



Sweet Grass County High School

*Sam Spector, B.S.
Mathematics,
Head Custodian
BOC Level 2
Certified*



Sweet Grass County High School- Home of the Herders!



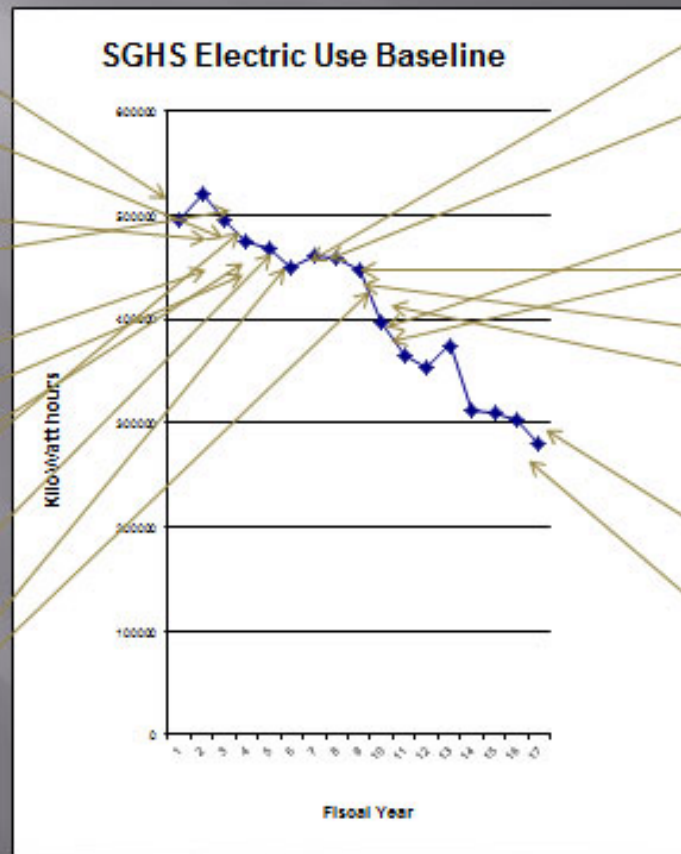
Small Class B school with 165 students located in Big Timber Montana in south central Montana next to the Yellowstone and Boulder Rivers.

We are known as the Shepherders as our county was the largest exporter of wool in the country at the turn of the century.

- What can you do to save energy in your school?
- What do you think we did to save energy?
- What can we turn off?
- Where can we find wasted energy?
- How can we product energy?

- We are creating a culture of conservation, saving money, and making our school healthier and more competitive.

Electricity Consumption Since 2001 Down 47%



Summer Shutdown

Exit and Emergency Light to LED

Shop Lights 500W Incandescent to 75W CFL

Eliminate Pop Machines

Occupancy Sensors and controls for Lights

Gym Light Retrofit
Planter Area Light Retrofit

Outside Light Retrofit

Weatherstripping
Concession Stand Shutdown

Boiler Motor Replacement with NEMA Premium

Building Addition of 2 Classrooms- Skills and Resource

HRV Unit

Exhaust Controls
Insulated Window Blinds

DDC Controls for HVAC

VFD on Motors

New Domestic Hot Water Heater

Reduction of Hot Water Heater Circulation Motor

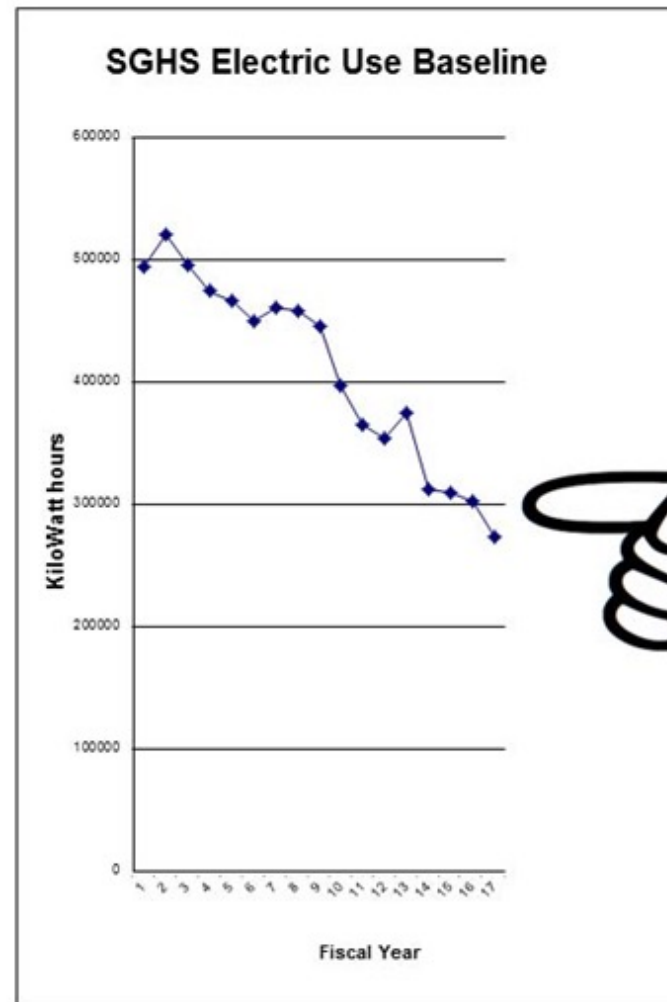
Schoolwide LED Lamp Replacement

SMART Schools Club



Energy Project #28

- Retrofitting our light fixtures with LED lamps.
- Projected additional electrical savings by 48445 KWh.
- Actual savings 29816 KWh or 10%.



- Energy Use Index- used to compare building based on cost per square foot.
- The Nationwide average school energy use index costs are \$1.15/ square foot
- In 2001 we were at \$1.37/square foot.
- Today SGHS spends \$0.53/square foot.
- SGHS now beats the national average by 46%!

Greening America's Schools

COSTS AND BENEFITS

Gregory Kats



SPONSORING ORGANIZATIONS:

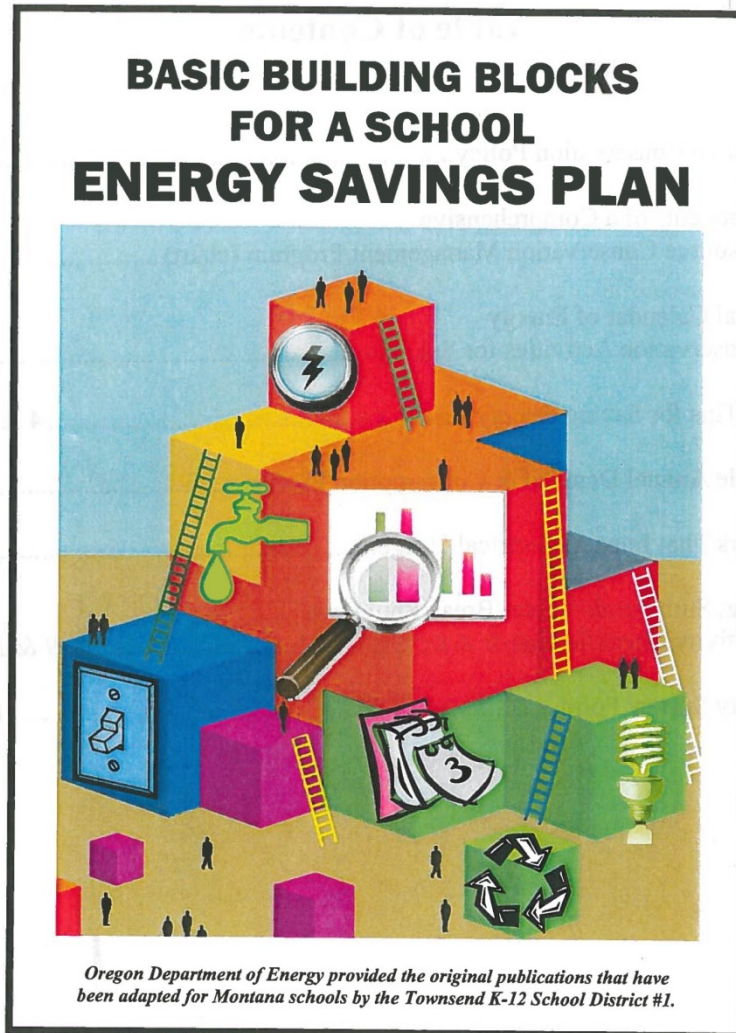
American Federation of Teachers
American Institute of Architects
American Lung Association
Federation of American Scientists
U.S. Green Building Council

Resource- LEED Schools Checklist



- Sustainable Sites
- Water Efficiency
- **Energy** and Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Innovation and Design Process

Adopt an energy use policy and goals



- Resource Conservation Policy
- Components of a Comprehensive Resource Conservation Management Program
- Annual Calendar of Energy conservation Activities for Schools
- Staff Tips for Saving Energy
- Sample Annual Demand and Consumption Profile
- Factors that Impact Electrical Usage
- Spring, Summer & Winter Shutdown Activity Checklist
- Facility Survey Form

Executive Views of Green Schools

Recognition... Dollar Savings

- Our own Superintendent, Mr. Alvin Buerkle, saved us \$2,400 on our utility bills by noticing that we were being charged \$400/month for supply charges at the football field during the winter when it was not in use.



FIGURE 5: Executives' Views of Green Building Benefits

Percent of Executives Saying Green Buildings are Superior to Conventional Buildings

Organizations Involved with Green Buildings

Organizations Not Involved with Green Buildings

Health & Well-being of Occupants



88%



78%

Worker Productivity



78%



63%

Buildings Value



84%



72%

Return on Investment



68%



52%

Mr. Buerkle has showed his concern for the health, productivity, and financial welfare for our building. He has helped implement the building improvements by supporting projects!

Student Learning

- ▣ “I learned that focusing on the little things alone can make a huge difference in the amount of resources used and hence the money saved for the school. The project can be improved next year by just brainstorming more small ways to save resources! Because they will add up!”

. Sam Curry SMART Club member



Today's Students are tomorrow's Leaders

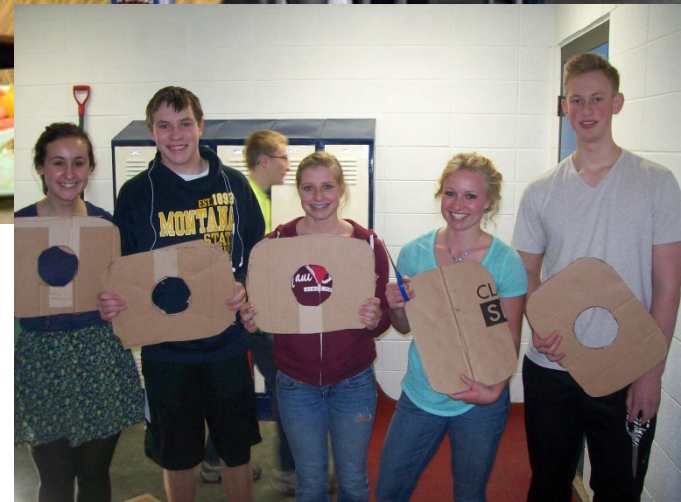
- ▣ “I learned that even just small little tasks can help conserve energy.
.....I hope our group can follow through with these ideas, and that we motivate others to want to join the smart group and recycle.”

Holly Emter



Student Involvement... S.M.A.R.T. Club

- One person can make a big difference, but together we make a HUGE difference!



SGHS- 5 time SMART Schools Energy Champions- Winning \$5,000



SMART School Challenge
Recycling, Energy Savings, and
Healthy School



SMART Schools have a Better Public Image

Thursday, February 26, 2015

SGHS students get SMART

Recycling, energy savings challenge spurs campus projects

By Sam Spector

Sweet Grass County High School

Lt. Gov. Angela McLean challenged schools across Montana to participate in a contest to save money and resources. SMART refers to a school's ability to "Save Money and Resources Today," and so far more than 50 schools are signed up for this year's contest, now in its second year.

This year, Sweet Grass County High School decided to join the charge, with the approval of the SGHS Board of Trustees and Superintendent Al Buerkle. Head custodian Sam Spector volunteered to be the SMART Schools Coordinator at the start of the year.

Each school has the option of participating in one, two or three different challenges: SMART Energy Challenge, SMART Green Schools Challenge and SMART Recycling Challenge.

SGHS students selected the energy and recycling challenges to compete against other class B schools throughout the state. Schools are assessed based the design and implementation of programs to address each challenge during the 2014-2015 school year. In addition to saving money and promoting health, the top four schools in each category will receive a "SMART Schools" designation, a \$1,000 cash prize and statewide recognition from Lt. Gov. McLean.

Spector and Bill Pedersen, a representative of the lieutenant governor's office, spoke to the students Feb. 18 at an all-school assembly about the challenge. Pedersen talked about what this challenge means for both Montana and the world,



Photos courtesy Sam Spector

Sweet Grass County High School students pledged their support for the "Save Money and Resources Today" (SMART) challenge during an assembly Feb. 18. Students and staff implemented several projects as part of the challenge including new plastic bottle recycling bins and paper waste awareness.

Custodians Jeff Harper and ballgame event help John Faw further helped out by recycling what plastic bottles were left in the stand during event cleanup, leading to an approximate 95 percent recycling rate.

Taking plastic out of the equation was crucial to allowing SGHS to drop from an 8-cubic-yard dumpster to a 6-yard dumpster. The city charges the school commercial rates of \$13.32/cubic yard whether or not the dumpster is full. This 2-cubic-yard difference saves the school approximately \$1,200 per year.

Since 2005 the school reduced waste by 57 percent by going from 14 cubic yards of dumpsters to only one 6-yard dumpster, saving \$4,582.08 annually.



SGHS cook Elena Mattheis cleans tin

National Recognition

- Department of Environmental Quality invited a representative from the Department of Energy to come and showcase our school.
- Russel Lamp from the Department of Energy came and toured our school thus giving Sweet Grass County High School National Recognition.



Thank You to the SMART Schools Leaders for
your commitment to our schools...

- Governor Steve Bullock
and Lt. Governor Mr.
Mike Cooney
- Claudia Hewston—
2018 SMART Schools
Coordinator
- Robyn Boyle- Energy
Resource Specialist
Energy Bureau
Montana DEQ

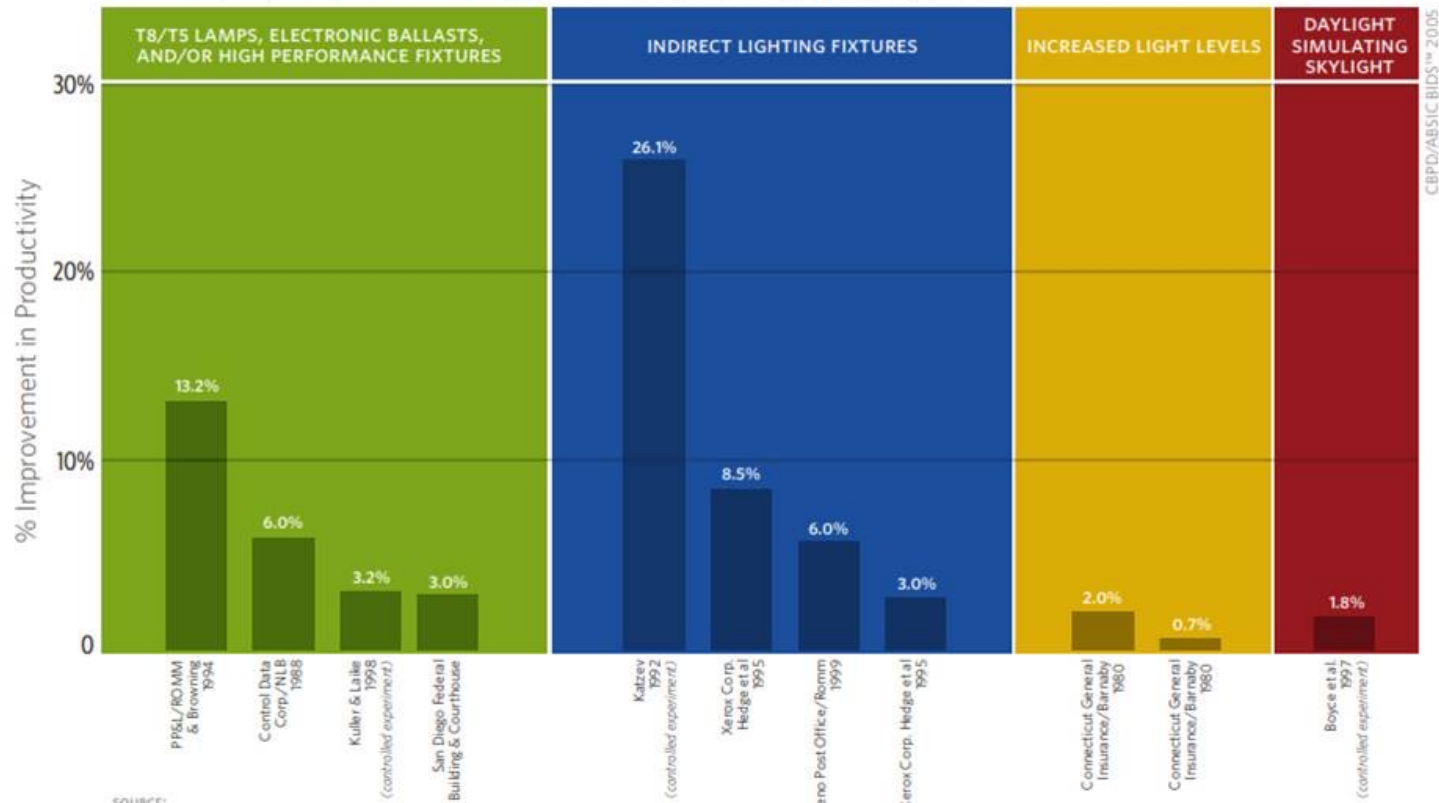


- We would also like to thank Bonnie Rouse for her dedication to the SMART Schools Program.



Higher Productivity

FIGURE D
Productivity Gains from High Performance Lighting Systems



SOURCE:
Carnegie Mellon University Center for Building Performance, 2005

CBPFD/ABSIC BIDS™ 2005

Hidden Benefits of a High Performance School

FIGURE E

Benefits of Green K-12 Facilities

Executive Views on Green School Performance Compared with Conventional Schools

● Much Better ● Somewhat Better

SOURCE:

Turner Construction Company 2005 Survey of Green Buildings



Community Image



Reduced Student Absenteeism



Ability to Attract/Retain Teachers



Student Performance

High Performance Lighting increases Student Performance



Lower Operation and Maintenance Cost

- SGHS is saving \$8/square foot over a 20 year period as the study suggests, then the added benefit in dollars to our high school is a total of **\$512,000** (64,000 square feet times 8)

LOWER OPERATIONS AND MAINTENANCE (O&M) COSTS

A major recent study of costs and benefits of green buildings for 40 state agencies found that the operations and maintenance (O&M) benefits of greening California public buildings provide savings worth \$8/ft² over a 20 year period.⁷³ Green schools, like other green buildings, incorporate design elements such as commissioning and more durable materials that reduce O&M costs. For example, the Canby School in Oregon, designed by Boora Architects, (see *Table B*) at a level equivalent to LEED Gold, features exterior surfaces of brick and metal with a baked finish that require virtually no maintenance/painting, as well as a linoleum floor with lower maintenance than conventional flooring.⁷⁴ Estimating O&M benefits from green schools is beyond the scope of this study but the benefits are probably significant.

Insurance Costs Lowered

INSURANCE BENEFITS OF GREEN BUILDINGS

- **Worker Health & Safety.** Various benefits, including lower worker's compensation costs, arise from improved indoor environmental quality, reduced likelihood of moisture damage, and other factors enhancing workplace safety.
- **Property Loss Prevention.** A range of green building technologies reduce the likelihood of physical damages and losses in facilities.
- **Liability Loss Prevention.** Business interruption risks can be reduced by facilities that derive their energy from on-site resources and/or have energy-efficiency features. These risks include those resulting from unplanned power outages.
- **Natural Disaster Preparedness and Recovery.** A subset of energy efficient and renewable energy technologies make facilities less vulnerable to natural disasters, especially heat catastrophes.

Source- Greening of America's Schools- Costs and Benefits

Energy Reliability

By reducing demand, the energy efficiency programs contribute to system reliability in terms of supply adequacy within a particular area or region... all energy efficiency measures... help maintain adequate margins of generation supply, and can help deter brownouts and blackouts....By reducing load and demand on the power distribution network, the [efficiency] programs decrease the costly likelihood of failures.⁷⁶

This report does not quantify the power quality and reliability economic benefits of greening the nation's schools, but they appear substantial.

- **By our school eliminating ballasts for florescent lights the benefits are: our energy power factor is better, there is no flickering, the light quality is improved to full spectrum, maintenance costs are significantly lowered, and we are saving money!**

What can you do for your school?

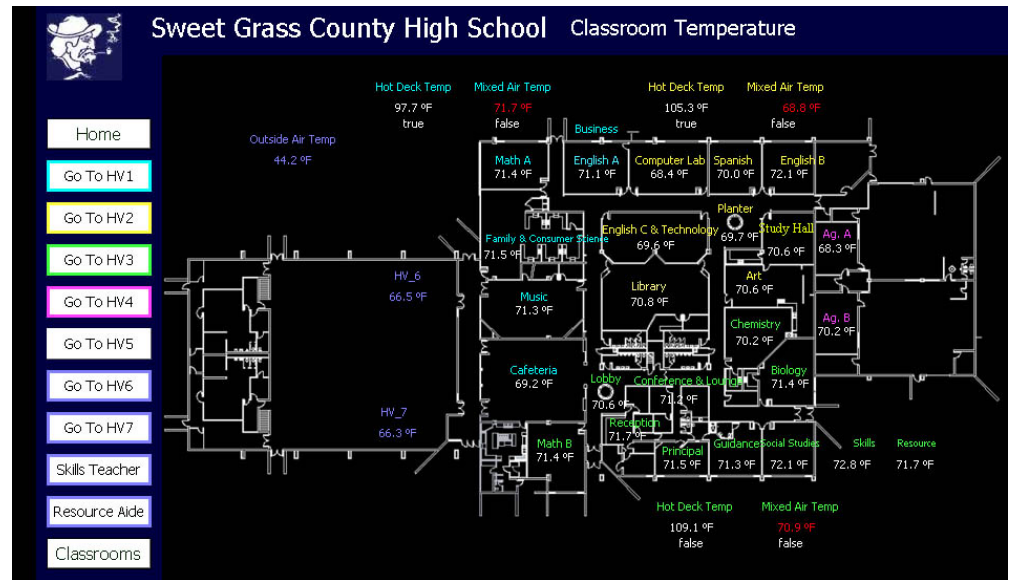
- Volunteer
- Collaborate with other Schools.
- Supporting Solar Projects
- **Funding-Grants and Fundraising**
- **Rebates**
- Turning off the lights, shutting windows



Biggest Win

7 of the top 41 building improvements related to the building concerned thermal comfort!

2009-10 Building Items Staff Survey Sorted						
Sorted by Average of Rating and Response						
Rating Sort	Average Rating	Responses Sort	Average Response /Rating Sort	Responses	Number of (Responses)	Building Item
1	1	1	1	1,1,1,1,1,1,1	7	AC in the Server Room
2	1.166667	6	4	1,1,2,1,1,1	6	Isolate HV (Heat and Ventilation) controls for the
4	1.333333	4	4	3,2,1,1,1	6	Install ADA Accessibility Door Hardware
5	1.333333	5	5	1,1,3,1,1,1	6	HV-Heat and Ventilation Controls
7	1.5	7	7	1,1,2,2,2,1	6	Ventilation in the Art Room
11	1.666667	8	9.5	1,2,1,1,2,3	6	Insulate exterior walls
12	1.666667	9	10.5	1,1,2,3,2,1	6	Heat in the Kitchen Storage/Hall/Entry
19	1.857143	2	10.5	2,2,3,1,2,2,1	7	Parking Lot Gravel/Maintenance
6	1.4	16	11	2,1,1,2,1	5	Insulate Roof
9	1.6	17	13	1,1,2,2,2	5	Retrofit/fix heat in locker and shower rooms
10	1.6	18	14	1,1,1,2,3	5	Block sealant on west wall of addition
20	2	10	15	2,2,2,3,1,2	6	Fix Exterior Walls Masonry Mortar
3	1.25	29	16	2,1,1,1	4	Make ADA Accessibility-Restrooms
21	2	11	16	2,2,3,3,2	6	Concrete Restoration Walls/Sidewalks
15	1.8	19	17	1,1,3,3,1	5	Improve Ventilation in Locker Rooms
16	1.8	20	18	1,2,2,1,3	5	Replace Boiler
25	2.166667	12	18.5	1,2,2,3,3,2	6	Painting the Gym rounded covering- flashing
8	1.5	30	19	1,1,2,2	4	Plumbing- Replace Bathroom Cutoff valves, Kitch
17	1.8	21	19	1,2,2,3,1	5	Carpet in Classrooms
36	2.428571	3	19.5	3,2,2,3,3,1,3	7	New Concession Stand
18	1.8	22	20	1,3,1,1,3	5	Landscape the South Berm for Temp Control
31	2.333333	13	22	2,2,3,3,3,1	6	Ceilings- Replace Ceiling Tiles in Gym
14	1.75	31	22.5	1,1,2,3	4	Fix Gutters



I wrote a grant where we won \$207,000 in funding to install digital controls for our heating system for Increased Thermal and energy savings

Solar Project- 50KW

- Grant- \$67,162
- Cost- \$98,500
- Cost after Grant- \$31,338
- Benefit- \$12,000 annual savings
- 25 Year Benefit Estimate \$250,000,
- Expected to last 50 years

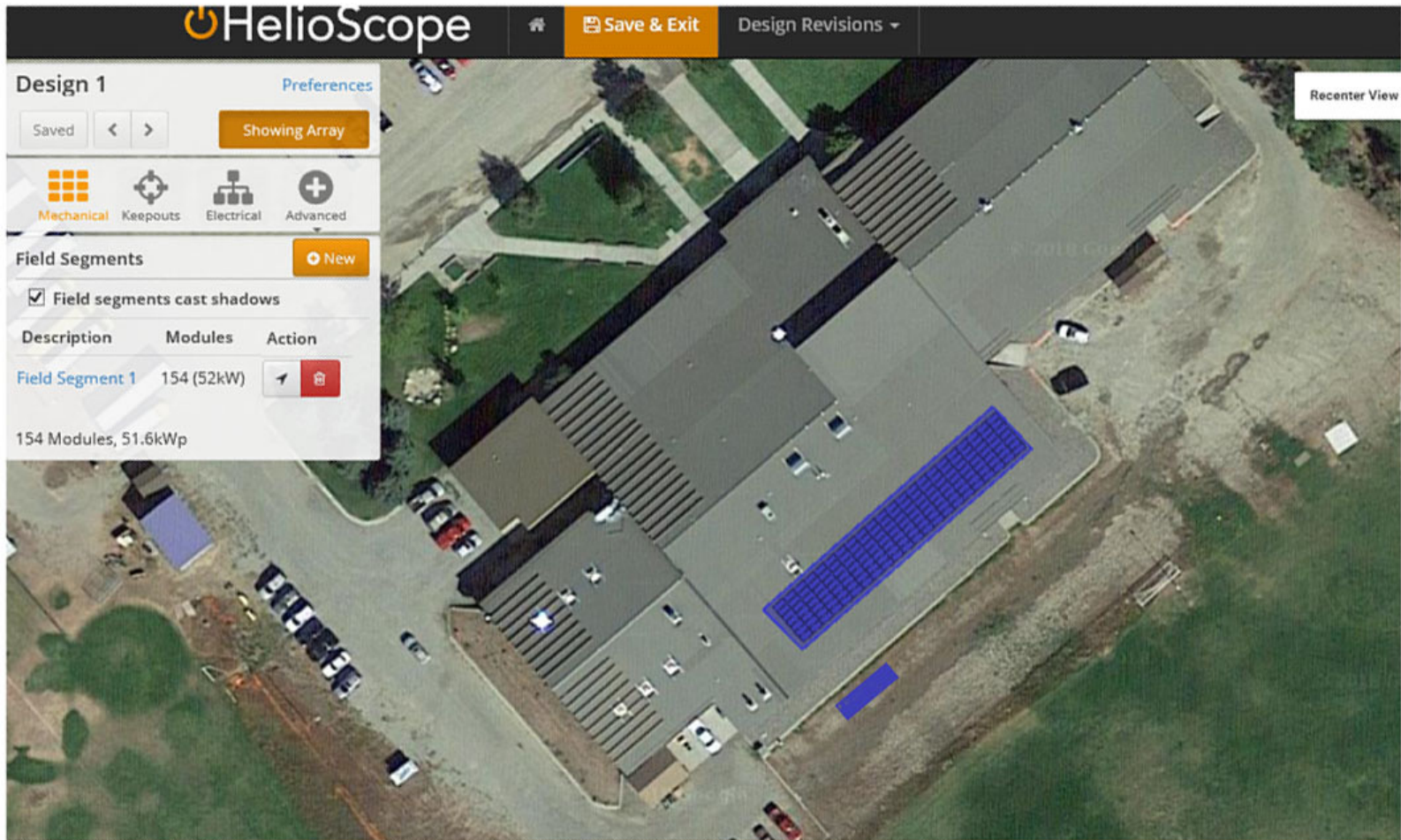
Steps to Getting Solar

- Team Build
 - Get Approval from Administration, School Board, Public, student groups
- Design Considerations- site
- Secure Funding- Grants
- Promote solar- fundraise and awareness, flyer
- Create a Timeline- summer project
- Create a Request for Proposal
 - Contact all state qualified solar installers for bids
- Manage the Project
 - Involve your state building inspector
 - Evaluate Bids
 - Contact local contractors
 - Work with your power company for net metering requirements
 - Work with the installer

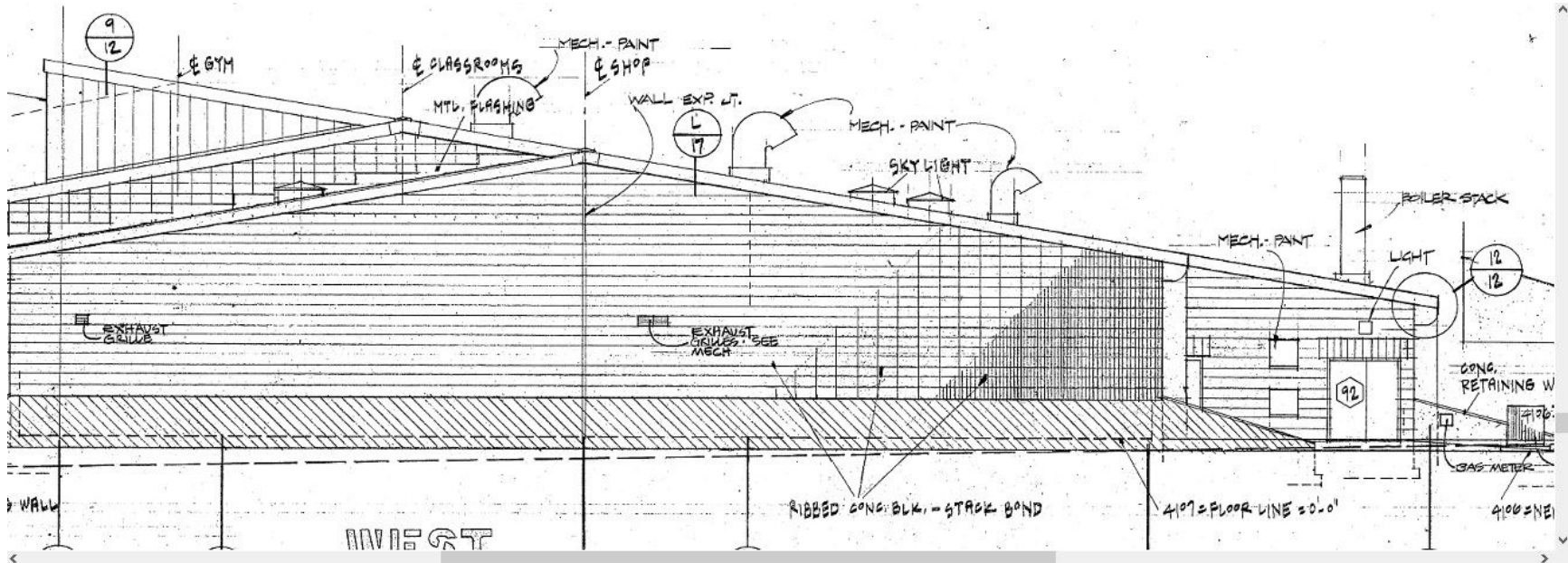
Considerations of Solar

- Commitment to Energy Efficiency
- Design
- Funding
- Qualified Contractors
- Site
- Maintenance

PV Sites- Roof and small array on rock berm



Roof Structure



We have a 2-12 pitch metal roof manufactured by ARMCO. It is a Single Lock Standing Seam roof. We will have an engineering firm determine the load capacity of the solar installation and hardware to make sure that our roof and the solar hardware are approved for this project.



Ground Mount Option

Sweet Grass County High School Proposed Ground Site PV Array



Electric Supply Hookup Site



Learning Solar Array Site- South Rock Berm



- Accessible to students to experiment by adjusting panel angles
- Near utility meter

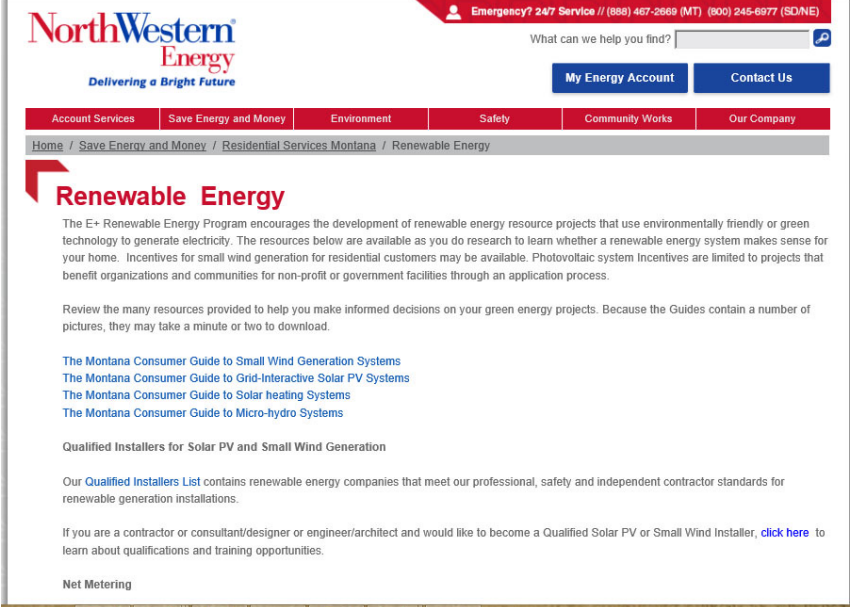
USB Grant- Universal System **Benefit**

NorthWestern Energy (NWE), formerly Montana Power Company, periodically provides funding to its customers for renewable energy projects. In 1997, Montana established the Universal System Benefits (USB) program. The USB legislation requires all electric and gas utilities to establish USB funds for low-income energy assistance, weatherization, energy efficiency activities, and development of renewable energy resources. A typical NorthWestern Energy residential customer pays approximately \$1 per month in electric USB charges. About \$9 million is collected annually by NorthWestern, and about \$1.2 million is used for renewable energy projects.

All Sweet Grass County residents who use NorthWestern Energy pay a small amount each month on their energy bill

USB Grant

- USB Grant – Universal System Benefit
- All Sweet Grass County residents who use NorthWestern Energy pay a small amount each month on their energy bill

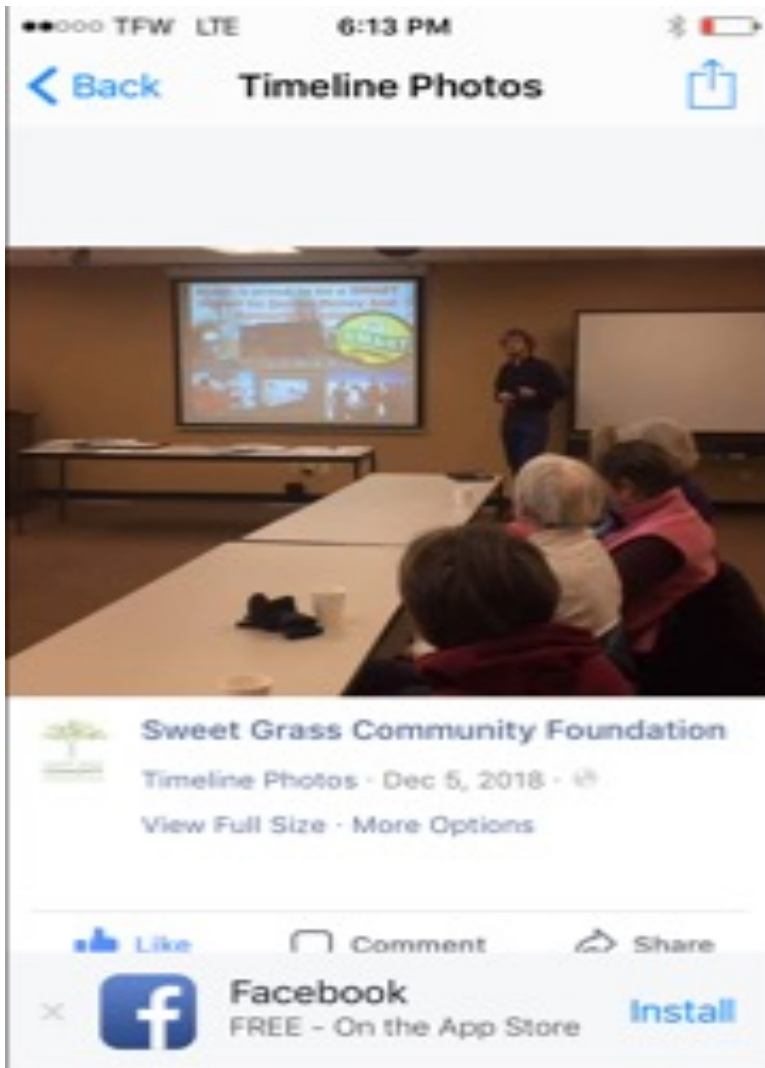


The screenshot displays the NorthWestern Energy website. At the top, the logo reads "NorthWestern Energy" with the tagline "Delivering a Bright Future". To the right, there is a search bar and a red banner with contact information: "Emergency? 24/7 Service // (888) 457-2669 (MT) (800) 245-6977 (SDNE)". Below the logo is a navigation menu with links for "Account Services", "Save Energy and Money", "Environment", "Safety", "Community Works", and "Our Company". A breadcrumb trail shows the path: "Home / Save Energy and Money / Residential Services Montana / Renewable Energy". The main heading is "Renewable Energy". The text explains the E+ Renewable Energy Program, which encourages the development of renewable energy resource projects using environmentally friendly or green technology. It mentions that resources are available for research, and incentives for small wind generation and photovoltaic systems are limited to projects that benefit organizations and communities for non-profit or government facilities through an application process. A note states that guides contain many resources to help with informed decisions, but they may take a minute or two to download. A list of guides is provided: "The Montana Consumer Guide to Small Wind Generation Systems", "The Montana Consumer Guide to Grid-Interactive Solar PV Systems", "The Montana Consumer Guide to Solar heating Systems", and "The Montana Consumer Guide to Micro-hydro Systems". Below this, there is a section for "Qualified Installers for Solar PV and Small Wind Generation", which includes a link to a "Qualified Installers List" and a note that the list contains companies meeting professional, safety, and independent contractor standards. A final note mentions that contractors or consultants/designers/engineers/architects interested in becoming Qualified Solar PV or Small Wind Installers should "click here" to learn about qualifications and training opportunities. The page also includes a "Net Metering" section.

USB Grant Funding Qualification Factors

- School and Community Support
- Student Learning Opportunity- USB Grant projects include public education or demonstration component to increase awareness of renewable energy.
- Previous Energy Conservation Measures
- Letters of Support
- The largest commercial system size supported is 50 kW.

Student Council President John Baxter Presenting at Womens Club Meeting





RAW DEAL RUN COMMUNITY FUNDRAISER

Name: _____
 Mailing Address: _____
 City: _____ State: _____
 Zip: _____ Phone: _____

This gift is for:

I want to give to the Match Fund	\$
(Helps all 20 participating organizations)	
ASPEN	\$
Big Timber After School Club	\$
Crazy Mountain Dog Park	\$
Crazy Mountain Museum	\$
Crazy Mountain Wrestling Club	\$
Crazy Peak Cattle Women	\$
Friends of Dornix Park	\$
Friends of the Library	\$
Hearts and Hands Hospice	\$
Hospitality House Senior Center	\$
Sweet Grass Arts Alliance	\$
Sweet Grass Cancer Alliance	\$
Sweet Grass Community Foundation	\$
Sweet Grass County Ambulance	\$
Sweet Grass County High School	\$
SGC Search and Rescue	\$
SGC Chamber of Commerce	\$
Sweet Grass County Partners in Education	\$
Sweet Grass Recycle	\$
Sweet Grass Technical Institute	\$

TOTAL: \$

Write one check payable to:
 Sweet Grass Community Foundation
 PO Box 517 Big Timber, MT 59011

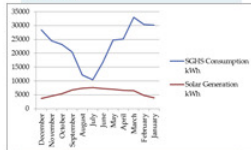
Your donation information will be included in SGC's recognition materials and shared with the organizations designated above unless you instruct us otherwise.

I wish this gift to remain anonymous

****Donations must be received by 9/28 at Noon**



Students and Staff and the public will be able to see how the solar array is performing by looking at a "kiosk" dashboard installed somewhere in the school. Anyone will be able to access the same information also on the high school website SGCHS.com.



All of the power generated from our solar array will be used at the high school. The graph above compares month by month the power generation as compared to our actual kilowatt hour electrical use. When school is out in June, July our consumption goes down considerably, but we still will use the power from the solar array at the school.

In May the High School was awarded \$67,162 from NextGeneration Energy which will cover 80% of the project cost. The High School is now working to fundraise the remaining matching funds. Our goal is to raise \$20,000.

If you are interested in the SGHS Solar Project you can donate at the High School. You can also donate through fundraising events including the Raw Deal Run fundraiser organized by the Sweet Grass Community Foundation. The donation period is from Sept. 1 thru 28th and the run event is held on September 28th.

Cottonwood Resource Council has offered matching funds of \$2,000 towards the project and also the high school has offered their \$1,000 winnings from 2018 the Montana Governors Energy SMART Schools Challenge to go towards the SGHS Solar Project.

Any additional money raised will go towards fencing of the project and for future maintenance costs. If we can successfully raise our 20% match, and if the weather cooperates, we should be installing the solar projects in the spring of 2020 and be

A donation of \$1 to the SGHS Solar Project will return \$10 worth of power generation over the project lifetime.

SGHS Solar Project

Sweet Grass County High School is looking to the future and working to install solar panels. This project, called the SGHS Solar Project, would allow the High School to install a 50 kilowatt solar array on the ground at the south side of the school facing the interstate. The array would offset 26% of the High School's electricity usage and save the school \$5,000 annually on energy bills.



The goal is to reduce ongoing operating costs at Sweet Grass County High School, and invest more money into the education of our students, and to educate student, staff, and community residents on the benefits of solar renewable energy.

Sweet Grass County High School
 P.O. Box 888
 Big Timber, Montana 59011
 SGCHS.com

We are creating a culture of conservation, saving money, and making our school healthier and more competitive.

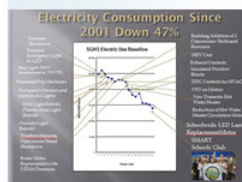


Hidden Benefits of a GREEN School

- Health and Well Being of Occupants
- Higher Student and Teacher Productivity
- High Performance Lighting
- Improved Indoor Air Quality
- Lower Insurance Cost
- Improved Temperature Control
- Improved Learning and Test Scores
- Reduction in Absenteeism
- Better Community Image
- Ability to attract and retain teachers
- Lower costs of utilities
- Lower Operation and Maintenance Cost

•SGHS Solar Project Benefits

- Savings of \$6,000 annually
- Lifetime savings of \$184,000
- Educational Benefits
- Community collaboration



Energy Conservation Measures at SGHS are now saving the school \$30,000 per year and we are down on our electrical consumption by 47%!



Students at SGHS have won the Governors S.M.A.R.T. Schools Energy Challenge 4 of the 5 years. SMART stands for Saving Money and Resources Today. Each winning year SGHS has won \$1,000 which has been invested in energy savings projects like high performance LED lighting!

Promotion SGHS Solar Flyer went to grade school weekly folders to parents.

THE BIG TIMBER PIONEER

WWW.BIGTIMBERPIONEER.NET \$1

THURSDAY, SEPTEMBER 26, 2019 | VOL. 130 NO. 51

SGHS solar project could make big impact

By Elias Baer
Pioneer Reporter

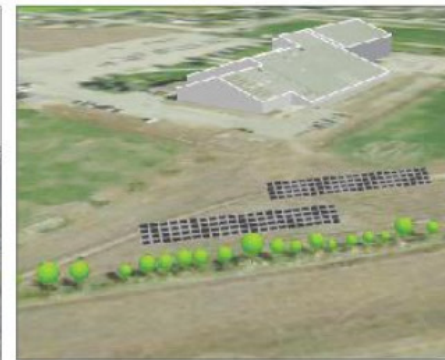
Sweet Grass County High School is negotiating a solar array project that could potentially save thousands of dollars, significantly reduce the school's carbon footprint and promote a culture of conservation.

The 50-kilowatt array will consist of two rows of fixed panels set at a 35-degree angle for optimal year round energy production. It would have the capacity to generate around 70,000 kilowatt/hours of energy, accounting for 26 percent of the energy required to operate the school.

With a projected lifespan of 30 years and approximately \$6,000 in annual savings, the array is predicted to save the school more than \$180,000.

"We received a grant from NorthWestern energy for \$67,162," said Sam Spector, head custodian at SGHS, and the grant funds account for

SOLAR/see Page 7



Pioneer photo by Elias Baer

Left, Sam Spector points out the future site for the proposed solar array behind SGHS.

Above, A 3D mock-up of what the solar array would look like, created by OnSite Solar for the high school.

WEEKLY HIGH

73° F

WEEKLY LOW

21° F



Weather 9



BARN DANCIN'

A crowd kicked up its heels at the first annual barn dance at the fairgrounds 3

HERDER TEAMS FALL

The SGHS football and volleyball teams lose in last week's contests 6


BIRDS IN DANGER

Bird populations are down in Montana and across the nation 4



8 06205 92406 1

Fundraising

 Sweet Grass Community Foundation
116 West Second Ave.
Big Timber, MT 59011

3200

DATE October 17, 2019

Pay To The Order Of Sweet Grass County High School - Solar Project \$ 3,922.71

Three thousand nine-hundred twenty-two dollars and 71/100 Dollars

Memo RDR Community Fundraiser Corry Cremer-Seitz

⑆200946550⑆ 6847630111⑆ 3200

Letters of Support

OFFICE OF THE GOVERNOR
STATE OF MONTANA

STEVE BULLOCK
GOVERNOR



Angela McLean
LT GOVERNOR

March 26, 2015

Dear Sweet Grass County High School Building and Grounds Committee:

On behalf of *SMART Schools*, I would like to support Mr. Sam Spector's efforts to deploy solar photovoltaic and solar thermal arrays at Sweet Grass County High School (SGCHS). As you may know, *SMART Schools* is a statewide effort to promote energy efficiency, waste reduction and health in schools, and installing solar panels helps a school do just that. *SMART* stands for *Saving Money and Resources Today*, as schools can make simple behavioral and operational changes to save taxpayer money. Deploying solar at Sweet Grass County High School will help do that.

I had the pleasure of meeting Mr. Spector on a *SMART Schools* panel we both served on at the 2015 U.S. Green Building Council's annual summit. Mr. Spector's innovative energy conservation projects impressed the entire *SMART Schools* team, as he has found ways to save taxpayer money while reducing SGCHS's environmental footprint. The *SMART Schools* Challenge now uses SGCHS as a success story when talking to schools across the state about saving money through resource conservation. That is why I support Mr. Spector's next project of acquiring renewable energy systems.

Deploying solar on schools makes sense as it can save school districts money, lessen schools' environmental impacts and provide STEM learning opportunities. There are a number of grants and loans available to help schools finance solar projects. Once the upfront costs are covered, solar has minimal maintenance costs and can save schools money by producing cheap, clean electricity. Solar also provides numerous practical learning opportunities. Teachers can use school-based renewable energy systems to teach students about calculating financial savings, expected payback periods, engineering, graphing, unit conversions, resource conservation, environmental stewardship, and more.

Again, on behalf of *SMART Schools*, I am excited to see Sweet Grass County High School join other schools across Montana in examining the possibility of developing renewable energy systems. Thank you for your consideration of my support. Please do not hesitate to reach out with questions or concerns.

Sincerely,

ANGELA MCLEAN
Lt. Governor



April 8, 2015

To Whom It May Concern,

We are excited to write to you about the potential for solar power units at Sweet Grass County High School and where we would be able to incorporate that into the classroom and FFA.

The Electrical Wiring class already does a unit on the uses of solar energy and how they work. It would be great to be able to have something of this size to show the class and allow them to gain a better understanding of how it works and the job opportunities there. If it is something that is needed, the class could help to prepare for the installation of the units as well. While the class does not spend a great deal of time on solar power, there would still be a week or two every semester on the subject.

It is our understanding that the power produced here, could be used to potentially charge batteries for power storage. The FFA is still in the planning phase of adding a greenhouse to the Agriculture Department of the high school and could use this to energize light, heat, and other aspects to this extension of the classroom. Energy usage has been one of the major issues against installing a greenhouse for the program and this could be a way of offsetting that cost.

Please feel free to contact us if you have any questions.

Sincerely,

Gary Mattheis

Casey Luncford

Sweet Grass County High School



501 West 5th Street
Big Timber, MT 59011
(406) 932-5993
Fax: 406-932-5982

To whom it may concern,

In regards to a solar photovoltaic cell, I would support and encourage the implementation of the device as a teaching tool. The physics program currently uses an inquiry based model to investigate electrical circuits that include parallel and series forms based on the work of Lilian McDermott. The voltaic cell would lead right into the research portion of Ohm's law and Kirchhoff's rules. A reading off the device that would show the variation of electric flow due to weather and direct sunlight would be useful and give a teachable moment through the application of use versus output. Cost efficiency would also be an area of interest in our unit on saving energy through the implementation of high efficiency items, such as led lights, motion sensor switches as well as timers for heating systems in homes. In the presentation of new ideas, it would lead to the functionality of storing electrical energy and the need for investigating new research in this area. I would utilize the voltaic cell and encourage the students at SGHS through the application of active inquiry in its use.

Sincerely,

Dan Campbell
Physics Instructor – Sweet Grass County High School



October 29, 2018

Dear Universal Systems Benefits (USB) Grant Selection Committee,

On behalf of Montana SMART Schools, I support the Sweet Grass Country High School's (SGCHS) request for funding to install a solar PV power system to reduce energy costs, move toward energy independence and provide educational opportunity.

SGCHS has participated in the Montana SMART Schools challenge for several years now; a challenge that aims to inspire schools across the state of Montana to practice energy efficiency, conservation, waste reduction, and healthy environmental choices. Through the years SGCHS has joined in both the waste reduction and energy efficiency challenges, proving their commitment to energy efficiency. But SGCHS efforts toward energy efficiency can be observed as a nearly linear reduction in electrical consumption accomplished through countless energy saving measures from the past 17 years.

In their continued pursuit of energy efficiency, SGCHS has developed a learning opportunity for its students. Through their involvement with SMART Schools, and the creation of a SMART club, SGCHS has made a commitment to educate and instill an understanding of clean living to their students. SGCHS plans to expand the reach of this project not just to the rest of their student body, but also into the community. It is proposed that with a solar PV power system installed, solar dashboards would be placed in student common areas and on the high school's website, giving the students and the community a real time display of energy production.

With the development of this project, SGCHS has shown a dedication to energy efficiency in the true spirit of SMART Schools (Saving Money And Resources Today), and I hope that you will consider giving them and this wonderful educational outreach proposal your full attention. Thank you for your time and consideration of SGCHS for the USB grant. If you have any further questions about SGCHS's qualifications please contact me, as I am truly excited to support them in their continued energy efficiency endeavors.

Sincerely,

A handwritten signature in blue ink that reads "Robyn Boyle".

ROBYN BOYLE
Energy Efficiency Conservation and Financing Specialist
Montana Energy Office, Department of Environmental Quality
1520 E. 6th Ave. Helena, MT 59601
rboyle@mt.gov, (406) 444-1842

OFFICE OF THE GOVERNOR
STATE OF MONTANA

STEVE BULLOCK
GOVERNOR



MIKE COONEY
LT. GOVERNOR

October 31, 2018

To Whom It May Concern:

On behalf of the SMART Schools Challenge, I am writing today to support Mr. Sam Spector and Mr. John Baxter in their efforts to receive a USB Grant through NorthWestern Energy for a 50KW solar array at Sweet Grass County High School. As you may know, the SMART Schools Challenge is a statewide effort to promote energy efficiency, waste reduction, and healthy living in Montana schools. SMART stands for *Saving Money And Resources Today*, as schools can make simple behavioral and operational changes to save taxpayers money and be better stewards of state resources. This solar array acquisition for Sweet Grass County High School helps the school do just that.

I had the pleasure of meeting Mr. Spector in 2016 when I visited Sweet Grass County High School to award them the SMART Schools Energy Challenge Champion award. I was impressed with Mr. Spector's excitement and willingness to save taxpayers money, while reducing Sweet Grass County High School's environmental footprint. Mr. Spector and the Sweet Grass County High School team have been awarded the SMART Schools Energy Challenge Champion award each year of the SMART Schools Challenge, dating back to the 2014-2015 inaugural year.

If awarded this grant, Sweet Grass County High School would be able to produce about 22% of the current electrical needs at the school. Those savings will reduce the overhead costs of providing reading materials, educational technology, hands on activities, and other important services. Not only is this an investment in the community of Big Timber and Sweet Grass County, it represents a step towards diversifying our state's energy supply with clean, renewable energy. This project is also an investment in building Montana's solar industry, along with the electricians, engineers, and roofers that local solar contractors put to work.

Again, on behalf of the SMART Schools Challenge, I am excited to see Sweet Grass County High School examining the possibility of expanding their renewable energy systems. Thank you for your consideration and please do not hesitate to reach out if I can be of assistance.

Sincerely,

A handwritten signature in blue ink that reads "Mike Cooney".

MIKE COONEY
Lieutenant Governor



P.O. Box 1105 • Big Timber, Montana 59011

Sweet Grass County High School Board:

Cottonwood Resource Council has been keeping an eye on the progress of efforts to explore the development of solar in Sweet Grass County. John Baxter, Conner Murnion and Sam Spector have been researching and learning what it will take to get a project such as putting an array of solar panels on the roof of the high school together and CRC has set forth \$2000.00 in our budget to do a matched fund fundraising project as soon as they get approval on their grant money. We are in agreement to help them with fundraising and we are open to the possibility of more money for this project in future.

Please feel free to contact CRC if we can be of help.

Sincerely,

Teri Schlabach
Cottonwood Resource Council Chairperson



Office of the County Commissioners

*William Wallace
Bob Faw*

October 29, 2018

Dear Board of Trustees:

Sweet Grass County would like to offer our support for the proposed solar array project at the Sweet Grass County High School.

The school has participated in the SMART program and other energy cost savings programs and this solar project would provide a valuable educational process about solar energy and other renewable resources.

Sweet Grass County supports these efforts for the proposed solar array project. Please feel free to contact us at sgcommish@tstriangle.com or 406-932-5152.

Sincerely,

Board of County Commissioners
Sweet Grass County Montana

William Wallace, Commissioner

Bob Faw, Commissioner



April 8, 2015

To Whom It May Concern,

We are excited to write to you about the potential for solar power units at Sweet Grass County High School and where we would be able to incorporate that into the classroom and FFA.

The Electrical Wiring class already does a unit on the uses of solar energy and how they work. It would be great to be able to have something of this size to show the class and allow them to gain a better understanding of how it works and the job opportunities there. If it is something that is needed, the class could help to prepare for the installation of the units as well. While the class does not spend a great deal of time on solar power, there would still be a week or two every semester on the subject.

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Please feel free to contact us if you have any questions.

Sincerely,



Gary Mattheis



Casey Lunceford



Big Timber FFA

Sweet Grass Co. High School
P.O. Box 886
Big Timber, MT 59011



October 9th, 2018

Board of Trustees;

We are excited to write to you about the potential for solar power units at Sweet Grass County High School to be incorporated into our classrooms and FFA.

The Electrical Wiring class would be able to briefly explore the system through hands-on demonstrations that would allow them to gain a better understanding of how solar power works and what job opportunities are present in the industry. It may be possible for the class to assist in maintenance, if needed.

In Natural Resources class, the students would be able to investigate an often lesser discussed resource, the sun. Students would have the chance to work hands-on with the panels and discover the science behind turning sunlight into electricity. We could also connect what we are doing here at Sweet Grass High with the solar farm outside Reed Point by having the students tour their operation and compare it to how we operate them here at the school.

Students from both classes and FFA could also be involved in investigating the efficiency of these panels and determining how much energy and money is saved every month. They could potentially conduct experiments to determine how to best utilize the panels and share the results with the board and school staff. This would allow students public speaking and research opportunities they might not otherwise be exposed to.

Please feel free to contact us if you have any questions.

Sincerely,



Taylor Standley



Austin Standley

Request for Proposal



Evaluation/Selection Criteria:

SGHS will evaluate proposals according to the evaluation criteria below. Result of this step will be the identification of the selection of a proposal for negotiation of a contract. Points will be awarded based on the relative merit of the information provided in the response to the solicitation. Selection based on the total number of points awarded by the evaluation committee.

- | | |
|---|-----------|
| • Project Cost | 40 points |
| • Technical Approach/ Implementation Schedule | 25 points |
| • Company Qualifications/Project Experience | 20 points |
| • Project team, team experience and approach | 15 points |

Costs

- We had 5 Qualified NorthWestern Energy Solar Installers bid the project.
- I have the Request for Proposal that I can share as a template.
- Fence around the ground mount site for protection.

















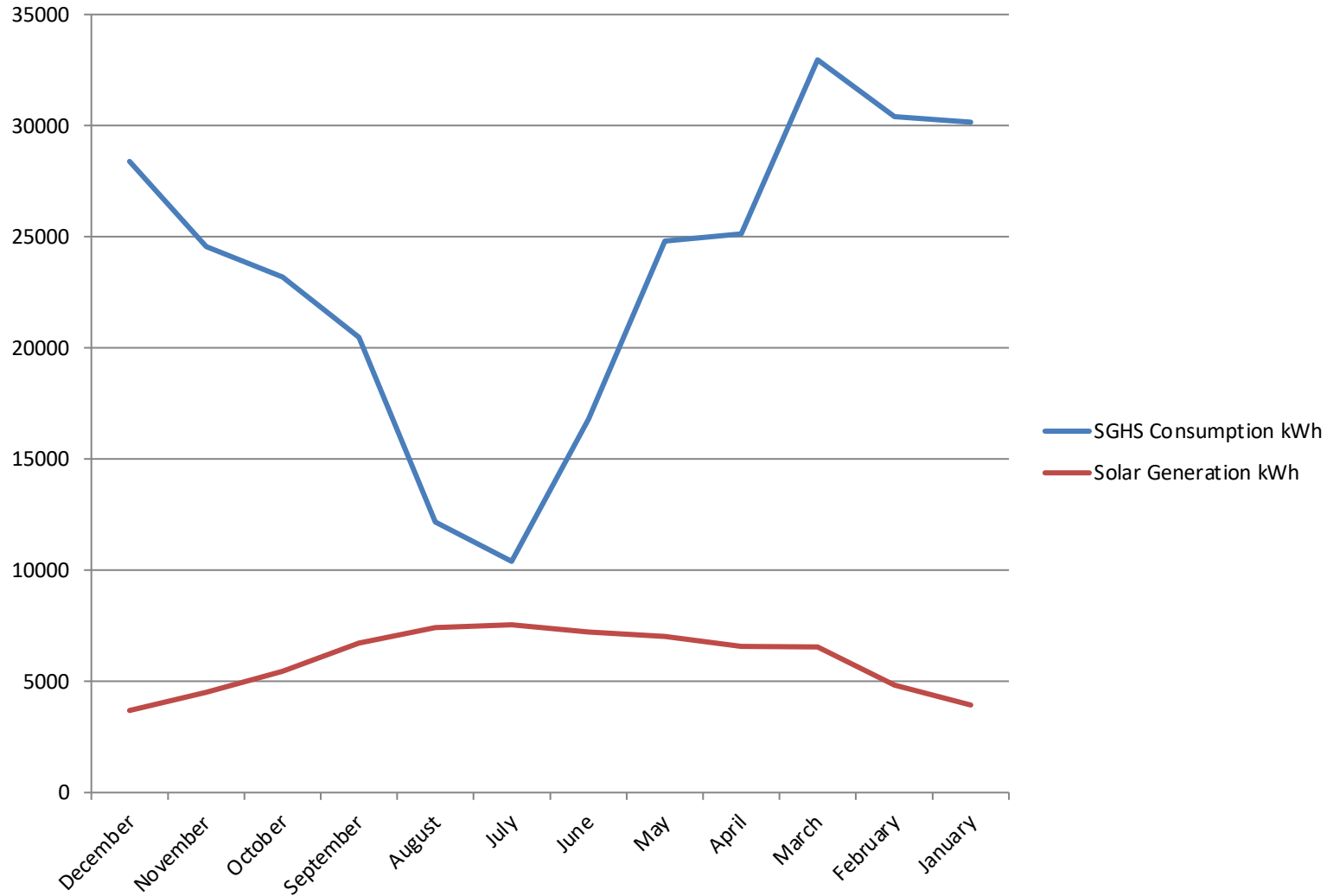








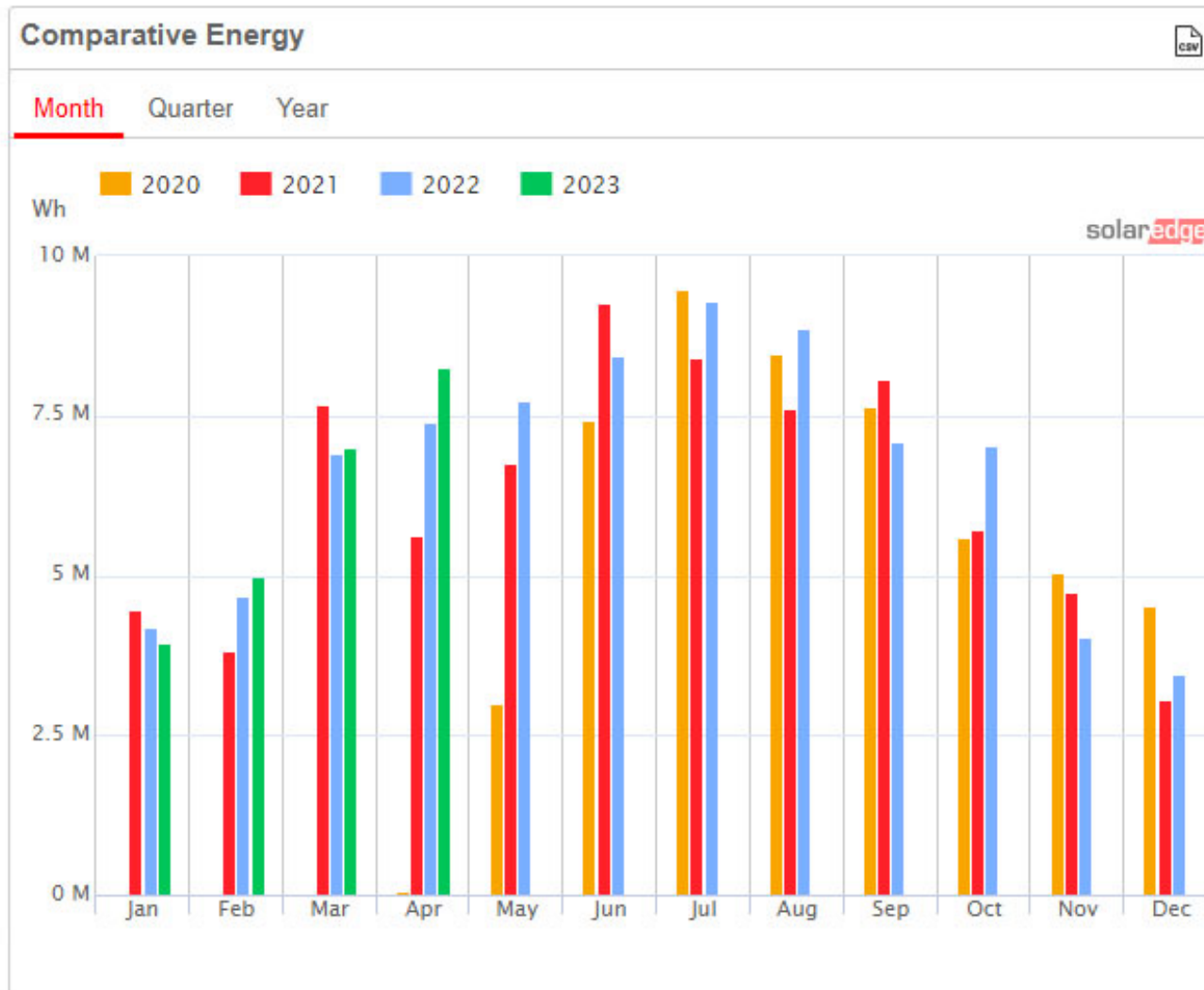
SGHS Electric Consumption vs Proposed 50 kWh Solar Generation



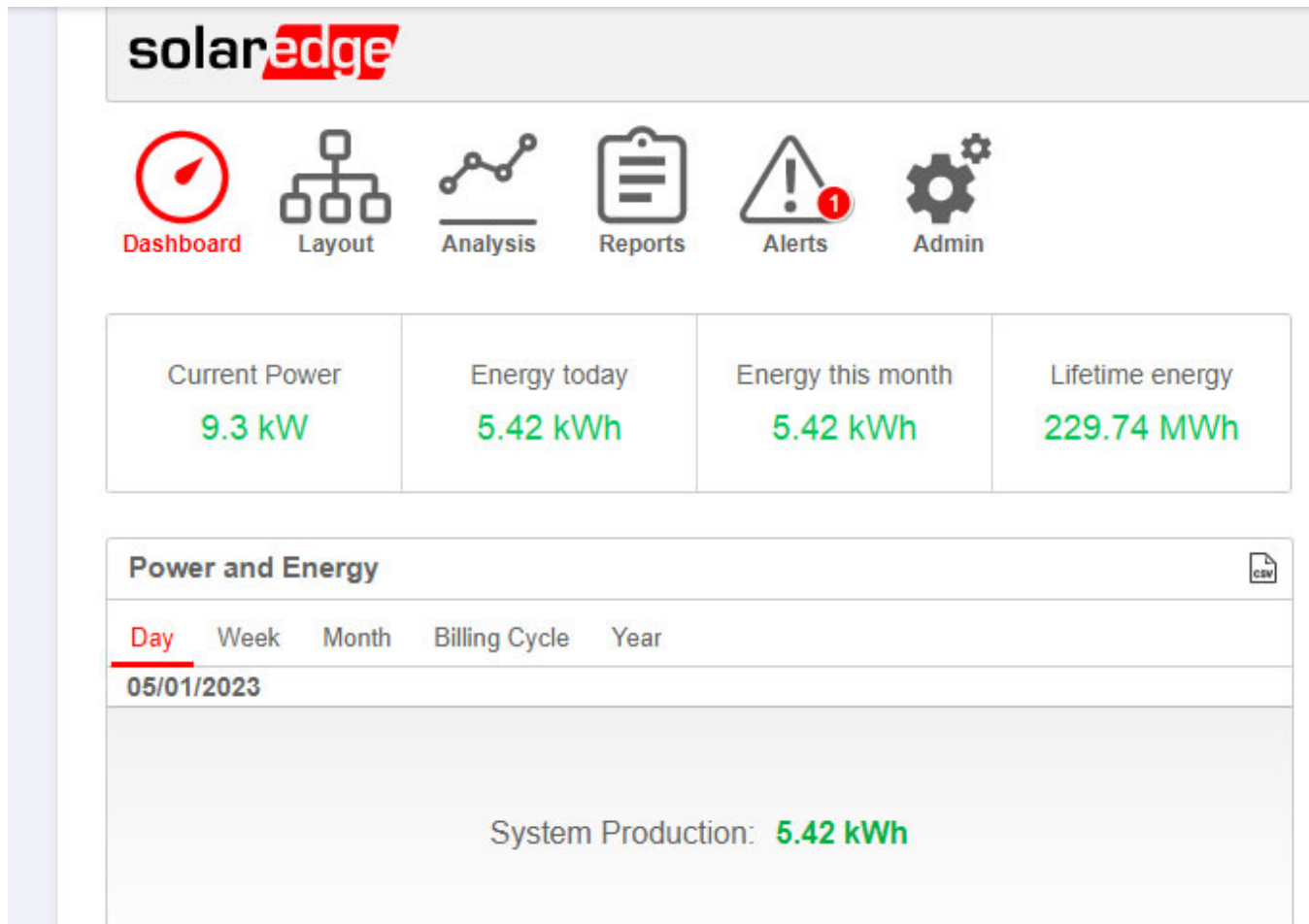
The array produces 26% of the High School's electricity needs.

Month	<u>Consumption</u> SGHS 2017-18 KiloWatt hour	<u>Generation</u> Calculated PV Array KWh	<u>PV Array Generation amount based on Percentage of Electrical Consumption</u>
December	28400	3692	13%
November	24560	4498	18%
October	23200	5450	23%
September	20480	6734	33%
August	12160	7422	61%
July	10400	7547	73%
June	16800	7220	43%
May	24800	7019	28%
April	25120	6574	26%
March	32960	6555	20%
February	30400	4824	16%
January	30160	3928	13%
Total	279,440	71463	26%

System Performance- 78,000 Kwh annually or 26% of the school needs



Solar Kiosk- Dashboard in our Cafeteria



Biggest Win- 50Kw Solar Array

- Installed May 2020
- Savings of \$12,000 annually
- Lifetime Benefit over \$250,000



SGHS Savings in the Next 10 Years

- \$45,000 annually or \$450,000
- Where can we use these dollars...?
- All money we save can be re-invested into educating our students!
- Student/Teacher ratio remains low.
- Students benefit with a better education.
- School is more competitive.
- Lower absenteeism
- Higher Performance