

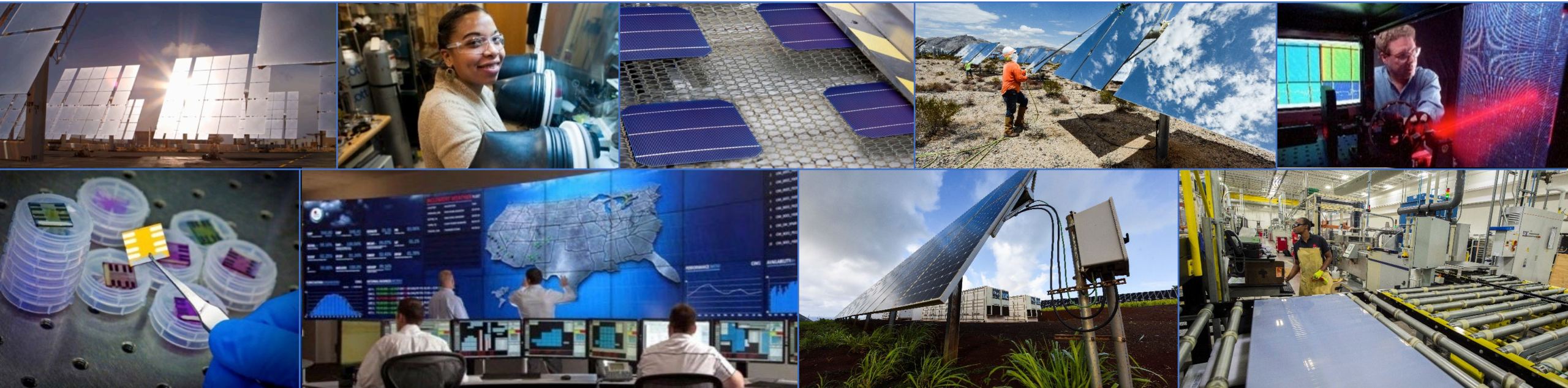
# Federal Context: Solar Deployment in the U.S.

**Nicole Steele, Program Manager**

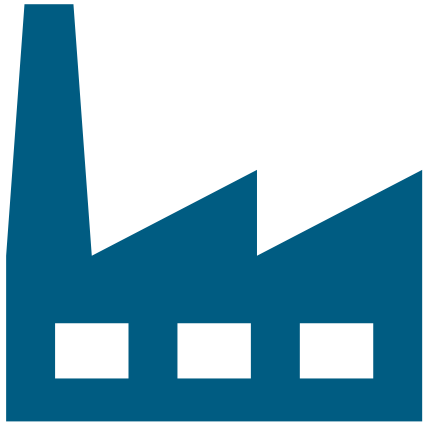
**Anna Balzer, Contractor to the Solar Energy Technologies Office**

**Juan Botero, Technology Manager**

Solar Energy Technologies Office

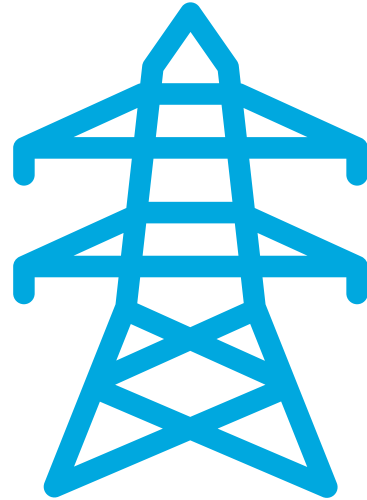


# Biden-Harris Administration Climate Priorities



**2030**

Reducing U.S. greenhouse gas emissions 50-52% below 2005 levels



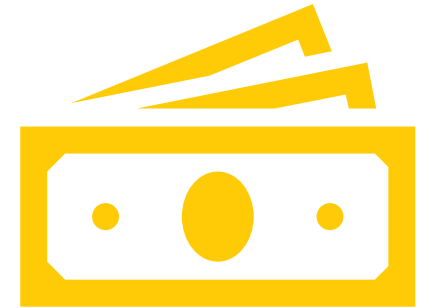
**2035**

Reaching 100% carbon pollution-free electricity



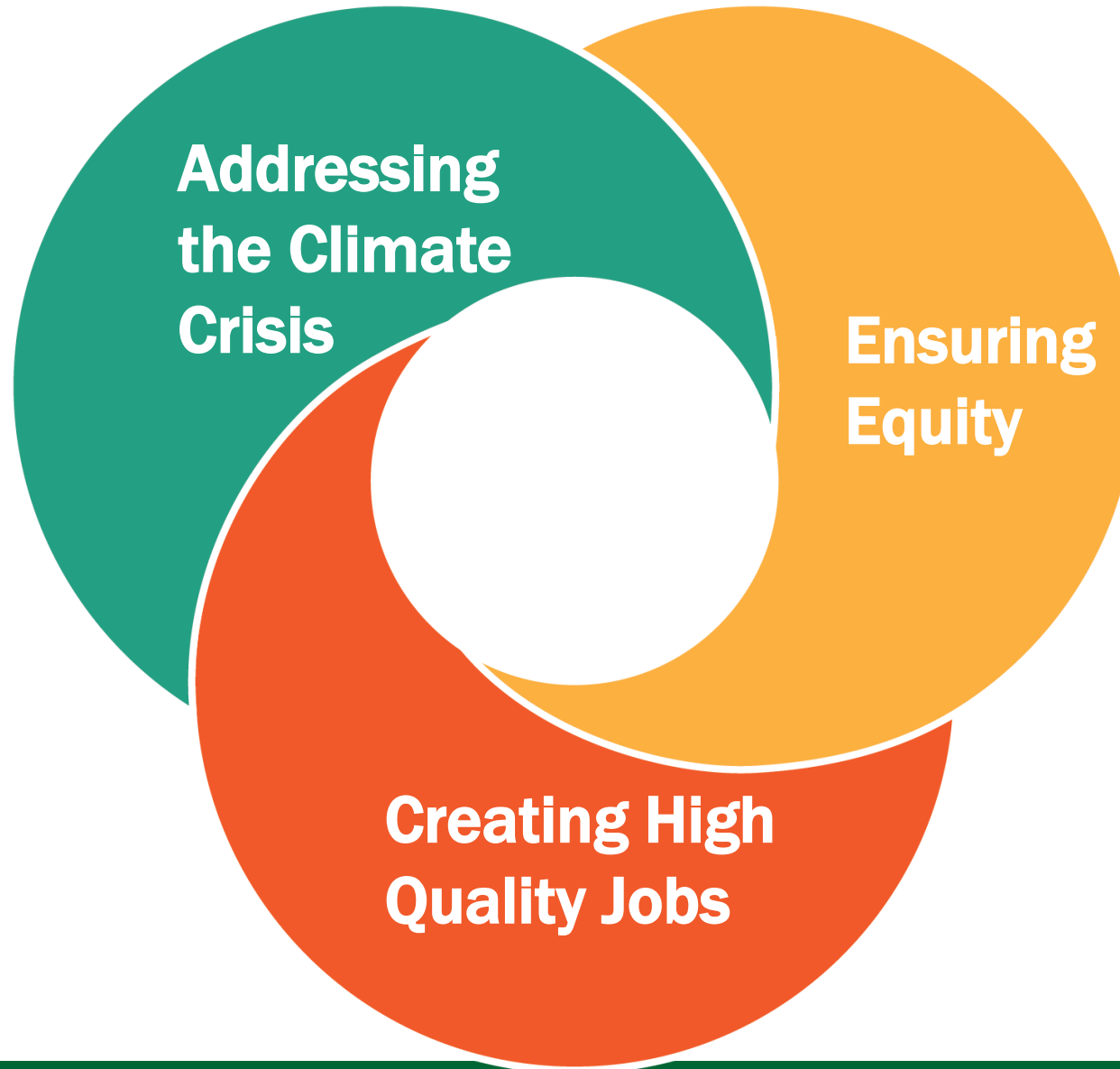
**2050**

Achieving a net-zero emissions economy



Delivering 40% of benefits from federal investments to disadvantaged communities

# Biden-Harris Administration Climate Priorities





# Solar Energy Technologies Office Priorities

## MISSION

We accelerate the **advancement** and **deployment of solar technology** in support of an **equitable** transition to a **decarbonized economy no later than 2050**, starting with a decarbonized power sector by 2035.

## WHAT WE DO

Drive innovation in technology and soft cost reduction to make solar **affordable** and **accessible** for all Americans

Enable solar to support the **reliability, resilience, and security** of the grid

Support **job growth, manufacturing, and the circular economy** in a wide range of applications



# Can we reach our goals?



# Solar Futures Study (September 2021)

**1 Deploy, deploy, deploy.** We must install an average of 30 GW of solar capacity per year between now and 2025 and 60 GW per year from 2025-2030. (In 2020 the U.S. installed 15 GW.)

- 1,000 GW of solar meets 40% of electric demand in 2035, 1,600 GW meets 45% in 2050.
- We must reshape workforce development, supply chains, siting and permitting, and regulation.
- Major growth in wind and storage are also required.

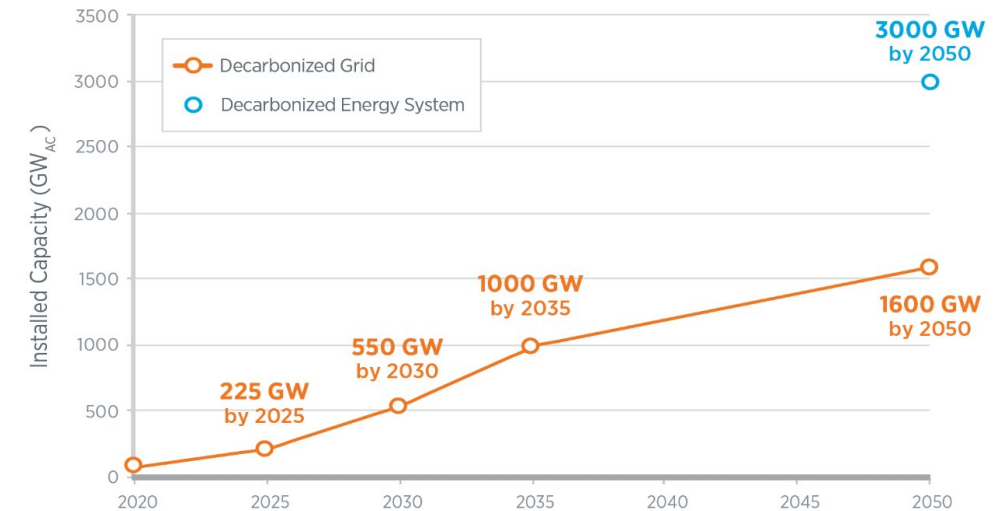
**2 With continued technological advances, electricity prices do not increase through 2035.** This includes solar, wind, energy storage, and other technologies.

**3 The grid will be reliable and resilient.** Storage, transmission, and flexibility in load and generation are key.

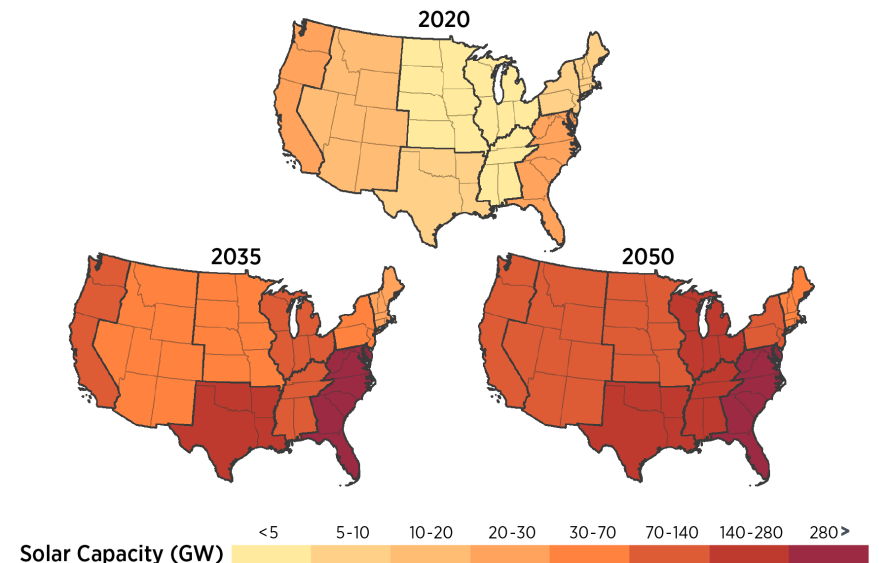
**4 Expanding clean electricity supply yields deeper decarbonization.** Electrifying buildings, transportation, and industry reduces carbon emissions.

**5 Policy changes are necessary.** Limits on carbon emissions and/or clean energy incentives.

Solar Deployment 2020–2050



Solar Capacity by Census Division in 2020, 2035, and 2050



# Can solar grow fast enough to meet our goals?

Solar capacity has grown **24-fold** in the last 10 years. Solar energy accounted for **50% of all new generating capacity** installed in 2022.



**10,000+**

Solar businesses in the U.S.



**\$35 billion**

Value of the U.S. solar market in 2022



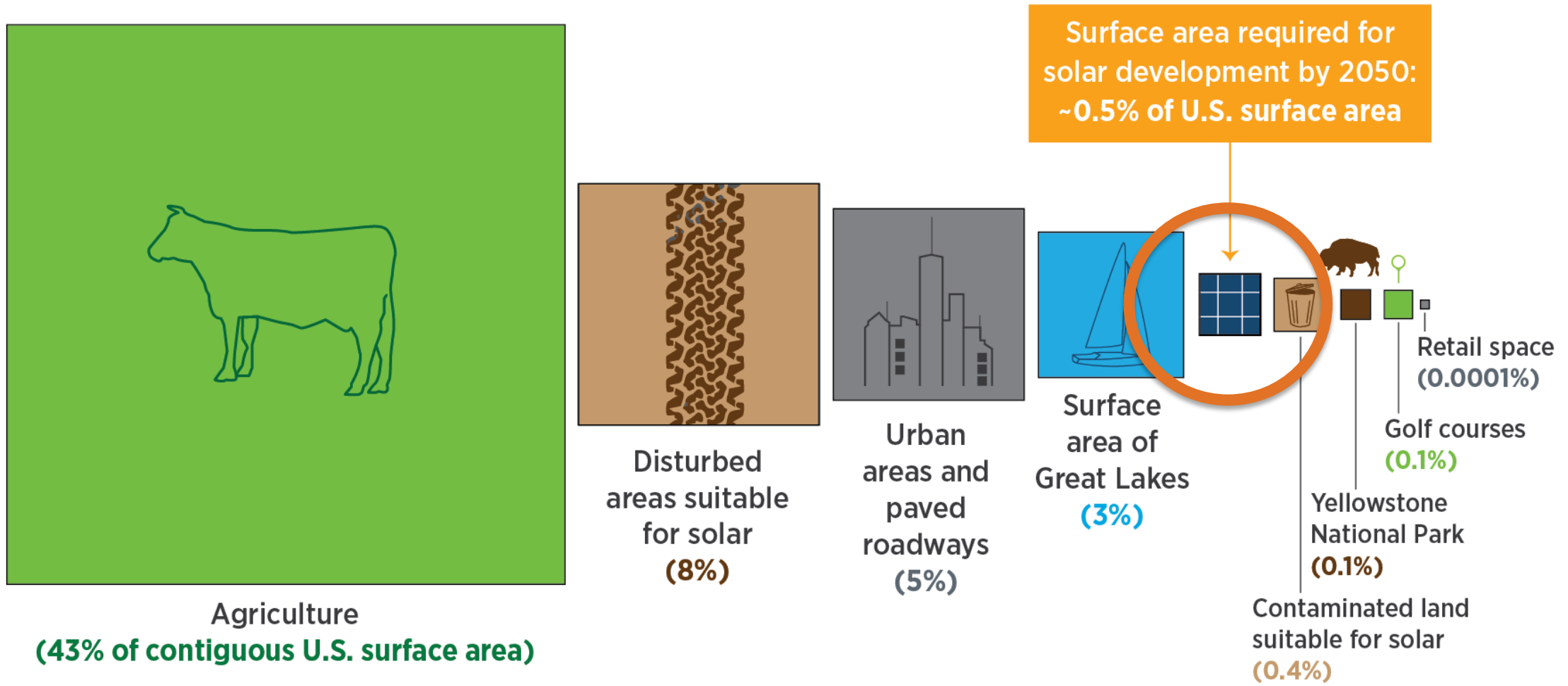
**53% ↓**

Solar PV prices have dropped over the last 10 years

Source: Data from SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Report



# How much land will be required to achieve solar goals?





# Large-scale Solar Siting

## Siting is hyperlocal:

- Policies, communities, environmental factors, etc., all vary extensively
- Siting decisions need to be grounded in local processes

State and local authorities have important roles in evaluating and proactively planning for clean energy opportunities, but they may not have the resources to carefully consider many complex issues and perspectives

## Renewable Energy Siting through Technical Engagement and Planning (R-STEP)

To improve large-scale renewable energy planning, siting processes, and outcomes for host communities, local governments, and renewable energy developers.

1. Provide **funding** for capacity expansion at state level
2. Provide **technical assistance** to institutionalize expertise
3. **Disseminate** achievement and **convene** interested stakeholders

# Siting is Multidisciplinary



## Community Priorities and Perspectives

- Project location and design (e.g., viewshed)
- Changes to community character
- Economic benefits and impacts
- Permitting policies and processes in place



## Interactions with Wildlife and the Environment

- Direct interactions with native wildlife
- Indirect impacts (e.g., mitigating climate change)
- Habitat creation and disturbance
- Ecosystem services



## Innovative Siting Opportunities

- Agrivoltaics
- Brownfields and mine lands
- Floating PV (FPV)

# SETO is Active in Massachusetts!



## Community-Informed Proactive Solar Siting and financing in Massachusetts

- Framework for community-focused solar siting and financing in rural communities
- Bottom-up solar siting processes driven by community residents
- Community Planning for Solar Toolkit
- Evaluation of Local Benefits from MA SREC II Program



## Informing Wildlife Conservation Strategies and Best Practice for Solar Facilities

- First assessment of bird reproductive success at solar facilities
- Emerging bioacoustics technology to study insect biodiversity
- Developing resources and tools to improve habitat and wildlife management decisions at solar facilities



## Impacts of Dual-Use Solar on Crop Productivity and the Agricultural Economy in Massachusetts and Beyond

- Conduct agricultural testing, evaluating yield and soil impacts
- Analyze economic impacts of agrivoltaics on farm profitability and rural economies
- Test social acceptance of agrivoltaics to neighbors
- Develop management guidelines for growers, solar developers, and others

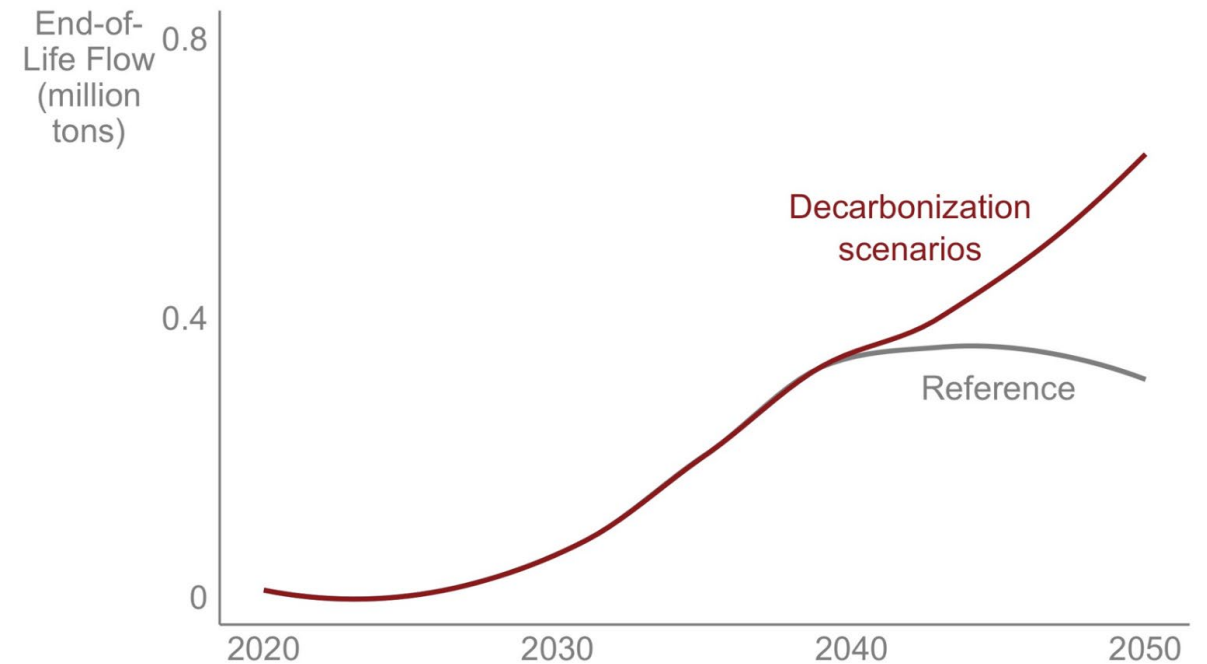
# Will achieving the solar goals create a lot of waste?

Waste volumes increase as PV panels reach the end of their useful lives (typically 30 years), but can be reduced through sustainable end of life practices e.g.

- Recycling, re-use, re-manufacturing

Governments, industry, and associated stakeholders can begin preparing now for higher end-of-life solar volumes through various measures e.g.

- Development of low-cost recycling approaches
- Maximizing value from recovered materials
- Matching recovered materials with markets
- New policies and incentives for sustainable end-of-life practices

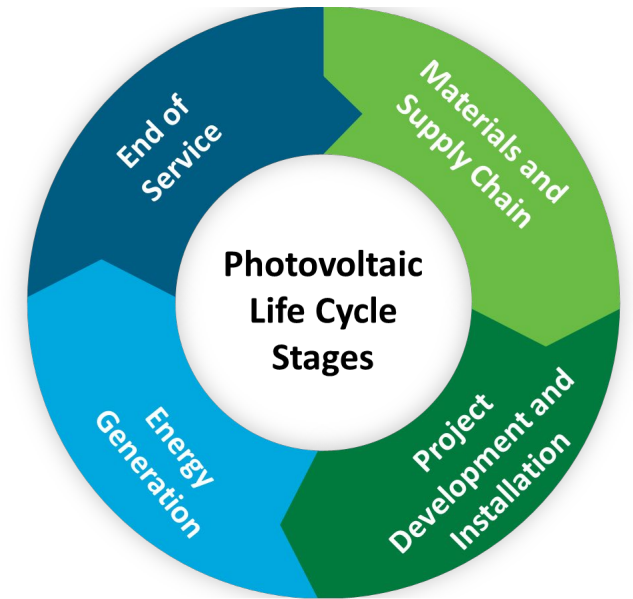


End of life material mass (million tons),  
Decarbonization scenarios vs. Reference Scenario



# Now open for proposals: FY23 MORE PV FOA

- Topic 1 calls for collaborative projects spanning all stages of PV life cycle aiming to address challenges of rapidly growing PV deployment:
  - reduce material usage
  - improve installation quality and resilience of PV systems
  - address handling of PV systems at the end of life
- Topic 2 will set up Solar Partnership to Advance Recycling and Circularity



**Solar Funding OPPORTUNITY**

U.S. DEPARTMENT OF **ENERGY** Office of ENERGY EFFICIENCY & RENEWABLE ENERGY  
SOLAR ENERGY TECHNOLOGIES OFFICE

Materials, Operation, and Recycling of Photovoltaics (MORE PV)

Letters of Intent due Sep 6, 2023 5PM ET  
Concept Papers due Sep 13, 2023  
Full Proposals due Nov 28, 2023

# Will we have the workforce to reach our solar goals?

Decarbonization requires significant, but achievable acceleration of clean energy deployment.

- For 95% grid decarbonization by 2035, U.S. must install ~30 GWac of solar each year between now and 2025 and ramp up to ~60 GWac per year from 2025-2030.
- Solar workforce would need to grow from ~230k today to 500k-1.5M by 2035
- Developers *today* have challenges finding adequate labor



# Advancing Equity through Workforce Partnerships FOA

Advances the goals of the Biden-Harris Administration by supporting workforce programs that **enable the growth of the solar industry**, while **fostering an inclusive workforce and improving job quality**.

Selections Announced	June 13
Total Funding	\$13.5M
Number of awards	12
Award Size	\$750K - \$1.5M

## Key Elements of Successful Applications:

- Equity centered
- Multi-stakeholder teams (employers, CBOs, labor unions, non-profits, etc.)
- Demand-driven and worker-centric
- Leverages existing infrastructure and resources
- Sustainable, scalable, & replicable

## Topic Areas Include:

- Pre-apprenticeship/apprenticeship programs
- Community-led training partnerships
- Sector partnerships



## Designed to Support Opportunities for:

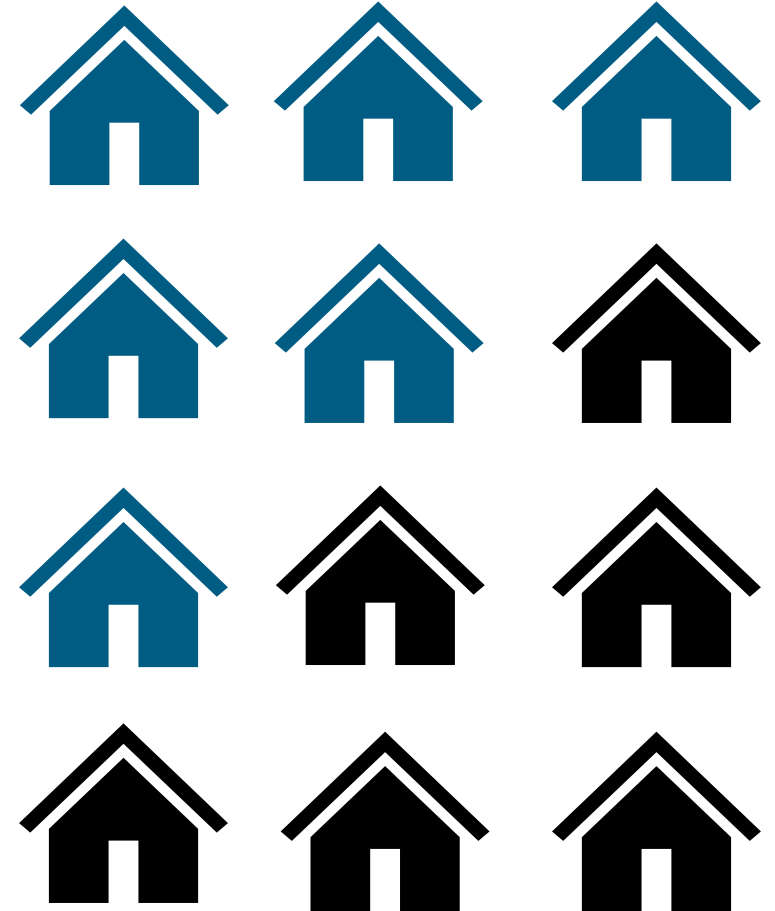
- Disadvantaged or LMI communities
- Communities of Color
- Tribal communities
- Young people with disadvantaged backgrounds
- Previously incarcerated individuals
- Transitioning fossil fuel communities
- Rural communities
- People with disabilities
- Women



# Will everyone benefit from reaching our solar goals?

Nearly half of all households and businesses **cannot** host a solar PV system on their roof, due to:

- Limited Sunlight/Potential
- Insufficient Roof Space
- Roof Ownership/Tenancy



According to unpublished data from the National Renewable Energy Laboratory (NREL), 42% of households and 44% of businesses cannot access behind the meter solar

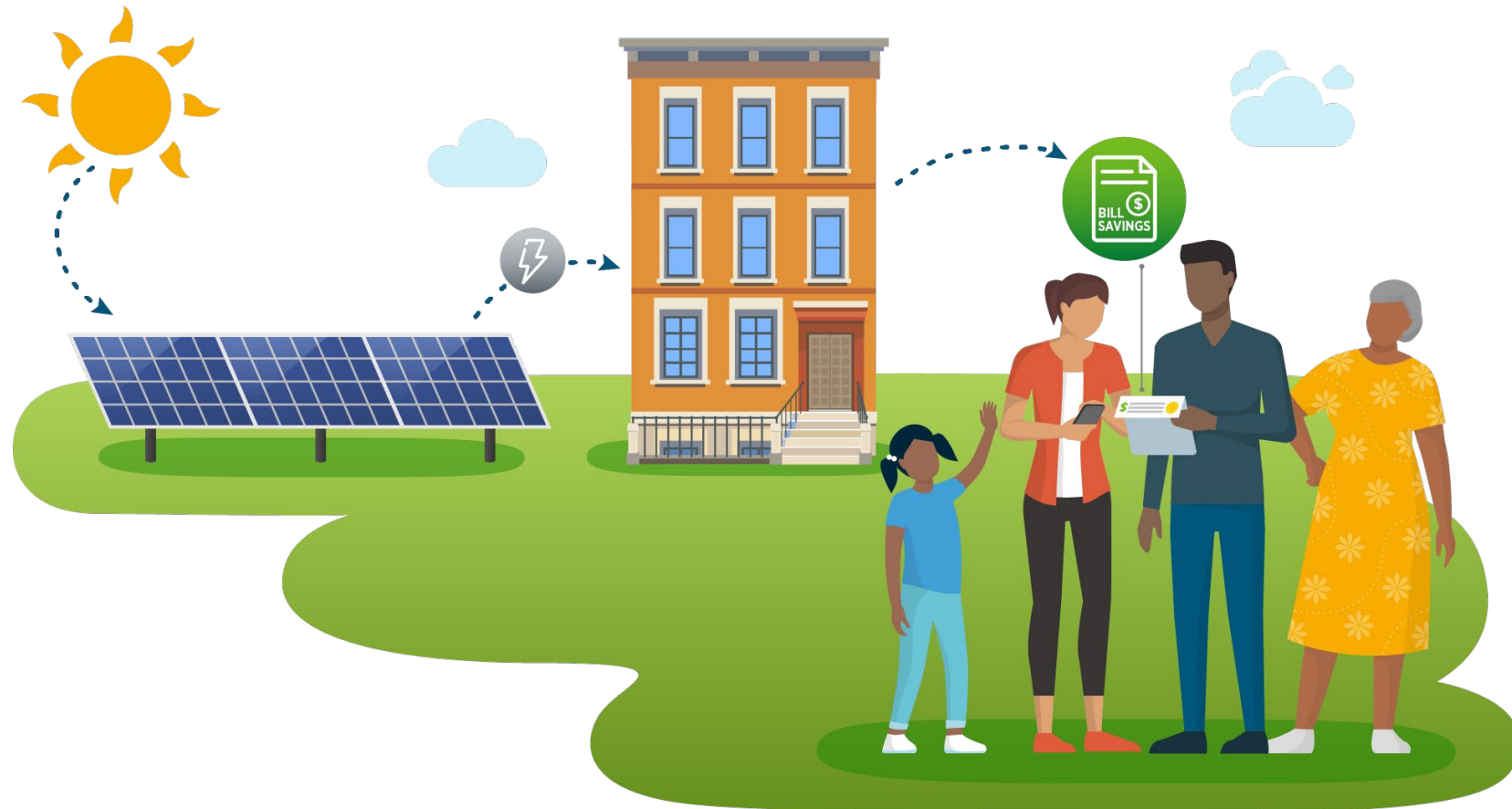


# Community Solar

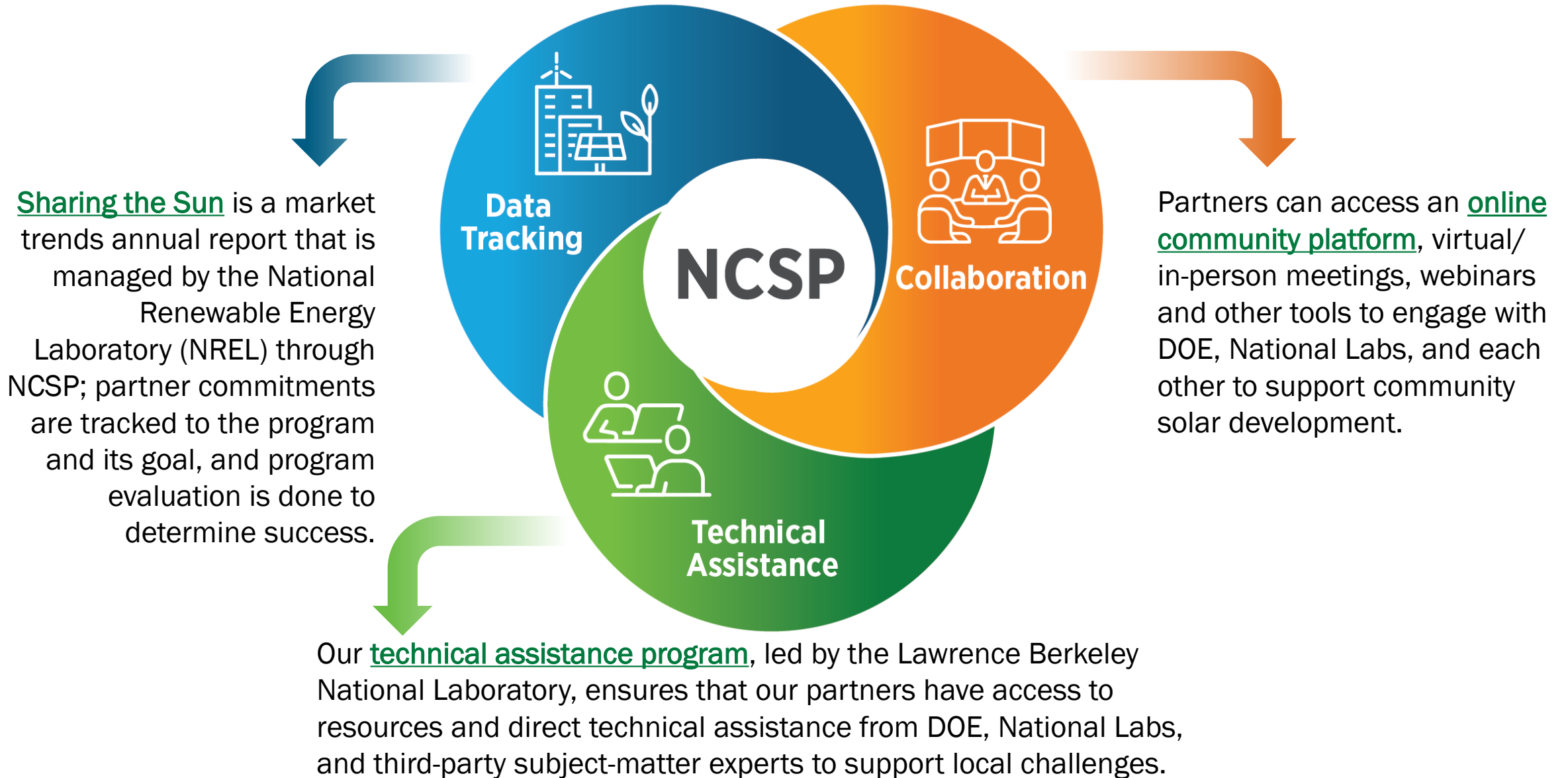
DOE defines community solar as any solar project or purchasing program, within a geographic area, in which the benefits of a solar project flow to multiple customers such as individuals, businesses, nonprofits, and other groups.

## Community solar...

- Allows households who cannot access rooftop solar to access the **benefits of solar energy** (which can be due to barriers such as rooftop suitability, cost, or tenancy).
- **Creates subscriptions, benefits, and/or ownership opportunities** that participants can access for a portion of electricity produced.
- Typically **provides participants with an electric bill credit** for electricity generated by their share of the system.
- **Can provide meaningful benefits** such as low-income access, electric bill savings, resilience, community wealth building, and workforce opportunities.



# The National Community Solar Partnership



# Solar & the Inflation Reduction Act

## Information on Solar Tax Credits:

<https://www.energy.gov/eere/solar/federal-solar-tax-credits-businesses>

Join the U.S. Department of Energy  
**Solar Energy Technologies Office**



### **Webinar:**

Celebrating One Year of the IRA and  
What's Next for the Solar Industry



Thursday, **September 7 @ 2:30 p.m. ET**

Register: [energy.gov/seto-events](https://energy.gov/seto-events)



U.S. DEPARTMENT OF  
**ENERGY** | Office of ENERGY EFFICIENCY  
& RENEWABLE ENERGY  
SOLAR ENERGY TECHNOLOGIES OFFICE

# Get Involved

## EERE Funding Opportunity Updates

Promotes the Office of Energy Efficiency and Renewable Energy's funding programs.



SIGN UP NOW:

[energy.gov/eere/funding/eere-funding-opportunities](https://energy.gov/eere/funding/eere-funding-opportunities)

## SETO Newsletter

Highlights the key activities, events, funding opportunities, and publications that the solar program has funded.



SIGN UP NOW:

[energy.gov/solar-newsletter](https://energy.gov/solar-newsletter)