U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

SOLAR ENERGY TECHNOLOGIES OFFICE

SETO Quarterly Stakeholder Webinar

Becca Jones-Albertus, SETO Director

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energy.gov/solar-office

Solar Energy Technologies Office Webinar Speakers

Dr. Becca Jones-Albertus
Director

Dr. Lenny Tinker
Photovoltaics Program Manager

Dr. Avi Shultz
Concentrating Solar-Thermal Power Program Manager

Dr. Guohui Yuan
Systems Integration Program Manager

Garrett Nilsen
Manufacturing and Competitiveness Program Manager

Michele Boyd
Strategic Analysis and Institutional Support Technology Manager (Contractor)

Andrew Dawson
Manufacturing and Competitiveness Technology Manager (Contractor)

Today's Webinar

- SETO Overview
- SETO Updates
- "Ask an Expert" Submitted Questions
- Open Q&A

Solar Energy Technologies Office Mission

Our mission is to accelerate the development and application of technology to advance low-cost, reliable solar energy in the U.S.

To achieve this mission, solar energy must:

- Be **affordable** and **accessible** for all Americans
- Support the **reliability**, **resilience**, and **security** of the grid
- Create a sustainable industry that **supports jobs**, **manufacturing**, and the **circular economy** in a wide range of applications

Solar Energy Technologies Office

WHAT WE DO

The Solar Energy Technologies Office (SETO) funds early-stage research and development in three technology areas: photovoltaics (PV), concentrating solar-thermal power (CSP), and systems integration with the goal of improving the **affordability**, **performance**, and **value** of solar technologies on the grid.

HOW WE DO IT

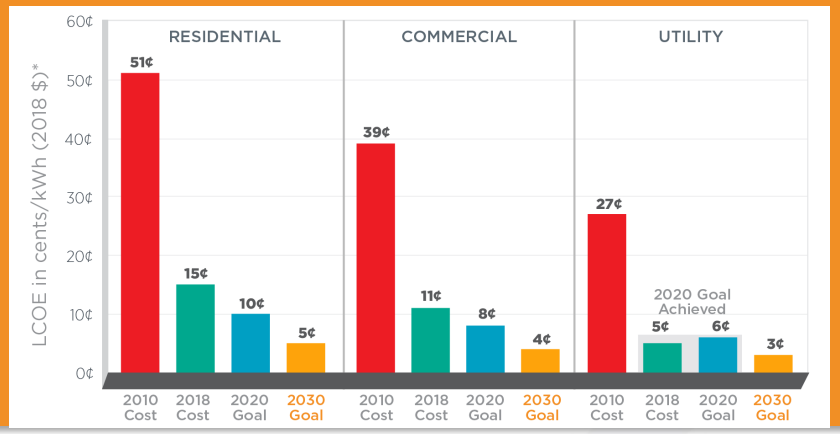
Advance solar technology to drive U.S. leadership in innovation and reductions in solar electricity costs.

Enable solar to **support grid reliability** and pair with storage to provide new options for **community resilience.**

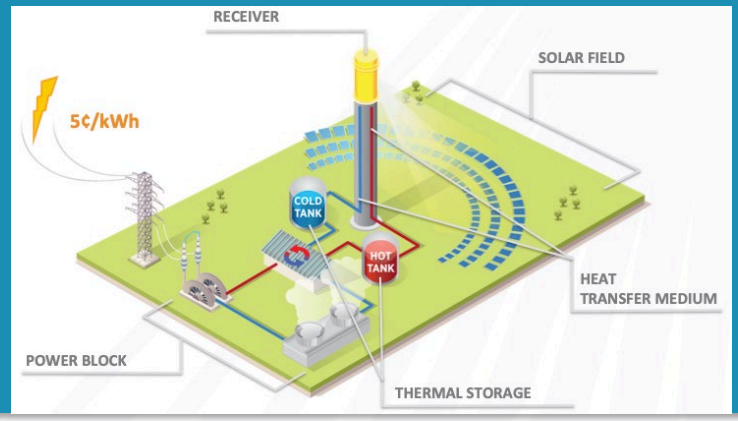
Provide **relevant and objective technical information** on solar technologies to stakeholders and decision-makers.

SETO Teams

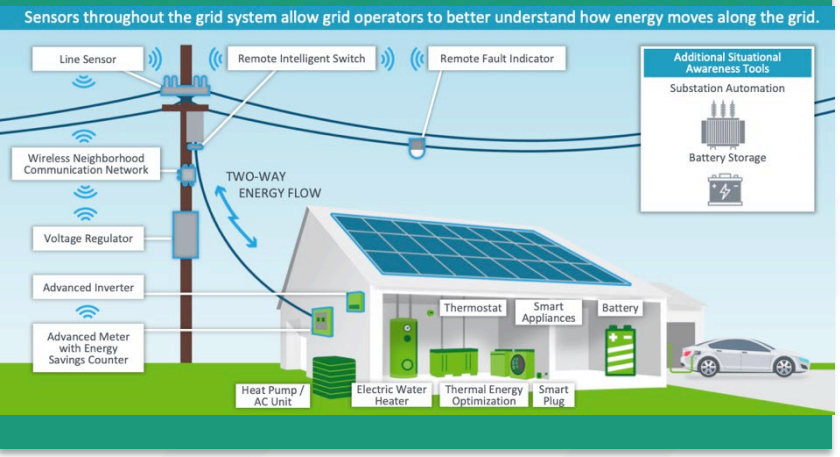
PHOTOVOLTAICS



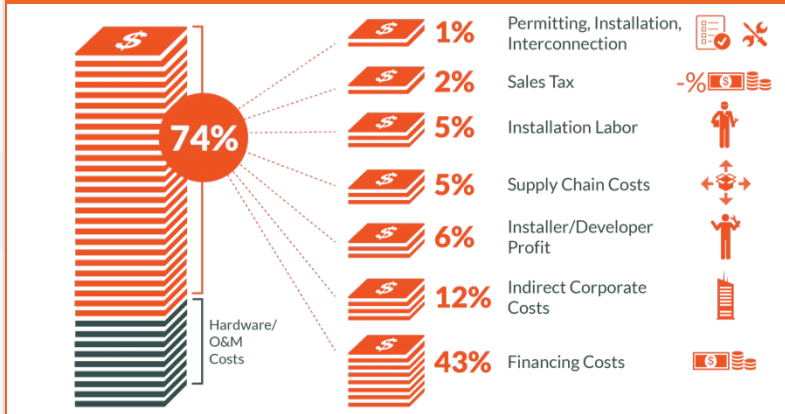
CONCENTRATING SOLAR POWER



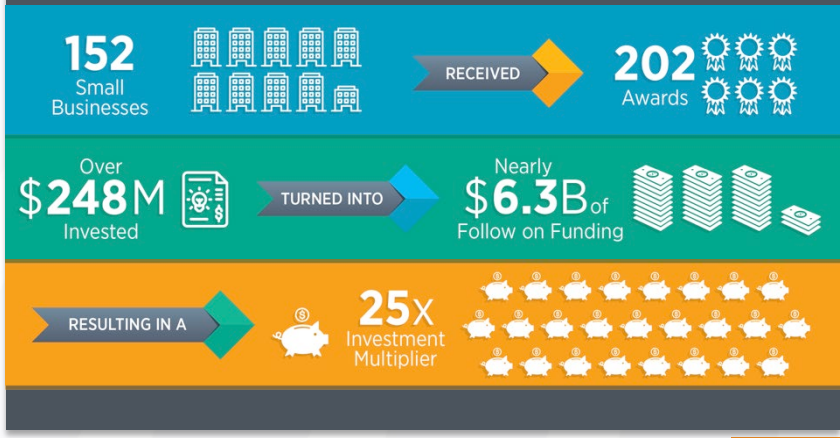
SYSTEMS INTEGRATION



STRATEGIC ANALYSIS AND INSTITUTIONAL SUPPORT



MANUFACTURING AND COMPETITIVENESS



Solar Energy Innovation Network

- Collaborative research program supporting multi-stakeholder teams researching solutions to real-world challenges associated with solar energy adoption
- March 23: DOE announced eight teams selected to participate in the second round
- Round 2 teams are focused on increasing solar energy adoption and resilience in rural communities and at the commercial scale.

SOLAR ENERGY INNOVATION NETWORK
U.S. DEPARTMENT OF ENERGY

American-Made Solar Prize Round 2

- Prize competition designed to revitalize U.S. solar manufacturing
- March 30: SETO selected 10 teams to compete in the final phase of Solar Prize Round 2
- Teams received $100,000 cash and $37,500 in vouchers to advance their prototype
- Two winners will be chosen at a final demonstration day on August 27
- Winners receive up to $500,000 cash and $75,000 in vouchers

Education Materials for Professional Organizations Working on Efficiency and Renewable Energy Developments (EMPOWERED)

- April 6: Announced $4.5 million in funding for training programs
- Enable first responders, safety officials, and building managers and owners to manage new energy technologies safely and effectively
- Collaborative effort by DOE solar, buildings, and vehicles offices

Solar Desalination Prize

- April 28: Announced $9 million prize competition to accelerate development of low-cost solar-thermal desalination systems to produce clean water from salt water
- $1 million grand prize for successful testing and demonstration of promising solar-thermal desalination system prototype

National Community Solar Partnership (NCSP)

- Supports teams in specific goal areas:
  - ✓ Models that enable community solar adoption in underserved communities
  - ✓ Models that reduce energy bills for multifamily affordable housing units
  - ✓ Utility partnerships to expand solar access

- First meeting for partners: April 28
- If you're interested in becoming a partner, email community.solar@ee.doe.gov

Coming Up…

- June 15: Fellowship application deadline
- June 18: SETO FY2020 FOA full applications due
- June 18: Solar Desalination Prize webinar
- July 9: American-Made Solar Prize Round 3 Set! Demo Day
- Aug. 27: American-Made Solar Prize Round 2 Go! Demo Day

Ask an Expert

Does SETO cover energy storage technologies?

Will there be equal efforts in pushing for reduced energy storage costs from SETO? Energy storage systems better complement PV adoption.

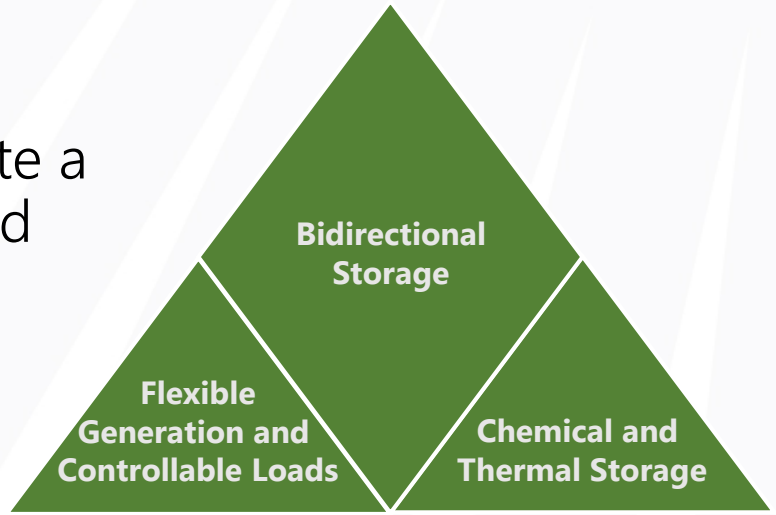
DOE Energy Storage Grand Challenge

Vision

By 2030, the U.S. will be the world leader in energy storage utilization and exports, with a secure domestic manufacturing supply chain independent of foreign sources of critical materials

Mission

The ESGC will focus resources from across the DOE to create a comprehensive program to accelerate the development and commercialization of next-generation energy storage technologies and sustain U.S. global leadership in energy storage, through the following objectives:



What specific types of projects would fall under the Coronavirus Aid, Relief, and Economic Security (CARES) Act funding guidelines? I am asking from a government entity standpoint.

How far away is perovskite solar cell technology from commercialization?

With durability issues of perovskite materials not fully addressed, what is the reasonable lifetime a customer can expect out of these modules?

Will there be a Solar Prize Round 4?

What are we doing to keep solar plug-and-play moving ahead?

Given what we've seen with COVID-19, does the DOE expect to create a "resiliency" function cutting across all sectors?

Multi-Lab Technical Support for Puerto Rico after Hurricane Maria

https://www.nrel.gov/state-local-tribal/multi-lab-planning-support-puerto-rico.html

North American Energy Resilience Model

https://www.energy.gov/sites/prod/files/2019/07/f65/NAERM_Report_public_version_072219_508.pdf

Grid Modernization Laboratory Consortium and the Resilient Distribution Systems program

https://www.energy.gov/grid-modernization-initiative-0/resilient-distribution-systems-lab-call-awards

What can be done to get better integration for electric-vehicle makers, such as Tesla and Rivian?

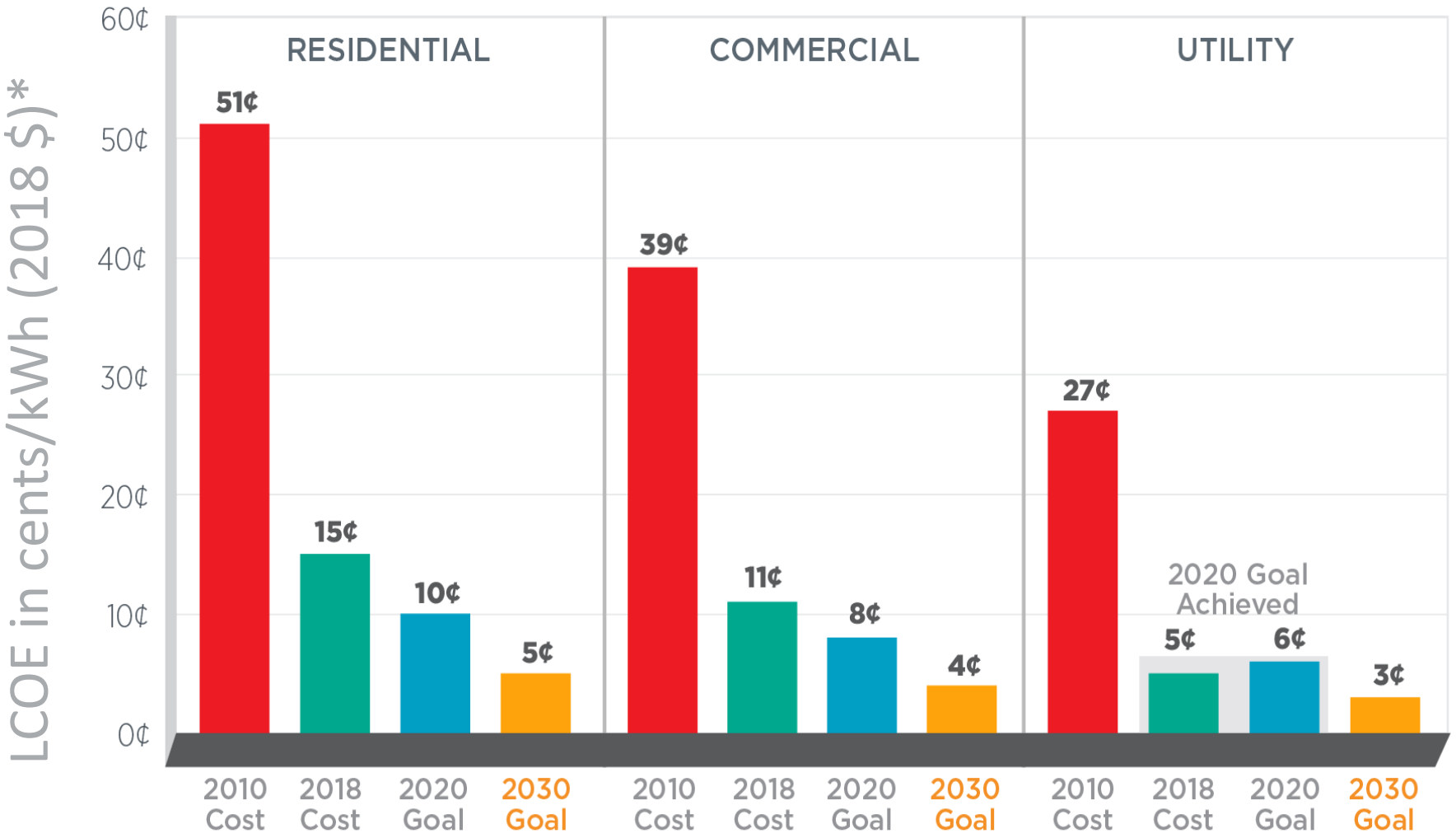
Are there environmental concerns with scaling up cadmium-telluride production?

How is SETO working with states to advance solar deployment?

How did you set the relative targets for residential and utility-scale?

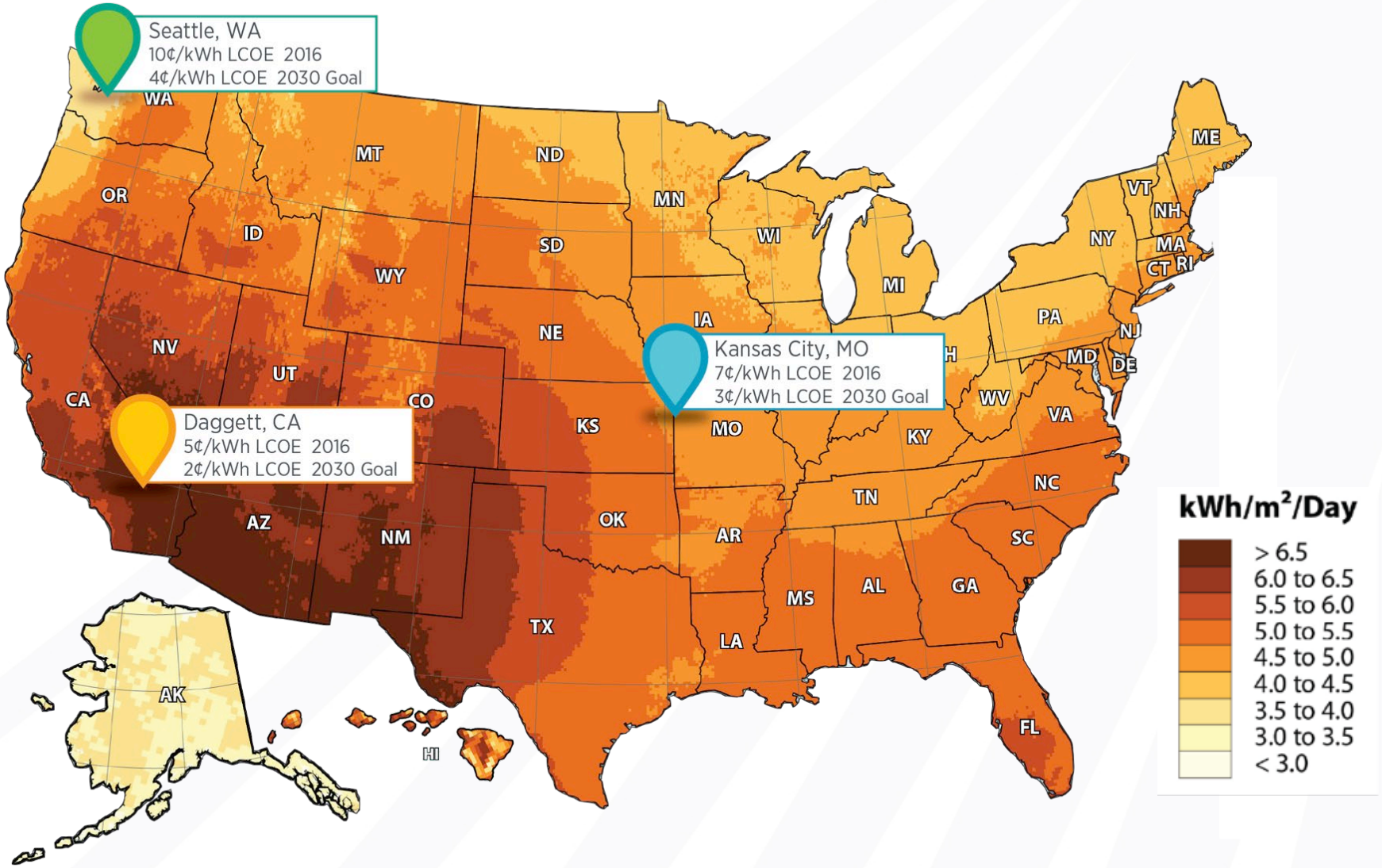
Why isn't the PV levelized cost of electricity (LCOE) goal more aggressive than $.03/kWh? China, India and others are already below this goal.

DOE Solar Cost Targets



*Levelized cost of energy (LCOE) progress and targets are calculated based on average U.S. climate and without the Investment Tax Credit or state/local incentives. The residential and commercial goals have been adjusted for inflation from 2010-19.

Cost Targets Across the U.S.



What storage technology does SETO anticipate seeing the greatest advances in over the next decade?

Promising solar-thermal technologies and applications that are not receiving DOE funding include solar thermal water heating for multi-family and commercial applications, PV-thermal hybrids, solar-assisted heat pumps, solar-assisted air conditioning, and PV water heaters. Why has the DOE chosen to limit its programs to PV and concentrating technologies? Is there an opportunity to expand the scope?

Do you see any role for green hydrogen in expanding the role of solar electricity?

How does SETO measure the lifetime of new PV module technologies?

How do you know module reliability is increasing?

What grants or special programs are available for 501.c.3 organizations?

Perovskite-silicon tandem solar cells have 29% efficiency and are progressing rapidly. Shouldn't they be a bigger part of the discussion?

With the recent lack of deployment of concentrating solar-thermal power (CSP) plants in the U.S., what is the future of CSP? Will a U.S. utility want to take a chance on Generation 2 or Generation 3 technology?

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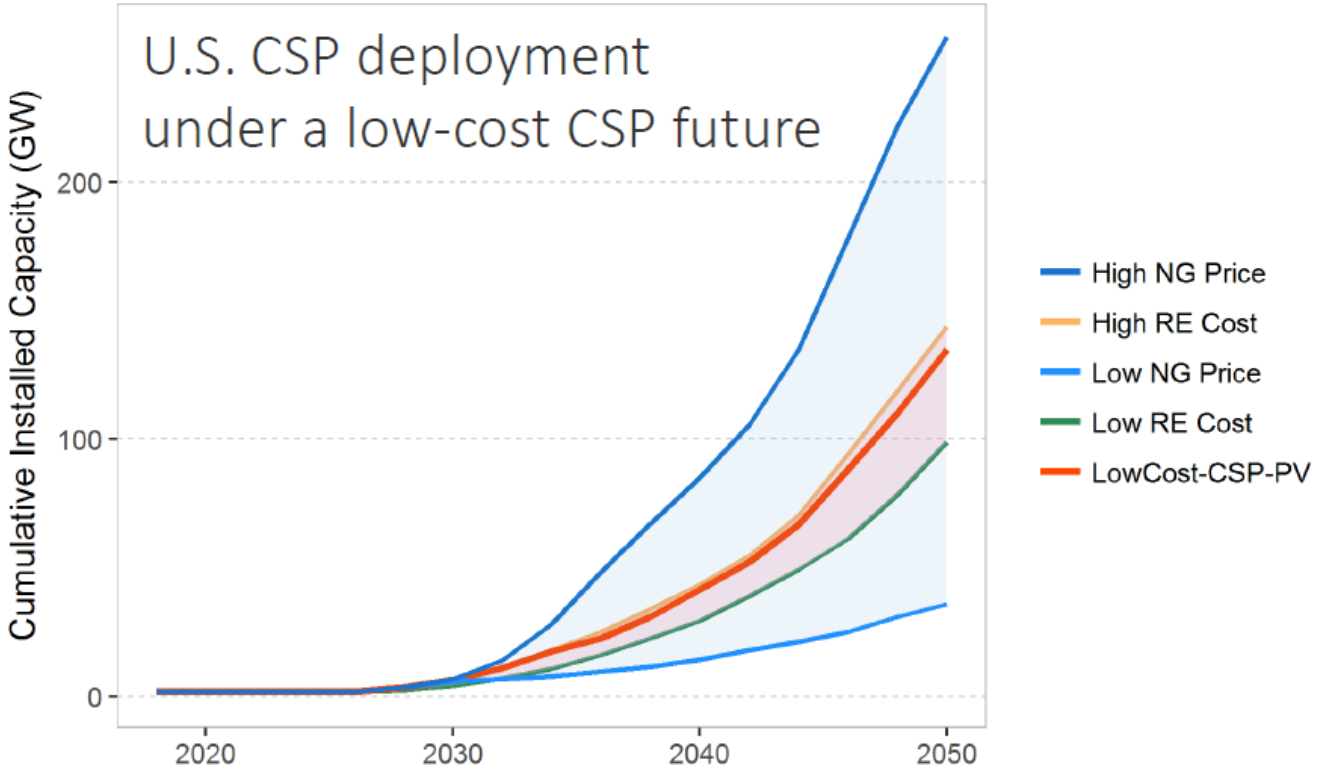
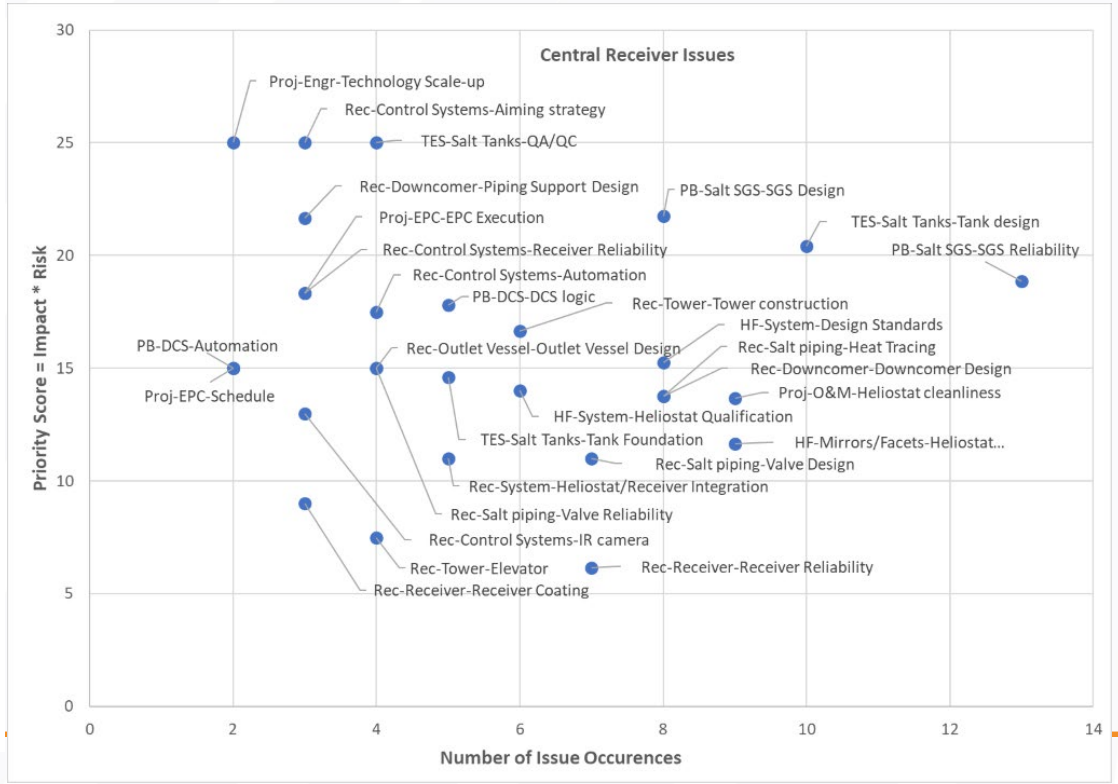
Documenting CSP Best Practices



Murphy, et al. **2019**, NREL/TP-6A20-71912



Report in preparation

energy.gov/solar-office

How does the increase in residential PV affect the electric utilities supplying residential communities?

How can we better increase manufacturing across the supply chain in the U.S. solar industry to increase resiliency and update our electricity generation?

Can modules be made AC plug-and-play installable (and permit-able) by non-experts to reduce soft costs? Building owners? Roofers? Electricians?

Monte Carlo simulation may be a really useful methodology for integrated system analysis. Is this an area of current research or interest at SETO? If so, whom would I contact to connect, collaborate with, and learn of relevant SETO research objectives?

Open Q&A