



CASDEM MEETING

SVVSD HIGHLIGHTS: ENERGY & SUSTAINABILITY

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Agenda

1. Solar Systems
2. Resource-Wise Program
3. EV & EVSE Project

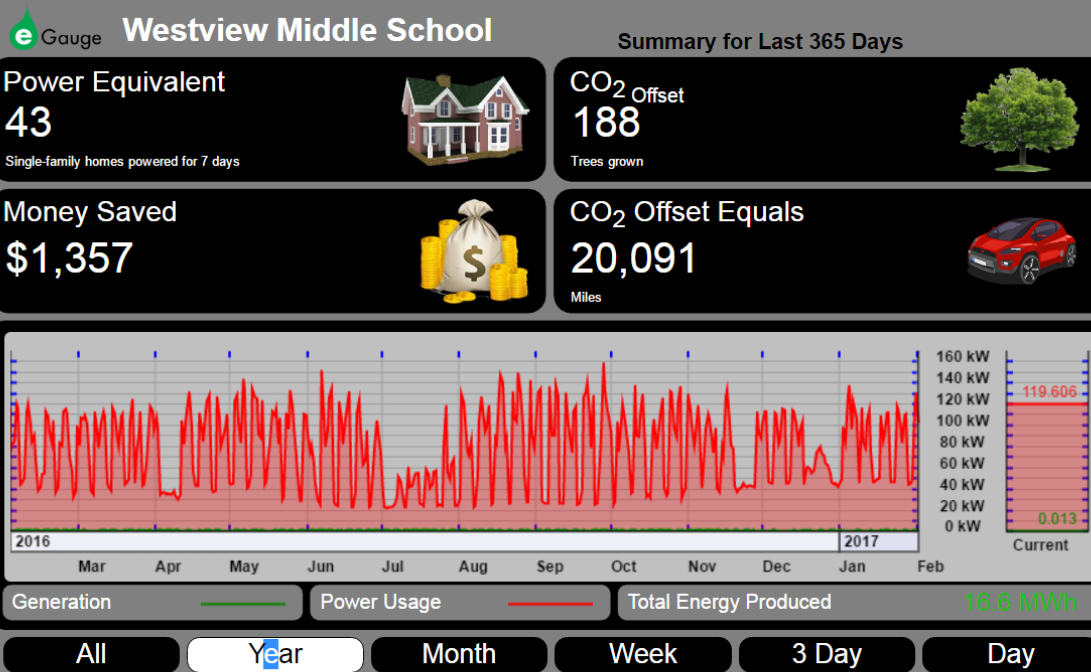


Solar System Project Overview

- Request for Proposals went out in June 2015 for solar power purchasing agreements
- Selected Advanced Energy Systems based on best pricing and terms
- Secured Xcel's solar rewards through extremely competitive application in April, July, and October 2016
- 5 rooftop systems (1.7MW):
 - Red Hawk ES: 250 KW
 - Erie ES: 200 KW
 - Erie MS: 500 KW
 - Niwot HS: 500 KW
 - Niwot ES: 250 KW
- Expected annual solar production: 2,650,776 kWh's

Renewable Energy Objectives

- Clean Energy
- Mitigate current and future risk against rising electricity prices
- Educational opportunities



Power Purchasing Agreement

- No upfront cost
- 20 year contract with buyout option starting end of year 6
- We pay for solar generation to AES instead of paying for that electricity from Xcel
- Through the PPA we have negotiated a price of \$.035 per kWh, 0% escalator
- We only pay for what is generated
- This includes the Xcel solar reward which equals \$.05 per kWh!
- We currently pay \$.035-.041 per kWh to Xcel so we are saving in year 1
- Roof remove/repair is included in contract at no added cost
- Operations and maintenance included in contract

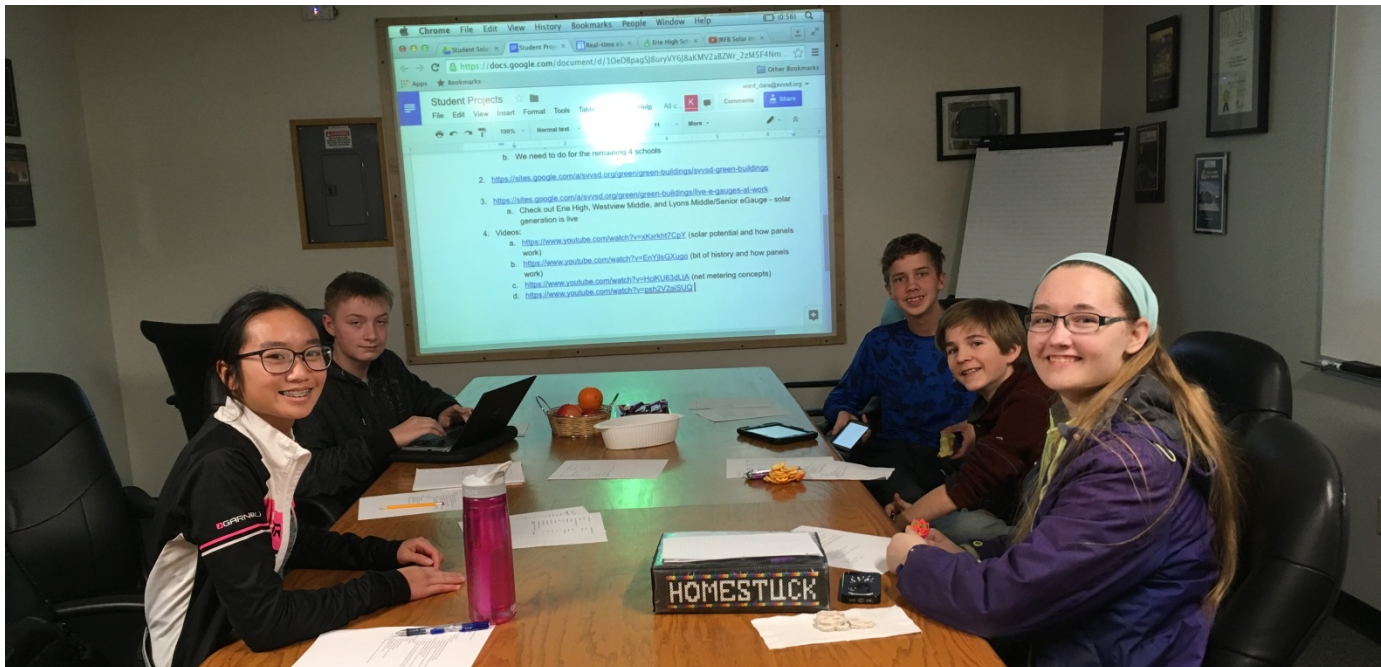
District Ownership

- Upfront cost of \$3M - \$4M
- Savings from solar generation as direct reduction on electric bills
- District receives \$0.05/kWh solar rewards on generation
- Responsible for operations, maintenance, system failures, roof removal and replacement
- Savings begin in year 12-19 depending on cost

Solar Project Financing Structures	Pros	Cons	25 Year Savings	Notes
PPA (Buyout option not executed)	<ul style="list-style-type: none"> -District presence minimal -No upfront cost -Maintenance covered -Predetermined electricity prices for 20 years -No rate escalator for 20 years -Pay only for energy generated -System gifted at 20 years -Buyout options at year 6-20 	<ul style="list-style-type: none"> -Lose control over roof usage -20 year project horizon if buyout not executed -Other people on roof -What happens if the school is closed or sold? 	\$1,254,000	<p>Solution: Access to roof during non school hours in contract</p> <p>*Include in contract what happens if school is closed or sold</p>
PPA/Buyout at Year 6	<ul style="list-style-type: none"> -District presence minimal -No upfront cost -Maintenance covered -Pay only for energy generated -Buyout options at year 6-20 -Opportunity to learn solar system needs year 1-6 -Energy prepaid years 6+ -No other people on roof years 6+ -Regain complete control over roof years 6+ 	<ul style="list-style-type: none"> -Lose control over roof usage for 6 years -6 year commitment -Other people on roof years 1-6 -Year 6 capital expense -District responsible for system maintenance year 6+ Insurance cost year 6+ 	<p>\$750,000 - \$1,500,000</p> <p>(depends on buyout price)</p>	<p>Solution: Access to roof during non school hours in contract</p> <p>*Include in contract what happens if school is closed or sold</p>
District Owned	<ul style="list-style-type: none"> -District control over roof usage -No other people on the roof -Energy prepaid year 0+ 	<ul style="list-style-type: none"> -Significant upfront capital expense plus cost of capital -District responsible for project management/system maintenance -Train staff or hire contractors to do repairs -Insurance cost -No federal tax credit 	<p>\$500,000 - \$1,500,000</p> <p>(depends on upfront cost)</p>	

Student Solar Committee

- 10 students 6th-12th grade from all over the district
- Two Teams
 - Research & Knowledge (videos, website materials)
 - Communications & Presentation (BOE, press releases)



Resource-Wise Program Mission

- The Resource-Wise program was created to build upon the success of the Renew Our Schools competitions and other SVVSD Energy & Sustainability Department programs, which reward and recognize schools for reducing their energy use and other environmentally conscious efforts. RW supports the creativity of students and staff in developing initiatives that change resource use behaviors and reduce the financial and environmental impact of our buildings.
- **Links & Info:**
 - svvsd.org/green/esp-strategies/eci-program
 - **Resource-Wise program Google Doc folder for Leaders**

Why Resource-Wise?



- School-wide incentives



- Students & staff are equipped with the tools and knowledge to act as environmental stewards



- More efficient schools = improved building performance & occupant comfort



- Be part of the solution!

Resource-Wise Overview

- Pilot 3 schools 2014-2015, 8 schools 2015-2016, 14 schools 2016-2017
- Full academic school year
- RW Leaders earns 2.0 professional development credits OR \$500 stipend, minimum of 15-20 hours per semester
- Engaging school community is critical to program success (staff, teachers, students, custodians, etc.)
- Shared savings for 4 months:
 - November, February, March, April
- Matrix for waste, water, environmental quality, green site projects; earn additional funds
- Funds earned used for energy or environmental materials, upgrades, field trips, toolkits etc.
- September training, site visits, final written report & results meeting in May

Tools & Resources

- School Energy Profile Report
- RW Toolkit
- Energy Toolkit (kill-a-watt, digital light meter, infrared thermometer)
- External Experts & District Staff
- Cube Dashboard
- eGauge
- PLT GreenSchools!

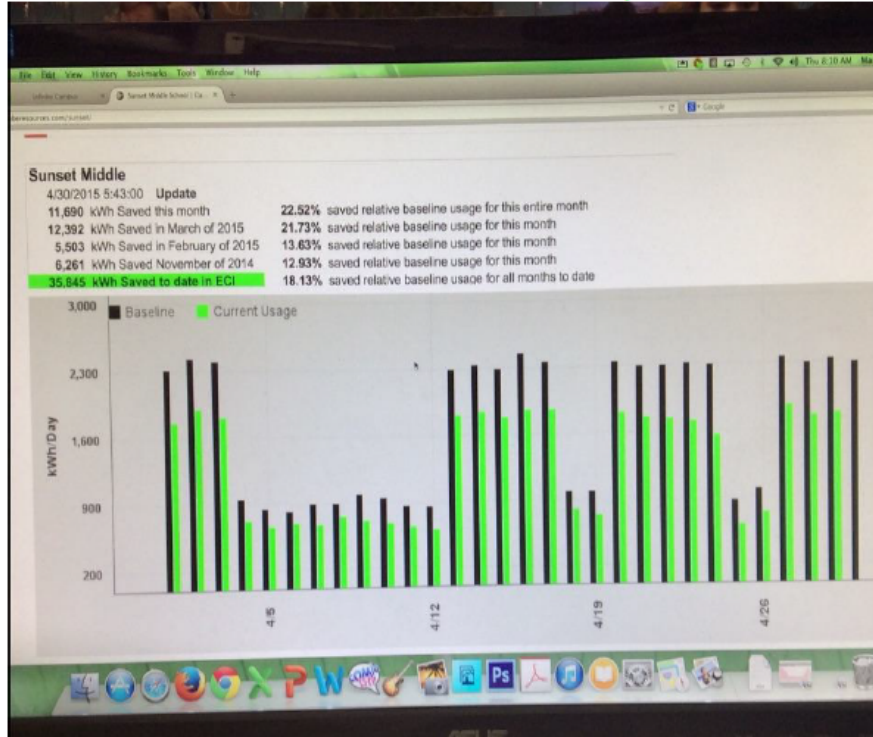


Measuring Progress

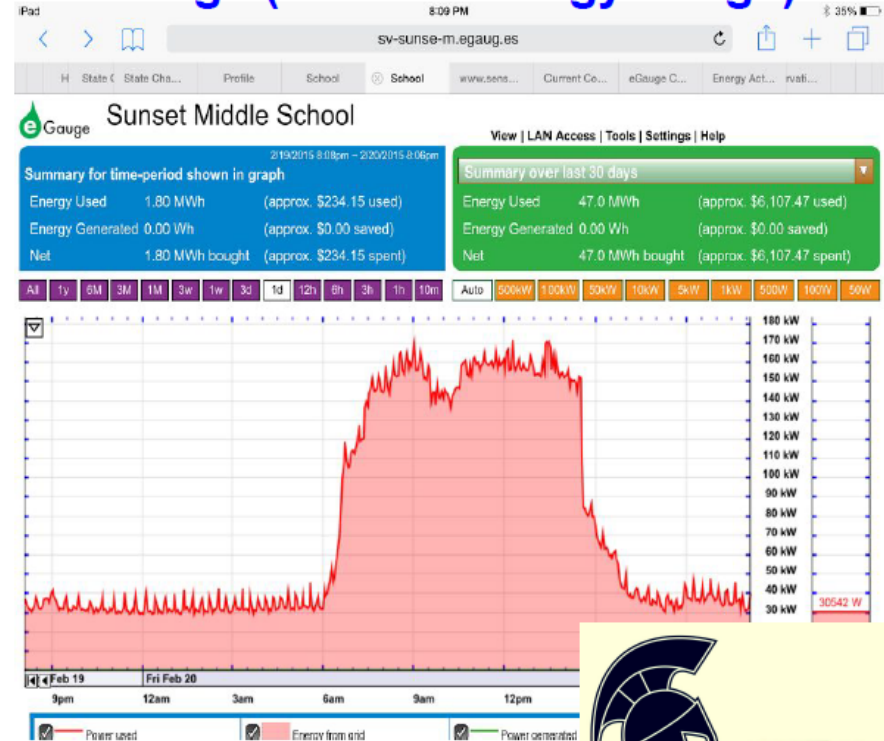
(Sunset Middle Presentation)

1. Energy Savings (compared to baseline usage)

Cube Resources Graph



eGauge (current energy usage)



2. Number of Club Members



2014 (our first year)

12 members attended meetings and activities.

2015

24 different members attended meetings and activities

WE HAD AN 100%
INCREASE IN MEMBERS
FROM OUR FIRST YEAR.



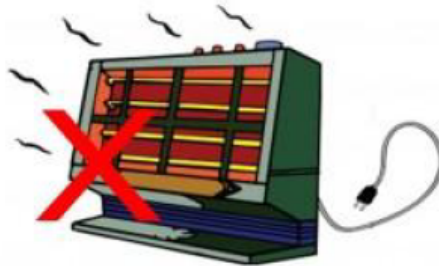
3. AUDIT DATA --- BEHAVIOR CHANGE

You can use AUDIT DATA to show BEHAVIOR CHANGE.

2014 66% (29/44) of staff members in classroom their own mini-fridge, microwave, coffee pot etc.)

2015 39% (17/44) of staff members were using those appliances in their rooms.


That is a 27% reduction of appliance use over last year.



Summary of energy savings

	kWh Saved				
	November	February	March	April	Total
Black Rock Elementary	1,739	1,268	2,680	2,206	7,893
Burlington Elementary	1,094	2,021	2,000	1,760	6,875
Eagle Crest Elementary	1,067	2,230	2,642	2,126	8,066
Longmont Estates Elementary	1,294	3,000	3,121	2,877	10,292
Mead Middle School	651	1,557	3,501	3,570	9,280
Rocky Mountain Elementary	98	1,095	1,716	1,245	4,153
Sunset Middle School	3,989	5,932	9,191	8,299	27,410
Westview Middle School	1,138	3,139	1,674	989	6,940
	11,070	20,241	26,527	23,072	80,909
	% Saved				
	November	February	March	April	Total
Black Rock Elementary	4.9%	3.4%	6.4%	6.2%	5.2%
Burlington Elementary	5.1%	8.8%	7.7%	7.9%	7.4%
Eagle Crest Elementary	3.3%	6.2%	6.6%	6.4%	5.7%
Longmont Estates Elementary	4.9%	10.8%	10.3%	11.2%	9.3%
Mead Middle School	1.8%	3.9%	7.9%	9.9%	5.9%
Rocky Mountain Elementary	0.4%	3.9%	5.4%	4.6%	3.7%
Sunset Middle School	8.8%	12.4%	17.1%	18.3%	14.3%
Westview Middle School	2.2%	5.6%	2.7%	1.8%	3.1%
	\$ Saved at \$0.09/kWh				
	November	February	March	April	Total
Black Rock Elementary	\$156	\$114	\$241	\$199	\$710
Burlington Elementary	\$98	\$182	\$180	\$158	\$619
Eagle Crest Elementary	\$96	\$201	\$238	\$191	\$726
Longmont Estates Elementary	\$116	\$270	\$281	\$259	\$926
Mead Middle School	\$59	\$140	\$315	\$321	\$835
Rocky Mountain Elementary	\$9	\$99	\$154	\$112	\$374
Sunset Middle School	\$359	\$534	\$827	\$747	\$2,467
Westview Middle School	\$102	\$282	\$151	\$89	\$625
	\$996	\$1,822	\$2,387	\$2,077	\$7,282

Highlights from student learning

- Lessons around why energy is a vital element in human survival
 - Lessons around carbon and the ozone layer
 - Learning what you can do as a student to make a difference
 - Signs, posters, tips, morning announcements, blog postings
 - eGauge tool for classroom instruction (math, science, project learning etc.)
 - Renewables vs nonrenewables
 - NREL resources/field trip
 - Passive solar still competition
 - PLT materials
 - Increased recycling efforts
 - Earth Day events
- 
- A photograph of two young students sitting at a table in a classroom. The student on the left is a girl with blonde hair and glasses, wearing a blue t-shirt and a hat, holding up a small globe with a face. The student on the right is a girl with dark hair, wearing a white shirt, holding up a white paper mache figure with a face. They are both smiling. On the table in front of them are various art supplies, including markers, a basket, and a sign that says 'EARTH DAY'.



Green Team Conservation Tactics

Delamping:

- Based on district light level requirements and light meter measurements
- Get approval to remove lamps and always use custodians or staff
- Reducing excessive light improves student comfort and student productivity

Plug Loads:

- Steadily grows
- Use kill-a-watts to determine energy hogs

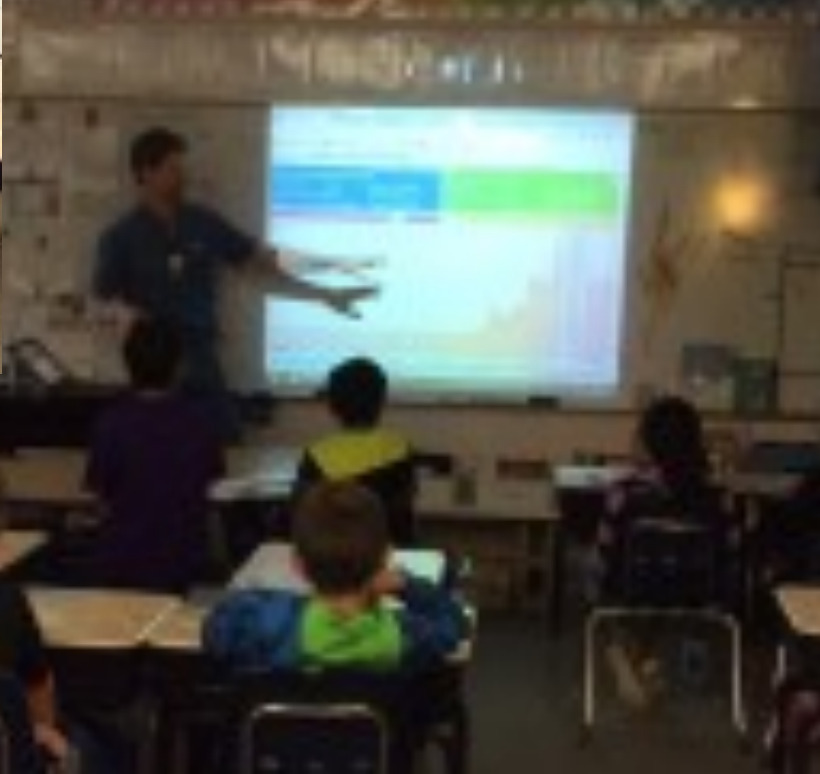
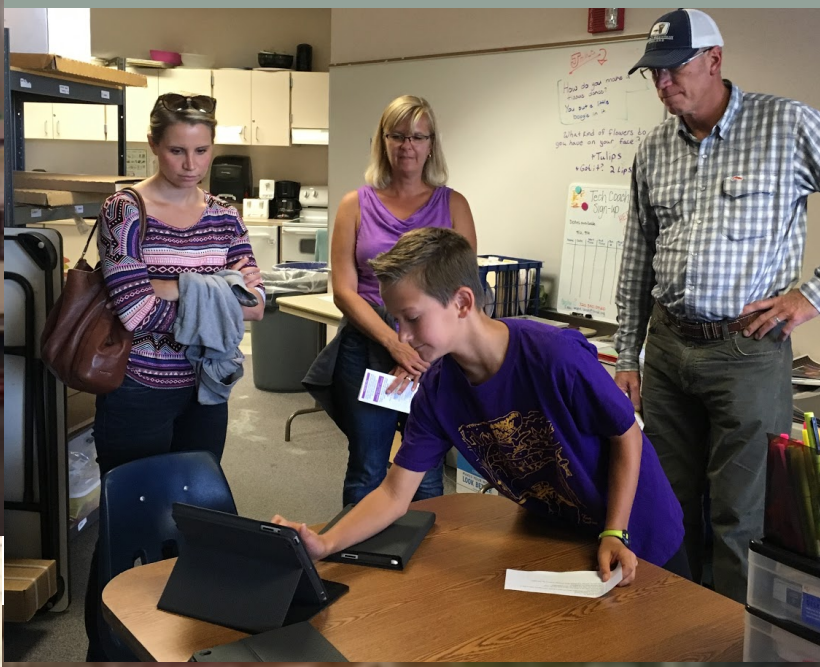
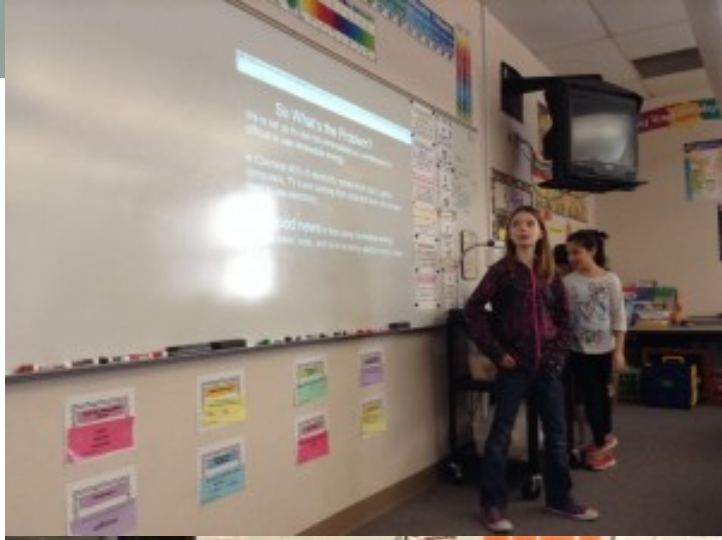
Idle Equipment:

- AV systems, egress, server rooms – opportunities for change

HVAC:

- Influence schedules, policy, procedures
- Weatherproof and address comfort issues

Culture Shift



Eagle Crest Elementary Videos

[E-Gauge](#) by Ben and Julia

[Classroom Sustainability](#) by Alyssa and
Ruby

[Computer Lab and Tools](#) by Ben and Conner

[Natural Light](#) by Ryder and Tyler

[Recycling and Composting Presentation](#) by
Alyssa

[The Teachers' Lounge](#) by Ryder

[Water Faucets](#) by Julia and Sofia

SVVSD EV & EVSE Project: RAQC Grant

9 EV Supply Equipment

- Grant covers 80% of materials + labor up to \$6,260 per station
- Data collection, payment, scheduling features

2 EV's

- Grant covers 80% of the incremental cost differential between an EV and a comparable gasoline vehicle up to \$8,260

Solar carports at several sites



Questions?
Thank you!

