U.S. DEPARTMENT OF ENERGY

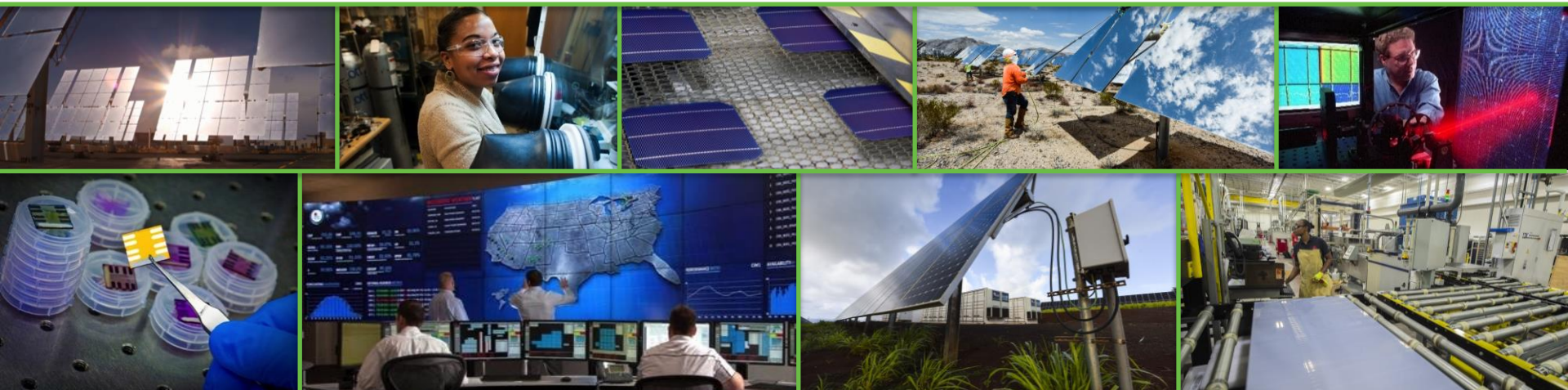
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

# Open-Source Software: Building Community Engagement for Lasting Impact

Albuquerque, Oct 12, 2022

Dr. Tassos Golnas

Solar Energy Technologies Office



# Solar Energy Technologies Office (SETO) Overview

## 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

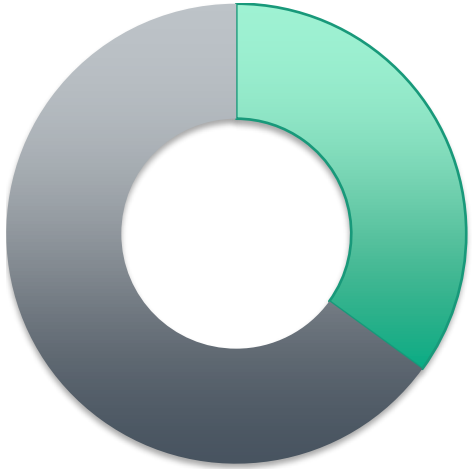
# DOE Solar Office Funds 400+ Active Projects

## Projects and partners in 42 states plus the District of Columbia

33% of projects led by national labs

32% of projects led by universities

35% of projects led by businesses, non-profits, and state and local government



# SETO Teams

## PHOTOVOLTAICS

R&D advancing photovoltaic technologies to improve efficiency and reliability, lower manufacturing costs, and drive down the cost of solar electricity.

## CONCENTRATING SOLAR-THERMAL POWER (CSP)

R&D to develop low-cost CSP technologies, which incorporate thermal energy storage to provide electricity when the sun is not shining, and which can be utilized for desalination, process heat, and fuel production.

## WORKFORCE AND EQUITABLE ACCESS

Supports the growth of a diverse and well-supported solar workforce and increasing equitable access to solar energy for all Americans.

## SYSTEMS INTEGRATION

R&D to enable solar energy to support grid reliability and security as well as coupling with energy storage and smart load management to provide new opportunities for enhanced resilience.

## STRATEGIC ANALYSIS AND INSTITUTIONAL SUPPORT

Supports the development and dissemination of analysis, tools, and data resources related to the cost and value of solar technologies and provides technical assistance to address specific challenges.

## MANUFACTURING AND COMPETITIVENESS

Supports activities that amplify the impact of R&D projects and enable the private sector to develop and sustain new solar products with a focus on technologies with the strongest opportunities for manufacturing in the United States.

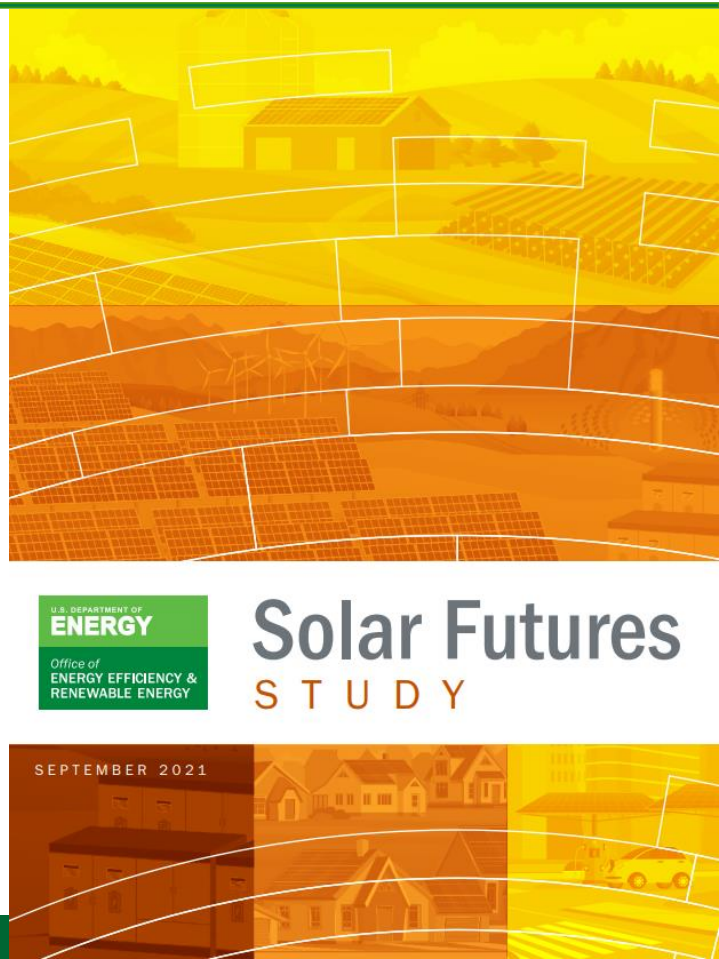
# Solar Futures Study Overview

## PURPOSE

- Comprehensive review of the potential role of *solar* in decarbonizing the electricity grid by 2035 and the energy system by 2050.
  - Addresses other large trends and activities across the U.S. economy that are necessary to achieve a zero-carbon energy system.
  - Builds analytical foundations to guide the next decade of solar research.

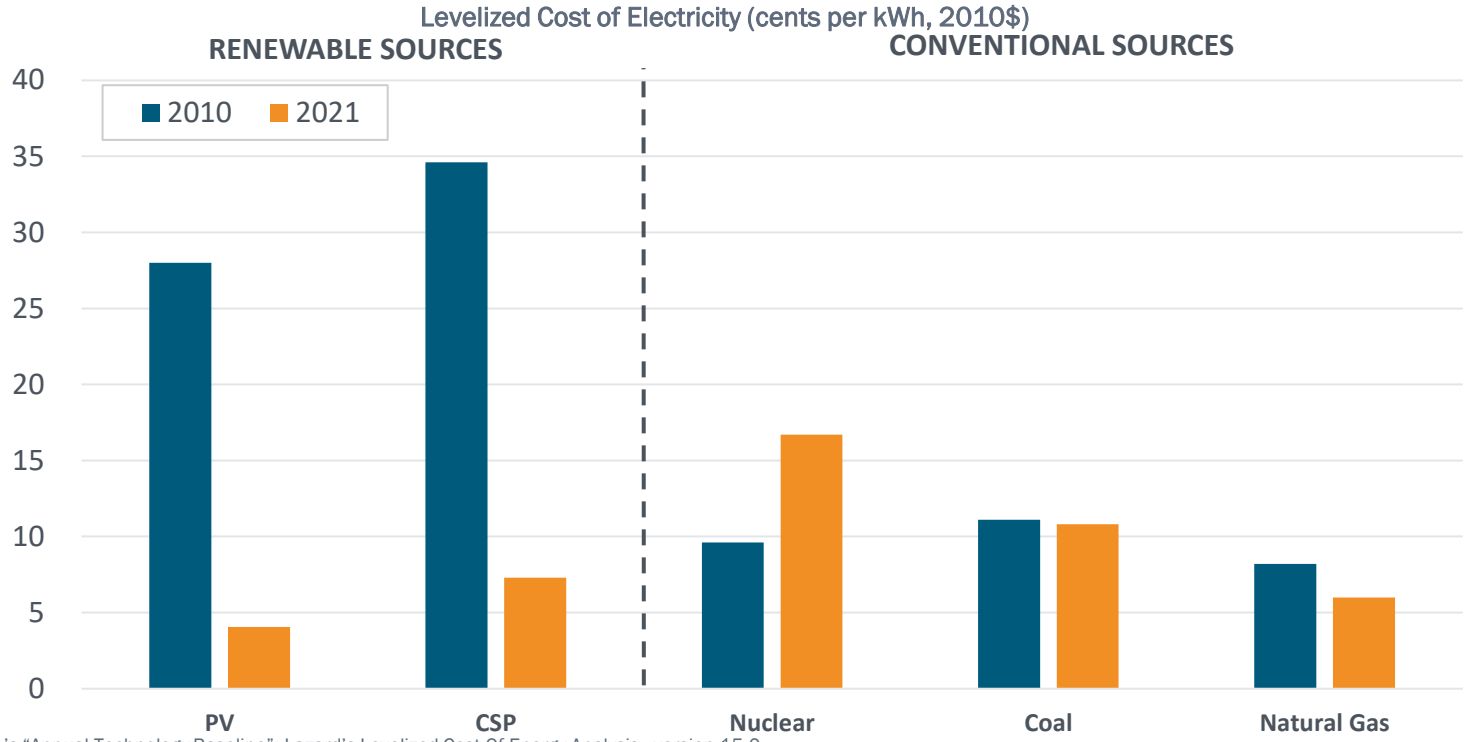
## SCOPE

- Chapters cover future scenarios, technology advances, equity, grid integration, cross-sector interactions, supply chain, and environmental impacts.



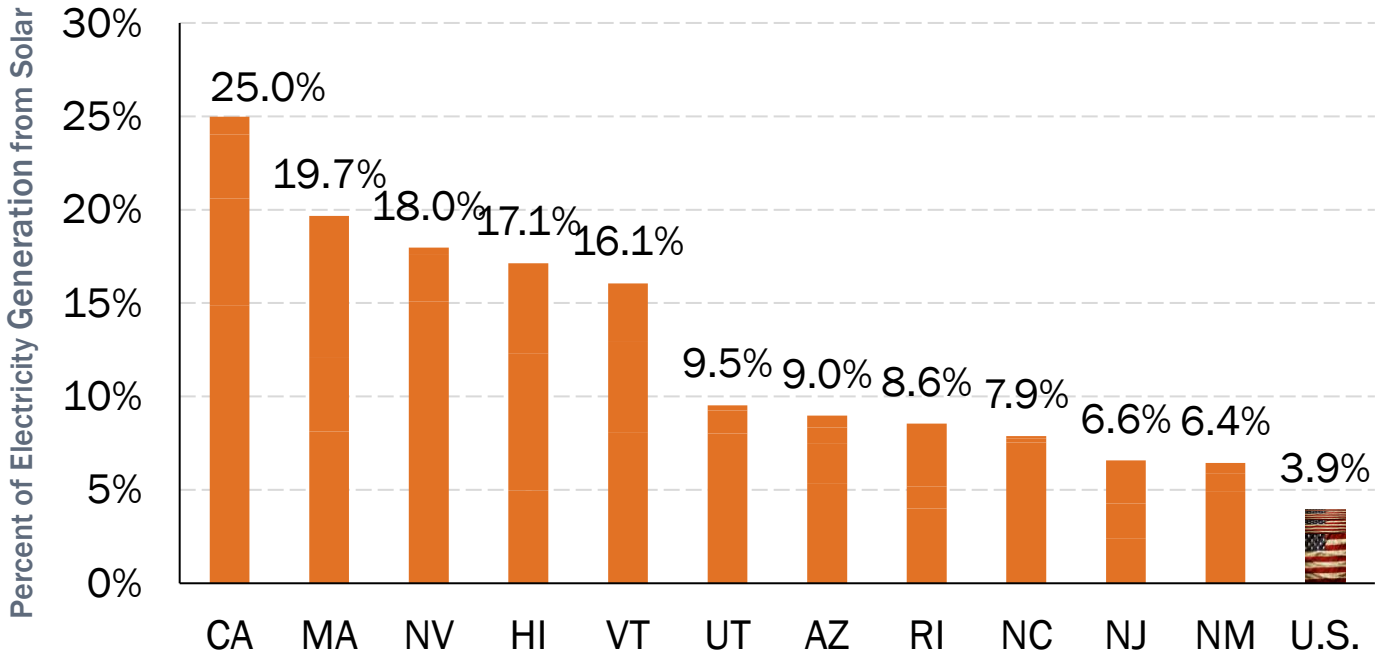
# Just 11 Years Ago

Growing from 1 gigawatt solar capacity in the United States
in 2010 to over 90 GW in 2021




Sources: NREL's "Annual Technology Baseline"; Lazard's Levelized Cost Of Energy Analysis—version 15.0

# Percent of U.S. Electricity from Solar (2021)




**Sources:** U.S. Energy Information Administration, "Electric Power Monthly," forms EIA-023, EIA-826, and EIA-861. U.S. Energy Information Administration, "Electricity Data Browser." Accessed February 28, 2022.
**Note:** EIA monthly data for 2021 are not final. Additionally, smaller utilities report information to EIA on a yearly basis, and therefore, a certain amount of solar data has not yet been reported. "Net Generation" includes DPV generation. Net generation does not take into account imports and exports to and from each state and therefore the percentage of solar consumed in each state may vary from its percentage of net generation.

# Learn About Upcoming Funding Opportunities

## 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

## SETO Newsletter

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

SIGN UP NOW:

energy.gov/solar-newsletter

# Agenda (pre-lunch)

| Time (MDT) | Session |
|---|---|
| 11:00AM–<br>11:15AM | **Introduction**<br>*Tassos Golnas, Solar Energy Technologies Office* |
| 11:15AM–<br>11:40AM | **What Code.gov Taught Us About Increasing Community Engagement**<br>*Joe Castle, SAS* |
| 11:40AM–<br>12:00PM | **A Twelve-Year Retrospective On pvlib: Open-Source PV Performance Modeling Library**<br>*Josh Stein, Sandia National Laboratories* |
| 12:00PM–<br>12:20PM | **Perspectives Of a Corporate User, Funder, and (Occasional) Contributor**<br>*Will Hobbs, Southern Company* |
| 12:20PM-<br>1:00PM | Lunch Break |

# Agenda (post-lunch)

| Time (MDT) | Session |
|---|---|
| 1:00PM–<br>1:20PM | **Successes, Lessons Learned, and Ongoing Challenges from the Open-Source Release of the System Advisor Model**<br>*Brian Mirletz, National Renewable Energy Laboratory* |
| 1:20PM–<br>1:40PM | **Forecast Arbiter and Open-Source Development**<br>*David Larson, EPRI* |
| 1:40PM–<br>2:00PM | **Building GridAPPS-D into a Platform for Advanced Distribution Operations R&D**<br>*Andy Reiman, Pacific Northwest National Laboratory* |
| 2:00PM–<br>2:20PM | **Gaining Project Contributors - A NumFOCUS Perspective**<br>*Leah Silen, NumFOCUS* |
| 2:20PM–<br>2:40PM | **Open Source - Licensing To Build Community**<br>*Bob Westervelt, Sandia National Laboratories* |

# Agenda (post-break)

| Time (MDT) | Session |
|---|---|
| 2:40PM–<br>2:50PM | Coffee Break |
| 2:40PM–<br>3:10PM | **Q&A (priority to remote participants)** |
| 3:10PM | End of Remote Attendance |
| 3:10PM–<br>3:55PM | **Discussion** |
| 3:55PM–<br>4:00PM | ***Closing Comments – Adjourn***<br>*Tassos Golnas, Solar Energy Technologies Office* |

# General Workshop Rules

## Questions for presenters

- Presenters may encourage interactive questions from in-person attendees (i.e., during presentation).
- Remote attendees may submit questions online.
  - Please preface with speaker's name
  - If there is time, online questions may be answered at the end of the respective presentation. Otherwise, the presenters may answer them during the Q&A session @2:40PM, MDT

## Jamboard

- Remote attendees may use link to jamboard (check Zoom chat) to provide opinions and insights on a number of topics.

# Workshop At a Glance

## WHY FUND OSS

- ✓ Access to results of publicly funded R&D
- ✓ Impact multiplication
  - ✓ Community engagement
  - ✓ Sustained development
  - ✓ Multiple paths to market

## WORKSHOP GOALS

1. Listen to experiences from maintainers, contributors, and users
2. Identify best practices towards building sustaining communities

# Many Thanks to:

- Josh Stein (Sandia)
- Kailey Wulfert (Sandia)
- Selina Spottswood (SETO)
- Allan Ward (SETO)
- Rodney Kizito (SETO)

# QUESTIONS