inadequate electricity supply and/or its total absence impact can go to the extent of slowing down socio-economic development of a nation.

Oftentimes low level of growth and development is attributed as a manifestation for low level of electricity services delivery. Consequently, affordable and reliable access to electricity has been thought as the 'missing millennium development goal' that enable other targets to be achieved (Joseph N.,etal, 2013).This is considerable in the case of developing countries. Accordingly, less than 25% of Sub Saharan households have access to electricity,falling to 10% in rural areas(JosephN.,et al,2013).

In cognizant to the importance and contribution of energy, of which electricity is the main part, to the socio- economic development of a nation the United Nations has adopted (Affordable and Clean Energy) as the number 7 Sustainable Development Goal (SDGs). In this connection to promote sustainable energy, the UN Secretary General Ban Ki- Moon launched a global initiative to achieve Sustainable Energy for All (SE4ALL), with the aim of achieving three main goals by 2030.These include: ensuring universal access to modern energy service; doubling the global rate of improvement in energy efficiency and doubling the share of renewable energy in the global energy mix (MWIE ,2013).

Since its launch, governments from around the world have formally engaged with the initiative and it has the recognition of the United Nations support as well. Attaining SE4ALL goals will require an almost tripling of annual investment flows in these areas to about \$1 trillion, such that countries need to put in place an enabling environment that attracts all forms of investment—public and private(IBCD,2014).

In an effort to comply with changes in the socio-economic development, the government of Ethiopia attempted to develop electricity infrastructure to enable the service for the needy. Achievements explicitly remarks that expansion of electricity generation; transmission and distribution construction infrastructure have taken place progressively so far through state and non-state actors (Zereay Tessama,et al, 2013). However, it did not satisfy the demand rise to date. This calls the attention of the Ethiopian Government to look for the private sector involvement to fill the gap in providing electricity service to the public at large.

The fact that, the power sector development endeavor in Ethiopia has been under the public domain for long, the private sector involvement in the electricity development endeavor have not been encouraged. But, in recent times the government of Ethiopia has embarked on to recognize the need to adopt frameworks for the private sector involvement. Thus, the investment proclamation of Ethiopia has been re-gazated as proclamation no.769/ 2012 along with the regulation no.270/2012, that provides the benefit and privillages to the private sector involvement in the sector development initiatives. Moreover, the government of Ethiopia has taken measures of reform such as management contract and followingly unbundling the vertically integrated power company Ethiopian Electric Power Co-operation into two company's one being solely responsible for distribution/Ethiopian Electric Utility/ and the other to Generation and Transmission/ Ethiopian Electric Power/. In addition, the regulatory agency in the electricity sector has also been reformed and re-established as Ethiopian Energy Authority in 2014(FDRE Gazata, year 20 no.12,2014).

Ethiopia has the envision to reach rural and urban areas electricity access and connectivity 100 percent by the year 2025, from the current 30 percent access rate and

20+ percent of grid connected household population(NEP,2017). Ethiopia's electrification need is huge. It has a generation capacity of 4.3 Gega Watt(GW) and, double of this, 8.9 Gega watt(GW) is under construction, and many other diverse sources of energy are in the pipeline to develop (NEP,2017).

In view of addressing electricity service need the National Electrification Program provides that out of the total population to be covered through the program 65% is allotted to the on grid connection and 35% is for off-grid basis. The program stipulates to involve private sector developers. Accordingly, the program provides comprehensive off-grid access scale-up program—individual solar systems and isolated micro/mini grids(NEP, 2017).

The private sector involvement in development initiative plans can be realized if the sector is provided with market access and a level play field. In this regard the regulatory framework for the electricity sector needs to provide grid connectivity and market-access platform on fair terms together with policies that enhance competitiveness as well (Remco, et al, 2011).

The Sub-Saharan Africa(SSA) reality shows that to secure private investment commitment needs to be demonstrated. Moreover, both local and international understanding of how private investment works and how it can be effectively promoted and mobilized through enabling environment is essential (Remco,et al, 2011). In this connection South Africa's shift from Feed in tariff to competitive tendering process for renewable energy development and Kenya financial support for geothermal development have shown remarkable achievement in providing the enabling environment for private sector involvement in the sector development (J. Ryan,2017). In addition, by the time where the Ugandan Government faced delayed performance of large scale hydro projects and power shortage threat it needed more power-generating capacity to avoid power shortages and reliance on expensive rented thermal power plants.. To curve in the situation and attract small scale Independent Power Producers and development partners intervention Ugandan government introduced a renewable energy feed-in tariff (REFiT)

programme in 2007(ECA,2016). This implies achievement in electricity sector services development is subject to each country specific enabling environment context.

Private sector investors evaluate enabling environment/factors/ individually as well as collectively before making any decision (Kat Harrison, et al,2016). Consequently, in recognition to challenges and business model identified and opportunities investigated under the study an attempt will be made to spell out specific enabling environment that will address the need to drive private sector investment under the program envision.

1.2 Statement of the Problem

Ethiopia has the capacity to generate electricity among others; from hydro, wind, solar, geothermal and west to energy resources (MWIE,2013). Even so, the attempt to electrify the country through grid extension focused around urban and semi- urban areas effort still did not match with the demand rise. Moreover, the attempt to make the rural areas accessible to electricity through state and non- state actors is limited to cover the demand rise (Zereay,et al, 2013). More than 85% of the Ethiopian population lives in rural areas, where the electrification rate is very low (around 5%) (MWIE,2015), which is less than the sub Sahar Africa 8% rate (Remco,2011). The majority of population cooking is based on the most inefficient and health hazard method, the three stone cook stove fire (MWIE,2015).

In regards to accessing electricity empirical experience of some African countries and elsewhere in the world showed that private sector involvement has resulted in remarkable achievement. A study examined whether the power sector reforms in Ethiopia can attract private investment in rural energy (RE) as an alternative to the sole reliance on the public enterprise indicated that private investment could be enhanced with improvement in the legal and regulatory provisions, along with extension of technical assistance from the public enterprise to private investors (Mengistu,2002). Moreover,on the aspects of the rural area private sector involvement the commercial interest has been stated as little(Mengistu,2002). In another study on the assessment of the role of private sector plays in GTP II provides that the private sector can take part in energy sector

infrastructure development. However, the study has limited the role of the private sector to contractor's who can enjoy universal access program opportunities (TAK-IRDI, 2016)

The studies indicate that the private sector can play a role in accessing electricity. However, the studies fail to discuss on the importance of specific enabling environment to involve private sector investment to access electricity service. Hence, this study is initiated to enlighten the need to put in place specific enabling environment to derive private sector involvement in electrification program of Ethiopia.

1.3 General Objective

The general objective of this study is to assess on opportunities and challenges of private sector involvement in electrification program of Ethiopia.

Specific Objective

1.4 The specific objective of the study is to:

- Identify challenges to the private sector involvement in electrification program
- Investigate opportunities for the private sector involvement in the electrification Program.
- Identify business model to involve private sector in electrification program

1.5 Significance of the Study

This work will provide useful insights to policy makers, private sector investors, academicians, and other stakeholders in different ways to their interest of participation to increase access and/or improve the delivery of electricity services in Ethiopia.

The private sector involvement in electrification program can be motivated through specific enabling environment provision that are helpful to attract the private sector interest. To this end, this study will try to identify specific enabling environment that facilitate and capture the private sector involvement in electrification program of the country. Moreover, the private sector can also benefit in factoring out the study result in building its confidence and reliance on government effort to put in place specific

enabling environment to the best use of the private sector involvement. Policy makers can make use of this study result in the process of establishing appropriate policy, legal and institutional framework to involve the private sector in electrification program undertaking as well. It is also, hoped that the study result will initiate academicians for further study interest in the stream too.

1.6 Scope of the study

Electrification plays an important role in human kind development effort. However, the access to electricity through state and non-state actors in Ethiopia witnessed limited move so far. Cognizant to the importance of access to electrification the National Electrification Program of Ethiopia provides room for private sector involvement. This study covers private sector permit holders at the federal level as it pertains to the involvement in electrification program of Ethiopia to reveal the role of specific enabling environment in attracting the private sector involvement. In this respect, the study aims to identify business models type and challenges/hindering factors/ and investigate opportunities for the private sector involvement in electrification program of Ethiopia.

To this effect, the study is conducted on the basis of secondary and primary data sources. These include: desk review of materials on the aspects of private sector investment in general and on enabling environment to drive the private sector involvement in electrification program of Ethiopia in particular. To this end, survey/ census on private investors who secure permit from the licensing authority has been taken up with the aim to know their views on enabling environment, opportunity and challenges pertaining to their involvement in electrification program of Ethiopia through questionair feedback. Followingly a Key informant interview with selected government sector institutions /Ministry of Water,Irrigation and Energy,Ethiopian Investment Commission, Ethiopian Electric Power, Ethiopian Electric Utility,Ethiopian Energy Authority,Ministry of Finance PPP unit/ and Development partner on issues pertaining to the specific objective and related matters was carried out to know the observation on the private sector opportunity, challenges and business model.

The private sector permit holders obtained from the Federal licensing Authority through survey shows 20 companies and individuals. Questionnaire was prepared and dispatched for feedback to private sector permit holders on issues of the private sector involvement in electrification program business model, opportunities and challenges/hindrance factor/ for the private sector involvement to accommodate their views in the study. In a nut shell, with the help of the aforementioned tools the study tries to identify challenges, investigate opportunities and identify business model to the private sector involvement in electrification program and attempt to specify enabling environment for private sector involvement in electrification program of Ethiopia.

1.7 Limitation of the study

Primary data source survey envisioned at the start of the study appeared not only limited but also some respondents identified for questionnaire response are found unwilling to give feedback for questionnaire submitted to their input for the study. Since electrification program at national level in Ethiopia is of its first kind it has been hard to find a study pertaining to the private sector investment undertaking within the context of the program. Consequently, the problem statement of this study is coined based on electricity access study gap, of which the writer have come across to observe is absence of specific enabling environment to show the need as it relates to the private sector involvement in electrification program.

CHAPTER TWO

2.1 Theoretical Literature Review

Electricity service is a vital arm to speed up growth and development and by doing so contributes to the reduction of poverty in due course. However, existing capacity does not meet the growing demand for electricity. The need for electricity supply is enormous, and investment, however, have not matched the need (Jeffrey,2009). Regardless of increasing private sector investment, public funding accounts for the largest share of electricity infrastructure development finance.

Investment needs for infrastructure services are generally in the range of 5 to 6 percent of developing country's GDP(Gross Domestic Product) and this range is higher 7 to 9% in lower –income countries where poverty is more acute. For all developing countries, the aggregate infrastructure investment necessary to sustain a global 4 percent growth rate is estimated to be \$500 to \$600 billion per year (Jeffrey,2009). The public sector provides the lion's share of investment (about 70% through budget allocations and retained earnings of state-owned enterprises). Public funding is not sufficient, so to close the gap between infrastructure needs and available funds the private sector financing about 20% and official development agencies –bi-lateral or multi-lateral are funding 10%.(Jeffrey,2009) respectively.

As there are competing sectors for public or donor financing, there is little prospect to increase public or donor financing in the electricity infrastructure development. So electricity infrastructure development should have to rely on private sector investment. This, however, demands to look for appropriate energy sector investment support enabling environment such like; Feed in Law (Feed in Tariff), Renewable portfolio-standard, Capital subsidies, Grants or Rebates, Investment or other tax credits, Sales tax, Energy tax, Excise tax reduction, Tradable energy certificates,Energy production payments or Tax credit, Net metering, Public investment Loans or Financing and Public competitive bidding (GSR,2007,p.23) to be in place.

In Ethiopia, according to the investment proclamation private sector investment is encouraged to pull foreign direct investment (FDI). To this end, the government of Ethiopia has established a commission to follow and liaison on all matters of investment in the country. In spite of this, in the establishment proclamation of the commission electricity generation investment permit issuance and follow up of activities are delegated to a regulatory authority/Ethiopian Energy Authority/ to implement and report to the commission as per the proclamation and the regulation specifics stipulated in the law (FDRE Negarit Gazeta year 18 no.63,2012).

The policy framework is placed under the umbrella of the energy policy of the country which mainly opted for to address the aggregate energy need of the country. It focuses at large on the development of hydro potential of the country. This may be for the reason that the hydro resource of the country is abundant enough for exploitation. The National Energy Policy was adopted in 1994. The policy provides an opportunity of support and incentive to the participation of private sector and community, particularly women in the development of energy (National Energy policy,1994).

It seems that in lieu of the energy policy provision that incentive and privilege recognition to domestic and foreign investors is taken up under the law. Accordingly, those who invest in new projects will have the privilege of income tax exemptions for a period of four to five years, depending on the range of distance away from and near to Addis Ababa where they are interested to invest (FDRE Negarit Gazata Regulation no.270,2012). In case an investor incurs a loss within the period of income tax exemption period, his loss will be carried over forward to the future depending on the region where the investment is made. Furthermore, machinery, equipment and related accessories, necessary for generating and distributing electrical energy, and spare parts of 15% of their value are exempted from payment of customs duty. In general, the investment law allows the import of capital goods free of customs duty, if the same capital goods are not locally produced (Dalelol, n.d). Though the investment proclamation provides incentive package to the benefit of private sector involment in the sector development effort the private sector entry to generate electricity and avail the service appears limited. Why? Although, this may call for further study, one can among

others; may assume that the enabling environment may not be to the satisfaction of private sector investment attraction.

The Energy Policy of Ethiopia (National Energy Policy,1994) emphasis investment on hydropower resources development. It also encourages the development of other renewable energy resources including (solar, wind, west to energy and geothermal energy in accordance to their cost competitiveness). The indigenous energy resources as provided under are ideal to the private sector involvement to generate electricity.

Table 2.1

Indigenous Energy Sources of Ethiopia

Resource	Unit	Exploitable Reserve	Exploited Percent
Hydropower	MW	45,000	<5%
Solar/day	kWh/m2	Avg. 5.5	<1%
Wind: Power Speed	GW m/s	1,350 > 6.5	<1%
Geothermal	MW	7000	<1%
Wood	Million tons	1120	50%
Agricultural waste	Million tons	15-20	30%
Natural gas	Billion m3	113	0%
Coal	Million tons	300	0%
Oil shale	Million tons	253	0%

Source: Ethiopian National Electrification Strategy Project: Gap analysis report, 2016

As per the preference of country context perspective the private sector involvement to develop electricity is highly encouraged through a variety of policy instruments. Accordingly, at least 48 countries—34 developed and transition countries and 14 developing countries—have some type of policy to promote renewable generation (AMES-E,2008).In due account to involve the private sector developer different policies have been introduced around the world.

The most common policy which has been enacted in many countries is the Feed-in law/Feed in Tariff/. It establishes legal guarantees to support the market development of energy technologies, specifically for electricity generation. These guarantees ensure low level investment risk, and therefore access for all levels of producer, and allow all

technologies to receive a fair price and therefore help them to compete fairly. In a nutshell, the benefits of its application are to reduce CO₂ emissions, secure domestic energy supply, guarantee investment security, provide fair market conditions (AMES-E, 2008)

Considering the experience learned elsewhere from around the world how Feed in Law policy has the potential to transform energy system tailored to the local context increase overall energy production both on and off-grid system (Joseph, et al, 2013). The national regulator (Ethiopian Electricity Agency, currently known as Ethiopian Energy Authority) in the electricity sector attempted to draft Feed in law (EEA, 2009), which has been brought to the stakeholders comment through a forum organized under the Ministry of Water, Irrigation and Energy to promote private sector investment in the sector. Nonetheless, the effort has not been kept on to materialize the intention of the regulator until now.

Pressure to question the legality of Feed in Law within South Africa's public procurement framework to motivate developers insisted the legal advice to focus on that Feed in Laws inconsistent with South African public finance and procurement laws (World Bank, 2013). Hence, the Department of Energy publicized a competitive bidding process for renewable energy known as the Renewable Energy Independent Power Producer Procurement (REIPPP) program which resulted in a downward scaling price result. As a result, the South African regulator abandoned Feed-in Law without its being materialized (World Bank, 2013). The challenge against the South Africa Feed in Law program and the success story from shift to competitive bidding may have influenced the effort to slow down and finally deferred to introduce the policy in Ethiopia.

The growth of investment in 1990's was pushed by increasing demand, restrictions on concessionary loans by multilateral lending institutions and, fresh investment opportunities sought by the investors in the US and Europe, who was facing liquidity with low returns (Woodhouse Eric, 2005a). Enhanced private sector participation in the power sector of developing countries took place for the reason of policy initiatives that liberalized private and foreign investment, implemented regulatory and market reforms in the sector (Anoop Singh, 2005). However, the approach to reform and its implementation

strategy varies across countries. Some have opened the electricity generation for private investment while retaining government monopoly on the transmission & distribution services.

The reform programs are meant to provide possibility that establish risk minimum, if not risk free play field to the private sector involvement. This will assist to provide investment attractiveness conditions, such as; legal framework (rule of law), including the regulatory efficiency, public ethics and effectiveness of dispute settlement procedures, political risk, ease of access to information, sophistication and development of financial market enablers for infrastructure financing, track record of various types of private investment in infrastructure, government and society, including society's willingness to pay for services related to infrastructure and government readiness to facilitate private investments (Irene, 2007)

The theoretical review on the private sector investment in electricity generation development endeavor generally imply that where there is an enabling environment that provides play level field to minimize the impact of risk the private sector is highly encouraged to invest in the sector development initiatives.

2.2 Empirical Literature Review

The recognition to growing need for electricity access has initiated to allow private sector investment in developing countries (Anoop, 2005). This reality has come about into picture due to the limited public budgetary support for investment necessitated to open up a room for private sector involvement in the sector development effort. Such initiative earmarked that, the flow of private sector investment to power sector was promising before it slows down after the late 1990s. The financial crises in the East Asian countries (1997), Brazil (1999) and Argentina (2001) led to devaluations of local currencies. Yet, private sector investment decision is more inclined in countries displaying healthy Gross Domestic Product/ GDP/growth, competitive real effective exchange rates and a sound financial system, counted with an extended market(Irene,2007).

This situation implied that policy, legal and institutional frameworks play a crucial role in the attraction of private sector investment, more importantly in the energy sector to direct investment in developing countries. To scale up deployment as well as to ensure sustainable growth and maximization of the socio-economic benefits of electricity access the measures taken up are categorized as primary, secondary and tertiary(IRENA,2018).

Primary measures are related to the national energy framework and remain under the public institutions mandated with energy matters, such as ministries of energy, while secondary measures are related to taxation, land rights, environmental protection and banking and tertiary measures are related to capacity building, data collection and efforts to increase synergies with other sectors.

For the private sector participation the key policy and regulatory condition are: the generation, distribution, and sale of electricity by private firms must be legal. Licenses and permits should be obtainable within a reasonable time and at a reasonable cost, private mini-grid developers, operators, and investors must be allowed to recover costs for sustainable operation and within a reasonable time and at margins commensurate with risk, regulations must address the risk to minigrids created by the arrival of the main grid, measures to affordable finance(IRENA,2016).The empirical records in some African countries/South Africa, Kenya, Rwanda, Tanzania,Nigeria, shows how enabling

environment of governments are instrumental to the private sector involvement in the sector development activities to fill gaps in accessing electricity. Accordingly;

The Policy initiatives

In view of promoting the private sector investment the South African Government has adopted non-grid electrification policy guide with the objective of provision of non-grid electrification to households as part of the Integrated National Electrification Programme (Department: Energy Republic of South Africa,2012).South Africa Wind and Solar power tariffs are amongst the cheapest in the world, and cheaper than some domestic coal power. This success has been achieved through the shift from feed in tariff policy to a competitive tender process which enabled private investment in grid-connected power generation (J. Ryan, 2017).

Private investment in geothermal was impeded by high upfront costs and risk associated with exploration and drilling. However, with increased interest from the private sector, the United Nations Environment Programme, Global Environment Facility and World Bank sought to extend the lessons from Kenya. To this end, they have established US\$18 million African Rift Geothermal Facility which built a regional network of geothermal experts and promoted regulatory framework in support of geothermal development (J.Ryan, 2017). Moreover, in order to further promote private sector investment in the power sector development of Kenya, the government has introduced Feed in Tariff policy in 2008. The policy provides fixed rates and electricity connection to the grid(Kenya Ministry of Energy,2012)

Mini-grids have been part of Rwanda's energy policy since 2004, and since then, the country has introduced several adaptations. However, deployment has been picked up only since 2015. The Rwanda government issued Rural Electrification Strategy (RES), published in June 2016, sets out a clear development plan for the off-grid sub-sector. The strategy aims to facilitate the development of mini-grids by the private sector (Rwanda,2017)

The National Electric Power Policy of 2001 of Nigeria established the basis for electric power sector reform act (EPSRA), the overarching law governing the power sector. There have been numerous policy updates over the years, among them being the establishment of Rural Electrification Agency (REA) in 2008. Policy on mini grids guarantees operators holding a permit to be compensated when the expansion of main grid arrives at their development site (IRENA, 2018). This has motivated many private sector involvements in electricity generation of the country.

In recognition to the role of the private sector and the opportunities to increase and diversify the energy supply, Tanzania has developed a comprehensive set of policies, supporting acts, and regulations to encourage private actors to develop small-scale distributed renewable energy resources. The Standardized Power Purchase /SPP/ framework addresses some of the barriers that previously discouraged commercial or quasi commercial mini-grid development. The primary policy and regulatory measures, including those related to national policies, the rural electrification strategy, mini-grid regulations and direct financial support have been introduced and adopted to promote the private sector involvement in the sectors development effort (Lily etal, n.d).

The Legal Framework Initiatives

In South Africa generation licensing requirements (Schedule 2 of the Electricity Regulation Act, 2006) doesnot apply on the demonstration of off-grid projects. However, a draft notice released details amendments to the requirement exemptions (the Department of Energy, December 2016). Consequently, although they are required to register, mini-grid projects under one mega watt (MW) would most likely not be required to obtain a license. Moreover, mini-grid pilot projects would also not require a licence. In addition, the following generation facilities are exempt, under certain circumstances: Facilities connected to the grid at the same point as the load that they serve, i.e. where no wheeling takes place (with installed capacity under one mega watt (MW)), Facilities wheeling through the grid (with installed capacity under one mega watt (MW)), Off-grid generation (with installed capacity under one mega watt (MW)), Facilities used for

demonstration purposes (no sales of electricity allowed) and Back-up generation (CSiR,2017)

Generation, transmission, distribution, supply, import and export of electricity can only be carried out by parties in possession of a licence or a permit issued by the Energy Regulatory Commission (ERC) of Kenya. In the event that the capacity involved is more than one mega watt (MW) but does not exceed 3 megawatt (MW), a permit is required as opposed to a licence (permits having less burdensome conditions than licences).The extension of licences to various private electricity-generation companies has been key to the role played by Independent Power Producers (IPPs) in increasing Kenya's electricity-generation capacity, so the efficiency of this process is crucial to the industry as a whole (Joseph & Anton,2013)

The licenses application process in Rwanda takes up no more than 60 days. However, in the case of the main grid arriving within connecting distance of a mini-grid project, the license holder is given an option to prefer. These include: switch his license to a small power distributor and generation license which will be valid for the remainder period of the original license(effectively splitting his business into a generator that sells to the grid that can qualify for feed in tariff, and an electricity retailer that buys from it), negotiate the acquisition of the project by the national utility, relocate the assets where possible and in exchange of a relocation fee, and operate for the remainder of his license period and finally in the exceptional case were connecting to the main grid would not benefit to the local population, the regulator may decide to withhold the license conversion(Rwanda,2015)

The Licensing and legal provisions in Nigria provides for mini-grids with a distributed capacity above 100 kilo watt(kW) and installed capacity of less than 1 mega watt(MW), obtaining a permit is mandatory. For mini-grids with a distributed capacity below 100 kilo watt (kW), registration with NERC is sufficient although developers may apply for a permit voluntarily (NERC,2016)

Before, the Energy and Water Utilities regulatory Authority (EWURA) of Tanzania came into being in 2006 the private sector has been initiated.Since then, EWURA has made

clear goodwill to initiate private sector. The principal legislation is innovative in granting EWURA powers that are not common in other regulatory institutions, such as the initiation of procurement for new capacity to the electricity-supply industry. The legislation also presents a unique mechanism that allows for more transparent and formal engagement with government and consumer groups (Joseph & Anton, 2013)

Institutional Framework initiatives

The South African Electricity Supply Industry is dominated by the state-owned and vertically integrated utility, Eskom, It generates about 96% of South Africa's electricity requirements which equals more than half of the electricity generated on the African continent. Eskom owns and controls the high voltage transmission grid and it supplies about 60% of electricity directly to customers (Anton Eberhard, n.d). However, in 1990's this institutional arrangement witnessed inefficient performance of the sector and so necessitated a reform of the sector. In this connection, the Energy and Development Research Centre (EDRC) at the University of Cape Town argued for an accelerated programme of electrification that would peak at 500,000 connections per annum and would electrify 85-90% of South Africans by 2010((Anton Eberhard,n.d).The accelerated programme initiation of EDRC was backed by the National Electrification Forum(NELF).

The efforts of the forum highly influenced the ANC/ African National Congress/ Reconstruction and Development Programme. The South African experience demonstrates that as electricity industries are restructured, it is possible to make substantial progress in widening access to electricity services for the poor. Eskom is not yet unbundled or privatized,it has faced pressures to operate on a sound commercial basis, and has discontinued internal subsidies for new electricity connections. This has been achieved due to the introduction of democracy and a political commitment to provide electricity services effectively.

The structure of Kenya's electricity-supply industry is traced back to the reforms that curved the sector in the mid 1990s. The Electric Power Act of 1997 was passed. This has made the government's primary function, through the Ministry of Energy, policy

formulation, and its regulatory authority was devolved to the newly established Electricity Regulatory Board (ERB). But, the passing of the Energy Act of 2006 resulted in its dissolution of ERB and brought about the birth of the Energy Regulatory Commission (ERC). In contrast to Electricity Regulatory Board, the ERC's mandate extends beyond electricity and includes natural gas (including petroleum), renewables and all other forms of energy. At industry level, rationalisation and unbundling translated into a redefinition of the scope of Kenya power Light Company (KPLC's) activities such that it now focuses only on the transmission and distribution (including supply) of electricity, while Kenya Generation (KenGen), established in 1997, has taken over all the generation activities that KPLC had previously managed. While a number of Independent Power Producers (IPPs) have subsequently entered the industry, KenGen and KPLC (both loosely referred to as state-owned entities) remain the dominant players (Joseph & Anton,2013)

Government institutions in Rwanda play a key role in identifying sites and establishing a framework for financially viable investments. The Ministry of Infrastructure (MININFRA), Rwanda's Development Board (RDB), and development partners, among others are the institutions which take part individually or jointly to the sector development (Rwanda,2017)

The enactment of the Electric Power Sector Reform Act (EPSRA) in 2005 directed Nigeria's power sector to unbundle and the vertically integrated entity National Electric Power Authority was divided into 6 generation companies, 11 distribution companies and the government-owned Transmission Company of Nigeria. The privatisation of generation and distribution companies concluded in 2013(Emmanuel et al,2015). This measures have opened up possibility for the private sector investment to take place in the country.

The Ministry of Energy in Tanzania is in charge of developing and reviewing government policies in the electricity supply industry. The Ministry takes all measures necessary to reorganize and restructure the industry with a view to attract private sector. Through Rural Energy Agency(REA), prepares the Rural Electrification Plan and takes measure to promote rural electrification in accordance with the Rural Energy Act (United

Republic of Tanzania, n.d).The key agencies in the country's power sector have responsibilities relevant to the sector deployment (The Ministry of Energy,Rural Energy Agency, The Energy and Water Utilities Regulatory Authority (EWURA), Bureau of Standards),while private sector actors include generation companies, independent power producers and small power producers (Joseph & Anton,2013). The institutional framework for the energy sector in Tanzania has been reformed since enactment of the Electricity Act of 2008. The Key institutions in the electricity sector include government, private sector operators, and nongovernmental organizations (NGOs)(Lily Odarno et al, n.d)

The aforementioned empirical review about some African countries /South Africa, Kenya, Rwanda, Nigeria and Tanzania/ provide practical witness as to how enabling environment /specific policy, legal and institutional set up/ can initiate private sector involvement in the sector development endeavor. With due account to existing circumstance of the power sector, governments in developing countries are increasingly recognize the need for enhancing investment in the power sector through private sector involvement. To this end, developing countries took various initiatives to develop specific enabling environment for private sector investment in the power sector of their respective countries. As a follow up to the introduction of specific enabling environment initiatives, the 1990's witnessed active private investment in the power sector of developing countries. As a result, annual private investment reached a peak of USD 43.3 billion in 1997(World Bank,2004). The growth of private sector investment in 1990's was pushed by increasing demand, restrictions on concessionary loans by multilateral lending institutions and fresh investment opportunities sought by investors in US and Europe (Woodhouse Eric,2005a).

The restructuring and/or reform programs are meant to provide favorable environment for private sector involvement in the sector. These are also aimed at improving in the technical and financial performance of electric utilities and enhancing competition in the sector.Reform initiatives have influenced flow of private capital to varying degree across countries. The flow of capital to power sector in developing countries is subject to a higher expected return and the growth potential of markets. A number of factors, (such as

macro economy instability, political risk, regulatory independence, market conditions, off-taker paying ability), however, influence the higher expected return and risks thereof (Irene et al,2007). From a study on nine countries five key factors that constitute the investment climate for private sector participation identified for the power sector are: (i) strong public finances, (ii) viability of the sector, (iii) efficiency of fuel markets,(iv) political climate including the role of civil society and (v) the legal framework (Woodhouse,2005a).

Investors in the power sector of developing countries give priority to (i) Legal framework that defines investors' rights and obligations; (ii) Payment discipline and enforcement and (iii) availability of a guarantee from the government or a multilateral agency (Lamech et al,2003). Countries that have succeeded in attracting finance for investment have taken care for: (i) establishing a system for protecting private investment, (ii) create mechanisms for parties to bind themselves through contracts and (iii) provide for enforcement of agreements reached (Kumar *et al.*,1997)

Governments in many countries have devised an institutional approach to support funding. However, this has failed to deliver desired result. From a study of five case studies in developing countries, it has been identified two main sets of reasons for failure of such institutions to fall short of their objective to support investment - absence of favorable environment for private participation; and faulty facility design. Private participation in investment failed to benefit due to: poor sector policies, an unstable macroeconomic environment, and inadequate financial sector policies (Klingebiel et al ,2000).

Developing countries with weak investment climate keep on providing government guarantees, which typically include payment and / or revenue guarantees. Another kind of support from government as well as multilateral institutions comes in the form of credit improvement mechanisms like maturity extension, performance based grants etc (Klingebiel et al,2000). Sovereign guarantees are not a substitute for an effective policy and regulatory environment. It often used as an instrument of comfort in the early stage

of opening up the power sector for private investment. Transparent and predictable government policies preclude the need for sovereign guarantee (Irwin et al,1997).

In general, the aforementioned review draws a lesson that specific enabling environment to involve private sector participation in the development endeavor of accessing electricity earmarks the significance for developing countries initiatives in the power sector investment. However, these countries adopt different approach to put in place enabling environment to attract private sector as per their country context. Few countries introduced market reforms in the early period while others waited to observe the outcome of the partially implemented reform process.

Sub Saharan Africa lags from all other regions of the world in installed generation capacity, per capita electricity consumption, and household access to electricity (Masami & Chris,2016). Fifteen of the countries ranked in the bottom 20 worldwide for per capita consumption of electricity are in Africa (IEA, 2016; World Bank, 2016a). Moreover, according to the 2015 Global Tracking Framework report the region has 13 of the top 20 countries in the world with the largest numbers of people without electricity(World Bank and IEA,2015),

Some African governments have attempted to expand access to electricity by subsidizing its use, the cost of connection to grid electricity supply, or both. However, in view of falling fiscal balance, government support is limited. This underscores the need to improve utility performance, adjust tariff to achieve cost recovery, and design subsidy support in a way that maximizes the benefits to the neediest through private sector intervention (Masami and Chris,2016).

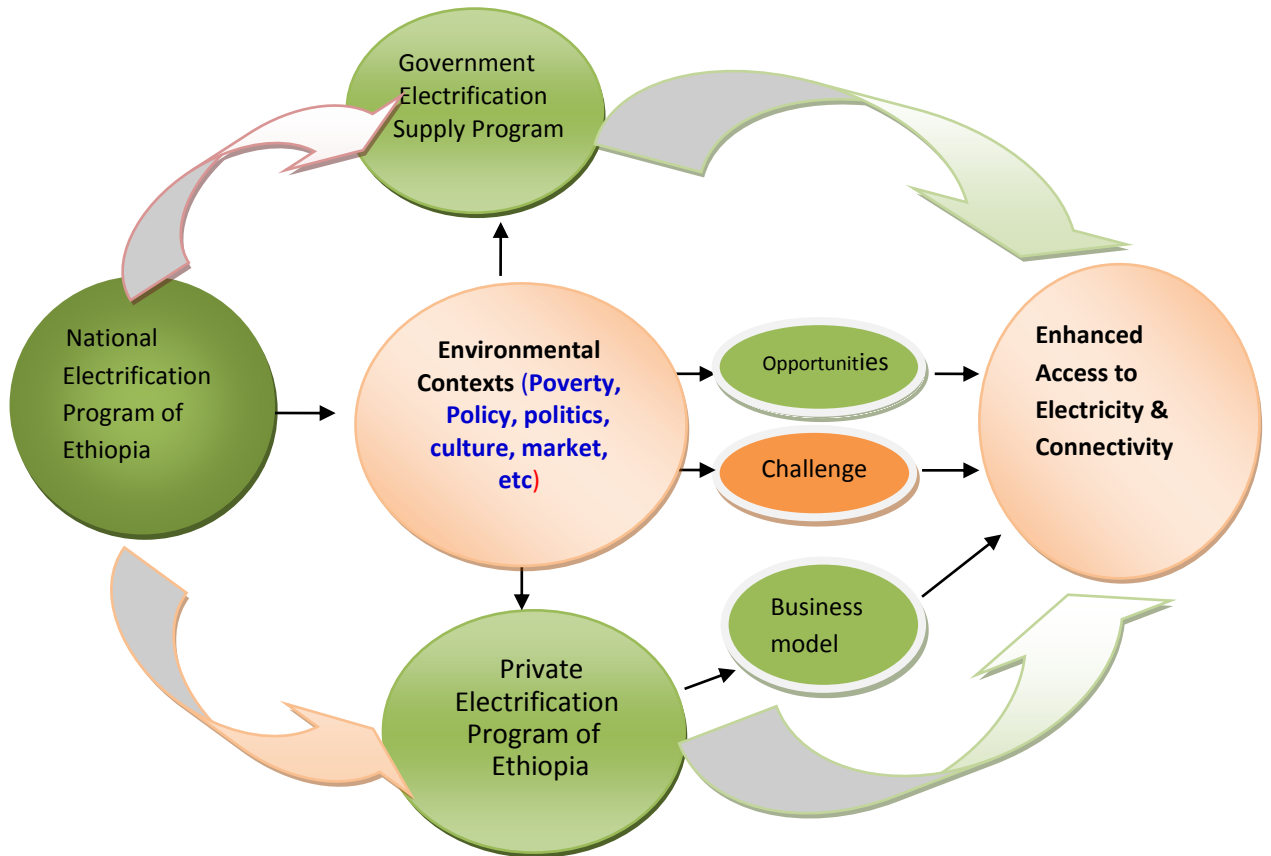
In a whole the empirical observation and the practical initiative taken by governments to involve the private sector investment signifies that the materialization of enabling environment with no doubt enable the involvement of the private to a larger extent of expectation to enhance electricity generation and deliver electricity service by the private sector.

2.3 Conceptual Framework

The private sector role in an economy is at most considered as an engine to growth and development endeavors of a nation. Accordingly, we can trust that the private sector involvement in Ethiopian National Electrification Program plays a vital role in speeding up the effort to access electricity service. Private sector refers to individuals, business companies and/or organizations either domestic or foreign or a combination of them, and/or a Public Private Partnership arrangement which are not owned and managed by the government. These are business entities licensed according to the law of the land to undertake private business with a motive to secure profit and make so decision of investment and production to this end.

Electricity services can be referred as a business undertaking in pursue for economic gains/profit/. Thus, the private sector involvement in this study refers to involvement in electricity generation, distribution and sale undertaking owned, controlled and financed by the private investor with the main motive to earn profit under the umbrella of Ethiopian National Electrification Program stipulation. The private sector involvement in electrification program in light of reaching the services to the needy can be captured through the following conceptual framework developed.

Figure 2.1 Conceptual Framework for Private Sector Involvement in National Electrification Program of Ethiopia



The conceptual framework exposts that the National Electrification Program of Ethiopia foresee two wings of approach for implementation to secure enhanced access to electricity and connectivity. While the first wing, that is, the ongrid electricity supply approach exclusively left for the government undertaking alone, the off-grid electricity supply on the other hand provides the possibility to engage the private sector investment to enhanced access to electricity and connectivity. Added the conceptual framework earmarks that to secure enhanced access to electricity and connectivity both electricity supply approaches need to have enabling environmental context.

The conceptual framework on one hand shows that where there is government action to put in place environmental context to investment and secure profit, the private sector will be motivated to invest for enhanced electricity access and connectivity under the national electrification program. That is, where there are enabling environment it is possible to ascertain that opportunities for the private sector investment can be easily utilized and challenges thereof can be solved or curved otherwise without harming the private investor.

On the other hand, the conceptual framework shows in the event where the private sector unwillingness to involve under the program signals government to put in place environmental context for involvement. In this regards sources in the sector state that a practical example that demonstrate this situation is the frequent amendment and/or the change of proclamation and regulation as well. Generally, the conceptual framework serves as an instrument of guide to see the interdependent relationship of the private sector interest to involve in electrification program of Ethiopia on one hand and the necessity to put in place environmental context to involve the private sector investment under the program.

CHAPTER THREE

Methodology

In this sub section, the study area, the research approach and design, method of data collection, sample of the study and method of data analysis on the aspects of private sector involvement in electrification program of Ethiopia as it pertains to address the study objectives is stated.

3.1 Description of the study area

The study focuses on the aspects of private sector involvement in electrification program of Ethiopia. Accordingly, the private sector permit holders survey at the Federal Government level in electrification development undertaking are the subject area of the study to show the private sector involvement opportunities and challenges under National Electrification Program of Ethiopia.

3.2 The Research Approach and Design

The study entails to search for the underling reasons, attitude, opinion and interest for the private sector involvement in electrification program of Ethiopia. Accordingly, the intention of the study is to look for how specific enabling environment drive the interest of the private sector to exploit opportunities and combat challenges thereof under the program. In view of this the specific objective of the study is to identify business model, challenges and to investigating opportunities of the private sector involvement under the program.

Consequently, since attitudes, opinions,facts and feelings are much of subjective to explain desires and/or wants qualitative research methedology approach is chosen to collect primary data from purposely surveyed and selected list of private sector permit holders and sector institution with a mandate of policy formulation,regulation and service delivery and oversight functions respectively. In order to align with the research methodology approach preferred the research design is opted to follow narrative, thematic and textual analysis. The reason to make use of this design is to state the facts,

attitudes, feelings and opinions procured from data sources for better understanding to readers the reality as it pertains to the private sector involvement in electrification program of Ethiopia.

3.3 Data Source

Both primary and secondary sources were used to conduct the study. The primary data is collected from purposely surveyed list of private sector permit holders through survey questionnaire. Moreover, sector institutions namely; MoWIE, EEA,EEU, EEP, MoF which have a mandate of policy formulation,regulation, licensing and services delivery respective appropriate line department middle level managers and/or senior expert have been approached for key informants interview. On the other hand the secondary data was gathered from published and unpublished sources,such as; Ethiopian energy policy,Public-Private Partnership policy,GTP_{1&2},Off-grid investment plan of Ethiopia, NEP and NEP_{2.0}, energy sector reports, proclamations, regulations, regulatory documents, investment permit issuing authority records and other related documents. In addition, publication from international institutions such as WB,AfDB,IRENA, IEA,ECA,websites and books have been also used as secondary data source as well.

3.4 Method of Data Collection

In order to collect the necessary input for the study a survey on private sector permit holders was conducted through physically approaching the federal government permit issuing authority office/Ethiopian Investment Commission via Ethiopian Energy Authority/. The intention of the survey on private sector permit holders was to know the actual number of private sector involved in electricity resources development practically and to have an insight on the nature of business model, opportunity and challenges they have come across so far and to figure out what specific enabling environment they require to make use of opportunities and curve challenges thereof to involve in the current electrification program initiatives of Ethiopian government. To this end, a survey questionnaire with objective and open ended nature has been prepared and planned to dispatch to a list of permit holders surveyed in their respective office address observed from survey list record of permit authorizing authority. A close follow-up has been taken

up to receive the feedback on the survey questionnaire from the respective permit holders.

In addition key informant interview has also been conducted with sector institutions, including permit issuing authority, regulatory oversight institution, the public utility company, development partners appropriate line department middle level managers and/or senior experts. A semi-structured questionnaire was used to support the oral interview and open expression of personnel opinion on the issues under discussion. The key informant interviewees were approached personally with the help of the College of Development Studies, Centre for Environment and Sustainable Development support letter for cooperation. It has been managed to hold an interview session with 5 sector institutions appropriate line department middle level managers and/or senior experts and with one development partner organization deputy manager.

3.5 Sample of the study

Electrification services in Ethiopia for long have been characterized with the public domain at most and so the private sector involvement in this regard witnessed very limited. As a result, we objectively find quite small number of private sector involvement in the sector development endeavor. Even the majority of these are engaged solely on off-grid electricity development effort. In spite of the objective reality on ground the National Electrification Program of Ethiopia specify for electricity access to be 100% by the year 2025 with a ratio of 65% and 35% for on grid and off-grid development respectively. To this end, it envisions to involve the private sector investment in electrification development endeavor. In view of the electrification program intention the study opts to search for opportunities and challenges for the private sector involvement through a sample size of 12 out of the survey /census/ list of 20 private sector permit holders at the federal level.

3.6 Method of Data Analysis

Data/information obtained through the means of primary and secondary data sources are analyzed through a means of thematic, textual and narrative techniques of analysis. The data analysis with the respective techniques is captured through a series of process; including: conversion of verbal opinions and written remarks into textual format, categorizing/organizing, interpreting key informant interviewee and open end questionnaire response data/information obtained using table and narration. It is also attempted to establish the requisite relationship with the specific study objective and forms the basis for observable conclusion and recommendation.

Chapter Four

Data presentation and Discussion

Introduction

The primary data sources for the study are taken up from KII and private sector permit holder's sample survey questionnaire response. The KII was conducted with middle level managers and/or senior expert of sector institutions namely, MoWIE, EEP-PPP/IPP unit, EEU, EEA and MoF-PPP General Directorate and one development partner deputy manager.

The key informant interview has been carried out with the help of semi-structured interview guide focused on thematic areas like; enabling environment (policy, legal and institutional framework), opportunity, challenges and business model plausible to involve the private sector in electrification program of Ethiopia. On the other hand the private sector survey questionair response was collected from the sample permit holders survey list obtained from the licensing authority for the sector investment and trade activities. The survey list from the licensing authority shows as there are 20 permit holders operating in electricity generation, sales and import of appliance and distribution activity in various parts of the country. Despite the list obtained from the licensing authority it was only possible to collect feedback from 12 of them alone as these are taken as the sample of the study. The views and response of KII and the private sector permit holders survey questionnaire are discussed hereunder:

4.1 Challenges of private sector involvement in electrification program

Both the key informants of sector institutions involved in policy formulation, regulation, permit issuance and private sector permit holders involved in business activity undertaking as it relate to electricity service's have been approached to seek their reflection on the aspects of challenges as to their involvement in electrification program

of Ethiopia. The approach to their response was based on interview guide and survey questionnaire response respectively.

Table 4.1

A Summary of Key Informant Interviewee Response on Hindering Factors

What factors hinder the private sector involvement in electrification program of Ethiopia? 1 being the highest and 2 being medium and 3 being low consideration . How do you rate its significance ? (Tick v) in the box under.	Significance of scale response per KII respondent						Remark
	KII ₁	KII ₂	KII ₃	KII ₄	KII ₅	KII ₆	
Absence of Policy framework	2	1	1	1	2	3	
Poor Regulator	2	1	3	2	2	1	
Lack of Technology awareness	2	2	3	3	3	2	
Lack of upfront capital cost	1	2	1	1	1	1	
Political instability	1	1	2	2	1	1	
Physical Location resource reliability	2	2	2	3	3	2	
Currency inconvertibility	2	1	2	1	2	1	
Change of Law	1	2	1	2	1	1	
other specify							
Labour Law	1						Specified
Work Permit	1						“ ”

NB : KII₁KII₆ referes to Key Informant Interviewee

The key informants summary response to an interview shows that the highest hindering factor to the private sector is lack of upfront capital with a percentage ratio of 83% of the respondents, change of law and political instability with a percentage share of 66.7% of the respondents, absence of policy framework and currency inconvertibility both with a percentage ratio of 50% of respondents followed by physical location resources reliability as medium hindering factor with a percentage share of 66.67% of respondents, poor regulator ,lack of technological awareness and currency inconvertibility with the share of each 50% of the respondent and some gone to level the significance of technological awareness as low hiding factor with a percentage ratio of 50% of the respondents as well.

Though, the key informants response in a nutshell imply that policy framework as a medium significant hindering factor, the writer is with the opinion of that the one's identified as highest significant hindering factors by the KII respondent cannot be addressed without the presence of specific policy framework measures.

For a survey question to the private sector permit holders "what challenges they have faced so far"? Each respondent provided different response to the survey question. Accordingly respondent₁ provided that;

unclear regulation, change of law, responsiveness of regulator, regulatory expectation even for pico/micro grids (i.e. exemption from regulatory processes or minimise), Incentives (i.e., import tax exemption & tax holidays) for investment in off-grid electricity, reducing price of renewable energy technologies for off-grid electrification

While respondent_{2,4,5,6,7,8,9} respectively stated that;

cumbersome and long process of tariff regulation, inconsistency in approach of different bodies of the policy makers (i.e. government ministries and directorates), hard currency and import challenges at customs, no clear understanding on the technology and policy respondent, lack of public sector experience to work with the private developer, contractual & legal capabilities, currency convertibility and transferability, "Farm land compensation issues, delay in regulatory law enactment and guidelines in place to implement it.

On the other hand respondent_{10, 11 and 12} provided the challenges they have faced so far as follows respectively;

PAYG SHS: foreign companies not allowed to import and retail SHS, mini grid: subsidy, clarity on national expansion plan, low electricity tariff, financial availability (local financing institution), legal framework (waiting for tariff directive, licensing directive, corporate PPA: law does not allow private companies to retail electricity in areas where electricity grid is available, lack of Feed in Tariff (FIT), lack of wheeling mechanism in areas where the national transmission grid is available, lack of foreign exchange, counterfeiters product that undermine our price and quality. Sub standard small solar home systems are also problems, no support for feasibility study and there is no sufficient information about the potential sites, long permission process, no clear arrangement with electric utility authority about grid expansion.

The response to challenges practically experienced by the private sector implies an existence of a range of problems for the private sector not to operate smoothly. In fact the range of practically observed challenges response diversity is born out of the private

company's back ground taken as the sample of the study. That is some company's of the sample /TM geothermal Plc, Orpower 12(Ormat), Cluff Geothermal and ENGIE/ are with well to do international experience of the sector and highly sensitive to the risks they may encounter due to their involvement. On the other hand the local company's are with less experience and the scale of their engagement in the power sector development is also limited with capacity and capital as well. In any case, whatever may be the dimension of experience and capacity of involvement without addressing practically witnessed and experienced challenges to call upon the private sector to step in electrification program may stands as a deterring effect for the involvement.

As a follow up to practically observed challenges expressed respondents have been asked to rate on hindering factors to their involvement under Ethiopian National Electrification Program of Ethiopia as super serious,very serious, serious and low serious. Their response is presented in table 4.2 along with the factors to be rated.

Table 4.2

A Summary of Survey Questionnaire Respondents on Hindering Factors

Question	Rate of scale response per private sector survey questionnaire respondent												Remark
	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀	R ₁₁	R ₁₂	
In your opinion what are the main hindering factors to private sector involvement in electrification program of Ethiopia? How do you rate it? 1 being super serious, 2 being very serious, 3 being serious and 4 being low serious (Tick ✓) in the box under													
Absence of policy	4	4	1	4	3	3	2	3	3	3	4	1	
Poor regulator	1	1	1	3	4	2	3	3	2	4	1	2	
Lack of technological awareness	3	4	2	2	4	2	3	1	1	4	1	3	
Upfront finance/capital	2	3	2	2	1	3	3	3	1	2	1	1	
Political instability	3	4	1	1	2	1	3	4	2	4	1	3	
Physical location of resource	4	4	-	2	2	4	4	4	4	3	2	4	
Currency inconvertibility/ transferability	4	3	2	1	1	1	4	4	-	2	1	1	
Change of law	2	4	2	1	1	1	4	4	-	4	1	3	
Other specify													
Lack of private sector investment, Economic inefficiencies, Skilled man power, Low electricity tariff, financial availability	-	-	-	-	-	-	3	-	1	2	-	-	

NB: R₁R₁₂ refers to respondents to survey questionnaire

For each of the hindering factors provided to be rated as super serious, very serious, serious and low serious the private sector respondents to the survey question responded independently as provided in table 4.2 above. The close look up to each of the hindering factors signals in a nutshell different views. Accordingly,

For the absence of policy framework presented as an hindering factor for the involvement in electrification program of Ethiopia out of the total respondents to the survey questionnaire 41.67% of them responded as it is serious while 33.33% of them gone in favour of low serious and 16.67% rated it as if it is super serious and 0.083% as very serious respectively. From the range of response for super serious to serious we observe an inference could be made that though the rate of scale differs the respondents takes into account absence of policy framework affects their involvement in the process.

The response on poor regulator as main hindering factors presents that 33.33% of the respondents consider it as super serious while 25% of the respondents takes it into account as if it is very serious and serious respectively and only 16.67% of the respondents considered it as if it is low serious hindering factor to their involvement in the process. The response to the hindering factor in sum shades light that the private sector is of an opinion of indifferent to invest where there is poor regulator for the sector. From the response implication though the national electrification program opts for the private sector involvement in the process the regulator standing to serve the purpose needs to be looked into and strengthened to address the concern of the private sector so as to derive the required involvement.

The response on lack of technological awareness as hindering factor falls under a paradoxical response result. The respondents in the range of super serious and low serious equally shared 25% of concern. Nonetheless, the total share of serious, very serious and super serious reply signifies that awareness on technology needs

to be made so as to smooth out the challenge in due course of involvement under the program.

The upfront finance/capital as hindering factor has been rated as 33.33% for super serious, very serious and serious equally and no respondent designated upfront finance /capital as low serious hindering factor. The response in sum implies that the private sector is of an opinion of that upfront finance/capital is an issue of concern for their involvement under the provision of the electrification program opportunities to invest.

The political instability as hindering factor to the private sector involvement has been rated as 33.33% superious, 16. 67 % as very serious,25% serious and low serious respectively. Out of the total respondents response nearly 75% of the respondents air their views under the range of super serious and serious rating response implication draws that political instability is much of concern for many of the private sector investor if not special for foreign investors.

For physical location of resources as hindering factor the survey respondents at large gone with a share of 63.63% in response stated that as it is low serious hindering factor for their involvement while 27.27% rated as very serious and 9% as serious respectively and one respondent didn't provide any response. The implication we may infer from the response stands as wherever there is likelihood for investment many investors are not worried about the physical location of the resource to be tapped.

Currency inconvertibility/transferability as hindering factor to the private sector involvement in the sector development endeavor effort has been rated as 45.45% super serious, 18.18% very serious, 9.1 % as serious and 27.27% as low serious respectively and one respondent failed to provide his response on the rating. The implication we may draw from the response is that many of the respondents rating shows that currency convertability is a concern for their involvement. Since the respondents to the survey questionnaire are a mix of local and foreign investors

engaged indifferent capacity of investment, that is generation of electricity, import of appliances and distribution it wouldn't be surprising to see that many of the response be fallen under the range of super serious and serious. From the response we also observe that some with the share of 27.27 % noted currency inconvertibility/transferability as low serious hindering factor to their involvement in the sector development endeavor. The writer recognize that these respondents as the local investor who at most dependent on securing grant for their electricity generation and supply engagement in the sector and wouldn't be required to repatriate the currency. Otherwise, since involvement in the sector requires the need to import technology for the resources tapping they wouldn't have behaved in their response rating as it appeared now objectively since they go for to ask the government to provide them foreign currency for the payment of their letter of credit.

Change of law as hindering factor has been rated by 11 out of 12 respondents. Accordingly, for the change of law as hindering factor 36.36% of the respondents rated it as super serious, 18.18% as very serious, 9.1% as serious and 36.36% as low serious respectively. From the response rating we see that those who gone in favour of super serious and low serious takes equal share of the weight. We may fall in to ask that why it did so happen? The writer presume that since there are a mix of private sector survey questionnaire respondent being foreign and local while the foreign respondent go for super serious impact the local private company's may have gone otherwise for the impact in change of law. However, though the extreme dimension of thought implies equal weight the sum of the response rating goes for the change in law with range of super serious and serious implies that the change in law has a deterring effect to make use of opportunities provided under the national electrification program for the private sector involvement.

For details on how and why these factors are hindering private sector involvement in electrification program of Ethiopia respondents 1,3,4,5,6,7,8,9,10,11 and 12 provided the

following details respectively. Respondent₁ provided that; “These factors weaken predictability of situations to warrant private sector investment. Private sector takes calculated risk, but makes sure that the return to investment is guaranteed.” While respondent₃ for the same question provided that; “There is a policy, however, it is not clear on how investments could be sustainable. The regulator has no clear guidance to attract investors and do not promote private investment. Forex problem, political instability affect on decision to invest”

Respondent₄ provided a response for the same question as; “ Too many uncertainties. New comers use existing entities as an example and difficulties faced by existing companies deter new investors”. And respondent₅ stated that; “Unclear policy/Regulation, Access to hard currency, Access to finance, different regulations in different regions”. Respondent₆ on his part provided that;

Lack of technical knowhow will delay project grid-connection. Lack of finance to undertake technical, legal, financial works from public side will delay project commencement and private sector will have to be either supported in financing or increase risk premium. Political instability will increase insurance premium for project. Physical location with regards to access roads, basic infrastructure is necessary. But, if not can be included on project cost. Currency convertability is very important otherwise investors will require extra government guarantees. Change in law is important but usually covered under project agreement.

Followingly respondent₇ indicated; “Several challenges face private sector involvement: These include ; lack of a comprehensive energy policy and strategy, low level of renewable energy development other than hydro power, huge investment finance requirement for geothermal exploration in electric generation”. Respondent₈ on his part responded as “ lack of awareness is leading to the project delay and people that are in place do not understand clearly the importance of geothermal energy for the country”. Respondent₉ provided that;

The regulation based on law and guidelines is much delayed to take place. Dependence in technology and awareness of the public and even government actors other than EEA. Political instability seems to be getting worse and we lack the available appropriate skilled

manpower in the field we are engaged in area all hinderances and made us to creep

Respondent 10 outlined the details how hindering factors affect as;

Policy:PPP proclamation,National Electrification Program,Energy Regulation no. 447,power grid expansion study etc... encourage the private sectors. **Regulator,** EEA establishment regulation no.308/2014 encourage the private sector. However,in future it would be more interesting if EEA is established independently (rather than operation under MOWIE),**Financial Sector:**local financing institutions lack capability and experience in financing electrification project(specially ppp/ipp project which are usually financed with project financing). Banking sector is also highly regulated /foreign bank not allowed). The new law which allows Ethiopian national gaining other nationality in banking sector is encouraging. **Political stability:-**Despite growing inter-ethnic conflict and un-stability in last few years, Ethiopia is generally stable. Reform in political space by new Prime minister is really encouraging.**FinancialRisk**(inconvertability,transferability,availability,inflation,foreign exchange or Fx): This increases the cost of financing due to relate insurance cost.Some items difficult to obtain insurance itself.**Resource:** Gis leaps rollout plan and resource mapping availability is important. **Change in law:** can be mitigated in contracting change in law. Opening financial sector to foreign banks,Providing proper banking guarantee where sovereign guarantee to attract private investors in large IPP projects carefully the government doing this in IPP Licensers, Boost exporting capability, Making resource potential and GIS least cost rollout plan public,Subsidize private companies to compete with low electricity paid tariff.

Respondent 11 on his part also indicated how hindering factor affect as “ lack of policy hinders private sector to involve in the sector. As a result of poor regulators private sector faces challenge to import its product, to invite foreign direct investment. As a result of lack of awarness private sector spent their resources to train and conduct awarness training on marketing, strategies, etc.” Last but not least respondent 12 also provided that;“ To make decision about the investment the return on investment must be clear.If there is no tariff setting fixed it will be difficult. Government should make some prefeasibility study about the potential site for energy development. It is not yet available for investors”

The feedback in the form of response to the details on how and why the hindering factors affect private sector investment in the sector enlighten that the factors

needs to be care of so as to derive the private sector investment. Otherwise, it appears that the factors have a greater extent of deterring effect not only on local investor decision to invest but also on foreign direct investment decision as well. The details provided how the hindering factor may affect the private sector involvement in general signal that the private sector needs clarity on how to be involved. More, interesting the views reflected as details are of tilted to the background of the private sector being local and international. While the international companies walked for tough details like liberalization/Banking / sectors to the extent of foreign private entity entry, the local company's details, however, expressed the need to improvement on enabling enviromemnt to the private sector involvement. All in all the response signifies that these hindering factors and similar of them not covered under the survey questionnaire of this study are the subject of concern that needs to be clearly addressed for the private sector investment decision to take place under the electrification program of Ethiopia.

The observation what has been procured from the KII and the private sector survey questionnaire response to challenges and the details provided thereof, how hindering factors affect the involvement of private sector in electrification program indicate that the existing circumstance to the private sector intervention falls under doubt of clarity. So, to enable the private sector involvement specific enabling environment needs to be in place. And this falls under the government respective authorities' assignment to address.

Accordingly, for a question, "What should the Government do to address the hindering factors?" Please specify the details of your expectations. Respondents of the survey questionnaire are of the opinion for the government to do the following;

Respondent ₁ provided that; "need clarify on regulation/laws (avoid change of law), strenghen the capacity of regulator and provide authority to independently regulate, provide access to finance (to the private sector,for communities) or co-investment,etc), provide concessional guaranttee in the area of investment". Respondent ₂ on the other

hand replied that, “ the regulatory body need to be equipped with Human resources and appropriate regulations” while respondent 3 stated that “Issue a clear policy and related directives that are workable”.

Respondent 4 on his part indicated that “Better co-ordination between different government bodies and clarity of policy directions and better implementation of the policies”. Respondent 5 added that government should “Assign responsible government body clearly. Aware the law to the lower level implementers (staff) in government offices”. Similarly respondent 6 stated that government should do “capacity building, increase retail tariff, privatize hydro plants, reduce excessive Capex and Opex overspending due to miss management, Restructure strengthen EEP vis-à-vis political influence , provide, facilitate basic infrastructure to protect sites, reform financial sectors, ease forex policy”. Respondent 7 on the other hand indicated that; “The Government should raise the efficiency of the energy sector and also develop institutional and manpower capabilities by introducing appropriate incentive measures to undertake energy development programs in advance”.

Respondent 8 and 9 provided that; “The government should involve and help the Ethiopian Electric Power/EEP/ to modernize their system and make this more faster”. And “modernize its bureaucracy, make laws(land use, tariff,etc) easy and usable develop its own capacity in regulating and facilitating, improve the human resources development for the field both in quality and number.Slowly withdraw from being main actors in the field of service other than its regulatory role” respectively .

Respondent 10 on his part indicated that ;

opening financial sector to foreign banks, Providing proper banking guarantee where sovereign guarantee to attract private investors in large IPP projects carefully the government doing this in IPP Licensers, Boost exporting capability, Making resource potential and GIS least cost rollout plan public, Subsidize private companies to compete with low electricity paid tariff.

While respondent₁₁ stated; “Regulator shall coordinate smoothly with different government initiative to fulfill a clear tax, custom and clearance and foreign exchange

issues”. And last but not least respondent₁₂ has also provided that the need to “Fix Feed in Tariff, facilitate the investment through capacitated personals and institutions, give financial support for investor through incentives”

The response of the private sector to the question what the government should do to address hindering factors indicate that the private sector is with a thought of diverse feeling as per their context of engagement to electricity generation business. However, the majority of them go for to see clarity on policy, law, regulation, subsidy, feed in tariff and certainty of risk are emphasized. In addition the existence of modernized system for the sector and a simple bureaucracy and capacity building is also a concern to be on board that needs to be addressed for the private sector to be confident and trust full to involve under electrification program opportunities initiatives undertaking. The writer is with the opinion of underlining the views and comments of the respondent to the survey questionnaire needs to be taken care to speed up the desire of private sector investment under the program.

4.2 Opportunities of the Private Sector Involvement in Electrification Program

Key informants of sector institutions involved in policy formulation, regulation, permit issuance and private sector permit holders involved in business activity undertaking as it relate to electricity service's have been approached to seek their reflection on the aspects of opportunities as to their involvement in National Electrification Program of Ethiopia. The approach to their response was based on interview guide and survey questionnaire respectively. In view of that the feedback on the key informant interviewee conducted is presented here under with a table summary 4.3.

Table 4.3

A Summary of Key informant Interviewee Response on Opportunities

What opportunities motivate private sector involvement in electrification program initiatives of Ethiopia? 1 being the highest and 2 being medium and 3 being low consideration. How do you rate its importance? (Tick v) in the box under.	Importance of response rating per KII respondent						Remark
	KII ₁	KII ₂	KII ₃	KII ₄	KII ₅	KII ₆	
Policy existence	2	1	1	1	1	2	
Profit	1	1	2	1	1	1	
Cheap labour	3	3	3	3	3	3	
Investment Incentives	1	1	2	2	2	1	
Government committment	2	1	1	1	1	2	
Independent regulator	3	2	3	2	2	2	
other specify							
Bank regulation offering to attract profit/ revenue							No rating has been provided

NB : KII₁KII₆ referes to Key Informant Interviewee

The key informants summary response to an interview shows that the highest opportunity that motivates the private sector is aired as profit with a percentage share of 83 of the respondents, while policy existence and government committment with a percentage share of 66.7 of the respondents, followed by independent regulator as medium motivating factor with a percentage share of 66.67 of respondents.

The key informants interviewee response in a nutshell imply that profit, policy existence and government commitment are the highest motivating factors for the private sector to invest in the sector followed by independent regulator and investment incentives as a medium motivating factor with a percentage share of 66.67 and 50 of the respondent record to the interview respectively. The writer recognizes that under normal circumstance the key informant interviewee response fits to rationale investor desire to hold on to make decision for an investment to take place.

From the response summary table we can see that investment incentive is equally given emphasis as highest and medium importance. This could be probably due to the key informant's little background about the behavior and interest of the private sector. With regards to the cheap labour response all key informant interviewee rated cheap labour as low importance. This may be due to that even the private sector looks for cheap labour the learning and experience of the technology lacks to exist in Ethiopia and so they may have considered the productivity rate of the labour never be to their satisfaction. It may be for this reason that it is marked as low importance by all respondents of the interviewee.

As a follow up to the KII response on opportunities an attempt has been made to look for the response of the private sector permit holder on the aspects of opportunities that insist them to invest through a survey questionnaire " what opportunities derived you to invest in electrification supply? Please specify? In view of that the response of 11 out of 12 respondent to the survey questionnaire is provided hereunder. Accordingly;

Respondent₁ expressed that he/she is derived to invest in the sector for the reason of "High number of unelectrified population, Government electrification strategy alone cannot by itself address all electrification program". While respondent₃ stated that "We are investing in very small solar home systems .Because, the policy does not affect it. However, investing in micro/mini-grid is not encouraging due to lack of clarity in government policy". Respondent_{4 and 5} on the other hand stated that they are derived for

“the opportunity to contribute to the development of rural communities in Ethiopia” and “the off-grid community access to electricity. It is huge market” respectively.

Added respondents 6,7,8,9,10,11 and 12 to the survey questionnaire also provided that as they are derived to invest in the sector for the reason of ;

Demand - Supply Gap, gut of willingness to involve private investors, institutional frameworks, being involved in geothermal exploration company as an explorer, and consultancy services provider, the existing demand of electricity in the country, the resource availability in Afar region and the community initiative to establish the company, fast economic growth, enormous energy resources potential (45GW hydro, 1350GW wind, 10GW Geothermal, 5.5kwh/m²/day average solar in advance), Low electricity access rate (only 45%, house hold has access to electricity among 20.4 million house hold); Generation expansion plan, Electricity demand growth projected, NEP target plan, Government policy recognizing the role of private sector, etc., as a founder witnessed the lack of electrification in the majority of the rural environment and it is essential to pursue in order to change this. The Majority Population has no electric specially off-grid rural people.

The drivers expressed by each of the respondents are expressed uniquely to their own respective context. However, the views are at most subject to demand-supply gap of electricity access to the rural- urban community in particular and economic growth of the country need in general. The drivers are expressed as per the engagement interest of the private sector either in small or large scale generation. As most of small scale generators are in favour of addressing the rural community need state that the driver to their involvement as high number of unelectrified population, policy does not affect small solar home systems, opportunity to the development of rural communities, huge market in the off-grid community to electricity services, resource availability, community initiative and lack of electrification in the majority of the rural environment. On the other hand the larger once/private sector permit holders with international experience/walks for utility scale generation intended to fill demand – supply gap of the countries economy as a whole.

Followingly in search of the private sector feelings about opportunities that may derive them to involve in electrification program undertaking a question for

response has been posed as “In your opinion what opportunities motivate the private sector involvement in electrification program? A summary of the response is provided in the following table 4.4

Table 4.4

A Summary of Survey Questionnaire Respondents on Opportunities Importance

Question	Rate of importance response per survey questionnaire respondent												Remark
	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀	R ₁₁	R ₁₂	
What opportunities motivate private sector involvement in electrification program initiatives of Ethiopia? 1 being the highest and 2 being medium and 3 being low consideration. How do you rate its importance?													
Attractive tariff	1	-	2	1	3	1	1	1	1	1	1	1	
Independent regulator	1	-	1	2	2	2	1	1	1	1	1	2	
Soveriegn Guarantee	-	-	1	1	3	1	3	1	1	1	1	2	
Currency parity rate	3	-	3	1	1	1	2	1	1	1	1	2	
Incentive packages	1	2	2	1	3	1	1	2	1	1	1	2	
Government policy	-	-	-	-	-	-	-	-	-	1	1	1	

NB: R₁R₁₂ refers to respondents to survey questionnaire

Though some respondents have not taken a part to rate the importance, from the list provided for three options choice, that is, highest, medium and low respective response implied the importance to motivate the private sector investment. The reply to attractive tariff with a percentage of 81.2, sovereign guarantee with a percentage of 70, independent regulator with a percentage of 63.36, incentive package with a percentage of 58 and currency parity rate with a percentage of 54 choice remarked a highest importance implies that many of the respondent are

motivated to derive their investment in the sector if the opportunities for choice prevail to exist. Moreover, the respondents seem to have the understanding of the regulator to paly as well. In contrast those respondents who labled the choice of importance as medium motivator and those who left the choice response blank needs to be promoted to the better understanding of the opportunities under consideration. In the opinion solicited the response to the Government policy opportunity choice response record shows that with the exception of 3 respondent responses as highest motivator the majority of the respondent left it blank. We may speculate that the private sector may have no good understanding about the role of policy or they may assume that policy may not bring any change to their investment decision making process. Nonetheless, this requires further investigation.

Next to opportunity of impotence choice indication the respondents are also requested to provide other opportunities they may think and rate the importance. Accordingly, the respondents provided a list of opportunities with a highest designation of importance of rating as follows;

Off taker guarantee, Guarantee for grid encroachment, GiS based information for sites, retail price of electricity, grid connectivity & availability, technical, financial and legal capacity of Off-taker, forex priority access, access to finance, ratification of new conventions, opening institutional forum for private sector engagement, political stability, financial stability including credit worthness of the off-taker, financial availability (DFI, financing institution, insurance), electricity market potential: demand growth, access to electricity, risk premium, risk mitigation measures, money(convertability, transferability, change in law, foreign exchange risk), controlling illegal solar and related products entry in the market, knowledgable personnel at regional energy bureau administration, one stop services for permission, positive attitude and inviting approach for investors.

The lists of opportunities added to motivate the private sector involvement are almost a wish list under the sky. Hence, it is the opinion of the writer that these lists are checked for use to hold on against compatible specific enabling environment for adoption or exclusion.

4.3 Business Model

A business model explains how company operates, make money and how it intends to attain its targets formulated (Romon C.and John H.,©2015). Consequently, the business process describes the possibility of delivering product and the value chain thereof for the company and the customers as well. In light of this for a question asked “what is the type of business model you are making use of in your electrification business undertaking so far? Please specify? The response procured shows that as there are business models currently in place under use in Ethiopia. These are under the category of services and ownership type model. The services type business model include: pay per use and PAY as you go /PAYG/ while the ownership type business model under the umbrella of Public Private Partnership include: Design build finance, Operate and Manage (Design Build Finance Operate and Manage), Built Own and Operate (BOO), Built Own Operate Transfer (BOOT) and Built Operate Transfer(BOT).

In due account to the business models under implementation so far a question has been put forward to key informants respondents as what type of business model do they prefer from a choice given and scale it in terms of highest, medium and low significance designating as 1,2 and 3 subsequently. Accordingly, the feedback from key informant interviewee on business model significance is given in the under table 4.5

Table 4.5

A Summary of Key Informant Interviewee Response on Business Model Significance

Given your knowledge and experience what type of business model can be helpful to motivate the private sector involvement in electrification program of Ethiopia? 1 being the highest and 2 being medium and 3 being low consideration. How do you rate its significance?		Significance rating per KII respondent response						Remark
		KII ₁	KII ₂	KII ₃	KII ₄	KII ₅	KII ₆	
I	Ownership business type model							
1.1	Public Private Partnership common model							
	Build-own-operate-transfer (BOOT)	1	2	1	2	2	2	
	Build-own-operate (BOO)	1	1	2	1	1	1	
	Build-own-transfer (BOT)	2	3	1	3	-	3	
1.2	Multi party ownership	3	-	3	3	3	2	
1.3	Lease or Hire Purchase	2	-	3	2	1	1	
II	Service type model							
2.1	User co-operative	1	1	1	-	1	-	
2.2	Distribution Licensee Energy Service /Desco/ model							
	Pay per use	3	-	2	-	3	2	
	Rental	3	-	3	-	2	2	
	<i>Lease finance</i>	1	-	1	2	1	1	
2.3	<i>Mini/micro Grid system Business</i>	2	-	-	-	2	1	
III	Other specify							
	Transparent tender model		1					

NB : KII₁KII₆ refers to Key Informant Interviewee

As per the six key informant's response rating on the significance of the business model the so called build own and operate/BOO/business model under the public private partnership ownership umbrella shown up with 83% of respondents to record highest significance followed by Build Own Operate and Transfer/BOOT/ with 66.67% as medium significance. Surprisingly 60% of the key informant significance rating to Build Operate Transfer(BOT) business models which is under the

preference treatment of Public Private Partnership 2018/19 project pipeline of Ethiopia gone to exhibit low significance for key informants response.

Unlike the merit order of the business model to hold on the government of Ethiopia seems practically go against to bear the risk transfer to the utility. It is not certainly clear why the Ethiopian government through its Public Private Partnership arrangement go in favour of BOT/BOOT model. However, the writer feels that since business models under the umbrella of Public Private Partnership ownership introduction in this country is a recent phenomena those who are assigned to under go the process may have no deep understanding on the consequence of the business model under consideration. The writer is convinced to underline that the key informant's significance rating for BOO model walks on the right line of the merit order of the model to work for Ethiopia. This model would allow the utility not to bear technical risk transfer and the deal will only be on the price of the product/electricity/ delivery terms.

In parallel to the ownership type business model the key informants are also responded on the significance rate of service type business models. Accordingly, 4 out of 5 respondents significance rating for lease finance and cooperative type business model shows 80% and 100% response respectively as highest significance. On the other hand for micro/mini-grid business model only 3 respondent's feedback on the significance shows that 66.67% of them go for medium and 33.33% goes for highest significance rating. The Cooperative and Mini-grid service type business models are under the preference treatment of electrification program of Ethiopia. These business models are of vital in their nature to hold on in off- grid electrification business as it can be employed in small scale engagement undertaking. As a result of this plausible feature the significance rating of the key informant's interviewee response quite fits to the preference for adoption and implementation in Ethiopian context.

Following to the key informant interview response an approach has also been made to seek the opinion or choice of the private sector participants on business model type

they think of better for involvement in the sector investment undertaking. The question along with their response of interest is provided hereunder in table4.6

Table 4.6

A Summary of Survey Questionnaire Respondents on Business Model preference

Question		Rate of preference response per survey questionnaire respondent												Remark
		R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀	R ₁₁	R ₁₂	
In your opinion which type of business model is preferable for the private sector involvement in electrification program of Ethiopia? provide the scale of preference 1-3, where 1 being most preferred, 2 being preferred and 3 being least preferred.														
I	Ownership business type model													
1.1	Public Private Partnership common model													
	Build-own-operate-transfer (BOOT)	1	3	2	2	1	2	-	-	-	1	2	2	
	Build-own-operate (BOO)	-	3	-	2	-	-	-	2	-	2	2	-	
	Build-own-transfer (BOT)	-	2	1	3	-	-	-	-	-	3	3	-	
1.2	Multi party ownership	2	-	-	2	3	2	-	-	2	2	-	-	
1.3	Lease or Hire Purchase	2	-	-	3	2	2	-	-	3	3	2	-	
II	Service type model													
2.1	User co-operative	3	2	-	-	-	2	-	-	-	1	2	2	
2.2	Distribution Licensee Energy Service /Desco/ model													
	Pay per use model	-	2	-	-	-	-	-	-	-	3	3	3	
	Rental model	-	-	-	-	-	-	-	-	-	2	3	-	
	Lease finance model	2	-	-	-	-	-	-	-	-	3	2	-	
2.3	Mini/micro Grid system Business model	2	2	-	-	3	2	2	-	3	-	-	-	
III	Other specify													

NB: R₁R₁₂ refers to respondents to survey questionnaire

Though, significant number of respondent fail to showup the rating on their response to business model preference from the response obtained Build Own Operate and Transfer(BOOT) with a record of 55% out of 9 respondents followed by Multi-party ownership business model with a record of 57% out of 7 respondents are suggested as preferred business models. Meanwhile for the service type business model the response obtained signifies that micro/ mini-grid business model with a record of 66.67% out of 6 respondents and user cooperatives business model with a record of 83% out of 6 respondents respectively noted that as preferred model to engage the private sector.

The response gained from the private sector survey questionnaire on the business model types within the prespective of ownership and services type earmarks that the majority of the private sector inclination to see the prevalence of such models to hold on. Actually the preferred business models are the once the government of Ethiopia is heading to put in place through Public Private Partnership and electrification program engagement.

Both the key informant interviewee and private sector respondent are consistently infavour of service type business models, that is, user cooperatives and micro/mini-grid business models. In contrast, the key informant response on ownership type business model and that of the private sector survey questionnaire respondent go otherwise. While the key informants are infavour of BOO followed by the BOOT business model the private sector survey questionair respondents are infavour of BOOT and Multi-party ownership model respectively. As the private sector always seek to avert risk it is not surprising to see the survey questionnaire response to fall under the preference of BOOT and multi-party business model to be on board.

The writer is with the opinion of that the services type business models preferred both by the private sector respondents and key informat interviewee feedback be structured in the form of ABC /Anchored Business and Customer/ model so that this mode of business structure allows cross subsidies of the tariff rate across the different category of customers to the services. Moreover, for effective

implementation of the model under the ABC structure it is advisable to support it by specific enabling environment that can enable the private sector engagement interest more reliable. So, in order to make use of opportunities to the private sector involvement under electrification program and combat challenges thereof the specific enabling environment at the dispose of the private sector involvement needs to be in place.

4.4 Enabling Environment

With regards to the enabling environment role to the effect of materializing the envision under electrification program of Ethiopia the updated version of the electrification program provides the need to:

establish policies,regulation,and incentive support of the whole off-grid ecosystem across the value chain,from importers to customer. This include adoption and enforcement of enabling regulation,as well as regulatory certainty,quality,standards, and financial public support programs targeted to ensure equity, human capital development,and economic growth across the country.

(NEP_{2.0} : Integrated planning for universal access, 2019)

The inclusion of enabling environment in the updated version of electrification program seems that the government has come to realize that without putting in place enabling environment the envision in general and the private sector involvement intention in particular may not hold. Wonderful enough from the updated version of the program provision for enabling environment to take place it is possible to infer that the program is launched without due account to its implementation requirements to occur ahead of the launch. Still it is not clear how things can be materialize in parallel. That is, on one hand putting in place the enabling environment and the implementation of the program targets on the other hand.

What soever may be the case in order to explore on the presence of specific enabling environment for the private sector involvement under electrification program of Ethiopia an attempt has been made to seek the opinion of key

informants and the private sector participants through interview and survey questionnaire dispatch respectively. Accordingly, the key informants interview based on a guiding question “Is there enabling environment/policy,law, licensing process,tariff rate etc.../ to the private sector involvement in electrification program of Ethiopia you may know? If “yes” would you mind to mention the type you may know? If “no”, in your opinion what type of enabling environment you may recommend to the private sector involvement helps? Please specify? Discussion revealed that “no” and “yes” answers. Those who responded “no” provided a recommendation of enabling environment.

Consequently KII₁ stated that;“Financing support at minimal interest rate, grace period for repayment with moderate interest rate payment during this time, long payback period for debt secured and administrative support to smooth out the service delivery undertaking”. While KII₆ resorted to state that;“ Distinct responsibilities and authorities of institutions (institutional independence),optimised licensing and regulatory process, cost refeitivity”. On the other hand those who responded “yes” also provided as there are a list of enabling environment. Accordingly KII_{2,3,4, and 5} in general listed;

Energy policy, Investment proclamation, Investment regulation
Energy proclamation and its amendment, Energy regulation,
Geothermal development licensing proclamation, draft tariff
guideline and methethodology, draft directives on licensing, GTP II,
Public Private Partnership proclamation, PPP policy, PPP directive,
guideline to govern the relation of contracting authority and the
private developer and Electrification programe.

The “no” answer response and the follow up recommendation provided enlighten that as long as electrification program in this country is a recent phenomena it needs to capture the thoughts of the government to put in place enabling environment geared to wards private sector involvement under the program. In contrast the response in favor of “yes” and the list provided thereof clicks on to question how a high level enabling environment can be at the dispose of electrification program undertaking or not?

Added to the the “yes” and “no” answer together with the list of enabling environment known and the possible opinion of the key informants also indicated additional points for the private sector to involve in electricity development endeavor. According to KII₁ there is a need to put in place; “Sector role alignment, commitment to respect contractual agreement for the private sector entry, avoid bureaucratic and corruption grounds that hinder the private sector true interest to participate” Aligned to KII₁ opinion KII₂ also highlighted on the need to have;

Clear enabling environment such as; policy on upfront capital subsidy, feed in tariff, policy framework need more improvement to support appropriate and actionable institutional framework, develop in house capabilities for energy modelling /or least- cost and climate-resilient policy formulation, mobilize international donor financing that is currently sitting idle on accounts.

In addition KII₃ is also with the opinion of putting in place” Government commitment to involve private developers in due account to risks under consideration.” Moreover, KII_{4and 5} are also with the opinion of “Government commitment to support the private sector with upfront capital subsidy, feed in tariff and incentive packages.” Unlike the opinion of KII_{2,3,4,5} position to the private sector support through feed in tariff KII₆ states that;

Feed in Tariff never provides incentive for innovation. Hence, competitive approach needs to be preferred to drive technology innovativeness, so as to enable a cost reduction in electricity generation and reliable power supply for end users. Civic contractor quality, mutual accountability has the power to attract the private investment. Moreover, KII₆ added BOO/ Build Own and Operate/ business model involve innovation to reduce cost of operation and maintenance. Utilizing private sector capacity for sources delivery should be expanded. Besides, actualizing the energy (electricity) access as a critical input and also as a critical driver of socio economic transformation.

The response on the enabling environment and the added remarks note that either to put in place actual enabling environment to involve the private sector under the program or critically evaluate the so called existing enabling environment for the sector can be deployed to involve the private sector under the program envision. In

fact placing enabling environment as recommended by the “no” respondent would lead to look into the details of the program provision to the private sector involvement. On the other hand the critical examination of the so called existing enabling environment to fit the requirements of the private sector involvement under the program needs also a step ahead thinking to make it a reality. Consequently, the response procured on the enabling environment from the KII discussion in either of way “no” or “yes” the writer is convinced to underline the need to look for specific enabling environment geared to address the concern of the private sector involvement under the program. In sum it is true and agreeable that so long as the private sector involvement requires critical thinking and takes note into account risks that may arise from the engagement the response in questing for a workable enabling environment is something expected.

In view of soliciting the impression of the private sector participant on the enabling environment an approach has also been made to permit holders through survey questionnaire to seek their response on “ Is there enabling environment/policy,law, institutional framework etc./ that can attract the private sector involvement in electrification program of Ethiopia? If “yes” could you please specify the type of policy, law or institutional framework you may know? If “no”, what should the Government do to enable the private sector involvement in electrification program of Ethiopia? Please specify?”

Accordingly, with the exception of respondent₃ and ₄ who did not responded either “yes” or “no” the rest respondent feedback is secured. So, Respondent _{5,6,7} and ₁₂ reacted to the question “no” and provided that;

The government should provide clear policy on renewable technologies on where and how to implement in the country, clearly state import procedure mainly for solar technologies, policy on the issuance of government support measures in support of energy and other investment programmes(ex. guarantees,escrow accounts, Government support letters, the government should invite and make large-scale investment in power generation and transfer it at moderate limit capacity with sustainable financial negotiations with private sectors participation and fix feed in tariff for on grid supply.

While respondent^{1,2,8,9,10} and ¹¹ responded to the question “yes” and provided the enabling environment they may know as:

Policy – energy policy, ppp policy, NEP_{2.0} and Law- Executive Organ Federal Government Authority proclamation no.1097/2018, Ministry of Water, Irrigation and Energy Establishment proclamation no.691/2010, Geothermal proclamation no.981/2016, Investment proclamation no. 769/2012, Energy Proclamation no.810/ 2013, (Amendment 1085/2018, Public Private Partnership (ppp) proclamation no.1076/2018, Energy Regulation 447/ 2019, Investment regulation no.270/ 2012, Ethiopian Energy Authority Establishment regulation no.308/2014, Ethiopian Electric Utility establishment regulation no.303/2013 (Amendment no.382/ 2016), Ethiopian Electric Power establishment regulation no.302/2013 (Amendment no.381/2016)”and Institutional framework – “PPP board, Ministry of Water, Irrigation and Energy, Ethiopian Energy Authority, Ethiopian Investment Commission, Ethiopian Electric Utility (including UEAP), Ethiopian Electric Power, Regional Energy Bureau’s, Director of Electrification (DOE) at the Ministry of Water, Irrigation & Energy

Apart from the names of the policy, law and institutional framework it doesn’t seem that the permit holder are cognizant of its importance and use. In this respect a few of the respondent added that it is unclear and there is no a platform that enables to accommodate the views and comments of the private sector. Though, many of the respondents state policies, laws and institutional framework existence in reality the policies and laws are least known and the institutions fails to be appropriately staffed. So, it requires to promote and take note of its relevance to the private sector involvement in electrification program. In due account to the relevance fact on the enabling environment a question has been aired to the private sector permit holders to state the relevance. Consequently, a response has been provided as in the under table 4.7

Table 4.7

Survey Questionnaire Respondent on Enabling Environment Relevance

Question	Enabling environment relevance per survey questionnaire respondent												
	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀	R ₁₁	R ₁₂	Remark
How do you state the relevance of enabling environment to private sector involvement in electrification program ? 1 being the highest, 2 medium and 3 being Low.													
Policy	3	1	3	2	3	3	3	1	2	1	1	3	
Law	1	3	3	1	1	1	3	1	2	1	1	3	
Institutional Framework	2	3	3	2	-	1	2	1	2	1	2	2	
Other specify,													
Financing availability, technology capacity	2									1			

With the exception of one respondent silence on institutional framework relevance extent designation the rest of respondents designated the relevance as highest, medium and low respectively. From the designation of the relevance we can see that out of the possibility 40% fall to highest ,25.7% to medium and 34.3% low relevance designation. At face value of the response we infer that the respondents are infavour of highest state of relevance. Though, the response on the highest and medium relevance state designation in sum shows 65.7% as it is relevant to have enabling environment, the percentage response of low relevance designation together with the understanding that some respondent who have not reacted on enabling environment they may know response to this question implies the need to make awareness on the role of enabling environment to the private sector involvement under the program.

Cognizant to such relevance response disparity the write is with the opinion of that the respondents for low relevance fails to correctly understand the effect of enabling environment. The fact that the relevance designation for individual enabling environment for instance “Law” takes the highest designation followed by policy and institution may be taken as a signal for the private sector needs to be promoted for better understanding on specific enabling environment importance. So, unless and otherwise the government heads to make it specific and promote enabling environment the private sector involvement may not be as expected under the program.

Bearing in mind to know that whether the private sector involvement in electrification program support or not a “yes”, “no” question have been asked as “Do you think that the private sector involvement in electrification program support the effort to access electricity service?” all respondents earmarked a response of “yes”. As a follow up to the “yes” response a question of “how” please specify? Accordingly, each respondent provided their response as follows;

Respondent₁ stated that the involvement of the private sector under the program supports in;

Private sector raise finance, brings efficiency in addressing coverage, increase reliability of system/electricity supply, as payment is based on service many players can come on board, relieve government from continuous tariff subsidy. Since off-grid electrification and private sector involvement is new, regulations need to be light handed to permit innovation .Allow pilots through different ownership and business models as pilots. Quick and responsive regulation needed.

As a follow up respondent₂ also added that; “ If there is conducive environment the private sector will engage to mini- grid and grid-tied project construction which will play positive role in delivering electricity access.” Respondent₃ on the other hand stated that; “The government can’t do it alone by building mega dams. private sector can produce multiple small micro hydro and solar micro and mini-grids to augment the government effort to avail access to electricity”

Respondent₅ is with the opinion of “impossible to address more community without private sector”. In addition respondent ₆ provided that, “risk sharing is optimal, Government can get value for money; demand need for huge upfront capital investment that impact country's budget and debt levels”. Followingly respondent ₇ also noted that;

Engagement of international private sector involvement in electrification streamlining procedures expansion of mandatory standards as example for off- grid technologies and appliances providing high level of service and support social and productive uses from energy intensive business industries. In addition private sector involvement in electrification should feature public private participation as well as co-operative models to establish friendly enabling environment.

Respondent _{8,9} and ₁₀ respectively added that,

Because the private sector is more effective as it has the technology, manpower and money to make the electrification process fast and easy, competition & the business and profit model will force the private sector to give adequate service and competitive price for its service, private sector involvement in national grid generation sector will help in bridging financing requirement (which is large involvement) needed for the government. This will help the government to focus in another economic sector while boosting the fast procurement needed. private sector involvement in electrification sector also helps the government in achieving ambitious national electrification plan by 2025.

Last but not least respondent₁₁ and ₁₂ similarly provided that;

According to the National Electrification Program the government plans to electrify 100% of the population by 2025. As such 8 million off- grid communities are expected to obtain off-grid solutions with the participation of the private sector so it is highly relevant to involve the private sector. In addition any plan by the government shall be accompanied and negotiated with the private sector to ensure the sustainability and of course for the achievements as well. Open to the private sector renders flexibility and efficiency from all government institutions, only the private sector can reach efficiently most off-grid rural Ethiopia because of its cost efficient approach and the size of projects.

The response on “how” can the private sector contribute under the electrification program provides an opportunity of enlightenment to think about the contribution at times the government determine’s to open up the room for the private sector involvement. Hence, the response can be recognized as a bottom line of thinking in order to establish specific enabling environment for the private sector engagement under the provision of the program.

Chapter Five

Conclusions and Recommendation

5.1 Conclusions

Ethiopia has enormous capacity to generate electricity from various energy sources. Even so, the effort to electrify the country through grid extension development effort did not match with the demand rise. Moreover, the attempt to make the rural areas accessible to electricity through state and non- state actors is limited to cover the demand rise. Some studies attributed the limitation for the reason of failed private sector involvement in the development effort of the sector. However, the enabling environment for the private sector involvement lacks the proper treatment under the studies. Hence, this study opted to identify challenges and business model and investigate opportunities under the Ethiopian National Electrification Program with due account to placing specific enabling environment as pull factor to involve the private sector either through provision given under the program or business model.

Accordingly, the study shows among others that the private sector falls under short of upfront capital, lack of specific enabling environment/policy, law and institutional framework/, sector institutions staff capacity and understanding limitation to wards private sector investment as a challenge. It has been also noted that the recognition of opportunity for the private sector involvement in mini-grid development and off-grid solar. The business models identified have two wings. That is, a business model BOOT and BOO tilted to on grid connection on one hand while mini-grid and user cooperatives business model for off-grid connection on the other hand separately. Enabling environments are designated as either under development or to be developed in due course of the program implementation through sector institution.

In a nutshell, the study reveals its specific objectives to hold on and underline the need to provide specific enabling environment to buy the will and confidence of the private sector involvement in order to make use of opportunities identified and combat challenges thereof under electrification program of Ethiopia.

5.2 Recommendation

As the private sector investment decision requires critical understanding on the prevailing policy, law and institutional framework would like to know the possible change effect on the provisions in the investment proclamation, trade proclamation, tax proclamations, and that of energy proclamation and regulation needs to be harmonized and/or aligned to establish the confidence of the private investment in the sector. Added institutions alignment towards the program implementation needs to be clearly co-ordinated, staffed and accountability to that effect has to be established.

Though, the business model identified in the study shows for on grid and off-grid private sector involvement separately the program does not provide room for on-grid private sector involvement. The write feels that a partial treatment to involve the private sector may have a repercussion to the extent of deterring potential investors. So, it is necessary to revisit the program to include private sector involvement on on-grid investment as well.

The business model for off-grid identified as mini-grid system and user cooperative needs to be structured as ABC/Anchore, Business and Customer/ mode to support the tariff rate cross subsidize each other for the have nots be subsidized by the have once under the umbrella of the services undertaking.

Enabling environment not limited but including; incentive package/ tax exemption, grace period for soft loan repayment, administrative support to smooth out regional vs federal government communication, etc../, upfront and opex capital subsidy

policy and grid expansion encroachment compensation means needs to be provided to accommodate the interest of the private sector involvement for effective and reliable electricity access and connectivity be materialized under the program timeline in the year 2025 to capture 100% electrification service in Ethiopia.

Reference

- Africa Progress Panel (2015) Lights Power Action: Electrifying Africa
- Dalelo A.(n.d) “Rural Electrification in Ethiopia: Opportunities and Bottlenecks.” Department of Geography and Environmental Education Addis Adaba University. Print
- AMES-E (2008) Access to modern Energy Service- Electricity
- Anoop Singh(2005) Private Investment in Power Sector in Developing Countries: Lessons from Reforms in Asian and Latin American Countries.
- Anton Eberhard(n.d) The Political Economy of Power Sector Reform in South Africa Retrived from [https:// www.gsb.uct.ac.za/ files/ Stanford PSREberhard Sep2004final.pdf](https://www.gsb.uct.ac.za/files/Stanford_PSREberhard_Sep2004final.pdf)
- Carbon Trust(CSiR)(2017) Integrating off-grid solutions into South Africa’s electrification programme
- Council of Ministers Regulation no.302(2013) the Establishment of Ethiopian Electric Power,Addis Ababa.
- Council of Ministers Regulation no.303(2013) the Establishment of Ethiopian Electric Utility, Addis Ababa.
- Daniel W.(2012) Principles of Successful Expansion of Rural Electrification Program Debate in Ethiopia
- Department: Energy Republic of South Africa(2012). Non grid Electrification Policy guidelines
- Economic Commission for Africa(ECA)(2016) Enhancing domestic private sector development in Africa: A focus on renewable energy
- Ethiopian Electricity Agency (2008). Draft Feed in Tariff Law, Addis Ababa.
- Emmanuel G. Bakilana & et al (2015). Off Grid & Mini Grid in Tanzania: License and Regulatory Overview
- ESMAP(2018). Ethiopia: Beyond Connections, Energy Access Diagnostic report based on Multi-Tier Framework

FDRE (2017).National Electrification Program: Light to All

FDRE (2019) National Electrification Program 2.0:Integrated Planning for Universal Access

Federal Negarit Gazeta of Federal Democratic Republic of Ethiopia(FDRE ,1995). year 1 no.1

Federal Negarit Gazeta of Federal Democratic Republic of Ethiopia(FDRE) (2012). year 18th no.63

Federal Negarit Gazeta of Federal Democratic Republic of Ethiopia(FDRE,2014), year 20 no.12

Federal Negarit Gazeta of Federal Democratic Republic of Ethiopia(FDRE) (2014) year 20th no.36

Forum for Environment (2010) *Ethiopian Environment Review* , Addis Ababa.

Hailu G. (2000) "Energy Law Ethiopia." In *Kluwer Law International*.

Heinrich Boll Stiftung (2013). Powering africa through feed-in tariffs: powering africa through feed-in tariffs.

House of People Representative of Ethiopia (HOPR,2011). Standing committee for Natural Resources and Energy Field mission Report.

International Bank for Construction and Development (IBCD,2014).
Readiness for investment in sustainable energy rise: a tool for policy makers Irene M. et al (2007). Benchmarking National Attractiveness for Private Investment in Latin American Infrastructure, World Economic Forum, Cologny/ Geneva

IRENA (2016). Policies and Regulations for Private Sector Renewable Energy Mini-Grids

IRENA(2018). Policies and Regulations for Renewable Energy Mini-Grids

Irwin et al.(1997) Dealing with Public Risk in Private Infrastructure

J. Ryan (2017). Enabling private investment in renewable power in Sub-Saharan frica

- Jeffrey D.(2009) Private sector investment in infrastructure :Project finance, Private public partnership projects and risk,2nd editon
- Joseph N., et al (2013) Powering Africa through Feed-in Tariffs, Nairobi Kenya, Renewable Energy Ventures (K) Ltd.
- Joseph K. and Anton E.(2013) power sector reform and regulation in africa :lessons from Kenya, Tanzania, Uganda, Zambia, Namibia and Ghana
- Kat H. et al (2016). Accelerating access to electricity in Africa with off-grid solar the impact of solar household solutions.
- Kenya Ministry of Energy(2012). Feed-in-tariffs policy on wind, biomass, small- hydro, geothermal, biogas and solar resource generated electricity
- Klingebiel D. and Ruster J.(2000) Why Infrastructure Often Fall Short of their Objectives, World Bank Policy Research Working Paper # 2358,
- Kumar et al.(1997) Mobilizing Domestic Capital Markets for Infrastructure Financing- International Experiences and Lessons for China, World Bank Working Discussion Paper # 377,
- Lamech R. and Saeed K.(2003) “What International Investors Look for When Investing in Developing Countries: Results from a Survey of International Investors in the Power Sector”, Energy and Mining Sector Board Discussion Paper No. 6,
- Lily O. et al (n.d) Accelerating minigrid deployment in sub-saharan Africa : Lessons from Tanzania
- Masami K. and Chris T.(2016) Making Power Affordable for Africa and Viable for its Utilities.
- Mengistu T.(2002) Power sector reforms in Ethiopia: options for promoting local investments in rural electrification., Addis Ababa: MoFED
- Ministry of Finance (2017) Public- Private Partnership Policy
- Ministry of Finance , Office of Public Private Partnership /PPP/ Directorate General (2019) ,2018/2019 PPP project Pipeline.

MOFED (2010) Growth and Transformation Plan of FDRE:2010/11 -2014/
 2015 Volume I:Main Text, , Addis Ababa.

MWIE (2013) “Updated Rapid Assessment and Gap Analysis on Sustainable
 Energy for All (SE4ALL): The UN Secretary General Initiative”,
 Addis Ababa.

MWIE(2013) Ethiopian National Energy Policy 2nd updated draft, Addis
 Ababa

MWIE (2015) Off-Grid Investment Plan for Ethiopia

National Energy Policy of Ethiopia (1994)

Nigeria (2005) Enactment of the Electric Power Sector Reform Act (EPSRA)

Nigerian Electricity Regulatory Commission/NERC/(2016) Regulation for mini-
 grid

Remco F. et al (2011). Barriers and Drivers to Renewable Energy Investment in
 Sub-Saharan Africa, in Journal of Environmental Investing2, No.1
 Switzerland.

Ramon C. and John H.(©2015), The business Model : Nature and Benefits, The
 Journal of Economics and Management Strategy, 15-089_afa7e1c9- 486d-
 9bd4-b8ea71de9058.pdf

Rwanda (2017) Off-grid sector status report

Rwanda (2015) Rwanda simplified Rural Electrification Framework

TAK-Innovate Research and Development Institution PLC(TAK-IRDI) (2016)
 Assessment of the Role of Private Sector Plays in GTP II.

The Renewable Global Status Report (GSR,2007) Retrived from www.ren21.net

United Republic of Tanzania (n.d). National Electrification Program Prospectus

Woodhouse, E.(2005a) “The Experience of Independent Power Producers in Developing Countries”, Final Report, Program on Energy and Sustainable Development, Center for Environmental Science and Policy, StanfordUniversity, Stanford, CA world Economic Forum
retrived from [https://www.gsb.uct.ac.za/files/ Feed in tariffs or Auctions.pdf](https://www.gsb.uct.ac.za/files/Feed_in_tariffs_or_Auctions.pdf)

World Bank and IEA (2015). Progress Toward Sustainable Energy: Global Tracking Framework Report. World Bank:Washington,DC. DOI: 10.1596/978-1-46480690 retrived from [http:// tracking energy4all.worldbank.org /](http://tracking.energy4all.worldbank.org/)
World Bank (2013) View point public policy for the private sector, Note number 338

World Bank (2015) Beyond Connections: Energy Access Redefined.
Washington, DC: World Bank retrived from [http:// www.worldbank.org /en/ topic/energy/ publication/energy-access redefined.](http://www.worldbank.org/en/topic/energy/publication/energy-access-redefined)

Zereay T. et al (2013) Mainstreaming unstainable Energy Access into National Development Planning: the case of Ethiopia.

Bibilography

1. -----2016a. “World Development Indicators 2016.” Database, World Bank, Washington, DC.
2. Ethiopian Electric Power Co-orporation (EEPCO),2007,50th Gold Jubilee special issue, Addis Ababa.
3. Pegasys Institute and Ethio Resources Group,2017, The Climate Change and Energy
4. UNDP / World Bank, 1999,Global Energy Sector Reform in Developing Countries: A Scorecard, Energy and Mining Sector Unit, The World Bank, Washington, D.C.
- 5, World Bank, 2004, The Challenge of Financing Infrastructure in Developing Countries, in Global Development Finance 2004: Harnessing Cyclical Gains for Development,
5. Anton Eberhard, Katharine Gratwick,Elvira Morella, and Pedro Antmann,©2016, Independent Power Projects in Sub- Saharan Africa: Lessons from five key countries,Washington Dc.
6. Ethiopian Electrical Power Corporation (EEPCo,2011). Ethiopian Power System Expansion Master Plan Update (EPSEMPU).
7. RES Africa Foundation,2019, What does it take to accelerate RES investment in Africa:Priorities and Recommendations
8. Joey Lee Miranda,editor[©2009],Capturing the Power of Electric Restructuring
9. Ethiopian Rural Energy Development and Promotion Center, 2007, Final Report: Country background nformation Solar and Wind Energy Utilization and Project Development Scenarios.
11. NARUC,2016 Manual on Distributed Energy Resources Rate Design and Compensation
12. ESMAP,©2015,Beyond Connections Energy Access Program

Annex 1

List of Private Sector Licensee at the Federal Level

No	Name of the Licensee	Type of Activity	Source of power	Location	Response obtained for questionnaire dispatched(✓)
1	Ethio Resource Group/ERG/ Plc	Generation, Distribution and Sales	Wind	Mehale Meda,Amhara Region,	✓
2	Rensys Engineering and Trading PLC	Generation, Distribution and Sales	Solar	Deke Island, mahara Region	✓
3	Orpower 12 inc.(Ormate)	Generation	Geothermal	Afar Region	✓
4	Tulu moye Geothermal	Generation	Geothermal	Oromiya and South Region	✓
5	Cluff Geothermal	Generation	Geothermal	Oromyia, Amahar and South Region	✓
6	Corbetti Geothermal	Generation	Geothermal	South and Oromiya Region	
7	Reykjavic Geothermal	Generation	Geothermal	South and Oromiya Region	
8	Afar Geothermal Alternative Power share Company/AGAP/	Generation	Geothermal	Afar Region	✓
9	GreenScene Energy PLC	Import and Distribution of SHS	Solar	South and Oromiya Region	✓
10	ENGIE	Generation	Solar,wind,Geo		✓

No	Name of the Licensee	Type of Activity	Source of power	Location	Response obtained for questionnaire dispatched(✓)
			thermal, West to Energy		
11	STM Solar Technologies Manufacturing S.C	Import and Distribution of SHS	Solar	All Regions	✓
12	Solar Development PLC	Import and Distribution of SHS	Solar	All Regions	✓
13	Lydetco PLC	Solar +Wind	Oromiya Region	Oromiya Region	✓
14	As Wind And Solar Energy Engineering	Hydro	South Region		
15	R.E.E Renewable Energy Eth.PLC	Generation			
16	Basona Dongora Plc	Generation	Wind	Around D/Berhan, Amara Region	
17	Ameya micro Hydro power	Generation	Hydro	South Regiona	
18	Alphasol Modular Energy Plc	Generation, Import distribution and Sales	Hydro,Solar and Biomass	South Region,Oromiya	✓
19	AVCom Trading PLC	Import Distribution	Solar	All Regions	
20	Gedebe Mini-hydro power	Generate and sale	Hydro	Around Markos, Amhara Region	

Source: Ethiopian Energy Authority Archives/Records

Annex 2

Addis Ababa
University
(Since 1950)



College of Development Studies

Centre for Environment and Sustainable Development

Key informant Interview (KII)

Self Introduction

Greetings, Thank you for your time and willingness to this key informant interview.

*My name is Belayneh Gizaw, I am a Postgraduate Student in Addis Ababa University at **the** College of Development Studies under the centre for Environment and Sustainable Development. Currently, I am on thesis work entitled “ **Opportunities and Challenges of Private sector involvement in Electrification Program of Ethiopia**” In partial fulfilment to the requirement of Masters of Art degree in Environment and Sustainable Development. With the purpose to identify opportunities, challenges and business model that fit to private sector involvement in Electrification program of Ethiopia. I am here for key informant interview on matters related to my thesis work objectives with you.*

Private Sector involvement in electrification program of Ethiopia Key Informant Interview (KII) Interview guide

I. Background Information

Name of organization.....

Type of organization (Tick v):

- Government
- Private
- Other

If other, please

specify.....

Address of organization.....

Name of key informant.....

Position of the key informant.....

Contact details of the key informant:-

- Email
- Website-----
- Telephone.....
- Fax.....
- P.O.Box -----

II. Technical Questions

1. When was your organization established? -----

2. What is the role of your organization in electrification investment undertaking?-----

3. What opportunities motivate private sector involvement in electrification program initiatives of Ethiopia? 1 being the highest and 2 being medium and 3 being low consideration. How do you rate its importance? (Tick ✓) in the box under.

Motivating Factors	1	2	3
Policy existence			
Profit			
Cheap Labour			
Investment Incentives			
Government commitment			
Independent Regulatory			
Other specify,			

4. What factors hinder the private sector involvement in electrification program of Ethiopia? 1 being the highest and 2 being medium and 3 being low consideration . How do you rate its significance ? (Tick ✓) in the box under.

Hindering Factors	1	2	3
Absence of Policy framework			
Poor Regulator			
Lack of Technology awareness			
Lack of upfront capital cost			
Political instability			
Physical Location resource reliability			
Currency inconvertibility			
Change of Law			
Other specify,			

5. Given your knowledge and experience what type of business model can be helpful to motivate the private sector involvement in electrification program of Ethiopia? 1 being the highest and 2 being medium and 3 being low consideration. How do you rate its significance? (Tick ✓) in the box under.

No	Business model types	1	2	3
I	Ownership Business Models			
1.1	Public Private Partnership common model			
	➤ build-own-operate-transfer (BOOT)			
	➤ build-own-operate (BOO)			
	➤ build-own-transfer (BOT)			
1.2	Multi party ownership			
1.3	Lease or Hire Purchase			
II	Services Business model			
2.1	User Cooperative			
2.2	Distribution Licensee Energy Service /Desco/ model			
	➤ Pay per use model			
	➤ Rental model			
	➤ Lease finance model			
2.3	Mini/micro Grid system Business model			
III	Other specify			

6. Is there an enabling environment/Policy, Law, Licensing process, Tariff etc.../ to the private sector involvement in electrification program of Ethiopia you may know? Yes No

7. If yes, would you mind to mention the type of enabling environment you may know? -----

8. If no, in your opinion what type of enabling environment you recommend to the private sector involvement helps? Please specify-----

9. Any other information related to this thesis work you may have? Please provide-----

THANK YOU VERY MUCH

Addis Ababa
University
(Since 1950)



College of Development Studies
Centre for Environment and Sustainable Development
Private Sector Investors Survey Questionnaire

My name is Belayneh Gizaw, I am a student of Postgraduate Studies in Addis Ababa University at the College of Development Studies under the centre for Environment and Sustainable Development. I have prepared this questionnaire to survey private sector views with a purpose to identify opportunities, challenges and business model types for private sector involvement in Electrification Program of Ethiopia under a thesis work entitled “ **Opportunities and Challenges of Private Sector Involvement in Electrification Program of Ethiopia**” in partial fulfilment to the Masters of Arts Degree in Environment and Sustainable Development.

Questionnaire Instruction: Please provide your genuine response to the questions hereunder:

- a) By ticking the appropriate answer for choice questions
- b) By marking “X” for Yes / No questions and
- c) By providing statements for opinion solicits questions.

1. Background Information

Name of the Company/Firm

Year of Establishment

Investment Capital (In Birr'000).....

Name of the owner/ Manager

Number of staff by gender : Female.....Male.....Total.....

Address of the Company /Firm

Position of the respondent.....

Contact details of the respondent:

- Name.....
- Email.....
- Website
- Telephone.....
- Fax.....
- P.O.Box

Types of electrification Investment involved in (Tick v):

- solar
- wind
- Geothermal
- West to energy
- Hydro
- Other

If other, please

specify.....

II. QUESTIONS

A) Policy, Legal and Institutional Framework

1. Is there an enabling environment /Policy, Legal and institutional framework, etc / that can attract the private sector involvement in electrification program of Ethiopia?

Yes

No

2. If yes, could you please specify the type of :

2.1 Policy -----

2.2 Law -----

2.3 Institutional framework -----

you may know.

2. How do you state the relevance of the enabling environment to private sector involvement in electrification program ? 1 being the highest, 2 medium and 3 being Low (Tick ✓) in the box under.

Enabling Environment	1	2	3
Policy			
Legal framework			
Institutional framework			
Other specify,			

- 4.If no, what should the Government do to enable the private sector involvement in electrification program of Ethiopia? Please specify; ---

B) Private Sector Opportunity to involve in electrification program

1. What opportunities derived you to invest in electrification supply?,
Please specify -----

2. In your opinion which opportunities motivate the private sector involvement in electrification program? (Tick \checkmark) in the box under in the order of their importance rated 1 being the highest ,2 being medium and 3 being low.

No	Opportunities	1	2	3
1	Attractive Tariff			
2	Independent Regulator			
3	Sovereign Guarantee			
4	Currency parity rate			
5	Incentive packages			
6	Government Policy			

3. Other than the list provided in the above table what kind of opportunities motivate the private sector involvement in electrification program you think? Please specify, and rate them in the order of their importance as above table-----

C) Private Sector hindering factors to involve in electrification program

1. What type of challenges did your company faced so far? Please specify -----

2. In your opinion what are the main hindering factors to private sector involvement in electrification program of Ethiopia? How do you rate it? 1 being super serious, 2 being very serious, 3 being serious and 4 being low serious (Tick \surd) in the box under

Hindering Factors	1	2	3	4
Absence of Policy				
Poor Regulator				
Lack of Technology awareness				
Up front Finance				
Political instability				
Physical Location of resource				
Currency in-convertibility				
Change of Law				
Other specify,				

3. Please provide details on how and why these factors are hindering private sector involvement in electrification program of Ethiopia?

4. In your opinion, what should the Government do to address the hindering factors? Please specify the details of your expectations.

D) Business model

1. What is the type of business model you are making use of in your electrification business undertaking so far? Please specify;

2. In your opinion which type of business model is preferable for the private sector involvement in electrification program of Ethiopia?
(Tick) in the box under and provide the scale of preference 1-3, where 1 being most preferred, 2 being preferred and 3 being least preferred.

No	Type of Business model	Preferred	Not preferred	Scale of preference as 1,2 or 3
1	Ownership Business Models			
1.1	Public Private Partnership (PPP) –common model			
	➤ build–own–operate–transfer (BOOT)			
	➤ build–own–operate (BOO)			
	➤ build–own–transfer (BOT)			
1.2	Multi party ownership			
1.3	Lease or Hire Purchase			
II	Services Business model			
2.1	User Cooperative			

	model			
2.2	Distribution Licensee Energy Service(Desco)			
	➤ Pay per use model			
	➤ Rental model			
	➤ Lease finance model			
2.3	Mini/micro Grid system Business model			
III	Other specify			

E) General

1. Do you think that the private sector involvement in electrification program support the effort to access electricity service? Yes No lea

2. If your answer to question no.1 is yes, how? please specify,-----

3. If your answer to question no.1, is no. Why? Please specify-----

4. Other comments you may have, please provide?-----

