



Phase II EnergyScoreCards Minnesota

9/5/19

**m** MINNESOTA HOUSING

Minnesota Housing | mnhousing.gov

---

---

---

---

---

---

---

---

**m** MINNESOTA HOUSING

## Our Mission

Housing is the foundation for success, so we collaborate with individuals, communities and partners to create, preserve and finance affordable housing.

9/6/2019 Minnesota Housing | mnhousing.gov 2

---

---

---

---

---

---

---

---

## Agenda

Time	Topic
2:00 – 2:10	Housekeeping and Introductions
2:10 – 2:15	Purpose, History, and Project Design
2:15 – 2:30	Quantitative Results
2:30 – 2:45	Qualitative Results and General Recommendations
2:45 – 3:00	Q/A

9/6/2019 Minnesota Housing | mnhousing.gov 3

---

---

---

---

---

---

---

---

### Project Partners



**MINNESOTA HOUSING**

Minnesota Housing  
*Katherine Teiken*



**cee**  
Center for Energy and Environment

Center for Energy and Environment  
*Ashly McFarlane*



**BRIGHT POWER**

Bright Power  
*Jon Braman and Megan Rosa*

9/6/2019
Minnesota Housing | mnhousing.gov
4

---

---

---

---

---

---

---

---

---

---

### Purpose of the Project

Minnesota Housing's ongoing effort to enhance and refine our sustainability policies.

- Existing focus on **new construction and rehabilitation projects.**
- New focus on **asset management** within the existing portfolio.



9/6/2019
Minnesota Housing | mnhousing.gov
5

---

---

---

---

---

---

---

---

---

---

### Project History

**From 2012-2014, the original EnergyScoreCards MN project studied energy/water benchmarking in 500+ multifamily buildings in Minnesota.**

**Design:**


- Treatment Group: two years of free access to the EnergyScoreCards service
- Control Group: energy and water consumption tracked but no access to tool until after the two-year pilot was completed.

**Partners:**

- Bright Power
- Minnesota Green Communities
- Center for Sustainable Building Research
- Center for Energy and Environment

**Funding:**

- Xcel's Energy Emerging Technologies Grant Program
- Department of Commerce's CARD Program
- Minnesota Housing (part of the Corridors of Opportunity funding from HUD)



9/6/2019
Minnesota Housing | mnhousing.gov
6

---

---

---

---

---

---

---

---


---

---

### Phase II Project Design

31 buildings scoring a C or D at the end of the original pilot

- Free access to an additional two years of the EnergyScoreCards benchmarking platform.
- Free technical assistance from CEE.
- Help navigating Minnesota Housing and other financial assistance opportunities, such as loans, grants and rebates.



9/6/2019 Minnesota Housing | mnhousing.gov 7

---

---

---

---

---

---

---

---


---

---

### Participation in Utility Incentive Programs

Phase II encouraged buildings to participate in utility incentive programs.

- 29 buildings were eligible for Xcel/CenterPoint's Multi-Family Building Efficiency Program.
- 16 applied for the program and received energy assessments and direct install services.



9/6/2019 Minnesota Housing | mnhousing.gov 8

---

---

---

---

---

---

---

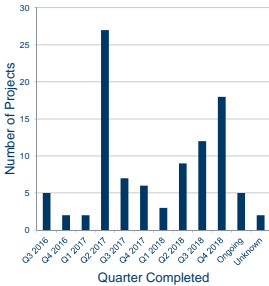
---

---

---

### Energy and Water Conservation Actions Taken

- 23 buildings **(74%)** implemented energy and water conservation projects
- Participants completed approximately **95 projects** during Phase II.



Quarter Completed	Number of Projects
Q3 2016	5
Q4 2016	2
Q1 2017	2
Q2 2017	2
Q3 2017	27
Q4 2017	7
Q1 2018	6
Q2 2018	3
Q3 2018	9
Q4 2018	12
Q1 2019	18
Q2 2019	5
Q3 2019	2
Q4 2019	2
Unknown	2
<b>Total</b>	<b>95</b>

9/6/2019 Minnesota Housing | mnhousing.gov 9

---

---

---

---

---

---

---

---

---

---

## Quantitative Results



Minnesota Housing | mnhousing.gov

9/6/2019 10

---

---

---

---

---

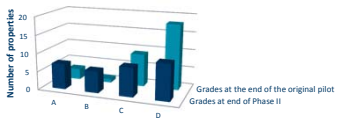
---

---

---

## EnergyScoreCards Grades

- 17 buildings (55%) saw improvement in their overall EnergyScoreCards grade.
- 11 buildings (35%) had their overall EnergyScoreCards grade stay the same.
- 3 buildings (10%) saw their overall EnergyScoreCards grade worsen (e.g. change from an A or B grade to a C or D grade).



	A	B	C	D
Grades at end of Phase II	7	6	8	10
Grades at the end of the original pilot	3	1	9	18

9/6/2019

Minnesota Housing | mnhousing.gov

11

---

---

---

---

---

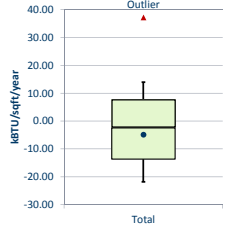
---

---

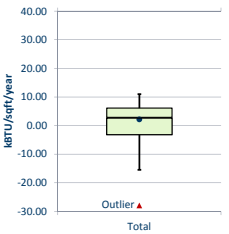
---

## Owner Energy Use Index

**Master-Metered Properties**



**Central heat and hot water**



Weather normalized, outliers omitted.

9/6/2019

Minnesota Housing | mnhousing.gov

12

---

---

---

---

---

---

---

---

### Owner Energy Use Index

Metering configuration	Number of buildings	Buildings with complete or partial natural gas and electric data for 2018	2015 - MRY	2015 - MRY	2015 - MRY
			EUI (kBtu/sqft/yr)	Electric (kBtu/sqft/yr)	Natural gas (kBtu/sqft/yr)
Master-metered	10	10	4.8 +/- 13 kBtu	0.5 +/- 2.8 kBtu	2.8 +/- 14 kBtu
Central heat and hot water	17	16	-2.2 +/- 6.8 kBtu	0.3 +/- 1.7 kBtu	-3.0 +/- 7.4 kBtu
Central hot water only	4	4	0.04 +/- 1.1 kBtu	0.7 +/- 0.4 kBtu	-0.7 +/- 1.3 kBtu

Weather normalized, outliers omitted. Positive or green value indicates a savings.

9/6/2019 Minnesota Housing | mnhousing.gov 13

---

---

---

---

---

---

---

---

---

---

### Cost Savings Metrics

**Building averages**

- Average of building total savings
- Larger buildings have bigger impact on average

**Per unit averages**

- Divide each property's savings by the number of units before averaging
- Large buildings have same impact on average as small

9/6/2019 Minnesota Housing | mnhousing.gov 14

---

---

---

---

---

---

---

---

---

---

### Master Metered Owner Cost Savings

Building Average				
	Average Savings	Minimum	Maximum	Total*
Electric	\$1,160	-\$5,660	\$6,135	\$12,763
Natural Gas	-\$301	-\$9,079	\$4,221	-\$3,312
Water	\$2,331	-\$2,259	\$12,532	\$25,637

\*For all buildings with a complete year of data for 2015 and 2018. Values are not normalized by square footage.

Average per unit			
	Average Savings	Minimum	Maximum
Electric	-\$6	-\$257	\$137
Natural Gas	\$17	-\$118	\$119
Water	\$33	-\$87	\$237

Weather normalized, outliers omitted. Positive or green value indicates a savings.

9/6/2019 Minnesota Housing | mnhousing.gov 15

---

---

---

---

---

---

---

---

---

---

### Central Heat and Hot Water Owner Cost Savings

Building Average				
	Average Savings	Minimum	Maximum	Total*
Electric	\$1,223	-\$10,547	\$15,698	\$19,560
Natural Gas	-\$1,066	-\$7,782	\$2,475	-\$15,996
Water	\$430	-\$7,064	\$8,683	\$5,590

\*For all buildings with a complete year of data for 2015 and 2018. Values are not normalized by square footage.

Average per unit			
	Average Savings	Minimum	Maximum
Electric	\$38	-\$124	\$523
Natural Gas	-\$10	-\$132	\$165
Water	\$36	-\$203	\$511

Weather normalized, outliers omitted. Positive or green value indicates a savings.

9/6/2019
Minnesota Housing | mnhousing.gov
16

---

---

---

---

---

---

---

---

---

---

### Central Hot Water Only Owner Cost Savings

Building Average				
	Average Savings	Minimum	Maximum	Total*
Electric	\$1,472	\$569	\$3,546	\$5,888
Natural Gas	-\$436	-\$1,111	\$131	-\$1,743
Water	\$613	-\$2,340	\$3,273	\$2,453

\*For all buildings with a complete year of data for 2015 and 2018. Values are not normalized by square footage.

Average per unit			
	Average Savings	Minimum	Maximum
Electric	\$38	\$25	\$72
Natural Gas	-\$9	-\$23	\$6
Water	\$2	-\$102	\$67

Weather normalized, outliers omitted. Positive or green value indicates a savings.

9/6/2019
Minnesota Housing | mnhousing.gov
17

---

---

---

---

---

---

---

---

---

---

### Cost effectiveness

- Total cost borne by Minnesota Housing for Phase II: **\$143,780**
  - Includes staff time, technical assistance, grant reimbursements, and EnergyScoreCard subscriptions.
  - Does not include \$122,009 in project costs borne by owners/managers
- Total annual cost savings: **\$50,840**
  - 3% of 2015 utility costs
  - Conservative estimate since 50% of projects were completed in the final year.
- Payback: **2 years and 10 months**

9/6/2019
Minnesota Housing | mnhousing.gov
18

---

---

---

---

---

---


---

---

---

---

Qualitative Results and Recommendations



Minnesota Housing | mnhousing.gov

---

---

---

---

---

---

---

---

Interview Results

What participants liked:

- Having a single point of contact with a real person
- Having access to grant reimbursement
- Having access to benchmarking data
- Having additional technical support



What barriers prevented them from doing more:

- Lack of staff capacity at the participant level
- Lack of financial resources at the participant level to implement projects
- Unclear benchmarking data
- Lack of clarity surrounding proposed solutions

9/6/2019 Minnesota Housing | mnhousing.gov 20

---

---

---

---

---


---

---

---

General Recommendations

- Make it easy to participate
- Have a real person that is able to answer questions and keep projects moving
- Keep project timelines flexible
- Incentivize projects in spaces where the owner/manager may not see the financial benefit.
- Provide information on how projects may also have non-financial benefits



9/6/2019 Minnesota Housing | mnhousing.gov 21

---

---

---

---

---

---

---

---

  
  
**Comments and Q&A**  
Minnesota Housing | mnhousing.gov

---

---

---

---

---

---

---

---

  
**Thank you!**  
**Katherine Teiken**  
*katherine.teiken@state.mn.us*  
651-296-7610  
9/6/2019 Minnesota Housing | mnhousing.gov 23

---

---

---

---

---

---

---

---