Proposal Title

1. Road to Financial sustainability and affordability (system loss, tariff, investment, equity...)

Statement of Problem/Background of the research

A generation capacity increment plan, with in a 10 years’ period will take the country to middle income country, wherein, the energy requirements are not only fully met but also being an energy hub in the east Africa region. However, the Ethiopian Electric Power still has financial viability & sustainability issue that warrants urgent attention and suitable interventions. EEP is the most financially distressed sector which has not been given the due attention so far despite the fact that the financial performance continued to deteriorate at alarming rate.

Research Objective:

- Conduct an in-depth study of the existing business processes,
- Assesses utility & construction best practices to identify additional revenue sources,
- Compile and report its findings and get it reviewed and approved,
- Develop a detailed cost control & management technical proposal document to reduce expenses to an acceptable value,
- Suggest a detailed technical proposal about additional source of revenues considering power utilities & construction industry best practices,
- Develop models for an integrated water reservoir level forecasting & windpower forecasting to enhance operational capability,
- Develop a detailed Cost Models and Pricing Framework to calculate the cost of providing dark fiber leasing services,
- Develop a detailed Financial Model in order to provide detail financial assessment and financial projections with financial decision criteria,
- Develop a detailed strategic roadmap document to renovate transmission & substation construction and engineering capacity,
- Develop a detailed technical proposal document to streaming line the business process and optimize organizational structure,

Rational/Significance of the research: The major services include but not necessarily limited to:

- The Rationale of the research is assessed Study Existing conditions and identify the gaps the current financial condition of EEP and proposed alternative solutions which improve financial viability of EEP.
Proposal Title

2. Power Quality problems and improvement in the Ethiopian Power System

Statement of Problem/Background of the research

There are dissatisfactions from internal and export customers due to poor power quality and interruptions, since it has significant negative effect on the company EEP so the factors affecting quality of power should be identified and corrective actions should be taken.

Research Objective:

- To evaluate and analyze the active and reactive load constraints of the grid system
- To evaluate and analyze the voltage and load profile of the grid system
- To evaluate and analyze the power system stability
- To evaluate and analyze the transmission lines power transfer capability
- To evaluate and analyze inter-connected power plants capability
- To evaluate and analyze the primary and secondary frequency regulations
- To evaluate and analyze the power quality at customer end including railway system
- To do Analytical modelling
- To evaluate existing power system resources (active and reactive power) including the interconnection
- To evaluate how the compensation devices in substations, on lines are used including the power plants PQ curve.
- To evaluate the percentage used compare to the installed capacity
- To evaluate utilization of the resources (transformers and generators capacity)
- To evaluate measured power quality in substation and customer side with standards
- Compare with standards
- Conclusion and Recommendation to improve the quality of power
Rational/Significance of the research: The major services include but not necessarily limited to:

- The Rationale of the research is to assess Existing system condition including system resource utilization and to identify the gaps compare to best practices or standards to improve the power quality of the Ethiopian Power System.
Proposal Title

3. Assessment of ESIA implementation on energy Sector in case of Ethiopian electric power project

Statement of Problem/Background of the research

Environmental and social impact assessment as an environmental management tool has been successful in terms of global awareness rising over the last four decades. Due to its rational approach it has been criticized for the inherent aim of influencing development decision and protecting the environment. In Ethiopia, the importance of follow-up in the environmental and social impact assessment (ESIA) process is clearly recognized. Follow-up involves the implementation of measures taken to mitigate the adverse environmental impacts of a project and monitoring to determine their effectiveness. This research will be focused on evaluate and follow-up of ESIA-implementation in the energy sector in the case of Ethiopian electric power project.

Research Objective:

- The objective of this study will be determine the critical factors affecting the successful implementation of EISA mitigation measures, developed to minimize environmental and social impacts of the energy sector project.
- Conduct an in-depth study of the existing implementation of ESIA processes in EEP projects,
- Assesses and identify the problems,
- To what extent are EISA-recommended mitigation measures implemented by the project proponent?
- How do regulatory bodies ensure implementation of ESIA-recommended mitigation measures?
- How and to what extent did the public participate in the ESIA process?
- What are the likely impacts of the project and to what extent where they considered?
- Recommend best practices and KPI Measures.

Rational/Significance of the research: The major services include but not necessarily limited to:

- The Rationale of the research is evaluating and assess the existing implementation of environmental and social impact assessment and its problem and then identify the gaps of the current implementation of ESIA in energy sector in the case of Ethiopian electric power projects.
Proposal Title

4. Integrated hydropower reservoir management and optimization with optimal power usage of renewable energy including technologies’ to be used.

Statement of Problem/Background of the research

Global energy demand, in particular the consumption of electricity, is growing to record levels due to population growth and the global economic prosperity. According to World Commission on Dams (WCD, 2000) hydropower is an important source of electricity in more than 150 countries. It supplies more than 90% of the electricity in about 24 countries but its share in the global electricity supply is only about 20%. Most of the remaining 80% electric energy is generated from nonrenewable energy resources, which in the light of the prospect of a rising average global temperature can be of significant environmental consequences. The World Energy Council (WEC, 2013) reports a 55% leap in the installed capacity of hydropower schemes worldwide in the past two decades.

Integrated hydropower reservoir management has become a trend of hydropower exploitation, as an effective technical measure, integrated operation can improve the utilization efficiency of water resources, reduce the risks of flood and drought disaster, increase the safety and stability power grid and make sure that hydropower stations and reservoirs operate in an appropriate and economical way.

In Ethiopia, greater than 90% of the total power generation is from Hydro. Water as natural resources is limited and needs to be properly used for the power generation. The amount of water stored is greatly affected by many factors including the environment, humidity rainfall, incoming streams, run off and amount of sediment. To improve the efficient utilization of water resources and increase the stability of power generation there should be integrated hydropower reservoir management system for optimal power generation.

It’s very useful to optimize this power generation system to meet the demand. To minimize the power generation fluctuation and optimize the power generation from available water integrating with other renewables (wind PP, Solar …) including using technologies, scheduling for the power generation is most useful. The hydrological aspect for the areas where hydro dams are located shall be investigated and the real time model will be set to schedule for power generation optimization.

Research Objective:

General Objective

The objective of this study is

- To optimize hydropower reservoir management system integrating with other renewables for optimal and stable power generation.
- To optimize the reservoirs using real model of the power plant and technologies.
- To assess the constraints to optimize the generation resources
Specific Objectives

- To schedule for optimal power generation from hydropower integrating with other renewables.
- To model the power generation (conventional and non-conventional) plants and demand and use real time data to optimize the generation resources.
- To do simulation for Ethiopian power system in order to properly optimize the system resources.

Significance of the research

This research will be helpful and will have the following significance.

- To improve the utilization efficiency of water resources,
- To reduce the risks of flood and drought disaster,
- Increase the safety of dam, to minimize power shortage and increase stability of power grid and make sure that hydropower stations and reservoirs operate in an appropriate and economical way.
Proposal title:

5. Assessing and determining factors which influence employee engagement in EEP

Statement of the problem/ background of the research:

To realize the vision of EEP and achieve major organizational objectives, the role to be played by the (its) human resource is inimitable. To this end, it is imperative to have highly engaged human resources to achieve efficiency and effectiveness through improved performance in all functional areas across the organization. Employee engagement is the strength of the mental and emotional connection employees feel toward the work they do, their teams, and their organization. Prior studies indicated that engagement level has a determinant role on a number of employee related behaviors, such as: job satisfaction, conflict rate, turnover, absenteeism rate, individual’s performance level . . . etc. (Christian & Slaughter, 2011). Above all, employee engagement level plays a significant role in the achievement of organizational objectives (Tensay & Singh, 2020; Christian & Slaughter, 2011). Despite such significant contribution level, there is a scarce empirical study in the context of Ethiopia, which assesses and determines the factors which influence employee engagement level. Among the few studies to mention, Tensay and Singh (2020) attempted to show the relationship of employee engagement and organizational performance in federal public service organizations in Ethiopia. Though this study provides a good insight on employee’s engagement in the context of Ethiopia, the study scope is limited to budgetary public organizations that confines its contributions. Public organizations which administer by their own budget, such as Ethiopian Electric Power, have their own context that could affect their employees’ engagement level. To address this gap further research on the topic is required.

On the other hand, there are preliminary observations that indicates low job satisfaction level, grievance, absenteeism rate . . . etc. among employees of Ethiopian Electric Power (SOFRECO, 2021). As mentioned above employee engagement has an antecedent effect of such negative work related behaviors that worth further investigation to have a clear understanding of the issue.

In this regard, determining the current level of engagement of employees and identify major factors which affect level of employee engagement through rigorous analysis and study is crucial; and can be taken as a prerequisite to devise strategies to enhance employee engagement to the desired level.

Research objective:

General objective:
The general objective of this study is to examine factors which affect employee engagement level in Ethiopian Electric Power and recommend strategies that would mitigate issues related to employee engagement.

Specific objectives:

- To identify current level (status) of employee engagement in EEP
- To identify major factors affecting employee engagement in EEP
- To prioritize factors of employee engagement based on their significant level
- To device specific strategies, methods and tools to enhance employee engagement level
Significance of the research (Rationale)

As mentioned above, there is a scarcity of empirical studies which examine the employee engagement, in the context of Ethiopian public organizations, which are governed by their own budget. The scarcity of such empirical studies made it imminent to pursue a study in employee engagement issues in the context of public organizations like, Ethiopian Electric Power. Recent studies conducted by external consultants indicated that there are high level of job dissatisfaction and low organizational commitment level among employees of Ethiopian Electric Power (SOFRECO, 2021). In this regard, this research would have a conceptual contribution by illuminating the less researched topic of employee engagement, in the context of self-financed public institutions. On the other hand, the findings would give a good insight to identify duties that needed to be accomplished to enhance the employee engagement level in Ethiopian Electric Power. Thus, this research and its result will be used as a baseline to implement several employee engagement programs in Ethiopian Electric Power and will have the following major significances.

- To align the existing HRM functions with employee engagement
- To achieve efficiency and effectiveness at organizational level by improving employees

References

- SOFRECO (2021) A diagnostic research on the existing HRM practices