

RENEWABLE ENERGIES IN SENEGAL: SIGNIFICANCE AND CHALLENGES OF LOCAL SMALL AND MEDIUM-SIZED ENTERPRISES

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Overview

Worldwide, small and medium-sized enterprises (SMEs) play a significant role in the development of national economies. In Senegal, 95 % of all enterprises are SMEs. They account for 20 % of the GDP, around 30 % of domestic valued added and about 40 % of all employees. Taking into account Senegal's development status, they play an important role in the reduction of poverty, economic growth and wealth creation. However, SMEs in developing countries face several challenges, above all, access to a reliable energy supply. In a 2012 survey of the power outages effects on firms in Senegal, 57 % of the participating SMEs stated that electricity is a major concern to their enterprise and 55 % that power outages affect their investment decisions.

In addition to this development context, the fight against climate change and the scarcity of fossil resources call for a worldwide increase in the use of renewable energies (REs) and energy efficiency technologies (EEs). Also in developing countries, the expansion of RE and EE is increasing significantly. Particularly in the solar energy sector, Senegal achieved enormous average annual growth rates between 2000 and 2016, both in terms of the capacities provided (28%) and in electricity generation (31%). At the same time, the total electricity consumption tripled from 1.01 TWh in 2000 to 3.79 TWh in 2016. Senegal aims to increase its overall production capacities, reduce consumption and energy losses. The aim is to achieve a 15% share of REs in electricity by 2025.

So far, we know a lot about the technical capacities and expansion targets for renewable energies of countries worldwide. However, we know little about the development opportunities for SMEs in developing countries arising from the growth of REs and EEs. Against this background, this study addresses following two research questions (RQs):

RQ 1: What are the challenges for SMEs regarding the use of REs and EEs ?

RQ 2: How can SMEs be supported in using REs and EEs, based on their existing knowledge, skills and competences?

Methods

In order to answer the above RQs we have conducted a qualitative survey. To gain a profound insight into the current situation of Senegalese SMEs, we have been conducting qualitative interviews with two different target groups since November 2019: (1) SMEs in the cities of Dakar and St. Louis, (2) experts in the Senegalese energy sector. As we are still in the field phase of conducting interviews, currently, interviews of 23 SMEs and 13 experts are integrated into the analysis. The interviews of both groups were semi-structured guideline-based. To access the knowledge of the respective interview partners, different guidelines were used. The guideline of group (1) consisted of 22 questions to answer our RQs. The guideline of group (2), contained five questions concerning the RQs.

All interviews were recorded and transcribed. We analyze the transcribed interviews with the program MaxQDA. A qualitative content analysis is conducted in order to identify themes and quantify the qualitative data for comparison. The main focus of a qualitative content analysis is reducing the material by selecting key aspects and focusing on those. For the systematic description of the material, relevant meanings are defined as main categories, which are explained by a content-analytical coding framework. A mixed inductive and deductive approach is used to formulate the categories. Codes, categories and corresponding segments of content are exported to an Excel spreadsheet to provide a clear comparison of the findings.

To analyze the data from our study, we reviewed existing models and theories on technology acceptance and decided to use the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) (Venkatesh et al., 2012)

as our theoretical framework because it offered the best fit to our research questions. However, we recognized the need to adapt the theory to Senegalese entrepreneurs, so we extended it by the categories of knowledge and communications channels from the Diffusion of Innovation Theory (DOI) (Rogers, 2003).

Results

We have identified the following results with regard to our research questions:

- Information and knowledge are acknowledged by both SMEs and experts as important barriers to RE adoption
- Mass media communication channels are insufficiently built out, if they exist at all, to reach the entrepreneurs. Networks, which can be an important communication channel, are clearly underdeveloped and do not contribute in Senegal to the diffusion of accurate practical knowledge about RE.
- Performance expectancy is clearly a positive factor that can promote the use of RE among SMEs in Senegal.
- Effort expectancy, on the whole, does not seem to be a barrier for RE adoption, but not because of justifiable confidence. It is more likely that the expectations belong to the prevailing knowledge deficit about RE.
- Social influence apparently does not act as a supporting factor for introducing RE into Senegalese SMEs.
- SMEs tend to be vague about the need for government support and other facilitating conditions, and they sometimes call for support that experts believe already exists. This points again to the knowledge and communication deficits that play a central role in our findings. Policies intended to facilitate the adoption of RE technology only work if the intended beneficiaries know about them and how to make use of them.
- The question of price dominates all other considerations.
- Senegalese SMEs have little experience with the productive use of renewable energy.
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