Challenges to Managing Distributed Energy Infrastructure

Distributed Energy Infrastructure (DEI) refers to energy generation assets that are located across diverse geographical areas and markets, involve multiple clients, encompass a variety of technologies, and operate in an ecosystem with a common purpose. DEI assets are often networked, modular, standardized, connected, digitized, and intelligent; and can be scaled physically and virtually to deliver value. Some well-known examples of DEI include solar photovoltaics (PV), energy storage Systems (ESS), electric vehicle (EV) charging, and combinations of them to create microgrids.

DEI continues to grow at a fast pace in the United States. According to the research and consultancy group, Wood Mackenzie, the forecasted capacity of electric vehicle charging, solar PV and ESS infrastructure from 2016 through 2020 is 27GW. The installed capacity between 2021 and 2025 is expected to reach 52 GW.[1]

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1. Source: Wood Mackenzie Energy Storage Service, Grid Edge Service, and U.S. Distributed Solar Service

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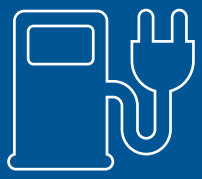
Electric Vehicles



1.5M
EVs in the US and 20,000+ charging stations in **2020**

19M
Predicted EVs in the US by **2030**

2.5B
EV charging infrastructure market in **2020**

28B
EV charging infrastructure market by **2027**

There are nearly 1.5 million electric vehicles (EV) in the United States according to the electric industry association, Edison Electric Institute, which projects that by 2030 the number of EVs will reach around 19 million. This growth is fueling the rapid development of EV charging infrastructure in the United States where there are currently over 20,000 charging stations in use. According to the market research company Markets and Markets the size of the EV charging infrastructure market today is over $2.5 billion and the expects the US will reach about $28 billion by 2027.

PV and energy storage are increasingly competitive with traditional energy technologies. The price of PV and energy storage continues to decline while the ability to forecast and manage the energy output of these assets continues to improve. The growing popularity of PV and PV and storage has led to a healthy market for operations and maintenance (O&M) services in the U.S. which is expected to exceed $1.3 billion by 2024 according to Wood Mackenzie.[2] PV and energy storage, as integral parts of microgrids, play an important role in minimizing the impact of hurricanes, wildfires and other extreme events on energy supply. The news site Microgrid Knowledge references that the global O&M microgrid market is expected to about $4 billion by 2026.[3]

The rapid growth of DEI poses significant challenges to asset owners and operators. Owners increasingly hold large portfolios of DEI assets which may include PV, energy storage, microgrids, and EV charging stations located throughout the United States and, in some cases, internationally. The DEI O&M market has been largely dominated by small and regional providers that lack the geographic coverage and experience to service entire portfolios of diverse assets. Consequently, DEI portfolio owners today contract with multiple providers to service their assets, resulting in high operational costs and risks.

The decrease in the price of the energy generated by DEI assets has placed significant pressure on O&M providers to cut costs which, in some cases, has led to a reduction in O&M scope and delays in corrective services.

As assets age, owners face the challenge of providing cost-effective solutions to asset underperformance. The solutions may involve the replacement of equipment that is no longer being manufactured, or an upgrade of the asset design to accommodate current technologies. The ability to devise such solutions is not widespread among local AM providers and can result in costly consulting engagements.

2. Source: Wood Mackenzie Solar PV O&M market update 3. Source: https://microgridknowledge.com/microgrid-om/

Successful asset operation requires accurate monitoring of asset performance and the development of fault diagnostics based on the data acquired from the asset. The data acquisition market is dominated by a few firms and the cost of data monitoring and fault diagnostics remains high.

These challenges have the potential to negatively impact the growth of the DEI market and asset owners need better solutions. An ideal AM provider will be able to:

- Handle multiple asset types across the United States and internationally. Such a supplier will eliminate the risk associated with contracting multiple local AM providers for each service. The provider will also be able to deliver quality service in a time-efficient manner.
- Provide technical expertise and engineering capabilities in PV, ESS, EV charging infrastructure and microgrids and the ability to devise financially-beneficial asset enhancements.
- Have current knowledge of the technologies and products in the marketplace and actively monitor where the industry is headed.
- Offer cost-effective data acquisition and diagnostic capabilities and be able to handle large databases across multiple languages.

In our opinion, AM providers that can meet these challenges have the potential to dramatically expand the DEI industry in the United States and globally.

Building a World of Difference.®

Dr. Ralph Romero | Senior Managing Director
P 757 903 7528 | **E** RomeroR@bv.com