

Industry

Industry focusing on managing assets on customers' premises behind the meter

Fereidoon Sioshansi, Menlo Energy Economics

Two inescapable trends are sweeping across the electric power sector. The first may be characterised as decentralisation – as, for example, the scale of generation resources shrinks while it moves ever closer to customers and load centres. The second, closely associated with the first, is that most new generation is renewable, particularly solar and wind, both of which, are variable.

These two trends are increasing interest in better management of what happens to appliances and other energy using or storing assets behind the meter (BTM). The interest in the industry is increasingly shifting to integrating distributed energy resources (DERs) in ways that delivers better value to customers, grid operators, distribution companies and retailers.

The growing importance of DERs is no longer in question. Wood Mackenzie, for example, predicts that installed DER capacity in the US alone will reach 390GW by 2025. Wood Mackenzie defines DERs to include flexible loads, on-site generation – mostly rooftop solar – batteries, electric vehicles, and other clean energy technologies. It estimates that the US is sitting on 145GW of unused solar potential and says annual global energy storage deployments are likely to increase from 11GW in 2020 to 164 in 2030, reaching a cumulative 741GW, most of it being tied to solar.

Next Kraftwerke

This is reflected in a wave of acquisitions and merges as well as new start-ups and existing stakeholders focusing on creating and monetizing value in the DER and BTM space. In November, for example, Next Kraftwerke (NK) announced a joint venture with Toshiba Energy Systems & Solutions Corporation to offer the former's expertise in the Japanese market. The two companies are expanding their cooperation by enabling others to provide balancing services for the owners of renewable energy assets and aggregators by applying virtual power plant (VPP) technology. This approach helps third parties to mitigate imbalance risks, optimises trading, and enhances customer profits in the spot market and reserve market.

The joint venture is intended to expand NK's reach within the Japanese market by leveraging Toshiba's sales channels – a well-timed move as the electricity sector in Japan is further opened to competition in the next couple of years. Markets for control reserve will open in 2021; in 2022 the government will introduce a new trading as well as balancing responsibility for renewable resources. The Japanese government's decision to turn Japan into a net zero carbon economy by 2050 further enhances the chance of success.

Voltus

Voltus, a company that offers a platform for managing DERs, announced that it has raised \$25mn (£18.7mn) in a Series B financing from a group of investors including NGP Energy Technology Partners, Prelude Ventures and Ajax Strategies. The funding will allow Voltus to develop additional products and expand into new markets.

Voltus has increased its presence across North American wholesale markets and is among the first aggregator of retail customers in the Midcontinent Independent System Operator and the Southwest Power Pool. It claims to have over 2,000MW of DERs in its portfolio. The Voltus financing comes on the heels of the recent Federal Energy Regulatory Commission (FERC) Order 2222, which encourages equal treatment of DERs in wholesale markets in the US.

There is little doubt that the exponential growth of DERs plus FERC Order 2222, which legitimises the participation of distributed generation and storage in wholesale markets, will further boost the fortunes of companies engaged in DERs, demand aggregation and management and more sophisticated types of services such as VPPs.

AMS

In October, for example, Fluence, a joint venture of Siemens and AES, acquired AMS, formerly Advanced

Microgrid Solutions, a leading provider of optimised bidding software for utility-scale storage and generation assets. The combination of the two companies' capabilities will help utilities, developers, and commercial and industrial customers optimise energy storage and flexible assets to deliver additional revenue, improve grid reliability and efficiency, and support the global transition to more sustainable and resilient power systems.

AMS' technology uses artificial intelligence, advanced price forecasting, portfolio optimisation and market bidding to ensure energy storage and flexible generation assets are responding optimally to market price signals. Combined, Fluence's deep experience in operating batteries in the field with AMS' ability to optimize market participation should be compelling. In the meantime, AMS will be able to leverage Fluence's global sales channels to make its software available to more customers around the world.

AMS' bidding software is already used in by the California Independent System Operator and in Australia's National Electricity Market (NEM), where it optimises over 15% of Australia's wind and solar resources, with plans to expand elsewhere.

According to Seyed Madaeni, CEO of AMS: "We have a unique opportunity to lead the clean energy revolution by using AI to optimize the dispatch of flexible assets, maximise their value and make the entire electric power system more responsive, reliable and resilient. As part of the Fluence team, we will have the capabilities and resources to accelerate the global expansion of our software."

AMS points out that energy markets are becoming increasingly complex, particularly with high percentage of renewables plus storage, a highly valuable and versatile option, which acts as both generation and load. In many markets such as Australia's NEM, one needs to bid roughly two dozen energy products and grid services every 5 minutes. Moreover, it is not just the next 5 minutes that matter but the whole range of options affecting both the costs and revenues across the entire trading day – and beyond.

As Madaeni puts it, that amounts to literally millions of combinations of decisions – totally beyond manual control or human capabilities – which is where AMS' optimisation engine becomes compelling. Together, AMS and Fluence cover nearly 5GW of existing or awarded assets around the world. AMS is currently bidding 1.7GW of assets, with a further 0.7GW under contract, in Australia and California; Fluence has deployed or been awarded 2.4GW of energy storage projects in 22 countries and territories.

Enbala

Other acquisitions and mergers are taking place at speed. A notable one was the acquisition of Enbala Power Networks by Generac Power Systems. While the financial details were not disclosed, Enbala's CEO Bud Vos said that the company's "investors would call it a very large success."

Enbala offers software that manages roughly 600MW of flexible loads including pumps and motors, backup generators and behind-the-meter batteries for grid services in the US, Canada and Australia.

Generac, which has presence in the residential and commercial backup power business, is expected to use Enbala's experience with utilities to boost the value of DER aggregation while expanding into new markets. With recent power outages due to fires, storms and floods, backup generators are in high demand among vulnerable customers while utilities find them useful to provide emergency service and/or relieve stress on portions of their network during emergencies.

☞ *As these examples illustrate, aggregation of BTM DERs has resulted in a host of activity among existing players, with the more established ones typically acquiring the smaller ones. In several cases, large established equipment vendors and service companies are acquiring or partnering with software companies to enhance the value of their hardware. This is happening up and down the utility value chain from large players like ABB, GE, Cummins, Schneider Electric, Siemens, Tesla, Sonnen, Enel X and Sunrun, all of whom have made or are exploring new partnerships. Electric vehicles and charging infrastructure are another business opportunity that is poised for exponential growth.*

This article originally appeared in November's issue of [Menlo Energy Economics' EEnergy Informer](#).