

A proposal for a Bachelor Project or Master Thesis Project in the field of

Innovation and R&D Management

Green Mini Grids in Sub Saharan Africa

Background and Problem statement

Globally, most power grids have been developed under the assumption that a nation-wide electric would provide ubiquitous access to electricity. However, it is expected that in developing countries, 70% of new rural power supply will by 2040 be most affordably provided by off-grid technologies and/or mini or micro grids. Two thirds of this will be powered by renewables as a result of technological development and more energy efficient appliances. Thus, the development of Mini-Grids (MGs) is an essential part of the strategy to achieve universal energy access in developing countries.

MGs are small electric grids (ranging from a few kilowatts and up to 10MW) to provide renewable power to households, businesses and institutions in, for example, rural communities. Often, MGs generate their power from renewable sources of energy, such as solar, wind, biomass and hydropower, as well as hybrid combinations of any of the above, including diesel generators for back-up and peak loads. When the mini-grids are powered by renewables we call them green mini-grids. The MGs are normally developed and operated by small businesses, communities or public utility operators.

Two interesting examples of the process of electrification through mini grids are Tanzania and Mozambique. Tanzania could be seen as somewhat of a role model in the region, and in 2017 there were more than 100 mini-grid systems in the country. Mozambique has increased electrification rates considerable over the last decade but still only 30% of the population today have access to electricity. This severely hampers socio-economic growth. The situation is particularly stern in some rural areas where only a mere 5% have electricity access. There are, however, a number of initiatives to speed up electrification, led by the Mozambican government as well as by international efforts. For instance, the Sustainable Energy for All initiative has set three targets for 2030: universal energy access to modern energy services, doubling of the share of renewable energy in the global energy mix, and doubling the rate of improvement of energy efficiency. Also, the World Bank prepares the Energy Development and Access Programme (EDAP) to help establish the necessary operational framework for increasing electricity access to rural areas, and the European Commission (EC) finances rural electrification in several districts. Also, specific countries, such as Sweden, are engaged: Sida supports the preparation of feasibility studies to accelerate building investment financing for generation, transmission and distribution infrastructure of electricity.

Aim and project description

This project aims to discuss what Mozambique can learn from the example of Tanzania or other developing countries, when it comes to speeding up the process of developing, implementing and utilizing green mini-grids.

The students will in this project find out which types of factors and actors that are crucial for the development. For example, to accomplish a change process of the energy provision and use in Mozambique, and a shift into renewable energy, the business sector with its firms, entrepreneurs and financiers are key actors. In addition, national policies as well as international support programs are important.

Moreover, an analysis will be made of mechanisms or processes implemented or refuted by other countries, and what Mozambique may learn from this.

Suggested research design, method and data

This will be a qualitative study, based on both quantitative and qualitative data, and with a qualitative approach to the data analysis.

- Literature review
- Desk top study of reports, papers and books on the issues
- Analysis of factors, actors, mechanisms or processes
- Synthesis of analytical models to describe the relevant factors, actors, mechanisms or processes
- Description of 1-3 countries' development and success factors through meta-analysis of secondary data from existing studies
- Potential survey to relevant actors

Keywords

Mini-grids, renewable energy, developing countries, sub Saharan Africa, Mozambique

Level

The content can be adjusted to be relevant for a Bachelor Project or Master Thesis Project.

Qualifications

Relevant knowledge and courses.

Contact

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