Development of the Output Power Stabilization System for Renewable Energy




Okinawa Enetech Co., Inc.

1. Back Ground

Challenge 1: Variability of Renewable Energy

- The output power of PV and wind power fluctuates according to changes in weather conditions such as solar radiation and wind speed.

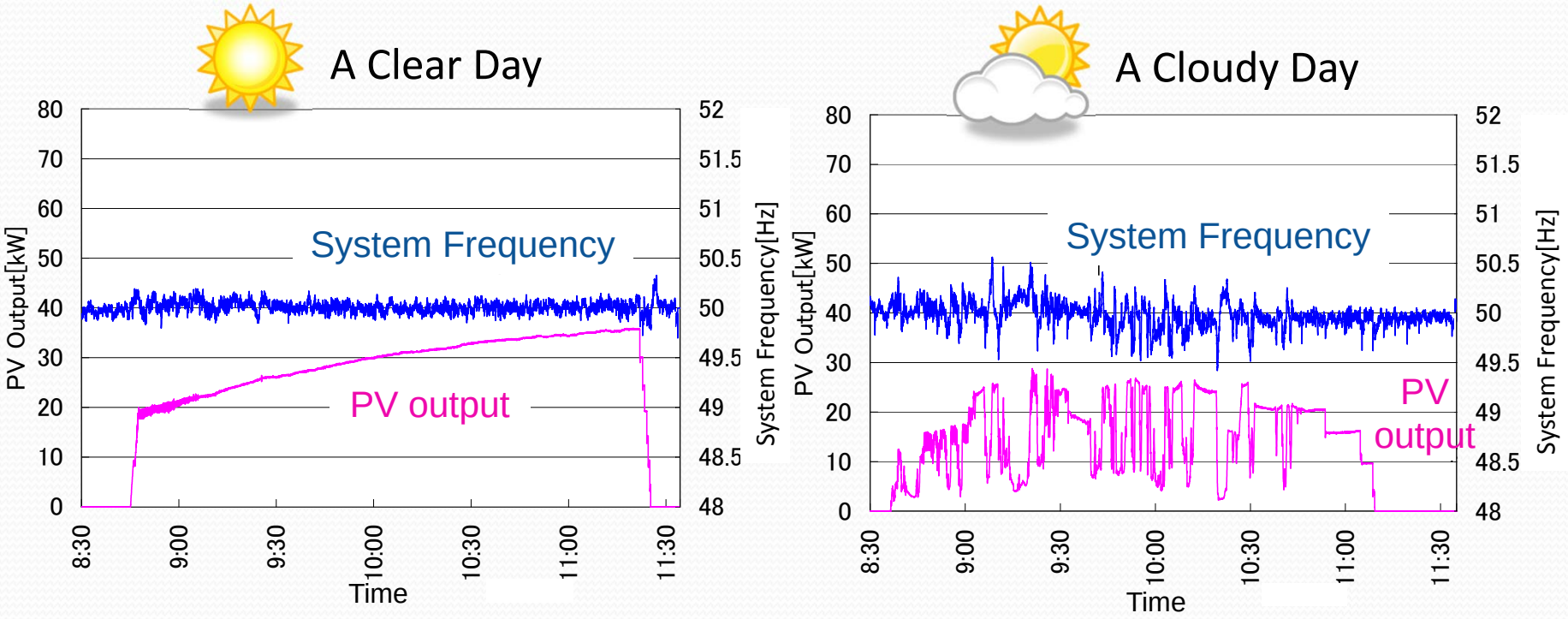

Fig.1 PV output and system frequency of a small-scale power system

1. Back Ground (Continued)

Challenge 2: Cost of the Output Power Stabilization

- Battery Energy Storage Systems (B.E.S.S) are mostly used to mitigate output power fluctuations of the renewable energy.

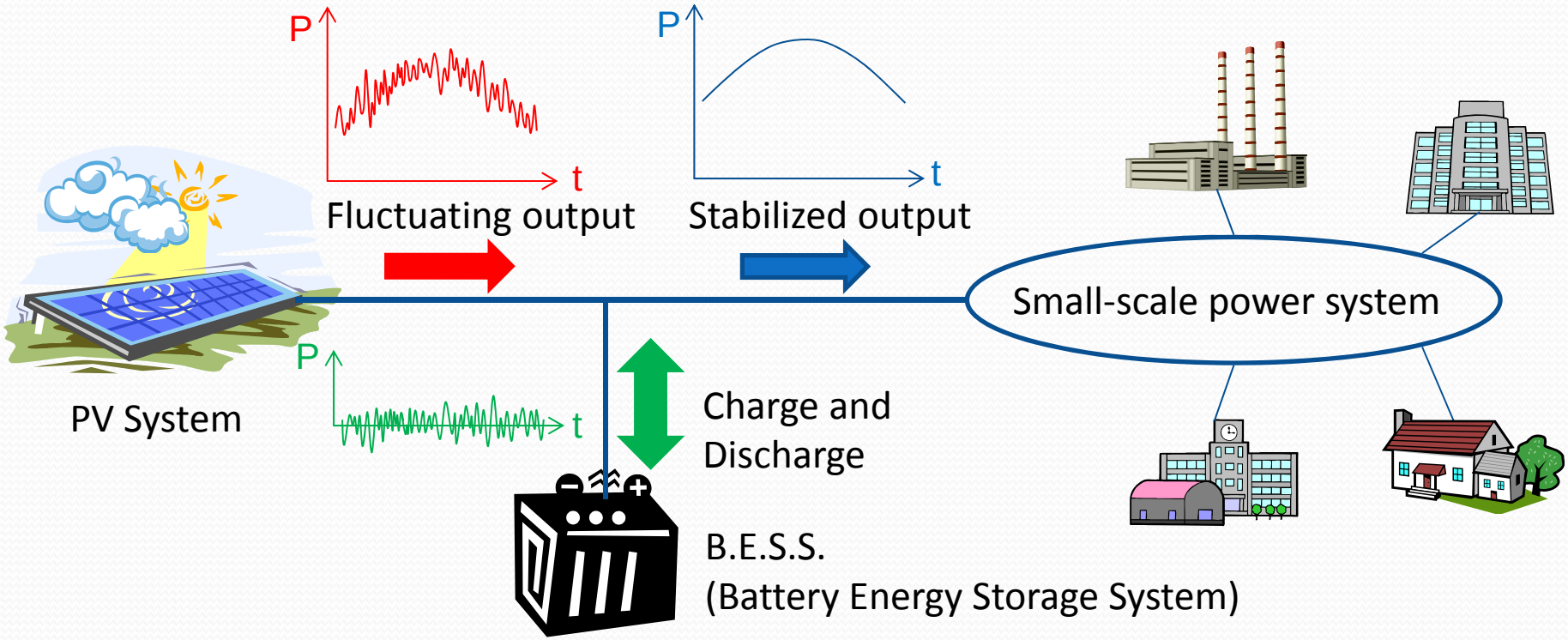

Fig.2 Output stabilization of a PV system by the B.E.S.S.

2. Objective

- In order to promote renewable energy we are developing the load control technologies that can mitigate output power fluctuations without batteries. In this project, a water pump is controlled to stabilize the PV output power.

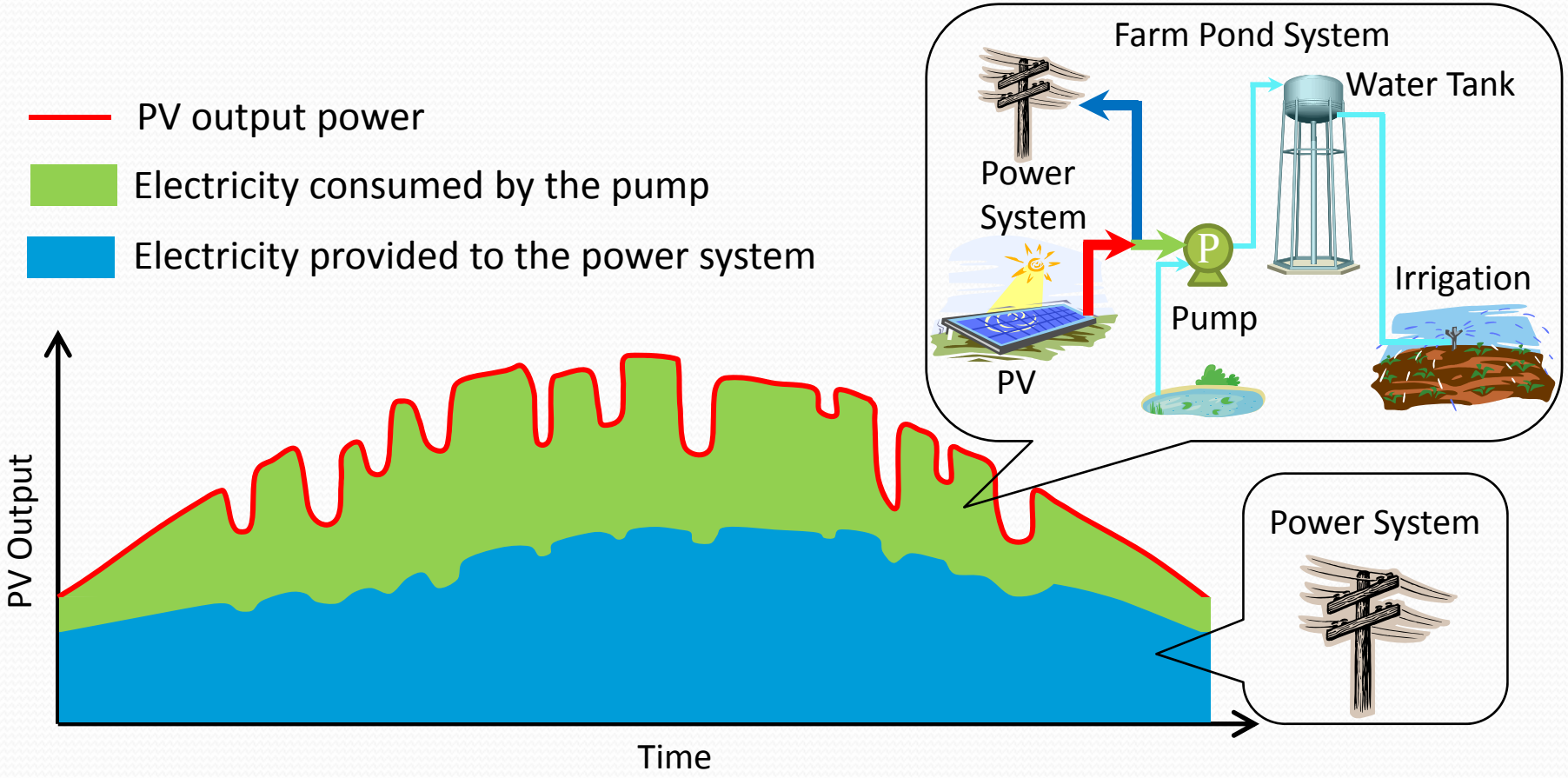

Fig.3 Schematic of the output power stabilization using farm pond

3. Verification Test

- Verification tests have been conducted to evaluate the effectiveness of the control technology. In addition, we are developing simulation models to optimize the control system.

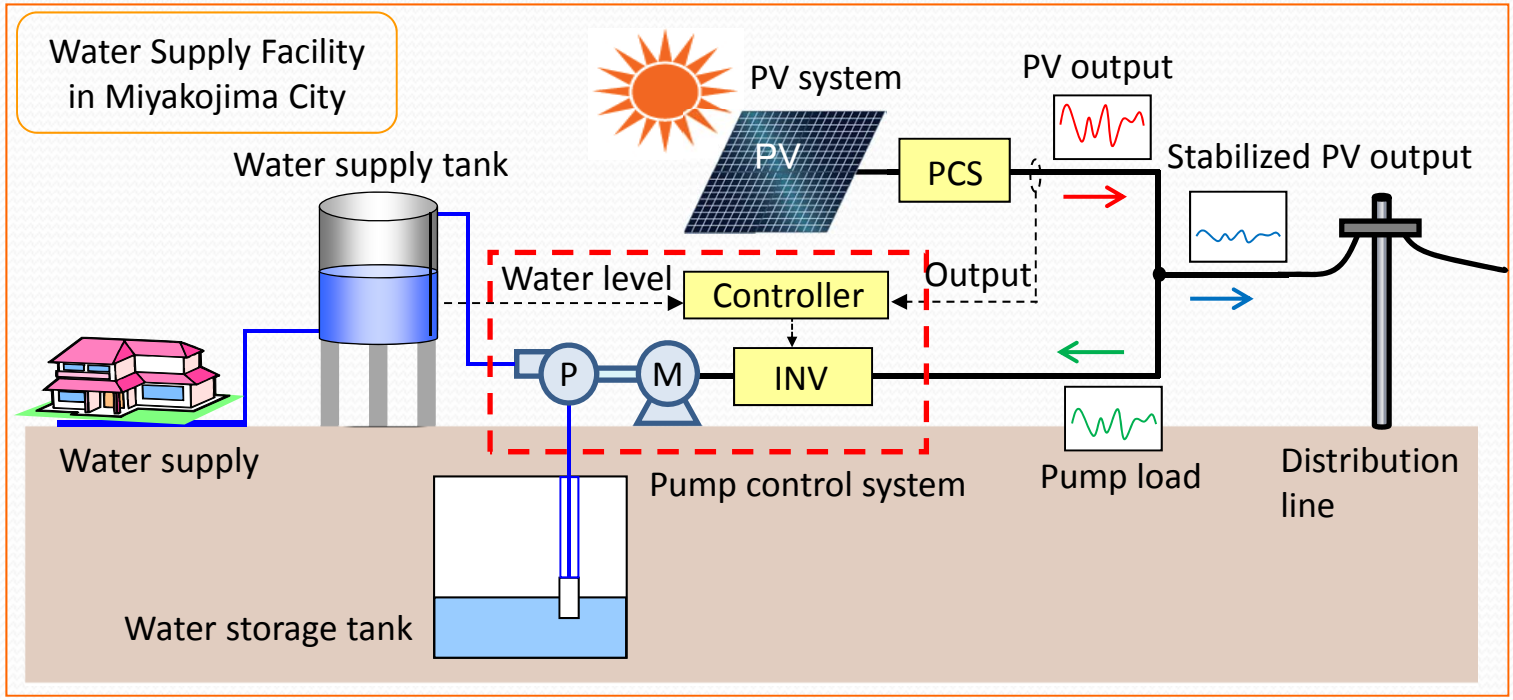

Fig.4 Schematic of the system developed for the verification test

4. Schedule

- Our goal is to develop the output power stabilization system utilizing existing farm ponds in Okinawa.
- We envision applying the technology to promote the renewable energy throughout the Pacific Islands in the future.

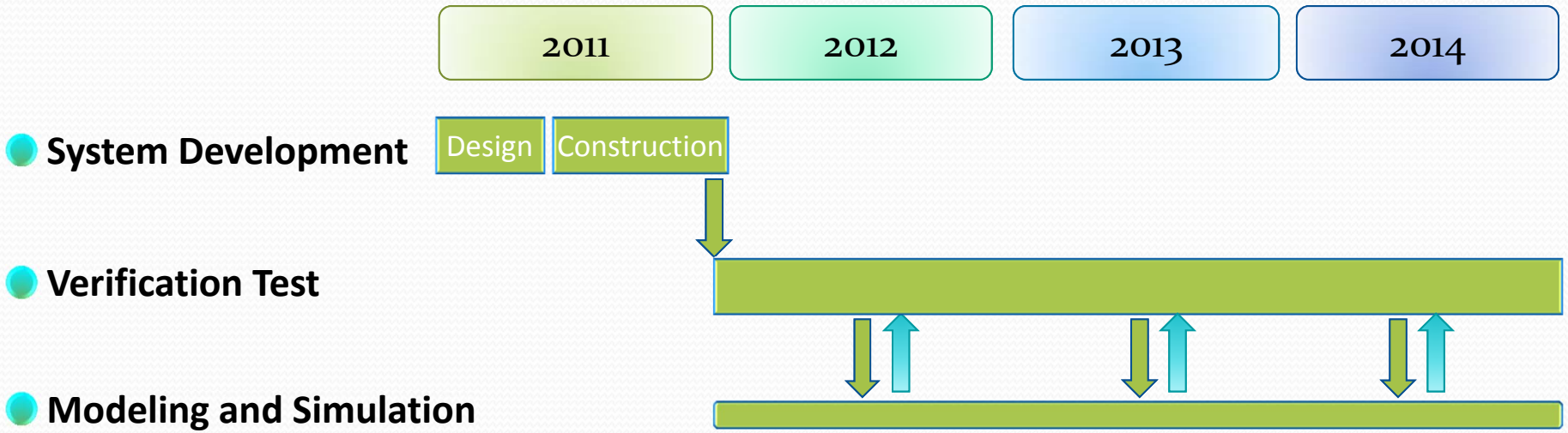

Fig.5 Schedule of the project

Thank you !