



Solar Schools

New Incentives Make NOW the Best Time to Go Solar

May 4th, 9:30-11AM

Speakers:

Dave Althoff, Director, Energy Programs Office, PA Department of Environmental Protection (DEP)

Liz Robinson, Executive Director, Philadelphia Solar Energy Association

Ron Celentano, President, PA Solar and Storage Industries Association

Roger Clark, Director, Sustainable Development Fund (retired)

Presented in partnership with



PHILADELPHIA
SOLAR ENERGY ASSOCIATION



PENNSYLVANIA
SOLAR CENTER



The Center for School Study Councils



Solar Schools Toolkit

Webinar # 1: May 4, 2023



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Philadelphia Solar Energy Association

Toolkit supported by: PA Department of Environmental Protection

In cooperation with: PHENND, Center for School Study Councils,
Delaware Valley Regional Planning Commission, PA Solar Center, and Generation 180

Solar Schools Toolkit

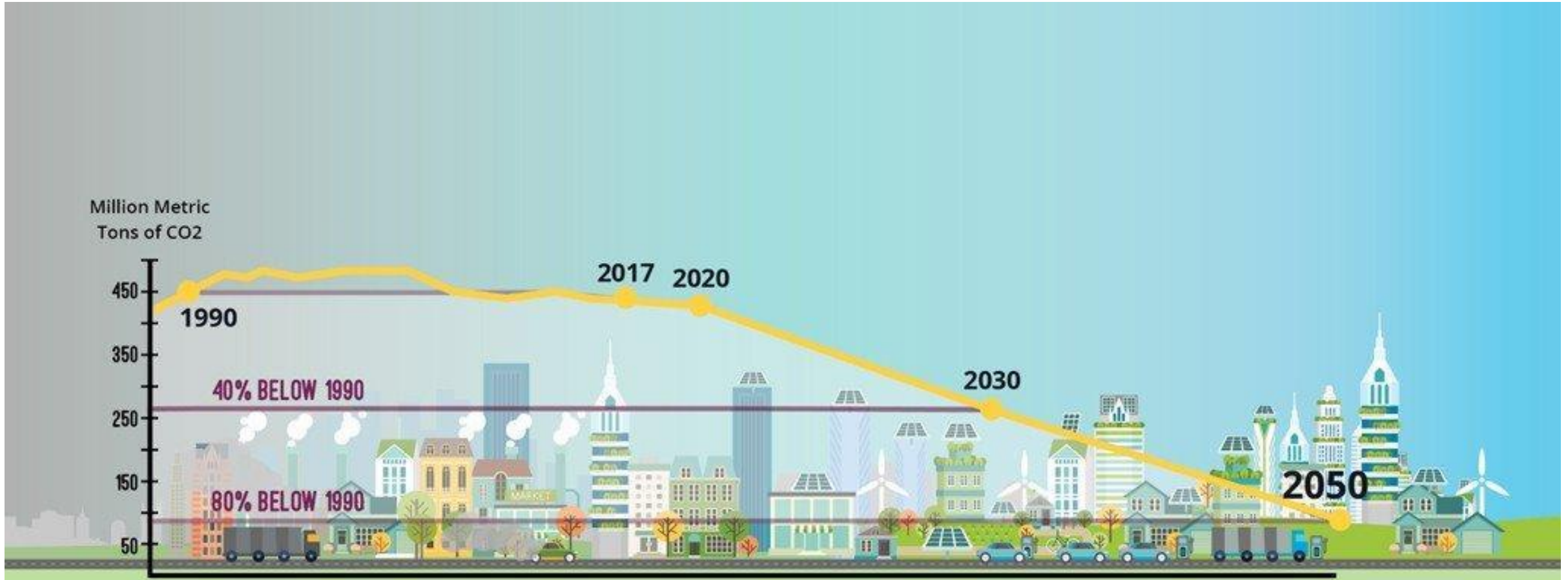


Welcome
Opening remarks
Why Go Solar Now?
Summary of Solar Components
The 10 Steps
Q&A
Next Steps

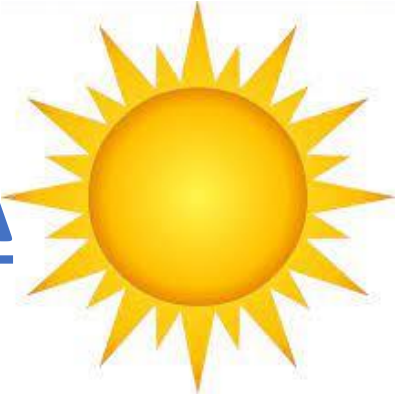
Inflation Reduction Act (IRA)

\$369 Billion for Climate Action

Game changer for Schools and Nonprofits



Investment Tax Credit per the IRA



- Solar Investment Tax Credit (ITC) = 30% if the project < 1 MW; or if project \geq 1MW & meets prevailing wage and apprenticeship rules.
- ITC now includes battery storage
- 10% adder for domestic content (“Buy America”)
- 10% adder for location in “[energy communities](#)” (communities near a brownfield, a closed coal mine or coal power plant, or with employment/tax revenue from fossil fuel operation - most of PA)
- 10% **competitive** adder for location in a low-income census tract
- IRS has issued [preliminary guidance](#) - final expected by June 30, 2023

Tax-exempt entities are included!

- For schools, government entities, non-profit organizations, and rural electric co-ops, the ITC is available as a direct payment (*i.e.* IRS will send you a check) in lieu of a tax credit.



Advantages of Going Solar



- **Energy Bill Savings**
 - Offset electricity consumption
 - Reduce peak
 - Earn Solar Renewable Energy Credits
- **Improve Resilience**
- **Reduce CO2 emissions**
 - Help meet local, state & nat'l goals
- **Increase stability of energy costs**
 - Avoid future rate hikes
- **Create educational opportunities for students and staff**
 - Strengthen STEM education and career readiness



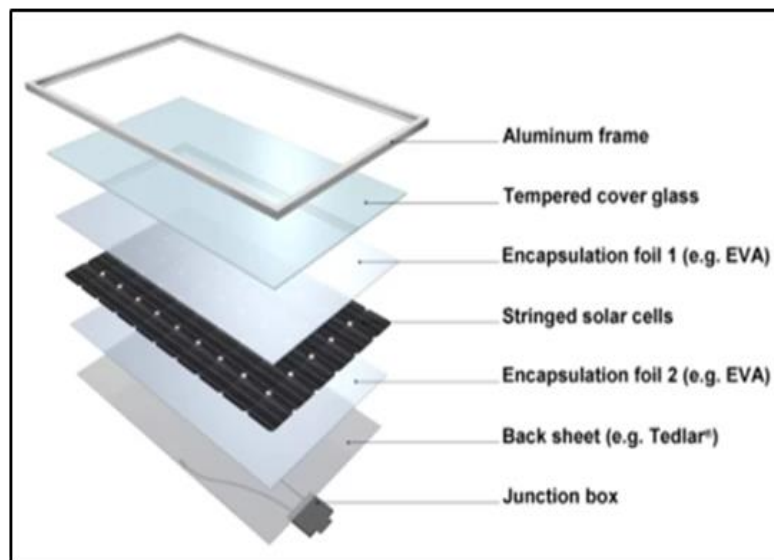
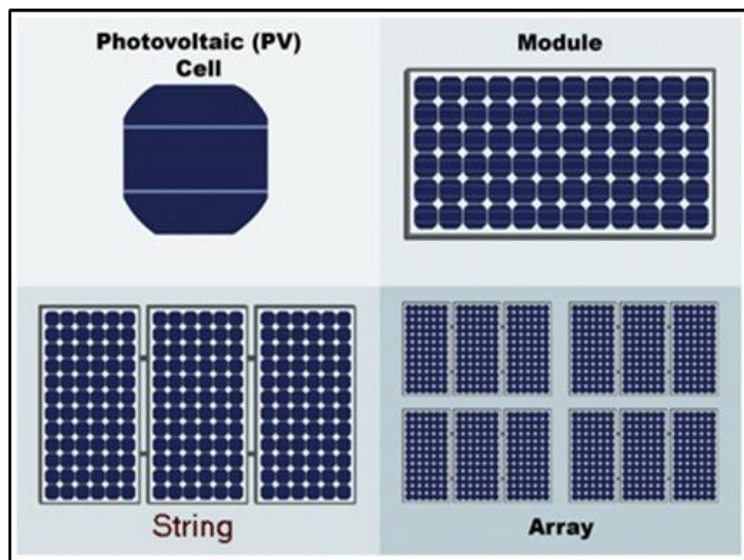
Overview of Solar PV System Components

Basic components of a grid-tied solar photovoltaic (PV) system include:

- Solar PV modules
- Inverter
- Racking system
- Balance of system (BOS)
- Battery storage (optional)
- Monitoring system

Overview of Solar PV System Components

Solar PV Modules:



Inverters:



Overview of Solar PV System Components

Racking System:



Balance of system (BOS):

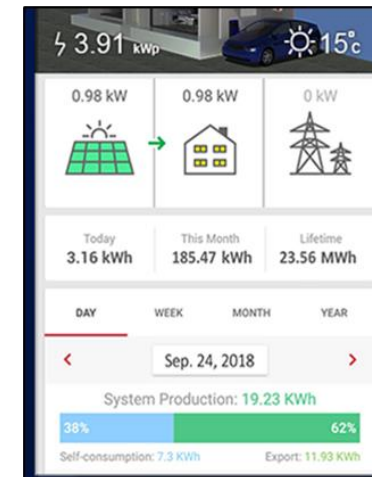
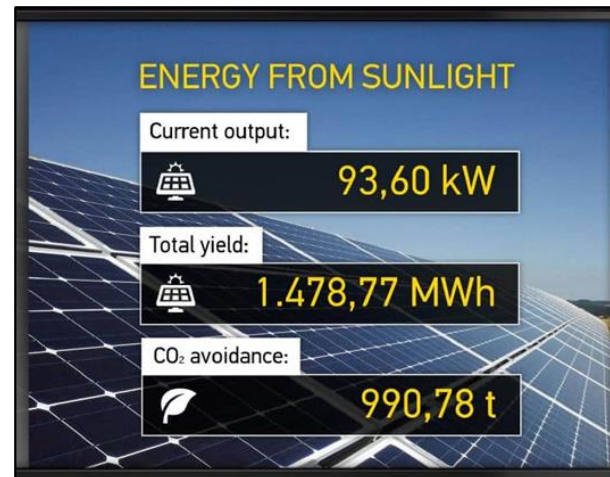


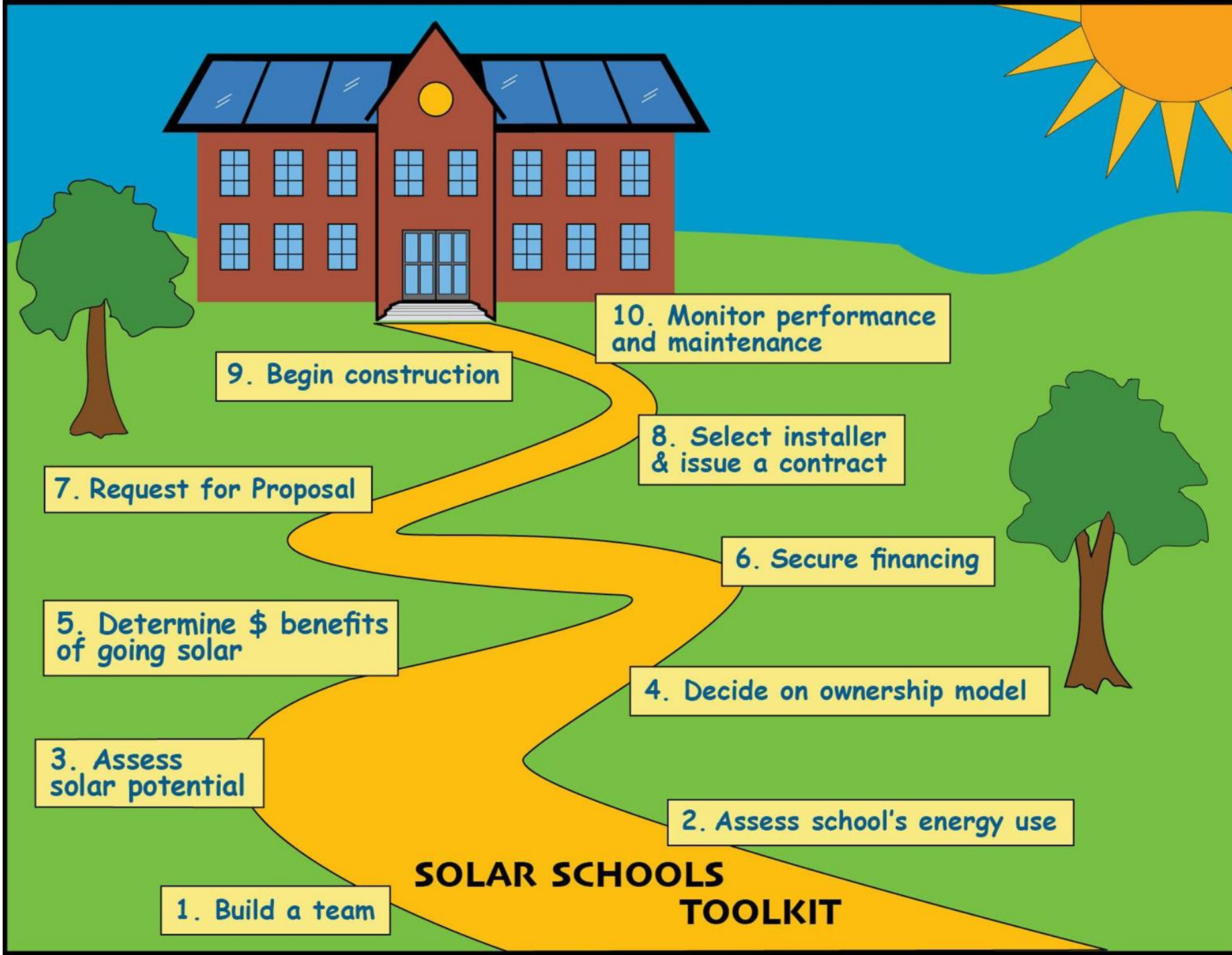
Overview of Solar PV System Components

Battery Storage:
(optional)



Monitoring System:
system performance
used for O&M and
classroom education





1. Build a Team

If possible, include resources, decision makers and worker bees, *e.g.*

- Facility Manager
- Chief Finance Officer
- Champions: People committed to getting the project done
- Students

Consultants



2: Assess your School's Energy Use

Know your Electric Bill:

Customer charge

Distribution Charges

Monthly Energy Usage - kWh, and rate (\$/kWh)

Monthly Peak Demand - kW, and rate (\$/kW)

Supply Charges (third party supplier - EGS ?)

Monthly Energy Usage - kWh, and rate (\$/kWh)

Monthly Peak Demand - kW, and rate (\$/kW)

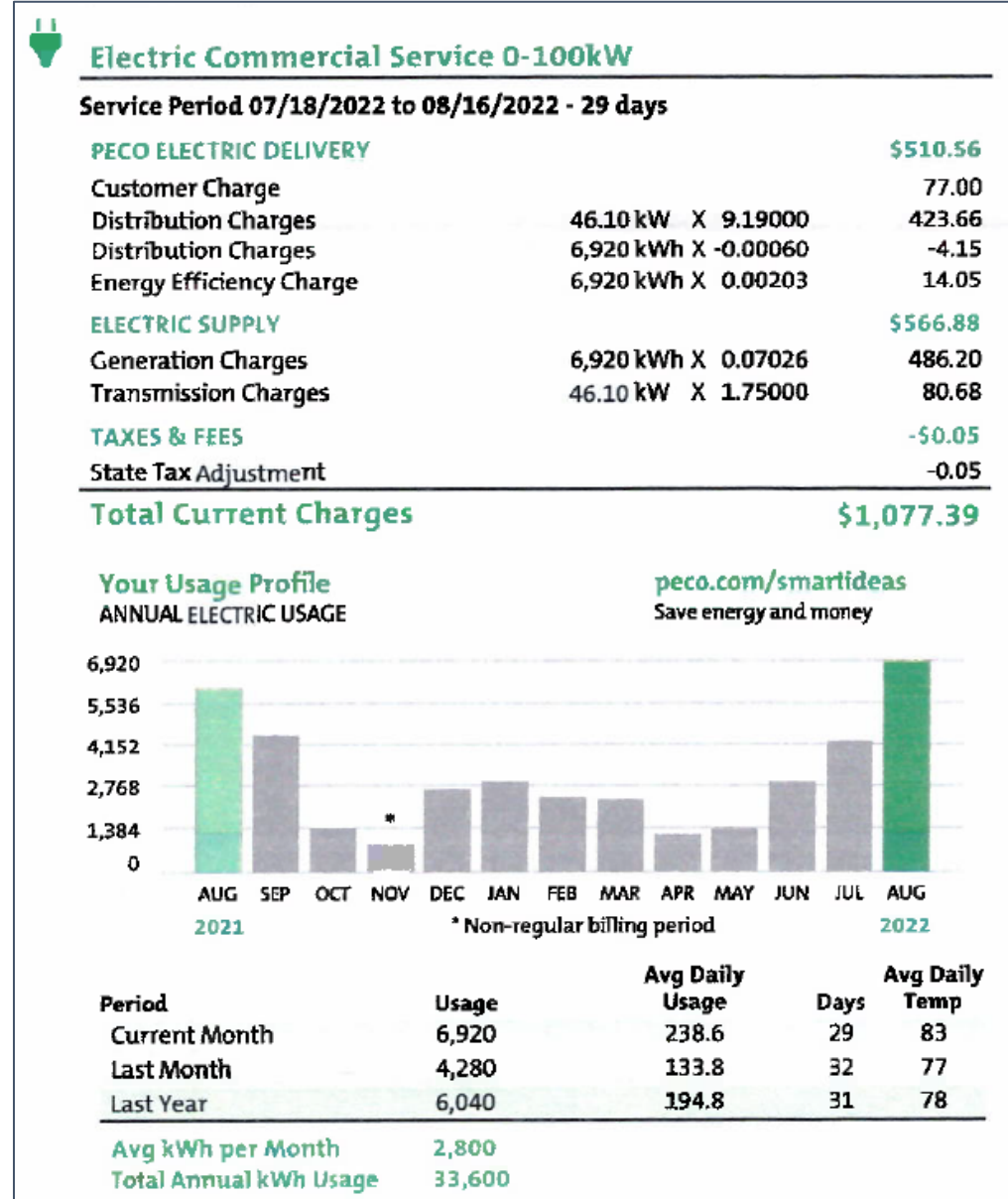
Annual Electric Usage (kWh/yr)

Benchmarking: Energy usage, efficiency improvements

Project future uses and costs:

EV buses, Charging stations

Decarbonization



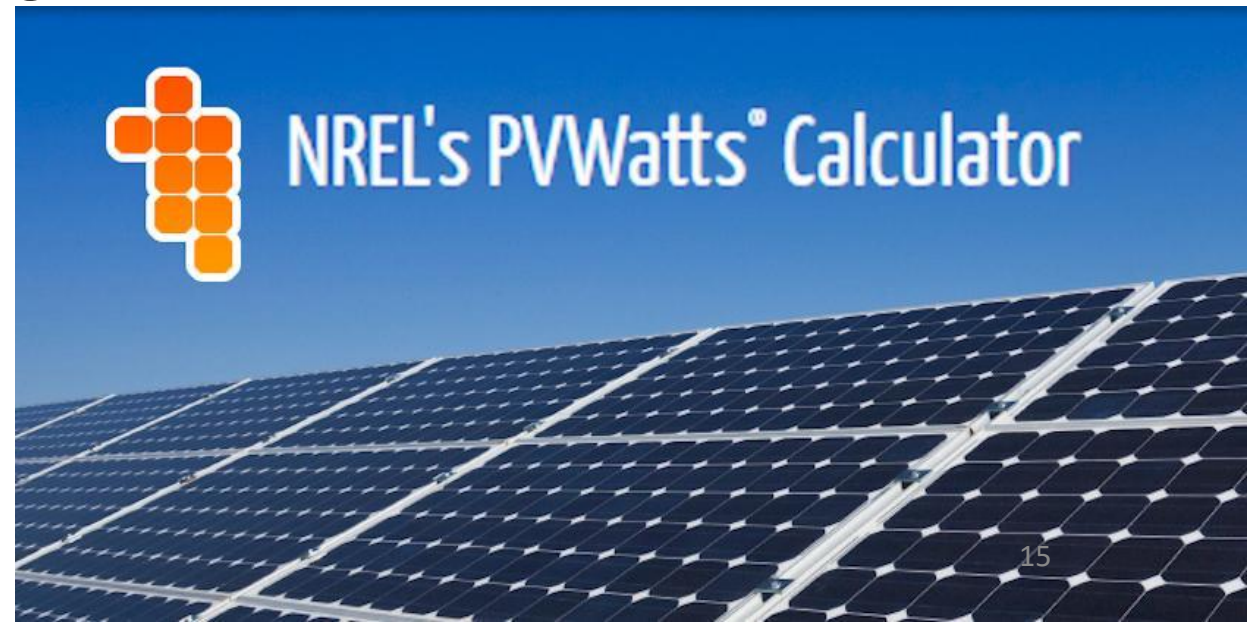
3. Assess School's Potential for Solar Generation

Final design is the responsibility of the solar installer, but early assessment is worthwhile.

- **Location of solar array and inverters** - roof(s) or ground-mount
- **Roof conditions** - age of roof equipment
- **Ground conditions** - parking lots, available land
- **Solar access** - orientation and shading
- **Safety** - access to system hardware
- **Interconnection point**

Predict solar generation -

PVWatts and simulation other tools



4. Decide your Ownership Model

Direct Ownership

Benefits not shared with a third-party

But you need to: arrange for financing

select the solar installer

maintain the system - O&M contract

Third-Party Ownership

Power Purchase Agreement (PPA)

Lease



5. Evaluate the Financial Benefits of Solar

- **Offset your electricity consumption - kWh**
Net metering / virtual meter aggregation
- **Reduce Demand - kW - probably not significantly**
- **SREC income**
- **O&M expense + finance costs (if direct ownership)**
- **PPA/lease costs (for third-party ownership)**



6. Secure Financing for your Solar Project

For **Direct Ownership** only (3rd party is responsible if PPA or lease)

1. **Cash on hand**

2. **Grants:** ITC direct payments; other federal grants; state grants;

Not all grants are cash - some are credit enhancement

1. **Public Finance:** school bonds, govt. finance programs, Green Banks,

PA Sustainable Energy Funds

1. **Private Finance** - other lenders



30% OFF
**SOLAR PANEL
INSTALLATION**

*With the Federal Solar Tax Credit. Expires in 2032.

7. Issue a Request for Proposal

Toolkit has generic RFPs

Important elements: Installer qualifications, Experience, References

Consider bidding the project both ways
(Direct ownership and Third-party) to
learn best option

Send RFP to qualified installers



8. Select Solar Installer & Issue Contract

Scoring responses to the RFP - what is important to you and the project

What to include in the project contract

What to watch out for in the project contract



9. Oversee Construction and Installation

Importance of regular communication - Facilities Manager

Contract deliverables / milestones:

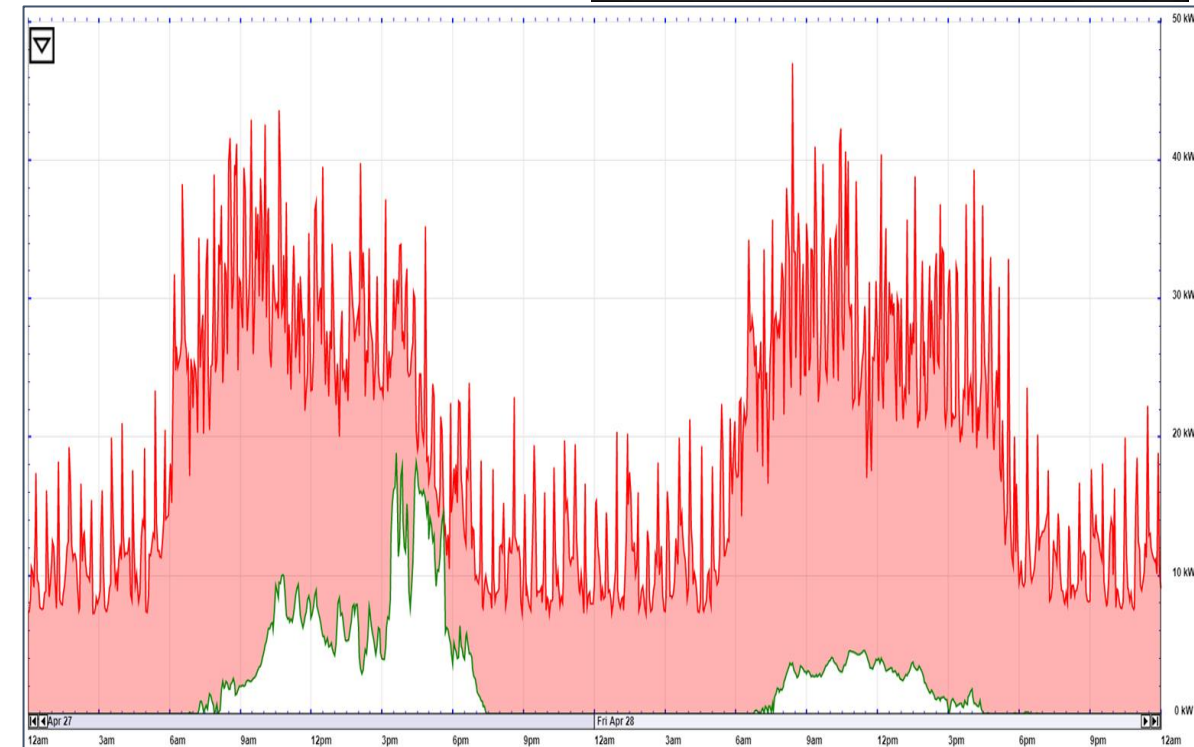
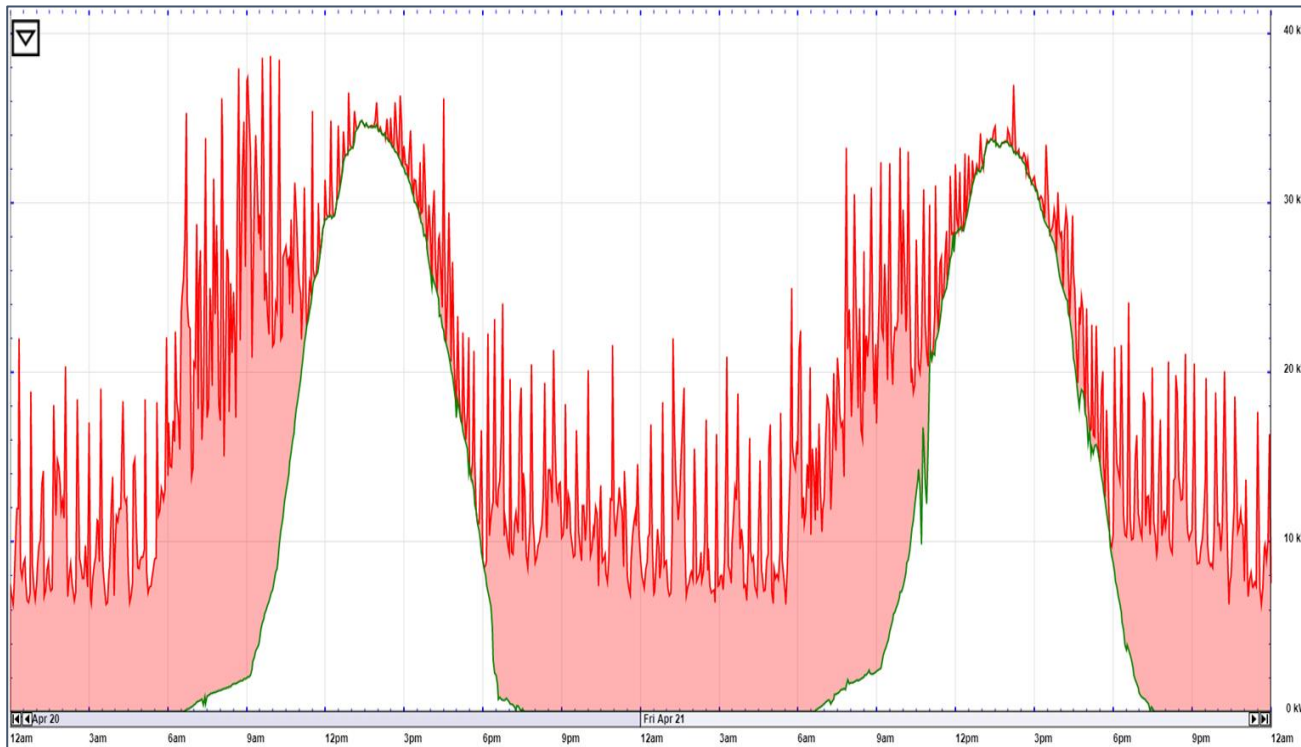
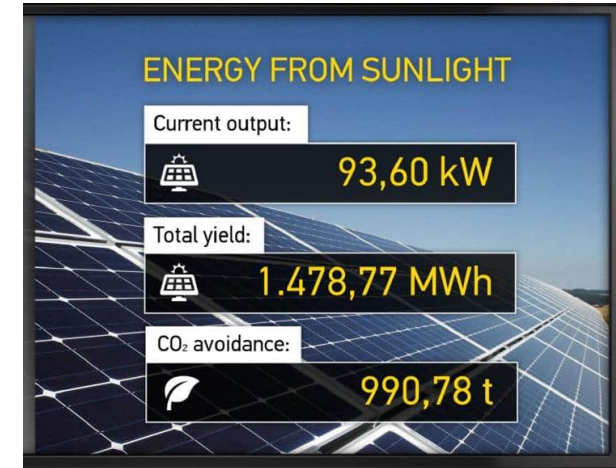
- system design
- equipment selection
- interconnection approval
- permits
- construction
- commissioning
- inspection
- Permission to Operate (PTO)



10. Monitor Performance and Maintenance

Monitoring performance - paying attention to output

- O&M contract
- Inverter replacement - 10-12 years
- Using data for STEM education



Upcoming Webinars and Other Work



- Webinar #2: *Lessons Learned: Case Studies of Solar Schools* - June 8
- Webinar #3: *Paying for your School's Solar Project* - June 29 (pending IRS rules)
- Publication of the *Solar on School Toolkit* on the web - June 30
- Project-Specific Technical Assistance available from us through June 30 - then through the Pennsylvania Solar Center



Questions & Discussion

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