



Conservation Applied Research and Development (CARD)  
Clean Energy Resource Teams (CERTs)  
Sustainable Buildings 2030 (SB2030)

# 2017 Annual Legislative Report

January 15, 2018

Prepared by  
Minnesota Department of Commerce, Division of Energy Resources

Pursuant to Minnesota Statute § 216B.241 Subdivision 1e

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# Executive Summary

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Funding for the Conservation Applied Research and Development program (CARD), Clean Energy Resource Teams (CERTs), and Sustainable Buildings 2030 (SB2030) has been established through Minnesota Statutes 216B.241 in the Conservation Improvement Program (CIP). These funds originate from utility assessments that provide resources to the Department of Commerce (the Department) and other legislatively named entities to support achievement of Minnesota's statewide energy policy goals. Each of these programs is uniquely positioned to help continuously achieve energy efficiency and renewable energy project implementation throughout the state. The following report details the activities of each of these programs.

## Conservation Applied Research and Development (CARD)

Major accomplishments of the CARD program overall include:

- Dissemination of CARD grant results to utilities and other stakeholders through project reports, newsletter articles, webinars, and at regional and national conferences (e.g. Energy Design Conference, American Council for Energy Efficient Economy Summer Study).
- Enhancements to utility CIP offerings and energy savings achieved toward the 1.5% goal.
- Use of CARD project results and insights to inform policy decisions in Minnesota.

Specific accomplishments of the CARD program for calendar year 2017 include:

- Four Request for Proposals (RFP) issued.
- 110 Notice of Intent (NOI) to propose received and reviewed.
- 51 full proposals received and evaluated.
- 18 new projects funded or in process of being funded.
- 17 previously funded CARD projects completed.
- Conducted strategic planning process and developed DRAFT three-year plan for CARD RFP topics.
- Redesign of NOI review process to incorporate feedback from utility representatives.
- Standardized and branded CARD webinars to disseminate results of CARD projects more effectively.
- Held meetings, presented at conferences and other events, and sought engagement from utility representatives and other stakeholders to obtain ongoing input and improve collaboration.
- Developed improved project tracking and project management policies and procedures.

## Clean Energy Resource Teams (CERTs)

Major accomplishments of the CERTs Partnership in 2017 include:

- Hosted 31 events with 2,349 attendees, connecting with an additional 8,306 community members through 220 meetings, presentations and other outreach activities across the state;
- Saved or offset 37.3 billion BTUs over the past year as a result of CERTs efforts; and
- Completed funding for the thirty-nine 2016 community-based clean energy seed grants projects.
- Released the request for proposals (RFP) for 2018 projects and received sixty-two applications; selection process is underway.

## Sustainable Buildings 2030 (SB2030)

Major accomplishments of the SB 2030 initiative in 2017 include:

- 154 buildings designed to the *SB 2030* Energy Standard are predicted to save approximately 867 million kBtus/year;
- To date, 94% of all building projects enrolled in the *SB 2030* program have documented designs that met or exceeded the *SB 2030* Energy Standard,
- Buildings designed to the *SB 2030* Energy Standard are predicted to save approximately \$12.6 million per year assuming an average cost of \$14.58 per mmBtu;
- Buildings designed to the *SB 2030* Energy Standard anticipate a reduction in carbon emissions of 107,000 tons of CO<sub>2</sub>e annually.
- 109 completed SB 2030 projects are estimated to have saved 1,765 million kBtu, a reduction of 216,000 tons of CO<sub>2</sub>e and a savings of \$25.7 million to-date.

## Statutory Reference

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Below is the statutory reference establishing funding sources for each of the programs as well as the legislative reporting requirements. The following report details the activities and performance of each of these programs:

Pursuant to Minnesota Statutes 216B.241, Subdivision 1e.

(a) The commissioner may, by order, approve and make grants for applied research and development projects of general applicability that identify new technologies or strategies to maximize energy savings, improve the effectiveness of energy conservation programs, or document the carbon dioxide reductions from energy conservation programs. When approving projects, the commissioner shall consider proposals and comments from utilities and other interested parties. The commissioner may assess up to \$3,600,000 annually for the purposes of this subdivision. The assessments must be deposited in the state treasury and credited to the energy and conservation account created under subdivision 2a. An assessment made under this subdivision is not subject to the cap on assessments provided by section 216B.62, or any other law.

(b) The commissioner, as part of the assessment authorized under paragraph (a), shall annually assess and grant up to \$500,000 for the purpose of subdivision 9.

(c) The commissioner, as part of the assessment authorized under paragraph (a), each state fiscal year shall assess \$500,000 for a grant to the partnership created by section 216C.385, subdivision 2. The grant must be used to exercise the powers and perform the duties specified in section 216C.385, subdivision 3.

(d) By February 15 annually, the commissioner shall report to the chairs and ranking minority members of the committees of the legislature with primary jurisdiction over energy policy and energy finance on the assessments made under this subdivision for the previous calendar year and the use of the assessment. The report must clearly describe the activities supported by the assessment and the parties that engaged in those activities

# Conservation Applied Research and Development (CARD)

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## Overview

The Conservation Applied Research and Development (CARD) grant program is administered by the Department of Commerce, Division of Energy Resources (the Department). Approximately \$2.6 million is available annually for the program. The grant funds benefit the State of Minnesota and Minnesota ratepayers through the Conservation Improvement Programs (CIP) that utilities operate. Specifically, the results from completed CARD projects provide Minnesota utilities with informative and timely information to enhance energy efficiency program designs within their CIP portfolios, assisting utilities to reach their energy savings goal. In turn CIP helps to conserve energy resources while reducing harmful emissions, minimizing the need for new utility infrastructure, and generating positive economic value for Minnesota's citizens.

Significant CARD program metrics since its start in 2008 and for calendar year 2017 are summarized in Table 1.

**Table 1 CARD program metrics**

Description of Metric	Since Start of Program	For Calendar Year 2017
Successful CARD grant funding cycles	10	2
Request for Proposals (RFP) issued by Department	20	4
Request for Information (RFI) issued by Department	1	0
Notice of Intent (NOI) to Propose submitted by Responders and reviewed by Department staff	320	110
Full proposals submitted by Responders and evaluated by Department staff	422	51
R&D projects funded through the CARD grant program	119	3
Pending CARD grants (currently in negotiation or awaiting final approval)	Not applicable	15
Completed CARD grant projects	83	17

## Projects

CARD projects:

- Quantify the savings, cost-effectiveness and field performance of advanced technologies.
- Characterize market potential of products or technologies within the state.
- Study and characterize hard-to-reach market sectors.

- Investigate and pilot innovative program strategies or technology-based approaches.
- Review and analyze relevant policy issues.

Completed CARD projects provide utilities with informative and timely information to enhance energy efficiency program designs within their CIP portfolios.

Through December 2017, the CARD program funded or has pending projects totaling about \$26.5 million (Table 2). These projects received (or will receive) an additional \$7.3 million in matching funds.

**Table 2 Summary of CARD program funding to date**

<b>Project Type</b>	<b>Number</b>	<b>% of Total Projects</b>	<b>Dollars Awarded<sup>1</sup></b>	<b>% of Awarded Dollars</b>	<b>Estimated Match<sup>2</sup></b>
Projects awarded through RFP process (includes completed, ongoing and pending projects)	107	89.9%	\$24,435,445	91.9%	\$6,809,636
Projects awarded outside of RFP process (includes completed, ongoing and pending projects)	12	10.1%	\$2,591,132	8.1%	\$496,605
<b>All CARD Projects</b>	<b>119</b>		<b>\$26,591,577</b>		<b>\$7,306,241</b>

As shown in Table 2, the vast majority of CARD grants are funded through a competitive Request for Proposals (RFP) process (nearly 90% of all projects and 92% of funding). Based on a review of current Conservation Improvement Program (CIP) needs with input from utilities and other stakeholders, the Department issues an RFP, and reviews and evaluates each submitted proposal based on specific criteria including:

- CIP priorities;
- Proposal’s content, scope of work and work plan;
- Responder’s qualifications, skills and experience;
- Anticipated impacts of the project outcomes; and
- Project budget (which often includes matching funds from the responder).

<sup>1</sup> Award amounts shown in tables are based on initial awards and does not include additional amounts that might be added through amendments. To date additional funds added through amendments has totaled less than 0.5% of initial awards. Amounts shown in the table also do not reflect funds left unspent after the close of contracts. To date, unspent money returned to the CARD fund has been about 2% of initially awarded funds.

<sup>2</sup> Matches shown in the tables are based on match commitments in contracts; collected matches often exceed what was committed in the contract. On average, matching funds are approximately 18% **higher** than initially estimated.

Table 3 and Table 4 below list completed and ongoing CARD projects, respectively, that were funded through the RFP process, including details on each project.

**Table 3 Completed CARD Projects Funded through RFP Process**

RFP Cycle	Grantee	Project Description	Dollars Awarded	Estimated Match
2008	Owatonna Public Utilities	Home Energy Reports Pilot Program	\$123,260	\$531,272
2008	Center for Energy & Environment	Actual Savings and Performance of Natural Gas Instantaneous Water Heaters	\$160,495	\$281,905
2008	U of MN - Sponsored Projects Admin. Grants & Contracts	Quantification of Changes in Residential/Multifamily Building Codes and Standards for Assessing Energy Conservation and Efficiency Impacts in a Cold Climate	\$90,606	\$15,912
2008	Great River Energy	Home Energy Reports Pilot	\$165,000	\$424,300
2008	Energy Center of Wisconsin	Plugging into Savings - Taming Home Electricity Use	\$285,700	\$60,000
2008	U of MN - Sponsored Projects Admin. Grants & Contracts	Researching Energy Conservation Potential for Minnesota Business and Industry	\$203,177	\$0
2008	Eugene A. Scales & Associates, Inc.	Quantification of Indirect Program Impacts (Re-Direct Program)	\$91,170	\$9,000
2008	Franklin Energy Services LLC (Glacier Consulting Group)	Research to Inform Design of Residential Energy Use Behavior Change Pilot	\$47,305	\$0
2008	Navigant Consulting (Summit Blue Consulting)	Demand Side Management (DSM) Potential Study	\$354,250	\$0
2009-10	Northwind Sailing, Inc.	Angry Trout Cafe Kitchen Exhaust HR	\$22,450	\$8,650
2009-10	Center for Energy & Environment	Capturing Energy Savings from Large Building Envelope Leakage Reduction	\$395,240	\$316,760

<b>RFP Cycle</b>	<b>Grantee</b>	<b>Project Description</b>	<b>Dollars Awarded</b>	<b>Estimated Match</b>
2009-10	Class5 (Energy Efficiency Programs, Inc.)	Energy Efficiency in the Workplace (Health Care Facilities).	\$395,444	\$5,000
2009-10	Franklin Energy Services, LLC	Emerging Energy Efficiency Financing Mechanisms: Provide Analysis of Emerging Energy Efficiency Financing Models and Assess the Applicability and Attractiveness to Minnesota	\$46,284	\$0
2009-10	Franklin Energy Services, LLC	Energy Management Teams - Coordinator Resource Pilot Study	\$340,464	\$76,284
2009-10	Franklin Energy Services, LLC	Utility Infrastructure Improvements for Energy Efficiency: Best Practices Study	\$27,864	\$0
2009-10	Energy Platforms, LLC	Energy Savings Platform (ESP) Creation of a standards-based Info Technology Platform Enabling Minnesota Utilities to Design, Implement, Administer, and Report on CIPs.	\$1,500,000	\$511,250
2009-10	Franklin Energy Services, LLC	ASHP Efficiency Gains from Low Ambient Temperature Operation using Supplemental Electric Heating	\$55,792	\$0
2009-10	U of MN (Bioproducts & Biosystems Engineering)	Residential Ground Source Heat Pumps Study: Monitor and Analyze the Performance of Installed Residential GSHP in Minnesota.	\$780,816	\$89,738
2009-10	Neighborhood Recycling Corp., (The Green Institute)	Develop an Energy Efficiency Program Model for Small Businesses Based on Low-Cost Operations and Maintenance Conservation Measures.	\$227,124	\$32,300
2011	Energy Center of Wisconsin	Field Test of Drainwater Heat Recovery in Commercial Buildings	\$138,294	\$5,000
2011	CLASS 5, Inc.	CLASS 5 Community (City-Wide)	\$162,226	\$146,000
2011	Center for Energy & Environment	Advanced Rooftop HVAC Unit Controls Pilot	\$408,108	\$417,865
2011	Energy Center of Wisconsin	Automatic Daylighting Control Commissioning in the Midwest	\$206,172	\$10,500



<b>RFP Cycle</b>	<b>Grantee</b>	<b>Project Description</b>	<b>Dollars Awarded</b>	<b>Estimated Match</b>
2011	Minnesota Project, The	LEDs: Energy Savings and Replicability in MN Livestock Facilities	\$185,130	\$75,000
2011	Franklin Energy Services, LLC	Technical Review of the Minnesota Deemed Savings Database	\$146,880	\$0
2011	Franklin Energy Services, LLC	The Energy Efficiency Potential in Minnesota's Multi-family Sector	\$599,056	\$0
2011	Energy Management Solutions, Inc.	Street Lighting	\$49,000	\$0
2011	Michaels Energy	Convenience Store Energy Efficiency	\$52,000	\$76,000
2011	Franklin Energy Services, LLC	Single Recommendation Strategy Study	\$11,380	\$0
2011	Minnesota Municipal Utilities Association	Smart Grid Technologies Installation and Assessment	\$283,825	\$283,825
2011	Energy Management Solutions, Inc.	Variable Refrigerant Technology in Cold Weather Climates	\$65,925	\$0
2011	Michaels Energy	Energy Savings from Demand Response and Load Management	\$100,000	\$0
2011	Bright Power	Multi-family Energy Benchmarking with EnergyScoreCards	\$398,164	\$330,776
2012	Center for Energy & Environment	Saving Energy by Reducing Duct Leakage in Large Commercial & Institutional Buildings	\$380,155	\$189,045
2012	Center for Energy & Environment	Window Retrofit Technologies for Increased Energy Efficiency without Replacement	\$47,224	\$28,458
2012	U of MN - MnTAP	Researching Energy Conservation Potential at Minnesota Data Centers	\$46,781	\$0
2012	Weidt Group, The	Integrating Benchmarking and the Green Button Initiative into Utility CIP to Capture Greater Energy Savings	\$50,000	\$10,000
2012	Center for Energy & Environment	Condensing Boiler Optimization	\$209,232	\$105,488
2012	U of MN - MnTAP	Motivating Manufacturing Energy Efficiency: E2 Assessments and	\$177,488	\$150,000

RFP Cycle	Grantee	Project Description	Dollars Awarded	Estimated Match
		GreenLean(SM) Training with Directed Implementation Assistance		
2012	Minnesota Project, The	Dairy Cooperative Partnerships for Improved Efficiency Program Adoption	\$210,232	\$5,557
2012	Center for Energy & Environment	Heat Pump Water Heaters: Savings Potential in Minnesota	\$25,941	\$17,294
2012	Center for Energy & Environment	Reducing the Energy Cost of Effective Ventilation in Multi-Unit Buildings	\$148,348	\$83,232
2012	Gas Technology Institute	Advanced Heat Recovery System Field Deployment	\$743,603	\$19,000
2012	Michaels Energy	Cost-Effective Recommissioning of Restaurants	\$276,410	\$12,600
2012	University of Illinois at Chicago, Energy Resources Center	Increasing Combined Heat and Power Opportunities to Aid Minnesota's Energy Savings Goal: Analyzing Net Metering Rules and Standby Rates	\$23,040	\$7,680
2013	FVB Energy Inc.	Combined Heat and Power Policy Review and Potential	\$199,976	\$0
2013	Seventhwave, Inc.	Improving Installation and Maintenance Practices for Minnesota Residential Furnaces, Air Conditioners and Heat Pumps	\$437,950	\$52,175
2013	Seventhwave, Inc.	Commissioning of Demand Control Ventilation Systems in Cold Climates	\$265,000	\$7,500
2013	Seventhwave, Inc.	Energy Savings from Institutional Tuning in Minnesota	\$200,000	\$17,580
2013	Franklin Energy Services	Field Test of Large Battery Charging Technologies	\$67,512	\$10,210
2013	Center for Energy & Environment	Improving Effectiveness of Commercial Energy Recovery Ventilation Systems	\$379,478	\$100,101
2013	Center for Energy & Environment	Demonstrating the Effectiveness of an Aerosol Sealant to Reduce Multi-Unit Dwelling Envelope Air Leakage	\$280,996	\$74,549
2013	Michaels Energy	Mainstreaming Motel Optimization	\$335,024	\$14,850

<b>RFP Cycle</b>	<b>Grantee</b>	<b>Project Description</b>	<b>Dollars Awarded</b>	<b>Estimated Match</b>
2013	Seventhwave, Inc.	Research-based Design of a Residential High-user Program	\$297,956	\$28,000
2013	Sustainable Engineering Group	The Energy Conservation Potential of Displacement Ventilation Technology in Minnesota Climate Conditions	\$90,170	\$0
2013	Outsourced Innovation	Improving Energy Efficiency and Crop Production in Controlled Environment	\$126,970	\$14,368
2013	Weidt Group	Net Energy Optimizer for Commercial New Construction	\$50,000	\$193,050
2013	Energy Center of Wisconsin	CIP: Stakeholder Meetings' Facilitator for Energy Savings Goal Study	\$59,978	\$0
2013	Strategen Consulting	CIP: White Paper Analysis of Utility-Managed, On-Site Energy Storage in Minnesota	\$99,781	\$0
2013	Meister Consultants Group	CIP: Value of Solar Thermal Study RFP	\$75,000	\$0
2013	U of MN (The Minnesota Project)	Maximizing Rural Electric Cooperative Farm Energy Efficiency Programming	\$74,993	\$5,195
2014	Burr Energy (Microgrid Institute)	Engagement Survey for Combined Heat and Power in MN	\$13,393	\$0
2014	Burr Energy (Microgrid Institute)	Combined Heat and Power Facilitator for Stakeholder Engagement	\$28,947	\$0
2014	Seventhwave, Inc.	Commercial Roof-top Unit Characterization and Performance	\$419,714	\$35,104
2014	Center for Energy & Environment	Small Embedded Data Center Program Pilots	\$272,829	\$71,490
2014	Seventhwave, Inc.	Assessments of Plug-Load Control Devices in Commercial Buildings	\$299,000	\$35,750
2014	Cadmus Group, Inc., The	Economic Impact Analysis of the Conservation Improvement Program	\$120,012	\$3,820
2014	APPRISE, Inc.	Statewide Policy Analysis and Evaluation of Low-Income Programs in Minnesota Utility CIP Portfolios	\$245,096	\$23,760

RFP Cycle	Grantee	Project Description	Dollars Awarded	Estimated Match
2014	Seventhwave, Inc.	Minnesota Manufactured Homes Characterization and Performance	\$346,208	\$27,200
2015	GDS Associates, Inc.	Identify and recommend Prescriptive EUI Measures for Inclusion in TRM	\$110,470	\$0
2015	Franklin Energy Services, LLC	T12 Socket Penetration Study	\$81,585	\$53,305
2015	Illume Advising, LLC	Statewide Commercial Behavior Segmentation and Potential Study	\$448,022	\$14,578
	<b>Totals:</b>	<b>72 completed projects</b>	<b>\$15,882,988</b>	<b>\$5,118,276</b>

**Table 4 Ongoing CARD Projects Funded through RFP Process**

RFP Cycle	Grantee	Project Description	Dollars Awarded	Estimated Match
2013	Gas Technology Institute	Field Study of High Efficiency Heating and Cooling Mixed-air Rooftop Units (RTUs)	\$236,382	\$66,275
2013	Center for Energy & Environment	Optimized Operation of Indoor Public Pool Facilities	\$240,000	\$60,000
2014	Center for Energy & Environment	Pilot Study of a Furnace Retrofit Device for High Efficiency Residential Heating and Humidification	\$401,201	\$93,373
2014	Gas Technology Institute	Advanced Commercial Clothes Dryer Technologies Field Test	\$193,756	\$14,500
2014	Center for Energy & Environment	Field Assessment of Cold-Climate Air Source Heat Pumps	\$201,445	\$103,155
2014	Center for Energy & Environment	Evaluation of New Domestic Hot Water System Controls in Hospitality and Commercial Buildings	\$200,599	\$42,235
2014	Illume Advising, Inc.	Behavioral Programs Literature Review and Benchmarking Study, and Workshops	\$122,620	\$16,125

<b>RFP Cycle</b>	<b>Grantee</b>	<b>Project Description</b>	<b>Dollars Awarded</b>	<b>Estimated Match</b>
2014	Center for Energy & Environment (86778 NEC)	Quality Installation and Retro-commissioning of High Efficiency Condensing Boilers	\$220,250	\$48,600
2014	Michaels Energy, Inc.	Continuous Commissioning for Small Outpatient Medical Clinics	\$220,296	\$33,700
2014	Center for Energy & Environment	Commercial Energy Code Compliance Pilot	\$354,525	\$45,200
2014	Franklin Energy Services, LLC	MN Technical Reference Manual Update for 2017-2019	\$331,172	\$0
2015	Seventhwave, Inc.	Enhancing New Construction Programs with Performance-based Procurement and Design	\$314,904	\$73,390
2015	Seventhwave, Inc.	Characterizing Opportunities for Small Commercial Energy Programs	\$437,589	\$24,860
2015	Gas Technology Institute	Field Study of An Intelligent, Networked, Retro-fittable Water Heat Controller	\$281,852	\$20,000
2015	University of Minnesota	Industrial Compressed Air Demand Reduction through Air Tool Replacement	\$68,889	\$3,150
2015	GDS Associates, Inc.	Direct Cooling Retrofit for Server Racks	\$158,987	\$231,103
2015	GDS Associates, Inc.	Dairy Farm Precise Ventilation Control Electric Savings	\$36,867	\$56,153
2015	GDS Associates, Inc.	Whole-Farm Energy Management Valuation	\$203,415	\$59,844
2016-17	Center for Energy & Environment	Natural Gas and Electric Potential Study	\$1,348,686	\$69,265
2016-17	GDS Associates, Inc.	Electric Utility Infrastructure Potential Study	\$277,965	\$0
<b>Totals:</b>		<b>20 Ongoing projects</b>	<b>\$6,158,966</b>	<b>\$1,078,102</b>

In addition to the completed and ongoing projects funded through the RFP process (Tables 3 and 4) at the end 2017, there are fifteen new CARD RFP projects that are pending contracts or approval. Anticipated funding for these pending projects is \$2.4 million.

Occasionally, the Department will fund a CARD project outside of the competitive RFP process, in cases where a project requires a sole source provider, or when the Department has the opportunity to leverage CARD funds for a project already underway or being funded from multiple sources. To date, 12 such projects have been funded

in this manner, representing about \$2.6 million of total funds awarded through CARD since the program's start in 2008 (Table 2).

## Ongoing Efforts

Each year, the Department solicits input from utilities and other stakeholders to inform CIP needs and help develop appropriate topics for the RFPs. In 2017, the Department conducted a strategic planning process with the CARD program, which included discussions with Minnesota stakeholders and regional and national research groups. As a result, the Department developed a draft three-year plan for CARD RFP topics.

The Department has been reviewing policies and practice for CARD grant contract negotiation and project management in an effort to improve the quality and consistency of CARD project reporting and monitoring and to produce deliverables that are more accessible to utilities and other stakeholders. In 2017, efforts were focused on aligning policies and procedures with new requirements and recommendations from the Department of Administration, as well as standardizing internal procedures for project management of CARD grant projects.

In 2013, a Notice of Intent (NOI) to propose procedure was added to the process for responding to general topic RFPs. This process allows the Department to review project ideas and recommend only certain projects to proceed to full proposal. Both potential grantees and utilities appreciated this improvement as it improved the efficiency of the evaluation process and allowed respondents to focus on proposals more likely to be successful. In 2017, the Department further improved the NOI process by inviting utility representatives to participate in it. This initiative was well-received and resulted in a more robust process, as well as recommendations for projects more in line with utility goals and needs.

Starting in 2014, the Department improved the accessibility of grant proposals and evaluation files by, making them available electronically on the Department website through the [Commerce Actions and Regulatory Document Search tool](https://www.cards.commerce.state.mn.us/CARDS/) (<https://www.cards.commerce.state.mn.us/CARDS/>). Previously, viewing these files required an appointment and in-person viewing of a hard copy of evaluation documents. In 2017, some minor improvements were made to the process of accessing these files.

In 2015, the CARD website was updated and now includes a search tool for CARD projects allowing users to quickly obtain a list of past and ongoing CARD grants, search or sort by market sectors or targeted technology, obtain more details on specific projects of interest and link to available final reports. The website underwent additional updates and improvements in 2016 and 2017 with more planned for 2018. In addition, CARD results continue to be presented at local, regional and national conferences with very positive feedback.

During 2017, the Department continued to improve stakeholder and public understanding of the CARD Grant Program's purpose and the role it plays in helping to achieve the State's 1.5% savings goal through meetings, webinars, conferences, and personal contact. The Department also conducted interviews and held numerous conversations with utility representatives, grantees and other stakeholders to obtain ongoing input regarding research needs, to work more collaboratively with all stakeholders on ongoing CARD projects, and to encourage grantees to seek more utility input and collaboration in their proposals.

Additionally, dissemination of CARD grant results have become more systematic, including writing regular articles for the CIP Newsletter and other publications, publicizing final CARD reports more broadly, holding webinars on CARD results and making the webinars available for download.

The Department also standardized CARD webinars for consistency and added an introduction by Department staff, which has raised the profile of the CARD program and received positive feedback from stakeholders. All of these efforts have improved the quality of CARD project proposals and CARD project results.

## Clean Energy Resource Teams (CERTs)

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### Overview

The Clean Energy Resource Teams—or CERTs—is a statewide partnership<sup>3</sup> with a shared mission to connect individuals and their communities to the resources they need to identify and implement community-based clean energy projects. CERTs empowers communities and their members to adopt energy conservation, energy efficiency, and renewable energy technologies and practices for their homes, businesses and local institutions.

From seed grants to campaigns and educational forums, CERTs' work is place- and people-based. Overall, CERTs:

- Works to advance projects identified as priorities by regional teams;
- Offers tools for energy efficiency implementation through campaigns, decision tools and direct assistance,
- Connects individuals and organizations to clean energy financing tools and incentives including utility rebates, Property Assessed Clean Energy (PACE) and Rural Energy for America Program (REAP);
- Provides limited financial assistance to projects through seed grants;
- Supports local government clean energy work through the Minnesota GreenStep Cities program, Guaranteed Energy Savings Program, and beyond; and
- Works directly with utilities to support their energy efficiency and renewable energy efforts.

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<sup>3</sup> The CERTs partnership joins the Minnesota State Energy Office, part of the Minnesota Department of Commerce, Division of Energy Resources; the University of Minnesota Extension Regional Sustainable Development Partnerships; the Southwest Regional Development Commission; and the Great Plains Institute.

## Program Outcomes

To integrate CERTs' work around the State, CERTs aligns its programming and documents its success within three major categories: learn, connect and act. Highlights from the past year in each of these categories include:

- **Learn** describes the variety of work CERTs does to help Minnesotans understand their clean energy options, identify project models, and see the range of projects underway around the state:
  - Demand for solar education and tools was high, comprising 20% of all website traffic (32,000 page views), with major use of CERTs solar ([mncerts.org/solar](http://mncerts.org/solar)), community solar ([mncerts.org/solargardens](http://mncerts.org/solargardens)), subscriber collaborative ([mncerts.org/collaborative](http://mncerts.org/collaborative)), and Renewable Energy for Greater Minnesota ([mncerts.org/greatrenewables](http://mncerts.org/greatrenewables)) pages.
  - Two other popular resources on the CERTs website this year have been the MN Clean Energy Jobs Board with over 6,000 pageviews ([mncerts.org/jobs](http://mncerts.org/jobs)) and an exhaustive page on Property-Assessed Clean Energy, or PACE with over 4,000 pageviews ([mncerts.org/pace](http://mncerts.org/pace)).
  - CERTs published 130 blog posts in the last year, with a great deal of interest shown for two series, one featuring women leading Minnesota energy industry ([mncerts.org/women-in-energy](http://mncerts.org/women-in-energy)) and another featuring successful CERTs Seed Grant case studies ([mncerts.org/blog-series/seed-grants](http://mncerts.org/blog-series/seed-grants)).
  - Lastly, there were more than 5,000 views of efficient lighting education and tools, with more than 100 downloads of the Right Light Guide ([mncerts.org/lighting/guide](http://mncerts.org/lighting/guide)), more than 1,000 users of the new Right Light App for selecting bulbs ([rightlightapp.org](http://rightlightapp.org)), a new guide on LED tube lights ([mncerts.org/ledtubes](http://mncerts.org/ledtubes)), and educational resources about the benefits of switching to LED holiday lights ([mncerts.org/lighting/holiday](http://mncerts.org/lighting/holiday)).
- **Connect** frames the work CERTs does via events, conferences, presentations, workshops and tours:
  - In 2017, CERTs hosted 31 events with 2,349 attendees. CERTs connected with an additional 8,306 community members through 220 meetings, presentations and other outreach activities across the state. Following events, summaries are posted to the CERTs Blog.
  - Two 2017 highlights were the Central CERT Electric Vehicle (EV) event hosted in conjunction with the Sprout Growers and Makers Fair in Little Falls that allowed participants to interview EV owners and kick the tires on a few EVs (<http://bit.ly/2pdMFWF>) and the West Central CERT event that featured biomass heating for poultry barns (<http://bit.ly/2sicBAC>).
- **Act** describes the range of work CERTs does to spur Minnesotans to take clean energy action, including:
  - “Utility Support” in which CERTs partners with Minnesota utilities to help them meet their energy savings goals.
  - “CERTified Campaigns” that provide Minnesotans with clear and actionable ways to implement quantifiable energy efficiency efforts in their communities.
  - “Project Assistance” to spur on-the-ground projects with motivated community partners.
  - Business-to-business outreach to raise awareness about utility rebates and uncover recent or upcoming projects in 6 communities for 2 utilities.



- A new CERTified Campaign called Saving Watts and Drops, which includes two tracks, Saving Watts and Drops Fundraisers helps Minnesota community and youth groups conduct fundraisers with plug-and-play energy and water saving products in collaboration with their electric or natural gas utilities. Saving Watts and Drops Bulk Buys helps cities and other similar community-level organizations distribute plug-and-play energy and water saving products for free or at a low cost.

Overall, CERTs programming saved or offset 37.3 billion BTUs, or enough to power 1 million LED light bulbs annually, over the past year as indicated in Table 5.

**Table 5 CERTs 2017 Programming Summary**

Type	Program Description	BTUs Saved/Offset <sup>4</sup>
<b>Utility Support</b>	<b>Otter Tail Power (OTP) Commercial Direct Install:</b> CERTs conducted door-to-door outreach to main street businesses and commercial districts about free energy assessments offered by OTP’s contractor. CERTs visited 112 businesses in Mahanomen, Red Lake Falls and Frazee. Assessments were performed at 76 businesses, which included directly installed energy efficiency measures saving 227,317 kWh of electricity and \$20,500 annually.	<b>775,605,604</b>
<b>Utility Support</b>	<b>Implementation from 2016 Business Blitzes:</b> In 2016, CERTs partnered with Federated Rural Electric, People’s Energy Cooperative, South Central Electric Cooperative, and Proctor Public Utilities to conduct door-to-door outreach about utility efficiency programming with main street businesses and in commercial districts in 11 communities. After six months, seven businesses had moved forward with energy projects. Businesses are saving 82,782 kWh and \$7,450 annually.	<b>282,453,071</b>
<b>Utility Support</b>	<b>Minnesota Energy Resources (MER) – Water Conservation Kits:</b> In October 2016, CERTs tailored press releases to all major media outlets in the service area to help promote MER’s free water and energy savings kit program. In the six weeks following the media release, 49 kits were distributed, which reduced natural gas use by 3,596 therms and \$2,700 annually.	<b>359,600,000</b>
<b>Utility Support</b>	<b>Minnesota Energy Resources – Home Energy Audits:</b> CERTs promoted MER’s home energy audit program in Grand Rapids, Fairmont, Farmington, Rosemont, Albert Lea and Bemidji, with the	<b>187,730,815</b>

<sup>4</sup> Calculations include conversions as follows: 3,412 BTUs per kWh, 100,000 BTUs per therm

Type	Program Description	BTUs Saved/Offset <sup>4</sup>
	latter two communities including the local electric utility co-offering the audits. The multi-faceted outreach (press releases, social media, and leveraging CERTs local networks and events) resulted in 33 audits and resulting savings from directly installed energy efficiency measures of 1,571 therms, 8,980 kWh and \$2,160 annually.	
<b>CERTified Campaign</b>	<b>Saving Watts and Drops:</b> CERTs’ new campaign has already engaged one Youth Energy Summit! (YES!) team for a fundraiser of LED bulbs in collaboration with Melrose Public Utility. One city is distributing LED light bulbs to residents through a multi-faceted outreach approach. One multi-family housing organization is installing faucet aerators in low-income units. These efforts total savings of 44,676 kWh, 689 therms, and \$5,400 annually.	<b>240,608,262</b>
<b>CERTified Campaign</b>	<b>Ripple Effects:</b> CERTs past campaigns’ “Gobbling Up Savings” and “Light Up Your Station and Save” continue to interest the public. CERTs continues to provide technical assistance, as requested. A turkey farmer and a gas station owner each converted to LED lighting, resulting in 162,164 kWh and \$14,000 savings annually.	<b>553,304,933</b>
<b>Collaborated Campaign</b>	<b>Nissan Leaf Electric Vehicle (EV) Promotion:</b> CERTs was a core partner in a Nissan Leaf promotion in March 2016. 400+ vouchers were requested and 41 Nissan Leaf electric vehicles were sold, an increase of monthly sales of approximately ten times.	<b>1,747,530,526<sup>5</sup></b>
<b>Collaborated Campaign</b>	<b>Solar Power Hour Bulk Buys:</b> Midwest Renewable Energy Association (MREA) hosted 25 Solar Power Hours (one-hour solar educational sessions for residents and businesses) with 762 attendees throughout Minnesota in 2016. CERTs reviewed the bulk buy approach, helped MREA connect with a range of installers, and heavily promoted these events. Fourteen residential solar installations occurred, resulting in 131,400 kWh of renewable energy generation.	<b>448,336,800</b>
<b>Collaborated Campaign</b>	<b>Home Energy Squad Low-Income Outreach:</b> CERTs partnered with the Minnesota Center for Energy and Environment to conduct outreach to an energy-burdened area, which resulted in recruiting over 75 income-qualified free home energy audits. These households are estimated to be saving a combined 45,600 kWh, 2,660 therms, and \$7,000 annually from directly installed energy efficiency measures.	<b>421,587,200</b>

<sup>5</sup> BTU savings from EV adoption are based on the BTU end-use savings that result from replacing gasoline fuel with electricity in a vehicle that travels, on average, 12,000 miles/year.

Type	Program Description	BTUs Saved/Offset <sup>4</sup>
<b>Collaborated Campaign</b>	<b>Regional Sustainable Development Partnerships (RSDP) – Rural Grocery Energy Efficiency:</b> In conjunction with RSDP’s efforts to improve economic stability of rural grocers and increase access to local foods, CERTs provided technical assistance with energy efficiency projects, including navigating funding options such as Rural Energy for America Program (REAP), Good Food Access Fund, and utility rebates. Two stores took action, resulting in 86,850 kWh and \$7,800 annual savings.	<b>296,330,835</b>
<b>Collaborated Campaign</b>	<b>MN GreenCorps – Energy Conservation Members’ Projects:</b> CERTs trained nine 2016-2017 members on behavior change science and offered intensive project mentorship. Four members’ projects helped 9 local units of government with energy efficiency. Lighting projects (Lake Crystal) and utilization of the B3 Energy Efficiency Operations Manual (Farmington, Golden Valley, Hutchinson and Woodbury) to schedule buildings’ air handling units resulted in saving 149,910 kWh annually.	<b>511,492,920</b>
<b>Collaborated Campaign</b>	<b>Retired Engineers Technical Assistance Program (RETAP):</b> CERTs referred 39 cities, organizations, and businesses to RETAP’s free resource management assessments. Fourteen sites received visits in 2017 based on referrals-to-date. We estimate those taking action have collective savings of 84,300 kWh, 1,500 therms, 390 gallons LP, and \$9,900 annually.	<b>474,064,556</b>
<b>Seed Grants</b>	<b>2016 CERTs Seed Grants:</b> CERTs funded 39 projects across the state for a total of \$140,000. These projects leveraged \$1,236,000 from other sources and involved or reached nearly 427,000 Minnesotans. Twenty-seven projects specifically included implementation (rather than research or education) of clean energy, including 12 projects producing renewable energy and 19 energy efficiency projects. Significant projects included the Chisago Energy Hub (also a MetroCERT Accelerator project), Minnesota Interfaith Power and Light’s work with communities of faith, and Red Wing’s Partners in Energy.	<b>5,894,446,109</b>
<b>Project Assistance</b>	<b>Property Assessed Clean Energy (PACE):</b> CERTs engages communities and businesses in PACE programs administered by the Rural Minnesota Energy Board and the St. Paul Port Authority. This engagement resulted in 44 businesses utilizing PACE financing for energy efficiency (e.g., lighting and HVAC) and solar projects.	<b>15,765,633,712</b>

Type	Program Description	BTUs Saved/Offset <sup>4</sup>
<b>Project Assistance</b>	<b>Greater Mankato Area Solar Garden:</b> Stemming from the Southeast Regional Session at the 2015 CERTs Conference, a 1.3 MW community solar garden broke ground in October 2017. The School Sisters of Notre Dame advanced the project and serve as one of the garden's biggest subscribers along with Blue Earth County. The array will generate approximately 1,708,200 kWh annually.	<b>5,828,378,400</b>
<b>Project Assistance</b>	<b>Wood Heat for Poultry:</b> With support from the Minnesota Department of Agriculture and in partnership with Agricultural Utilization Research Institute, CERTs and a poultry farmer collaborated to test a commercially-designed 1.65 MMBtu wood chip furnace. Fuel cost savings, flock production, and overall performance were researched and shared at a West Central CERT event that included a tour of the facility.	<b>1,702,310,000</b>
<b>Project Assistance</b>	<b>Renewable Energy for Greater MN:</b> With support from the USDA's Renewable Energy Development Assistance, CERTs worked with 71 Minnesota farmers and rural small businesses to identify efficiency opportunities, prioritize renewable energy options, and connect with resources (USDA REAP funding, PACE, utility rebates). CERTs conducted 23 on-site energy assessments and helped 10 farmers or small businesses move forward on project implementation. To date, four projects completed are saving 403,921 kWh and \$36,000 annually.	<b>1,378,178,452</b>
<b>Project Assistance</b>	<b>Solar Thermal Outreach:</b> From 2015 to early 2017, CERTs convened major players in the solar thermal industry to advance solar thermal projects. Two projects received Made in Minnesota rebates resulting in savings of 4,000 therms, 2,000 kWh electric heating, and \$3,225 per year.	<b>406,675,652</b>
<b>Total CERTs Program Savings</b>		<b>37.3 billion</b>

## Ongoing Efforts

- **2018 Seed Grants:** CERTs launched its 2018 Seed Grant request for proposals (RFP) in August of 2017. Each of the seven CERT regions will allocate seed grant funding to local clean energy projects.
- **Utility Conservation Improvement Program Support:** This past year, CERTs partnered with CenterPoint Energy to promote their Natural Gas Energy Analysis program to commercial customers by going door-to-

door in the cities of Victoria, Shakopee, and Shorewood. Savings from this effort, as well as any efficiency projects beyond the direct install measures described in Table 5 for Otter Tail Power and Minnesota Energy Resources, will be accounted for in 2018.

- **GreenStep Cities:** CERTs continues to support city-level actions on clean energy best practices through the GreenStep Cities program. This support includes providing direct assistance to cities as they pursue energy-related best practices and connecting cities with interns, where possible, for assistance in adopting the program, conducting building energy benchmarking, and taking action on the program best practices.
- **Community Solar Gardens (CSG):** CERTs has continued to serve as an educational resource to individual consumers, local governments, utilities and researchers working to understand community solar gardens. In 2017, CERTs assisted 35 unique jurisdictions (cities, counties, schools, and Tribal Nations) with community solar garden questions. This assistance has ranged from responding to siting and planning questions to evaluating proposals and understanding their potential for savings. CERTs also counseled jurisdictions on their range of solar options beyond participating solar gardens. At least six of these jurisdictions have moved forward with subscriptions based, in part, on this assistance.
- **Onsite Solar for Jurisdictions:** Third-party financing is a tool for public entities to tap into long-term energy cost savings without requiring large up-front capital expenditures. Even though local governments and schools can be good locations for solar, government entities cannot take advantage of federal tax credits for solar, and therefore, the projects often do not make sense financially. Third-party financing is a popular means to overcome this barrier, yet comes with its own barriers related to complex project models, contracts and financing. To address these challenges, CERTs collaborated with the City of Woodbury and KFI Engineering to develop a model Request for Proposals (RFP) that will enable local governments and school districts to more easily compare third-party proposals. The model RFP contains traditional RFP language about the responders experience, qualifications, project scope, and schedule while also providing a comprehensive overview of technical specifications, site utility use, energy generation estimates, and more.
- **Right Light Guide & App:** After years of engaging the public about light bulbs with a 2-page educational guide, CERTs' major focus this past year was to convert the paper Right Light Guide to an on-line, mobile-friendly app. CERTs worked in close collaboration with University of Minnesota Extension Technology and the University of Minnesota's Usability Lab to utilize rigorous testing of the new tool with end users resulting in the new <http://rightlightapp.org> which can be accessed from any device. As noted above, CERTs updated its lighting website to include holiday lighting content and developed a Right Light Guide for tube lights.
- **SolSmart:** CERTs and the Great Plains Institute provided support to Chisago and Stearns Counties and the cities of Austin, Grand Rapids, Hutchinson, Pine City, Rochester, and St. Francis to participate in and advance toward designation through SolSmart. SolSmart is a national program that provides free technical assistance with addressing local barriers to solar energy development.
- **Connecting Low-Income Communities to Efficiency and Renewable Sources (CLICERS):** CERTs has assisted the Minnesota Department of Commerce with initial data gathering, interviews and a series of

stakeholder meetings targeting identification of high value opportunities to lower the energy burden of low-income households.

- **Property Assessed Clean Energy (PACE):** Over the past year CERTs has partnered with the St. Paul Port Authority (SPPA) to assist counties with education and information as they consider signing the PACE joint powers agreement (JPA). PACE allows commercial entities (including non-profits) to finance energy efficiency and renewable energy projects and then repay them as a separate line item on their property taxes. Sixteen counties have signed the JPA in 2017 including Benton, Blue Earth, Dakota, Dodge, Goodhue, Hennepin, Le Sueur, Mower, Nicollet, Pine, Pope, Renville, St. Louis, Sibley, Wabasha, and Waseca. Staff also reach out to local business and local economic development authorities about PACE as an opportunity. In Southwest Minnesota, CERT partner the Southwest Regional Development Commission administers the Rural Minnesota Energy Board PACE program, another opportunity to finance clean energy projects.
- **MN Solar Pathways:** CERTs is one of five partners (led by the Minnesota Department of Commerce) working on the “Minnesota Solar Pathways: Illuminating pathways to 10% solar” project. This effort is funded by the U.S. Department of Energy and aims to find least-risk, best-value strategies for Minnesota to achieve its solar energy goals. CERTs leads the communications-related work for the project. Learn more here: <http://mnsolarpathways.org/>

## Allocation of Legislative Funding Resources and Leveraged Resources

CERTs has 16 staff who account for 11.5 full time employees (FTE), 8 of whom are paid via legislative allocation. Staffs are based across CERTs’ four partner organizations and across all seven regions. Given the nature of CERTs work, staff are critical to carrying out CERTs clean energy work across the State and thus represent the largest share of CERTs spending followed by seed grants. These funds catalyze local projects, connect communities to clean energy efforts and attract other dollars to further clean energy around the State.

Beyond the legislatively appropriated dollars, CERTs continues to leverage additional support for its work. Funding and related programmatic efforts include U.S. Department of Energy SunShot funding to advance solar, McKnight Foundation funding to spur community energy projects and U.S. Department of Agriculture Rural Energy Development Assistance funding to assist farms and rural small businesses with renewable energy assessments.

These leveraged dollars reflect the value of the CARD investment in CERTs and how those core dollars have spurred and accelerated additional programming through complementary investments.

# Sustainable Buildings 2030 (SB2030)

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## Overview

The *Minnesota Sustainable Building 2030 (SB 2030)* standards were enacted in 2008 and designated the Center for Sustainable Research (CSBR) at the University of Minnesota as the lead to develop a Minnesota program reflecting the goals of the national *Architecture 2030* program.

*Architecture 2030* establishes the goal of achieving net-zero energy use in buildings by 2030 and outlines specific incremental performance targets in order to meet this goal. Every five years, total carbon output due to energy use in buildings is to be reduced by an additional 10% compared to the average energy use of existing buildings in 2003. Reflecting this national program, the *Minnesota Sustainable Building 2030 (SB 2030)* program requires all state-bonded projects that began schematic design after August 1, 2009 to meet an energy reduction of 60% compared to the average building. Starting in 2015, projects have begun to meet the 70% reduction standard. By 2030, the Energy Standard will require a 100% reduction (net zero carbon).

The *SB 2030* legislation requires CSBR, in cooperation with The Department of Commerce, to “establish cost-effective energy-efficiency performance standards for new and substantially reconstructed commercial, industrial, and institutional buildings that can significantly reduce carbon dioxide emissions by lowering energy use in new and substantially reconstructed buildings.” All program elements are to be based on scientific or real world experience in building energy conservation, and all buildings are to be scientifically benchmarked and real reduction in energy consumption measured.

The energy standards for all types of buildings are to be comprehensive, reliable and equitable and provide procedures for the ongoing monitoring of energy use in buildings that have adopted the performance standards. Minnesota Statutes 216B.241 also requires that utilities develop and implement programs that help building owners achieve the energy savings goals through design assistance, incentives and verification.

Finally, continuing education and training programs for Minnesota designers, engineers and building operators are fundamental to the initiation of the *SB 2030* standards and the law made education and training a primary goal.

## Expected Cost-Effectiveness of the Sustainable Building 2030 Program

The significant improvements in building performance required by the *SB 2030* energy performance standards must be achieved in a cost-effective manner. Projects and activities are generally considered cost-effective if the project or activity results in a net benefit to the consumer or society. In the case of utility-administered conservation programs, benefits are based on the energy savings over the assumed lifetime of a particular measure.

In 2009<sup>6</sup>, the Center for Energy and the Environment (CEE) performed a preliminary cost-effectiveness analysis on a set of 115 buildings in the region. This initial review shows that the energy performance level required by the *SB 2030* standards can be achieved cost-effectively for the overwhelming majority of building types and situations.

The required level of energy efficiency is adjusted for the small minority of projects that demonstrate that they cannot meet the *SB 2030* standards cost-effectively. This process ensures that the *SB 2030* standards do not mandate energy efficiency upgrades that are not cost-effective for state-bonded projects. Such adjustments are granted after a project team demonstrates that appropriate energy saving design options were investigated in an effort to achieve the *SB 2030* performance level, that these design options are not cost-effective for the particular project and that all cost-effective measures were implemented in the project. To ensure this cost-effectiveness for projects where energy modeling may place a significant burden, smaller projects and those with limited mechanical upgrades are afforded a path to compliance through comprehensive prescriptive efficiency requirements.

## State-Bonded Project Cost Effectiveness Actual Results

From 2009 through October 2016, 154 building projects have been involved in the *SB 2030* process and have reported Energy Standard and Design Energy Consumption values. Of these 154 projects, 100 of the 107 state-required building projects and 45 of 47 volunteer building projects have reported as on track to meet the required *SB 2030* Energy Standard. To date, 94% of all buildings project enrolled in the *SB 2030* program have reported meeting or exceeded the *SB 2030* Energy Standard in design. On average, these projects have reported anticipated energy consumption 34% less than their 2030 Energy Standard.

As data has come in from projects in the last few years, the following savings have been reported, this trend continues for the subsequent phase of the project:

- 2013 Report: 40 projects expected to save \$3.25 million per year (250 million kBtu/year) in energy for operations.
- 2014 Report: 66 projects expected to save \$5.24 million per year (327 million kBtu/year) in energy for operations.
- 2015 Report: 78 projects expected to save \$7.04 million per year (490 million kBtu/year) in energy for operations.
- 2016 Report: 93 projects expected to save \$8.3 million per year (534 million kBtu/year) in energy for operations
- 2017 Report: 126 projects expected to save \$9.8 million per year (634 million kBtu/year) in energy for operations

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<sup>6</sup> This document is available online through the Minnesota Legislative Reference Library at <http://www.leg.state.mn.us/docs/2009/mandated/090892.pdf>



- 2017 Report: 154 projects expected to save \$12.6 million per year (867 million kBtu/year) in energy for operations; of these the 109 completed SB 2030 projects are estimated to have saved 1,765 million kBtu and \$25.7 million to-date.

When compared to buildings that just met the minimum energy code requirements, the buildings designed to the *SB 2030* Energy Standard are predicted to save approximately 867 million kBtus/year, a reduction in Carbon emissions of 107,000 tons of CO<sub>2</sub>e, and a savings of \$12.6 million per year assuming an average cost of \$14.58 per mmBtu.<sup>7</sup> As new projects are added each year and projects meet the 2015-2020 energy standard, ongoing annual savings to the State and other building owners will increase. Based on submitted anticipated performance the 109 completed SB 2030 projects are estimated to have saved 1,765 million kBtu, avoided 216,000 tons of CO<sub>2</sub>e and saved \$25.7 million as of January 1, 2018. The total cost of the program using CIP funds is approximately \$4.75 million through December 2017.

Example projects recently participating and contributing to this savings, and which were recently recognized at the [2017 Best of B3 Award Event](#) include:

- Higher Ground Saint Paul: 112,750sf building in Saint Paul. Annual savings over code are estimated at 2,400 mmBtu, \$35,000 and 99 tons of carbon
- Department of Natural Resources Glenwood Area Office Facility: 6,765sf building in Glenwood. Annual savings over code are estimated at 384mmBtu, \$5,600 and 20 tons of carbon

## SB 2030 Program Progress

Initial efforts have focused on the development of the tool that will be used to establish customized Energy Standards and development of the administration of the program. Ongoing efforts include the creation of a case study database, the development of a sustainable building operations system, the integration of *SB 2030* with the utilities' CIP programs, hosting education classes for designers and building operators, and assisting design teams in the integration of the *SB 2030* Energy Standards into projects.

- **Case Studies Database** - As part of the program, predicted building performance has been documented for 91 *SB 2030* projects. Reported metrics include predicted energy use, carbon emissions and construction costs, along with several water, waste, and indoor environmental quality metrics. These case studies, which are in various stages of the design process or operation, are displayed online on the [B3 Case Studies Database](#), where owners and project teams can market their successes, and design teams can search for strategies that may help them reach the SB 2030 Standards. As operations data is collected for these projects the case studies database will update, allowing the evaluation of their actual performance.

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<sup>7</sup> The average cost per kBtu from the B3 Benchmarking database is \$0.01458 for the most recent available estimate (assuming a mix of electricity, gas, and other fuels). For the 2018 report the data used to estimate program savings was improved from prior years – restricting the evaluation to only Minnesota buildings in the B3 Benchmarking program. Previously reported data has not been amended to reflect this change.

- **Sustainable Building Operations** - It is essential that *SB 2030* designed buildings are operated at the energy standards that they were designed to achieve. To do this, building operators need methods to ensure that each significant energy consuming device is using only as much energy as needed to perform its intended function. A web-based application has been developed to enable building operators to perform this function by completing occasional routine checks on large energy consuming equipment in the building. This application performs four critical functions:
  - Enables users to create a customized set of tasks for a particular building,
  - Notifies building operators when tasks are due to be completed,
  - Supplies detailed instructions on how to perform the task, and tracks completion and status of tasks for a building, and
  - Notifies facilities managers when tasks uncover malfunctioning systems.

Seven tasks are currently supported in the online tool, and tasks for heat recovery and demand-controlled ventilation are under development. The Center for Energy and Environment is working toward the completion of manuals for two pilot buildings. CSBR is working with Minnesota RETap members to deploy the Operations procedures in buildings at their sites. There are currently thirty buildings enrolled in the online tool.

- **SB 2030 Utility Programs** - As the *SB 2030* energy performance standard has been implemented, the project team has worked cooperatively with utilities to develop and/or modify CIP programs to encourage new buildings to meet the *SB 2030* standards. Priority items are listed below.
  - A) Comprehensive design assistance services.
  - B) Bonus incentives (per unit of savings) for achieving *SB 2030* standards.
  - C) Comprehensive whole-building performance program for small buildings.

No utilities have yet provided financial incentives related specifically to achieving the *SB 2030* Energy Standard. New construction programs do provide incentives based on energy savings for performance over and above the energy code, as well as no-cost services for projects committing to a high level of savings, including reporting of the *SB 2030* Energy Standard, and B3 Guidelines tracking tool entry of data and submittals.

- **Sustainable Building 2030 Education** – Educational programs for the designers continue to be delivered. In 2017, a two series of 3 educational seminars were conducted to introduce best practices when creating low energy buildings. Over 170 building designers participated in each of these 4-hour educational events. A one-hour presentation was conducted for the second time in May 2017 for facility managers and agency contacts of the Minnesota State Colleges and Universities. A series of presentations at facilities conferences for the University of Minnesota and Minnesota State Colleges and Universities have also been conducted. A two-hour presentation was given at the November 2017 American Institute of Architects Minnesota State Convention. Other presentations in 2017 include the 6th Annual Technology Solutions

for Sustainable Buildings 2030 on December 7, 2017 at the Science Museum of Minnesota. Throughout the year several “lunch and learns” were also presented to design firms.

## ***SB 2030* Next Steps**

All work on the *SB 2030* program completed to-date shows it is cost effective to meet the 2010 target. Ninety four percent of all buildings involved in the program were able to meet the *SB 2030* Energy Standard with little additional cost to the overall projects. Total project costs are \$4.75 million through December 2015.

The 154 buildings designed to the *SB 2030* Energy Standard are predicted to save approximately 867 million kBtus/year, 107,000 tons of CO<sub>2</sub>e and a savings of \$12.6 million per year. When new projects are added each year the annual savings to the State and other building owners will continue to grow. Savings from the 109 *SB 2030* projects in operation are estimated at 1,700 million kBtu, 216,000 tons of avoided carbon at a cost savings of \$25.7 million.

The program has demonstrated the value of establishing customized performance targets early in the design process, which allows projects flexibility in how to best achieve those targets. The savings to-date reflect the significant energy, cost and carbon savings achieved by the program. More educational opportunities are needed for architects and engineers to facilitate more *SB 2030* designs. The building operator training program has been developed and is being applied to pilot projects. Two of the three largest electric investor owned utilities have developed comprehensive design assistance services, but not all utilities have fully integrated *SB 2030* programs into their CIP as required by statute.

Finally, work must continue on the next stages of the *SB 2030* program to support the reduction requirement for new projects, which have increased from 60% to 70% reduction as of January 2015. This will require continued research from the project team lead by the Center for Sustainable Building Research at the University of Minnesota.