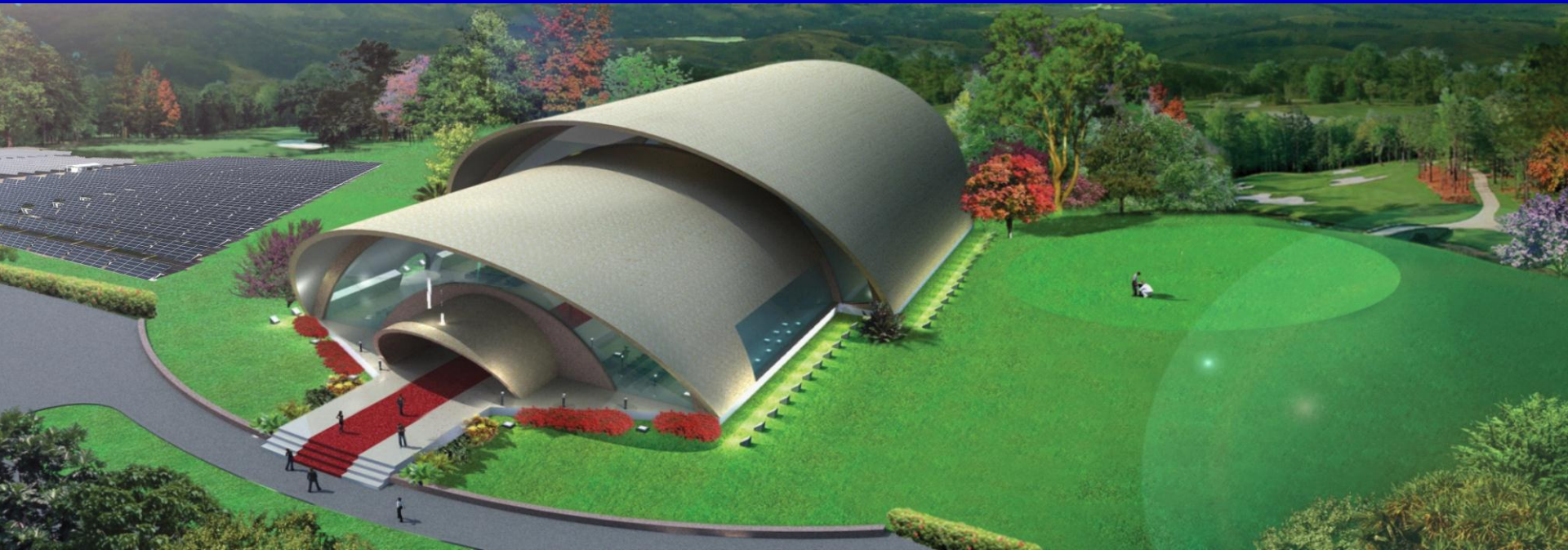


Community PV-DC Microgrid

Worajit Setthapun, Suchat Srikaew
Wattanapong Rakwichian

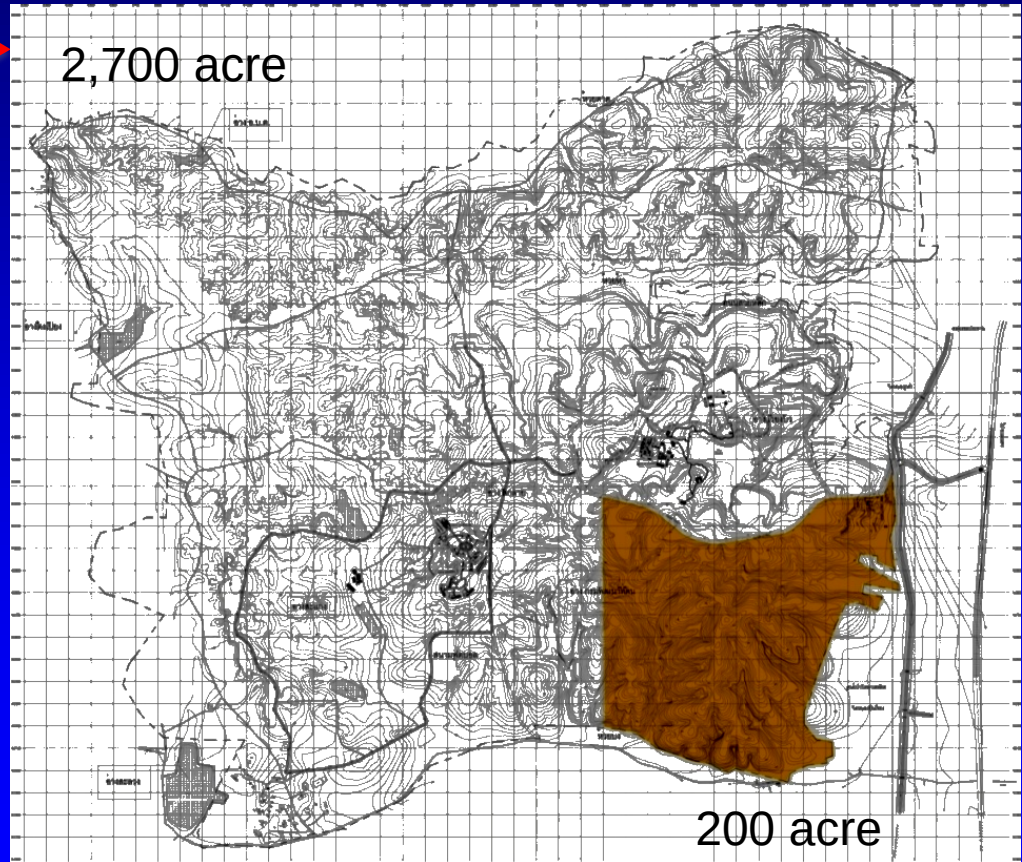
APEC Workshop on Small Hydro and Renewable Grid Integration
Ha Noi, Viet Nam
April 4, 2013

- Background
- Chiang Mai World Green City – Smart Community
- PV DC Microgrid
- Vision of the DC Microgrid



Location:

- Chiang Mai Rajabhat University
- Saluang Keelek Campus
- Mae Rim, Chiang Mai, Thailand





World Original Institute of Nature

- Academics
- Research and Training
- Community Business
- Chiang Mai World Green City

CHIANG MAI WORLD GREEN CITY





Chiang Mai
World Green City



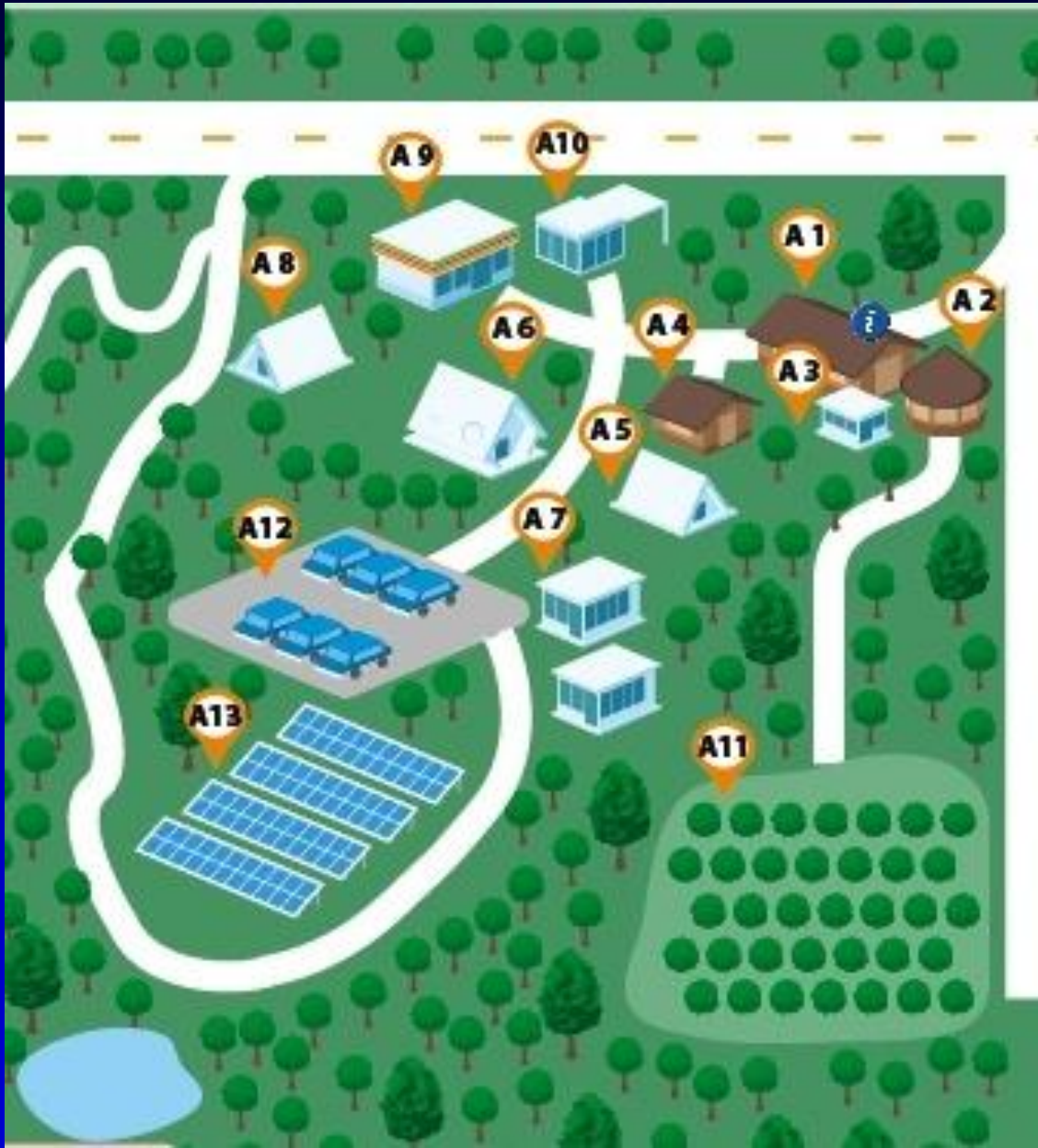




Low Energy Consumption
More than 80% Saving

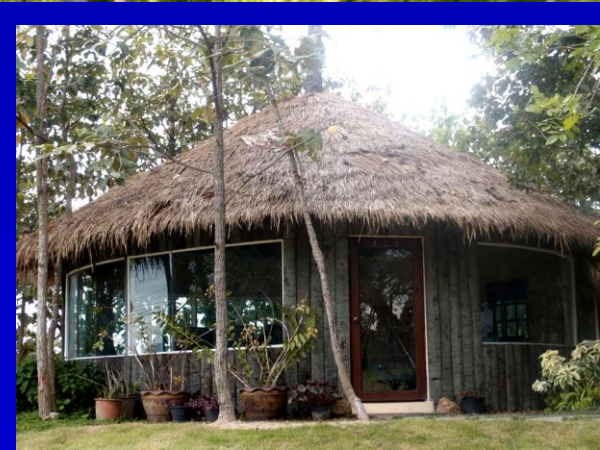
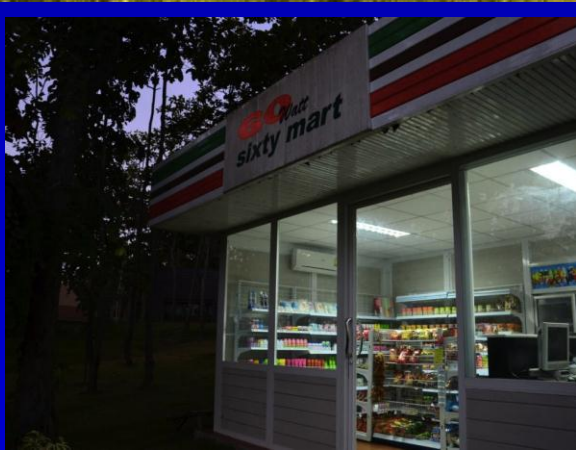


SMART COMMUNITY

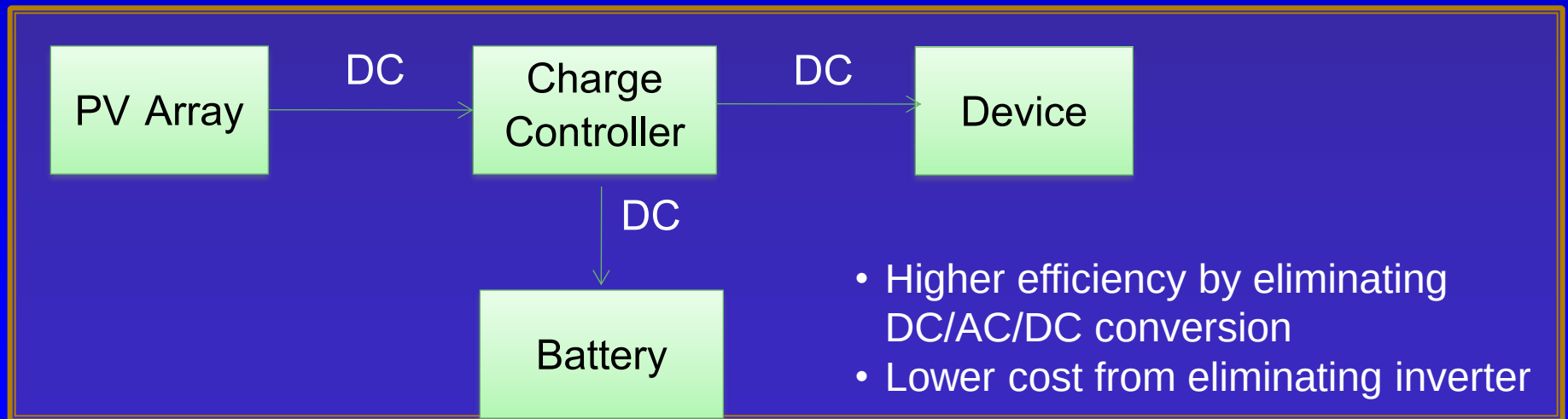
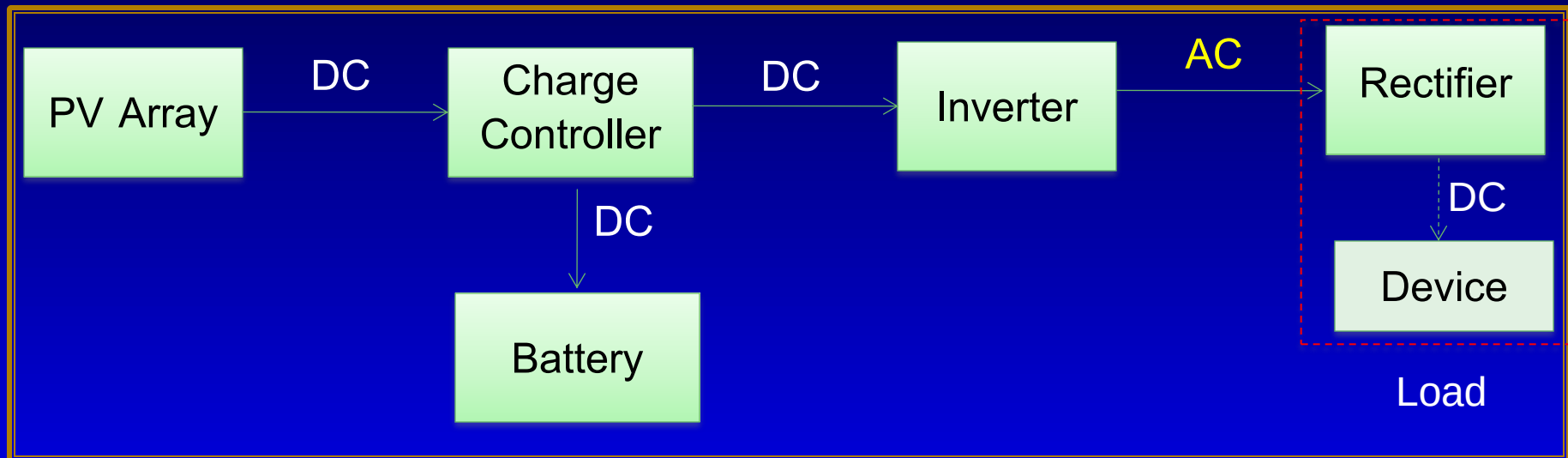


Sustainable Cycles for Low Carbon Community

- Energy
- Food
- Residential
- Economic
- Environmental

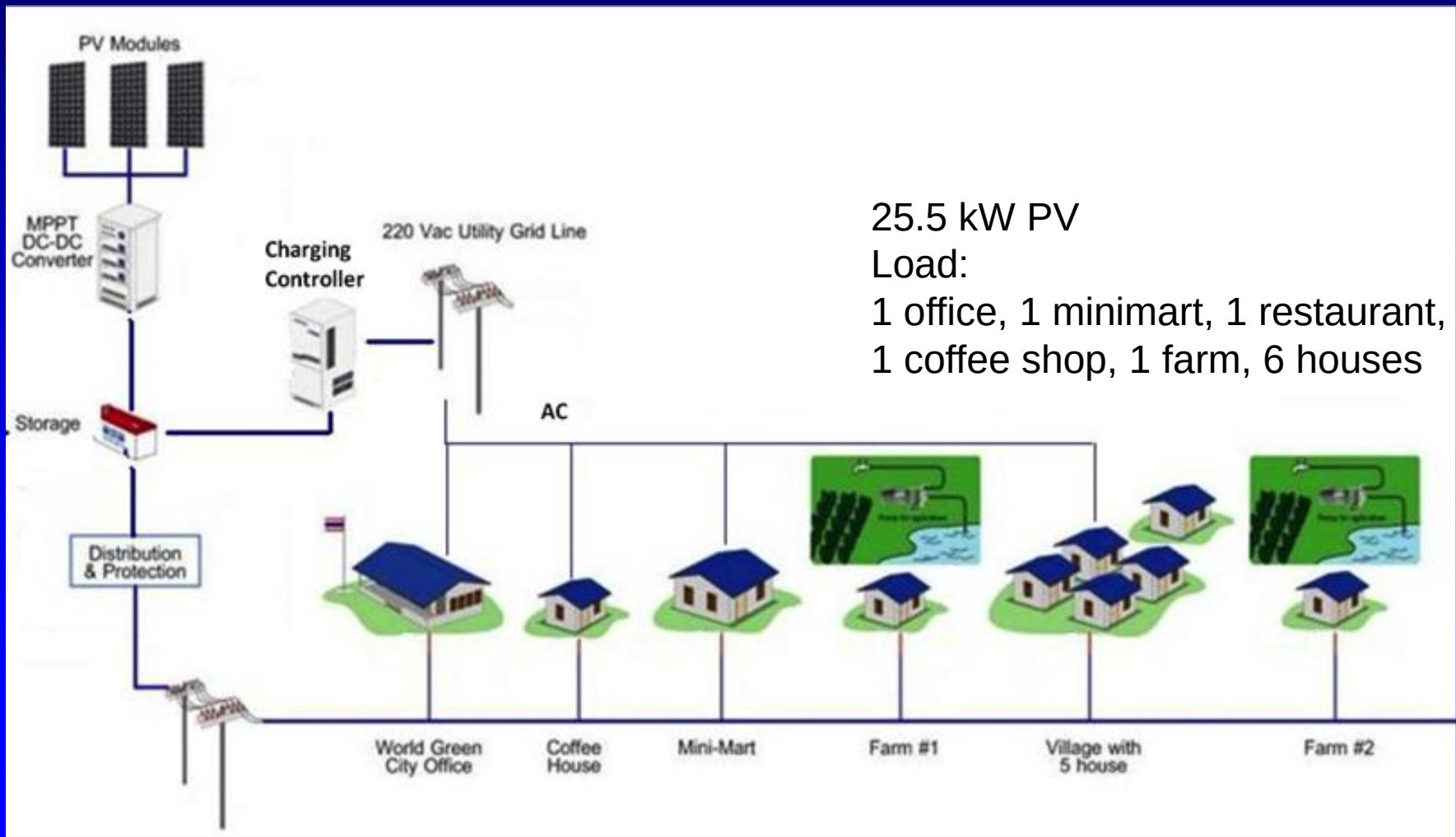


PV AC vs. PV DC

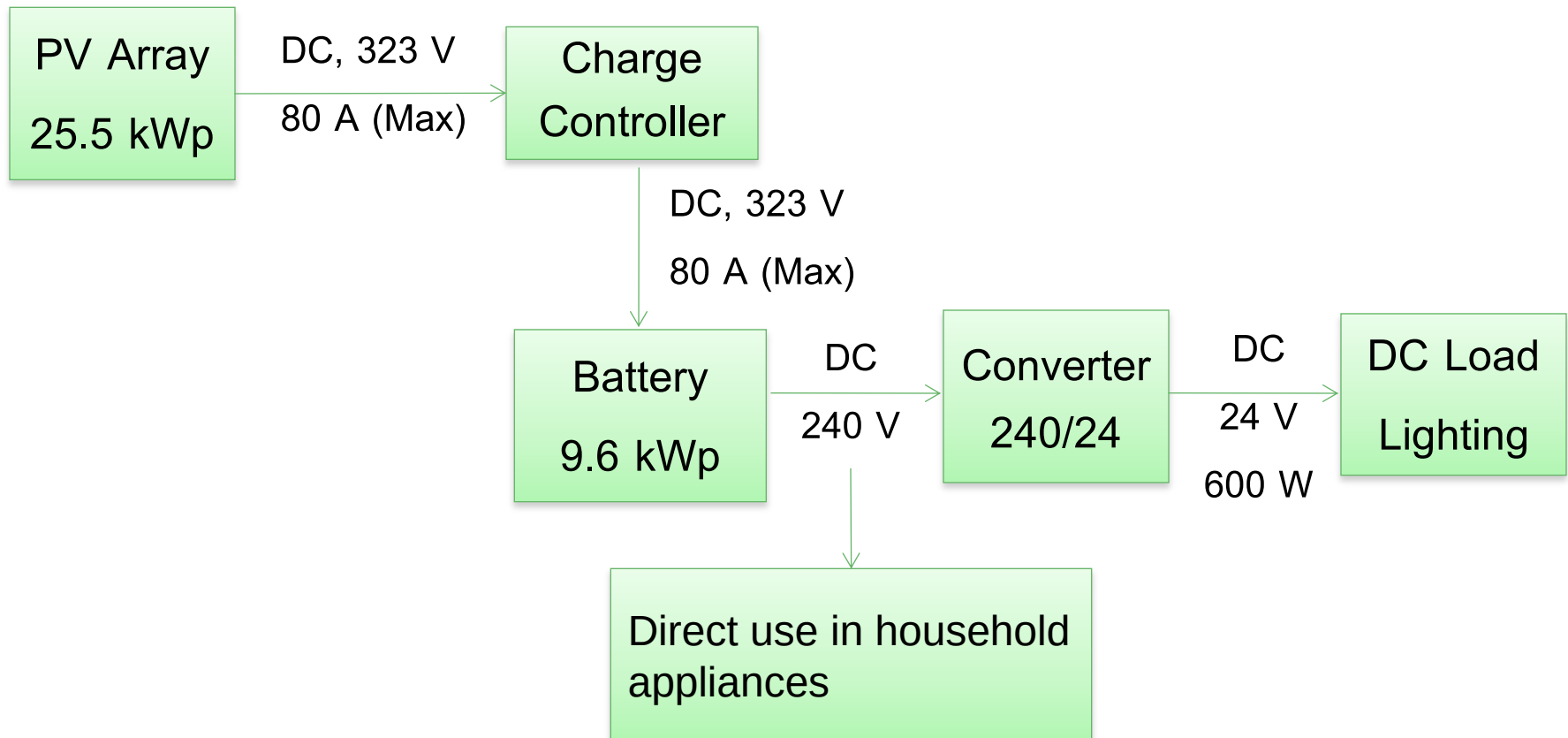


PV - DC Microgrid Pilot Project

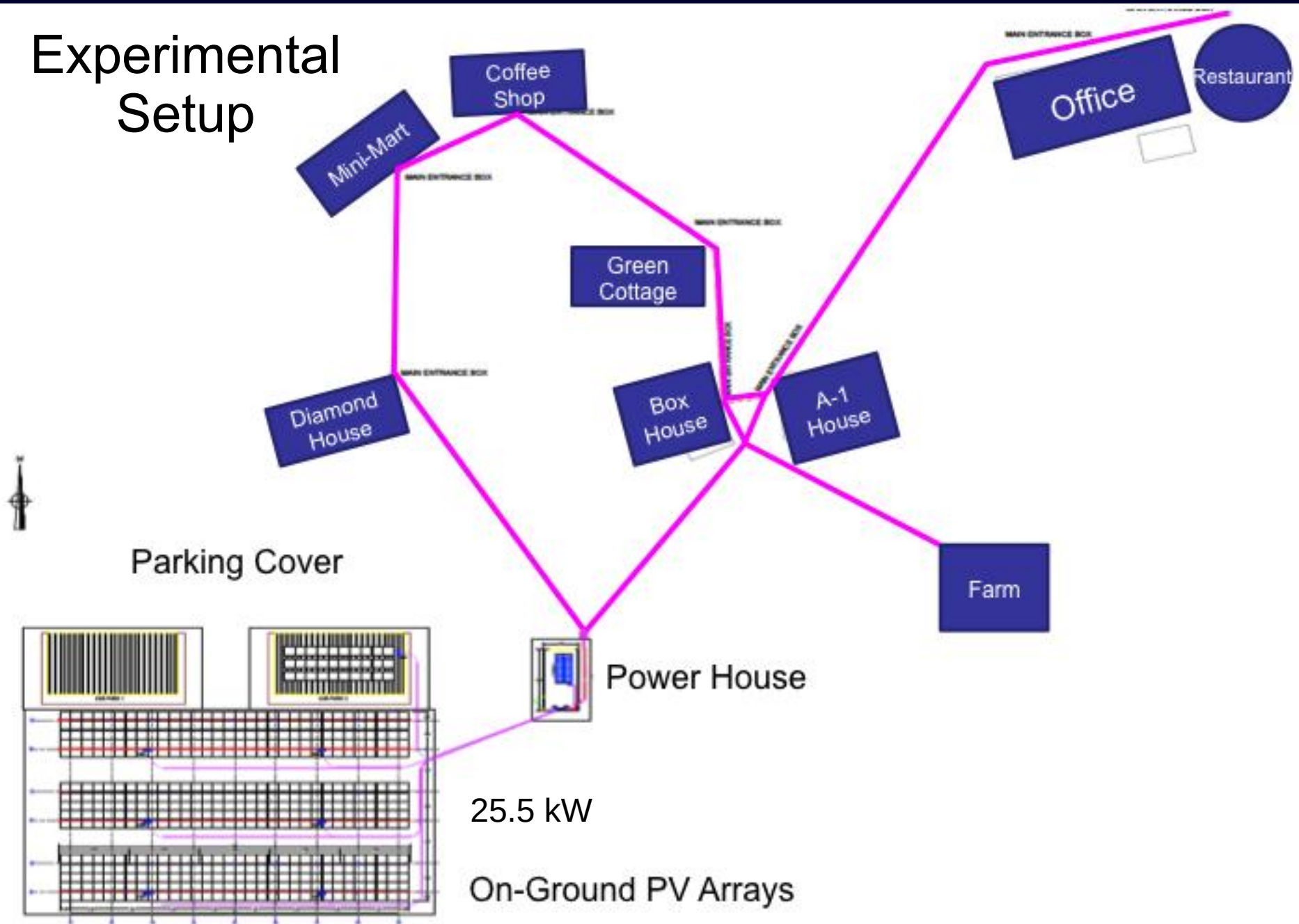
- Community DC power grid system with low voltage from PV



DC Microgrid



Experimental Setup









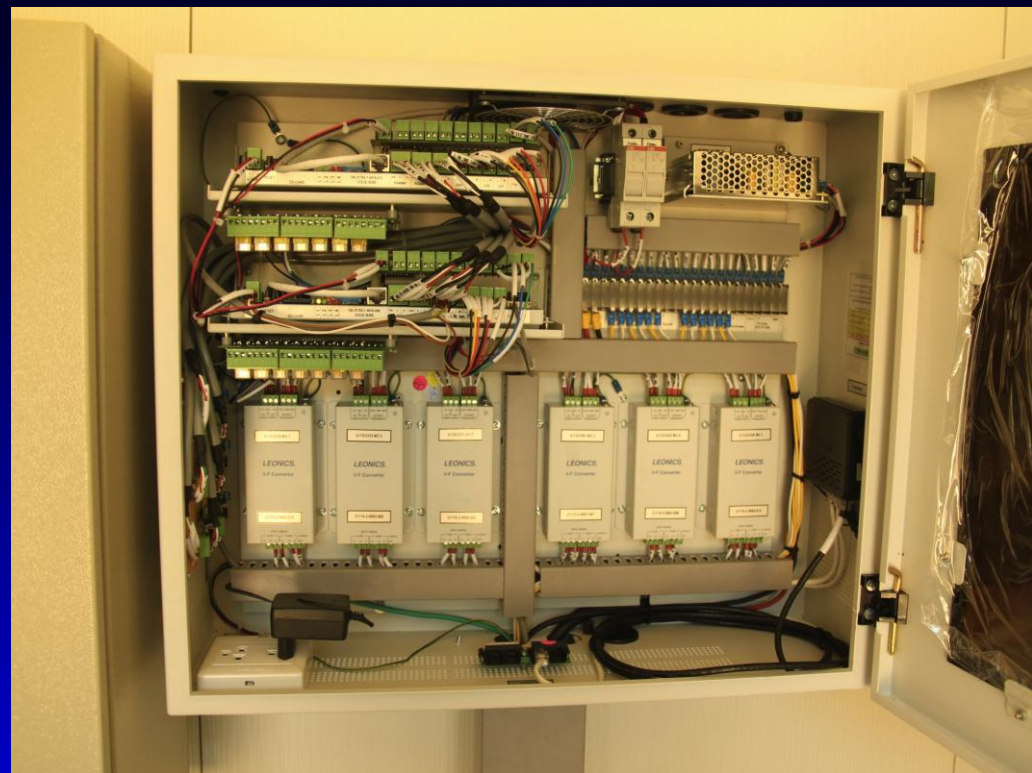
Power House

Battery House





Main Combiner Box



Monitoring Switches

Charger







Monitoring System

Converter
240/24



MODEL: SE-600-24
INPUT: 240-240VAC 7.5A
OUTPUT: +24V 1.0A
MADE IN CHINA

DC-DC CONVERTER

RS-485 SURGE PCB

POWER SUPPLY

VFD01A
LEONICS
V-F Converter
21715-2-0003-028

VFD01B NO.1
LEONICS
V-F Converter
21715-2-0003-006

VFD01B NO.2
LEONICS
V-F Converter
21715-2-0003-018

SHUNT2 240VAC

SHUNT2 240VAC

SHUNT2 240VAC





Office





Converter Box





Energy Efficient House





Reused Material House



Low Cost Box House

All Appliances - DC





LEONICS[®] Monitoring and Operation Center

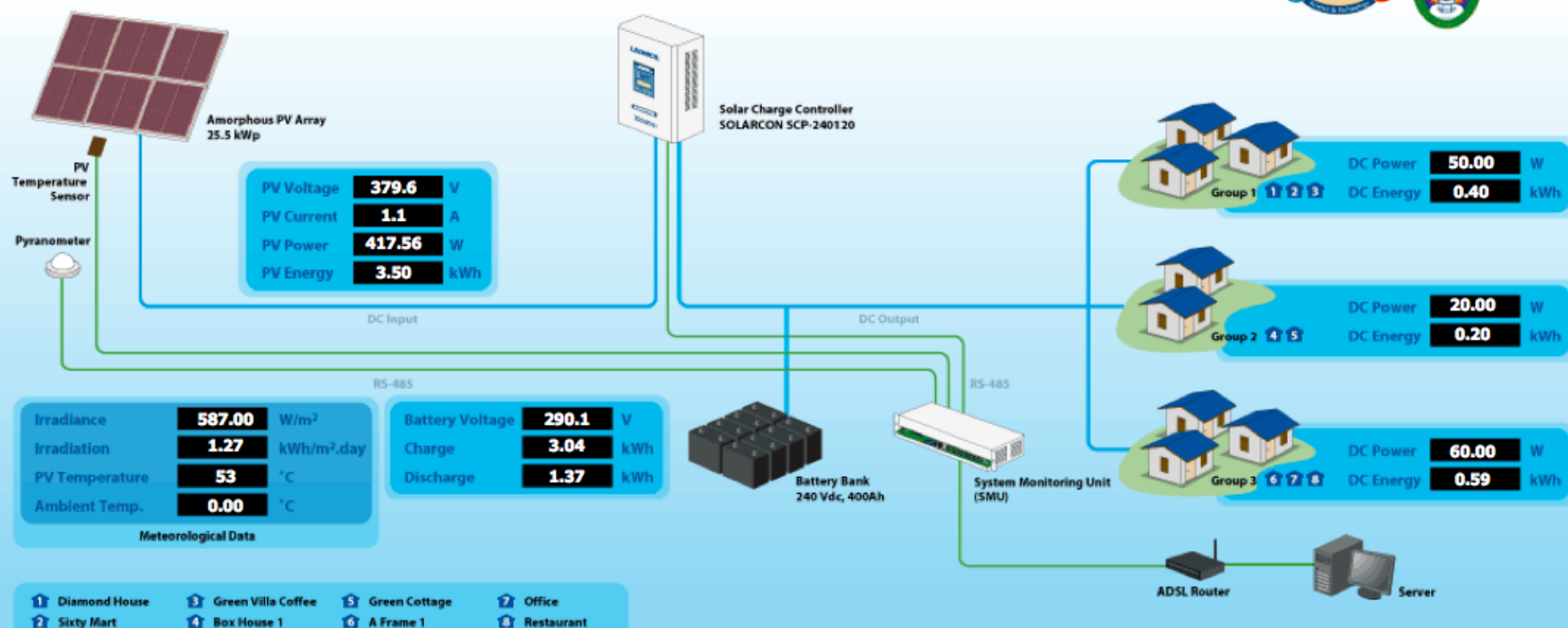


ADC-CMI

• [Main](#) • [House](#) • [Energy Log](#) • [Download](#)



adICET

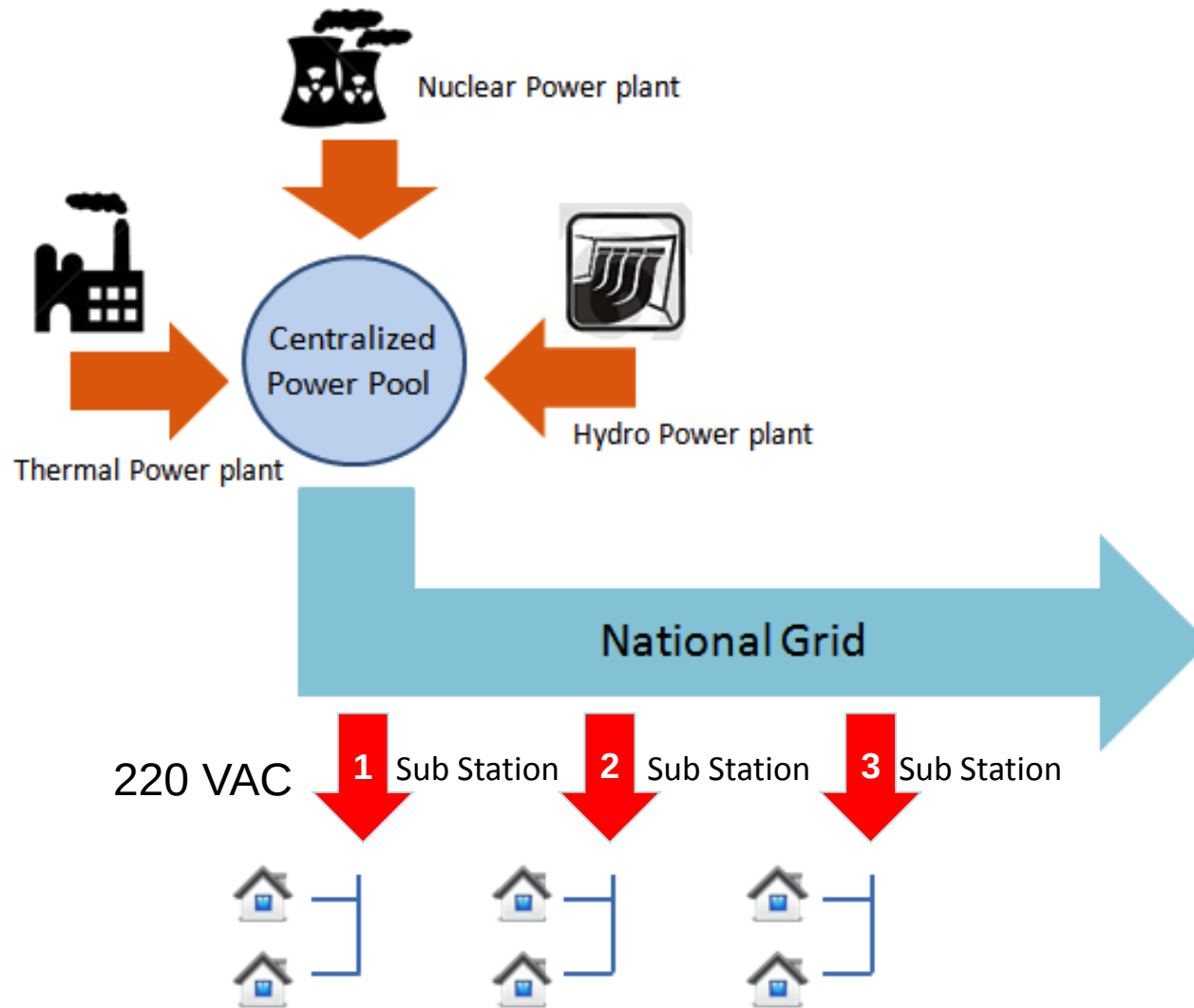


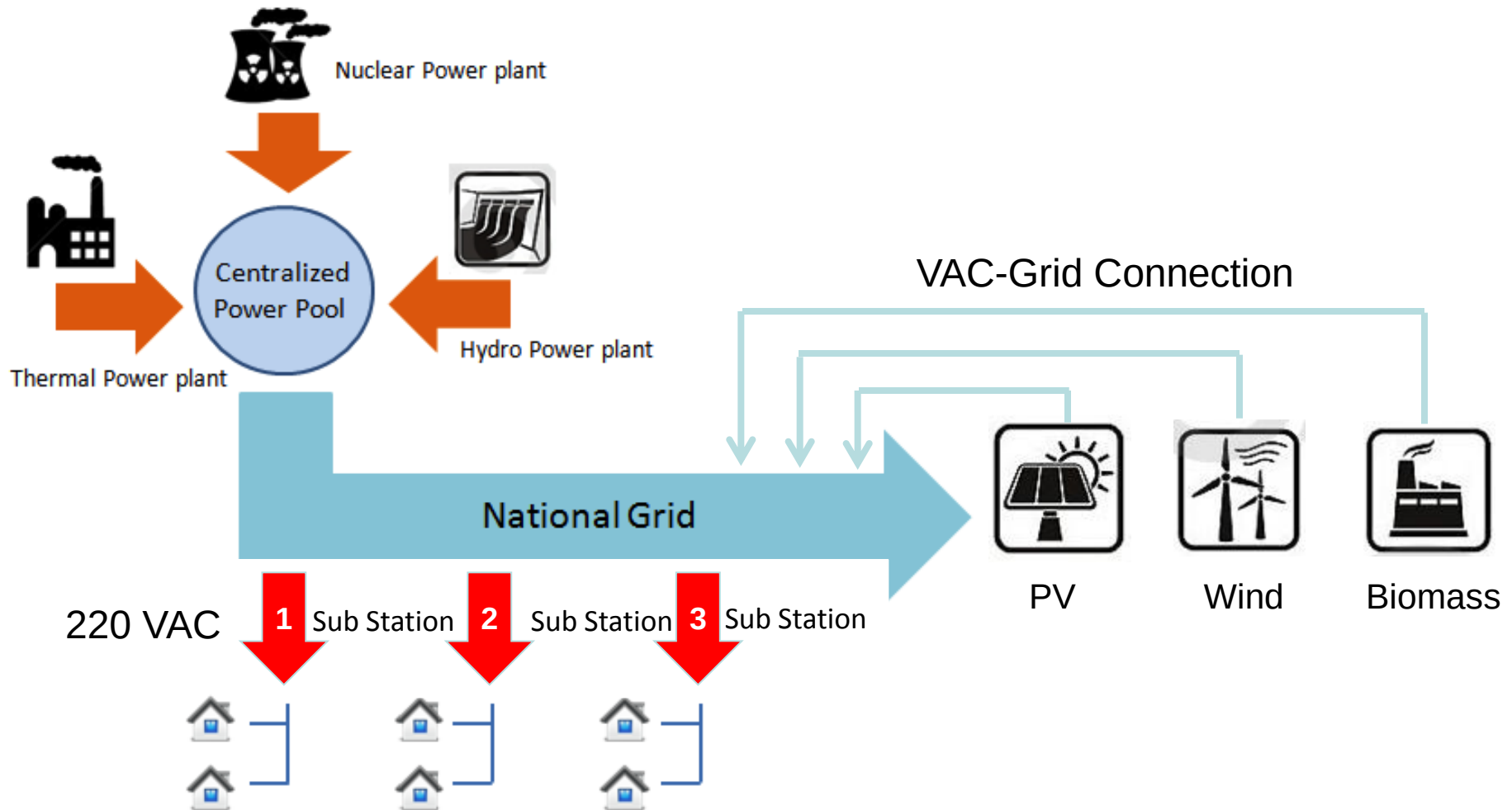
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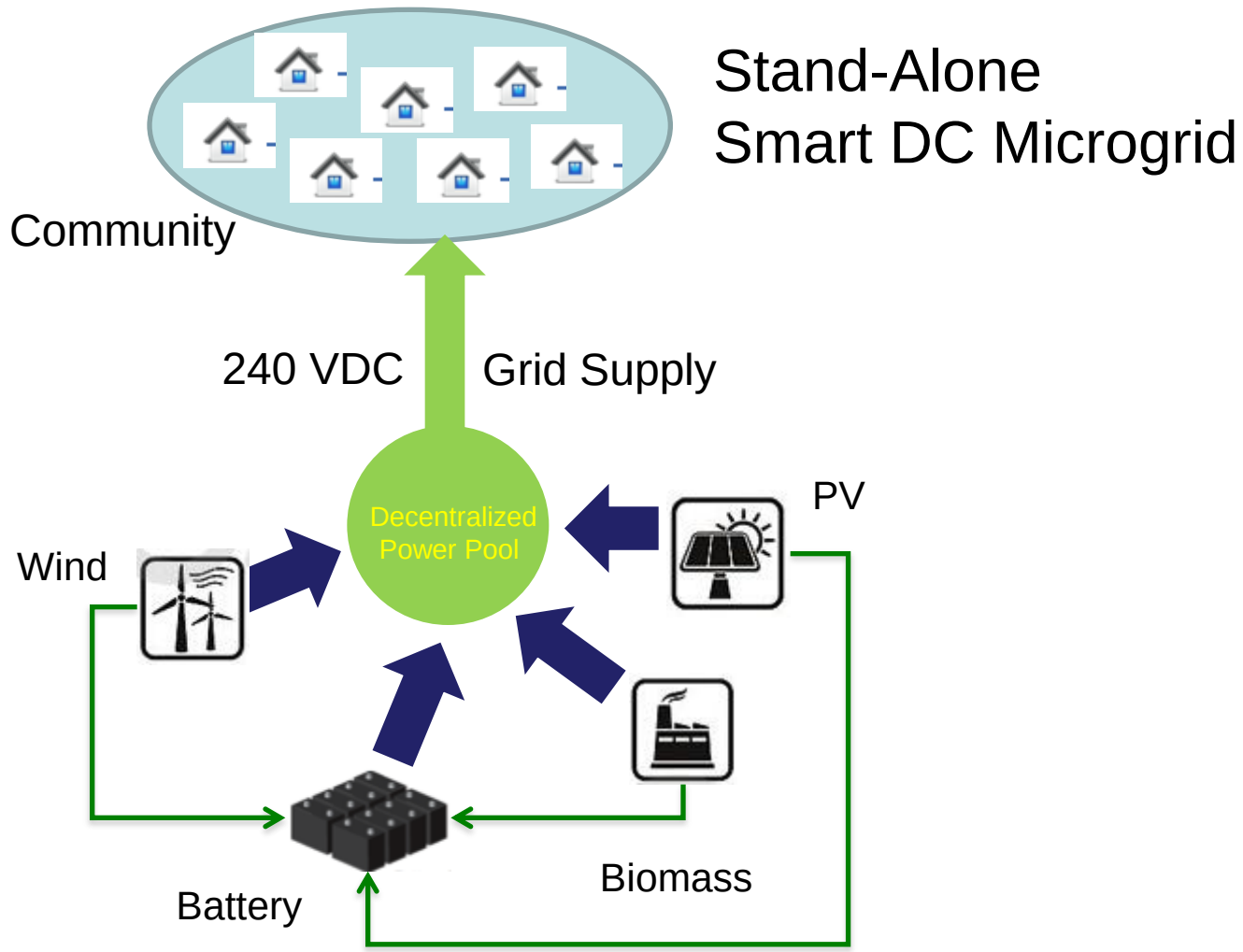
Alarm Message:

- Phase 1 – PV DC Hybrid Microgrid
 - 25.5 kWp PV Generator with DC Grid to each load
 - 24 VDC Lighting
 - 240 VDC for household appliances
 - Lighting, TV, Computer, Refrigerator
 - Rice cooker, Water heater, Microwave, Air Conditioner
 - Farm Pump
 - Online monitoring & data acquisition system



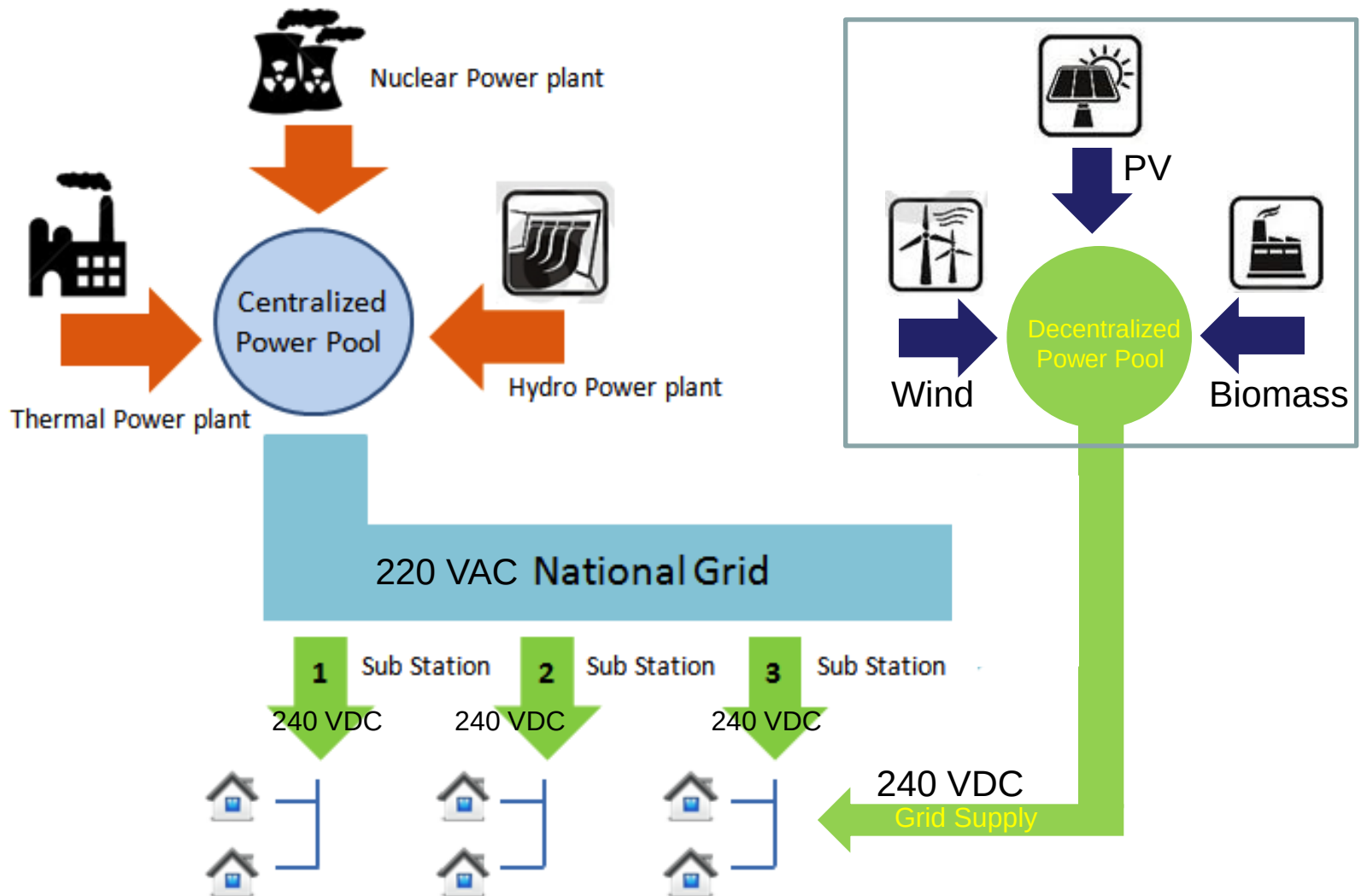


Power for Tomorrow..... Start with.....



Power for Tomorrow..... DC Society

Decentralized with Utility Grid Backup



Thank you



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