



RESEARCH REPORT

Executive Summary:

Market Data: Microgrids

Forecasts for Commercial/Industrial, Community/Utility,
Campus/Institutional, Military, and Remote Microgrids:

2013-2020

NOTE: This document is a free excerpt of a larger report. If you are interested in purchasing the full report, please contact Navigant Research at research-sales@navigant.com.

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Section 1

EXECUTIVE SUMMARY

1.1 Market Overview

Navigant Research defines the fundamental concept of a microgrid as:

“An integrated energy system network consisting of distributed energy resources (DER) and multiple electrical loads and/or meters operating as a single, autonomous grid either in parallel to or “islanded” from the existing utility power grid.”

In the most common configuration, DER is tied together on its own distribution feeder, which is then linked to the larger utility grid at a single point of common coupling. In the case of remote microgrids, there is no interconnection to a larger grid. As a result, these remote networks are operating in island mode 24/7 out of necessity.

To date, Navigant Research has developed the world's only database on microgrid projects, segmented into five applications and four major geographies. An update to this global database – the *Microgrid Deployment Tracker 2Q13* – was developed in parallel with this market data forecast report and will be published in the second quarter of 2013. The *Microgrid Deployment Tracker* product series tracks planned, proposed, under development, and currently operating microgrids divided into five segments. The market data forecasts presented in this report are informed by this tracker, which serves as a foundation for capacity forecasts, augmented by insights gleaned from interviews and other original and secondary research.

1.2 Market Forecasts

This report provides an update to Navigant Research's forecasts for the five primary microgrid market segments (commercial/industrial, community/utility, campus/institutional, military, and remote/off-grid), in addition to utility distribution microgrids (UDMs) and microgrid enabling technologies (METs); the latter is the group of components that are deployed within microgrids. Table 1.1 lists key assumptions Navigant Research made to calculate forecasts for microgrid segments in this report.

Table 1.1 Assumptions Contributing to Microgrid Market Segment Forecasts

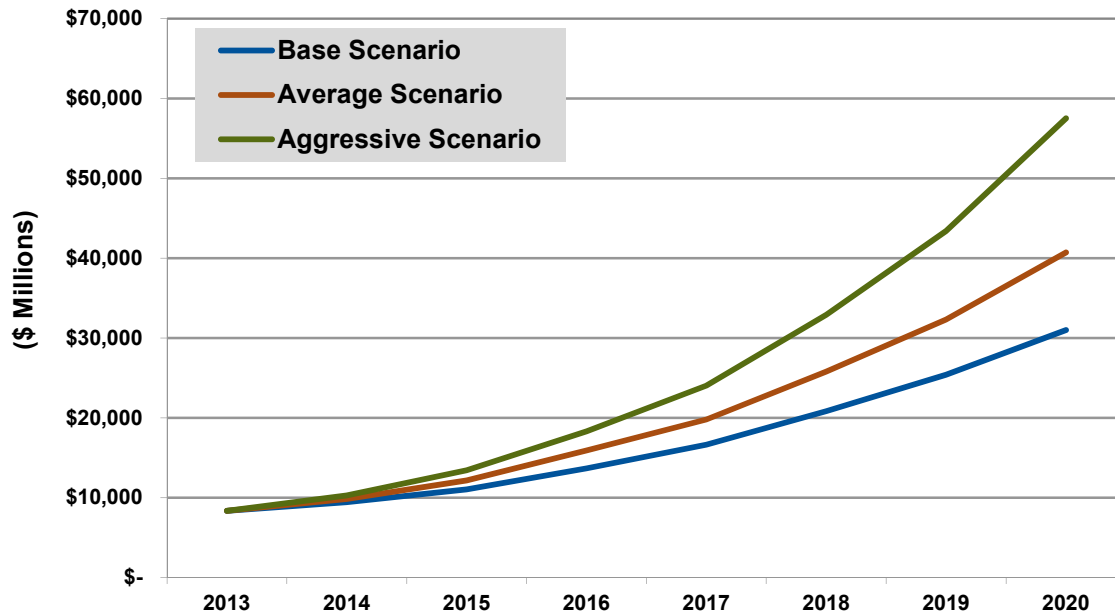
Key Data Input	Assumptions
Engineering Challenges	The plethora of companies offering hardware and software control solutions for microgrids will provide a rich diversity of IT and security solutions to validate the microgrid value proposition.
Extreme Weather Patterns Continue	The extreme weather events of 2011, 2012, and 2013 will continue, resulting in increased power outages and need for emergency response and resilient infrastructure globally.
Global Economics	The slow global economy will gain momentum, especially in key microgrid markets (i.e., North America and Asia Pacific). Developing countries will also benefit from efforts by the United Nations and others to end energy poverty through remote microgrids.
Utility Stance on Anti-Islanding Protocols	The historic anti-islanding bias of utilities will continue to erode due to technology advances with smart inverters and corresponding changes in protocols such as the IEEE 1547.4.
Electricity Prices	It is assumed that recent trend lines of increasing electricity prices will continue over time, but also that the shale gas boom will continue to depress power supply prices at the wholesale level in key microgrid markets such as the United States.
Government Cleantech Incentives	The forecasts assume that current incentives for key MET components (solar photovoltaic [PV] and wind power) will continue to shrink due to political pressures, a gradual maturing of technology, and wider disbursement of smart grid infrastructure.
Government Emissions Regulations	Current and planned regulations in place in the United States, European Union, and Asia Pacific will continue and will be enacted within current established timeframes.
Linkages to MET Sales	The growth of MET component sales will grow in parallel with microgrid market segments since these markets are mutually inclusive.

(Source: Navigant Research)

This market data report features revised capacity and revenue forecasts, which are described in more detail in Section 3. As a result of these updated market forecasts, the revenue from deployments of microgrids globally is estimated to be approximately \$8.3 billion in 2013, increasing to more than \$40 billion annually by 2020 in the average scenario. This is significantly higher than previous market forecasts due to new market intelligence suggesting that microgrids, including retrofit projects incorporating legacy assets, require greater

investment than previously recognized. Still, Navigant Research forecasts tend to be bullish on capacity (since many projects are under the radar) and conservative on revenue.

Chart 1.1 Total Microgrid Revenue by Forecast Scenario, World Markets: 2013-2020



(Source: Navigant Research)

1.3 Geographic Market Shares

North America is the leading microgrid market today and that will continue over the course of the 7-year market forecast period. At present, North America features 63% of total global microgrid capacity (992 MW), with Asia Pacific coming in at a distant second place with 17% of global capacity (271 MW). Europe is in third place with 14% of global capacity (217 MW), and the rest of the world – including Latin America, the Middle East, and Africa – has the remaining 6% of capacity (101 MW).

North America will remain the global leader in microgrid capacity by 2020, increasing its market share to 65% of the global market (5,973 MW) by 2020, with Asia Pacific remaining in second place, but with a proportionately larger share (22%) of the capacity market (2,012 MW). Europe's share of the microgrid market will decline to 8% (694 MW), while the rest of the world region declines slightly in market share to 5% (475 MW). Beyond 2020, Navigant Research expects that the relative shares of both Asia Pacific and the rest of the world will increase, with the Asia Pacific region emerging as the global leader within the 2025-2030 timeframe due to growth in remote and grid-tied systems and the slowing of deployments in North America because of market saturation and the resulting improvement in overall power grid performance.

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SCOPE OF STUDY

Navigant Research has prepared this report to provide participants at all levels of the microgrid market, including utilities, project developers, hardware and software vendors, public and private sector funders, with forecasts for the capacity and revenues associated with microgrid segments and microgrid enabling technologies. The study's major objective is to assess the market size and anticipated growth of the overall vendor revenues for both grid-tied and remote off-grid microgrids throughout the world. Four major global regions – North America, Europe, Asia Pacific, and Rest of World – are included and the forecast period extends through 2020.

SOURCES AND METHODOLOGY

Navigant Research's industry analysts utilize a variety of research sources in preparing Research Reports. The key component of Navigant Research's analysis is primary research gained from phone and in-person interviews with industry leaders including executives, engineers, and marketing professionals. Analysts are diligent in ensuring that they speak with representatives from every part of the value chain, including but not limited to technology companies, utilities and other service providers, industry associations, government agencies, and the investment community.

Additional analysis includes secondary research conducted by Navigant Research's analysts and its staff of research assistants. Where applicable, all secondary research sources are appropriately cited within this report.

These primary and secondary research sources, combined with the analyst's industry expertise, are synthesized into the qualitative and quantitative analysis presented in Navigant Research's reports. Great care is taken in making sure that all analysis is well-supported by facts, but where the facts are unknown and assumptions must be made, analysts document their assumptions and are prepared to explain their methodology, both within the body of a report and in direct conversations with clients.

Navigant Research is a market research group whose goal is to present an objective, unbiased view of market opportunities within its coverage areas. Navigant Research is not beholden to any special interests and is thus able to offer clear, actionable advice to help clients succeed in the industry, unfettered by technology hype, political agendas, or emotional factors that are inherent in cleantech markets.

NOTES

CAGR refers to compound average annual growth rate, using the formula:

$$\text{CAGR} = (\text{End Year Value} \div \text{Start Year Value})^{(1/\text{steps})} - 1.$$

CAGRs presented in the tables are for the entire timeframe in the title. Where data for fewer years are given, the CAGR is for the range presented. Where relevant, CAGRs for shorter timeframes may be given as well.

Figures are based on the best estimates available at the time of calculation. Annual revenues, shipments, and sales are based on end-of-year figures unless otherwise noted. All values are expressed in year 2012 U.S. dollars unless otherwise noted. Percentages may not add up to 100 due to rounding.

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