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ACEC/Mn Vertical Construction Conference October 27, 2015

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BUILDINGS, BENCHMARKS & BEYOND
Tools and Programs for Sustainable Buildings in Minnesota



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B3 History IN MINNESOTA



- Hennepin County Sustainable Building Guidelines developed in 1995.
- The B3 Sustainable Building Guidelines were established in 2004 for all new state-bonded projects.
- B3 Benchmarking was established in 2004 to track all public building energy use in Minnesota.
- The B3 Guidelines were updated in 2008 to include all substantial renovations.
- The original energy requirement in the B3 Guidelines was 30 percent below the State Building Code. **This was replaced by the Energy Standard from the SB 2030 program in 2009.**



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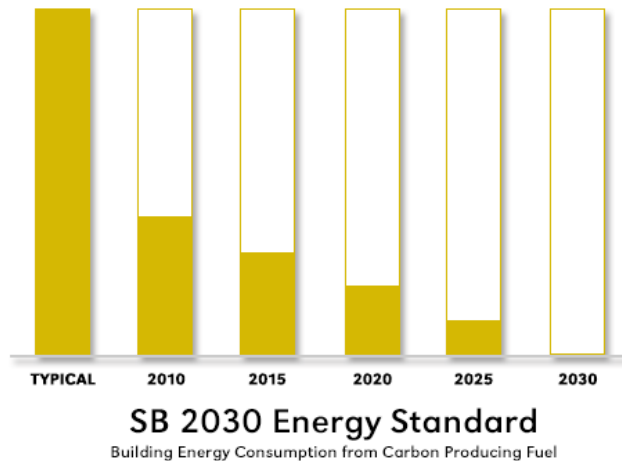
B3 History IN MINNESOTA



- The purpose of the program was to make the guidelines “performance based” so each project team could determine the most cost effective method of obtaining the objective
- The guidelines were designed to be connected to real outcomes
- The guidelines were to reflect the environmental issues of Minnesota and attempt to address these issues
 - Energy reduction and bldg. commissioning
 - Water reduction and pollution
 - Indoor Air Quality
 - Project Management/Commissioning



Sustainable Buildings 2030



- The SB2030 initiative was passed by the Minnesota legislature in the 2008 session.
- The purpose is “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 ...**”
- These standards have become the energy use requirements for state-bonded projects through the B3 Guidelines (Minnesota Sustainable Building Guidelines).



Legislation 2004/2009/2010

- Center for Sustainable Building Research at the University of Minnesota to coordinate development and implementation of energy-efficiency performance standards, strategic planning, research, data analysis, technology transfer, training, and other activities related to the purpose of Sustainable Building 2030.



Specific Tasks

- Training architects to incorporate the performance standards in building design;
- Incorporating the performance standards in utility conservation improvement programs; and
- Developing procedures for ongoing monitoring of energy use in buildings that have adopted the performance standards.



Additional Specification

- Sustainable Building 2030 energy-efficiency performance standards must be firm, quantitative measures of total building energy use and associated carbon dioxide emissions per square foot for different building types and uses, that allow for accurate determinations of a building's conformance with a performance standard.



Additional work may include:

- Research, development, and demonstration of new energy-efficiency technologies and techniques suitable for commercial, industrial, and institutional buildings;
- Analysis and evaluation of practices in building design, construction, commissioning and operations, and analysis and evaluation of energy use in the commercial, industrial, and institutional sectors;
- Analysis and evaluation of the effectiveness and cost-effectiveness of Sustainable Building 2030 performance standards, conservation improvement programs, and building energy codes;
- Development and delivery of training programs for architects, engineers, commissioning agents, technicians, contractors, equipment suppliers, developers, and others in the building industries; and
- Analyze and evaluate the effect of building operations on energy use.



Impact of B3 Programs

3 GUIDELINES

B3 Guidelines

- 258 projects in B3 Guidelines (including SB2030 projects)

3 SB 2030 ENERGY STANDARD

SB2030 Program

- 40 buildings from 2009-2012 (now over 70)
- Savings of 250 million kBtus/year
- Savings of \$3.25 million per year

3 BENCHMARKING

B3 Benchmarking

- Over 7,500 buildings representing over 300 million SF in program
- Identified over 1,500 buildings that would be good candidates for improvement (18% of the population)
- Savings of 1,850 million kBtu per year
- Potential Savings of 23 million dollars per year



RECENT AIA DOCUMENT

SUSTAINABILITY LEADERSHIP OPPORTUNITY SCAN



October 2013

Prepared for the AIA by Mary Ann Lazarus, FAIA, LEED AP BD+C, AIA Resident Fellow

CORE issues are central to the architect's role in the built environment.

Energy: Drive building energy efficiency and use of renewable energy toward meeting the AIA 2030 goals.

Materials: Make material selections that are informed by the full life cycle and health-related criteria that lead to healthy and sustainable environments.



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RECENT AIA DOCUMENT

SUSTAINABILITY LEADERSHIP OPPORTUNITY SCAN



October 2013

Prepared for the AIA by Mary Ann Lazarus, FAIA, LEED AP BD+C, AIA Resident Fellow

EMERGING issues are rapidly escalating at the community scale, where architects can provide a wide range of design solutions that will contribute to a better environment for current and future generations.

Design & Health: Play an active role in improving human health and wellness through the design of the built environment.

Resilience: Promote design that adapts to changing conditions and that maintains or regains functionality and vitality in the face of natural and man-made disturbances.



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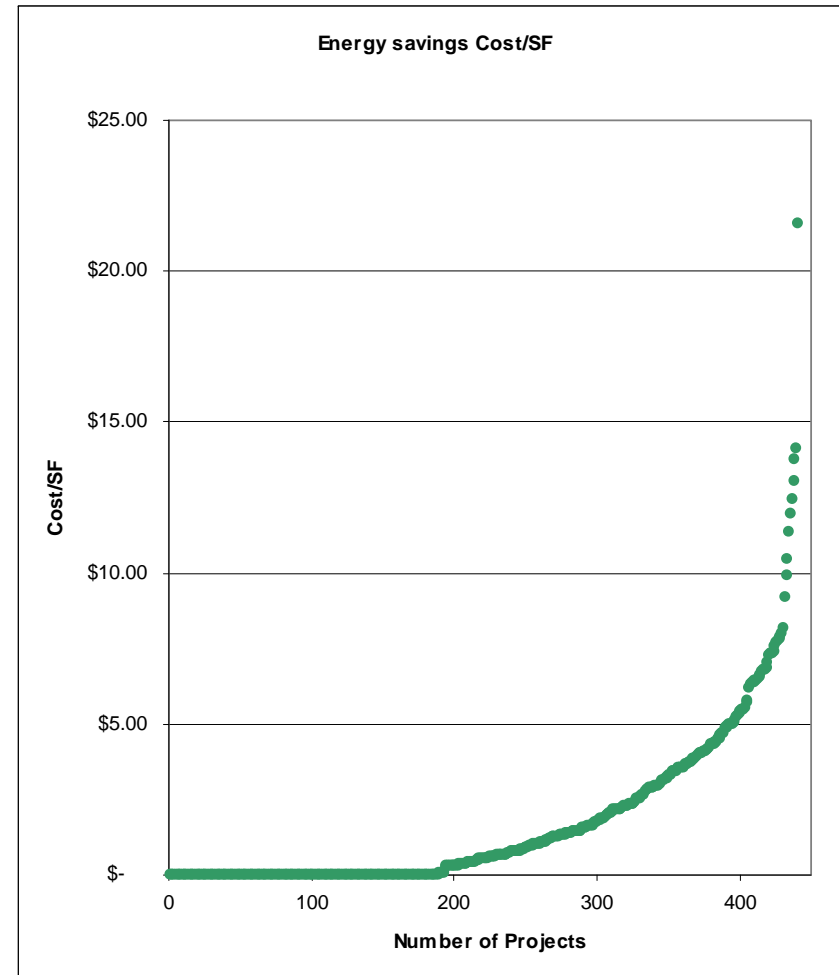
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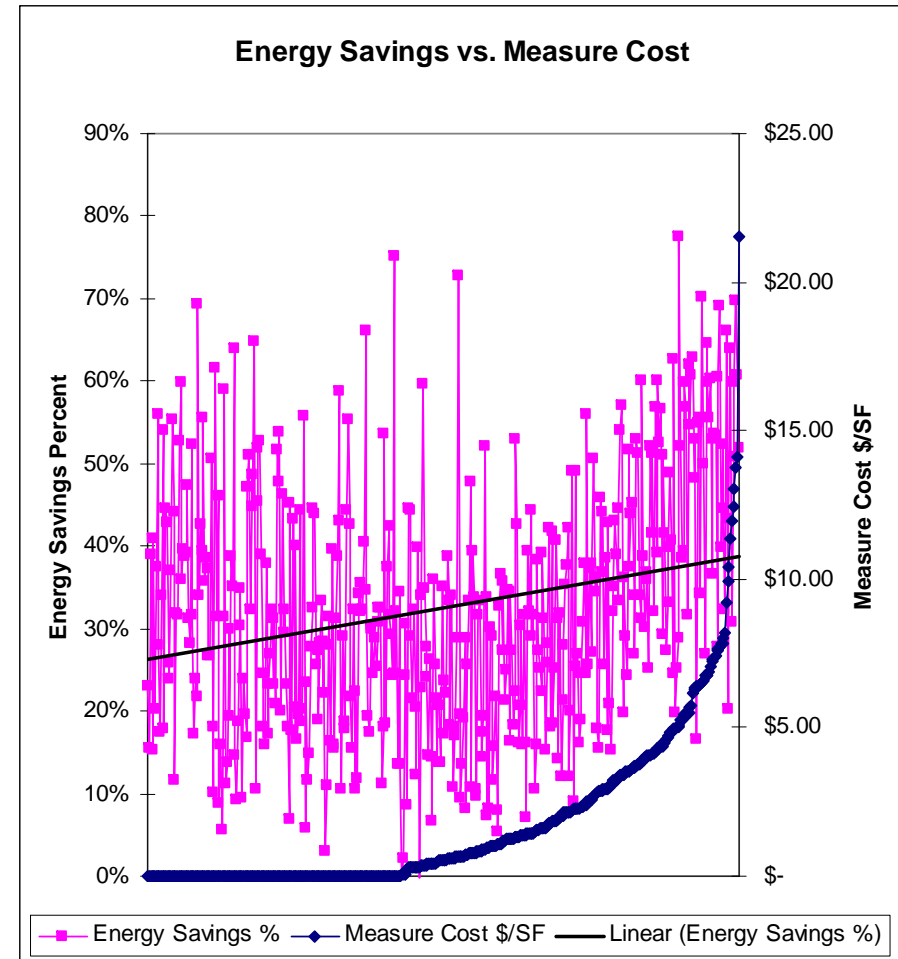
Energy Conservation Costs New Buildings

- 441 Recent Buildings
 - Average incremental cost: \$1.74/SF
 - Average payback after incentives: 1.6 years
 - Average of 2010 measures: \$5.22/SF
 - Average 2010 payback: 3.2 years

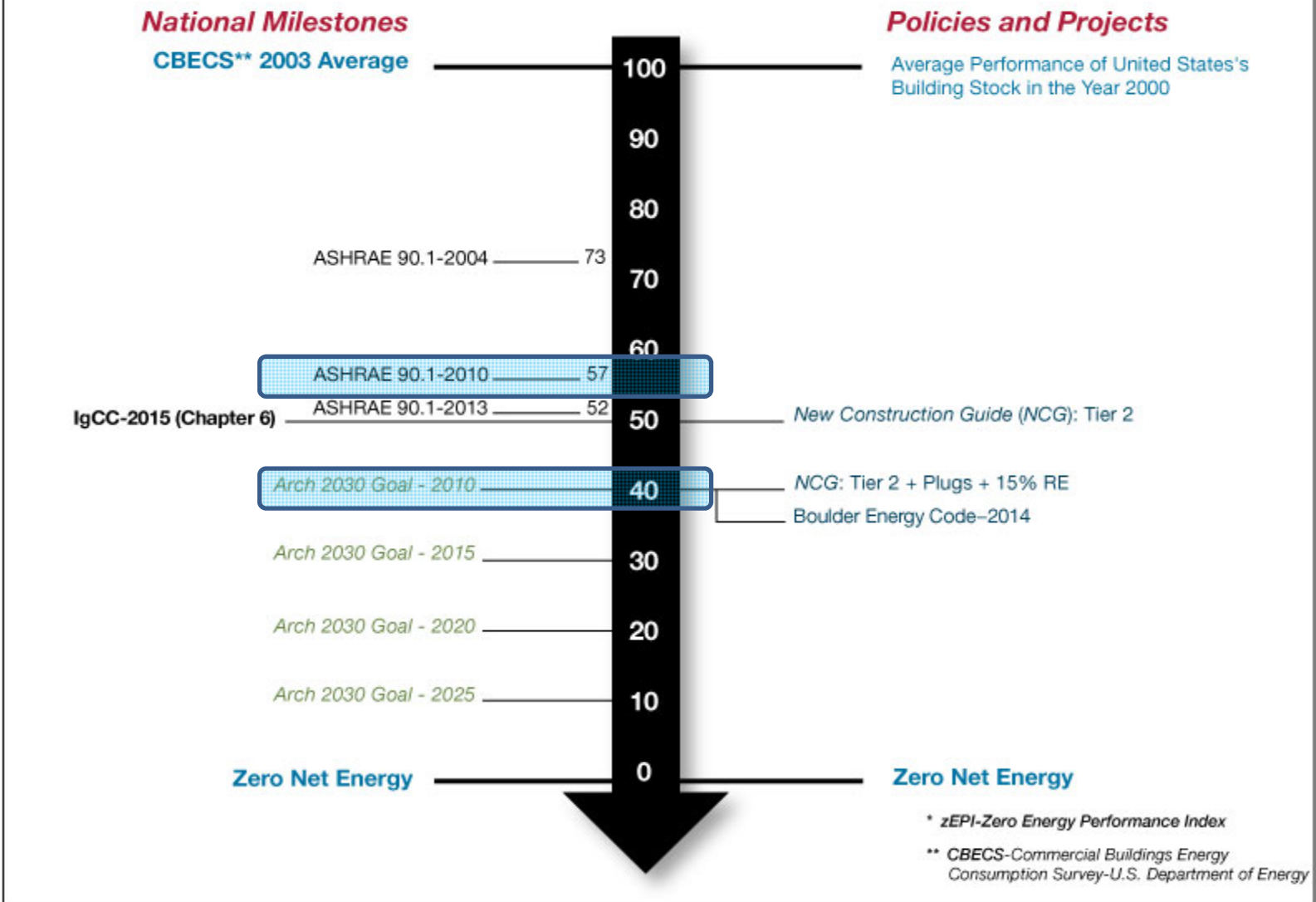


Good Design Can Lead to Good Savings

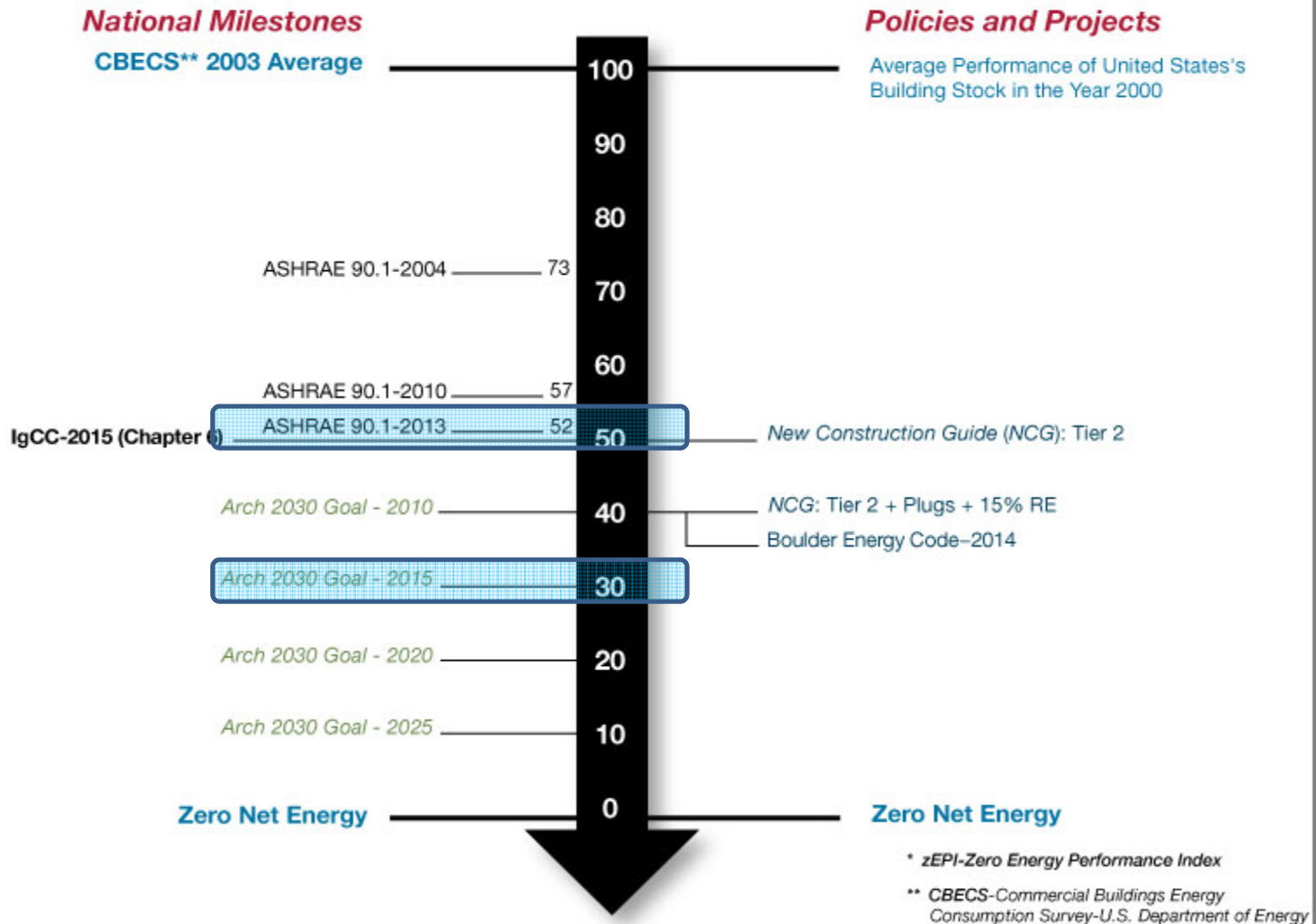
- Higher investment tends to lead to higher savings but only slightly
- Good design at low cost frequently leads to significant savings



zEPI* Scale to ZNE



zEPI* Scale to ZNE



New WEB SITE—www.b3mn.org



Buildings, Benchmarks & Beyond

The B3 tools and programs are designed to help make buildings more energy efficient and sustainable. The B3 programs have been developed for and are required on State-funded projects in Minnesota, however they are easily applied to any project. The B3 Guidelines and the SB 2030 Energy Standard can be applied to new and renovated buildings during design. B3 Benchmarking, B3 Energy Efficient Operations and the B3 Post Occupancy Evaluation (POE) can be used to evaluate and improve existing buildings.

Design of New Buildings and Renovations



Use **B3 Guidelines** on new buildings or renovations to meet sustainability goals for site, water, energy, indoor environment, materials and waste.

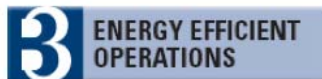


Use the **SB 2030 Energy Standard** to meet energy use goals only. If the B3 Guidelines are used, the SB2030 Energy Standard is automatically included in the process.

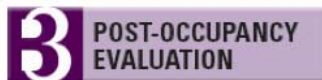
Operation of Existing Buildings



Use **B3 Benchmarking** to track and compare energy use on existing buildings. The B3 Guidelines and SB2030 Energy Standard direct the user to the B3 Benchmarking tool.



Use **B3 Energy Efficient Operations** to minimize energy use during building operations. This program can be applied to any existing building.



Use **B3 Post Occupancy Evaluation (POE)** to determine occupants' perceptions of the buildings' indoor environmental quality. The POE survey is required for B3 buildings.

WELCOME

We have a new web site and graphic design to make it easier to understand and use the B3 tools and programs. Use the buttons on the left to access all of the major program components. The footer on every page of the web site also contains links to the programs as well as the B3 Case Studies and other background information.

B3 CASE STUDIES

The **B3 Case Study Database** provides design and performance information on projects using the B3 Guidelines and the SB2030 Energy Standard. Each project case study includes a Scorecard with several performance metrics including energy, carbon, water, stormwater, and waste. The case study also includes an SB2030 Label indicating the projects Energy Use Intensity (EUI) during design and actual performance.

CONTACT US

If you have any questions or suggestions for improvements, please contact us.

B3 Program Overall
Patrick Smith, smit2059@umn.edu

B3 Guidelines
Patrick Smith, smit2059@umn.edu

B3 SB 2030 Energy Standard
Patrick Smith, smit2059@umn.edu



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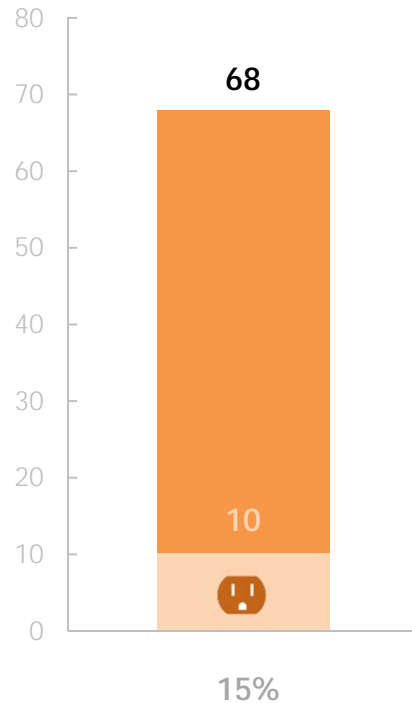
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New Guidelines—VERSION 2.2

3 GUIDELINES

KBTU/SQ.FT./YEAR



PLUG LOAD METERING



- Document predicted and actual energy use, including recording **modeled plug loads** and **sub-metered actual plug loads** separately from other electrical loads
- Meter Plan Guidelines and Examples

IMPORTANCE

- As other building systems are optimized, plug loads (miscellaneous energy loads) are becoming **an increasingly large portion of end use**.
- The energy models for 19 B3 projects show that plug loads range from **8-28%** of the total design energy use, with a weighted average of **15%**.
- There is a **lack of data** comparing modeled plug loads to actual plug loads.



NEW FEATURES OF SB2030



- Addition of more building types in Energy Standard Tool
- Addition of domestic hot water use to energy calculations
- Addition of parking lot and exterior lighting to energy calculations
- Tiered system of methods to set energy standard for a building
 - Under 5,000 sf—use Interim Standard
 - Over 5,000 sf—use Energy Standard Tool
 - Alternate method for buildings 5,000-20,000 sf—use ASHRAE Small Building Guides for certain building types – not modeling



NEW PROGRAMS

3 ENERGY EFFICIENT OPERATIONS

- Development of a Building Operations Manual
- Pilot testing on several projects
- Development of new software tool for managing energy-efficient operations tasks in Building Operation Manual

3 POST-OCCUPANCY EVALUATION

- Required on B3 projects at 9 and 18 months for applicable buildings
- Development of an on-line POE Survey
- Pilot testing on several projects



Key Steps

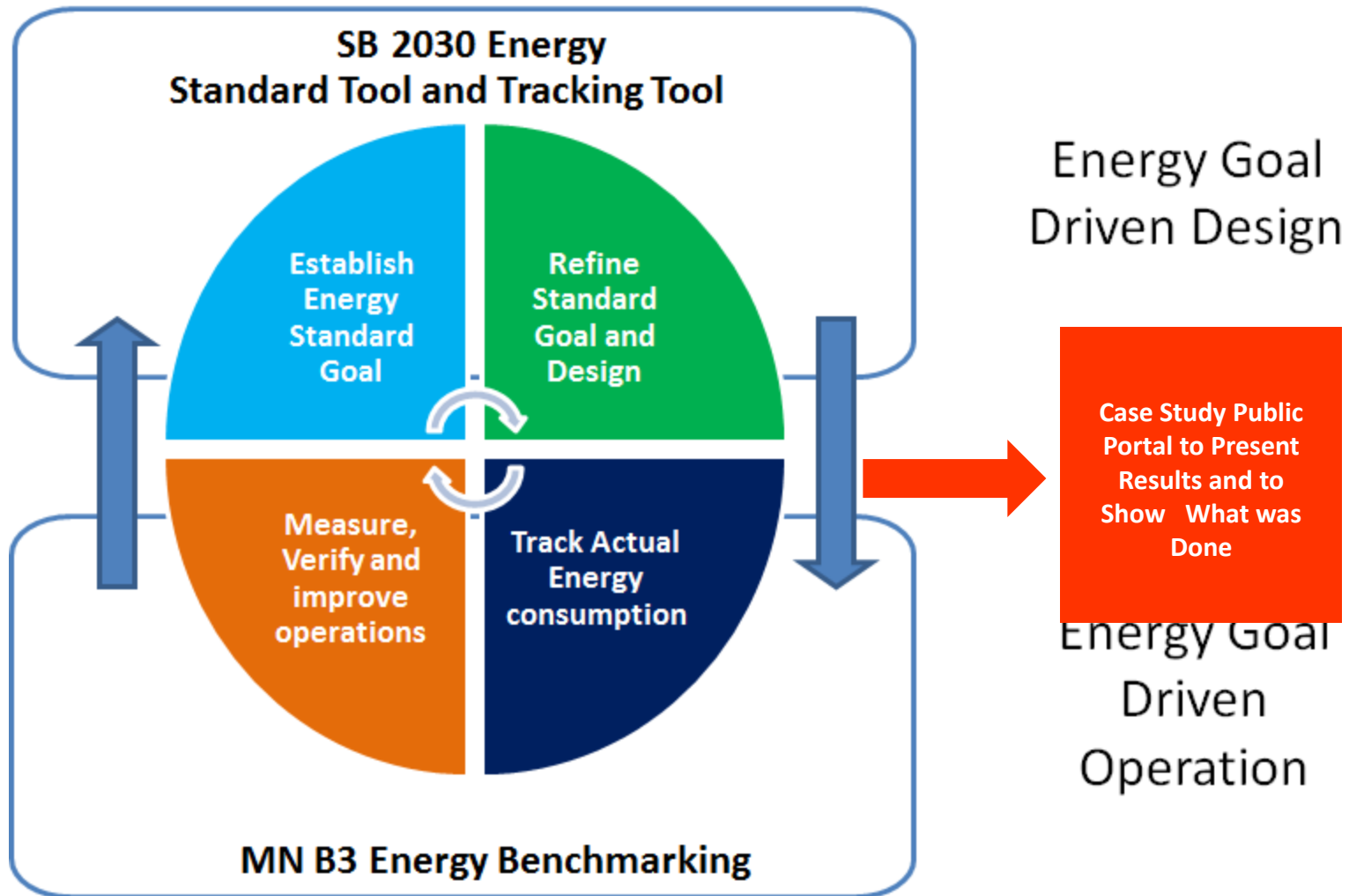
3 GUIDELINES

TRANSITION TO OPERATIONS

- When the B3 Tracking Tool has completed the last Design phase
- Tracking tool is ready to be converted from Construction Mode to Operations Mode
- Project is automatically entered into the B3 Benchmarking tool to set monthly energy targets and track monthly energy consumption



Influencing Building Performance During Design and Ongoing Operations



TRANSITION TO OPERATIONS – Building metering



All energy and water consumption is required to be reported in the B3 Tracking tool for ten year after the substantial completion of the B3 projects

What to do when B3/SB 2030 buildings are not metered separately from other campus buildings?

- Energy and Water meters are and were required on all B3 projects
- Energy Meters for all fuel types
- Building Automation System (BAS) tracking points
- External Flow meters where appropriate



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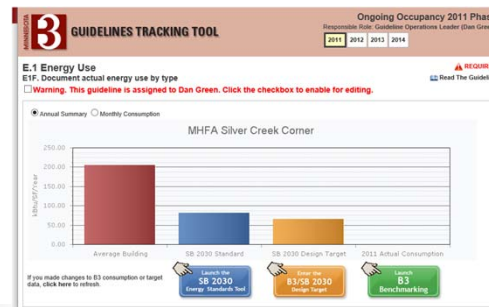
How the Program Works

- Uses a web-based workflow tool that makes all building owners and design teams accountable for the projects' performance
- Establishes a custom energy target for specific building program parameters and climate location

- Set Target by Building Program and Climate

- Enter Design Performance and Strategies

- Track Actual Energy and Compare to Target




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Tools and Programs for Sustainable Buildings in Minnesota



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TRANSITION TO OPERATIONS



Ongoing Occupancy 2011 Phase
Responsible Role: Guideline Operations Leader (Dan Green)

2011
2012
2013
2014
2015

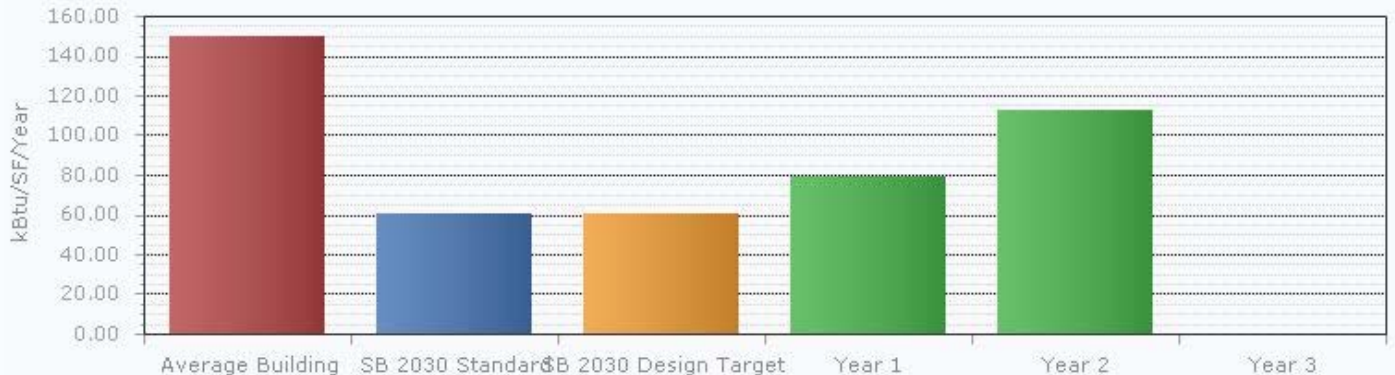
E.1 Energy Use ✔ COMPLETE

E1F. Document actual energy use by type 📖 Read The Guideline

Warning. This guideline has already been signed off. Click the checkbox to enable for editing.

Annual Summary
 Monthly Consumption

MHFA Silver Creek Corner



Category	kBtu/SF/Year
Average Building	~150
SB 2030 Standard	~60
SB 2030 Design Target	~60
Year 1	~80
Year 2	~115
Year 3	~115

👉 Launch the
SB 2030
Energy Standards Tool

👉 Enter the
B3/SB 2030
Design Target

👉 Launch
B3
Benchmarking

If you made changes to B3 consumption or target data, click here to refresh.



Key Steps



- Problem: 15 to 20% of energy use is wasted and is not detectable by normal operation
- Solution: A practical, cost effective easy-to-use early waste detection method
- The necessary elements of the method are:
 - Knowledge of largest energy wasting systems
 - A simple task to detect waste
 - A calendar to perform the task
 - The capability to correct the problem



Key Steps



- Conduct Post Occupancy Evaluations at 9 and 18 months for supported building types

The screenshot shows the B3 Post-Occupancy Evaluation (POE) Web Site. The header includes the B3 logo, the text "POST-OCCUPANCY EVALUATION", and a search bar. Below the header is a navigation menu with "POE Home", "About B3 POE", and "Contact". The main content area features a welcome message, a description of the POE process, and a list of evaluation levels. A photograph of an office workspace is also included.

Welcome to the B3 Post Occupancy Evaluation (POE) Web Site

As with other B3-MSBG compliance objectives aimed at demonstrating real outcomes from sustainable design guidelines, a post-occupancy evaluation (POE) method is used to collect occupants' (employees') feedback about their perceptions of the Interior Environment Quality (IEQ) related to their physical environments.

Analysis of the results provides insights into employees' satisfaction with their workspaces and perceptions of their performance and health as related to the overall building. These results help to inform business and building owners, facility managers, and designers how occupants perceive the building and serve as a diagnostic tool if problems exist.



The B3-MSBG utilizes the Sustainable Post-Occupancy Survey (SPOES) for buildings enrolled in the B3-MSBG project tracking system to collect occupant feedback. Survey events are coordinated with a designated 'Site Survey Coordinator' and distributed to building occupants at nine and eighteen months following occupancy.

Buildings may be **exempt** from the POE process based on the number of occupants, building type, or building function. Additional exemptions from the POE process are considered on a project-by-project basis. Buildings not following the B3-MSBG are also welcome to participate in the SPOES survey for a fee (see [Fee Schedule](#)) to cover administrative, analysis and report costs.

Scan Level
(approximately 10 minutes to complete per employee)

- Meets B3 Guidelines requirement (free administration and analysis for B3 buildings)
- Examines occupant satisfaction levels and the IEQ criteria in the physical environment (primary workspace)
- Measures "vital signs" of the building's IEQ based on occupants' perceptions
- Provides a quick evaluation of occupants' satisfaction with the IEQ sustainable criteria
- Offers some diagnostic potential
- Compares IEQ of building to benchmarks
- Available for non-B3 buildings for a fee (see [fee schedule](#)); administered and analyzed by CSBR

Core Level
(approximately 15 minutes to complete per employee)

- Includes all of Scan Level questions plus...
- Examines occupants' satisfaction levels + perceptions of their performance and the IEQ criteria in the physical environment (primary workspace)
- Connects responses to workstation location
- Analyzes relationships between occupants' satisfaction, IEQ criteria, and occupant perceptions
- Available for B3 and non-B3 buildings for a fee (see [fee schedule](#)); administered and analyzed by CSBR



Key Steps

3 POST-OCCUPANCY EVALUATION

WHAT IS A POE?

- Post-occupancy evaluation (POE)
- On-line survey sent to employees
- Questions related to their **satisfaction** with the Interior Environmental Quality (IEQ) of overall building and in-depth questions about their **workspace**
- Branded as **SPOES** (sustainable post-occupancy evaluation survey)



Key Steps

3 POST-OCCUPANCY EVALUATION

WHY CONDUCT A POE?

- To provide feedback on design solution and building performance...from occupants
 - Knowing which IEQ components influence employees' satisfaction with their work environments affects the business owners' economic bottom line via occupants' enhanced productivity and businesses' reduced recruiting and training expenses.
- To compare the buildings' metrics to benchmarks, industry standards, and other buildings



NEW CASE STUDY DATABASE

The screenshot shows the B3 Case Studies Database website. At the top left is the logo with 'MINNESOTA' and a large '3'. The main header reads 'CASE STUDIES DATABASE'. A search bar on the right says 'Search for a project by name'. Below the header is a navigation bar with 'Case Studies Home' and 'Contact'. The main content area is split into two columns. The left column contains filters: 'Organization: (All Organizations)', 'Building Type: (All Buildings)', and 'Choose Specific Strategies' with a tree view including 'Energy & Greenhouse Gas', 'Appliances', 'Domestic Hot Water' (with sub-options like '95% or greater DHW Effici' and 'Heat Pump DHW Heating'), 'Envelope / Insulation', 'HVAC', 'Lighting', and 'Massing'. A 'Search' button is at the bottom of the filter panel. The right column contains a descriptive paragraph: 'The B3 Case Studies Database provides design and performance information on projects using the B3 Guidelines and the SB 2030 Energy Standard. Each project case study includes a Scorecard with several performance metrics including energy, carbon, water, stormwater, and waste. The case study also includes an SB 2030 Label indicating the projects Energy Use Intensity (EUI) during design and actual performance.' Below this are view options: 'Tile View' (selected), 'Card View', 'Table View (Energy)', and 'Table View (Compliance)'. It says 'Showing 43 projects' and displays a grid of 24 project thumbnails. Some thumbnails have text labels: 'BEAR HEAD LAKE TRAIL CENTER', 'CAMP RIPLEY EDUCATION CENTER', 'CRYSTAL SPRINGS HATCHERY MANAGER'S RESIDENCE', 'ITASCA BIOLOGICAL FIELD STATION', and 'JACKSON'.



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Use the filters below to narrow down to a specific organization, building type, or set of strategies.

Organization:

Minnesota State Colleges and Universities

Building Type:

(All Buildings)

Choose Specific Strategies

Table Views:

Energy View

Columns:

- Project
- Organization
- City
- Building Type(s)
- Construction Type(s)
- SF
- Owner
- Architect

Submit

Reset












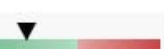



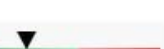


Export To Excel

The B3 Case Studies Database provides design and performance information on projects using the B3 Guidelines and the SB 2030 Energy Standard. Each project case study includes a Scorecard with several performance metrics including energy, carbon, water, stormwater, and waste. The case study also includes an SB 2030 Label indicating the projects Energy Use Intensity (EUI) during design and actual performance.


Tile View

Card View

Table View


Project	Organization	Building Type(s)	SF	Energy Standard EUI (kBtu/SF/Yr)	Energy Design EUI (kBtu/SF/Yr)	Energy Ratio Standard/Design	Energy Ratio Graphic
 ICC Academic Classroom Addition & Renovation	Minnesota State Colleges and Universities	Classroom	12,400	98	42	0.43	
 MSU Livingston Lord Library	Minnesota State Colleges and Universities	Library	131,993	79	45	0.57	
 MSU Science Education Center	Minnesota State Colleges and Universities	Laboratory, Classroom	64,163	154	69	0.45	
 NCC Academic Partnership Center	Minnesota State Colleges and Universities	Classroom, Office	76,000	102	95	0.93	
 NCTC Aviation Addition and Renovation	Minnesota State Colleges and Universities	Airplane Hangar, Classroom, Laboratory	20,370	69	78	1.13	
 NHCC Bioscience and Health Careers Center	Minnesota State Colleges and Universities	Classroom, Laboratory, Student Center	62,284	172	68	0.40	
 PTC Entrepreneurship Center and Technology Business Incubator	Minnesota State Colleges and Universities	Office, Classroom	12,110	62	51	0.82	
 SCC Classroom Renovation & Addition	Minnesota State Colleges and Universities	Classroom, Library	18,760	171	67	0.39	
 SCTCC Medium Heavy Truck and Auto Body	Minnesota State Colleges and Universities	Vehicle Maintenance Garage	27,025	85	71	0.83	

Case Study Database



CASE STUDIES DATABASE


Case Studies Home
Contact



Silver Creek Corner

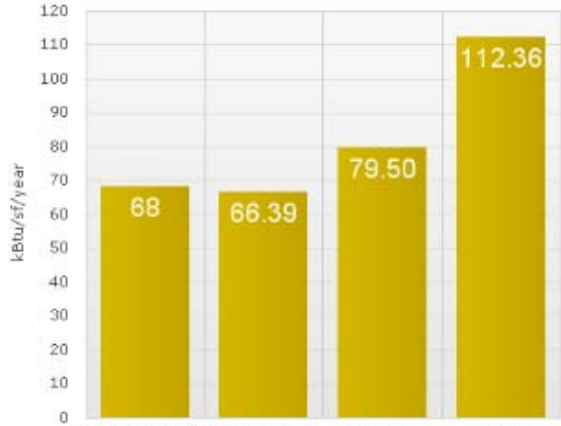
Minnesota Housing Finance Agency
21xx Silver Creek Road
Rochester, MN

- General
- Process
- Energy
- Carbon
- Water
- Stormwater
- Materials
- Cost




ENERGY CONSUMPTION

The project team opted to connect the building to the campus steam heating system for maximum efficiency.



Category	Energy Intensity (kBtu/sf/yr)
SB 2030 Standard	68
As Designed	66.39
Year 1	79.50
Year 2	112.36



0 Net zero 68 SB 2030 Standard 170 Average building

ENERGY STRATEGIES

APPLIANCES

- All Available Appliances Energy Star Certified

ENVELOPE / INSULATION

- R-20 to R-30 Wall Insulation (for Opaque Walls)
- R-40 to R-50 Roof Insulation

HVAC

- District Heating
- Economizer
- Natural Ventilation

LIGHTING

- Continuous Daylighting Controls
- LED Lighting
- Occupancy or Vacancy Sensors
- Stepped Daylighting Controls

MASSING

- Majority of Windows are North / South

OPERATIONS

This graph shows the project's energy use Intensity (EUI), measured in kilo (1,000) British Thermal Units per square foot per year (kBtu/sf/year). It shows the project-specific SB 2030 Energy Standard (which is 60% less than a typical building), the predicted EUI from the project's energy model, and the actual annual EUI from meter readings.



New Construction Projects that Qualify

3 GUIDELINES

APPLICABILITY



- When is your **new construction** project required to meet the B3-Minnesota Sustainable Building Guidelines Standards?
 - If it is funded in whole or partially for design or construction by General Obligation Bonds after **January 1, 2004** (including HEAPR funds), **AND**
 - If is considered a building under the State Building Code, and
 - If it is an addition, it is heated and/or cooled by its own mechanical system,
 - **OR** If it is required by the funding organization
 - (There is no square footage limitation)



Renovation Projects that Qualify

3 GUIDELINES

APPLICABILITY



- When is your **renovated** project required to meet the B3-Minnesota Sustainable Building Guidelines Standards?
 - If it is funded in whole or partially for design or construction by General Obligation Bonds after **January 1, 2009** (including HEAPR), **AND**
 - if the renovation is larger than 10,000 square feet, **AND**
 - there is a replacement of the mechanical, ventilation, or cooling system,
 - **OR** if it is required by the funding organization



The Responsibility of the Agency Contact

3 GUIDELINES

ROLE OF THE CONSULTANT



- It is the responsibility of the Agency Contact to ensure that state GO bonded projects successfully complete the requirements of the Minnesota Sustainable Building Guidelines
- The consultant works at the direction of the Agency Contact
- Failure to meet contract requirements reflects badly on all involved
- Life is easier when everyone works together



Key Steps

3 GUIDELINES

COMPLIANCE



- It is the responsibility of the project teams to keep the B3 tracking tool current
- The B3 tracking tool should be kept **within two months** of the actual project schedule
- Failure to do this will place the project in a non-compliance status
- The Agency Contact and the Guideline Leader receive monthly e-mails for all projects
- Each individual project member receives monthly emails when their portion of the B3 tracking tool is not current.

Key Steps

3 GUIDELINES

STATUS REPORTS



- Every participating organization has access to or receives status report of all their projects.
- These reports are available to a high level manager within the organization
- These reports shows the project compliance or non-compliance status of B3 and SB 2030



Filter

Group / SubGroup:
Department of Employment and

Export
Export To Excel

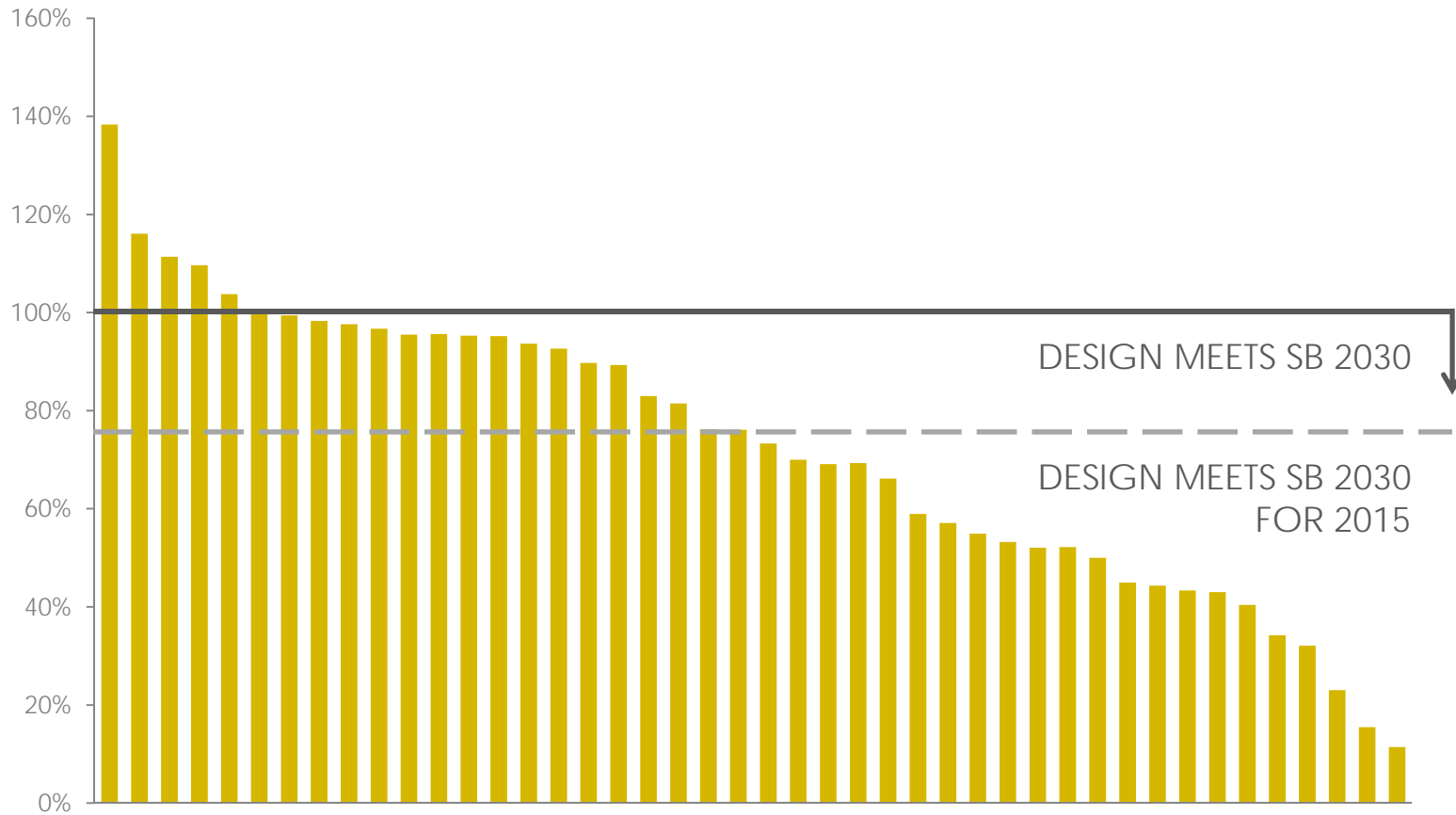
Department of Employment and Economic Development (DEED)

As of 11/8/2013

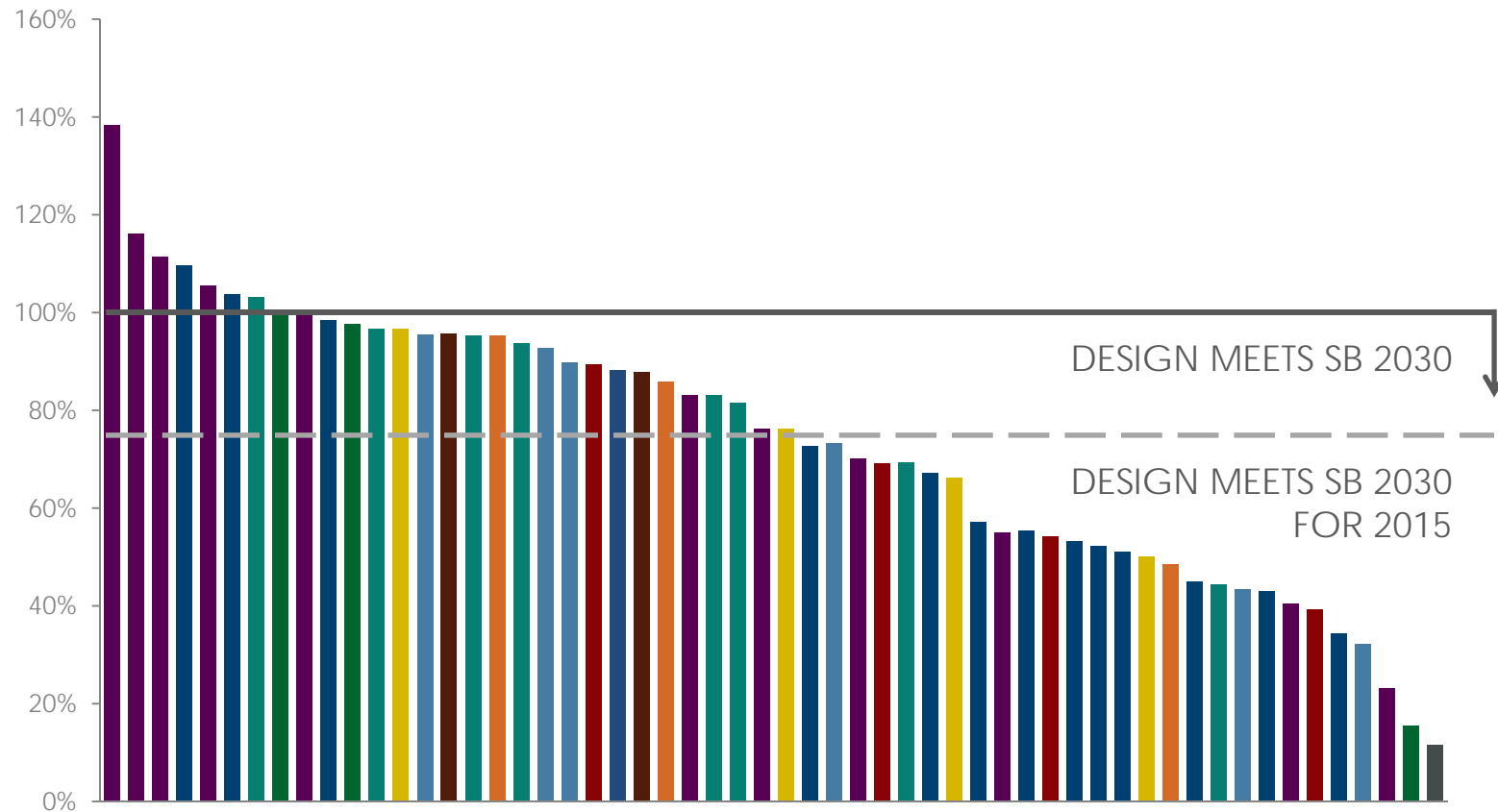
		Total Projects:	Design & Construction Reporting		Operations Reporting		SB2030		TALLY DISPLAYED FOR STATE REQUIRED PROJECTS ONLY
			20		17		6		
Construction Oversight Manager: mark.lothus@state.mn.us		Compliant	1	5%	0	0%	5	83%	
Operations Oversight Manager: (Not specified)		Not Compliant	19	95%	17	100%	1	17%	

Code	Project Name	SF	Proj. Type	Year Completed	Actual		Design & Construction Reporting		Operations Reporting		SB2030		Var.	Contacts
					Current Phase	Signoff Date	Current Phase	Current?	Last Reported	Current?	Standard kBtu/SF	Current kBtu/SF		
State Design and Construction Required Projects - Active														
U31	Austin International Center of Research and Technology	0	New Construction	-	-	-	AP	N			0		0	SubGroup Manager: - Agency Contact: Rich Strong Agency Operations Contact: -
G73	Bemidji Regional Public Television Station	18,038	New Construction	-	CA	4/8/2013	SD	N			118	45	8	SubGroup Manager: - Agency Contact: Rich Strong Agency Operations Contact: -
G28	Duluth Entertainment and Convention Center Arena Expansion	188,700	New Construction	2011	CP	11/30/2011	CA	N			90	80	21	SubGroup Manager: - Agency Contact: Dan Russell Agency Operations Contact: Dan Russell
G16	East Phillips Community Center	16,000	New Construction	2011	CP	2/14/2013	CA	N			48	108	18	SubGroup Manager: - Agency Contact: Julia Cline Agency Operations Contact: -
G80	Hector - Triple J Farms	2,987	New Construction	2014	CA	7/23/2013	DD	N			60		5	SubGroup Manager: - Agency Contact: Rich Strong Agency Operations Contact: -
G71	Hutchinson Business Incubator	0	New Construction	-	AP	9/9/2013	AP	Y			0		0	SubGroup Manager: - Agency Contact: Rich Strong Agency Operations Contact: -

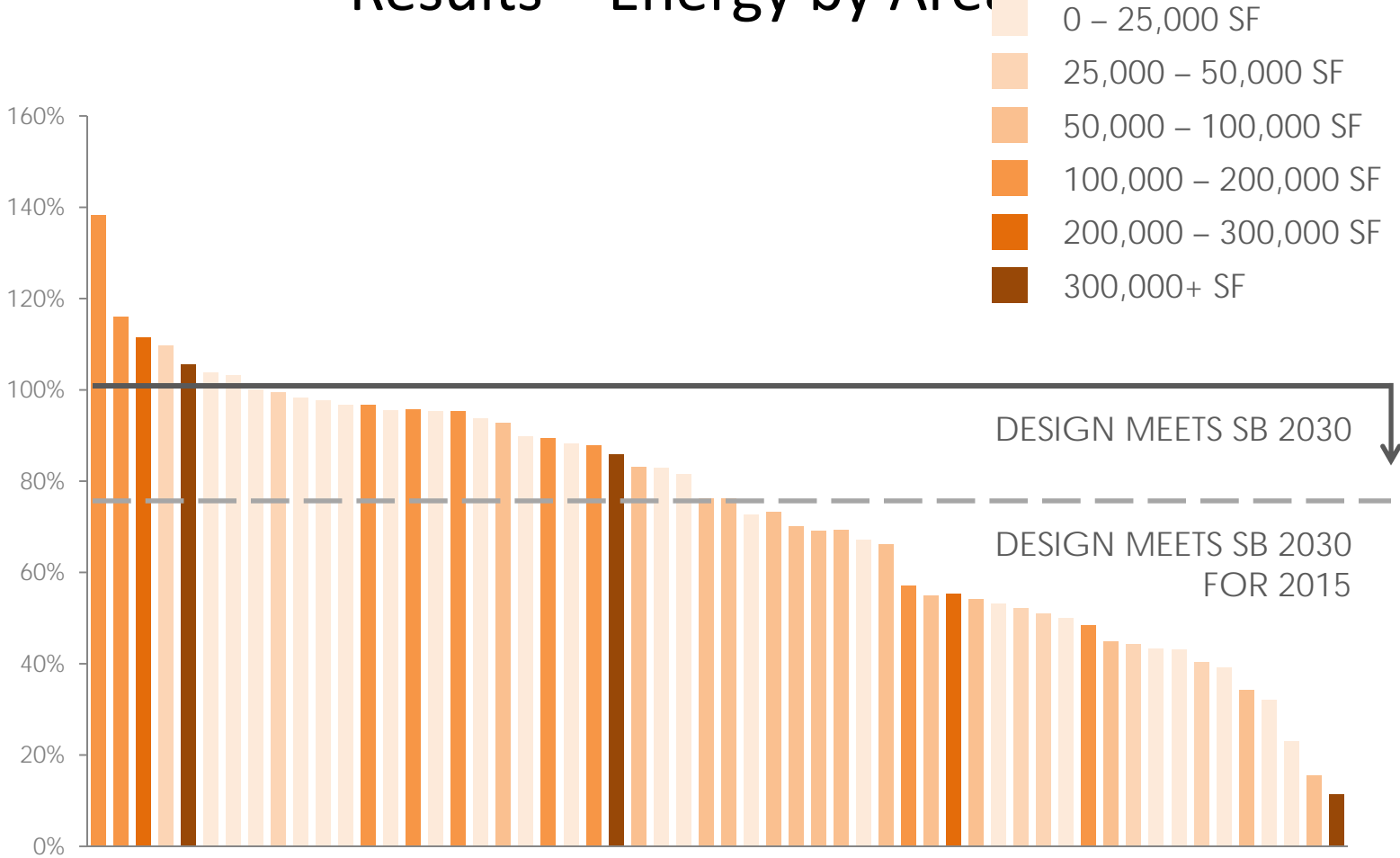
Results - Energy



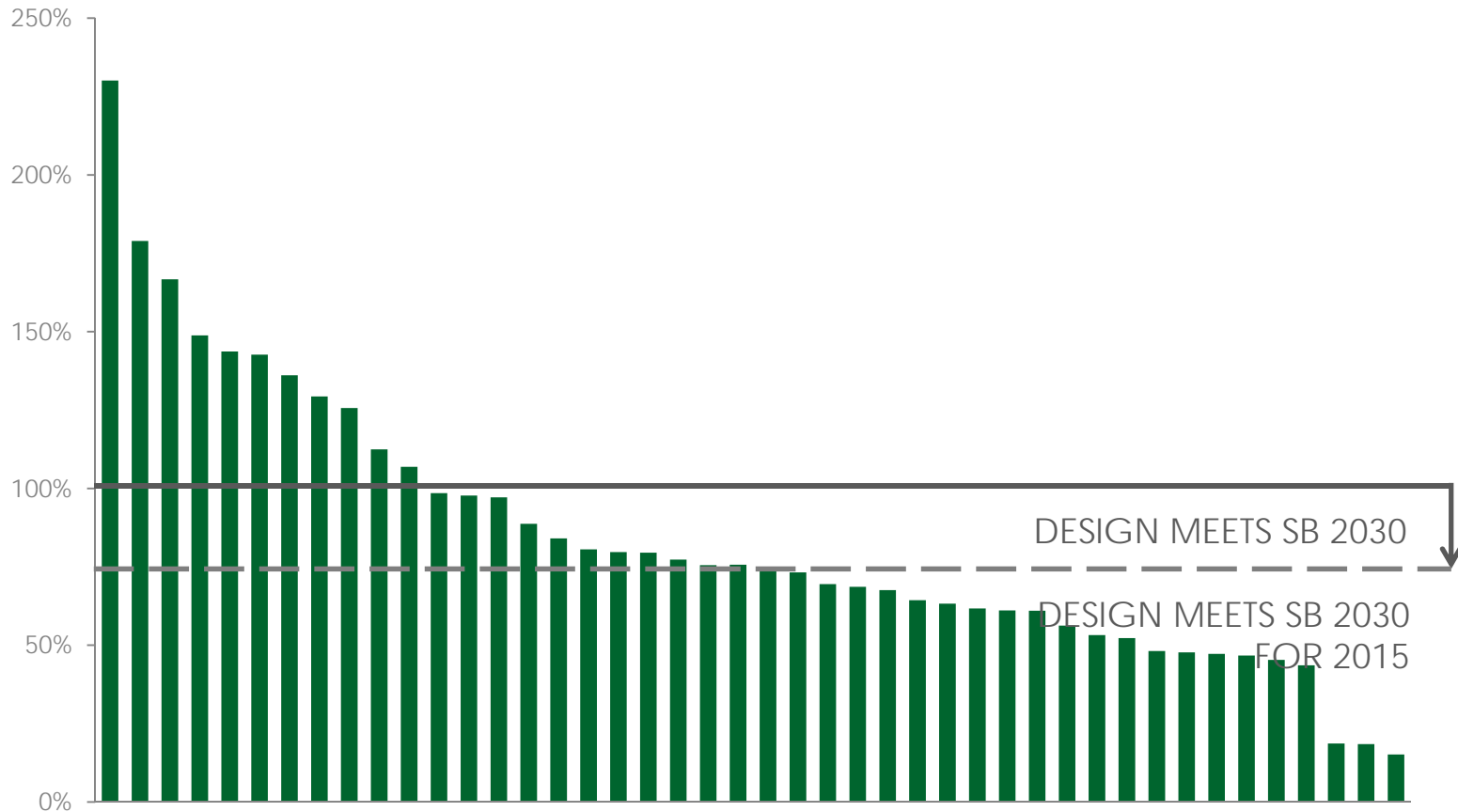
Results – Energy by Organization



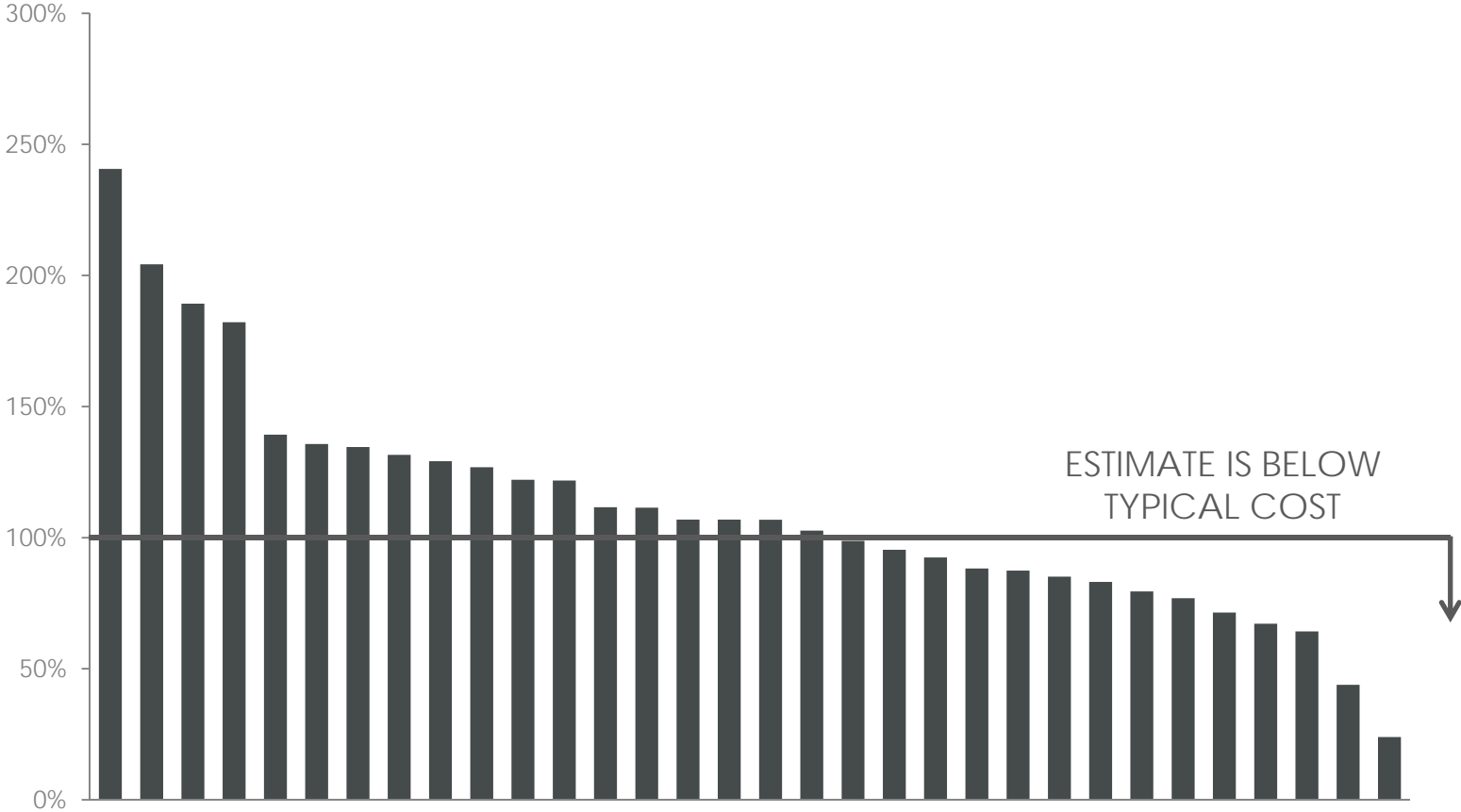
Results – Energy by Area



Results – Carbon Dioxide Equivalents



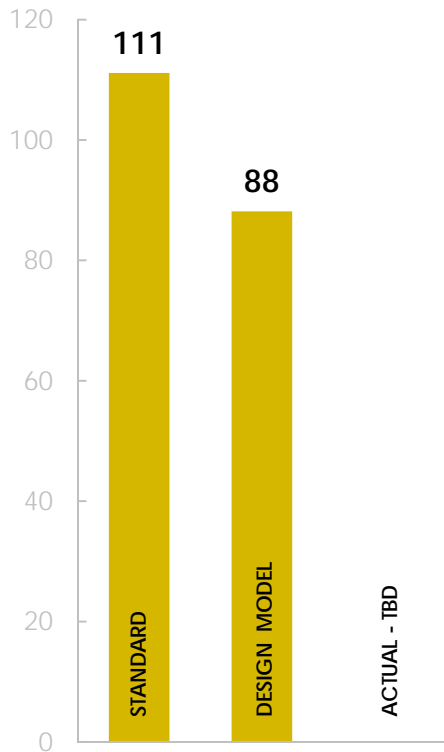
Results – Construction Cost



RESULTS - SUMMARY

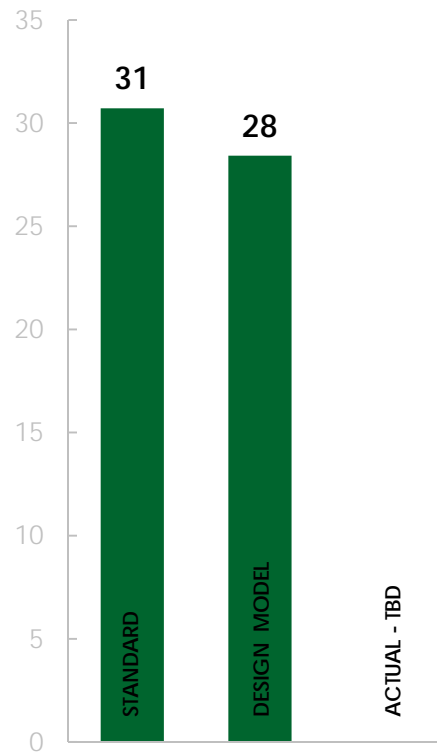
- * Mean EUI of all 45 projects, weighted by area
- ** Mean CO₂e of all 45 projects, weighted by area
- *** Mean cost of 32 projects with both typical and estimates, weighted by area

KBTU/SQ.FT/YEAR



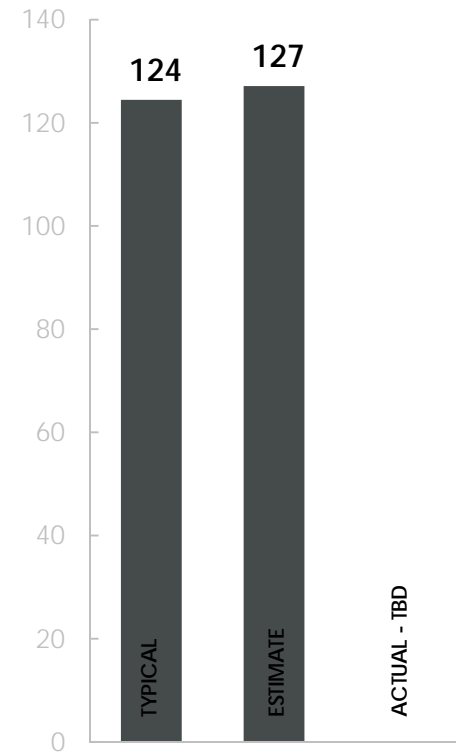
ENERGY *

LB/SQ.FT/YEAR



CO₂e **

\$/SQ.FT



COST ***



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ACEC

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October 27, 2015

Key Steps

3 GUIDELINES

TECHNICAL HELP



- There is technical help available from CSBR initially and from any one of our project consultants.
- The initial point of contact is guidelines@b3mn.org for tracking tool and guideline issues
- The initial point of contact for compliance issues is stn081@umn.edu

