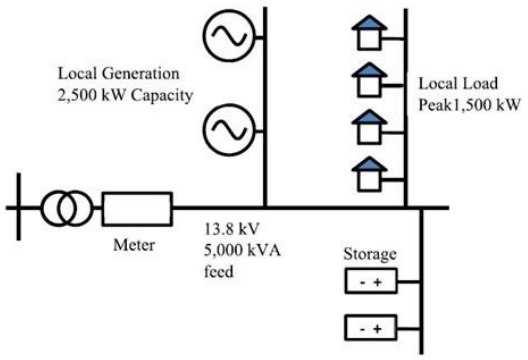

MAKING THE BUSINESS CASE FOR ON-SITE ENERGY STORAGE

Prof. Jessie Ma

As electricity grids add more renewable energy sources, energy storage becomes increasingly important to smooth out mismatches between production and demand. But does it make good business sense for private companies to add energy storage to their operations?

WISE researcher Jessie Ma and her colleague Bala Venkatesh believed existing models to address that question were too simplistic. So, they created a detailed, multi-year model that better captures the entire economic picture.

They accounted for net metering, which allows companies to export excess energy to the grid in exchange for credit on their electricity bill. They included potential revenues from providing ancillary services to the grid — services like operating reserves, demand response and voltage control.

And they incorporated a full suite of expenses: investment costs and operating costs for energy storage, as well the costs of generating electricity on-site.

Then Ma and Venkatesh tested their model on a large industrial electricity user in Ontario with a peak load of 1,500 kW and 2,500 kW in solar generation capacity.

They found that installing energy storage to hold excess electricity for future use would save the facility $4.5M over 15 years, reducing their net energy costs to $4.8M. If they also use that storage to provide ancillary services to the grid, they shift into profit mode, generating a total benefit of $11M over 15 years.

These results demonstrate the power of the model, which allows companies to test the business case for different storage sizes and scenarios, assess trade-offs between various options and identify profitable approaches.

***Researchers**: Jessie Ma, and Bala Venkatesh*

***Partners**: Independent Electricity System Operator*

Source: *Ma, Jessie, & Venkatesh, B. (2024). Sizing Merchant Energy Storage for Maximum Revenues Considering Net Metering and Ancillary Services. IEEE Access, 12, 2210-2223.*

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