Research Report

Commercial and Industrial Microgrids

Market Drivers and Barriers, Grid-Tied and Remote Capacity and Spending Forecasts, and Key Player Profiles

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Section 1
Executive Summary

1.1 Introduction

Historically, the commercial and industrial (C&I) segment has lagged behind other microgrid market segments. When Guidehouse Insights launched its Microgrid Deployment Tracker 10 years ago, it was the smallest of all application segments tracked by identified cumulative capacity. It has emerged as the fastest growing microgrid market worldwide.

One could argue that C&I customers pioneered the concept of microgrids, though these self-sufficient networks installed to support critical loads were based on manual islanding and 100% fossil fuel supply portfolios—somewhat primitive by today's standards. The need for resilience has only been amplified by the increasing power outage rates and cybersecurity threats due to climate change. The C&I microgrid segment is evolving into one of the most innovative microgrid markets. It is quickly maturing as risk-averse energy managers become more comfortable with the microgrid platform, which is being validated by other customer segments and applications of similar scale and purpose. The C&I microgrid market faces the following challenges:

- End users, such as large industrials, often pay the lowest electric rates of any customer class.
- This market segment often is required to make a valid value proposition in the absence of federal or state funding support—other than incentives related to key enabling technologies (such as solar PV or advanced batteries).
- Internal competition for capital outlays is fierce within these companies and subject to intense scrutiny from chief financial officers.

The C&I microgrid segment also has advantages:

- Potential clients are fiscally sound and value innovation in business models, especially energy as a service (EaaS), which is emerging as a compelling offering for growing numbers of well-established microgrid players.
- Reliability is highly valued in C&I—more so than in any other microgrid segment, with the exception of military projects.
- Project portfolios with a single client can scale up rapidly, replicating commercial success within shorter development cycles than slow-moving segments, such as military, community, and utility distribution microgrids.
The C&I microgrid market as defined by Guidehouse Insights has been slow to develop due primarily to the lack of a clear value proposition based on the ROI for microgrids. Many C&I customers, such as data centers, first focus on what they deem practical solutions to their reliability concerns, such as backup diesel generators and redundant utility feeds.

Remote applications for mines and other commodity extraction industries are among promising markets. As regulators increase focus on reducing emissions and policymakers phase out the use of fossil fuels, many of these facilities are expected to face increasing pressure to integrate cleaner energy resources for onsite operations.

**Chart 1-1. Total C&I Microgrid Capacity and Implementation Spending, World Markets: 2021-2030**

(Source: Guidehouse Insights)
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Scope of Study

Guidehouse Insights has prepared this report to provide participants in the microgrid market (including project developers, utilities, hardware and software vendors, installation and service providers, and other BOS component manufacturers) with forecasts of the market potential for all C&I microgrids. The chief objective of this report and market forecast is to determine the status of this maturing industry and the potential future growth of the following C&I microgrid market segments:

- Grid-tied commercial microgrids
- Grid-tied industrial microgrids
- Remote commercial microgrids
- Remote industrial microgrids

All major global regions are included (North America, Europe, Asia Pacific, Latin America, and the Middle East & Africa), and the report examines a 10-year forecast period through 2030. Although the market forecast is shaped by updates to the Guidehouse Insights Microgrid Deployment Tracker, estimates of existing capacity are also based on projections from leading companies that have revealed projected project portfolios. This report draws on interviews and secondary research to make market forecast projections.

Sources and Methodology

Guidehouse Insights’ industry analysts use a variety of research sources in preparing Research Reports. The key component of Guidehouse Insights’ 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 Guidehouse Insights’ 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 Guidehouse Insights’ 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.
Guidehouse Insights is a market research group whose goal is to present an objective, unbiased view of market opportunities within its coverage areas. Guidehouse Insights 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:

\[
\text{CAGR} = \left( \frac{\text{End Year Value} + \text{Start Year Value}}{2} \right)^{\frac{1}{\text{steps}}} - 1.
\]

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 revenue, shipments, and sales are based on end-of-year figures unless otherwise noted. All values are expressed in year 2021 US dollars unless otherwise noted. Percentages may not add up to 100 due to rounding.
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