

From centralized to distributed: The promise of decentralized localized electricity networks

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Extended Abstract

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Abstract Summary

As the cost of solar panels, batteries and EVs continues to drop while the cost of utility-supplied electricity continues to rise, more consumers are expected to become self-generators paired with storage. And as their numbers increase in many places, their impact on the legacy utility distribution systems declines. This phenomenon is beginning to become noticeable in places where it has reached high level of penetration such as in parts of Australia where roughly half of households are now solar customers.

This paper is based on anecdotal empirical evidence from a handful of customers in selected jurisdictions where households and small commercial customers are able to self-supply for extended periods – 90% of the time in average year – and in many cases are net generators, i.e., they generate more power than they consume over the course of the year.

The paper presents real-case studies of selected customers from several jurisdictions documenting the typical performance of the distributed systems and the financial implications of such self-supplied customers on the distribution utility and non-solar customers.

The most important implication of distributed self-generation and storage is their financial impact on the distribution utilities whose costs are primarily fixed and whose revenues are generally determined by volume of electricity delivered to customers.

Moreover, it suggests that the historical utility business model which was based on all customers relying on the infrastructure upstream of the meter and paying for it proportionately to their consumption volume is no longer a fair, just or equitable means of collecting sufficient revenues.

Other equally important implications of the divergence of customers' needs for electricity service suggests that distribution utilities should re-examine how they plan, finance and operate their networks in the future.

Presenting Author Biography

Fereidoon Sioshansi is the Founder and President of **Menlo Energy Economics**, a consulting firm in San Francisco, focused on the electric power sector.

He advises clients on the energy transition and the transformation of the electricity. His clients include utilities, innovators, regulators and policy makers.

Dr. Sioshansi has also been the Editor and Publisher of ***EEnergy Informer***, a monthly newsletter with international circulation for the past 36 years.

His professional experience includes working at **Southern California Edison Co.** (SCE), **Electric Power Research Institute**(EPRI), **NERA**, and **Global Energy Decisions**, among others.

He has edited 16 books published by **Academic Press**.