MAXIMIZING YOUR FACILITY'S ENERGY SAVINGS IN PREPARATION FOR RENEWABLE ENERGY

November 2, 2021

20 Years focus on energy®
Partnering with Wisconsin utilities

Presenters

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District B&G Operations Manager
Mukwonago Area School District

What does Focus on Energy do?

- Assists Wisconsin residents and businesses in identifying and implementing energy efficiency projects
- Offers unbiased third-party information and technical assistance to participating utilities' electric and/or natural gas customers
- Provides financial incentives for energy-saving projects that would not otherwise occur

Mission

- Empowers the people and businesses of Wisconsin to make smart energy decisions with enduring economic benefits

Benefits of Focus on Energy

Expert Energy Advisor support

Energy team coordination

Training facility staff

Improving return on investment

Supporting student/ consumer energy education

Economic impact

- For every $1.00 invested, Focus on Energy creates more than $5.00 in benefits for the state of Wisconsin
- A study of statewide energy efficiency programs by the Berkeley Lab found Focus on Energy runs the most-cost-effective in the nation
- Visit **focusonenergy.com/evaluation-reports** to view the full report

Agenda

- Benefits of Solar Power in Schools
- Preparing for Renewable Energy
- Solar PV Starting Steps
- Success Story: Mukwonago Area School District
- Potential Energy-Saving Opportunities
- Resources and Technical Assistance

Benefits of Solar Power in Schools

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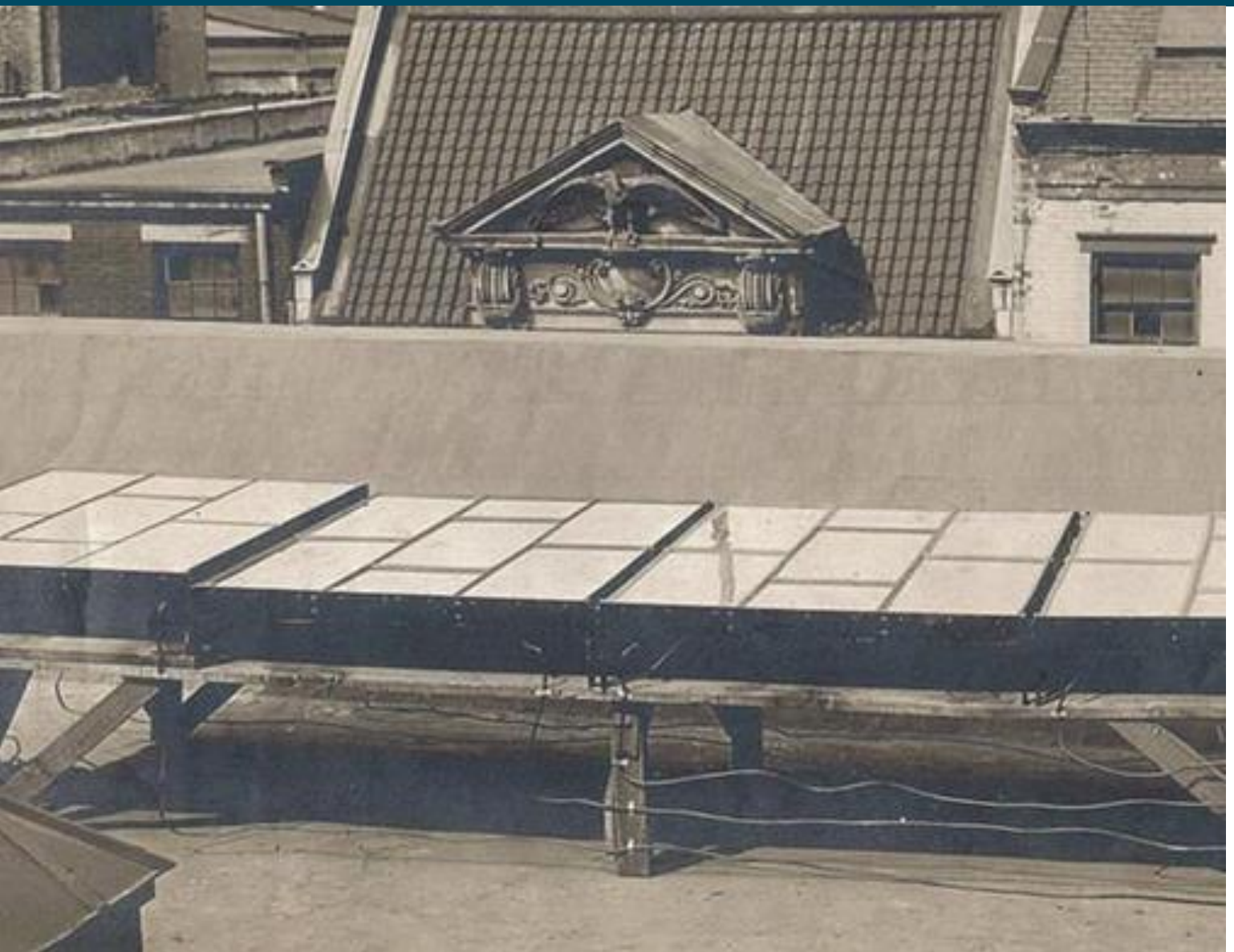


First U.S. solar panel to produce energy

Photo: Smithsonian Magazine

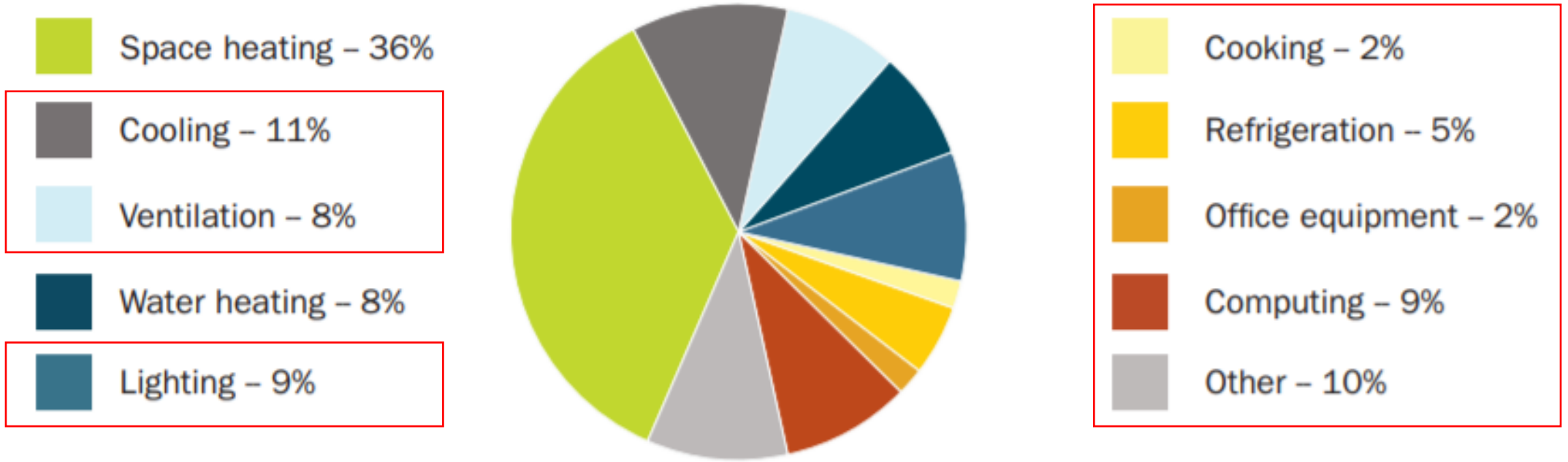
School district solar PV installation

Offset energy bills

- Over **7,300 schools in the U.S.** have solar installations
  - Wisconsin ranks **#12** in the nation with 148 schools with solar (The Solar Foundation)
- Dramatic decline in costs make solar options widely accessible
  - Average cost of solar panels per watt in Wisconsin is **$2.83/watt** (Solar-Estimate)

Photo: WPR

School energy use



Commercial Buildings Energy Consumption Survey (CBECS), 2016

Ideal candidate

- Schools include underutilized spaces
  - Facility structures offer a large, flat area ideal for solar rooftop systems
  - Parking lots have space for photovoltaic canopies to capture the sun
  - Vacant land provides an opportunity for a solar farm to maximize energy output

Types of solar options

- Roof-mount
  - Common option requiring minimal maintenance
- Pole-mount
  - Option when roof space is limited
  - Requires adequate land space
- Ground-mount
  - Large areas of land with ample sun exposure
  - Generate more power than roof system

Enhance educational opportunities

- Provides an on-site learning experience
- Allows students to learn about real-world energy issues
- Gives students the ability to track data through monitoring systems
- Motivate students to explore careers in energy conservation and sustainability

Photo: Macsteller-Energy

Preparing for Renewable Energy

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Benchmarking

- Monitor your energy usage by benchmarking electricity and natural gas using ENERGY STAR®
- What is your energy profile?
  - Spring
  - Summer
  - Fall

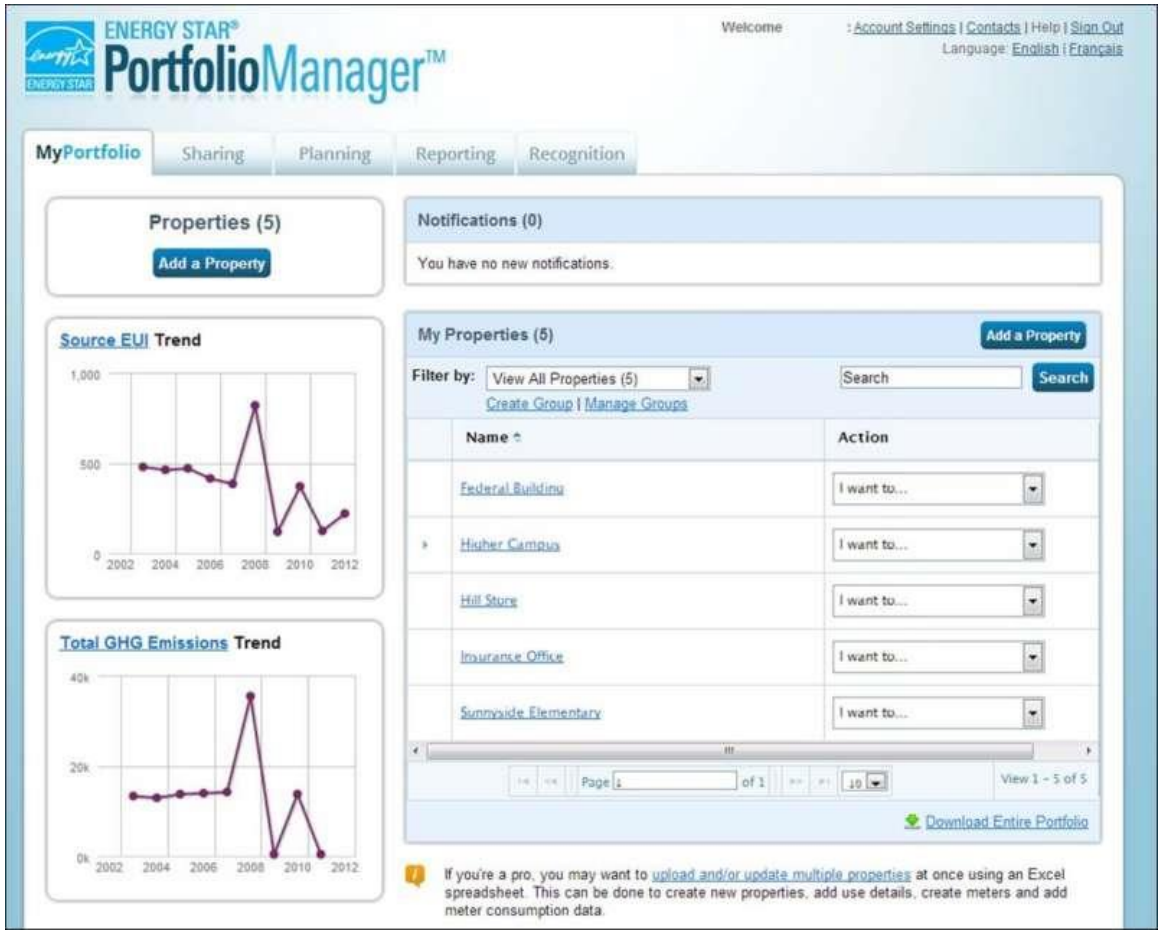

Photo: ENERGY STAR®

Submetering

- Start with metering main utility meters
  - Electric meter pulses provide 15-minute demand data
  - When are peaks happening?
- What should be submetered?
  - Chillers
  - Cooling equipment for large spaces like gymnasiums
  - PAC – rental information
  - Kitchen equipment
- 15 min demand average data – WE Energies

Photo: Setra Systems

Pursue energy efficiency upgrades first

- Upgrade facilities to be energy efficient to reduce the size of the renewable energy system
- Improve new and existing buildings in three primary areas
  - Lighting systems and controls
  - Mechanical systems (heating, cooling, ventilating and water heating equipment) including operation and maintenance
  - Building envelope (walls, floor and roof)

Utilize your Energy Advisor

- Invite your Energy Advisor to facility planning meetings
  - Provide expertise and advice
  - Strategize and brainstorm solutions
  - Assess building needs

Photo: Freepik

Getting Started with Solar PV

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Seek solar energy consulting

- Explore solar energy options with a trained professional
- Evaluate
  - Utility rate structure
  - Net-metering agreements
  - Interconnection requirements
- Utilize this information to determine the size of your renewable energy system
  - Cost/benefit analysis
  - Additional ROI calculations

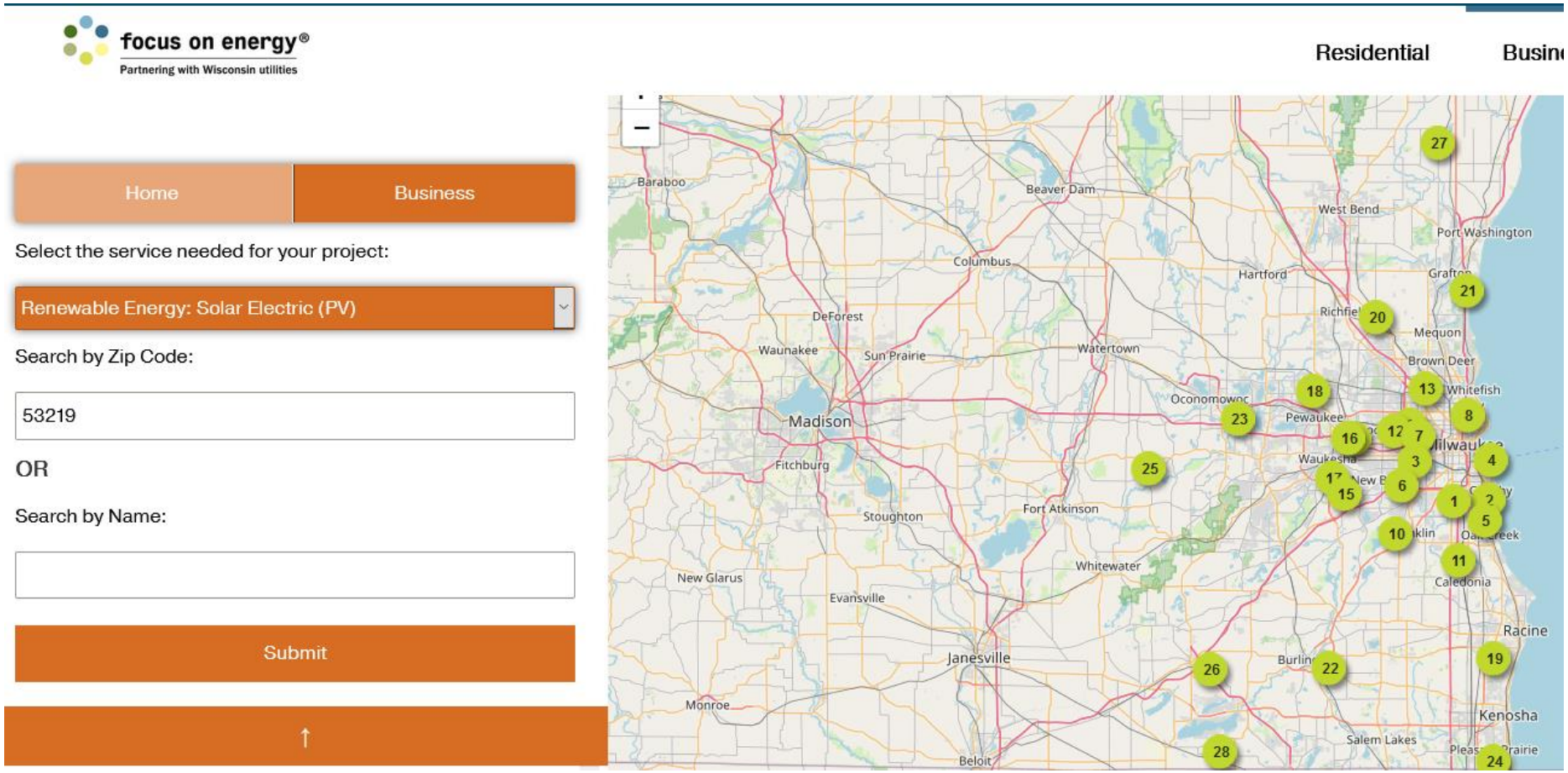
Photo: Proche

Realize available funding mechanisms

- Contact your local utility for renewable energy programs and incentives they offer
- Research available incentive funding from Focus on Energy and State Energy Office Funds
- Explore fundraising opportunities and private donations

Photo: Freepik

Find a solar PV contractor



- Visit **focusonenergy.com/trade-ally/find**

Pro tips

- Large scale battery storage is available but expensive
  - Prices will go down
- Systems can be sized to sell energy back to the utility
- Determine buyback rate for your utility
  - Utility buyback rates can be low
  - Average commercial rate in Wisconsin is **$0.11/kWh**

Photo: Energy Central

Pro tips

WE Energies Rate Schedule CGS NM

Customer's Buy-Back Energy Rate:

Residential and secondary customers on a flat rate:

All Energy (flat rate, all hours)	$0.04245 per kWh

Residential and secondary customers on a time-of-use rate:	Summer	Non-Summer
All on-peak energy, per kWh	$.05714	$.04608
All off-peak energy, per kWh	$.03876	$.03836

Primary Customers:	Equal to or Less than 12,470 volts	Greater than 12,470 volts and Less than 138,000 volts	Equal to or Greater than 138,000 volts
Summer Energy Rate			
All on-peak energy, per kWh	$.05572	$.05491	$.05422
All off-peak energy, per kWh	$.03780	$.03725	$.03678
Non-Summer Energy Rate			
All on-peak energy, per kWh	$.04493	$.04427	$.04372
All off-peak energy, per kWh	$.03741	$.03686	$.03640

Photo: Energy Central

Solar PV cost per watt history

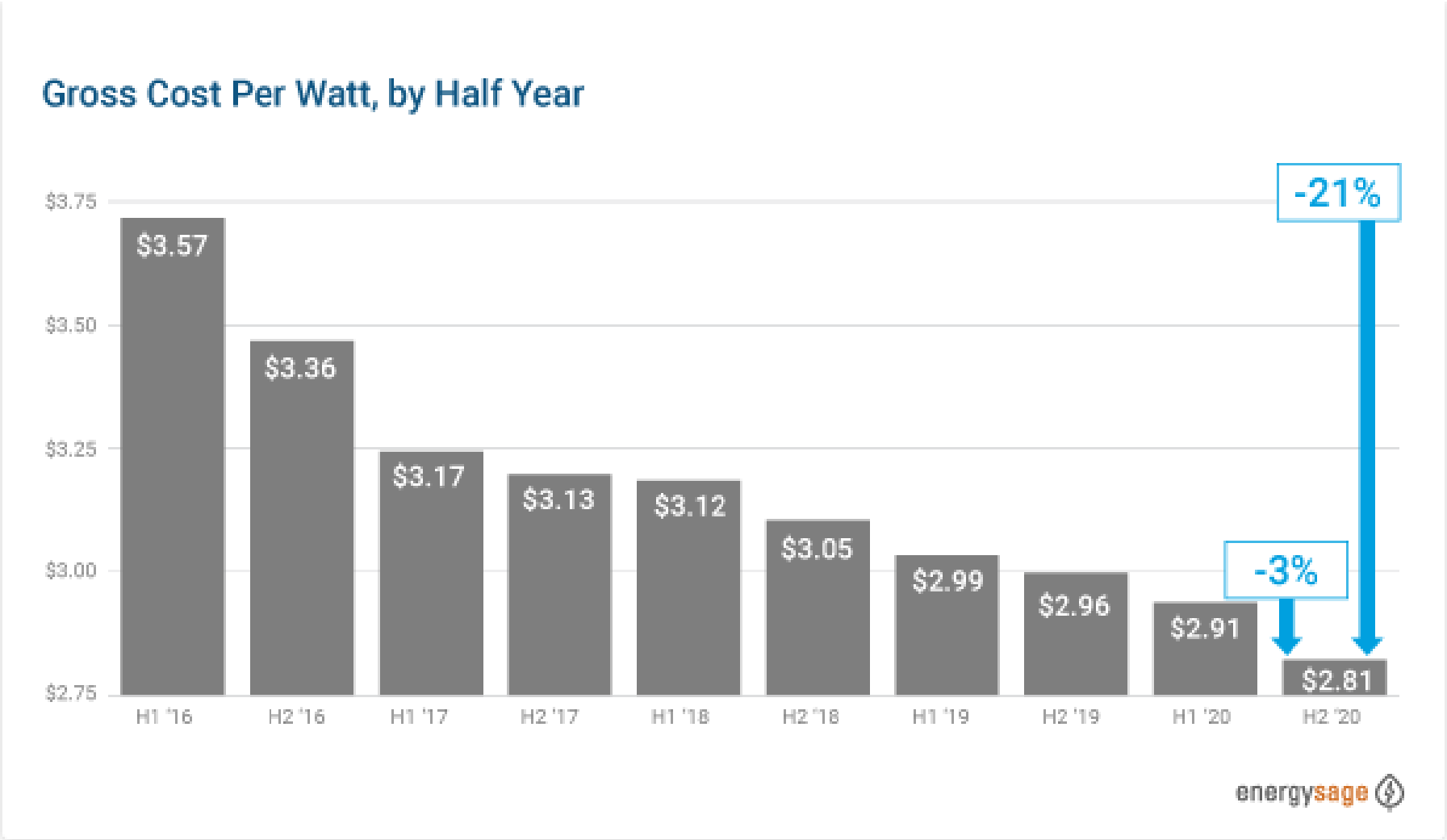


Photo: EnergySage

Prescriptive incentives

- Incentives available as of October 4, 2021
- Steps to participate
  1. Verify your utility participates
  2. Check status of available incentives
  3. Find a Trade Ally and ensure solar system meets requirements
  4. Complete online reservation application
  5. Complete installation
  6. Fill out incentive application

Multifamily and non-Residential Incentives – 0 to 100 kW	
Total Budget	$1,250,000
Paid/Entered/Reserved	$1,098,089
Remaining	$151,911

Multifamily and non-Residential Incentives – 100 to 300 kW	
Total Budget	$1,450,000
Paid/Entered/Reserved	$1,196,651
Remaining	$253,350

Multifamily and non-Residential Incentives – 300+ kW	
Total Budget	$1,300,000
Paid/Entered/Reserved	$1,098,997
Remaining	$201,003

Success Stories:

Mukwonago Area School District

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Lighting and Cooling Upgrade

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Background

- In 2015, Mukwonago Area SD upgraded lighting and DX cooling
- Benefits include improved occupant comfort and saved energy
- Projects were completed over four years through 2018

Energy savings

- Annual kWh savings
  - **137,515 kWh**
- Annual utility bill savings
  - **$15,127 per year**
- Focus on Energy incentive
  - **$22,191**

Solar Panels Upgrade

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Background

- In 2019, Mukwonago Area SD was interested in installing solar PV to offset energy use
- Worked with their Trade Ally contractor and the Office of Energy Innovation (OEI) to obtain financial incentives
- Financial incentives covered **50% of project costs**

Project scope

- Mukwonago installed solar panels on the high school
- Installed **930 panels** at **355 watts** each
- Total system production of **330 kW**

Solar PV kWh portal

https://ennexos.sunnyportal.com/2472408/dashboard

Solar PV kWh portal

AlsoEnergy

https://apps.alsoenergy.com/Account/Login?returnUrl=%2fpowertrack

Energy savings

- PV watts calculator estimated annual energy produced
  - **467,347 kWh**
  - Almost 2/3 of both school's energy requirement
- Annual utility bill savings
  - **$56,000 per year**
- Estimated payback
  - **7 years**
- Staff, students and community can view energy data in real time online

Potential Energy-Saving Opportunities

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Prescriptive incentive projects

- Specific dollar amounts for installing qualifying energy-efficiency equipment
- One-for-one replacement for commonly installed equipment
- Visit **focusonenergy.com/catalogs** to view current Incentive Catalogs
- Customer has **60 days** after project installation to submit application and invoice(s)

Custom incentive projects

- Eligible for non-standard technologies or projects that are not a one-for-one replacement
- Incentive based on estimated first year energy savings associated with a project or technology
- Work with your Energy Advisor to receive pre-approval prior to starting project

Custom incentive projects

- 2021 Incentive rates:
  - **$0.05 per kWh saved**
  - **$100 per peak kW reduced**
  - **$0.95 per Therm saved**
- Project must have a simple payback of 1 – 10 years
- Incentives cannot exceed 50% of the project cost
- Maximum incentive of **$300,000 per project**
- Customer maximum of **$400,000 per year**

Comprehensive Lighting Solutions (CLS)

- Transform your facility by optimizing your interior lighting system
- Offers two ways to save
  1. Fixture or retrofit kit upgrades
     - $0.25/Watt Reduced
  2. Fixture or retrofit kit/lamp upgrades **with** connected controls
     - $0.45/Watt Reduced
- Contact your Energy Advisor or Trade Ally to review your facility's lighting requirements

Fixture or retrofit kit upgrades

- Used when redesigning a space
- Number of fixtures per room must change
  - One-for-one fixture/retrofit kit replacements are **NOT eligible**
- Utilize Focus on Energy's CLS workbook available at **focusonenergy.com/CLS**
- Fixtures and/or retrofit kits must be DLC listed
- **Must be pre-approved**
- Complete project incentive documentation and submit within **60 days** of project completion

Fixture or retrofit kit/lamp upgrades with connected controls

- Utilize Focus on Energy's CLS workbook available at **focusonenergy.com/CLS**
- Fixtures, retrofits kits/lamps and controls must be DLC listed
- **Must be pre-approved**
- Complete project incentive documentation and submit within **60 days** of project completion

Connected controls

- Systems must have these features in order to receive a financial incentive
  - Individually addressable
  - Zoning
  - Occupancy sensing

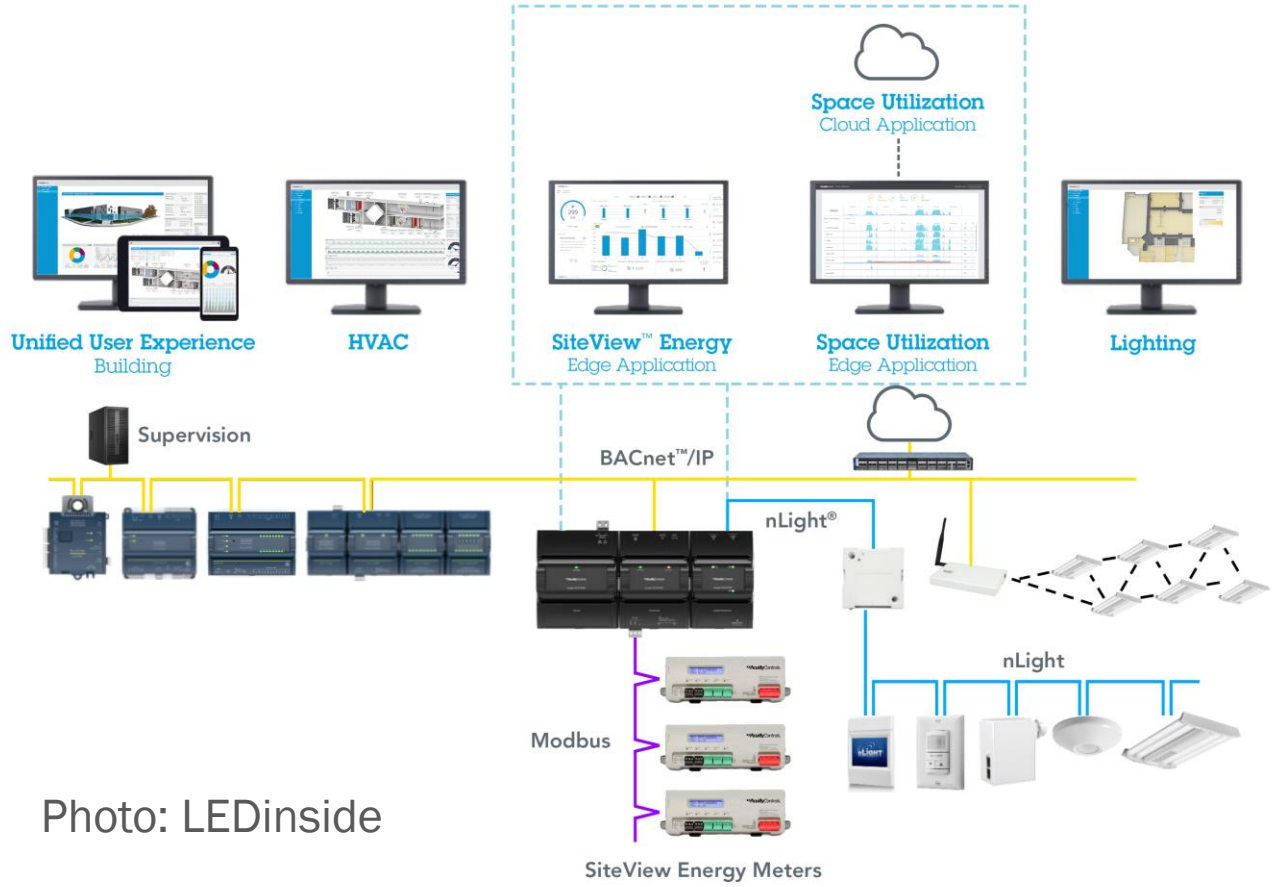

Photo: LEDinside

Real-time energy monitoring competition

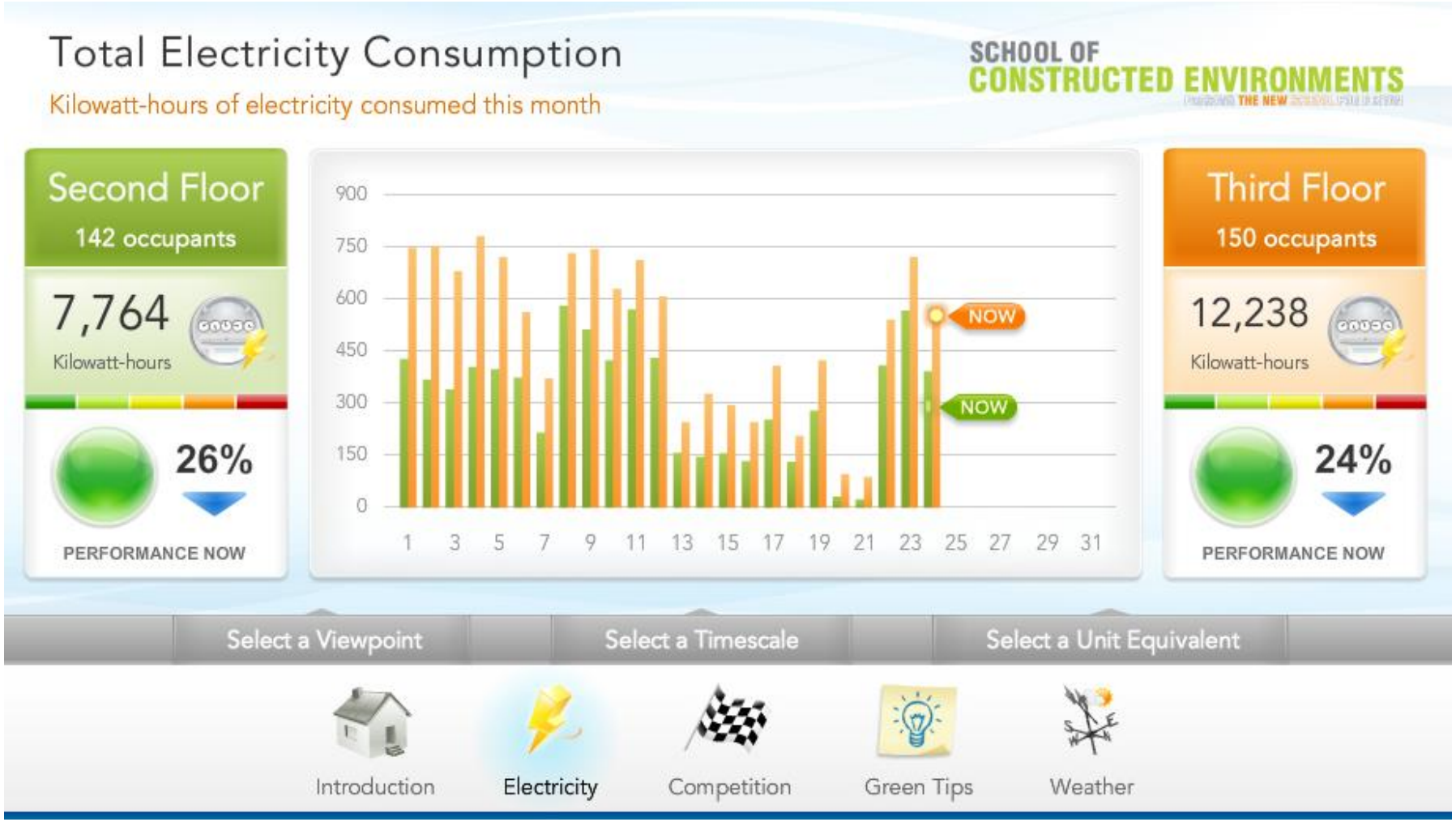

Photo: School of Constructed Environments

Retrocommissioning (RCx)

- Improves the performance and energy efficiency of existing building systems, equipment and operations
- Save up to 16% each year on energy bills using RCx to implement system and operational changes
- **NEW in 2021**
  - Complete the audit and reduce energy use intensity (EUI) to receive a minimum base incentive of **$0.10/ft²**
  - Additional incentives **up to $0.10/ft²** are available for achieving higher than a **5% reduction in EUI**

Energy recovery ventilation (ERV) systems

- Provide energy savings in mechanical ventilation systems
- Recycle energy from exhaust air to pretreat the incoming outside air/ventilation air
- Reduce the HVAC load while lowering the required capacity of the mechanical equipment
- Offer a cost-effective means to reduce energy consumption without reducing indoor environmental quality

Photo: Fanning Howey

NEW! Direct fired make-up air units

- Available for replacing indirect fired make-up air units or new installations
- Financial incentives
  - Equipment upgrades/retrofits - **$0.20/CFM**
  - New construction/major renovations - **$0.15/CFM**

Photo: Ventilation Direct

Boiler tune-ups

- Financial incentive - **$0.05/MBh**
- Trade Ally must perform before and after combustion efficiency tests for each boiler tune-up
- Separate application required for each unique job site
- Visit **focusonenergy.com/catalogs** to download an application

Early completion bonus

- Receive **up to 25%** in additional incentives for projects completed between September 6 and December 10, 2021
- Offering details:
  - **25% bonus** – within 30 days of installation (no later than **November 15, 2021**)
  - **10% bonus** – within 30 days of installation (no later than **December 10, 2021**)
- Submit applications within **30 days** of project completion or by the specified date
- Visit **focusonenergy.com/business** to review eligibility and how to apply

Resources and Technical Assistance

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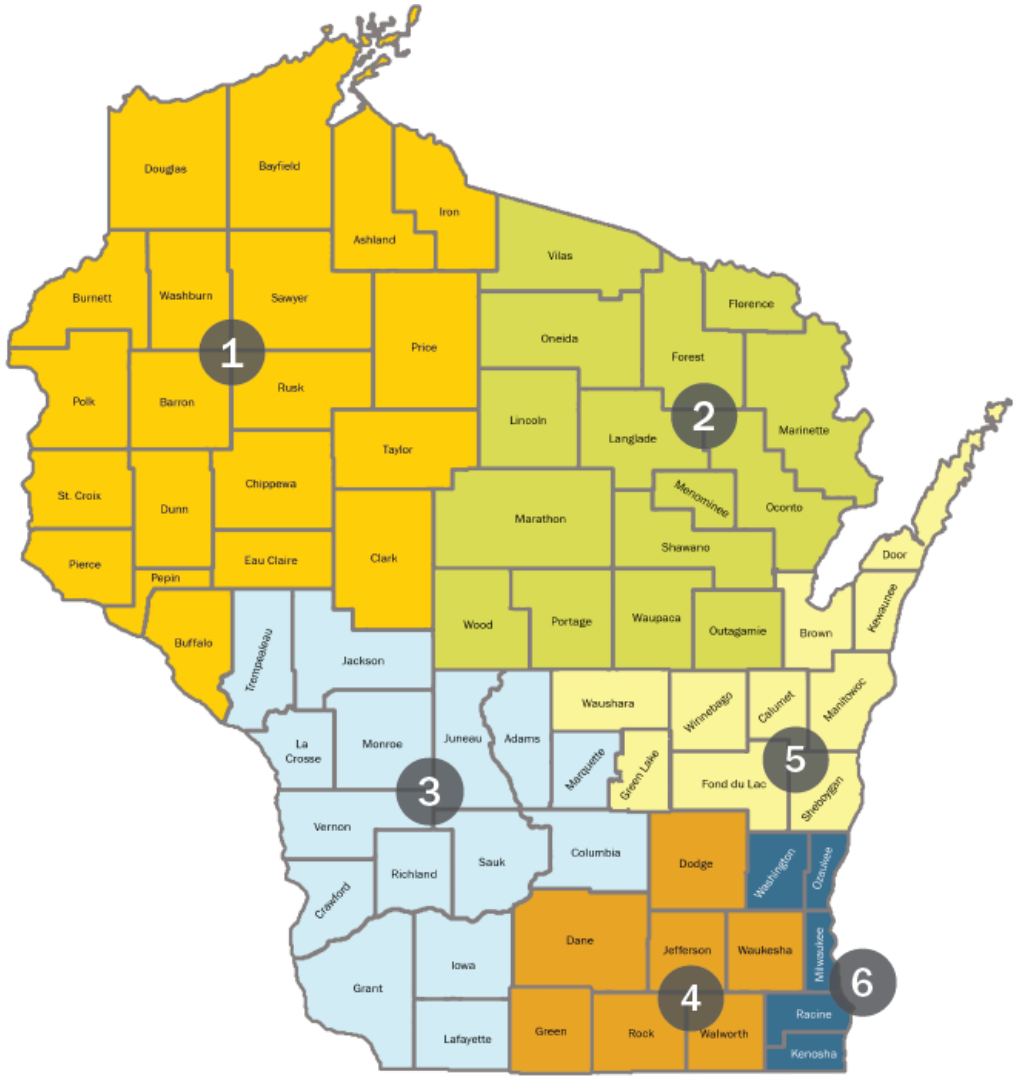
2021 Energy Advisor Map



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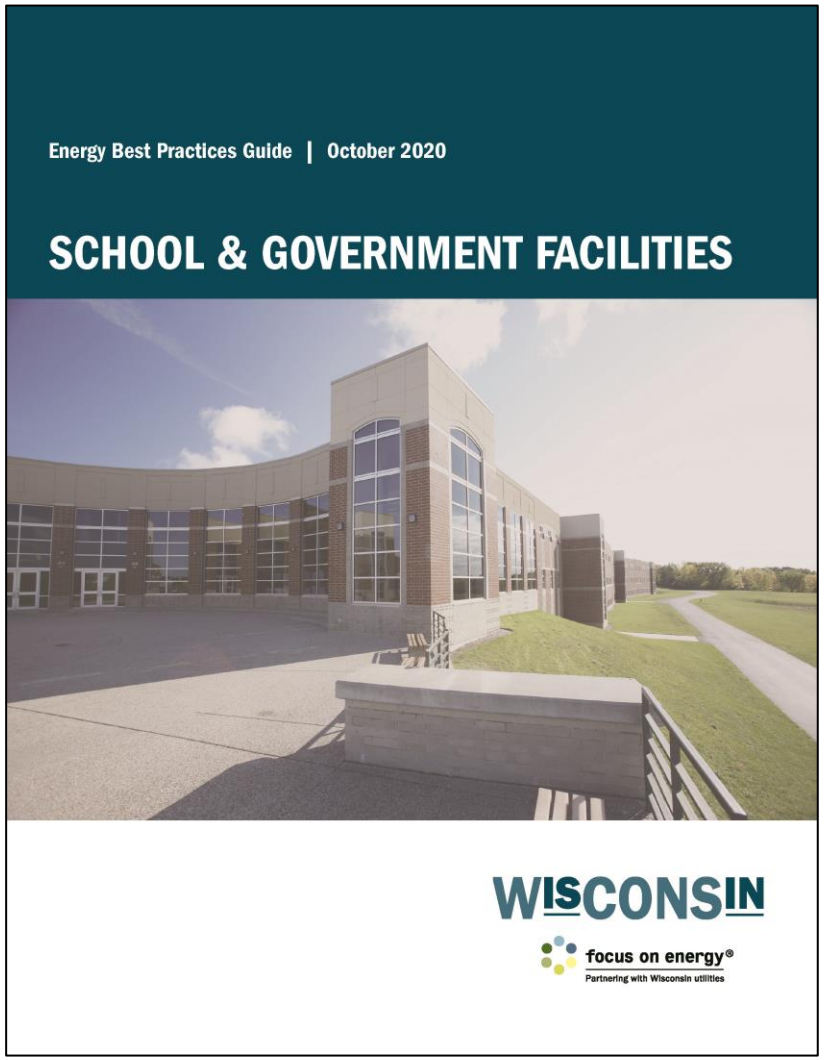
Training and education

- Focus on Energy offers a variety of courses to meet energy efficiency educational needs
- Check out a full list of sessions at **focusonenergy.com/training**
- Upcoming classes
  - **November 3:** Advanced Lighting Control System – Green Bay
  - **November 4:** Advanced Lighting Control System – Pewaukee
  - **November 9:** Energy Management and Technology: Fundamentals and Beyond

Energy team toolkit

- Each toolkit includes:
  - A sample energy policy
  - Energy team meeting topics and agendas
  - Highlights from successful energy teams
- Download a free copy at **focusonenergy.com/toolkit**

Energy best practices guide



- Outlines the basic steps in building an energy management program for school and government facilities
- Provides general best practices and recommendations
- Download a free copy at **focusonenergy.com/S&G-Guidebook**

FREE energy-efficient packs

- Save energy and money while improving your home comfort this winter
- Each pack contains a variety of product, such as:
  - LED light bulbs
  - High-efficiency showerhead
  - Water-saving bathroom faucet aerators
  - Pipe insulation
- Must be a customer of a participating Wisconsin utility company
- Complete your order online at **focusonenergymarketplace.com/free**

Thank You.

888.623.2146

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