

Novel Hierarchical Transactive Energy Management System Incorporating Predictive Assessment Techniques for Enhanced Community Market Participation

Principal Investigator

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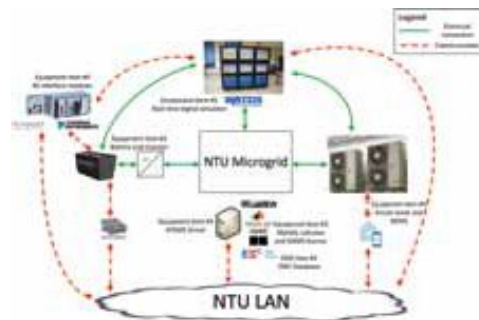
Project Summary

Existing energy management systems (EMS) are computationally intensive and increase in complexity exponentially with every new component added into the system. This project aims to develop a light-weight, scalable, hierarchical transactive energy management system that balances three sets of inputs: Supply (e.g. solar intermittency), demand-side (e.g. variable loads) and market price fluctuations. The system will also develop an advanced Model Predictive Control (MPC)-based controller that is capable of coordinating multiple controllable loads and intermittent energy sources, and an assessment tool that can facilitate participation of loads in demand response market.

Research is driven by Nanyang Technological University (NTU) and its industry partner DNV-GL. If successful, the system will improve the coordination and control of intermittent distributed energy sources, and increase end-user energy efficiency. Developed system will be piloted at the NTU campus.



• Overview of hierarchical transactive energy management system.



• Hardware setup map of hierarchical transactive energy management system.

Project Status

The project team is currently designing and developing the EMS and the MPC-based controller.