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Measurement data availability within EnerSHelf

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Proposal of a poster for the EMS2022

Intention:

Within the research project EnerSHelf (Energy-Self-Sufficiency for Health Facilities in Ghana), i. a. energy-meteorological and load-related measurement data are collected, for which an overview of the availability is to be presented on a poster.

Context:

In Ghana, the total electricity consumed has almost doubled between 2008 and 2018 according to the Energy Commission of Ghana. This goes along with an unstable power grid, resulting in power outages whenever electricity consumption peaks. The blackouts called "dumsor" in Ghana, pose a severe burden to the healthcare sector. Innovative solutions are needed to reduce greenhouse gas emissions and improve energy and health access.

The aim of the project is therefore to develop PV-based energy solutions for healthcare facilities and to improve the reliability and integrability of such systems in the local electricity grid.

The work is based on a measurement campaign that has been running since 2020 at three hospitals spread across the country. The variables measured include:

Global tilted irradiance (GTI)

Soiling ratio and temperature of the PV panels

All-sky camera recordings

Load measurement aggregate (grid node)

Load measurement sub-distribution (departments and devices)

In addition, weather stations are operated at the sites to improve weather forecasts.

These datasets can be used to follow different approaches to managing the harsh conditions caused by dry and rainy seasons, and to design and control PV hybrid systems appropriately.

According to the World Bank (2017) only 3% of the population in West Africa and the Sahel can currently access PV power through off-grid systems. As an important catalyst for sustainable development, access to a reliable source of clean energy is vital for inclusive economic development, improved human health, wellbeing and security. As such, EnerSHelf can contribute to Sustainable Development Goals (SDG) of health (SDG 3), energy (SDG 7) and partnerships (SDG 17).