
Minnesota Energy Efficiency Potential Study: 2020–2029

Appendix M: Minnesota HVAC Sales Data

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Conservation Applied Research and Development (CARD) FINAL Report

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Introduction

Minnesota has a thirty-plus year history of leadership in energy efficiency policy and achievements. In order to continue to maximize the benefits of cost-effective energy efficiency resource acquisition by utilities, the project team, consisting of Center for Energy and Environment (CEE), Optimal Energy (Optimal) and Seventhwave, was commissioned to:

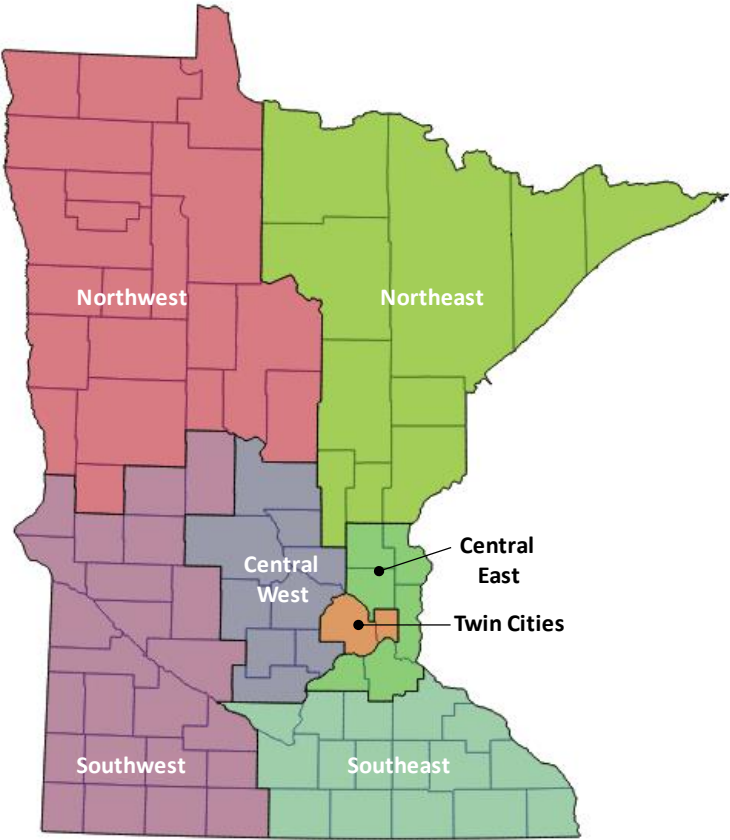
- Estimate statewide electric and natural gas energy efficiency and carbon-saving potential for 2020-2029;
- Produce data-driven and stakeholder-informed resources defining market segments, end uses, measures, and programs that could be targeted in the decade ahead to realize the state's cost-effective energy efficiency potential; and
- Engage stakeholders in order to help advance robust energy policies and energy efficiency programs in the state, and to inform future efficiency portfolio goals.

The full report, supporting documentation, and associated presentations can be found at the following website: <https://www.mncee.org/mnpotentialstudy/final-report/>

This appendix describes proprietary sales-volume data for Minnesota purchased from a third-party provider (D+R International) in order to better understand the current market for residential and small-commercial heating and cooling equipment. The dataset provided information about number of units sold at different efficiency levels for furnaces, boiler, central air conditioners and heat pumps between 2013 and 2016, and represented anonymized distributor-reported sales comprising an estimated 15 to 20 percent of the total market. Scaling factors were also provided to extrapolate the data provided by participating distributors to the total Minnesota market.

To protect the confidentiality of the distributors who provide the data, only regional identification of sales volume was feasible. Figure 1 shows the seven reporting regions identified in the sales data, and Figure 2 shows the regional shares of the statewide market for each of four equipment types.

Figure 1. HVAC sales data regions.



The sections that follow provide a high-level overview of an analysis of these data, which were used to set current market share estimates for these products in the potential-study modeling.

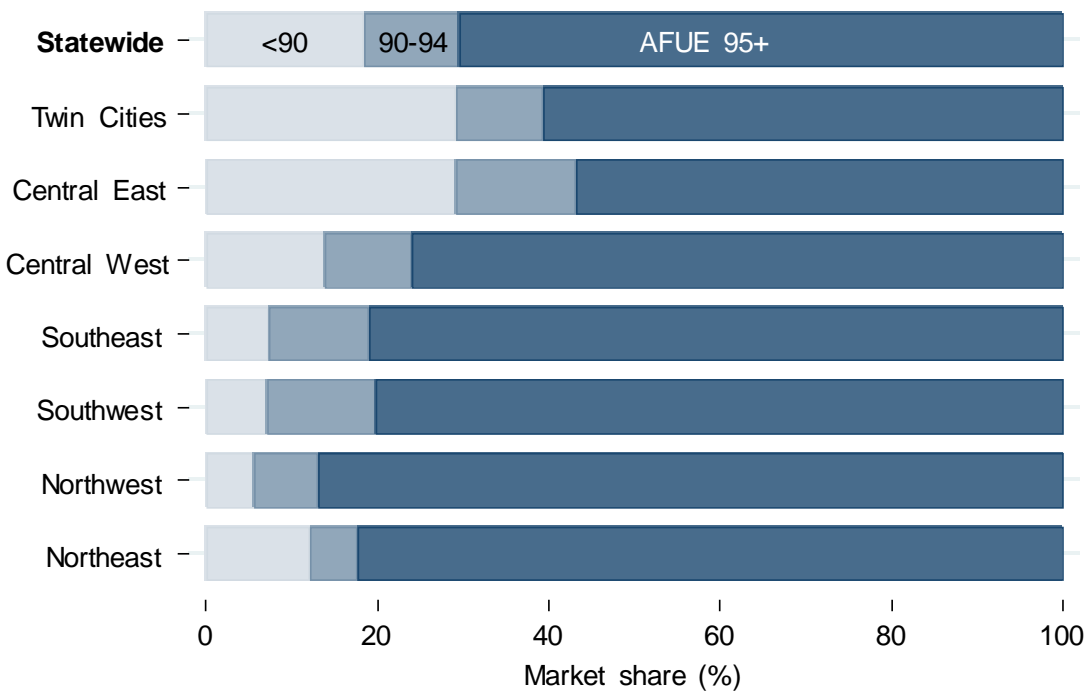
Table 1. Regional market shares for furnaces, boilers, central air conditioners and heat pumps (2013-2016).

Region	Furnaces	Boilers	Central Air Conditioners	Air-source heat pumps
Twin Cities	24.6%	14.5%	28.0%	17.1%
Central East	22.4%	7.8%	26.0%	7.6%
Central West	13.9%	11.9%	13.4%	17.8%
Southeast	17.3%	11.4%	18.1%	10.5%
Southwest	6.7%	6.8%	5.6%	9.9%
Northwest	6.4%	9.2%	4.2%	14.7%
Northeast	8.7%	38.4%	4.6%	22.5%
Total	100.0%	100.0%	100.0%	100.0%

Furnaces

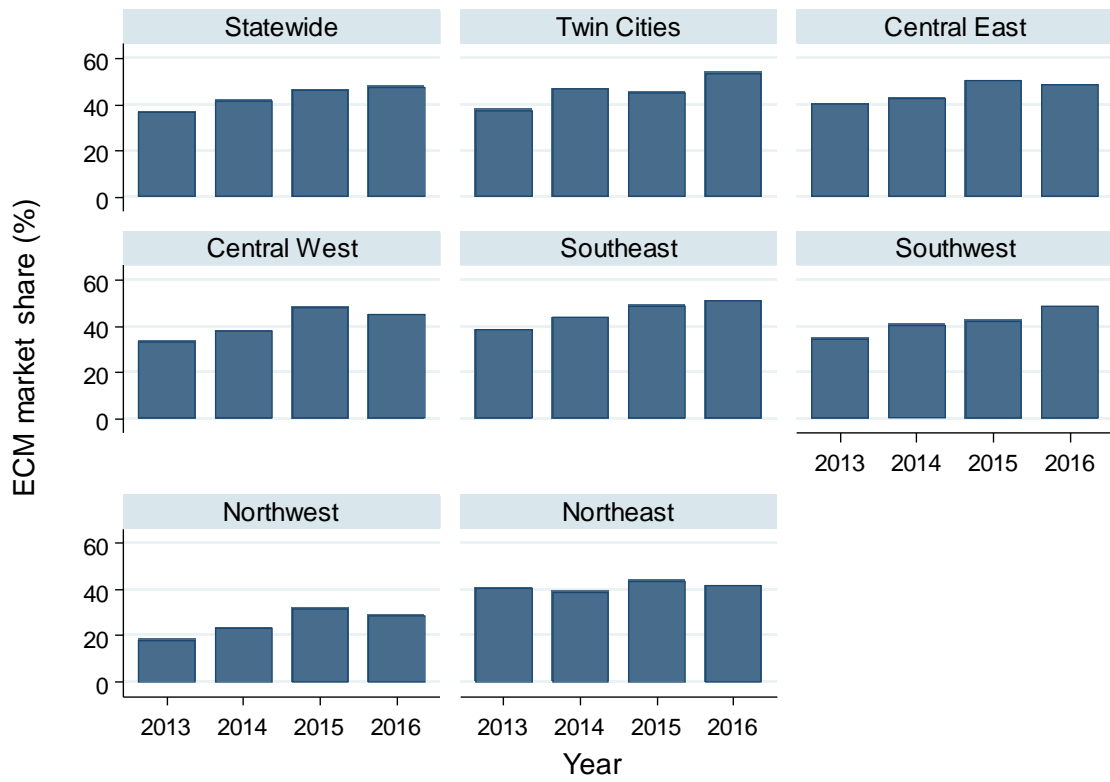
Statewide, the data indicate about 90,000 furnaces are sold in Minnesota each year. About 20 percent of these have an AFUE rating that is less than 90, 10 percent are rated at AFUE 90-94, and 70 percent are rated at AFUE 95 or higher. However, these proportions vary somewhat by region (Figure 2).

Figure 2. Statewide and regional furnace market share by AFUE category.



The market share for electrically-efficient furnaces that utilize electronically commutated motors (ECMs) rose from 37 percent to 48 percent between 2013 and 2016, but not in all markets (Figure 3). Also, the Northeast region shows a noticeably lower market share than the other regions.

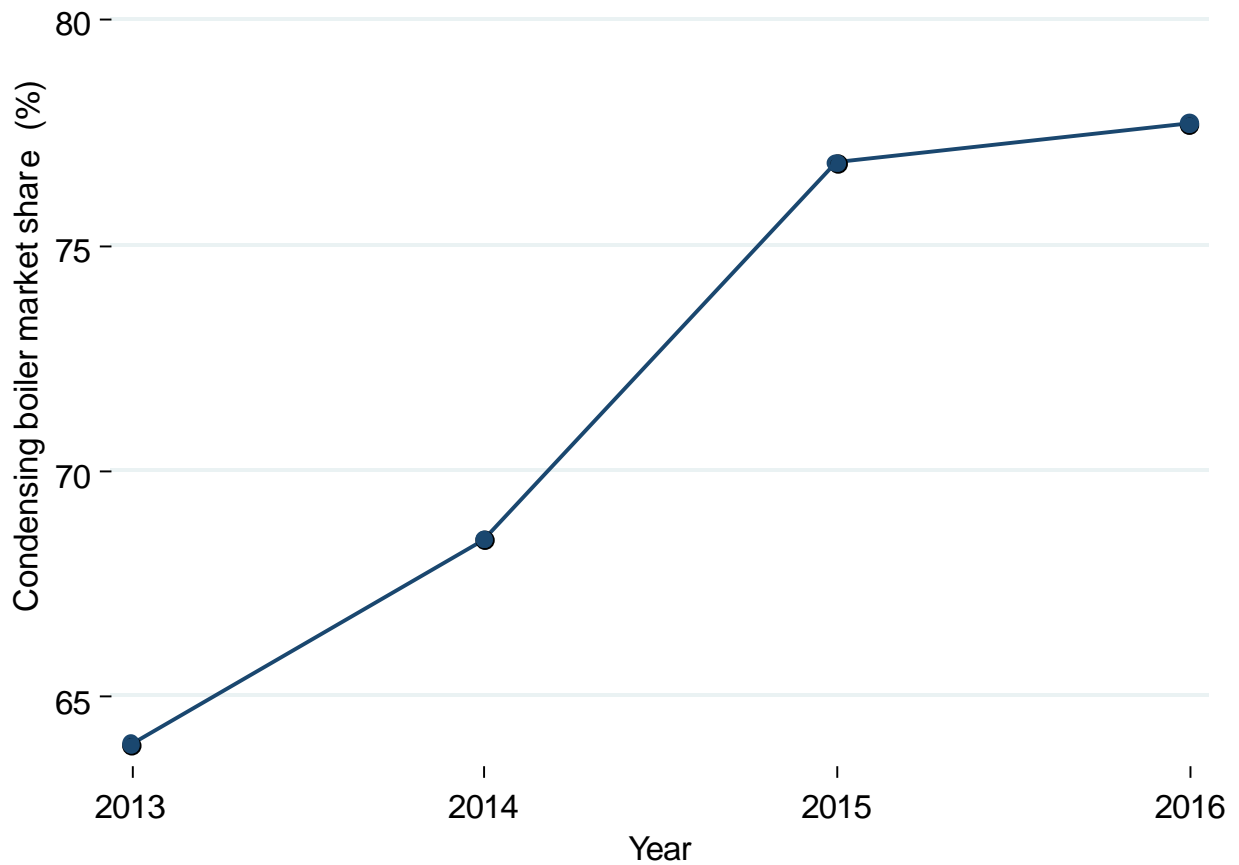
Figure 3. Market share for furnace with ECM blower motors, by year and region.



Boilers

The market for residential-sized boilers is fairly small: about 10,000 to 15,000 units sold statewide per year. As Figure 4 shows, the market share for condensing boilers rose from about 65 percent in 2013 to about 78 percent in 2016.

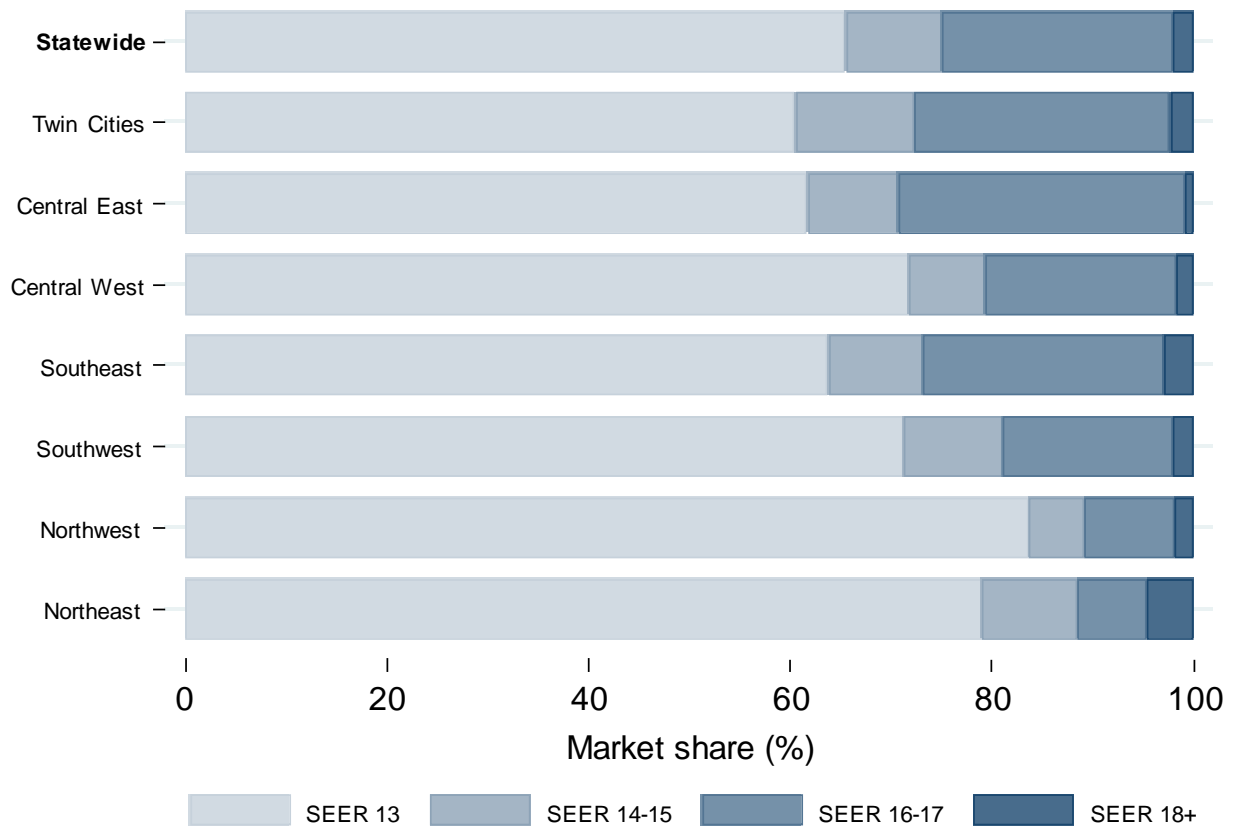
Figure 4. Statewide market share for condensing, residential-size boilers, 2013-2016.



Central Air Conditioners

About 100,000 central air conditioners are sold in Minnesota annually. Statewide about two-thirds of these units are at the lowest allowed efficiency level (SEER 13). As might be expected the market share for standard efficiency units is higher in the northern part of the state than in the south (Figure 5).

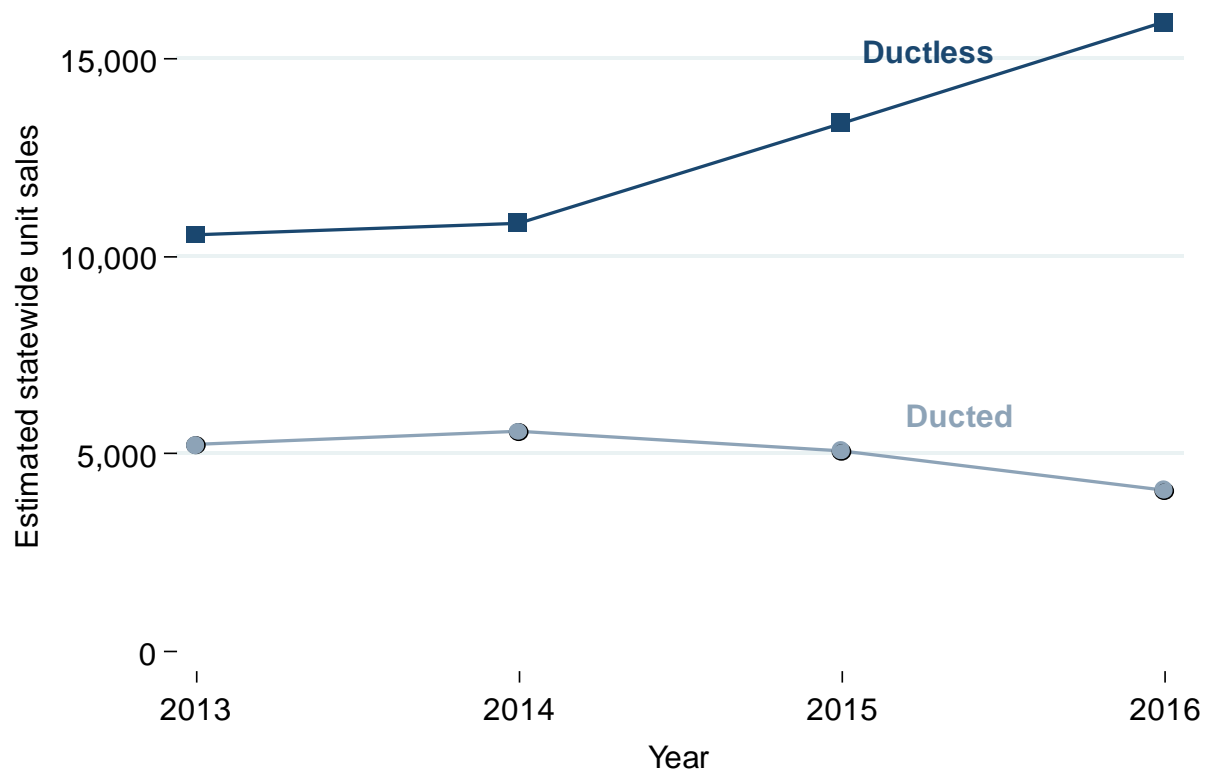
Figure 5. Market share for efficiency categories of central air conditioners in 2016, statewide and by region.



Air Source Heat Pumps

At about 20,000 units per year in 2016, the sales volume of air source heat pumps in Minnesota is only about one fifth that furnaces or central air conditioners but grew by more than 25 percent between 2013 and 2016. Sales of *ducted* heat pumps declined between 2014 and 2016, but sales of *ductless* units rose over the same period (Figure 6). In 2016, the average ducted system had a SEER rating of 14.8; the average ductless system had a SEER rating of 20.0.¹

Figure 6. Annual unit sales for air source heat pumps, by type, 2013-2016.



¹ The dataset provides only cooling SEER ratings and does not contain data on heating season performance factors (HSPF).