Climate Information for Integrated Renewable Electricity Generation

Introduction

In rural Sub-Saharan Africa, about 86% of the population has no access to electricity. Where West Africa's population is projected to double by 2050, the electricity demand is expected to increase fivefold by 2030 (IRENA, 2015). To meet the future electricity demand, decentralised off-grid and stand-alone solutions complement existing centralised grids. The abundance of unexploited renewable energy potential in West Africa is a valuable prerequisite for the implementation of modern energy technologies. This is an opportunity to keep future Greenhouse Gas emissions at a low level, energy prices affordable, and to contribute to the achievement of Sustainable Development Goals (SDGs). West African countries have a large potential to leapfrog on modern renewable energy technologies, a crucial transformation process the CIREG project intends to support by co-developing climate services and solutions to provide relevant information to stakeholders and decision-makers.

Our goals

- Delivering demand-driven climate services to support renewable energy planning, implementation, and investment decisions, aligned with SDGs and Nationally Determined Contributions (NDCs)
- Supporting decisions towards sustainable electricity generation mixes with a high share of renewables (including hybrid solutions based on solar, wind, and large to micro hydro power)
- Providing information on risks and opportunities for renewable electricity sources under climate change and variability
- Developing a framework for the systematic identification and valuation of renewable electricity generation potentials aligned with SDGs for national, regional, and international investors

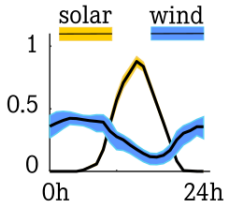

Figure 1: Example of the complementarity of diurnal profiles in a hybrid solar and wind power system along Senegal's northwestern coast (Sterl et al. (2018), in review)

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Approaches

- Stakeholder dialogues to identify and meet user needs and increase relevance of climate services
- Employing scenarios of socio-economic development to identify future electricity demand hotspots and supply options
- Investigating the complementarity of RE sources at the diurnal and seasonal time scales (Fig. 1)
- Model simulations to assess risks and opportunities for renewable electricity (RE) generation potentials under climate change and variability at the sub-continental and river basin scale (Fig. 2)
- Development of technologies and business models for decentralised mini-grid and stand-alone solutions in two demonstrator case studies
- Ethnographic field work analysing local knowledge and perceptions with regard to RE generation and demands in five peri-urban case studies

Figure 2: Climate modelling domain (red box), Niger, Volta, and Mono River basins (blue areas).

Project coordination
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JPI Climate

ERA4CS European Research Area for Climate Services

Consortium partners

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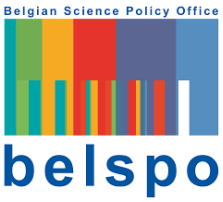

Innovationsfonden

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