

Behind-the-meter aggregations could play role in net zero

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Many experts now believe that the future of the electricity networks will be decentralised renewable generation paired with storage, electric vehicles and smart connected devices, which can be aggregated and managed by third parties. If properly managed, such a system can play a big part in the net zero energy systems of the future. In this article, we share a few insights from the editor of the new book *Behind and Beyond the Meter: Digitalisation, Aggregation, Optimisation, Monetisation* – Fereidoon Sioshansi.

The book examines the latest advances in digitalisation of behind-the-meter (BtM) assets. It describes how smart aggregators with intelligent software are creating value by optimising how energy may be generated, consumed or stored. It also explores new business models that are likely to disrupt the traditional interface between the producers and their customers.

Sioshansi explains that the power industry has traditionally been “supply focused”, i.e. always looking at the assets and infrastructure residing upstream of consumers and rarely, if ever, seriously concerned about assets owned and operated by consumers on their side of the meter. This omission has become hard to ignore especially now that consumers can generate, store and potentially trade or share electricity BtM.

With the continued drop in the cost of solar PVs and distributed storage, new business models have emerged to offer new services. In the process, they have challenged or disrupted the traditional ties between the incumbent suppliers and customers. Many innovative start-ups are also emerging to disrupt the traditional relationships and service models of the incumbents.

The BtM “revolution” is still in its infancy in most countries. But places like Australia, where roughly one in four customers are solar, or in Hawaii, where the power flows are routinely reversed on the distribution network, provide lessons on how the future may evolve. The next big game changer will be the rising popularity of distributed storage paired with solar PVs.

The most promising technologies will be intelligent aggregators, electronic platforms for peer-to-peer (P2P) trading and transactive energy. Advances in blockchain technology is expected to lead to virtual power plants where energy flows among and between consumers, prosumers (electricity producers and consumers) and prosumagers (electricity producers and consumers who have storage capability) are aggregated, monitored and optimised.

However, several barriers, mostly regulatory, remain. For example, prosumers with excess generation during sunny hours of the day may wish to trade or share this with neighbours across the street or across the country. But existing retail regulation generally does not allow such transactions to take place. One solution may be to form semi-independent energy communities where generation, storage and consumption can be managed within the community.

The biggest challenge facing regulators and policymakers is to not stifle innovation while maintaining a level playing field for consumers, prosumers and prosumagers, whose service needs will deviate from one another over time. Tariffs and service charges for use of the monopoly portions of the network must be fair, transparent and equitable based on the costs imposed on the network and the values derived from it, including reliability, balancing service and back-up in cases where the self-generation and/or the storage system cannot provide.

While there are limitations on how many consumers will ultimately become prosumers or prosumagers or engage in more exotic forms of transactive energy or join energy communities, there are indications that many will do so. A better question, therefore, is “where will they take the industry” rather than the other way around.

*Fereidoon Sioshansi is Founder and President of Menlo Energy Economics, a California-based energy consulting service. *Behind and Beyond the Meter* is now available to buy from [Elsevier](#).*