CERTs
CLEAN ENERGY RESOURCE TEAMS

Students Working Together: Energy Actions at School

Alexis Troschinetz & Jacob Selseth

Wednesday, March 1, 2023

Today's talk

- About CERTs
- Energy 101
- Activity: Classroom Energy Treasure Hunt
- Actions for Your Team
- Solar and Funding Programs for Schools
- Ask CERTs Anything (about energy!)

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About CERTs

Helping Minnesotans build clean energy

CERTs MISSION

We connect individuals and their communities to the resources they need to identify and implement community-based clean energy projects

CERTs Partners

Regional Sustainable Development Partnerships
University of Minnesota Extension

Great Plains Institute

SRDC

Minnesota Commerce Department

www.CleanEnergyResourceTeams.org

CERTs Regional Coordinators

Shannon Stassen
Northwest CERT
UMN Extension RSDP

Melissa Birch
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Jacob Selseth
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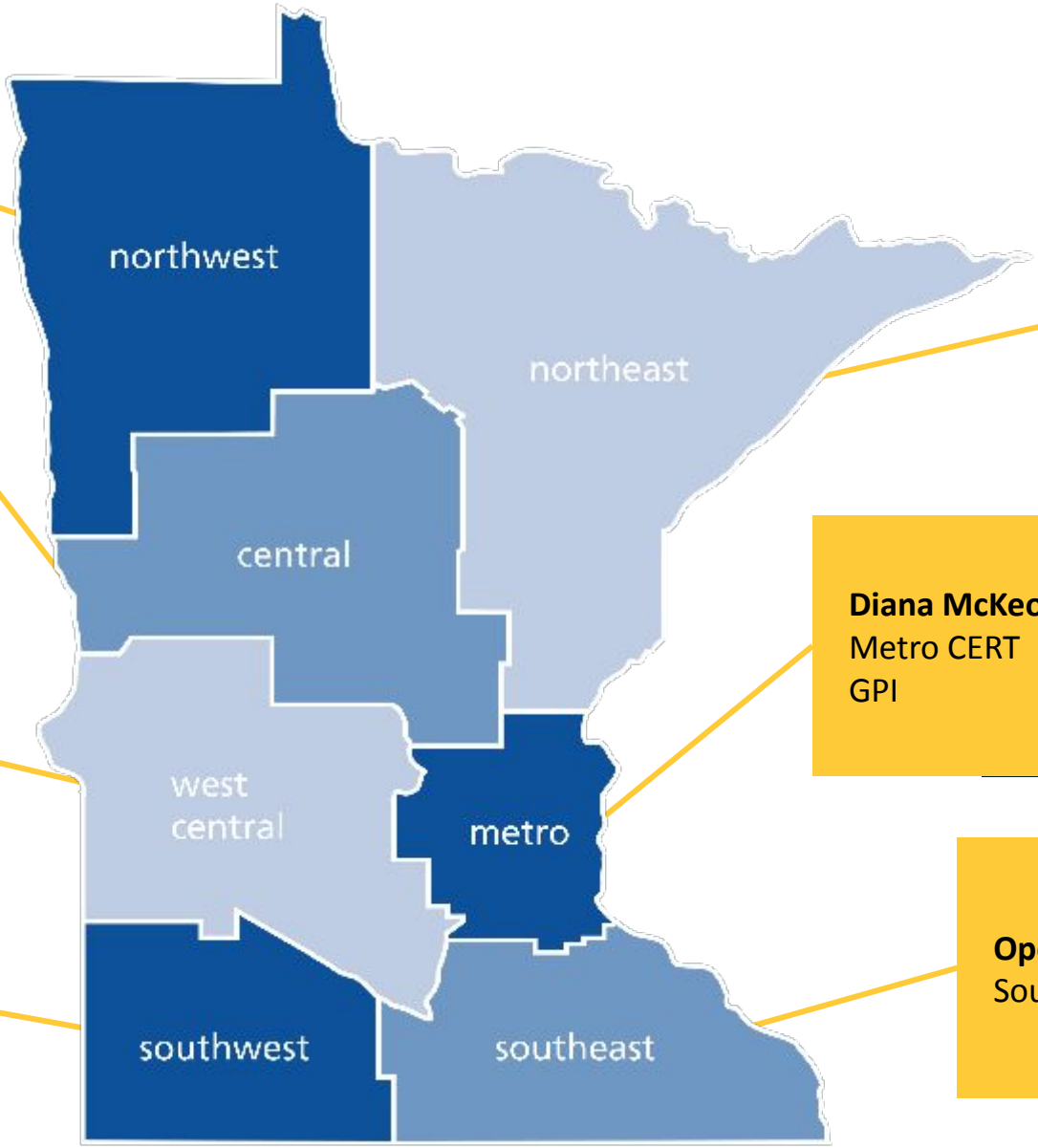

Colby Abazs
Northeast CERT

Diana McKeown
Metro CERT
GPI

Opening filled in March (we hope)
Southeast CERT

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Energy 101

What's a Matchstick got to do with ENERGY?

ENERGY is simply

- The ability to do work

Matchstick - fundamental unit

- 1 matchstick = 1 BTU
- 1 matchstick = 1 Candlelight

Where We Get Our Energy

MN Next Generation Act 2007

The SUN!

- Natural Gas
- Coal
- Wind
- Hydro
- Solar

kiloWatt (kW)
kiloWatt-Hour (kWh)

kW - Power

It's like the speedometer on your car.

kWh - Energy

It's like the odometer on your car.

1,000 Watts = 1 KiloWatt

British Thermal Unit
Therm

BTU - Matchstick*

Therm - 100,000 BTU's

*Energy to increase 1 lb. water 1 deg. Fahrenheit

1 kWh = 3,412 btu's

BTU Equivalent for Everything

Big Mac and Fries

3,170 Btu's

or

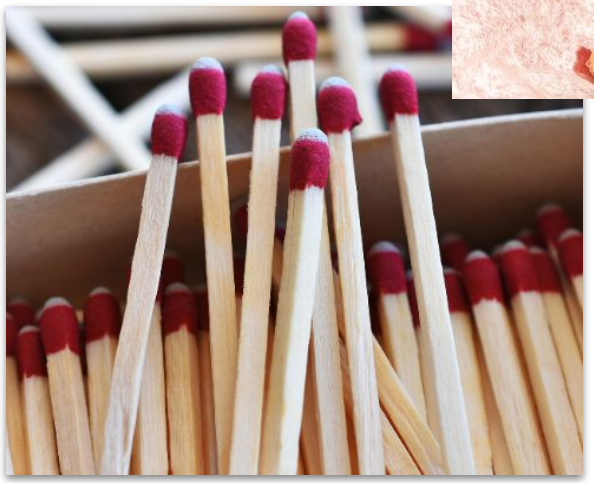
1 kWh

or

$6.00

BTU Equivalent for Everything

Food	Calorie
Electricity	kWh
Natural gas	Ccf or Therm
Gasoline	gallon
Propane	gallon
Wood	cord



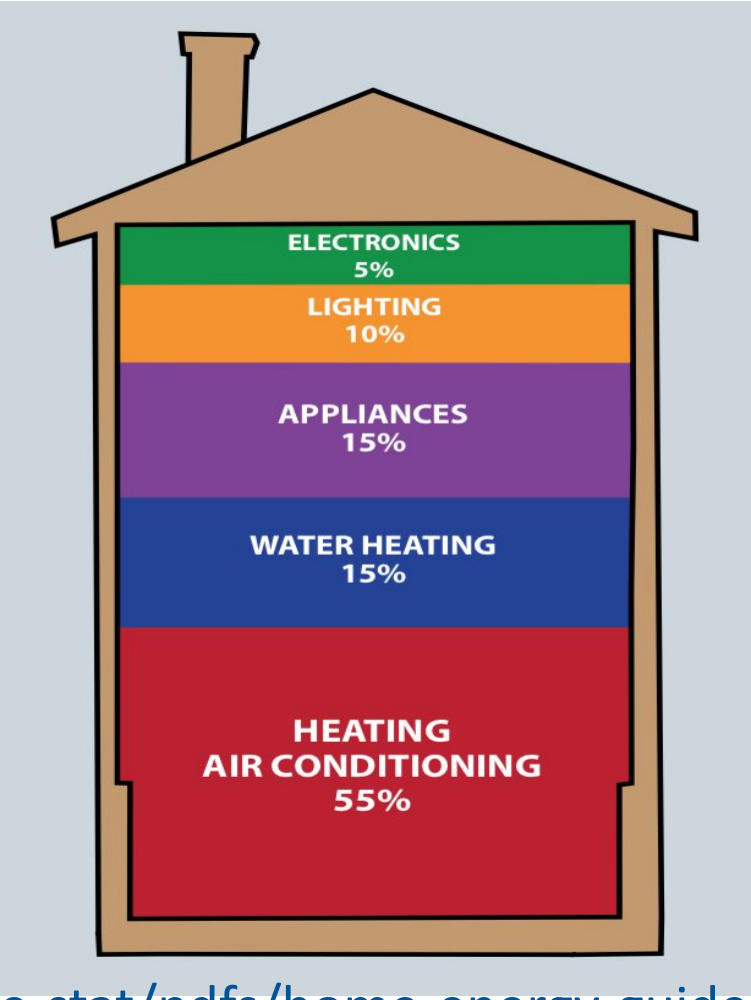
WHY DOES THIS MATTER?

How We Use Energy - Home

- 800 kWh / month
  - $100

- 900 Therms / year
  - It Depends!

*CenterPoint Energy Avg. customer



mn.gov/commerce-stat/pdfs/home-energy-guide.pdf

How We Use Energy - School

- **$10-20,000 / Month***

$6 Billion / yr.

$1.5 Billion / yr.

*10 kWh (ft^2),50 cubic feet of nat. gas (ft^2) annually.

How We Save Energy

Reduce Power!

Reduce Time!

Power x Time = Energy

kW x Hours = kWh

what number is this? 8,760????

Lighting: Choose Your Brightness (Lumens)

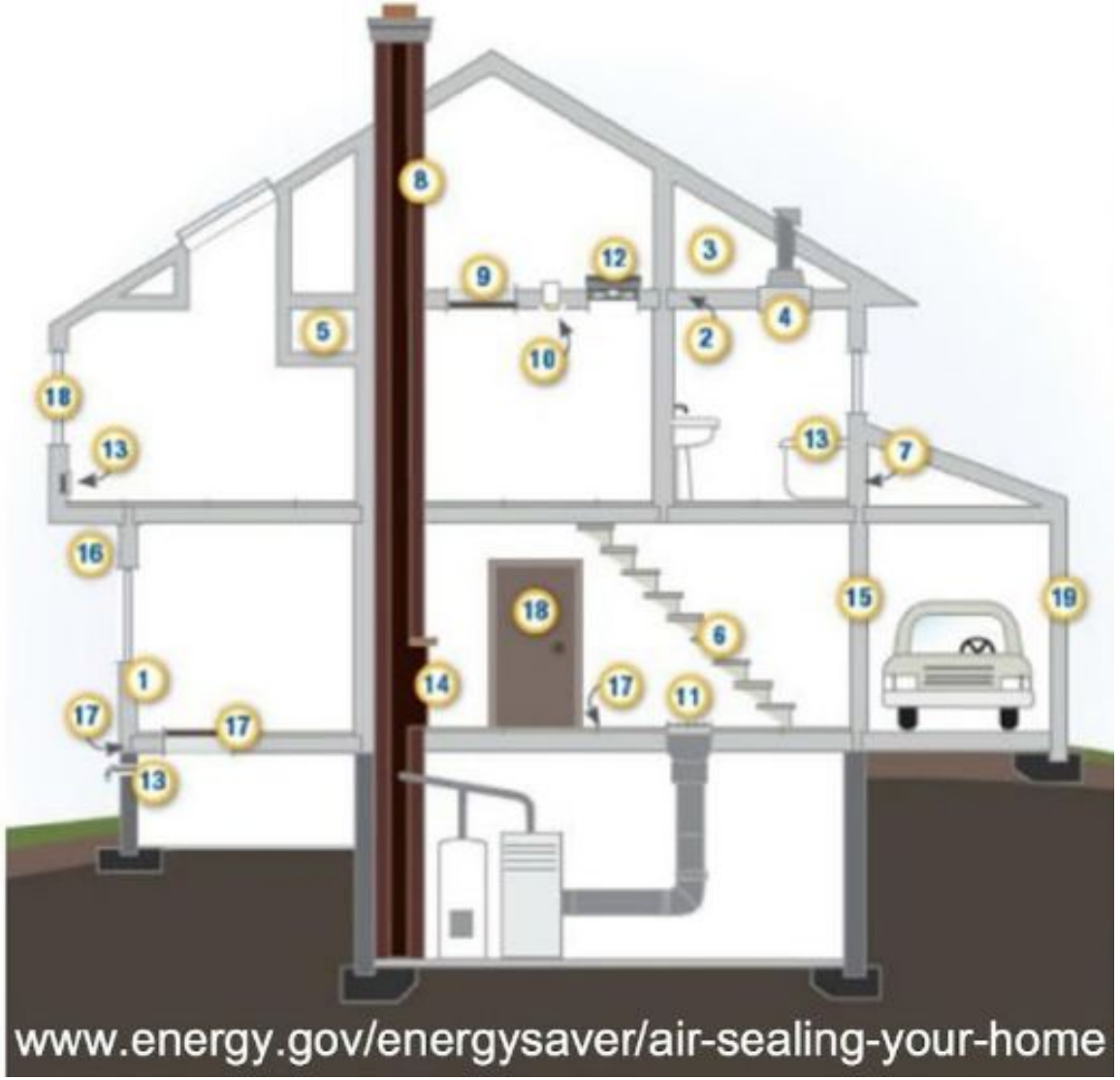
Brightness	Incandescent	CFL	LED
450 lumens	40W	9-13W	4-8W
800 lumens	60W	13-16W	8-13W
1100 lumens	75W	17-23W	11-15W
1600 lumens	100W	23-28W	16-20W

Least Efficient → Most Efficient

How your House loses Energy

SEAL Leaks!

Stop
<u>Infiltration</u>



Insulation: Where?

Attic

- R-50: 12-20 inches

Basement foundation

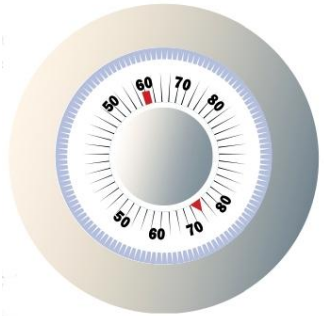
- Rigid foam outside
- NOT fiberglass inside!

Walls

- Fiberglass batts or dense-pack cellulose

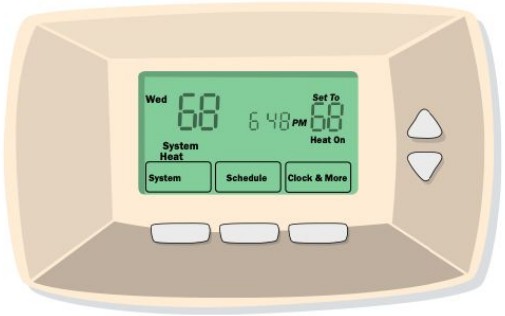
Everything you ever wanted to know about insulation can be found at www.energy.gov/energysaver/insulation

Heating Controls



Manual

- Holds set temperature until someone changes it.
- Energy wasted when temperature is kept high at night or when no one is home.



Programmable

- Allow occupants to program different temperatures for different times of day and days of the week.
- May include vacation or other override settings.

Smart

- Wi-fi enabled: occupants can monitor and control remotely.
- Learn occupant preferences and adjust according to whether anyone is at home.

mn.gov/commerce-stat/pdfs/thermostat-options.pdf

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Activity: Classroom Energy Treasure Hunt

Classroom Energy Treasure Hunt

Use Worksheet to note:

- Lighting
- Heating
- Windows
- Plug Loads

Time: 5-7 Minutes

Return for a discussion and polls about what you find!

Lighting

Heating

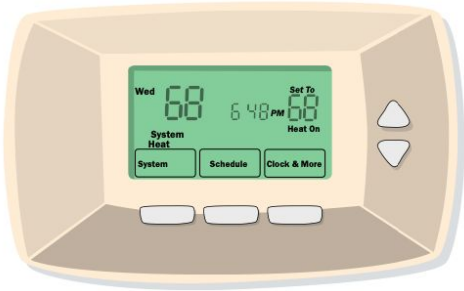
Radiators

Thermostats

Radiator Control

Manual

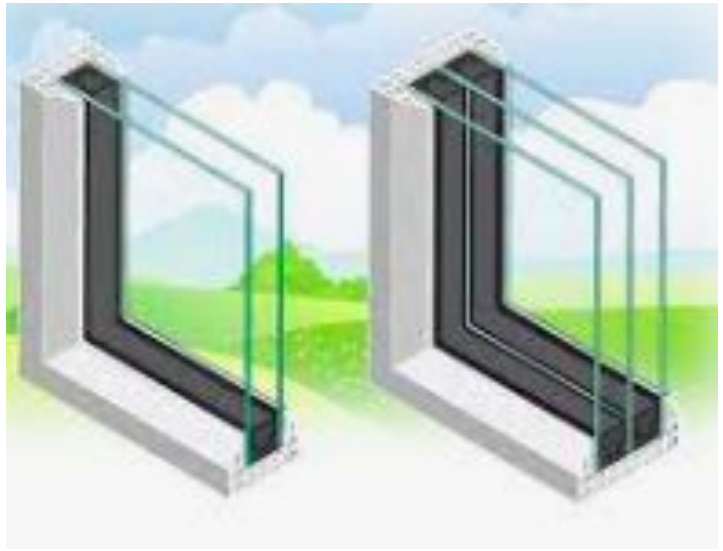
Forced Air Vents



Programmable

Smart

Windows



Plug Load

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Actions for Your Team

(after this workshop)

#1: Take action in the classroom

Based on what you learned today,

- Make posters to remind classmates to turn off the lights
- Make a plan to close/open shades and carry it out
- Add powerstrips to turn off plugged in items easily
- What ideas do you have??

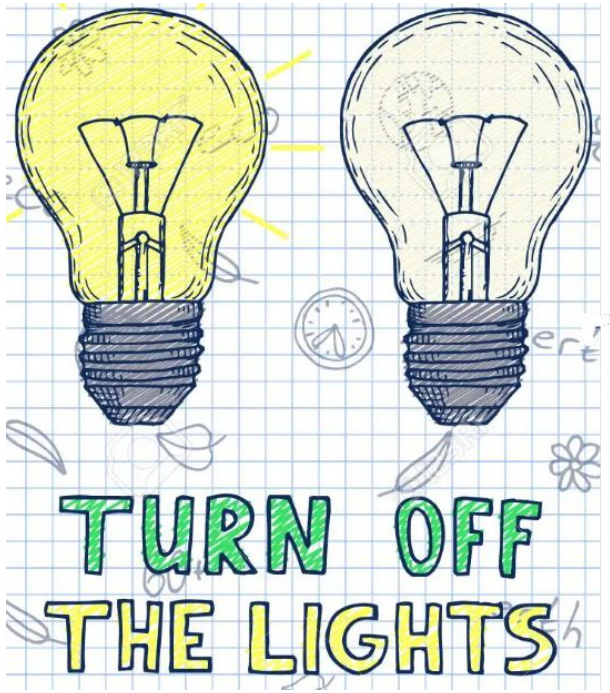


Image Credit: 123rf.com

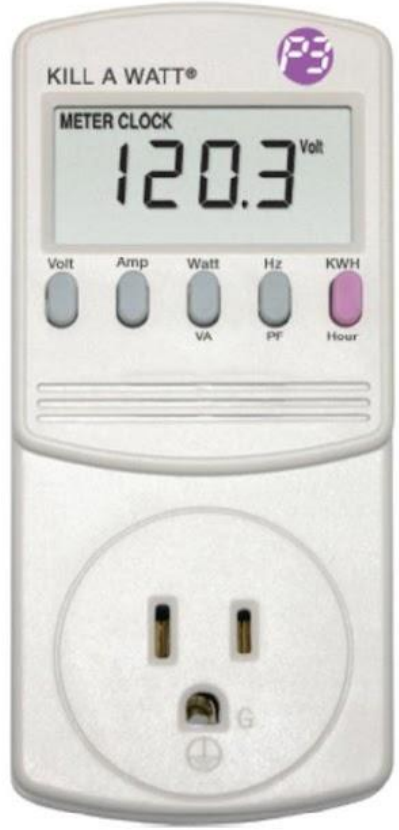
#2: Get curious and measure energy

Quick check: Turn off all lights in classroom and look for small power lights on any equipment.

Use a power meter to measure energy of plugged in items and record reading on worksheet.

How to get a power meter:

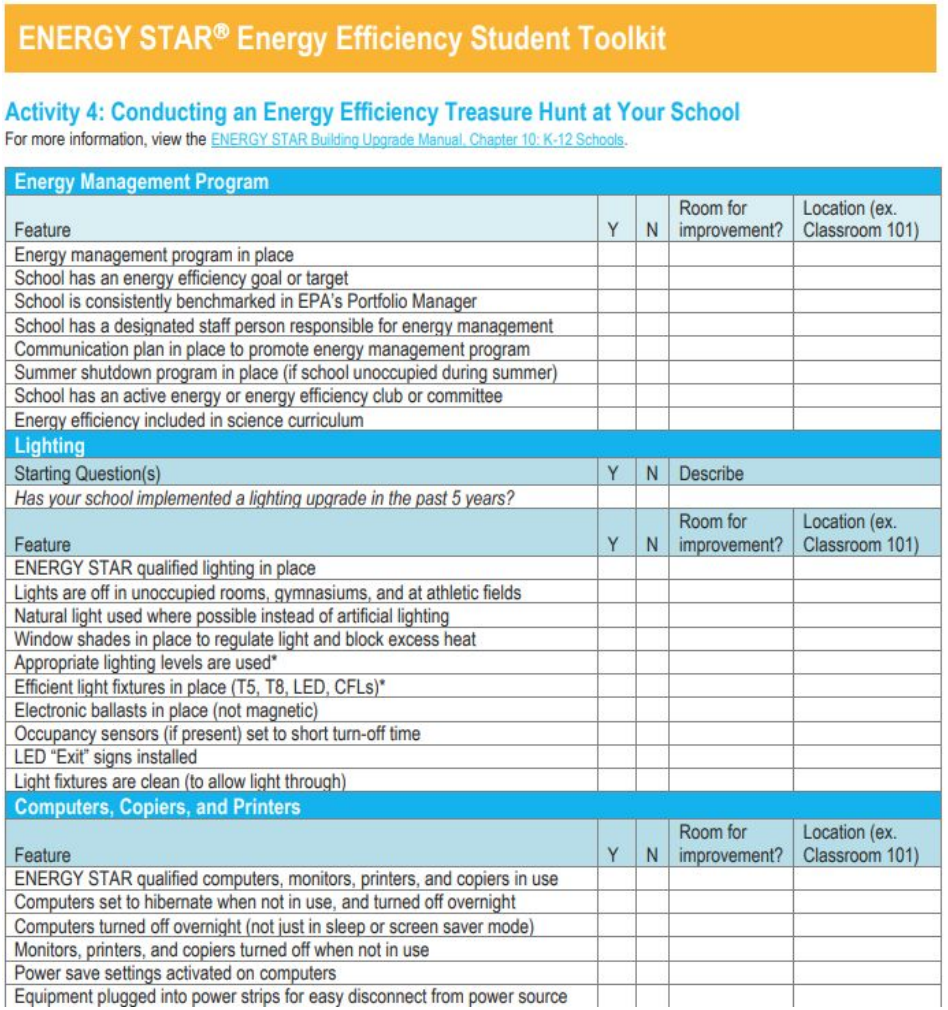
- Borrow one from YES!
- Use project seed funds to get one and keep it as team equipment from year to year



https://www.uvic.ca/sustainability/assets/docs/kill-a-watt-worksheet.pdf

#3: School Energy Treasure Hunt

- Connect with school facilities or maintenance staff
- Share Energy Star PDF (pages 8-9)
- Schedule 1-2 meetings with facilities or maintenance staff
- Ask for a tour of some of the items on this list so you can see real-world examples of the energy users in your school



ENERGY STAR® Energy Efficiency Student Toolkit

Activity 4: Conducting an Energy Efficiency Treasure Hunt at Your School

For more information, view the ENERGY STAR Building Upgrade Manual, Chapter 10: K-12 Schools.

Energy Management Program				
Feature	Y	N	Room for improvement?	Location (ex. Classroom 101)
Energy management program in place				
School has an energy efficiency goal or target				
School is consistently benchmarked in EPA's Portfolio Manager				
School has a designated staff person responsible for energy management				
Communication plan in place to promote energy management program				
Summer shutdown program in place (if school unoccupied during summer)				
School has an active energy or energy efficiency club or committee				
Energy efficiency included in science curriculum				
Lighting				
Starting Question(s)	Y	N	Describe	
Has your school implemented a lighting upgrade in the past 5 years?				
Feature	Y	N	Room for improvement?	Location (ex. Classroom 101)
ENERGY STAR qualified lighting in place				
Lights are off in unoccupied rooms, gymnasiums, and at athletic fields				
Natural light used where possible instead of artificial lighting				
Window shades in place to regulate light and block excess heat				
Appropriate lighting levels are used*				
Efficient light fixtures in place (T5, T8, LED, CFLs)*				
Electronic ballasts in place (not magnetic)				
Occupancy sensors (if present) set to short turn-off time				
LED "Exit" signs installed				
Light fixtures are clean (to allow light through)				
Computers, Copiers, and Printers				
Feature	Y	N	Room for improvement?	Location (ex. Classroom 101)
ENERGY STAR qualified computers, monitors, printers, and copiers in use				
Computers set to hibernate when not in use, and turned off overnight				
Computers turned off overnight (not just in sleep or screen saver mode)				
Monitors, printers, and copiers turned off when not in use				
Power save settings activated on computers				
Equipment plugged into power strips for easy disconnect from power source				

https://www.energystar.gov/sites/default/files/tools/K12EnergyEfficiencyStudentToolkit.pdf

#4: Work with CERTs on Projects

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UMN Extension RSDP

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Central CERT

Jacob Selseth
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Jason Walker
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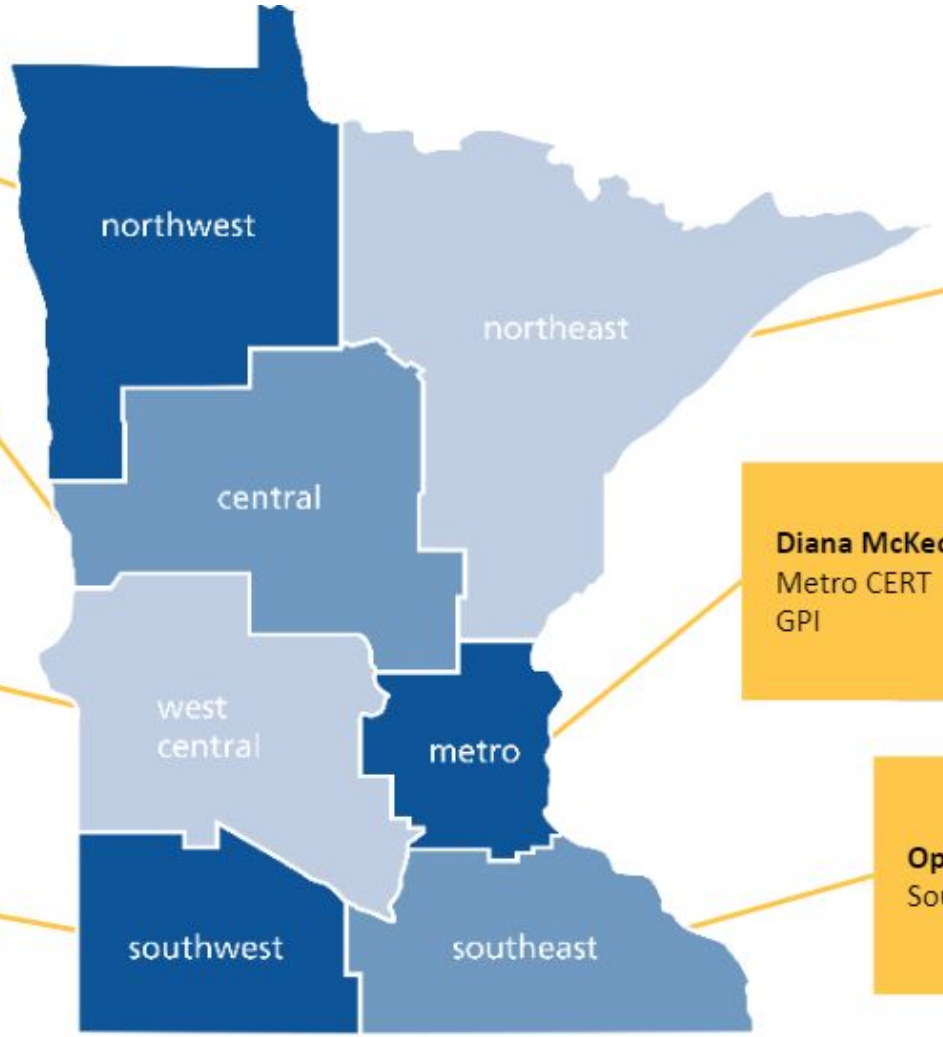

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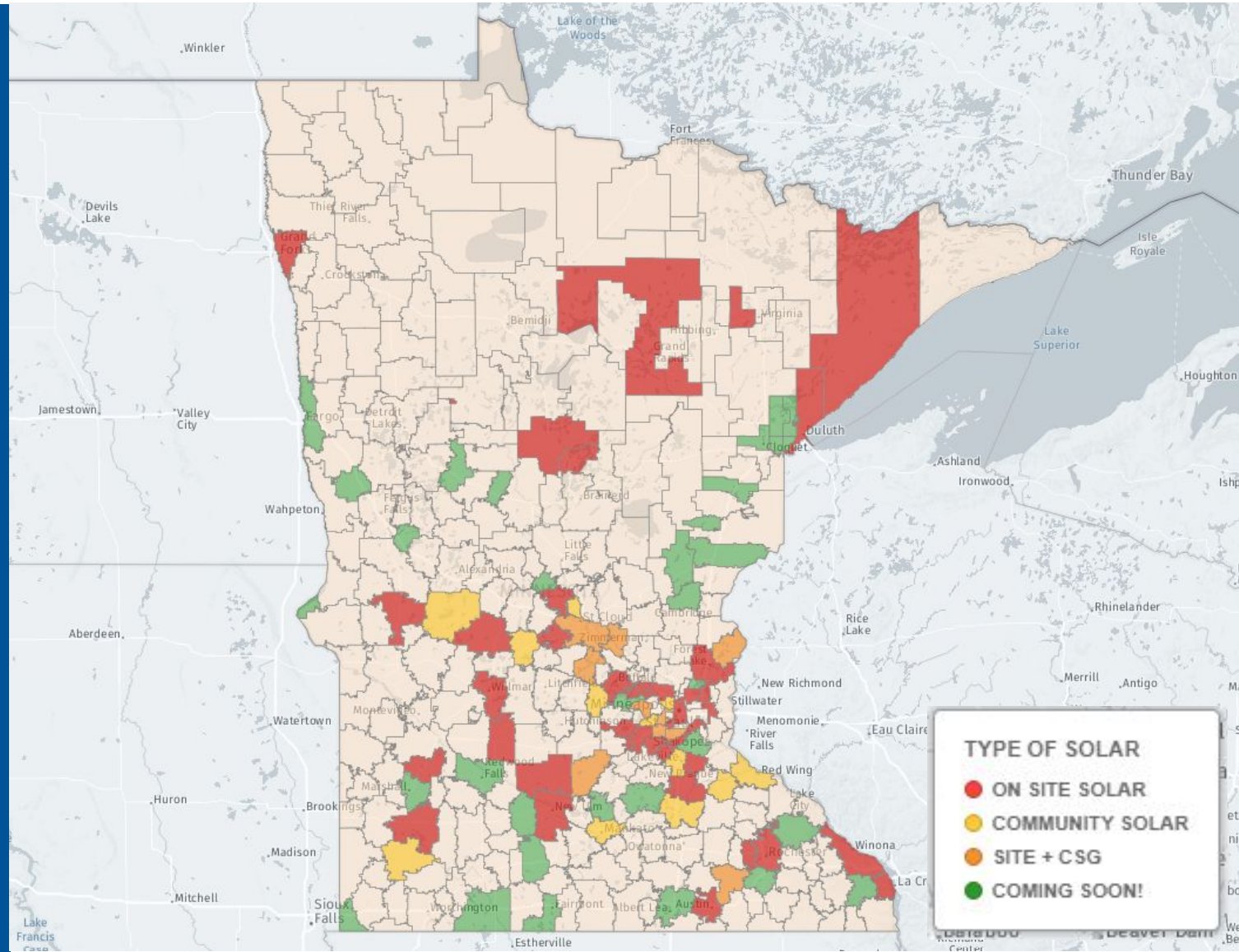
Solar and Funding Programs for Schools

Building a Brighter Future

- 336 districts serve 845,000 students
- More than 160 solar systems with over 40 school districts



Solar School Options

Pine River-Backus – 660 kW

So. St. Paul Kaposia Elementary – 329 kW

North Minneapolis Community Solar

ROCCORI

What can CERTs do?

Technical assistance

- Meet with Officials & Students
- Help with Tools

Tell stories

- Case Studies: School Stories
- Ribbon Cutting & the Media

Integrate into curriculum and empower students

on.mncerts.org/SolarSchools

SOLAR SCHOOLS
MENU OF SERVICES

+ 1. Address Energy Efficiency First
+ 2. Understand Renewable Energy Options
+ 3. Advance On-Site Solar Procurement
+ 4. Galvanize Your Community
+ 5. Bring Solar into the Classroom & School
+ 6. Empower Students to Advance Clean Energy
+ 7. Consider Electric School Buses

Energy Saving Partnership Financing

Projects: $100,000 or more

Energy savings money covers the cost of the loan payment

2-page application

Need: Calculated cost estimates and energy savings

Image Credit: WPR, CC by 2.0

sppa.com/portfinancing/energy-saving-partnership

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Ask CERTs Anything (about energy!)