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

U.S. DEPARTMENT OF ENERGY
SBIR·STTR America's Seed Fund

U.S. DOE FY25 SBIR/STTR Phase I Release 2 SETO Topics Webinar

Solar Energy Technologies Office

December 4, 2023, 1:00 – 2:30pm ET

This webinar is being recorded and may be posted on DOE's website or used internally. If you do not wish to have your voice recorded, please do not speak during the call. If you do not wish to have your image recorded, please turn off your camera or participate by phone. If you speak during the call or use a video connection, you are presumed consent to recording and use of your voice or image.

What we will cover in this webinar

- We will discuss only the technical content of the Solar Energy Technologies topics (C60-11 and C60-12). Any question about eligibility, process, criteria, or the Funding Opportunity Announcement should be directed to the DOE SBIR-STTR Office: sbir-sttr@science.doe.gov

- Please read carefully the Topics Document and the Funding Opportunity Announcement that will be available at this link on December 16: https://science.osti.gov/sbir/Funding-Opportunities

- We will collect questions over chat, but we will NOT answer them "live". Any questions you ask during the webinar will be reviewed and written responses will be made available to the public on our webpage (https://www.energy.gov/eere/solar/notice-funding-opportunity-sbirsttr-fy-2025-phase-i-release-2) so that everyone can read the answers.

- We DO NOT provide individual feedback on specific applications, ideas, or proposals. In order to be fair to all potential applicants, we discuss only the language of the topics.

- For more info: https://energy.gov/solar-office/sbir or contact solar.sbir@ee.doe.gov

Funding Opportunity: FY 2025 SBIR/STTR Phase I Release 2

KEY DATES

NOTICE OF FUNDING OPPORTUNITY

- Monday, December 16, 2024

MANDATORY LETTER OF INTENT

- Tuesday, January 7, 2025 - 5 pm ET
- Monday January 27, 2025 - Non-responsive LOI Feedback

FULL APPLICATIONS

- Wednesday, February 25, 2025 – 11:59pm ET

For more details and up-to-date information please visit the webpage of the DOE SBIR/STTR programs frequently: https://science.osti.gov/sbir/Funding-Opportunities

What we will cover in this webinar

- Who we are (Solar Energy Technologies Office)
- SETO technology-to-market programs
- SETO subtopics
- Technical and business assistance program & the American-Made Network
- Application guidelines

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 energy system by 2050**, starting with a decarbonized power sector by 2035

WHAT WE DO

Advance solar technology and drive soft cost reduction to make solar **affordable** and **accessible** for all Americans

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

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

Decarbonizing Electricity and Energy Sectors

- Carbon-free electricity sector by 2035
- 100% clean energy economy with net-zero emissions by 2050

- In a fully decarbonized grid, predictions indicate that **30-50% of U.S. electricity generation would come from solar**
- To meet the 2035 goal, we need to deploy solar at **two to five times the current rate**
- Solar can help decarbonization **beyond electricity**, with solar thermal heat for industrial processes and solar fuel production

Capacity & Economic Impact

The amount of U.S. electricity generated by solar has increased **6 times** in the last 10 years. In 2023 solar energy represented **11.2%** of net summer electricity capacity and accounted for **5.6%** of the annual electricity generation. Over **200 GW** of solar capacity currently installed in the U.S. with over **5 million** solar energy system installations. PV systems accounted for **55% of all new electric** generating capacity installed in 2023.

In 2023 a new solar project was installed every **39 seconds**.

10,000+

Solar businesses in the U.S.

263,000+

People employed by the solar industry

$60.1 billion

Value of the U.S. solar market in 2023

25%

Average annual growth of the solar market in the past 10 years

43% ↓

Solar PV prices have declined to almost half in the past 10 years

80% ↓

Utility-scale PV system prices have decreased tremendously since 2010

Sources: Data from SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Report 2024
Data from NREL Spring 2024 Solar Industry Update

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SOLAR ENERGY TECHNOLOGIES OFFICE

Technology to Market Funding Programs

Are you an...	With an...		You should apply for...
 INDIVIDUAL	Idea		American-Made Solar Prize
	Prototype	STOP Need to be an incorporated business	
 SMALL BUSINESS	Idea	$$$ Funding up to $800K over 1 year Ease of entry: easy No cost share	American-Made Solar Prize
		$$$ Funding up to $1.3M* over 3 years Ease of entry: medium No cost share	SBIR/STTR
	Prototype	$$$ Funding up to $2M over 2 years Ease of entry: hard Must provide cost share	Incubator**
 LARGE BUSINESS	Idea		American-Made Solar Prize
	Prototype		Incubator**

*SBIR/STTR funding level is based on participation in two phases of the SBIR/STTR funding program.

**Incubator can include Incubator funding opportunity announcements (FOAs) or Incubator topics in SETO-issued FOAs.

What we will cover in this webinar

- Who we are (Solar Energy Technologies Office)
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Topic C60-11

Open to **both** SBIR **and** STTR applications

Maximum Phase I Award Amount: $200,000	**Maximum Phase II Award Amount:** $1,100,000
Accepting SBIR Phase I Applications: YES	**Accepting STTR Phase I Applications:** YES
Accepting SBIR Fast-Track Applications: NO	**Accepting STTR Fast-Track Applications:** NO

a. Innovative Power Electronic Technologies for Solar Systems
b. Dual-Use Photovoltaic Technologies
c. Technologies Enabling Solar-Powered DC Microgrids
d. Cybersecurity of Solar Energy Systems
e. Distribution Reliability Visibility
f. Concentrating Solar-Thermal Power Technologies for Gen3 CSP, Commercial CSP (Gen2 CSP), or Concentrated Solar-Industrial Process Heat (SIPH)
g. Affordability, Reliability, Performance, and Manufacturing of Solar Systems

SUBTOPIC 11a

Open to SBIR and STTR

Innovative Power Electronic Technologies for Solar Systems

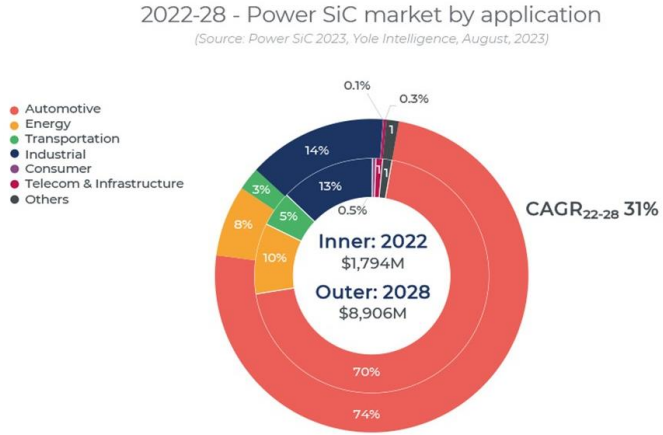
Power Electronics for Solar Systems

Goals and Focus

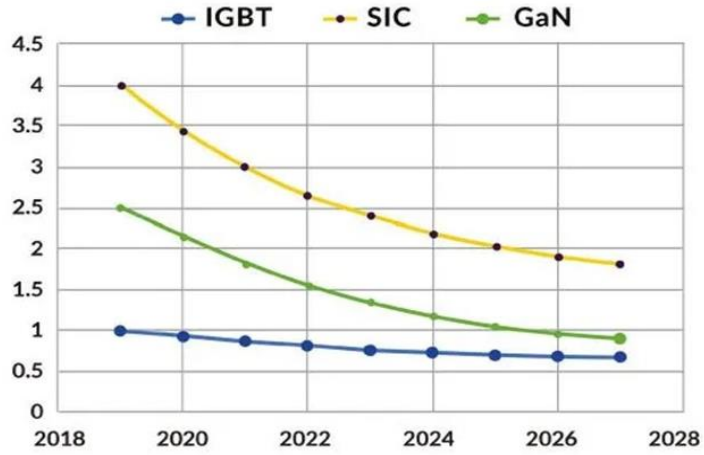
- Develop the **next generation of power-electronic systems** for solar applications demonstrating substantial advantages such as:
  - greater efficiencies,
  - higher power density,
  - lower weight/volume,
  - increased durability/reliability (based on improved design and manufacturing)
  - enhanced functionality and operational flexibility,
  - grid control and support services.
- Create **cost**-competitive, high-**performance**, high-**reliability** alternatives to the current state of the art
- Promote the case for **domestic manufacturing** of equipment
- Accelerate **decarbonization** with the utilization of **solar power**

Power Electronics for Solar Systems – Opportunity

- Accelerated **WBG-device market growth**, driven by the expanding electric vehicle industry
- Dropping SiC/GaN prices driven by the expanding industry



https://www.yolegroup.com/product/report/power-sic-2023/



https://ehv.mydigitalpublication.co.uk/articles/gan-on-silicon-comes-of-age-visic-

- Opportunity to use WBG chips in **power-electronics components for the solar** industry in a **cost-competitive way** compared to incumbent technologies.
- The United States is a pre-eminent supplier of high-quality SiC wafers and chips making a **compelling case for domestic manufacturing**

Power Electronics for Solar Systems – Areas of Interest

- Power-electronic equipment based on wide- or ultra-wide-bandgap semiconductor materials (SiC, GaN, Ga_2O_3)
  - Inverters, DC/DC converters/optimizers, solid-state transformers
  - Innovative designs and topologies
  - High-frequency transformers, planar magnetics, transformer-less designs
  - Faster switching frequency applications
  - High-power or high voltage applications
  - Design and build processes with potential for automated manufacturing
  - Technical innovation and assessment of the potential for domestic manufacturing

- Multi-port systems integrating distributed PV with **energy storage** and **electric vehicle charging** (including DC fast charging, V2H, V2G) that:
  - Improve generation to demand profile matching
  - Enable operational flexibility
  - Reduce system costs

Power Electronics for Solar Systems – Areas of Interest

- Advanced power electronic controls
  - Enable operational flexibility and dispatchability
  - Allow for grid control and support services
  - Perform grid forming functionality
- Improved component and system reliability and durability
  - Improve design and manufacturing processes
  - Minimize associated failures and their impacts
- Innovative methodologies and systems for health monitoring and diagnostics of solar inverters/converters
  - Detect and identify failures
  - Improve system reliability

Power Electronics for Solar Systems – Areas NOT of Interest

Applications will be considered nonresponsive and declined without external merit review if

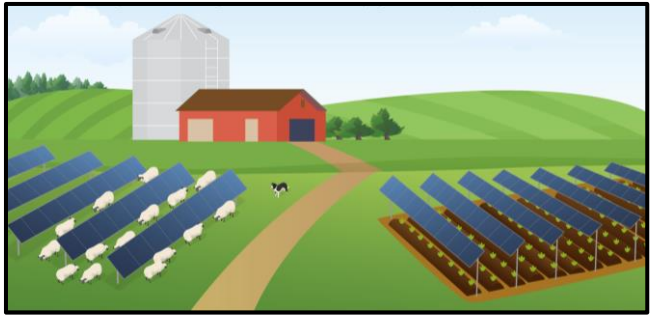
- they mainly **focus on improving maximum power-point tracking**;
- they do not have a **clear, direct, and immediate relevance and impact to the solar industry** but rather revolve around **earlier-stage research and development** that would be beneficial to multiple-industries;
- their emphasis is **not power electronic technologies and products** specifically designed **for solar applications** or their focus is **general manufacturing** of power semiconductor devices.

SUBTOPIC 11b

Open to SBIR and STTR

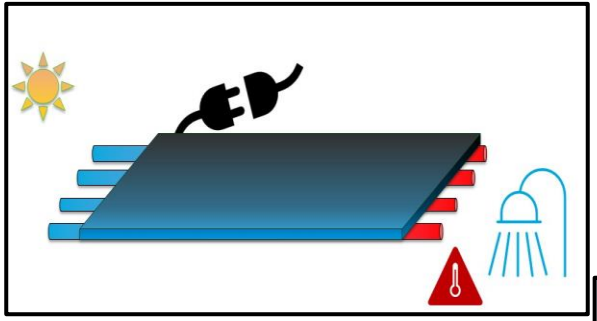
Dual-Use Photovoltaic Technologies

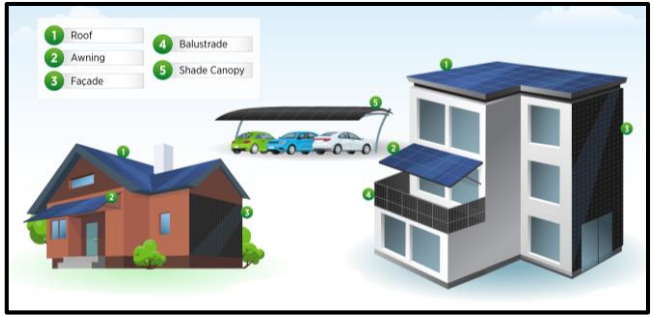
Emerging Sectors: Dual-Use PV



Agrivoltaics

Photovoltaic-Thermal

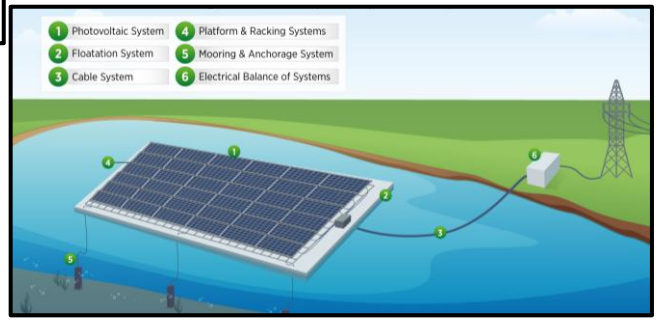




Building-integrated PV

Vehicle-integrated PV

Floating PV



Dual-Use PV Overview

VALUE PROPOSITION OF DUAL-USE PV

- Minimize or eliminate conflicts of land use
- Decentralize electricity generation, locate closer to end user
- Reduce infrastructure needs (distribution grid, EV charging stations, etc.)
- Enable consumer generation by removing barriers to access

SETO'S SCOPE

1. Scalable methods to address energy challenges
2. PV integration into the built or natural environment

Dual-Use Photovoltaic Technologies – Areas NOT of Interest

Applications in the following areas will be considered nonresponsive and declined without external merit

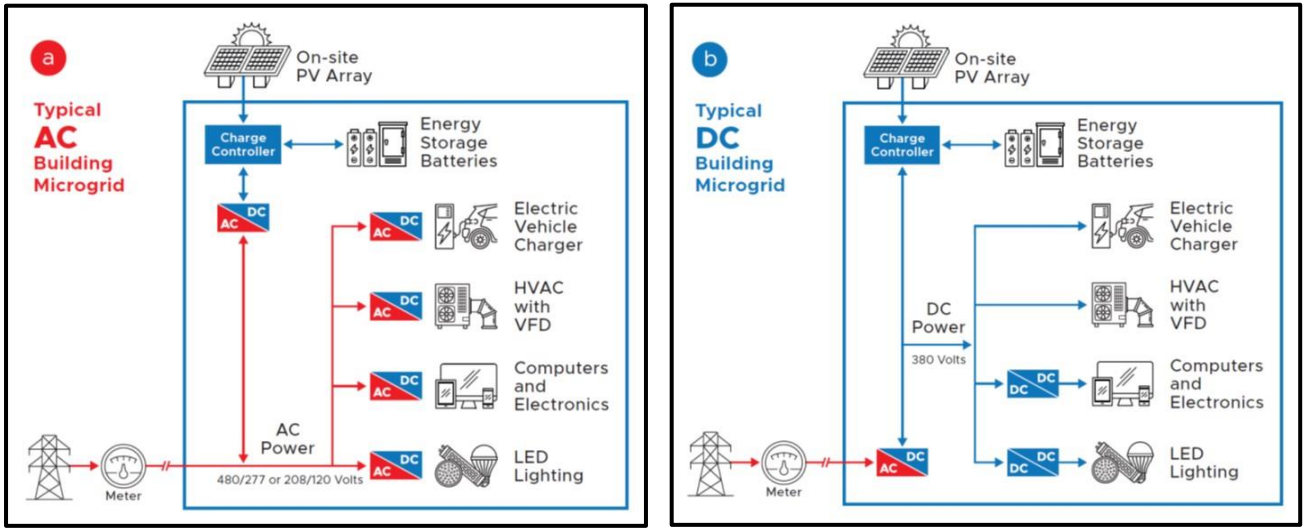
- Agrivoltaics
  - Any solutions where the PV is on building rooftops
  - Products that involve quantum dots and tube PV
  - Proposals exclusively related to pollinator habitats
- BIPV
  - Solar glass window products
  - Solar roadways or pavement-integrated products
- Floating PV
  - Products or technologies with sole application to offshore and oceanic environments
- VIPV
  - Recreational vehicles with added standard PV modules
  - Products or technologies that incorporate PV modules (e.g., standard PV modules with glass front sheets) not designed or tested for vehicle applications
  - Products and technologies for non-road vehicle applications (e.g., trains, marine vessels, aerial vehicles, or space vehicles)
  - Products and technologies for personal mobility applications (e.g., scooters or bicycles)
- PVT
  - Technologies that do not co-generate or aid in the co-generation of thermal and electrical energy for dual use

SUBTOPIC 11c

Open to SBIR and STTR

Technologies Enabling Solar-Powered DC Microgrids

Considerations for DC Microgrids



Potential benefits of DC vs AC microgrids

- Efficiency saving
- Design simplicity
- Improved reliability
- Reduced installation costs
- Reduced O&M costs

Source: Gabe Arnold, Grace Pennell, DC Lighting and Building Microgrids: Opportunities and Recommendations. Pacific Northwest National Laboratory, September 2020.

Solar-Powered DC Microgrids – Areas of Interest

- **Innovative designs and architectures** of dc microgrid and building nanogrids.
- **Tools for planning, design, and quantification of benefits** of dc microgrids.
- **Power electronics** for dc bus architectures including solar PV.
- **Local controllers and energy management systems** for the operation of dc microgrids.
- **Local and wide-area control systems** for the operation of multiple interconnected dc microgrids with multiple distributed energy resources.
- **Modeling and simulation** of dc systems and microgrids, including operation, control, and stability analysis.
- Systems for **fault detection, protection**, and **dc circuit breaker hardware**.

Solar-Powered DC Microgrids – Areas NOT of Interest

Applications in the following areas will be considered nonresponsive and declined without external merit

- Development of dc appliances.
- Converters and power electronics not designed and intended for dc microgrid operation.
- Technologies and products for ac microgrids

SUBTOPIC 11d

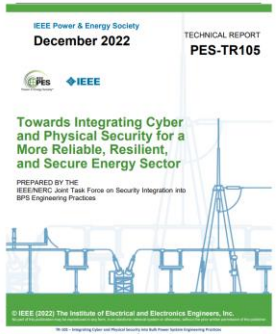
Open to SBIR and STTR

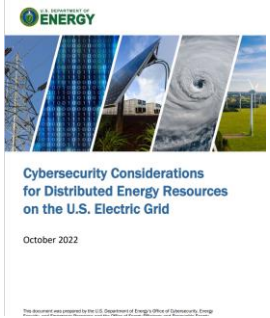
Cybersecurity of Solar Energy Systems

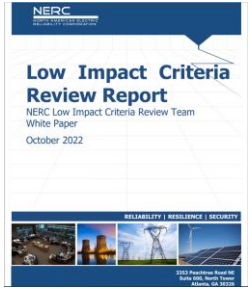
Cybersecurity of Solar Energy Systems

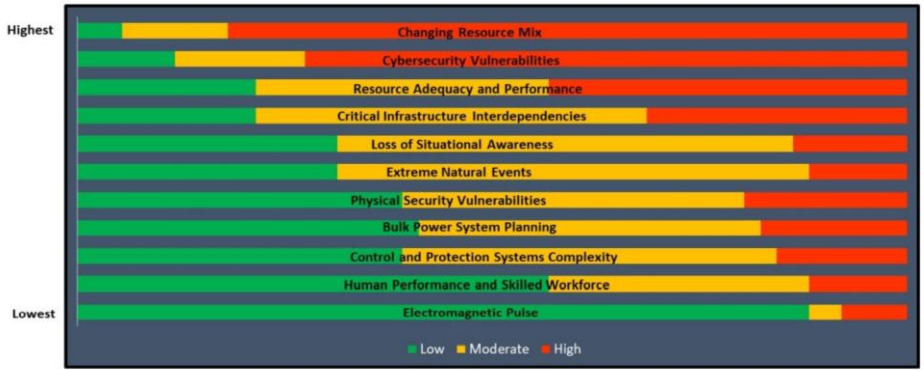
- **Objectives**
  - Enable more cyber-aware and cyber-secure electric power systems with high penetration of solar (particularly in the form of distributed deployment)
  - Improve the ability of electric grids and solar assets, like solar/hybrid power plants and their components (e.g., electronic devices associated with solar energy systems, such as inverters, dc-dc optimizers or other converters, smart meters, and grid-edge devices) to protect themselves from and quickly recover in response to cyber threats.

Cybersecurity of Solar Energy Systems







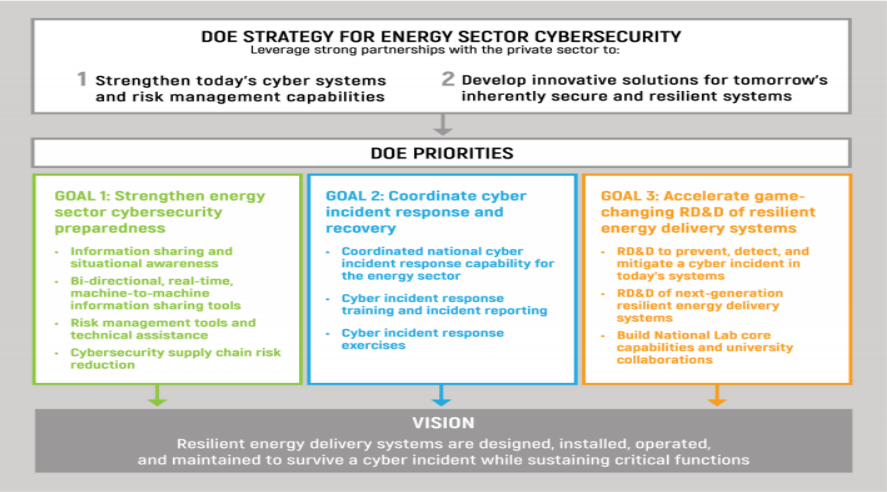


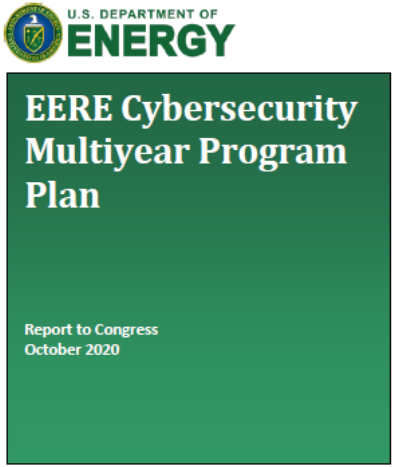
DER Threat Scenarios

Source: CESER/SETO Report: Cybersecurity Considerations for Distributed Energy Resources on the U.S. Electric Grid

Attack Summary	Attack Surface & Technique	Cyber Vulnerability Exploited	Consequence
Malicious Configuration or Compromised Patching	DER vendor, owner, operator, or aggregator	Firmware & configuration settings compromised through poor supply chain security	Loss of power and a complete blackout at higher DER penetrations
Manipulating Trip Thresholds	DER aggregator systems or DER-to-utility comm network	DER firmware settings compromised through comms network	Grid instability, unintended DER disconnection
Adaptive Protection Disruption	Manipulation of trip settings	Devices compromised through adaptive comms network	Compromise grid protection coordination
Spoofing Data & Man-in-the-Middle Attacks	DER communications	DER endpoints, SCADA, DER comms., aggregators, sensor data	Changes to operations causing grid instability or low of power.
Malicious DERMS Control Requests	DER comms and DERMS Systems	Unsecured ports/services exposed on public communications, poor firewall configuration, physical access to unprotected interfaces, remote access, bypassed DERMS authentication systems, escalating privileges.	DERMS control systems issue DER commands that induce instability and a potential loss of power

Cybersecurity of Solar Energy Systems





Goal 1: Accelerate Cyber Resilience R&D of EERE Operational Technologies

- **1.1 Improve cybersecurity defenses and resilience.**
- **1.2 Mitigate vulnerabilities**
- **1.3 Next-generation cyber resilient technologies.**

Goal 2: Increase EERE Stakeholder Cybersecurity Awareness

- **2.1 Improve situational awareness.**
- **2.2 Enhance EERE technology cybersecurity maturity.**
- **2.3 Identify opportunities for EERE stakeholder participation in cyber incident response exercises.**

Cybersecurity of Solar Energy Systems – Areas of Interest

- Innovative cyberattack detection and identification schemes that can be applied across various solar assets, from distributed customer devices to utility-scale systems.
- Tools that perform risk assessments that recognize the increasing interdependencies between physical and cyber (information and communication) systems and evaluate how cyberattacks can affect electric power grid operations.
- Automated risk-mitigation strategies that allow rapid response and service restoration of electric grid and solar assets after cyber-attacks and demonstrate the system ability to endure multiple simultaneous attacks.
- Device-level cybersecurity systems that enable self-awareness into the grid-interactive solar assets.
- Controls and operations of solar assets that are designed and can be deployed adhering with zero trust principles where data and commands from remote devices are validated using cryptographically secure mechanisms.
- System-level cyber threat detection, identification and mitigation approaches via cooperative strategies among large amounts of geographically dispersed assets/devices based on either centralized or distributed communication networks.

SUBTOPIC 11e

Open to SBIR and STTR

Distribution Reliability Visibility

Distribution Reliability Visibility

- **Objectives:**
  - This subtopic seeks to advance technologies and products to enhance the visibility of distribution grids and provide actionable information for grid operators to safely and reliably operate the distribution system.
- **Challenges and Opportunities**
  - The increased adoption of distributed solar and other energy resources (DERs) can impact the performance of distribution system if not properly managed and challenge the reliable operation of distribution grids.
  - The impacts (e.g., overvoltage and thermal violations, miscoordination and misoperation of protection devices, faster dynamics, uncertain, and potential adverse control interactions of inverter-based resources, etc.) are exacerbated by a lack of operator situational awareness of distribution grids, particularly the assets and systems at the grid-edge and even behind-the-meter.

Distribution Reliability Visibility

Advanced Systems Integration for Solar Technologies (ASSIST): Situational Awareness and Resilient Solutions for Critical Infrastructure

In 2019, ~6.7M for 7 selected projects to develop unique and innovative solutions that increase grid operators' situational awareness of solar PV systems deployed throughout the electricity system at strategic locations.

- **Topic Area 2**: TOPIC 1.1: R&D and Technology Transfer for Solar Situational Awareness

Source: Solar Energy Technologies Office Lab Call FY2025-27 | Department of Energy

In 2023~2024, ~40M for 13 selected projects to address emerging challenges and opportunities for grid planning and operation engineers and technicians arising from the power system's transition to variable renewable energy sources and inverter-based power electronic grid interfaces.

- **Topic Area 3**: Rapid System Health and Risk Assessment Tools for Grid Operators

Source: Operation and Planning Tools for Inverter-Based Resource Management and Availability for Future Power Systems (OPTIMA) Funding Program | Department of Energy

Solar Energy Technologies Office Lab Call FY2025-27

In 2024, ~6M for 2 selected projects to enable distribution and transmission systems operators and power plant owners to evaluate and select the most technically advanced and economically viable sensing and communication solutions.

- **Topic Area 2**: Sensor Placement and Optimization Tool for the Integration of Solar Systems

Source: Solar Energy Technologies Office Lab Call FY2025-27 | Department of Energy

Distribution Reliability Visibility – Areas of Interest

- Advanced voltage monitoring and analysis systems that can
  - Estimate the spatial and temporal voltage profiles of distribution feeders in real-time by considering the intermittency and uncertainty of solar energy resources;
  - Detect the 'hotspot' node voltages exceeding safe operational limits;
  - Facilitate voltage stability margin and hosting capacity estimation and analysis; and
  - Enable optimal voltage control via inverter-based DERs and other grid-edge devices.

  The proposed solutions should also be computationally efficient to be suitable for real-time applications.
- Advanced distribution state estimation techniques that can
  - address the complications inherent with distribution grids (e.g., time-varying unbalance, limited availability of real-time measurements, asynchronous and/or heterogenous measurements from different sensing/metering infrastructures, incorrectly captured and/or time-varying network connectivity and topology, etc.).

  The proposed solutions should also be computationally efficient to be suitable for real-time applications.

Distribution Reliability Visibility – Areas of Interest

- Innovative technologies that can estimate and predict dynamic operating envelopes and reserve margins (generally defined as time-varying upper and lower bounds on the import or export of power in a given time interval) of DERs at various aggregation levels of connection points (e.g., service entry point, feeder, substation level, or subdivision of a distribution grid).
  - The developed solutions are expected to support distribution operation in real-/near-real-time, enhance the utilization of DERs and their participation in energy and network services markets.
- Innovative technologies that support dynamic hosting capacity estimate for utilities to better strategize for distribution system upgrades.
  - The developed solutions are expected to incorporate, besides siting considerations of DERs, autonomous inverter functions (e.g. volt-var control), and/or optimal coordinated control of DER at various aggregate levels.

Distribution Reliability Visibility – Areas of Interest

- Innovative technologies that identify emerging risks and unstable system dynamics in real time and predict future behaviors.
  - The developed solutions are expected to ingest large amounts of data captured by dispersed sensors and monitoring devices with various resolutions and sources, such as wide-area phasor measurement units, substation intelligent electronic devices, devices capable of streaming point-on-wave data, power quality meters, and digital fault recorders and relays, and energy management systems.
  - The solutions are also expected to provide automatic event analysis, reporting, and recommendations for reliability risk mitigation.
- Grid-Edge intelligent analytics and devices that can improve distribution system's situational awareness, assist DER aggregation and support automated control and operation of distribution grids. The developed solutions are expected to
  - Host advanced real-time analytics and optimization (example applications listed above); and,
  - Support flexible and open communication and control architectures (e.g., the cloud/utility premises; centralized/ decentralized/distributed) for interoperable integration to a utility distributed energy resource management systems (DERMS) or advanced distribution management systems (ADMS), a third-party aggregator DERMS, and behind-the-meter (BTM) assets and resources.

Distribution Reliability Visibility – Areas NOT of Interest

Applications in the following areas will be considered nonresponsive and declined without external merit

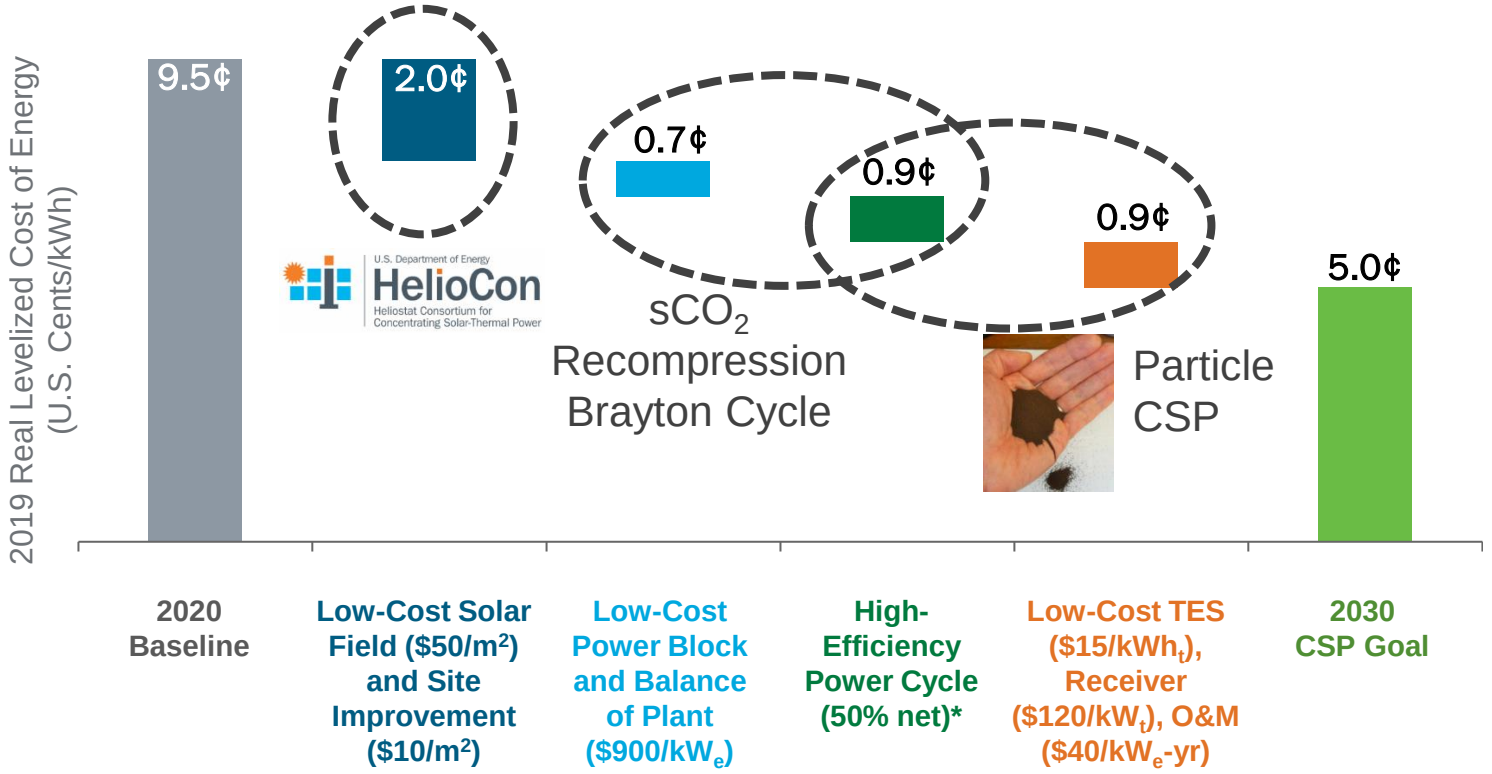
- Solutions that primarily focus on health monitoring and diagnostic of individual grid components and assets.

SUBTOPIC 11f

Open to SBIR and STTR

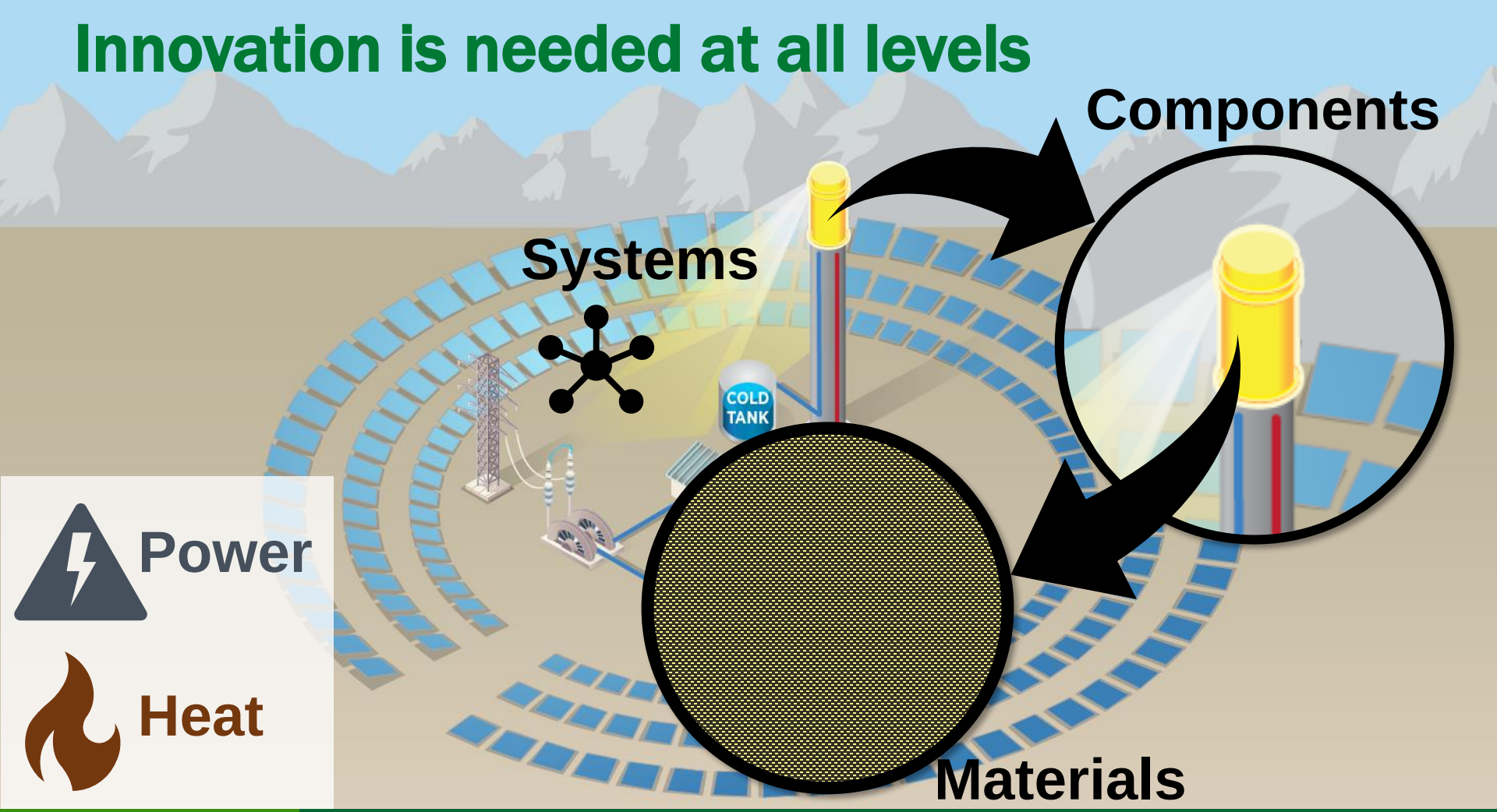
Concentrating Solar-Thermal Power Technologies for Gen3 CSP, Commercial CSP (Gen2 CSP), or Concentrated Solar-Industrial Process Heat (SIPH)

Cost targets drive innovation



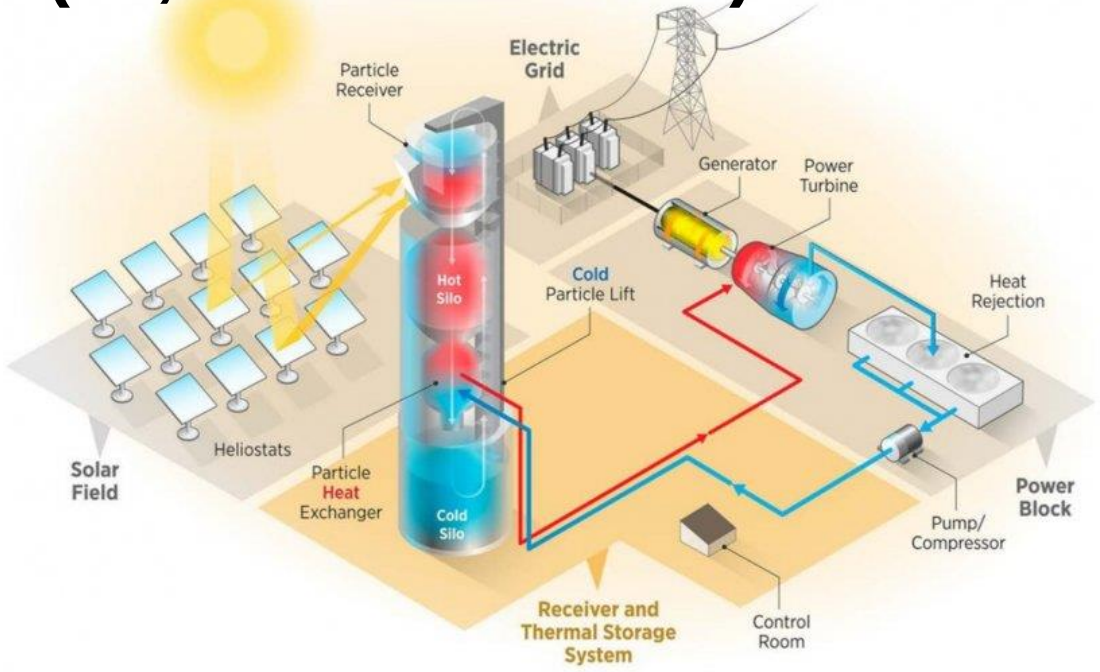
*Assumes a gross to net conversion factor of 0.9

Innovation is needed at all levels



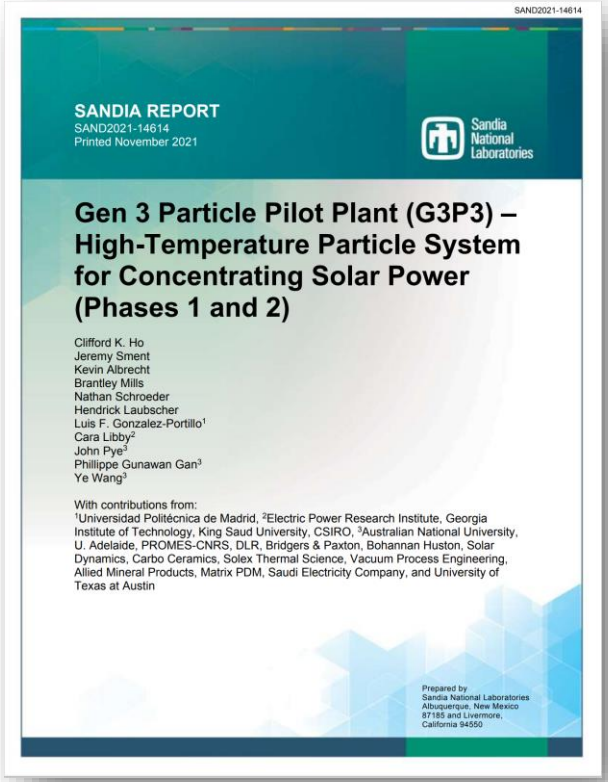
Improvements are needed in Gen3 CSP technologies

>700°C
(>1,290° Fahrenheit)



- Systems and component integration
- Component and materials development:
  - Receiver design
  - Heat exchangers
  - Thermal energy storage
  - Particle elevators and transport systems
  - sCO_2 power cycles
  - Measurement and metrology
  - Etc…

Check out this report for more Gen3 CSP info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SANDIA REPORT
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Printed November 2021

Sandia National Laboratories

Gen 3 Particle Pilot Plant (G3P3) – High-Temperature Particle System for Concentrating Solar Power (Phases 1 and 2)

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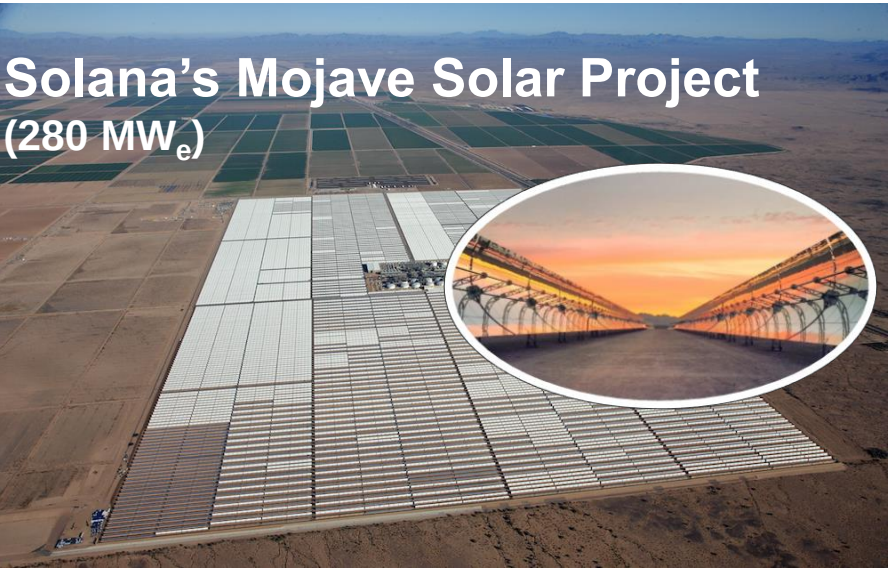
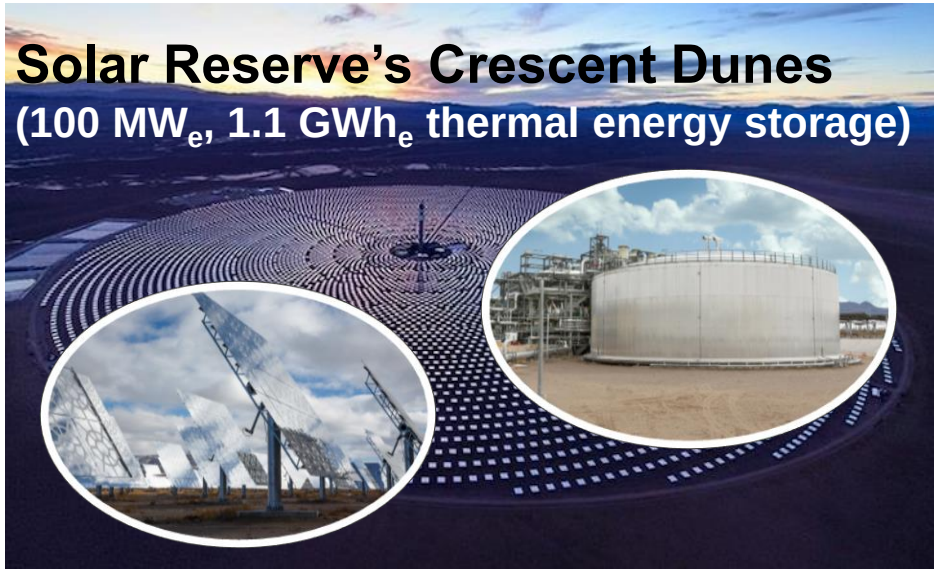
https://www.osti.gov/servlets/purl/1832285

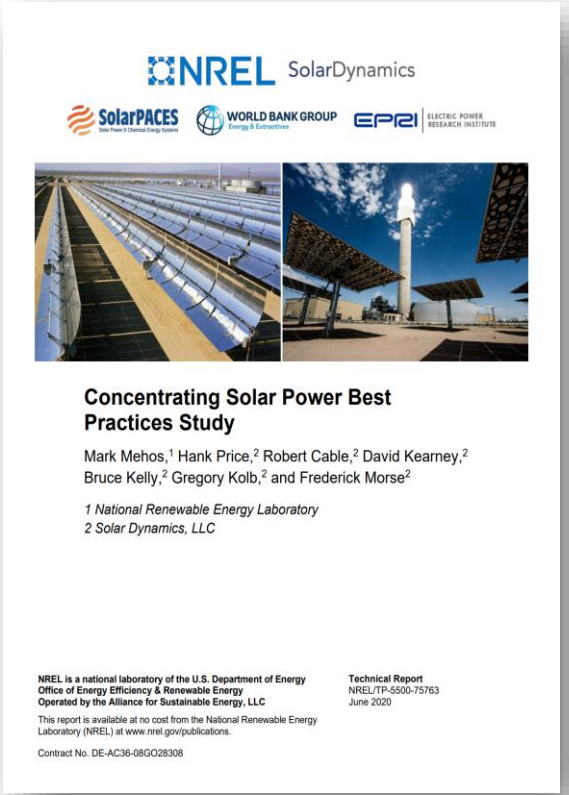
Improvements are needed in commercial (Gen2) CSP technologies





- Development of improved components that have historically suffered from reliability issues (e.g., molten salt tanks, flex hose couplings in parabolic trough systems)
- Operations & maintenance improvements and cost reductions
- Cheaper installation
- Improvements in the heliostat field (e.g., control and automation, manufacturing)

Check out this report for more Gen2 CSP info


NREL SolarDynamics

SolarPACES · WORLD BANK GROUP Energy & Extractives · EPRI ELECTRIC POWER RESEARCH INSTITUTE

Concentrating Solar Power Best Practices Study

Mark Mehos,[1] Hank Price,[2] Robert Cable,[2] David Kearney,[2] Bruce Kelly,[2] Gregory Kolb,[2] and Frederick Morse[2]

1 National Renewable Energy Laboratory
2 Solar Dynamics, LLC

NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC

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Technical Report
NREL/TP-5500-75763
June 2020

https://www.nrel.gov/docs/fy20osti/75763.pdf

Innovation is needed in CST for industrial process heat

Low temperature (≲400°C)

Oil recovery

Desalination

High temperature (≳400°C)

Cement

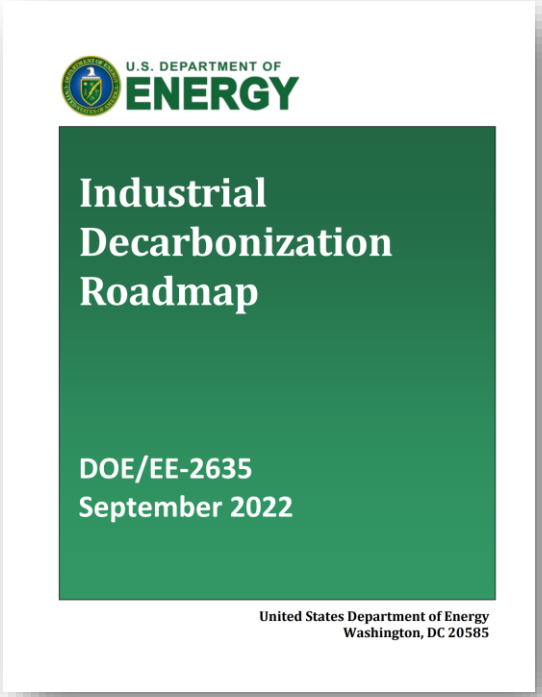
Integrating CST with many unique processes is challenging

Food & beverage

Pulp & paper

Chemicals

Check out this report for more industrial process heat info



https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf

SUBTOPIC 11g

Open to SBIR and STTR

Affordability, Reliability, Performance, and Manufacturing of Solar Systems

Subtopic Areas of Interest

Solar research and technology development within the SETO mission and goals. Specific **areas of interest** include, but are not limited to:

- **Reduction of manufacturing costs** of solar energy system components or subcomponents to boost domestic manufacturing;
- Measuring, validating, and increasing **outdoor PV system reliability**;
- Improving **operation and maintenance of PV systems**;
- Enhancing the ability of solar energy systems to contribute to **grid reliability, resiliency, and physical and cyber security**;
- Reduction of the **balance-of-system costs** of a PV system;
- Reduction of soft costs associated with the installation and operation of PV systems;
- Improving the overall **recyclability and refurbishment** of PV modules and/or other hardware or balance-of-system components of a solar system;
- **Building on other SETO programs** and/or leverage results and infrastructure developed through these programs.

Subtopic Areas NOT of Interest

Applications will be considered nonresponsive and declined without external merit review if they:

- Focus exclusively on HVAC or water heating applications;
- Propose products or projects for satellite or other space applications;
- Proposed products or applications of indoor or wearable PV;
- Propose development of concentrated PV or solar spectrum splitting technologies;
- Propose development of technologies with very low possibility of being manufactured domestically at a competitive cost (e.g., PV modules based on copper zinc tin sulfide (CZTS) or amorphous silicon thin films; technologies assuming incorporation of functional materials, such as quantum dots or luminescent solar concentrators);
- Propose technologies to improve the shade tolerance of PV modules;
- Include on business plans or proofs of concept that do not contain documentation supporting their necessity or benefit. Competitive approaches in this application segment should be clearly defined in the application;
- Focus on undifferentiated products, incremental advances, or duplicative products;

Subtopic Areas NOT of Interest

Applications will be considered nonresponsive and declined without external merit review if they:

- Involve technologies that are within the scope of any other of the subtopics listed under the Solar Energy Technologies topics. Such applications should be submitted to the appropriate topic and subtopic and would be considered nonresponsive for this subtopic.
- Involve technologies that fall under areas not of interest or under the non-responsiveness descriptions of all other subtopics of the Solar Energy Technologies topics. Such areas are not of interest for this topic overall.
- Focus primarily on the development of software solutions.
- Involve technologies that do not have a clear, direct, and immediate relevance and impact to the solar industry and do not have an immediate solar application or product as their end goal;
- Propose projects lacking substantial impact from federal funds. This subtopic intends to support projects where federal funds will provide a clear and measurable impact (e.g., retiring risk sufficiently for follow-on investment or catalyzing development). Projects that have sufficient monies and resources to be executed regardless of federal funds are not of interest;
- Propose development of ideas or technologies that have already received federal support for the same technology at the same technology readiness level.

Topic C60-12

Open **only to STTR** applications

Maximum Phase I Award Amount: $200,000	**Maximum Phase II Award Amount:** $1,100,000
Accepting SBIR Phase I Applications: NO	**Accepting STTR Phase I Applications:** YES
Accepting SBIR Fast-Track Applications: NO	**Accepting STTR Fast-Track Applications:** NO

a. Innovative Software Technologies and Products for Solar Energy Systems

Subtopic Areas of Interest

Solar research and technology development within the SETO mission and goals. Specific **areas of interest** include, but are not limited to:

- Software products that directly or indirectly **reduce costs, optimize performance, or provide a novel service** or functionality at any point within the life cycle of a solar system;
- Innovative **grid modeling and simulation software** incorporating novelties for the integration of inverter-based solar resources;
- Innovative **grid monitoring, operation, and control algorithms and software** incorporating novelties for the integration of inverter-based solar resources;
- Innovative software for **distributed energy resource management systems** (DERMS) or **advanced distribution management systems** (ADMS) that allows for improved coordination of renewable distributed energy resources and enhanced management of distribution grids in the presence of variable energy resources;
- Software facilitating the development and operation of **virtual power plants** (VPPs);
- High-level **control software for coordinating and optimizing the operation of solar plants** and fleets of solar plants.

Subtopic Areas NOT of Interest

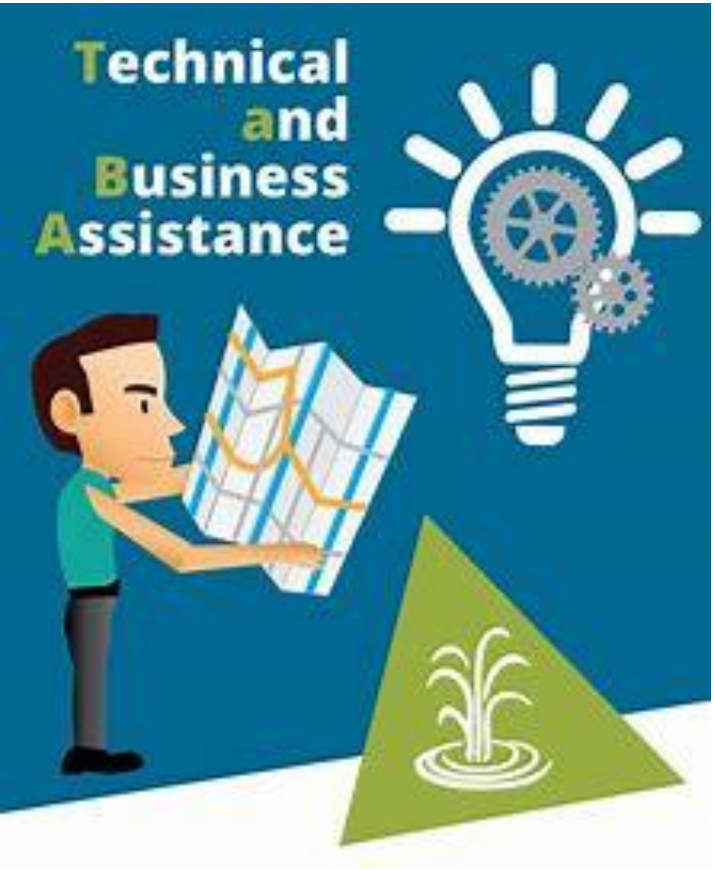
Applications will be considered nonresponsive and declined without external merit review if they:

- Revolve around software products comparable to what are already publicly available from government sources or government-funded research institutions without demonstrating significant objective improvements;
- Involve duplicative software solutions with many existing competitors in the market, such as software for:
  - Tracking solar system performance or data collection;
  - Facilitating solar system design or general solar system monitoring;
  - Designing transmission and distribution power grids with no special considerations for integration of inverter-based resources;
  - Improving customer and/or business acquisition processes;
  - Providing finance, tax, or monetary benefits; or
  - Listing, presenting, sorting, or otherwise organizing physical locations, websites, databases, or other collections of solar industrial data without meaningful, state-of-the-art processing.
- Focus on device-level control software for the low-level operation of inverters or other power electronics devices, which would typically be part of the operating firmware of such a device.

What we will cover in this webinar

- Who we are (Solar Energy Technologies Office)
- SETO technology-to-market programs
- SETO subtopics
- Technical and business assistance program & the American-Made Network
- Application guidelines

Technical And Business Assistance (TABA) Program



Additional funding for commercialization activities **in addition** (again, for emphasis!) to your R&D award funding

Up to **$6,500 in Phase I:**
total award amount = $200,000 + $6,500 = $206,500

Up to **$50,000 in Phase II:**
total award amount = $1,100,000 + $50,000 = $1,150,000

two execution options

Phase I only

Work with a vendor provided by DOE -> No need to do anything at this point

Phases I & II

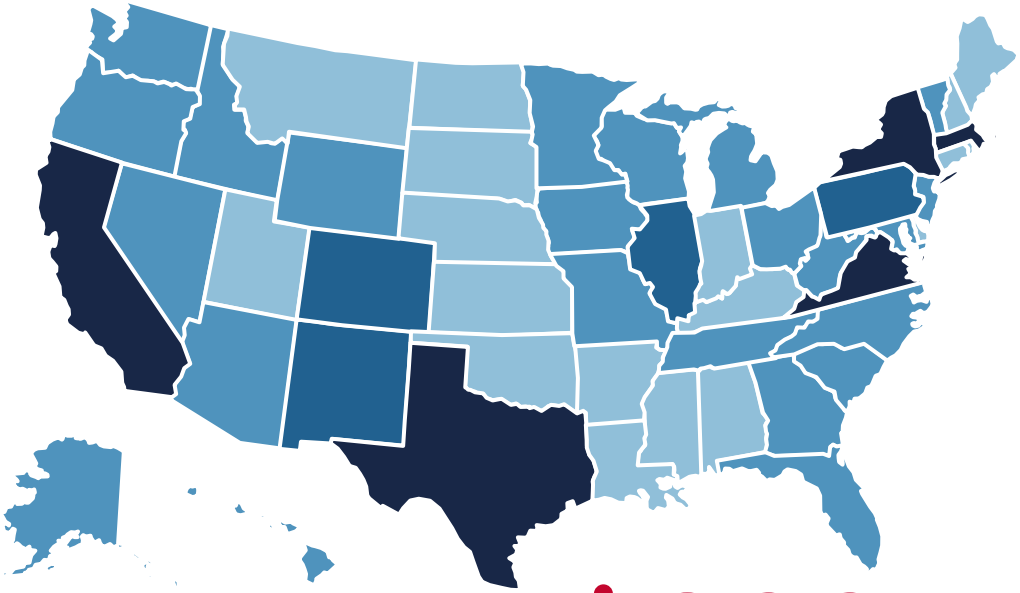
Select your preferred vendor -> Include it in your Application!!

TABA commercialization services include:

- Product Sales
- IP Protections
- Market Research
- Certification & Regulatory Plans
- Market Validation
- Manufacturing Plans

For more information, take a look here

American-Made NETWORK



None 1-5 6-10 10+

200+

NETWORK MEMBERS

Network members **fuel** America's Innovation Engine, propelling innovators into a successful cleantech future. These members of the public and private sectors are committed to **reenergizing** American energy innovation. Each one is actively seeking to provide mentoring, tools, resources, and support to accelerate ideas into real-world solutions for environmental justice and economic renewal.

AMN@nrel.gov

https://network.americanmadechallenges.org/

Application Education Services

https://www.adlventures.com

https://www.yet2.com

https://www.uaci.com

Resources:

- Application Education
- Webinars
- Workshops
- Office hours

Specific details and contact information can be found on the SETO SBIR/STTR webpage: https://www.energy.gov/eere/solar/notice-funding-opportunity-sbirsttr-fy-2025-phase-i-release-2

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- Application guidelines

Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR)

The SBIR/STTR programs encourage U.S.-based small businesses to engage in **high-risk, innovative research and technology development** with the **potential for future commercialization**.

The solar office funds businesses working to **advance the affordability, reliability, and performance of solar technologies** on the grid. Solar topics may include photovoltaics, grid integration, solar plus energy storage, and community solar, among others.

SMALL BUSINESS INNOVATION RESEARCH

- Use **small business** to meet federal research and development needs
- Increase **private-sector commercialization** of innovations derived from federal research and development
- **Principal investigator must be employed by the small business**
- Majority of the research and development tasks to be **conducted by the small business**

SMALL BUSINESS TECHNOLOGY TRANSFER

- Cooperative research and development carried out **between small business and nonprofit research institution**
- Foster **technology transfer** between research institutions and small business
- **Principal investigator may be employed by the small business OR research institution**
- A minimum of **30% of the research and development tasks to be conducted by the research institution**

Manufacturing and Competitiveness Project Approach

Promote activities that amplify the impact of R&D projects and enable technology transformations from prototypes to real-world, viable solutions.

Research & Development

Market relevant and self-sustaining technology

Plan	Validate	Engage
T2M road-mapping	Competition	Diversity
IP strategy	Standards	Partnerships
Product-market fit	Analysis	Follow-on funding
Path to scale	External feedback	Customer discovery

Application guidelines

- Phase I awards will be in the form of a **grant**.

- Applicants are strongly encouraged to include a table containing a **summary of objectives** they expect to achieve by the end of the Phase I period of performance. Each application should include **technical**, **business**, and **stakeholder engagement**-related objectives with clear, quantifiable, measurable, verifiable, aggressive yet realistic success metrics, and clear definitions of how completion of an objective will be assessed. Completion of a task or activity should not be considered an objective. The table should be organized chronologically.

- SETO expects applicants to plan their project execution using **SMART** (Specific, Measurable, Achievable, Relevant, and Time-Bound) **milestones** and goals.

- SETO expects to issue Phase II awards as **Cooperative Agreements**. In a cooperative agreement, DOE maintains substantial involvement in the definition of the scope, goals, and objectives of the project. A similar table will be required in a Phase II application. DOE has the **possibility to negotiate project milestones** with entities selected for a Phase II award.

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

https://energy.gov/solar-office/sbir
https://www.energy.gov/eere/solar/notice-funding-opportunity-sbirsttr-fy-2025-phase-i-release-2

solar.sbir@ee.doe.gov


SBIR·STTR
America's Seed Fund
SUPPORTING
small business
SOLAR INNOVATIONS