




IDEA TECHNOLOGY DEMONSTRATION OVERVIEW

<p><b>COMPANY</b> Encycle</p> <p><b>TECHNOLOGY</b> Swarm Energy Management</p> <p><b>DEMONSTRATION SITE(S)</b> DOE Health Opportunities High School, 350 Gerard Avenue, Bronx, NY</p> <p><b>DEMONSTRATION PERIOD</b> October 2014 – September 2015</p>	 <p>SYSTEM(S) INVOLVED</p> <p><b>COOLING AND VENTILATION</b></p> <hr/>  <p>TYPE OF SAVINGS GENERATED</p> <p><b>ELECTRICITY</b></p> <p><i>(Peak demand and energy consumption)</i></p>	<p>VENDOR'S POTENTIAL FOR SAVINGS</p> <p><b>35%</b> peak demand reduction of total HVAC load</p> <p>SAVINGS ACHIEVED IN THIS DEMONSTRATION</p> <p><b>10%</b> of building's total peak demand</p>  <p><b>SAVINGS</b></p>
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**Technology Description**

Swarm Energy Management is a wireless automated demand management and demand response controller for HVAC units. The goal of this technology is to establish intelligent communication between controllers for HVAC units to manage their duty cycles and reduce peak electrical demand. Reductions in energy consumption can be achieved through effectively scheduling overnight and weekend loads. The algorithms for the communication-enabled intelligent control of sets of HVAC units are proprietary. Air handling unit controllers are remotely monitored allowing system problems to be tracked and repaired.

**Optimum Facility Characteristics**

- Multiple rooftop units (3 or greater)
- High peak demand in building's energy profile
- Valid peak demand data to establish a baseline

**Demonstration Results**

Encycle installed 10 Swarm Energy Management controllers on 10 HVAC units and one REGEN energy gateway at a public high school located in the Bronx. Through the use of various demand management strategies in this facility, the controllers operated successfully to smooth out the daytime demand of the HVAC units, lowering peaks by 10.1% and energy consumption by 1.9% during the demonstration period. No major challenges were reported during the installation phase, and no connectivity problems or improper functioning of the technology occurred during the demonstration.

**Recommendations for Implementation**

- A validated baseline electricity-use model was developed based on monthly energy and temperature data. Uncertainties in this type of model are high for validation and/or prediction of peak demand results.
- Interval peak demand data is therefore recommended for a better assessment of load profile and in order to confirm statistically valid data for M&V.

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