Poster

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Ad-Hoc Microgrids Planning for Rural Communities Under Natural Disasters

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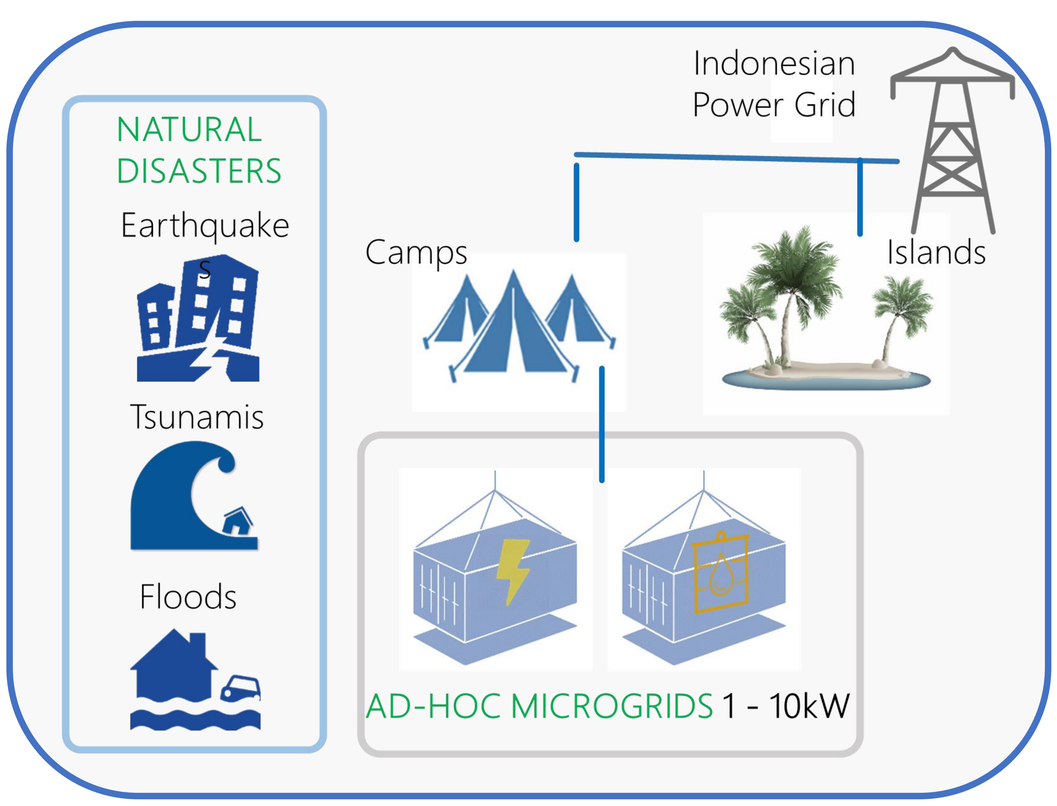
Project Description and Objectives

Most natural disasters (ND) have a direct impact on the overall power system as well as system communication. In this situation, low-power portable containerized ad-hoc MG can provide an emergency solution so that for two or three days, electricity for potable water pumps can be provided to relieve the damaged area. In this paper, a hospital load in Lombok Island in Indonesia is selected as the critical load because it requires high resiliency as compared to the other loads during extreme weather conditions. The simulation is performed by HOMER Grid with a 3-day outage.

Grid and Power Generation in Lombok Island: Lombok Island and some new solar photovoltaic (PV) plants are being developed in the south part of the island. This installed capacity did not cover the 260 MW peak, so the PLN borrowed peak demand from local industries which produced a total of 78 MW from diesel engines.

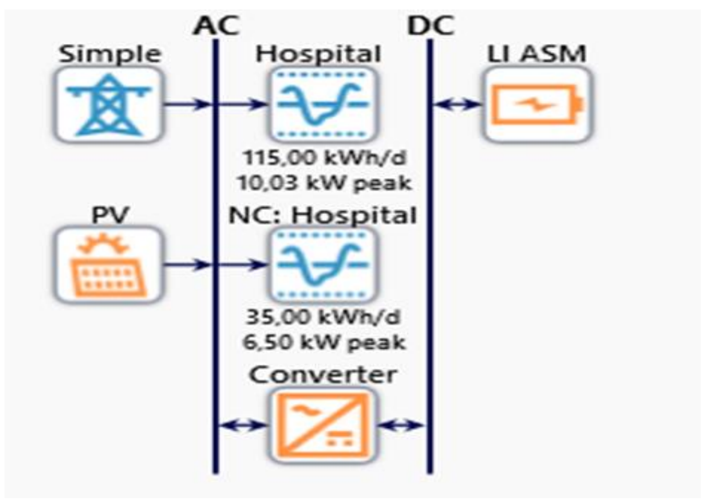
Ad-hoc microgrids:
The ad-hoc microgrid is mobile, can be in situ deployed, and containerized to supply energy for emergency clinic support and clean water provision.

Methodology

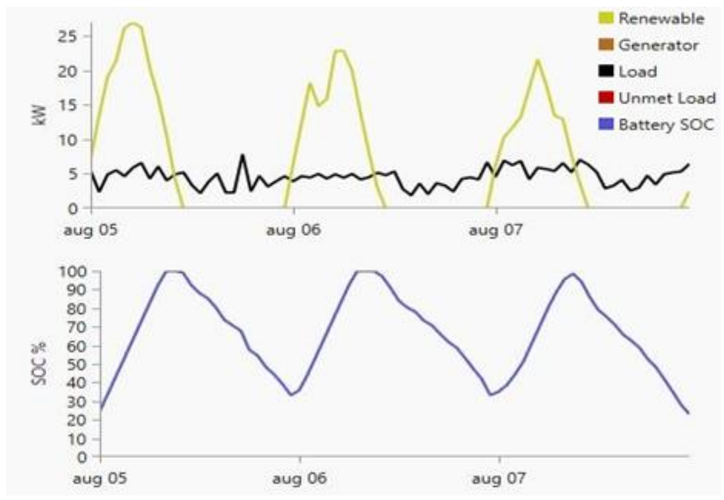


- **The outage is assumed for 3 days during the year 2019 starting from 05-August 07:00 AM and ending on 08-August 07:00 AM by using the HOMER Grid outage resilience function.**
- **In this simulation, containerized ad-hoc MG considers supplying electric power to critical loads during outages.**
- **The main purpose is to investigate the real-time analysis of the resiliency of the containerized ad-hoc MG during the outage of the power grid.**
- **The HOMER Grid provided the most favorable technology, size of the system, and optimal minimum net present cost (NPC).**

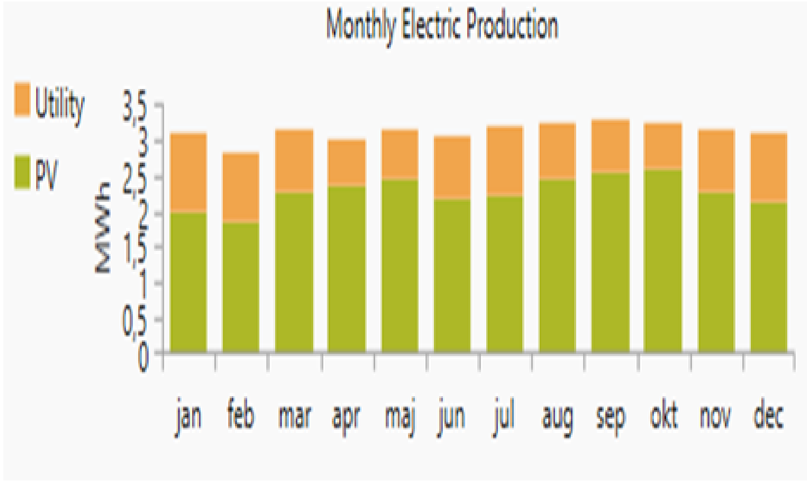
Results



Configuration of Ad-hoc MGs



Simulation Resiliency operation of ad-hoc MG



Monthly electric production for Ad-hoc MG

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