

FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

November 2, 2016
Bellevue, WA

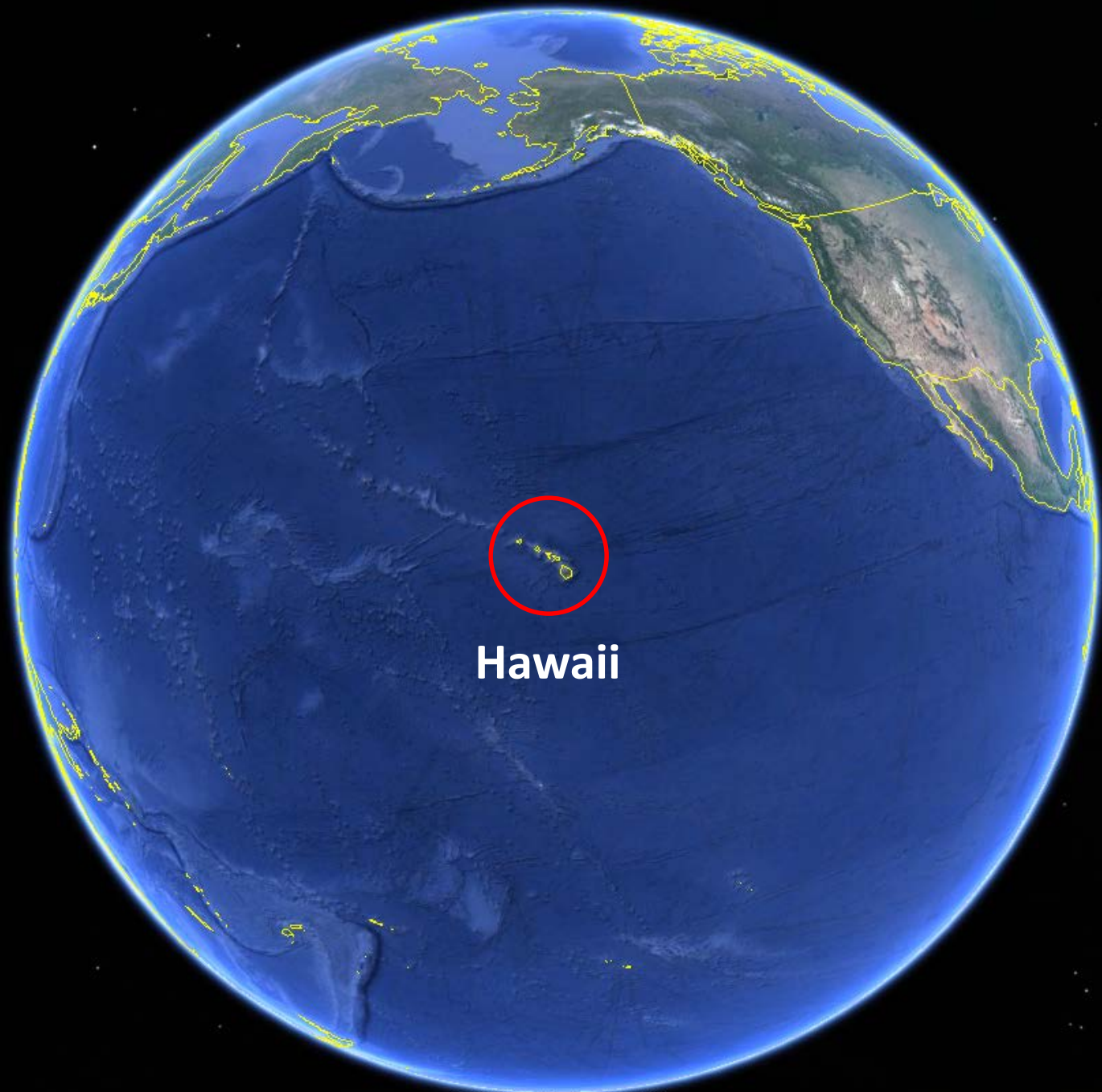
Partnering with Utilities for Energy Resilience

Hosted by:



Hawaiian
Electric





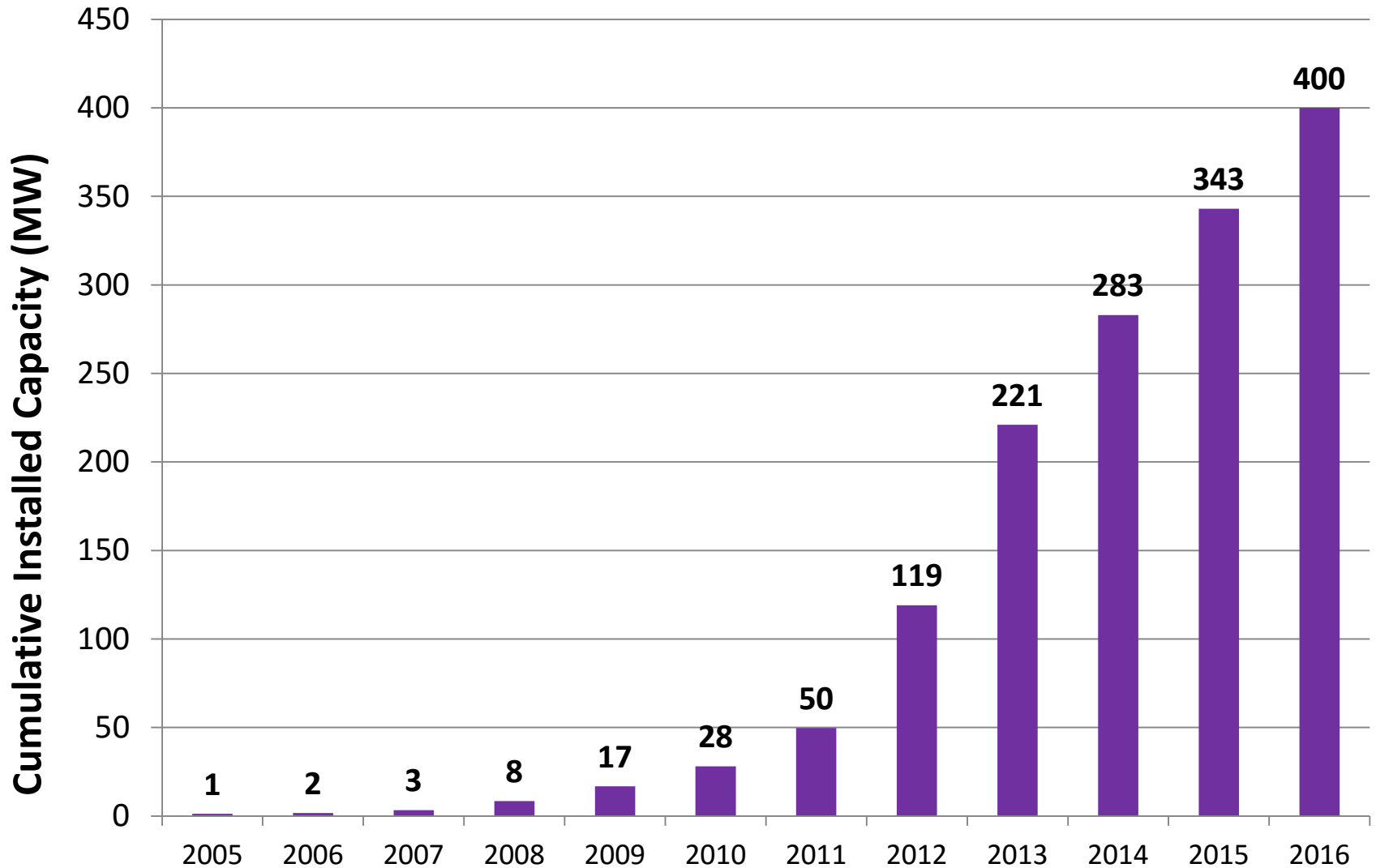
Hawaii

A topographic map of the Hawaiian Islands. The islands are shown in shades of green and brown, indicating elevation. The water is dark blue. A red circle highlights the island of O'ahu. The city of Honolulu is marked on O'ahu. Other islands labeled include Niihau, Kauai, Molokai, Lanai, Maui, Kahoolawe, and Hawaii. The text 'Hawaiian Islands' is written in the center of the map.

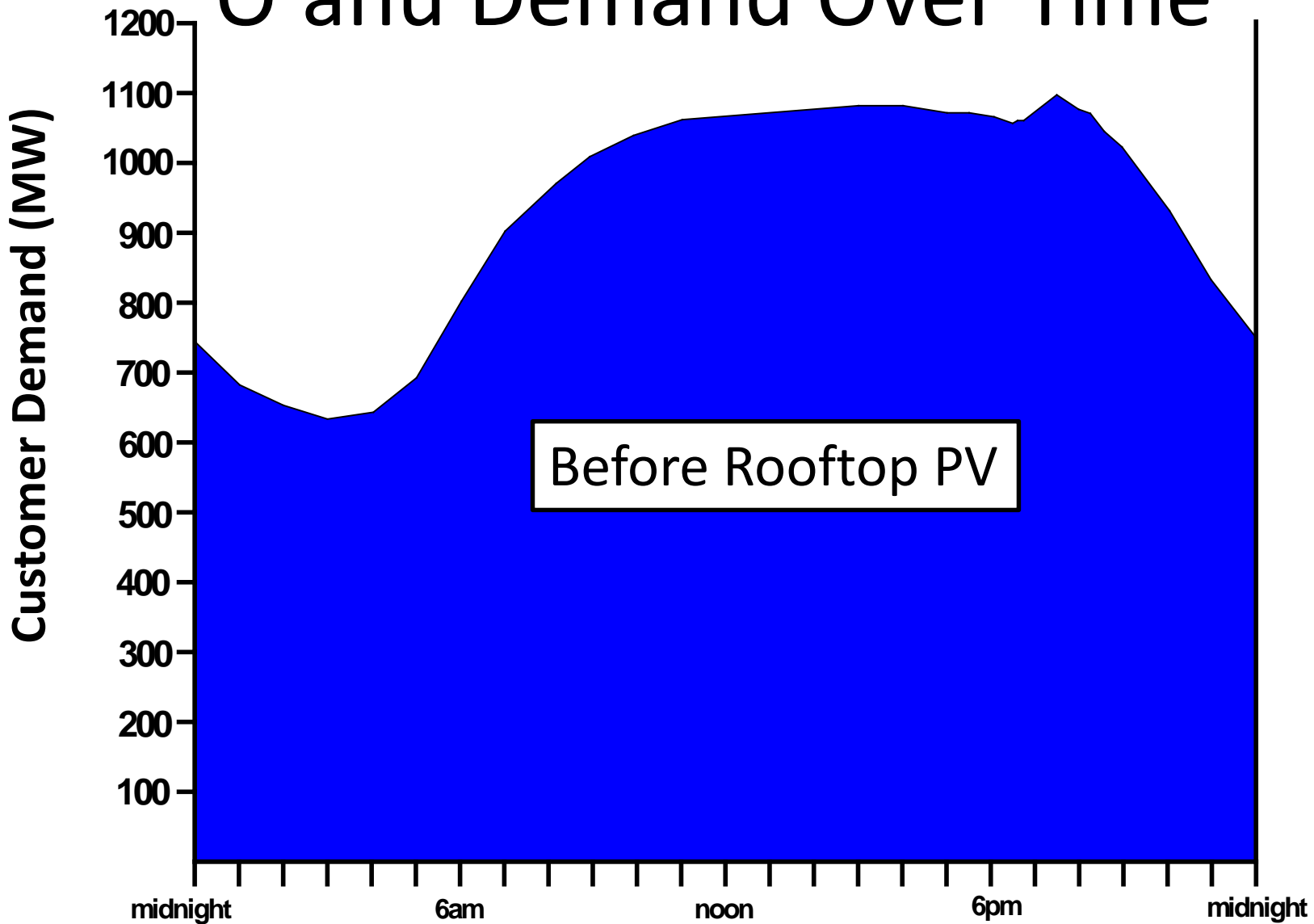
O'ahu

Each island is a separate grid

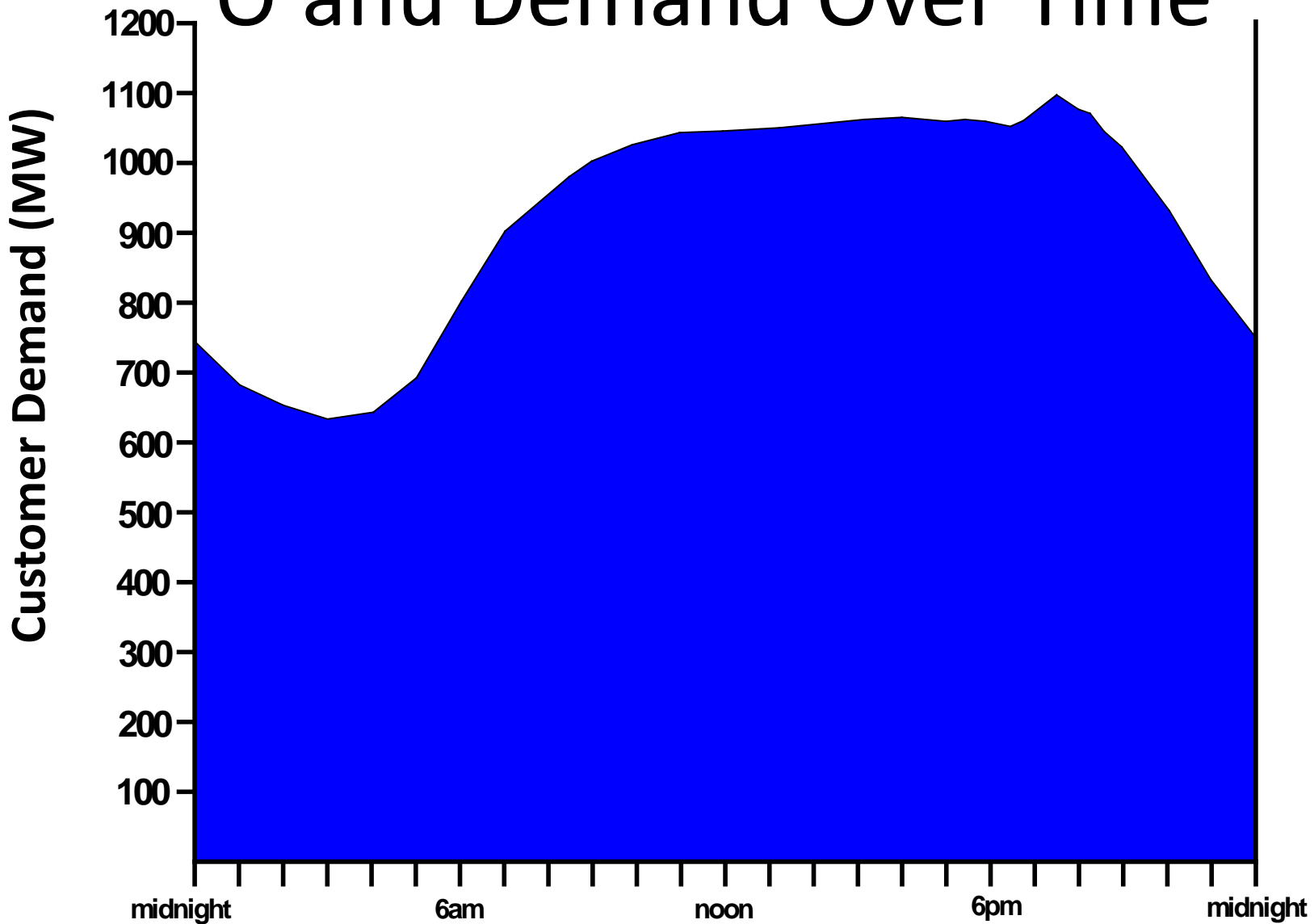
O'ahu Distributed Solar PV Capacity Growth



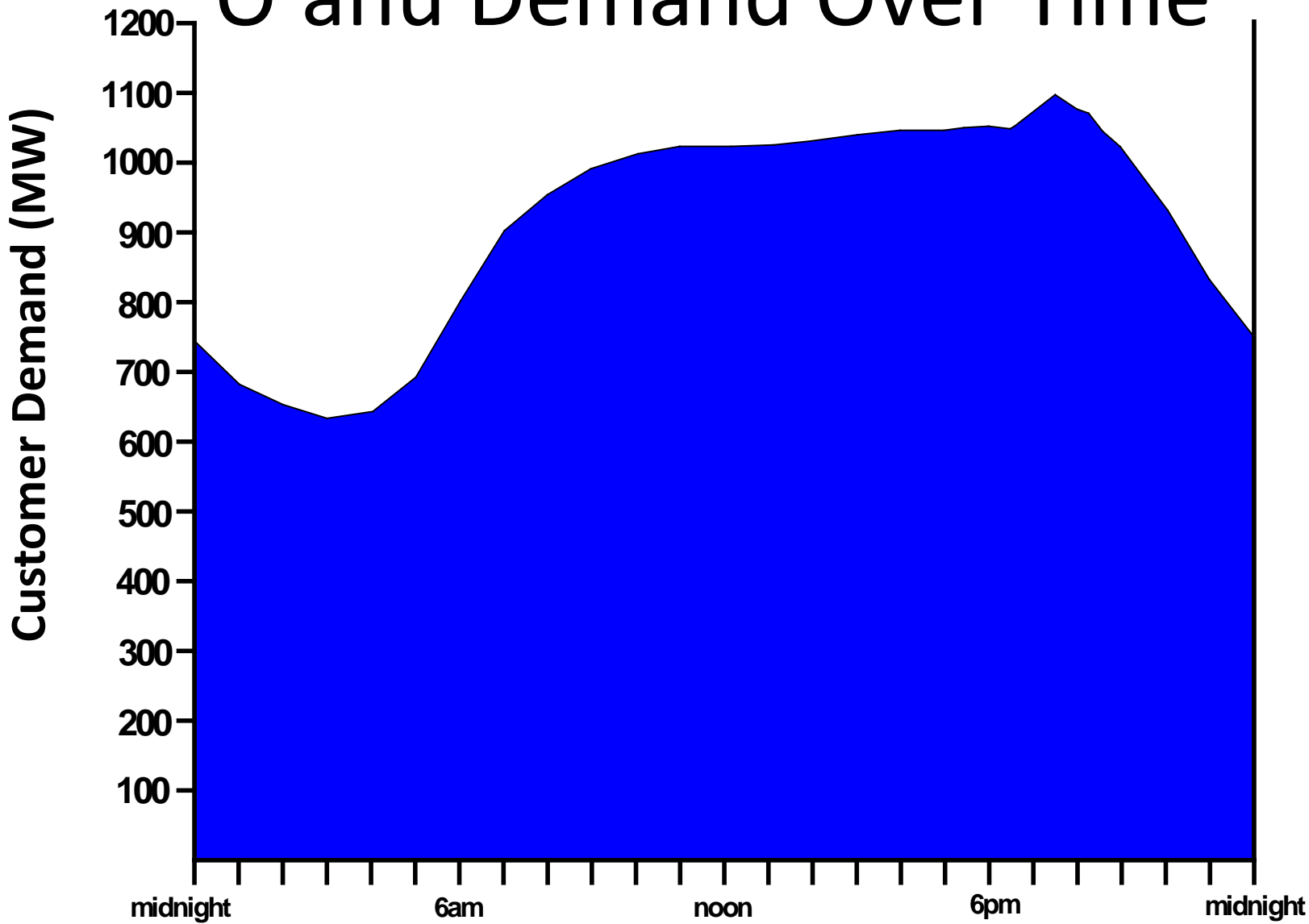
O'ahu Demand Over Time



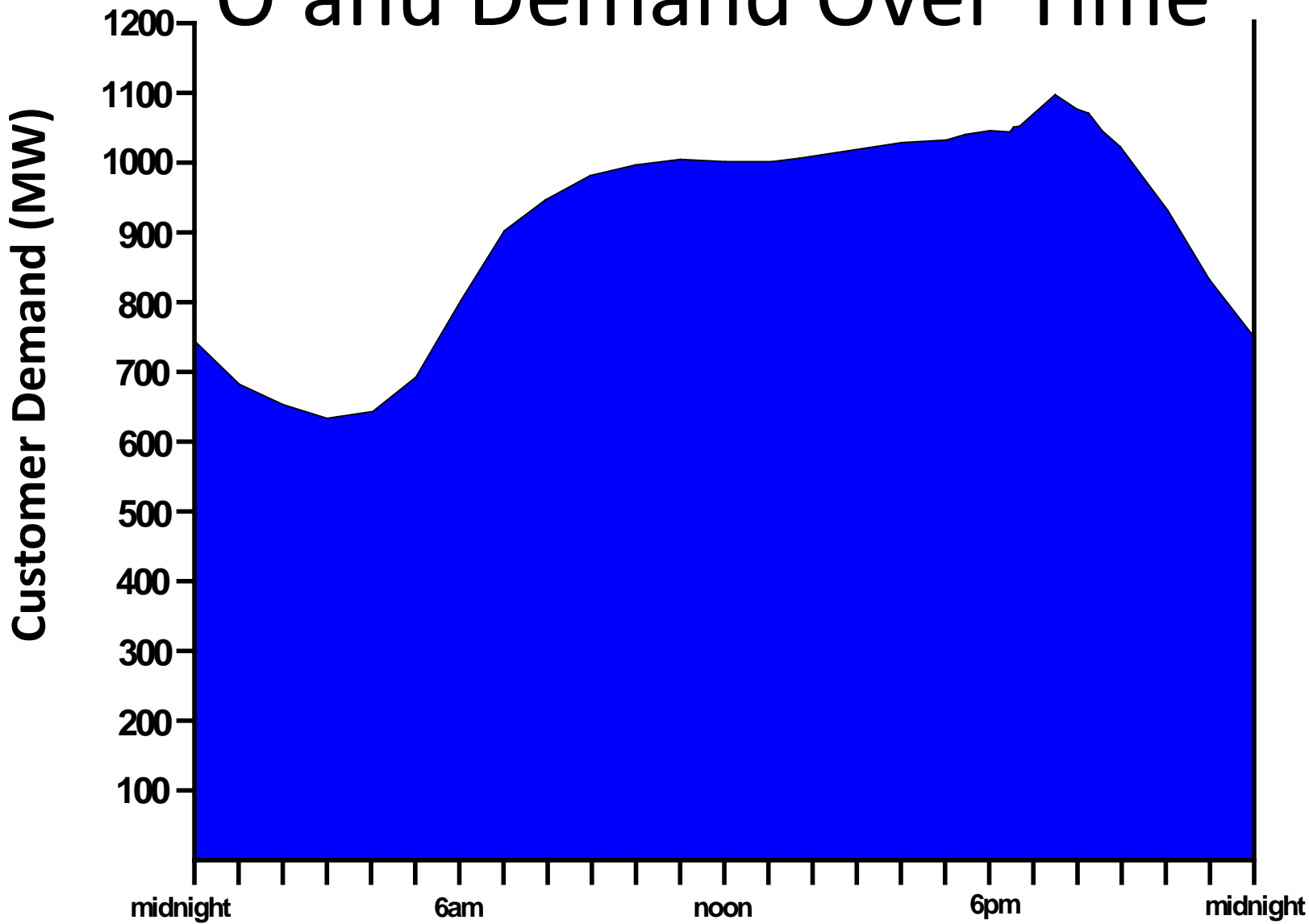
O'ahu Demand Over Time



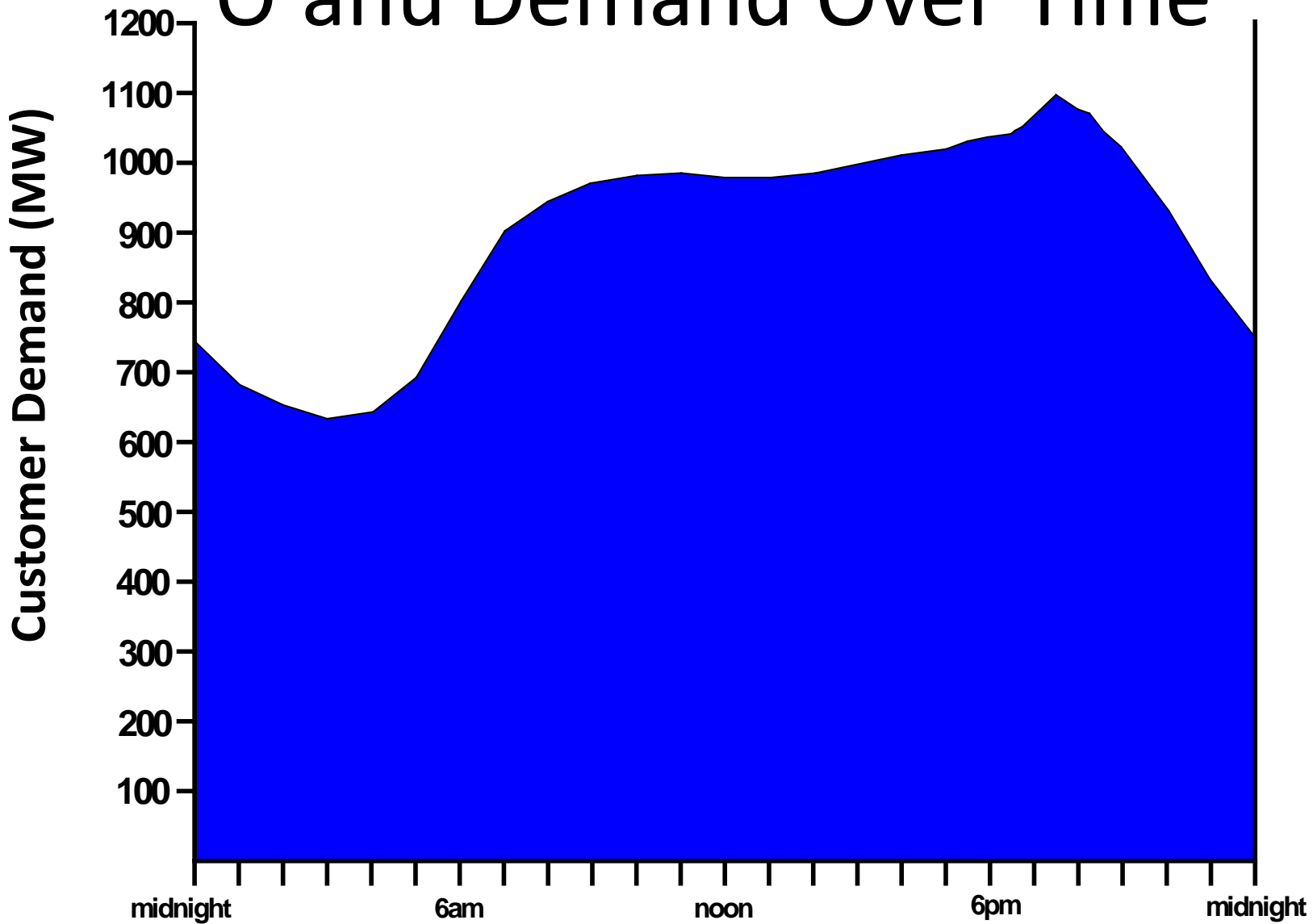
O'ahu Demand Over Time



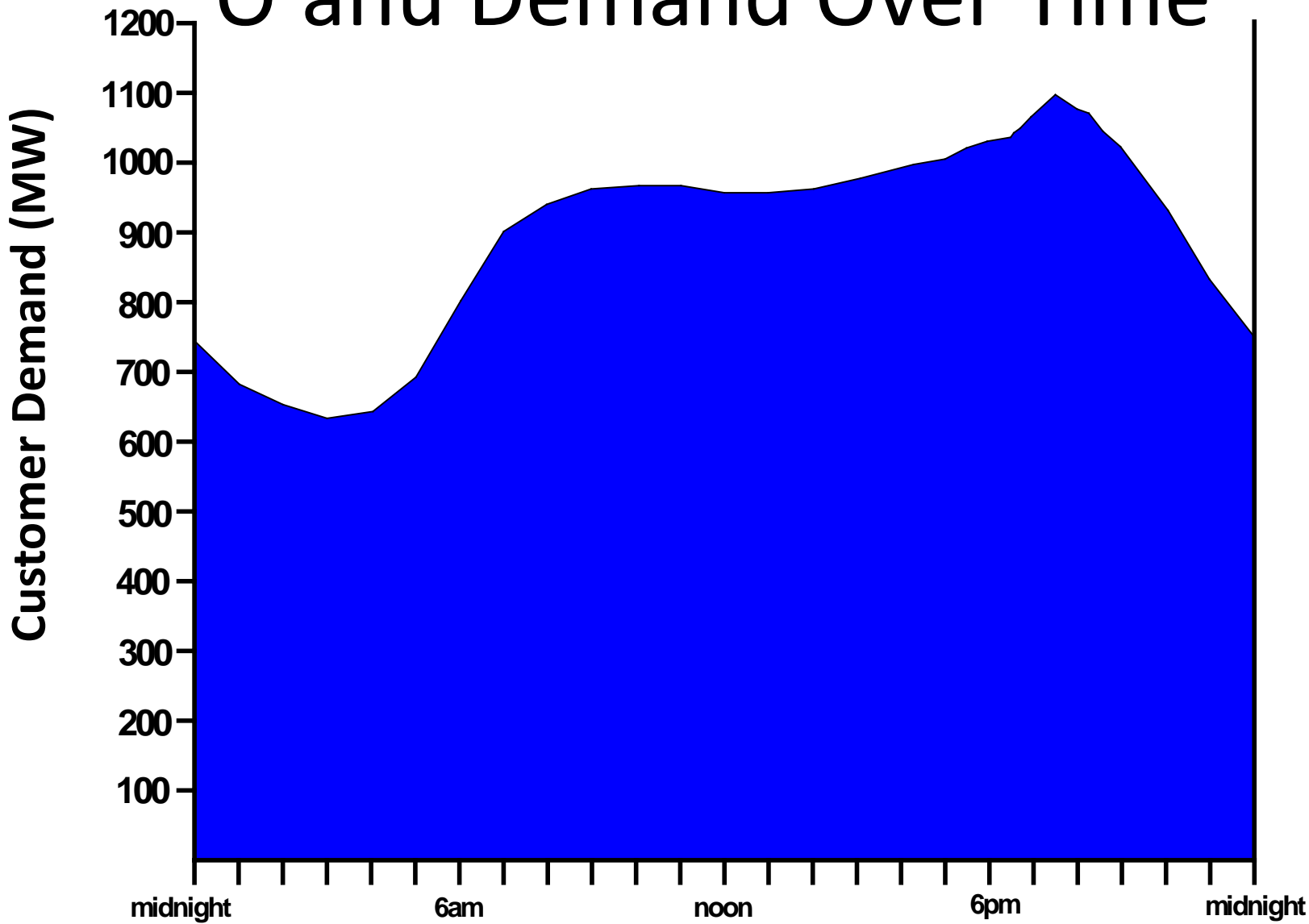
O'ahu Demand Over Time



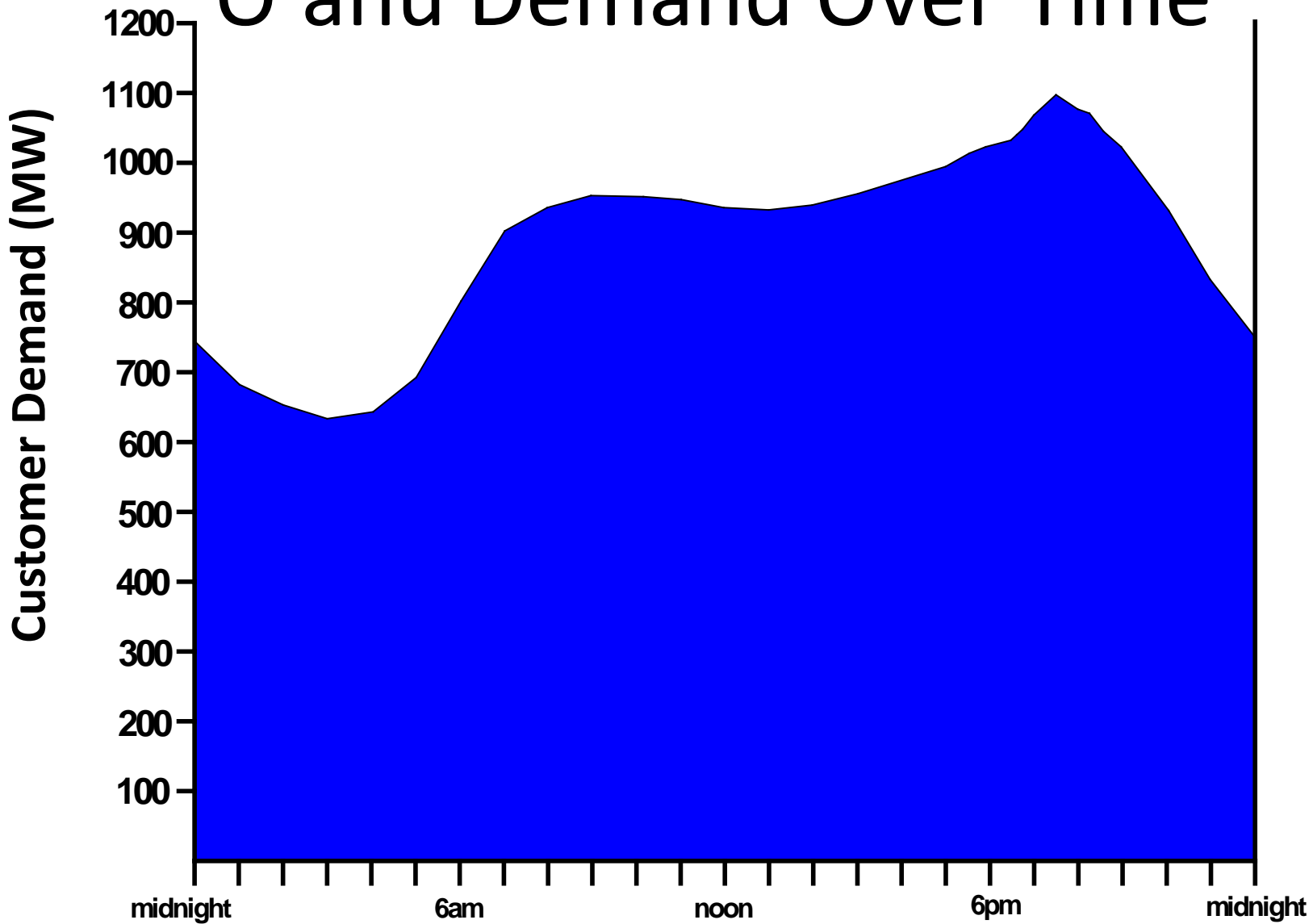
O'ahu Demand Over Time



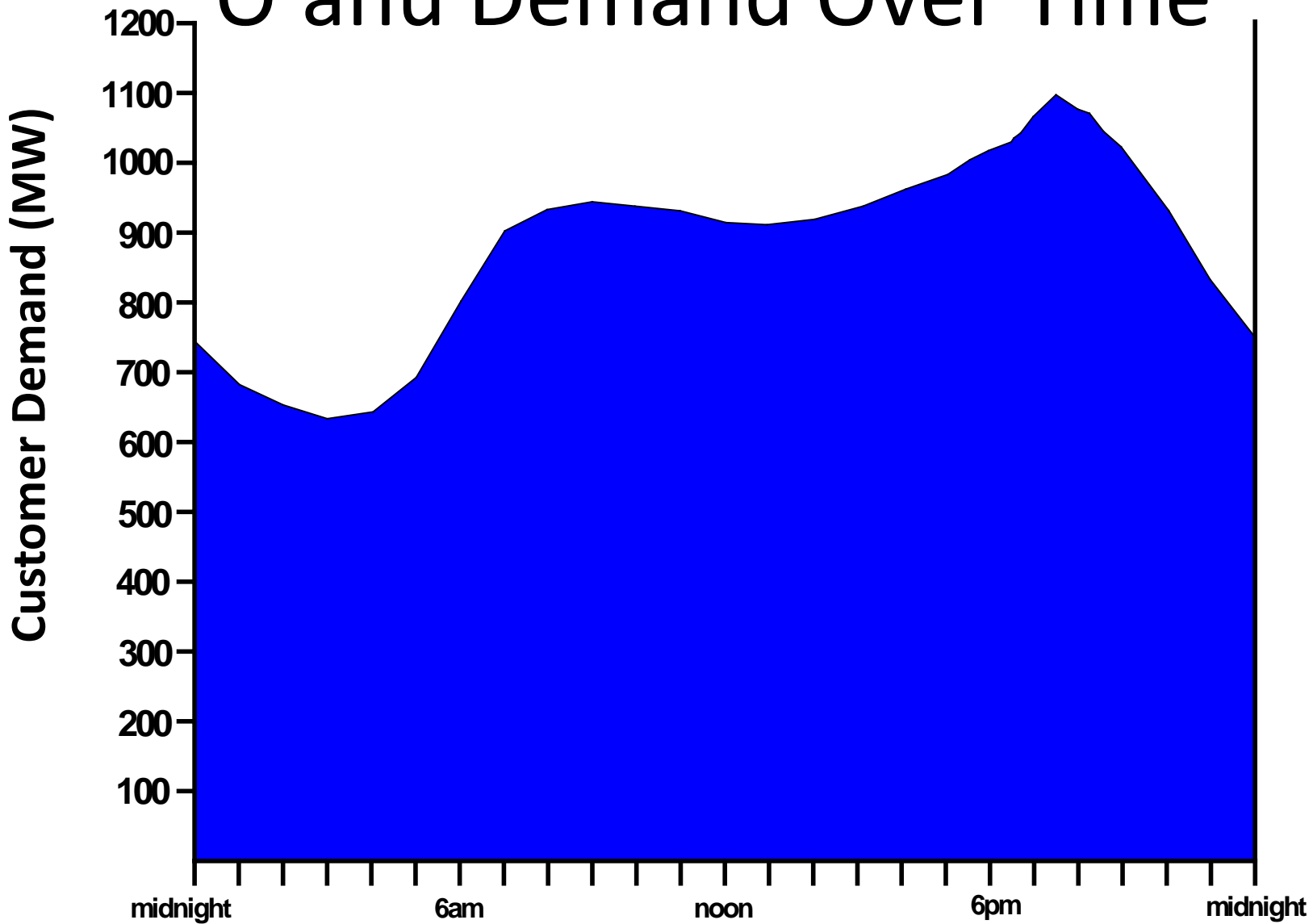
O'ahu Demand Over Time



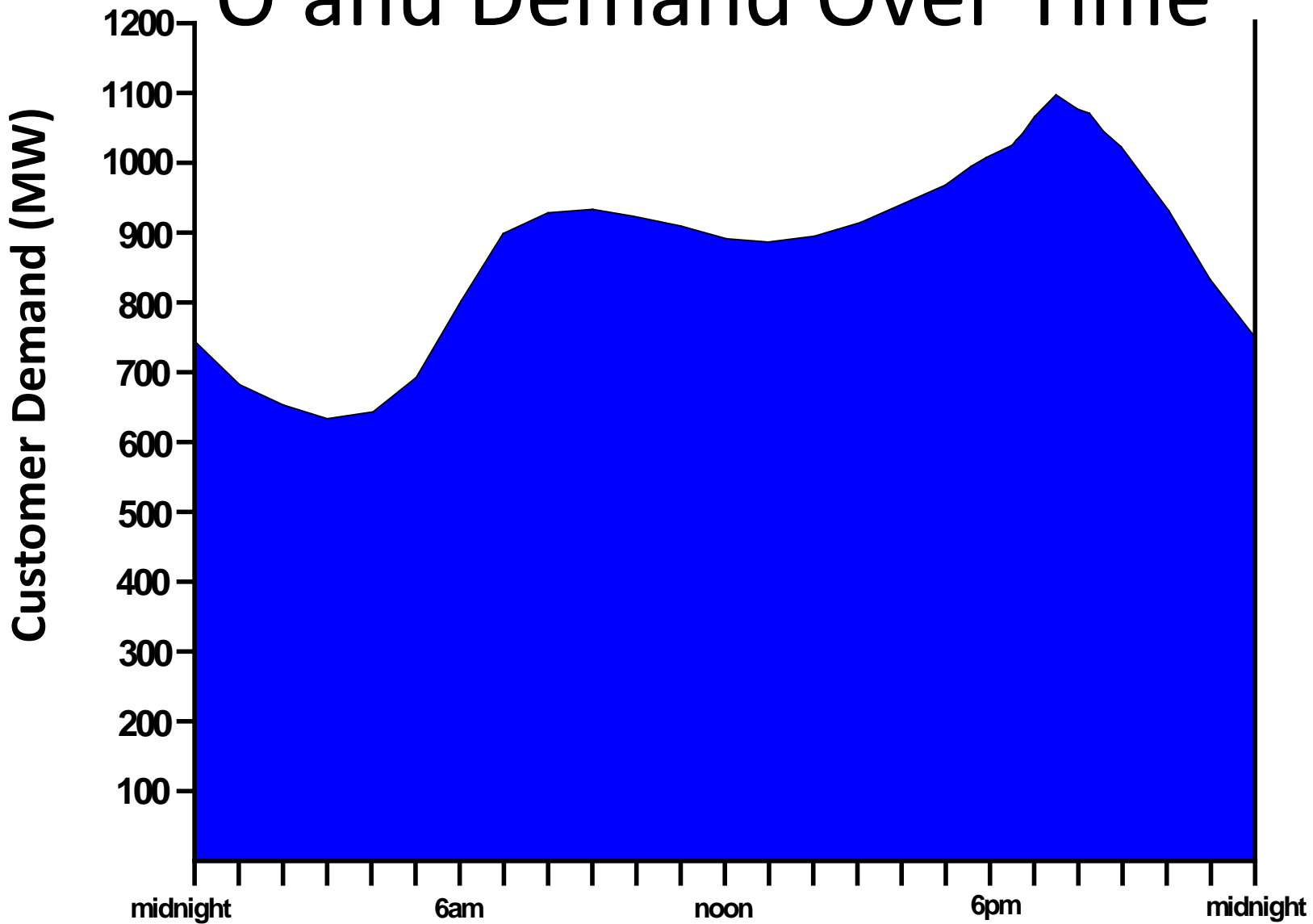
O'ahu Demand Over Time



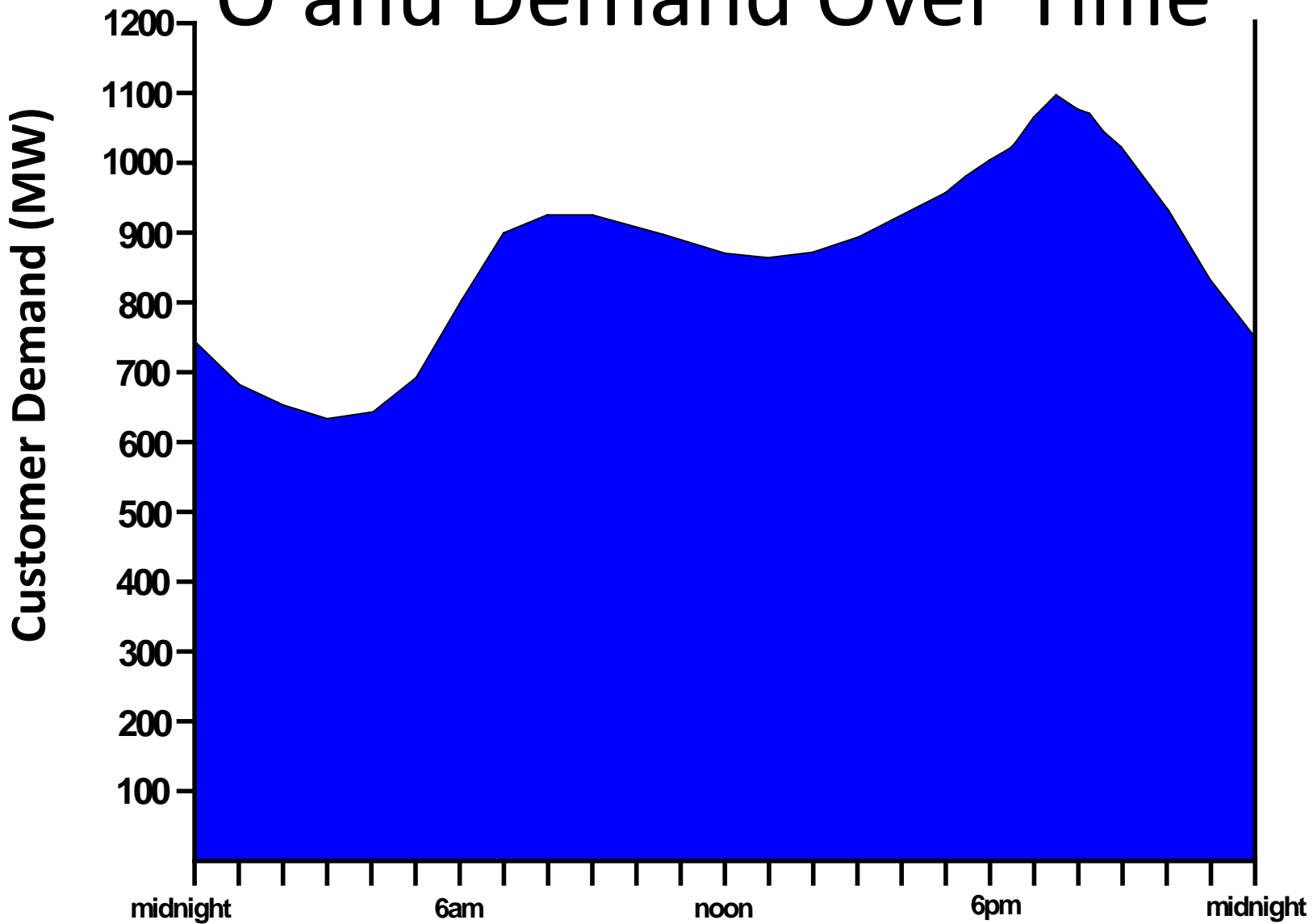
O'ahu Demand Over Time



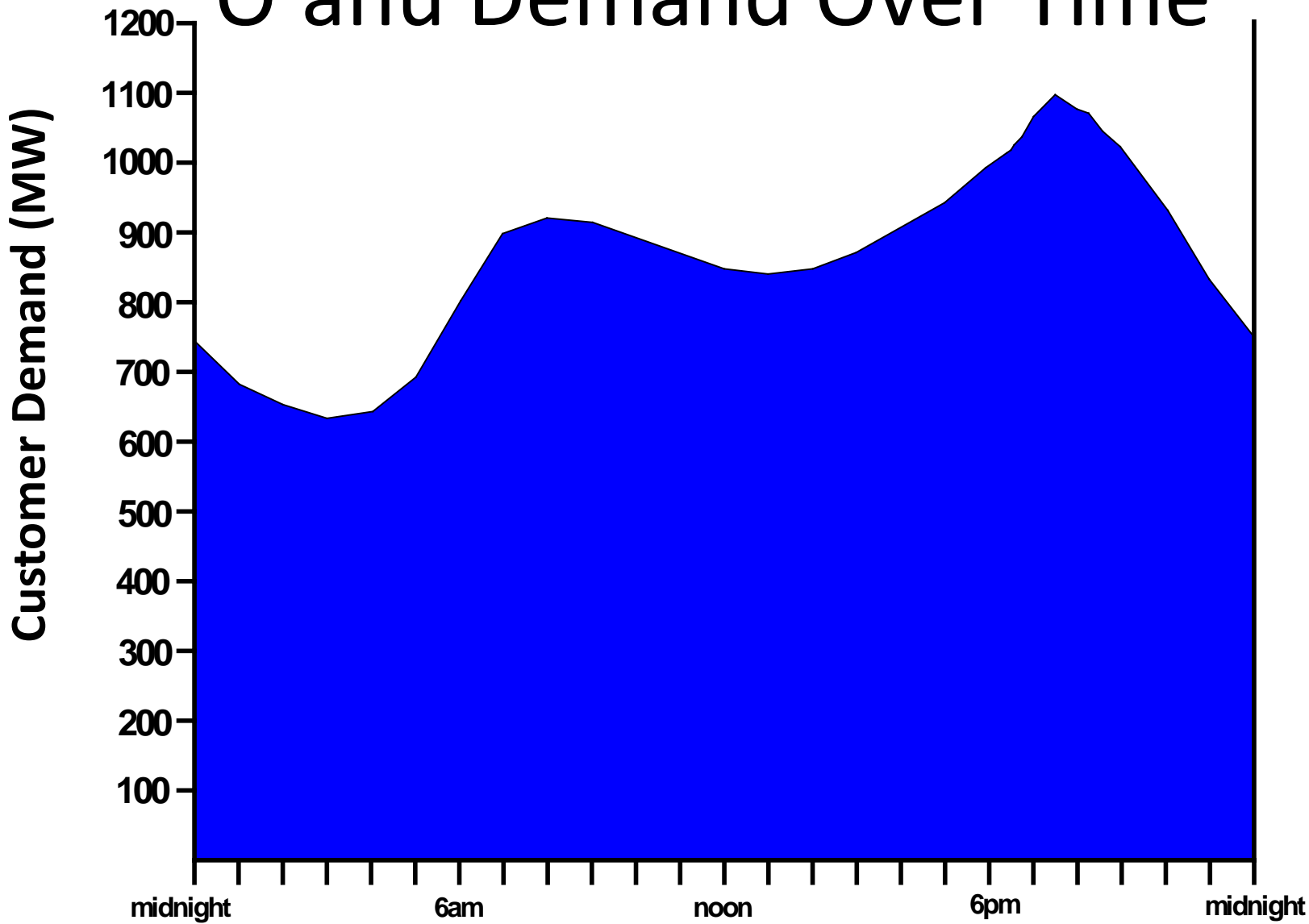
O'ahu Demand Over Time



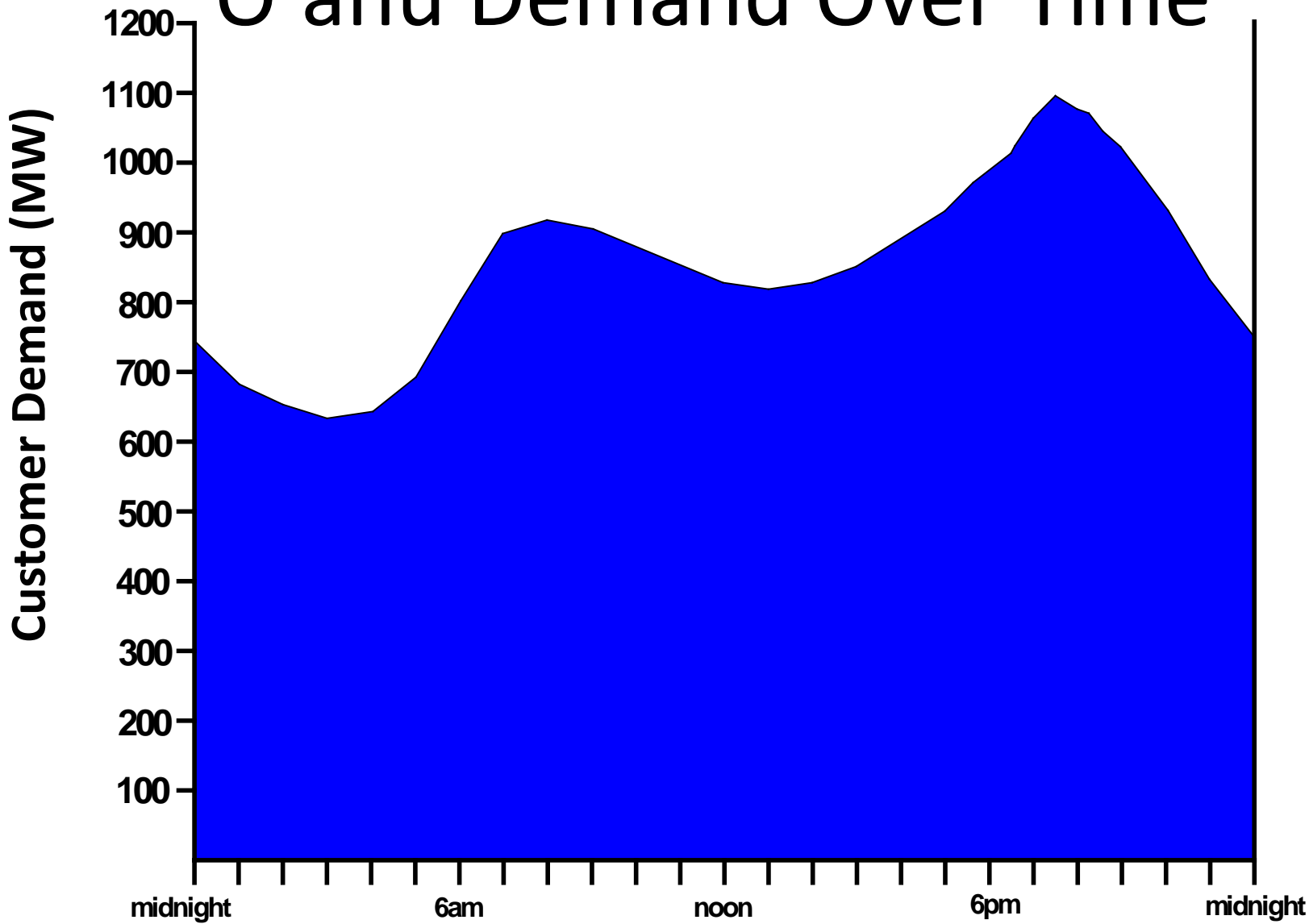
O'ahu Demand Over Time



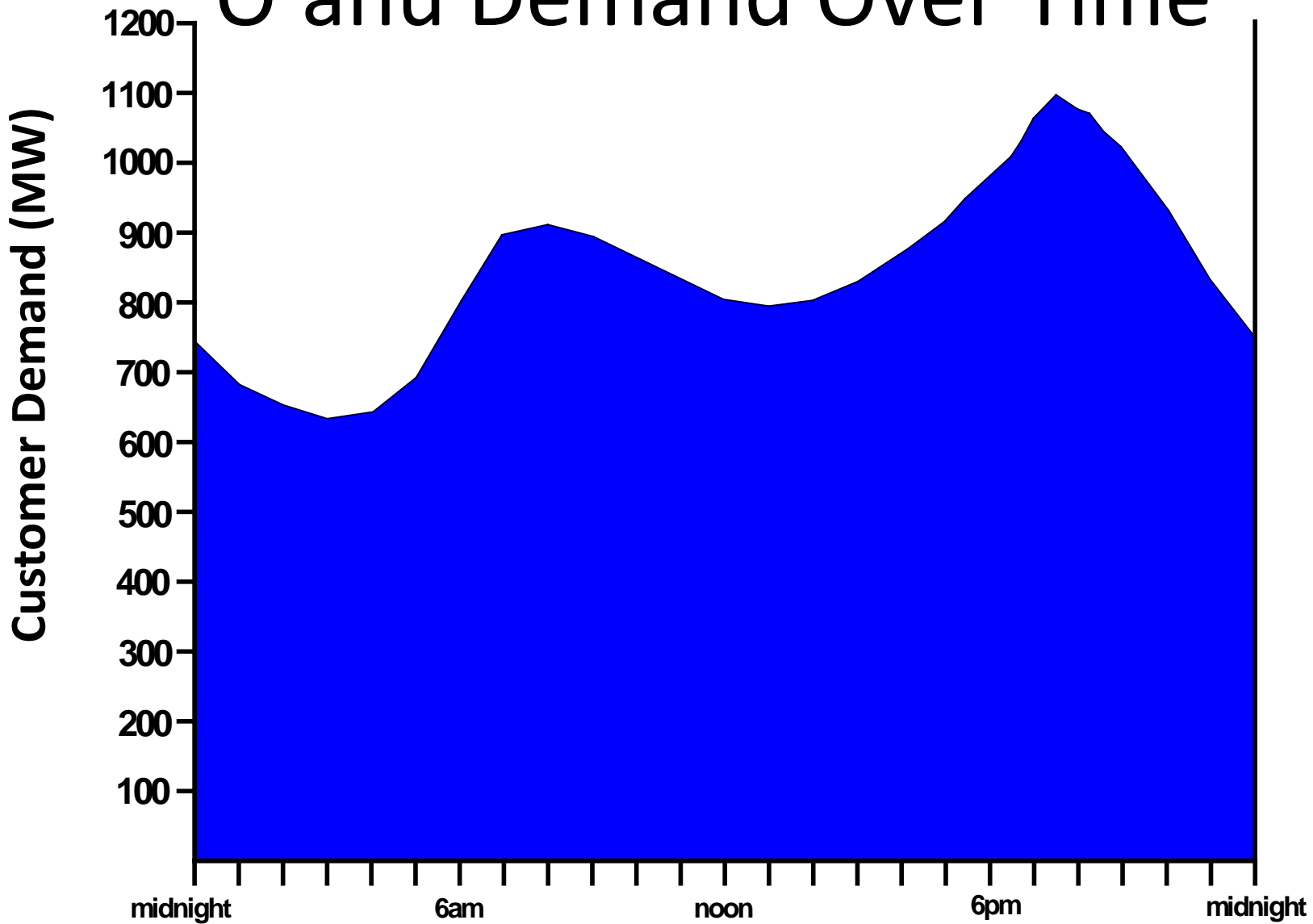
O'ahu Demand Over Time



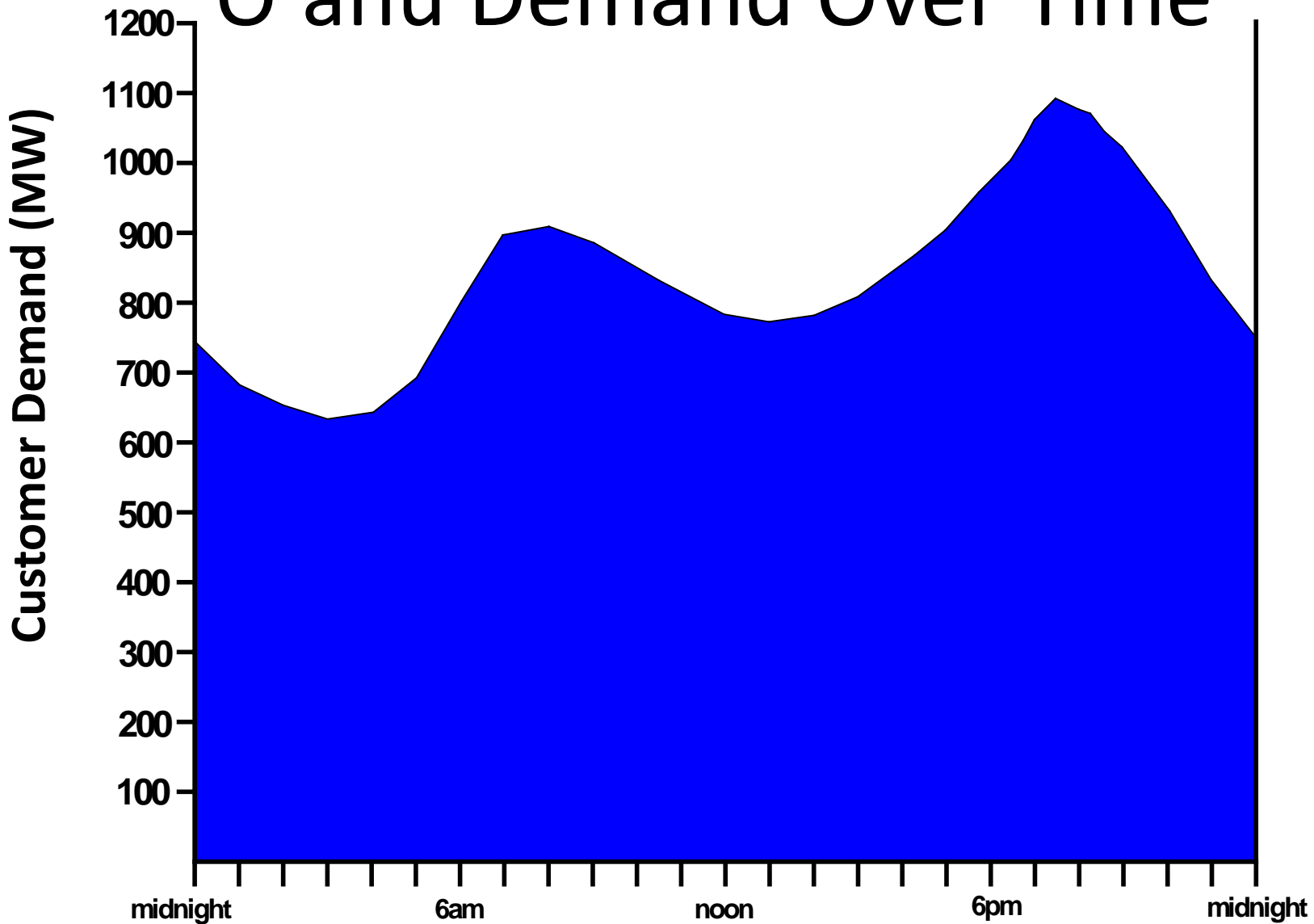
O'ahu Demand Over Time



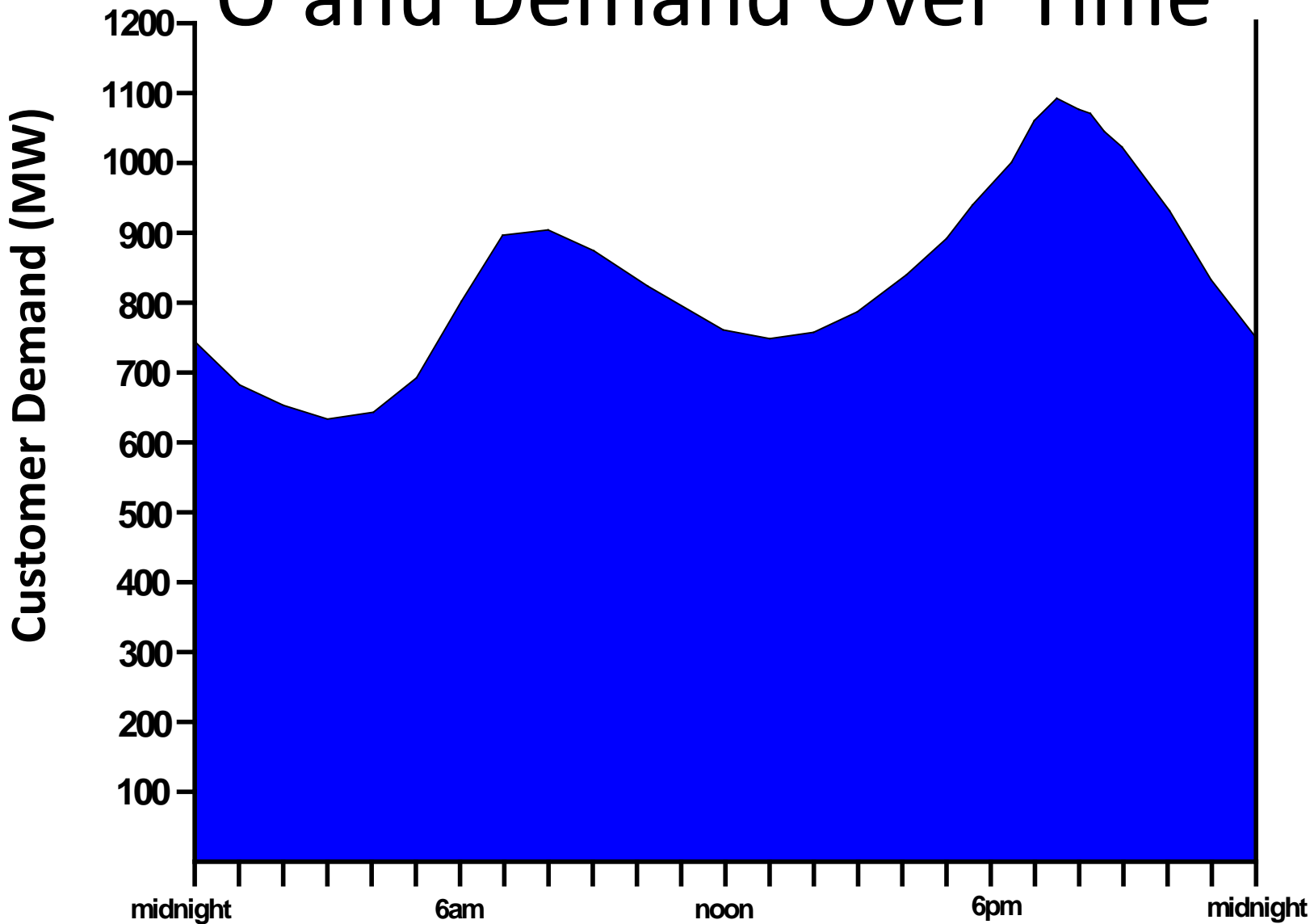
O'ahu Demand Over Time



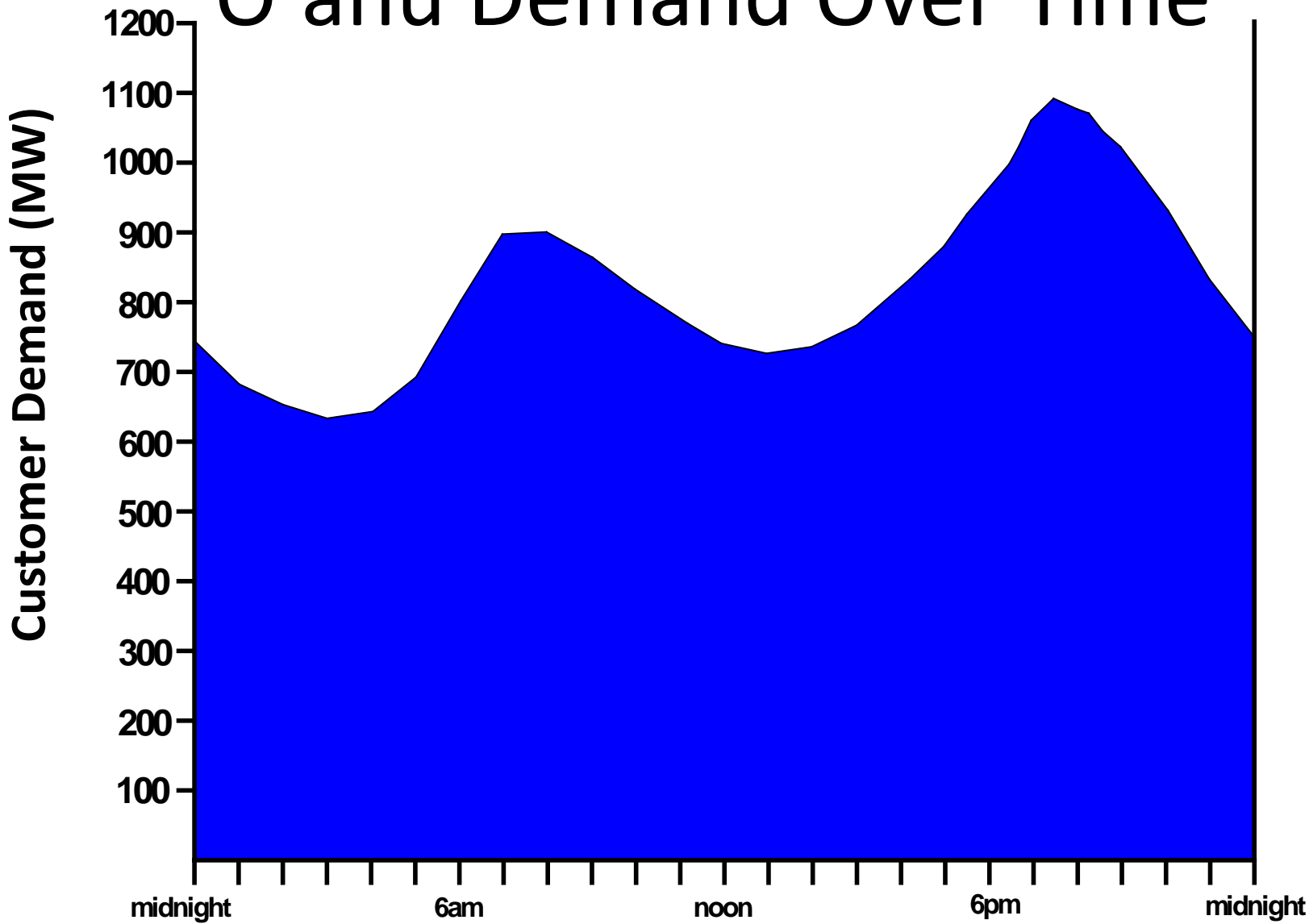
O'ahu Demand Over Time



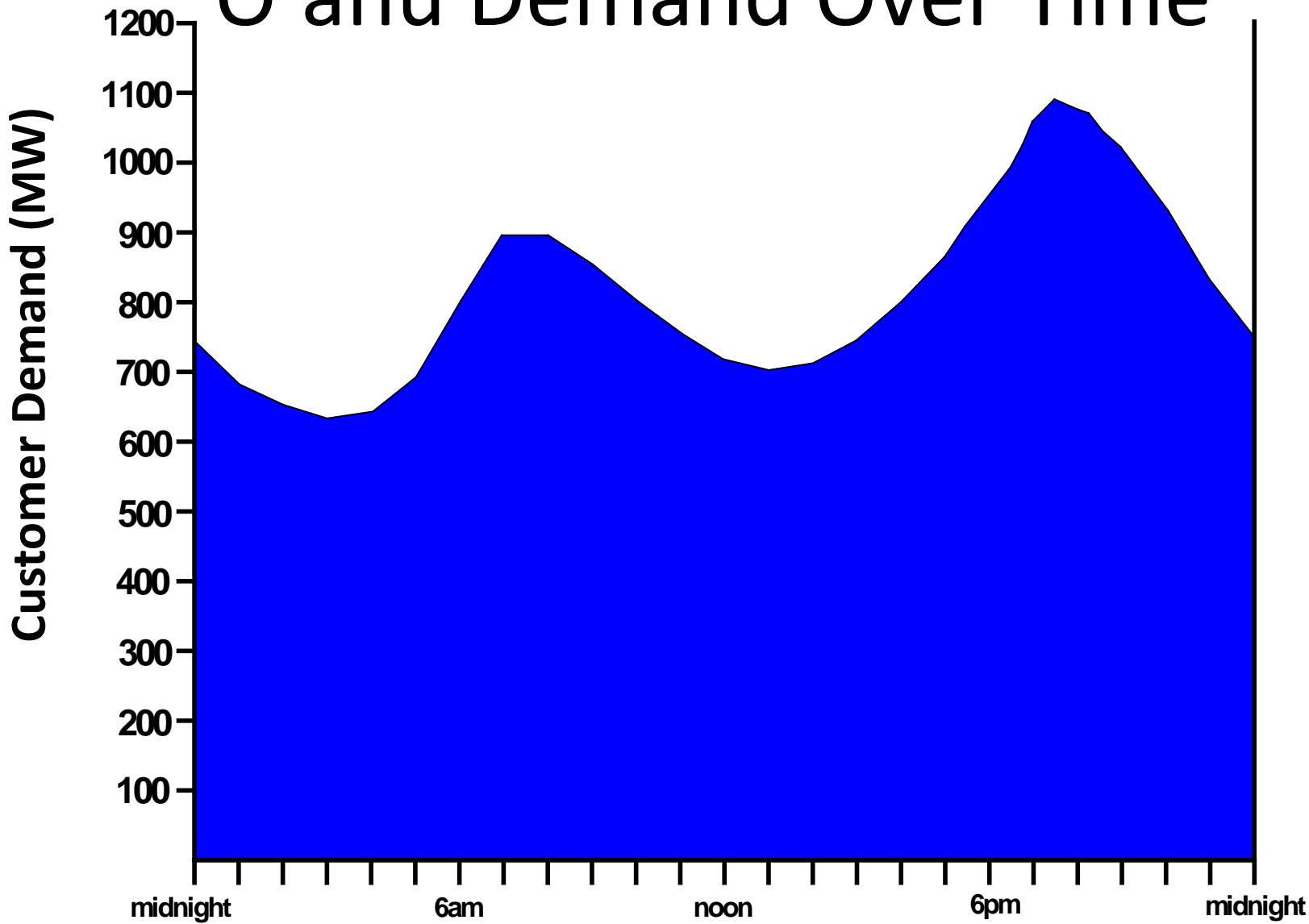
O'ahu Demand Over Time



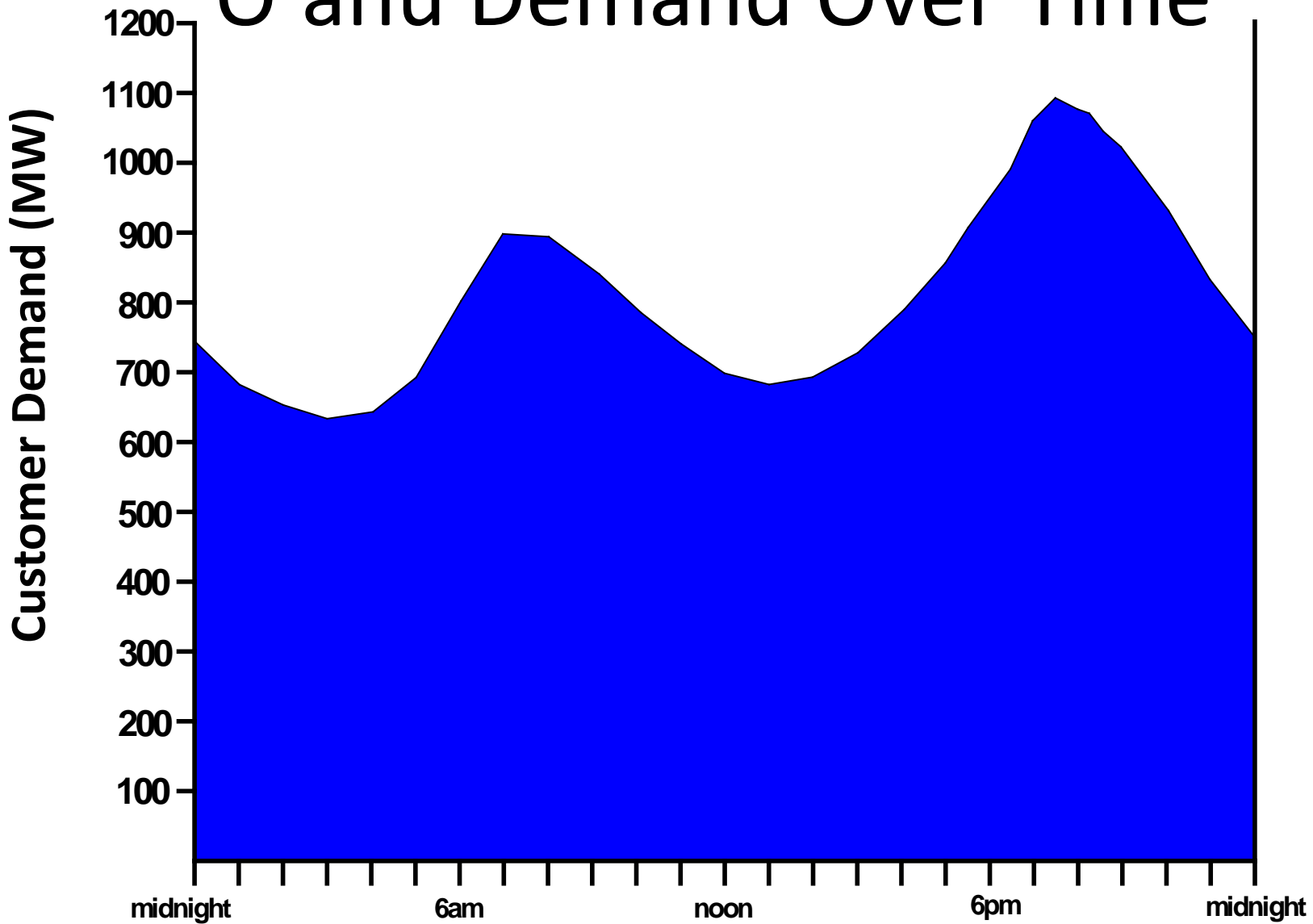
O'ahu Demand Over Time



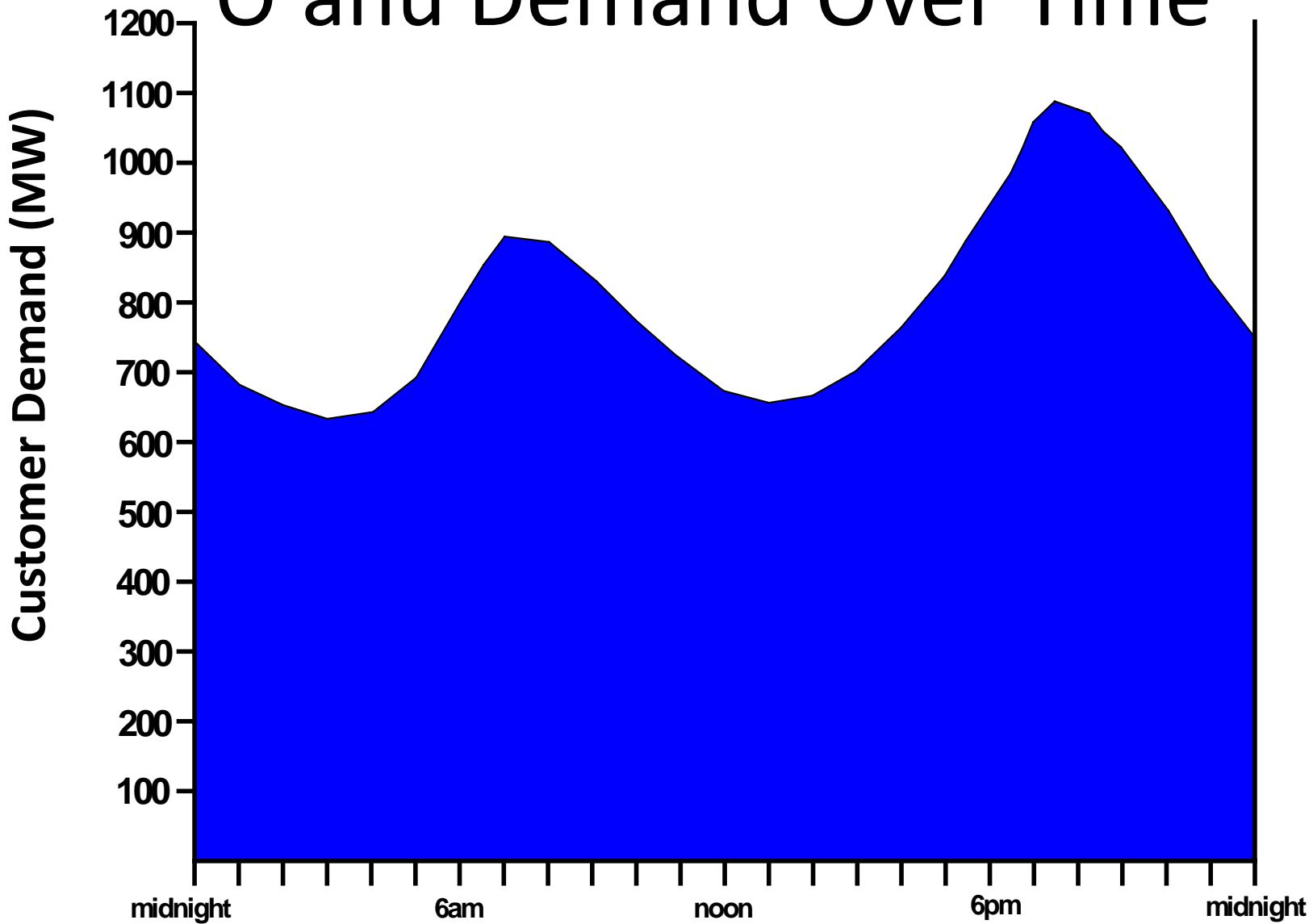
O'ahu Demand Over Time



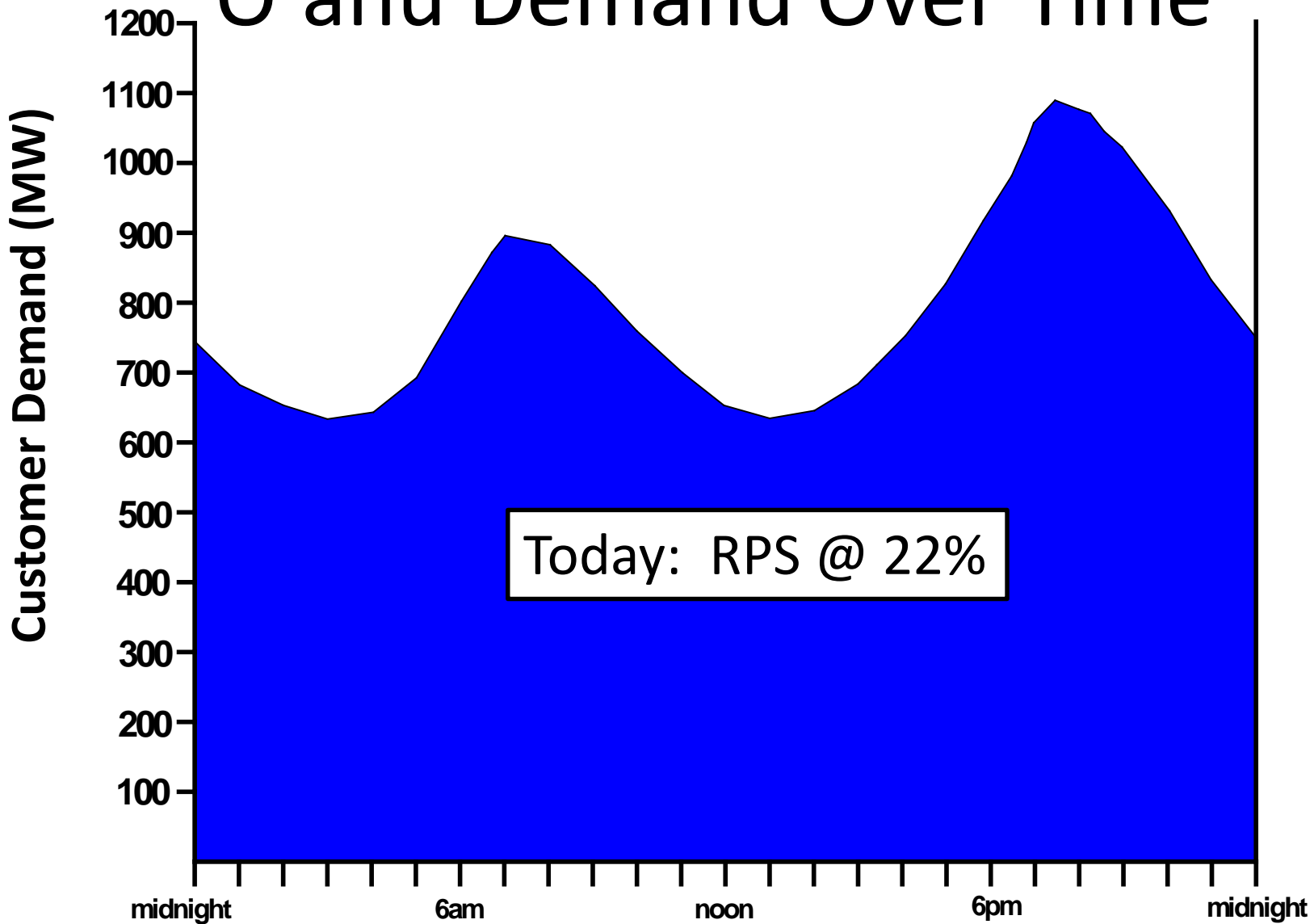
O'ahu Demand Over Time



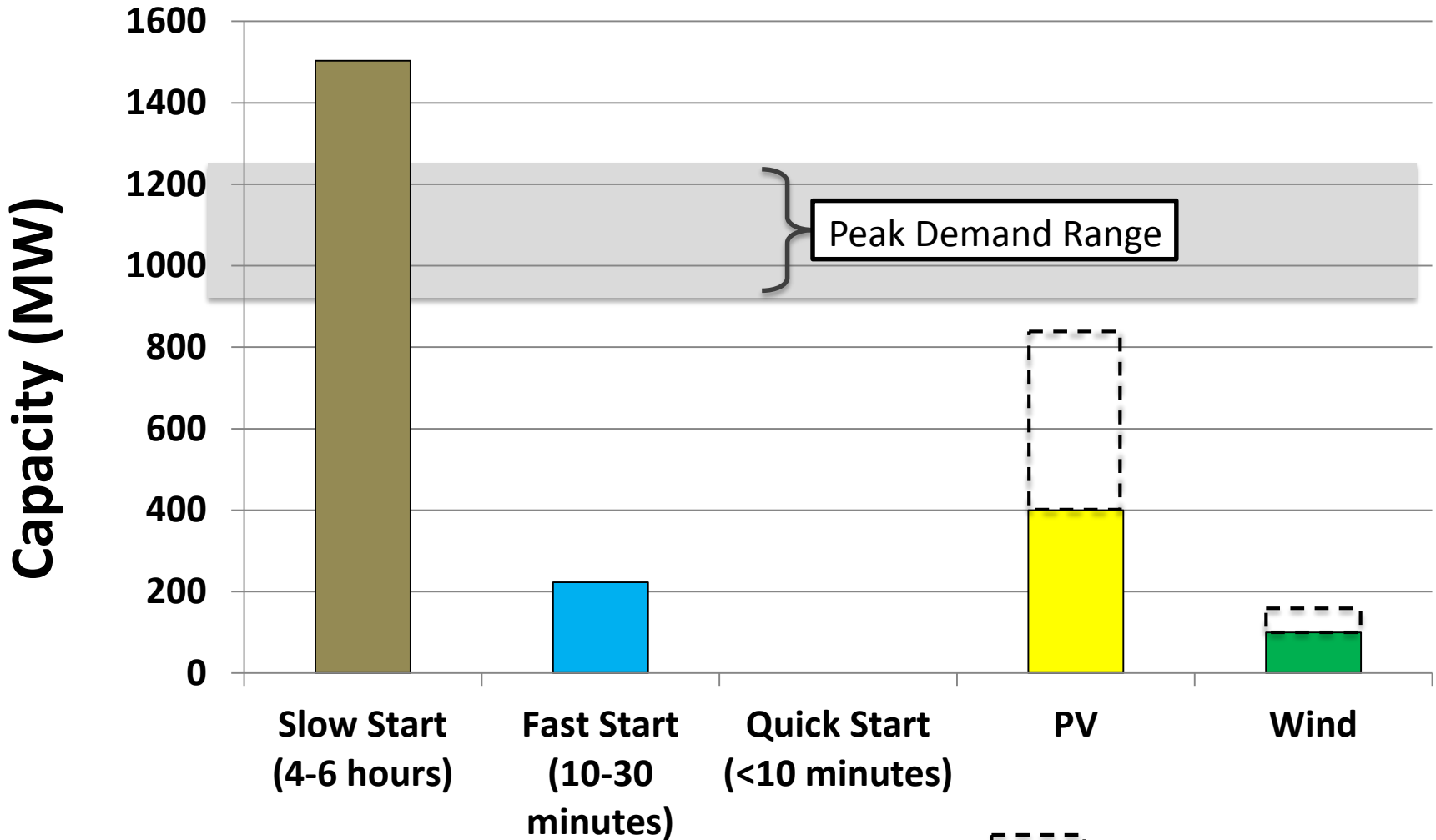
O'ahu Demand Over Time



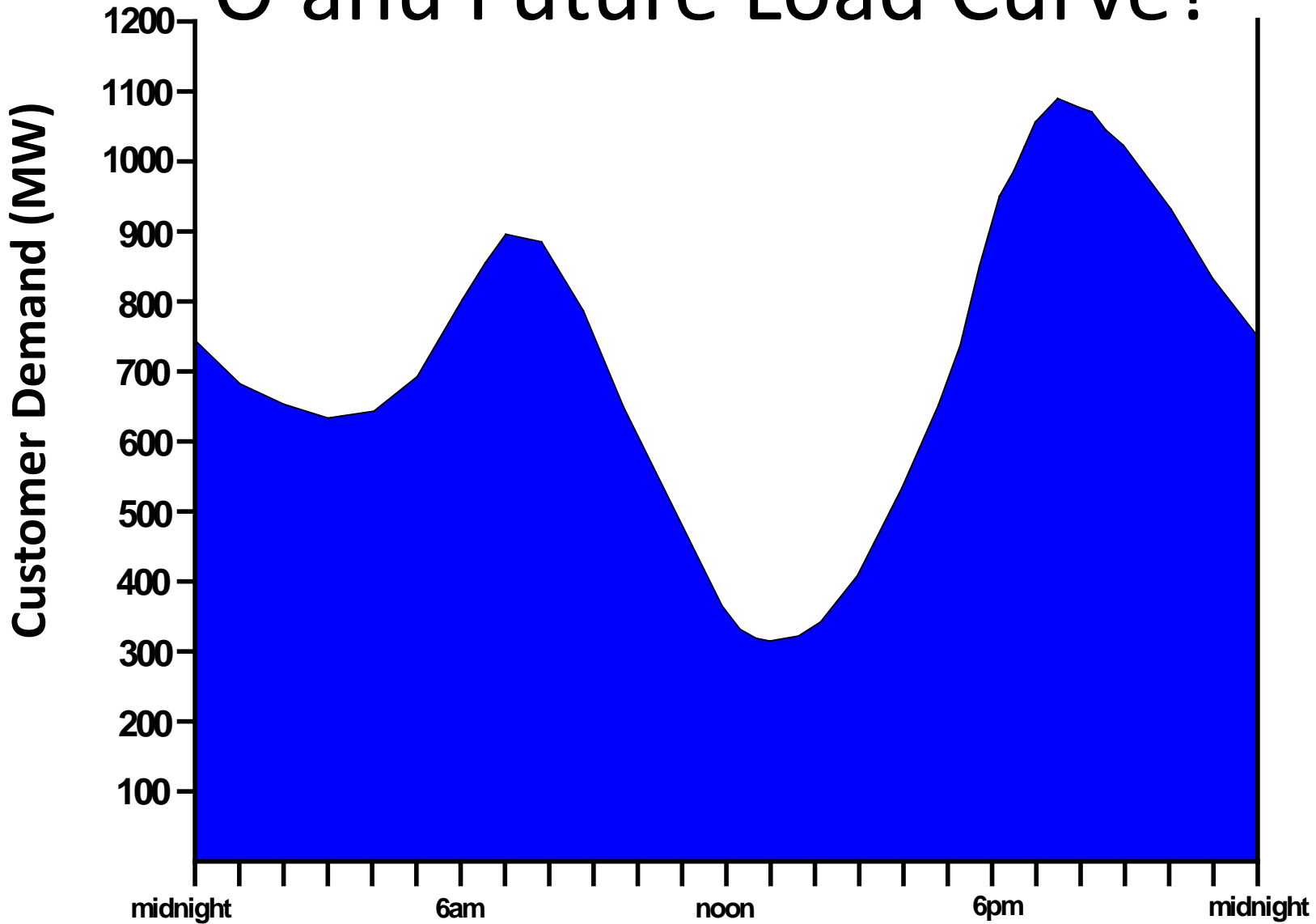
O'ahu Demand Over Time



O'ahu Capacity by Generation Type



O'ahu Future Load Curve?



Partnership Opportunities

- Grid Enabled **Resilience**
- **Utility designed solutions** for multiple stakeholders
 - Grid/DOD Installation Resilience
 - Grid/DOD Renewable integration
 - Contingency Response - Enable First Responders
- Local Government/Regulators **Key stakeholders**

Schofield Generating Station

- 50 MW of multi-fuel capable, flexible, quick-starting reciprocating engine
- Micro-grid capability enhances resilience



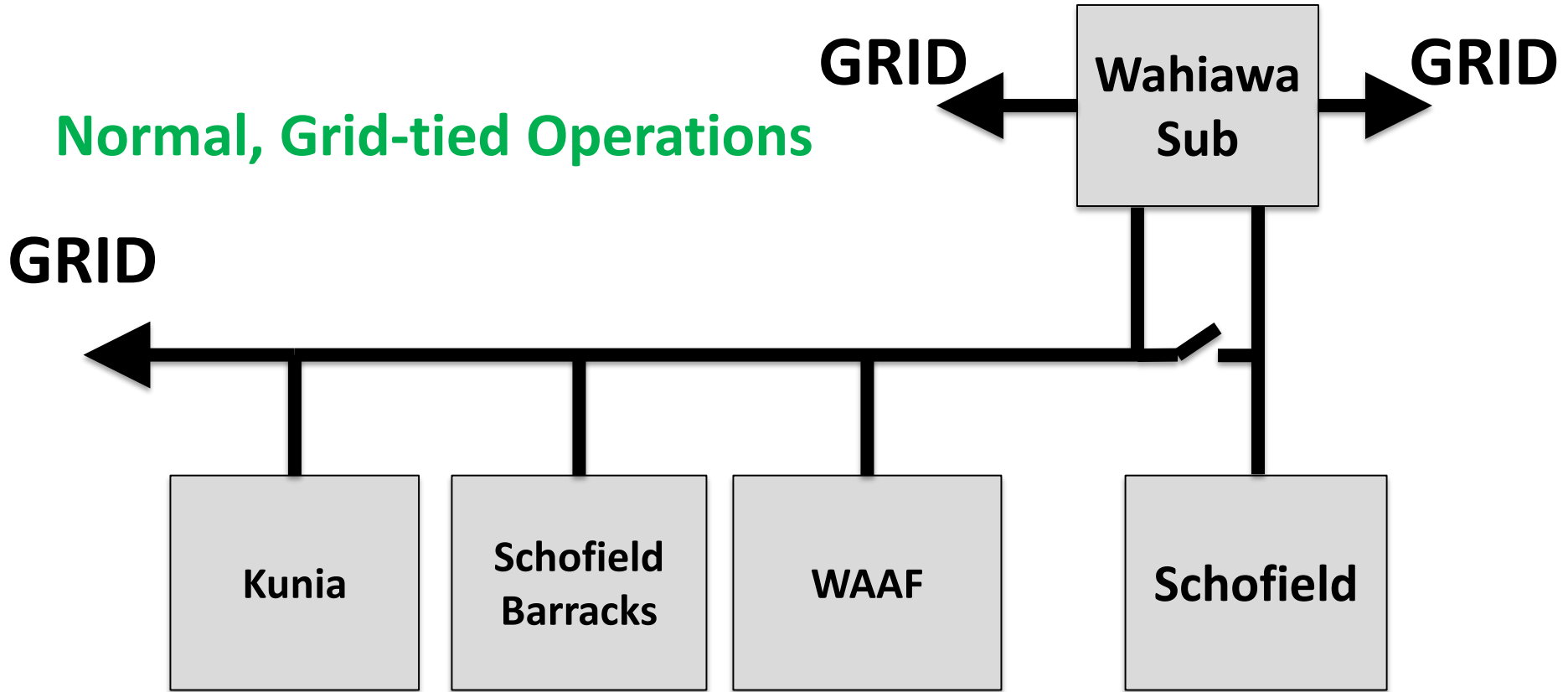
- Contributes to RPS by:
 - Using biofuel
 - Enabling integration of as-available generation (wind/PV)



Resilient and Renewable

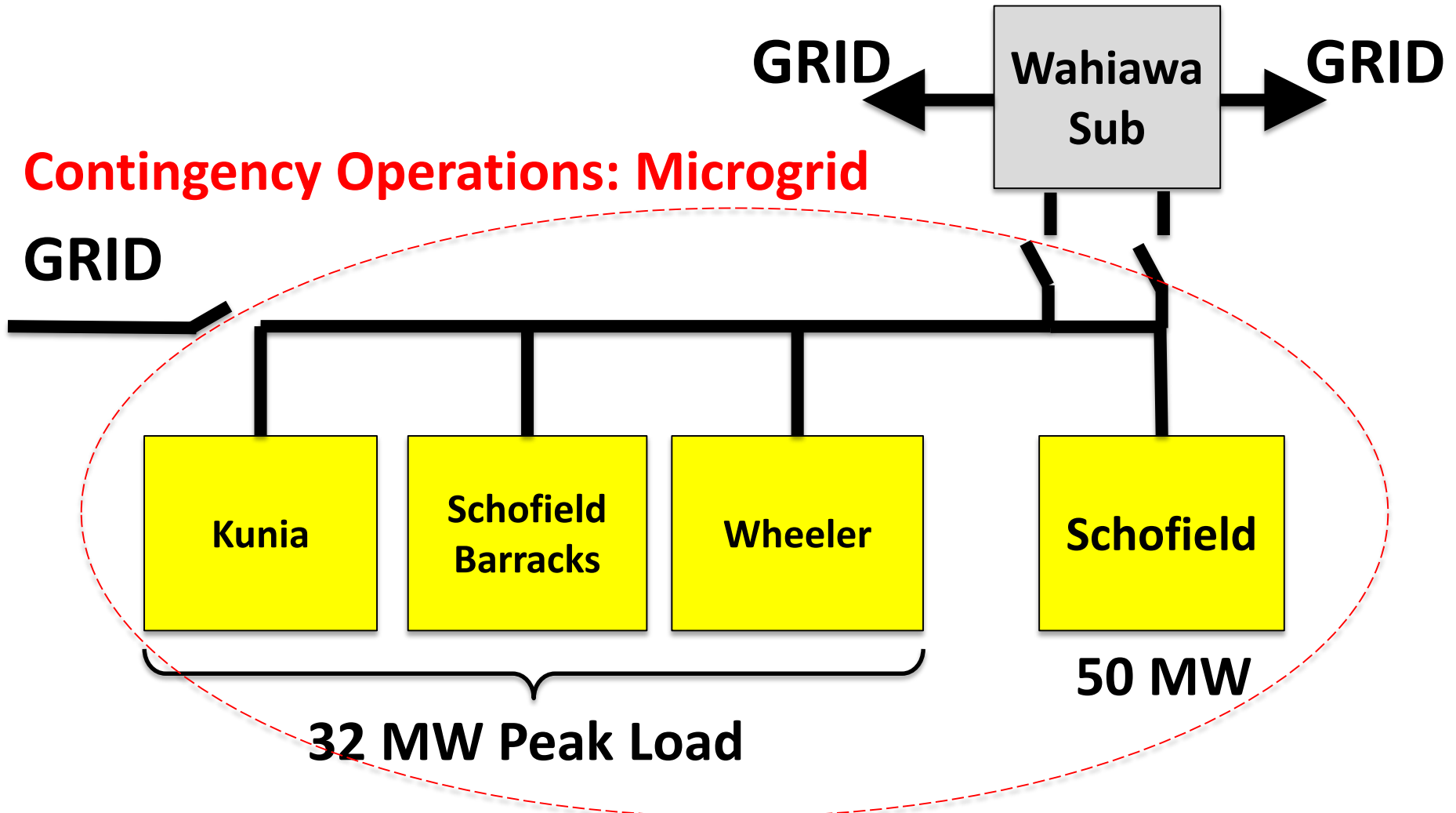
How Does the Army Microgrid Work?

Normal, Grid-tied Operations



Grid-tied Flexible Generation

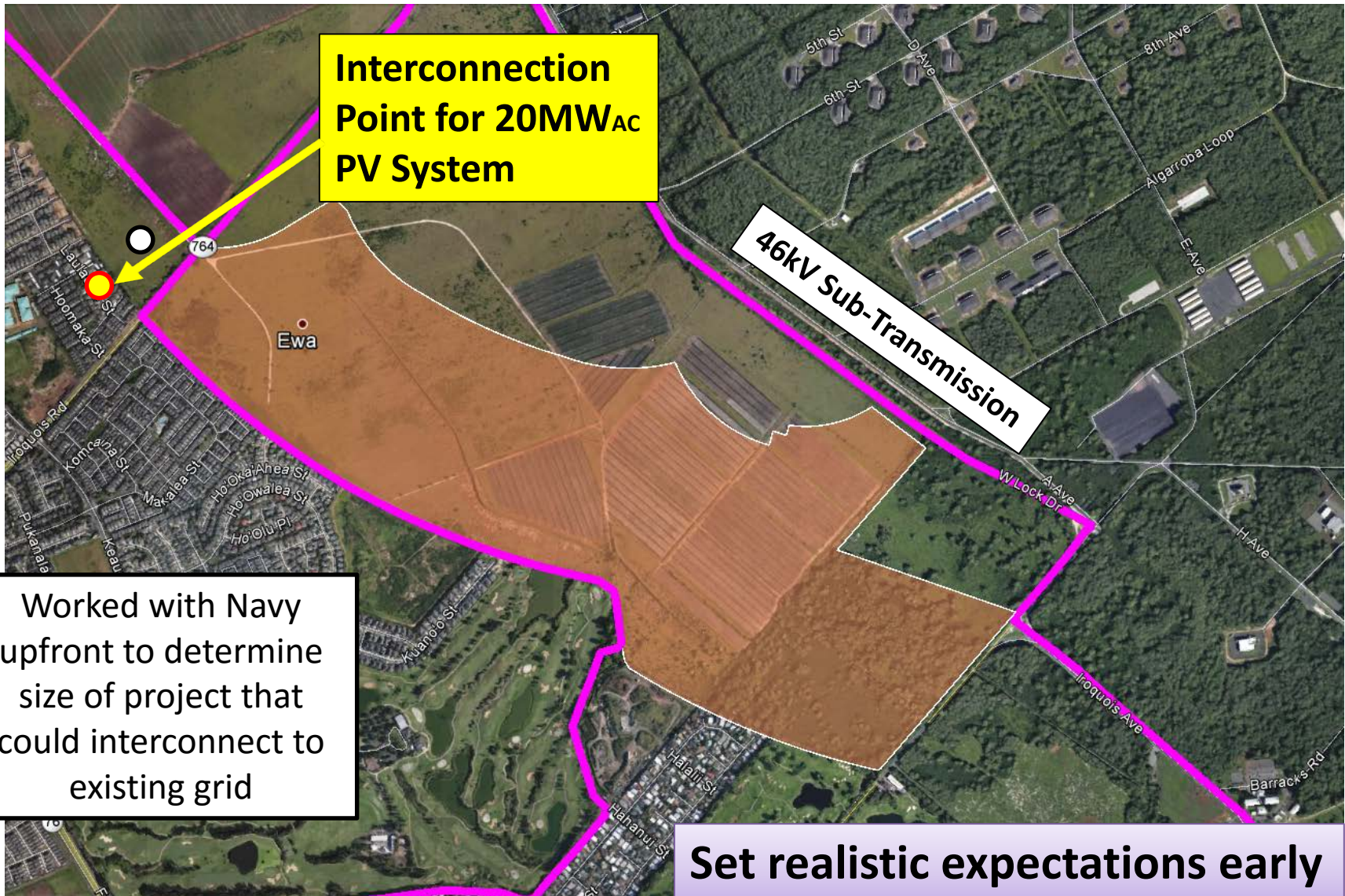
How Does the Army Microgrid Work?



Contingency Operations: Microgrid

Island-wide Blackstart Capability

West Loch Annex PV: Navy-Owned Site



Interconnection
Point for 20MW_{AC}
PV System

46kV Sub-Transmission

Worked with Navy
upfront to determine
size of project that
could interconnect to
existing grid

Set realistic expectations early

Questions?



Kahe Gen Station – West Side Oahu