Integrating Heating Oil with Air-Source Heat Pumps

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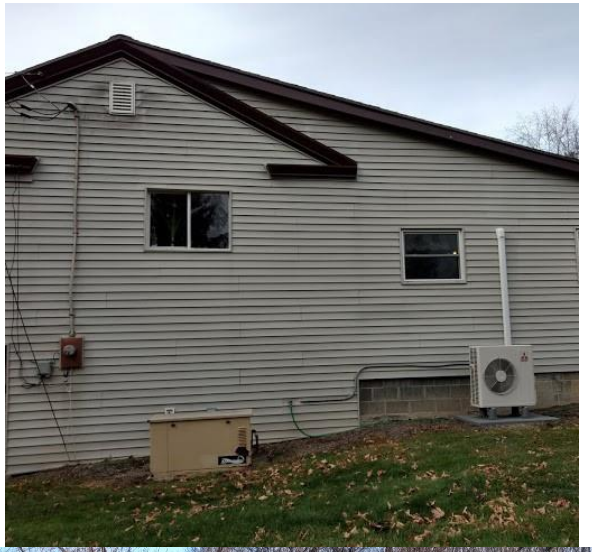
Objectives

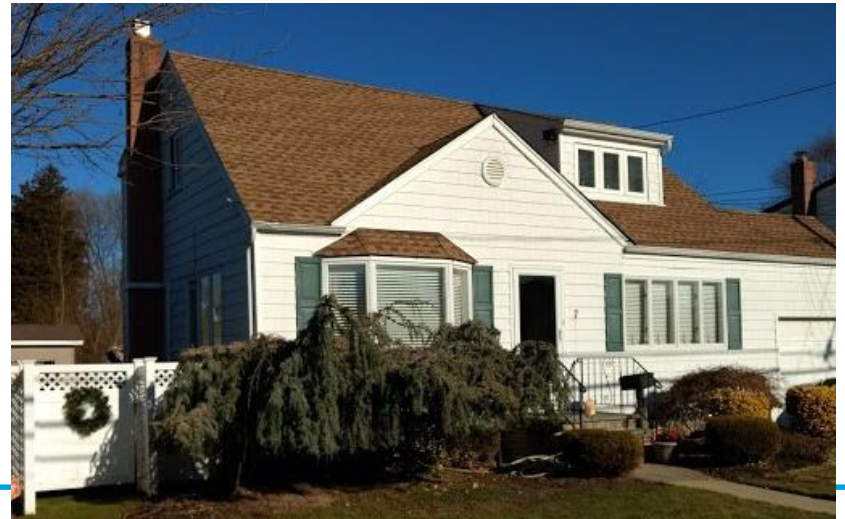
- Develop best practices guide for integration of mini-split heat pumps with oil-fired hydronic systems;
- Understand current field control practices and performance;
- Field tests of 6 homes in different parts of New York and other homes in New England.

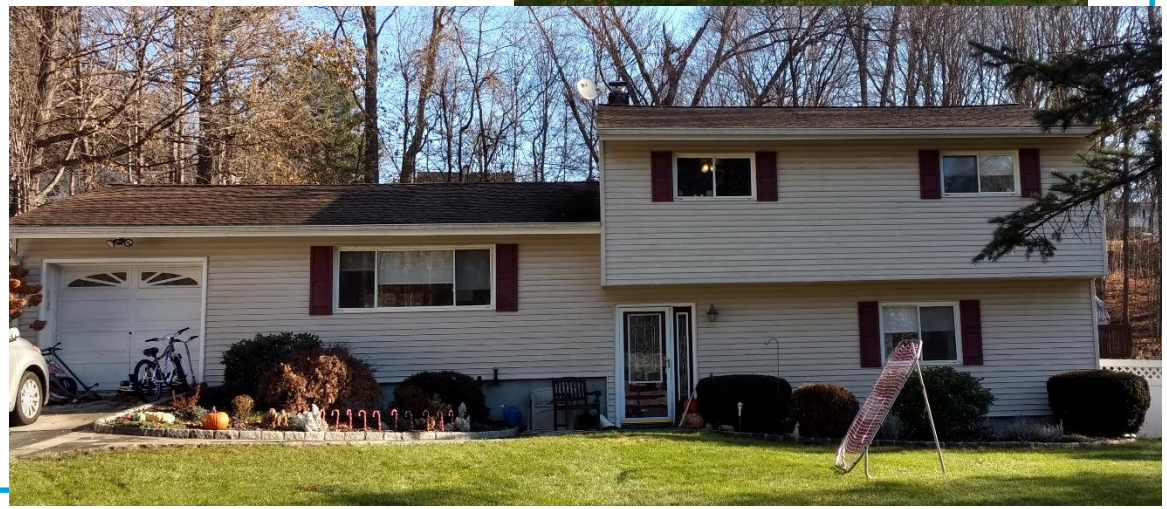
Site Selection

- Current oil hydronic heating;
- Minisplit added to provide heat for at least part of the home for at least part of the heating season.



Finding sites has been a challenge. 5 sites in New York were monitored during 2017/2018 season. One additional site in New York has been identified and will be started soon.



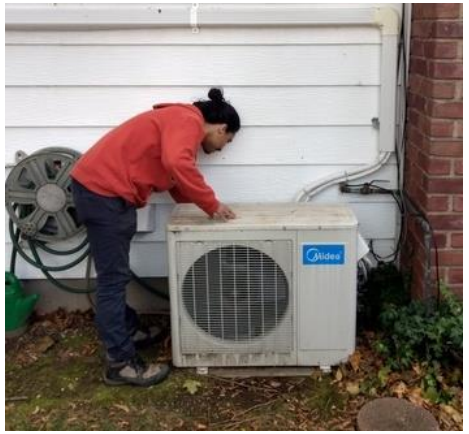


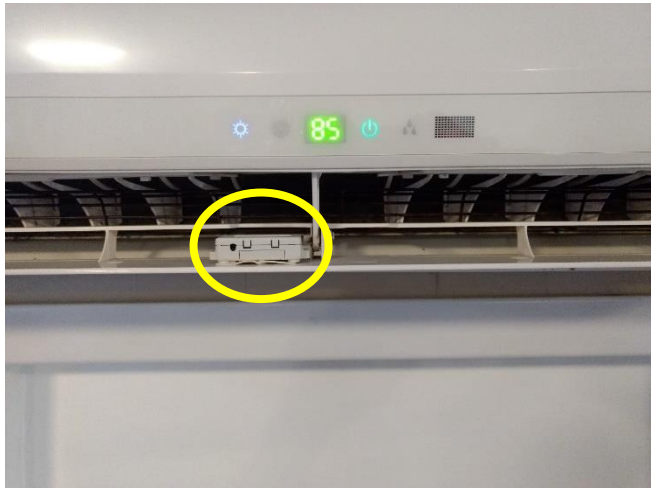
Motivation for Minisplit Installation

- Supplemental cooling and (less often) heating for one part of a home;
- Addition of cooling to replace window units in homes where there is no central A/C but there is hydronic heating.
- Ability to have really good temperature control in a small area (e.g. office, den) “Like a wood stove or electric space heater”

Site Measurements

- Indoor room temperature
- Outdoor temperature;
- Minisplit delivered air temperature;
- Hydronic supply / return (is hydronic supplying heat?)
- Flue gas temperature (is boiler running?)
- Outdoor unit coil temperature (defrost?)





Results to date

Homeowners are using both hydronic heating and minisplit systems for entire heating season;

Control of switchover is informal and inconsistent.

Planned analysis

Using simple minisplit performance model and hydronic system performance model (from FSA) calculate annual energy consumption with different strategies for switchover.

Develop best practices recommendations.