

# Building an Energy Efficient Island Grid

## Addressing island grid challenges

The Siemens Princeton Island Grid project, coined a "living lab", was designed to address the challenges of distributed energy resilience. Besides increasing energy efficiency of on-campus buildings, the research team has documented reduced CO<sub>2</sub> emissions thanks to an on campus solar generation plant. Overall energy costs were lowered while cost savings increased. Through storms and outages, power remained stable and secure. Even better, it's all scalable. Below are recommendations based on the lessons learned at Princeton for a phased approach to building an energy efficient grid.



## 7 Monetize Excess Energy

Generate funding opportunities by selling excess energy back to the grid. Optimize grid control and building energy management

- Siemens Services and Finance
- MindSphere Simulation and Digital Twins



## 1 Energy Strategy

Map out goals, objectives, needs  
Analyze existing systems / Identify improvement goals and objectives

- Simulation Tools
- Siemens MindSphere (data analytics/analysis of IoT)



## 2 Energy Savings

Improve resilience, drive energy savings

- Siemens MGC based on SICAM Microgrid Manager
- OPAL-RT Technologies
- Siemens Amplifier
- Tapas Inverter PLUS PV
- 836 kWp photovoltaic system



## 6 Facilitate EV

Use the microgrid-managed energy to charge electric vehicles on-site

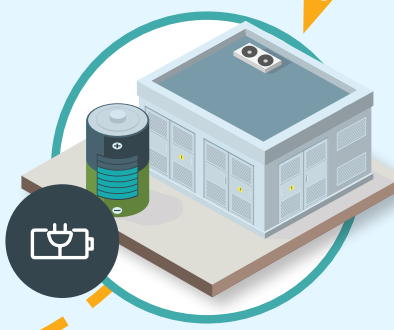
- EV distribution and stations
- Siemens VersiCharger



## 3 On-site Storage

Leverage excess energy

- Energy Storage Solution
- Siemens ESS System
- 1000 kWh energy storage system



## 5 Building Efficiency

Use building automation technology to further reduce greenhouse gas emissions and increase energy efficiencies

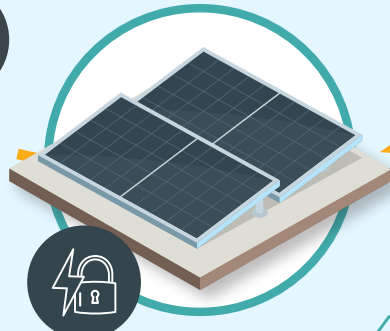
- Building automation/management software
- Siemens Desigo/Navigator



## 4 Power Generation

Ensure power security for long term operations

- Siemens Engine
- Siemens Generator
- Renewable Sources



## Siemens Grid Innovation

When building microgrids, each implementation is unique. The Siemens Princeton Microgrid is one of the first to combine renewable energy solutions with both building management and energy management solutions. The result is an innovative, resilient and cost-effective solution that serves as a live test bed for Siemens customers and partners. New proof-of concept ideas are validated while innovative new, high-efficiency tools for implementing microgrids are developed.

Learn more at [www.usa.siemens.com/princeton](http://www.usa.siemens.com/princeton)