

A photograph of an industrial facility, likely a power plant or refinery, featuring a complex network of pipes, metal structures, and walkways. The image is partially obscured by a dark grey diagonal overlay.

UPDATE ON WORLD GLOBAL MARKETS

FORT COLLINS 2019 SYMPOSIUM ON
MICROGRIDS

AUGUST 10, 2019

NAVIGANT
RESEARCH

NAVIGANT RESEARCH INTRODUCTION

NAVIGANT RESEARCH PROVIDES IN-DEPTH ANALYSIS OF GLOBAL CLEAN TECHNOLOGY MARKETS.

The team's research methodology combines supply-side industry analysis, end-user primary research and demand assessment, and deep examination of technology trends to provide a comprehensive view of the Energy Ecosystem.

RESEARCH PROGRAMS:

Energy Technologies

Utility Transformations

Transportation Efficiencies

Building Innovations

RESEARCH OFFERINGS:

Research Reports

Subscription Research Services

Custom Market Research

- Custom Market Analysis
- Market Sizing and Forecasting
- Primary Research
- Go-to-Market Services

DATA SERVICES:

Online Interactive Data

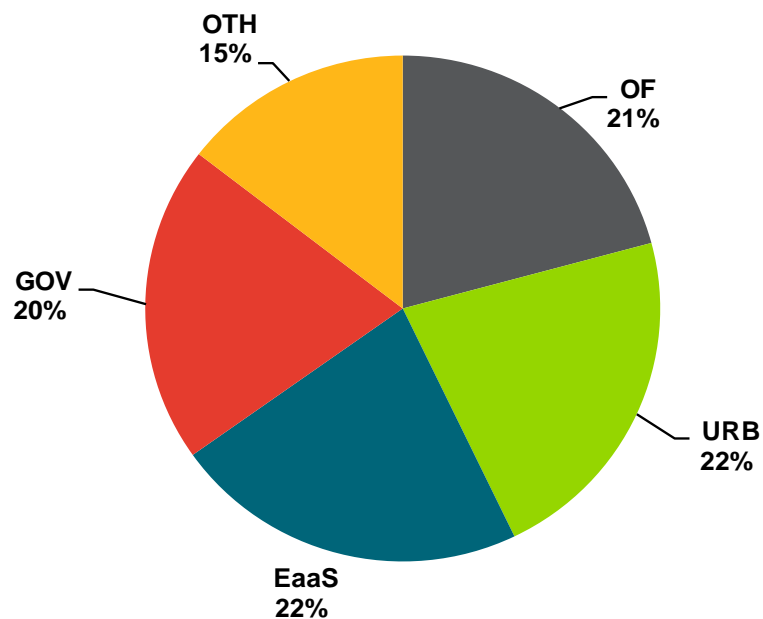
- Strategic Advisory Sessions
- Commercial Due Diligence
- Technology Evaluation

GLOBAL MICROGRID MARKET SNAPSHOT

- Navigant Research has published its 16th edition of its *Microgrid Deployment Tracker*, the only global data set on identified microgrid capacity in the world.
- The report lists available project details on 4,442 microgrids operating or being developed around the world representing 26,760 MW in total capacity.
- A stunning 81% of microgrids deployed globally rely upon an “energy-as-a-service” (EaaS) business model (a category that spans PPAs to pay-as-you-go programs)
 - On a capacity basis, however, the business model market shares are fairly remarkably evenly divided (see Chart on next slide)
 - Note that EaaS and utility rate base (URB) feature the same leading market share for microgrids deployed globally.
- Asia Pacific leads the world in total capacity for identified microgrids, followed by North America
- Remote applications – the most mature segment – leads the global microgrid market
- Commercial and Industrial (C&I) microgrids are expected to be the fastest growing market segment in the future

GLOBAL SNAPSHOT: MICROGRID BUSINESS MODELS

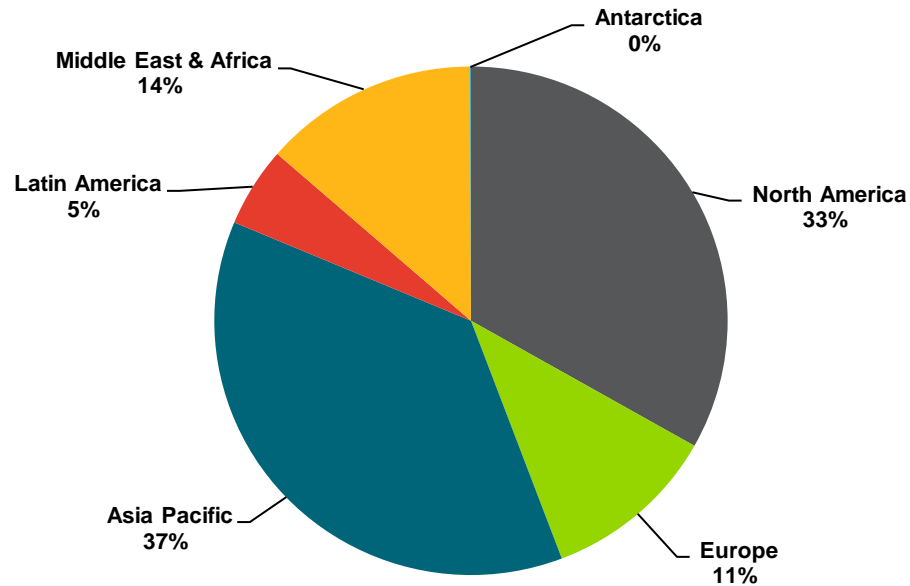
Microgrid Business Models, World Markets: 2Q2019



(Source: Navigant Research)

ASIA PACIFIC & NORTH AMERICA ARE MARKET LEADERS

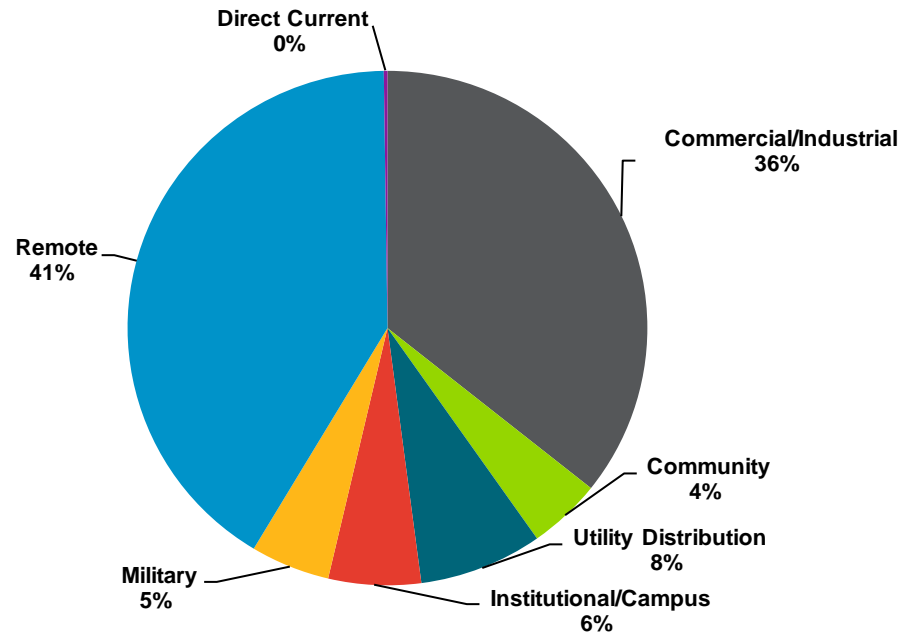
Total Microgrid Power Capacity Market Share by Region, World Markets: 2Q 2019



(Source: Navigant Research)

REMOTE SEGMENT IS GLOBAL MARKET LEADER

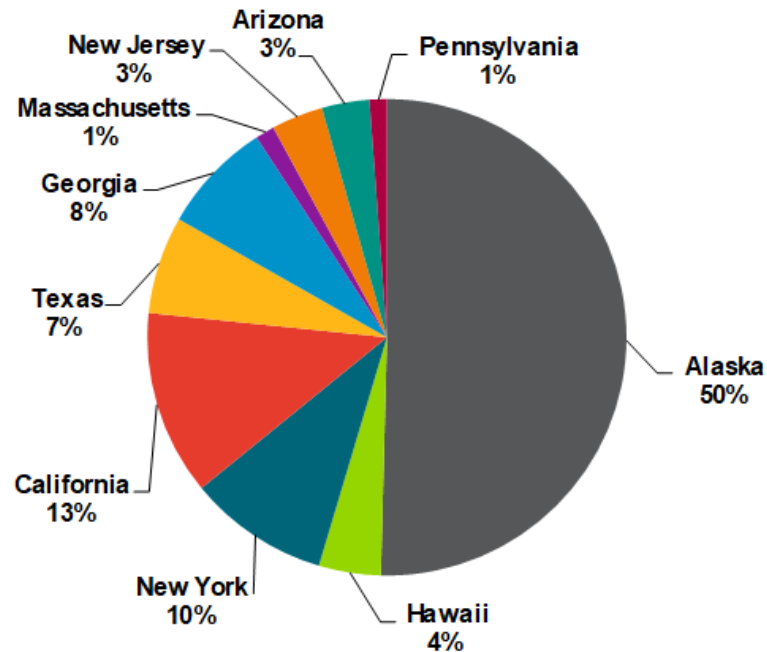
Total Microgrid Power Capacity Market Share by Segment, World Markets: 2Q 2019



(Source: Navigant Research)

ALASKA IS THE TOP U.S. MICROGRID STATE

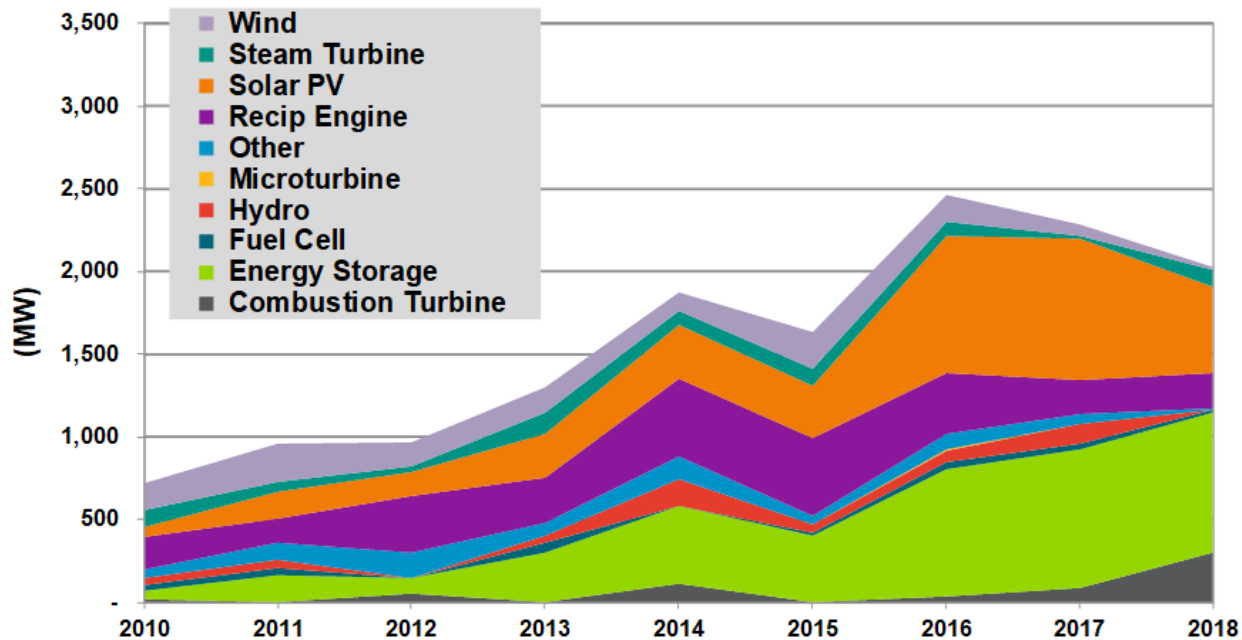
Top 10 U.S. States for Total Microgrid Capacity, 2Q2019



(Source: Navigant Research)

MICROGRID DER MIX EVOLUTION OVER TIME

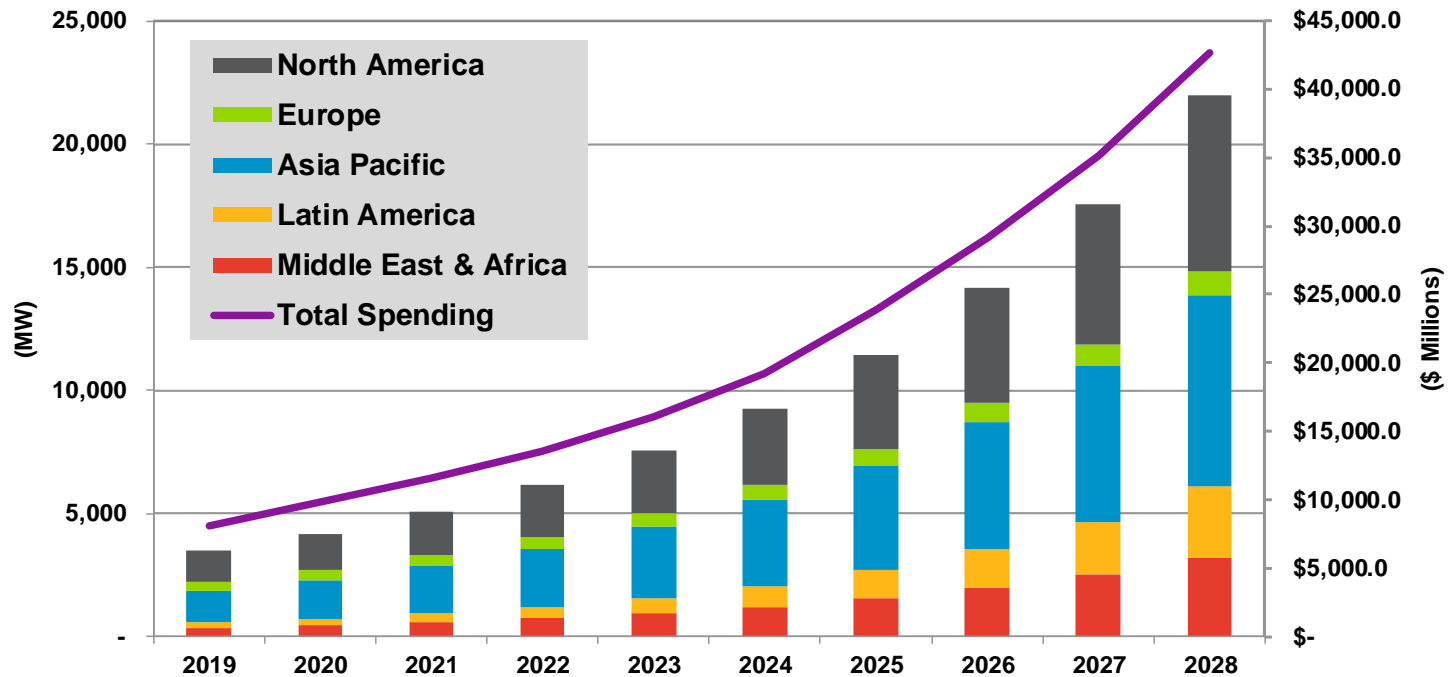
Microgrid DER Capacity Additions Over Time, World Markets: 2010-2018



(Source: Navigant Research)

HOW FAST WILL GLOBAL MICROGRID MARKET GROW?

Annual Microgrid Capacity and Spending by Region, Base Scenario, World Markets: 2019-2028



(Source: Navigant Research)

CONCLUSION

- **All microgrid segments will show growth over the next 5-10 years**
- **Remote microgrids show largest market share globally**
 - North America is more focused on grid-tied systems
 - Most recent trends there point to community and utility distribution microgrids
- **Segment poised for major global growth is C&I segment**
 - This is because economics of both solar PV and energy storage help build the business case, as well new innovative business models focused on low-cost natural gas
 - Data centers and remote mines appear to be the best long-term market bet among C&I prospects
- **Business model innovation is accelerating**
 - EaaS apparently best path for third-party microgrids
 - Utility rate-basing still facing regulatory resistance, though a few recent project wins
- **Merging of microgrids and virtual power plants (VPPs) also a recent trend**
 - Focus of vendors shifting from hardware to software
 - Increased interest in “plug-and-play” and “modular” microgrids across all market segments



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