

# 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  
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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

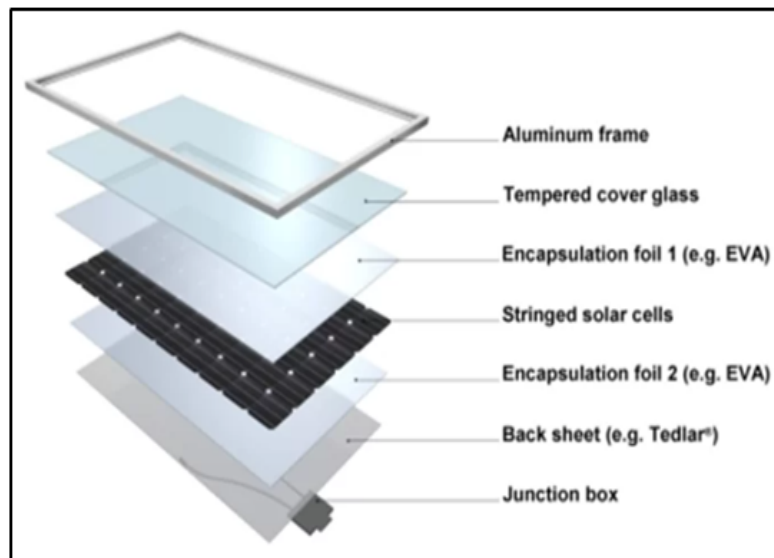
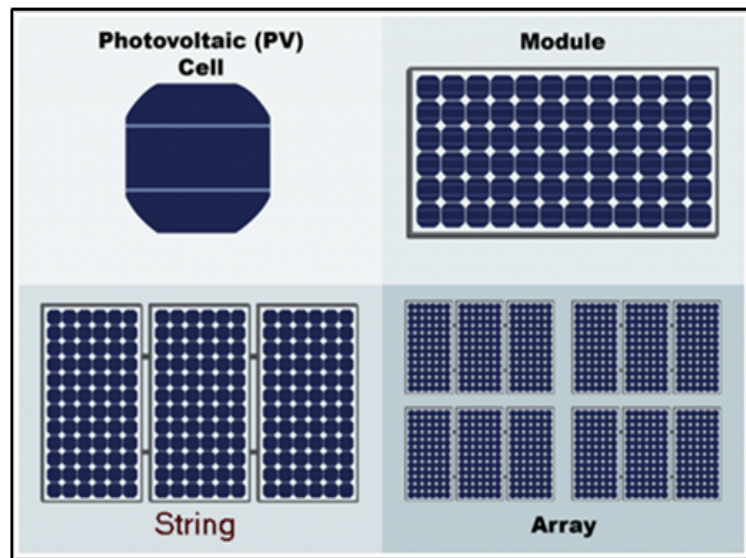
**Basic components of a grid-tied solar photovoltaic (PV) system include:**

- 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):

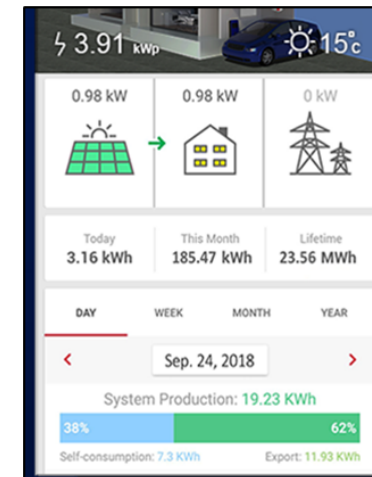
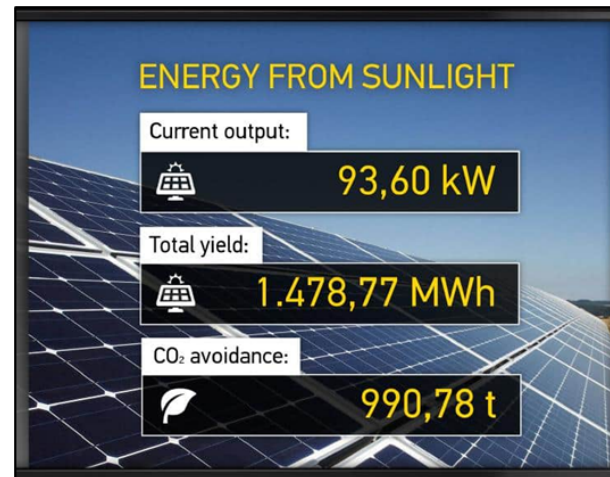


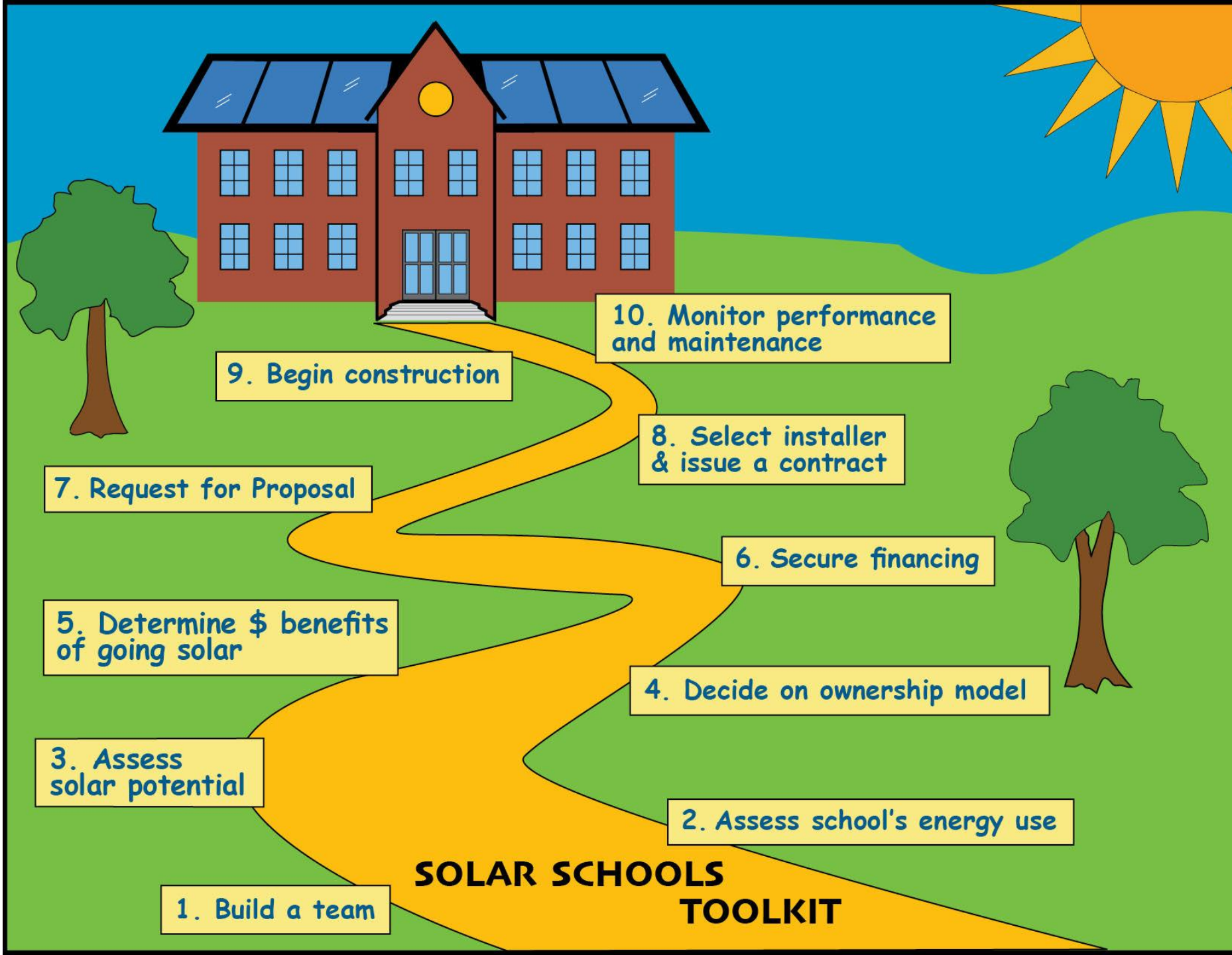
# Overview of Solar PV System Components

**Battery Storage:**  
(optional)



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





**SOLAR SCHOOLS  
TOOLKIT**

# 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)

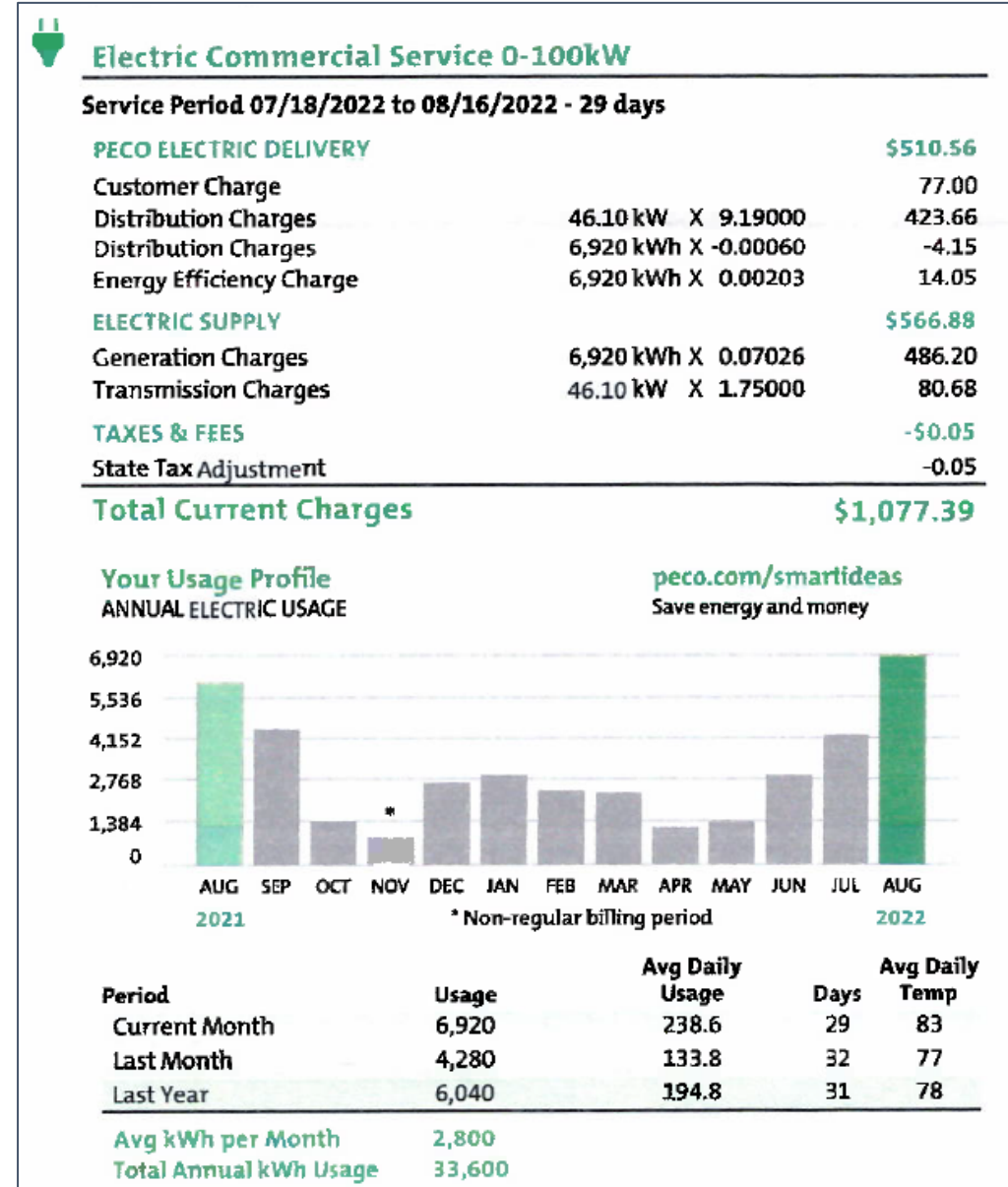
Annual Electric Usage (kWh/yr)

**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<sup>18</sup> 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:

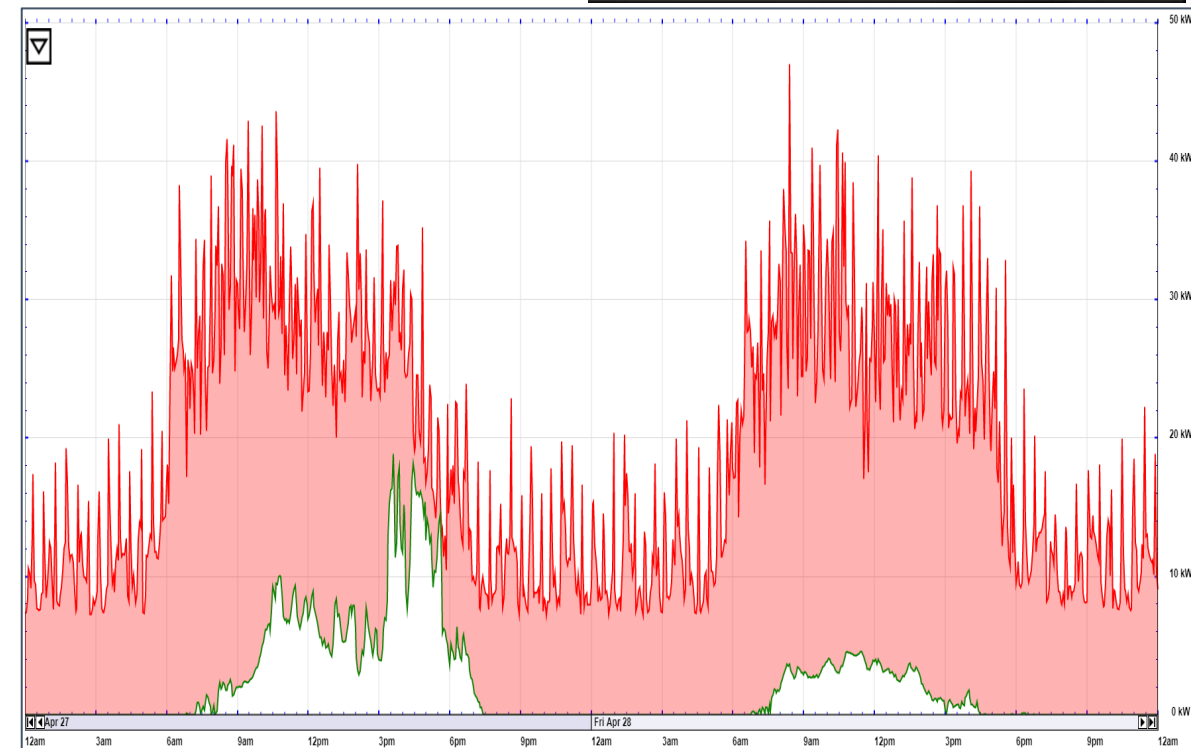
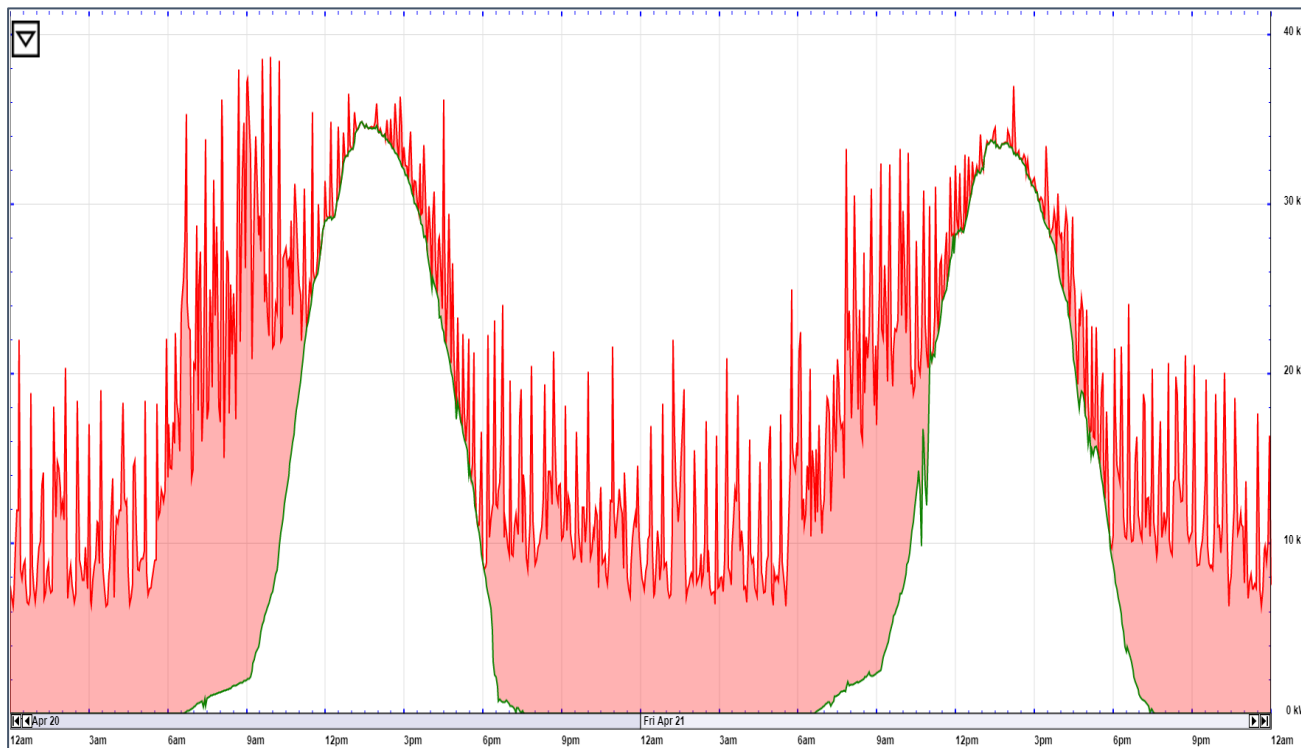
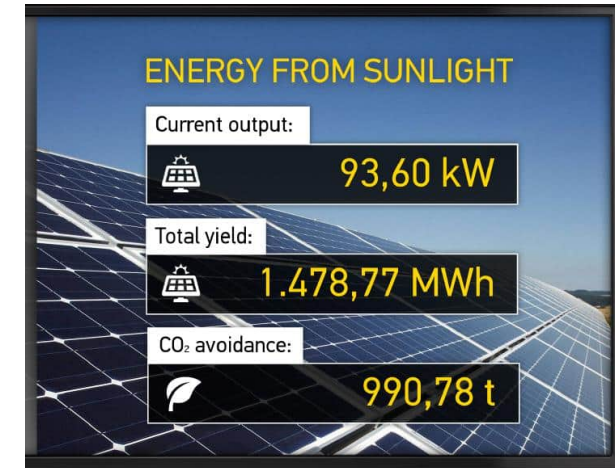
- system design
- equipment selection
- interconnection approval
- permits
- construction
- commissioning
- inspection
- Permission to Operate (PTO)



# 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

Liz Robinson

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