



driven by public entities, although the governments of Lesotho and Mozambique would like to encourage private sector involvement. However, a widespread use of solar PV-based Mini-Grids, including the private sector, requires robust and dynamic institutional frameworks<sup>2</sup>. So far, the policy specific targets and suitable strategies that operationalise the energy policy have not yet been sufficiently developed neither in Mozambique nor in Lesotho.

Regarding the technological aspects of solar PV-based mini-grids, typically questions such as resource availability, technical suitability under extreme conditions (temperature shocks, dust and sand, high humidity), interaction of electricity production and storage, modern battery technologies (lithium-ion versus lead-acid), user feedback and load management arise. To create tailor-made solar PV-based Mini-Grids, it is thus necessary to have fundamental insights into the technological barriers and challenges for the specific local contexts and their environmental and societal conditions. Research needs to be conducted in collaboration of academic experts from different locations and disciplines combining technological, financial, economic and ecological considerations as well as socio-spatial aspects of electricity practice and supply.

Hence the main aim of the subsequent research collaboration is to address technological, economic and socio-spatial factors currently hindering the widespread use of solar PV-based Mini-Grids. Furthermore, the project strives to create sustainable impact by supporting national and regional development goals related to the use of solar energy resources and by improving livelihoods of rural communities in Sub-Saharan African countries.

The three lead partners are represented by researchers of the Energy Research Centre (ERC) at the National University of Lesotho (NUL), Eduardo Mondlane University (UEM), Maputo/Mozambique and the Institute of new Energy System (InES) at Technische Hochschule Ingolstadt (THI) in Germany. All three partners are well-reputed and have wide ranging activities in RE research. Together, the three institutions have the capability to act as hubs that contribute to a change process that can expand further into a larger part of the university systems. As a supporting partner, the University of Bayreuth (UBT) will contribute their expertise in socio-geographic analyses of energy demand, usage and production patterns. The outcome of the initiated collaboration through the DFG support is expected to be a long-term trilateral partnership between the universities and RE research centres in Lesotho, Mozambique and Germany as well as joint research approaches as a basis for subsequent projects.

Within the project, several exploratory workshops will be carried out in the different partner countries, with participants from a variety of disciplines. This interdisciplinary approach reflects the need to analyse the challenges of wide-spread Mini-Grid use from a holistic perspective. The purpose of these workshops is to exchange on these diverse challenges and jointly develop a subsequent project proposal that is meant to help overcome them. With participants from Germany, Lesotho and Mozambique, these workshops benefit from the sharing of different experience and best practice, thus contributing to knowledge transfer and ensuring a sustainable and innovative approach to future joint projects.

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<sup>2</sup> Bhattacharyya, S. C.; Palit, D. (2016): *Mini-grid based off-grid electrification to enhance electricity access in developing countries: What policies may be required?*. In: *Energy Policy* (94), p.166–178. doi: 10.1016/j.enpol.2016.04.010.