

# RETROCOMMISSIONING OF CONDENSING BOILERS

Increasing boiler efficiency through development of a new programmatic approach for installation and retrocommissioning of high-efficiency condensing residential boilers.

## WHY THIS RESEARCH IS NEEDED

High-efficiency condensing boilers have been available in the residential market for many years, but consumer acceptance and market penetration is low. Furthermore, not all utilities offer incentives for these more efficient, but more expensive appliances. In part, condensing boilers' low cost-effectiveness is due to lack of confidence in efficiency performance, tied to poor installations that limit energy savings.

Despite Minnesota's estimated 180,000 homes that are heated with boilers, there have been few research projects aimed at optimizing condensing boiler installation and performance in the field. CEE's study on commercial condensing boiler optimization indicates that quality installation would increase savings for most commercial condensing boilers, but there are significant differences between residential and commercial systems.

## PROJECT PROCESS AND EXPECTED OUTCOMES

This project team will interview HVAC companies and utility managers to learn more about their attitudes toward and experiences with high-efficiency condensing boilers. Innovation Exchange researchers will gather data on existing condensing boiler installations and monitor the performance of seven to nine residential systems. Researchers will retrocommission those systems, and provide quality installation procedures for an additional seven to nine new installations. Both categories of boilers, retrocommissioned and new quality installations, will be monitored in the field to determine their energy savings and performance.

These project findings will be used to recommend quality installation and retrocommissioning best practices to ensure that all new and existing high efficiency condensing boilers in Minnesota achieve their expected efficiency. Throughout the process the project team will work closely with utilities, research partners, and contractors to disseminate this information and gain feedback on usability and adoption of a quality installation and retrocommissioning protocols.



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Project Partners: Neighborhood Energy Connection and University of Minnesota



**Neighborhood Energy Connection**  
making energy conservation easy

**Innovation Exchange**  
Center for Energy and Environment

## PROJECT SUMMARY



### Objectives 🌟

Evaluate the efficiency and performance of existing residential condensing boiler systems, as well as the experience of HVAC installers with condensing boiler systems, and develop better installation and retrocommissioning practices to improve system efficiency.

### Utility Implementation 🌟

This project will correct issues with condensing boilers that have resulted in elimination and under-utilization of rebate programs by working closely with utility and rebate managers to understand the issues and find solutions that will ensure high performance.

### Scope 🌟

Measure performance before and after retrocommissioning 7-9 boiler systems, and install new systems at 7-9 additional sites.

### Timeline 🌟

January 2015 to December 2017

### Non Energy Impacts 🌟

Improved boiler efficiency could eliminate the need for a make-up air duct, increasing air sealing and thermal comfort, and reduce the risk of depressurization induced combustion safety issues.

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