

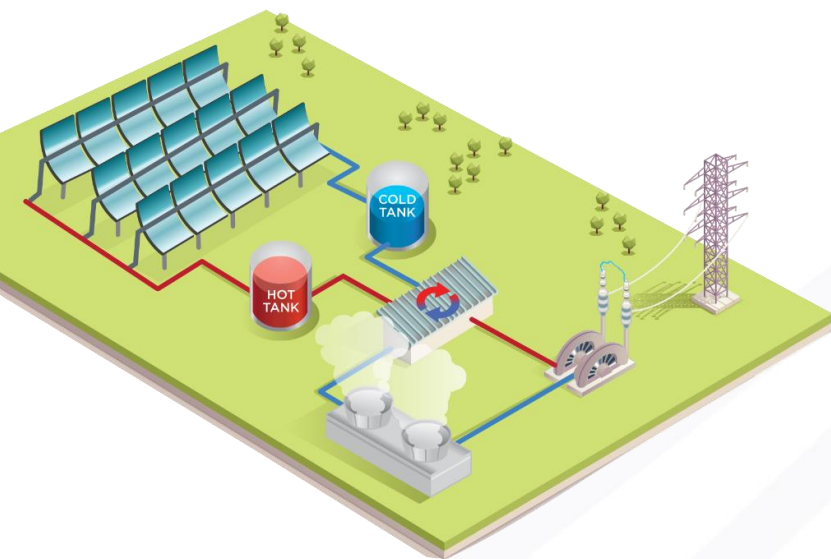


# Concentrating Solar-thermal Power and Energy Storage

Dr. Avi Shultz, Program Manager

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# CSP with Storage is Solar Energy On-Demand

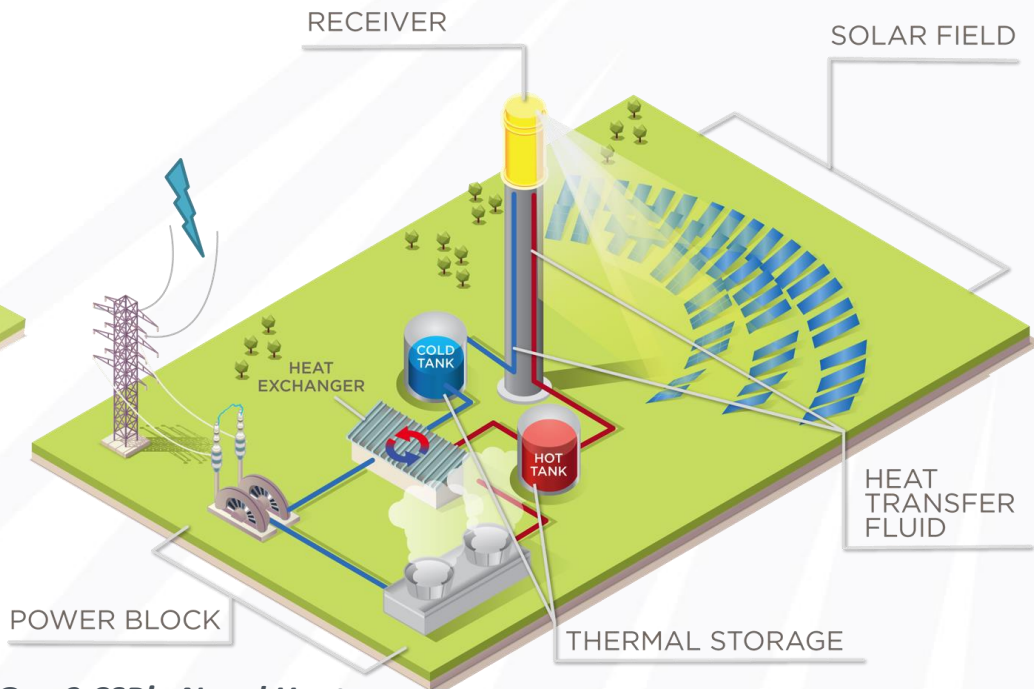


*Oil-Based  
Troughs with  
steam rankine  
cycle (~400 °C)*

[energy.gov/solar-office](http://energy.gov/solar-office)

*Molten Salt  
Towers with  
steam rankine  
cycle (~565 °C)*

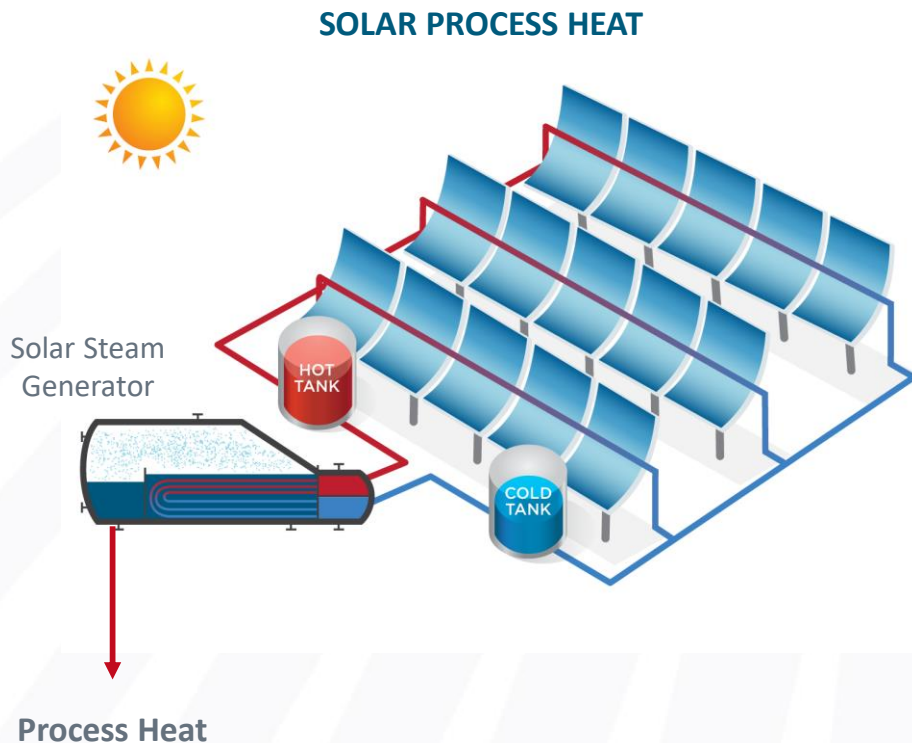
*'Gen 3 CSP': Novel Heat  
Transfer Media with  
advanced power cycle  
(>700 °C) @ 5¢/kWh*



# Concentrating Solar-Thermal Technology for Power and Heat-Based Applications

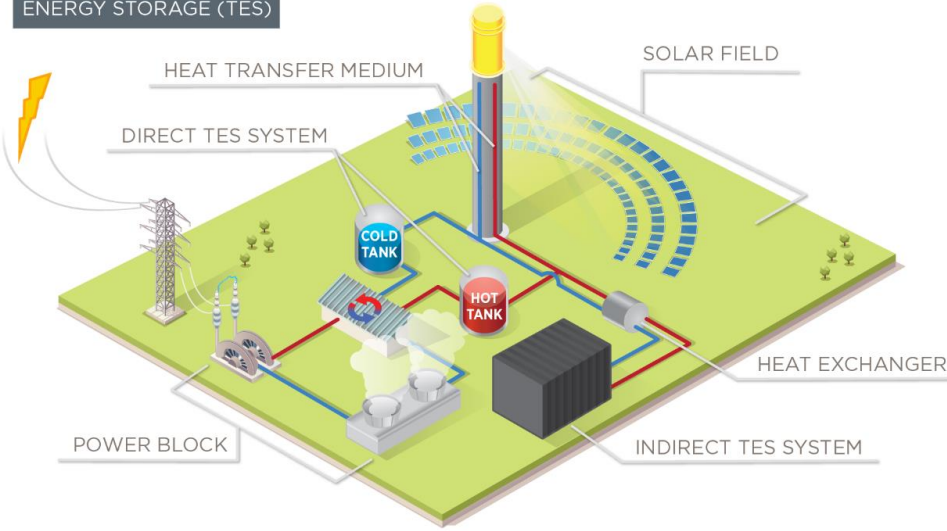
## Thermally-Driven Industrial Processes:

- Desalination
- Enhanced Oil Recovery
- Agriculture and Food Processing
- Fuel and Chemicals Production
- Mining and Metals Processing

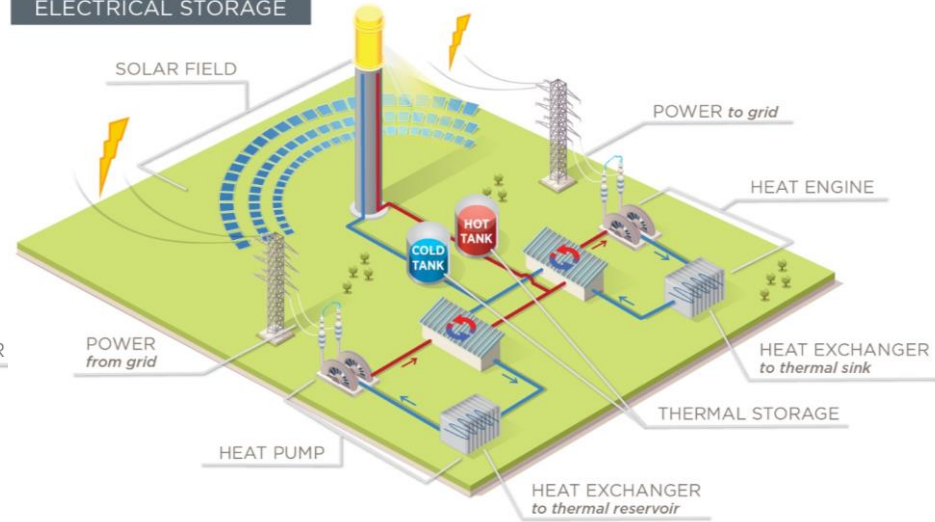


# 'Firm' Thermal Energy Storage

HYBRID THERMAL ENERGY STORAGE (TES)



CSP WITH PUMPED HEAT ELECTRICAL STORAGE



Existing power block at a CSP plant can be leveraged for high value 'indirect' TES:

- Long-duration thermochemical or (renewable) fuels
- 'Pumped heat electrical storage' for bi-directional grid value

# Notice of Intent to Issue 2020 SETO Funding Program

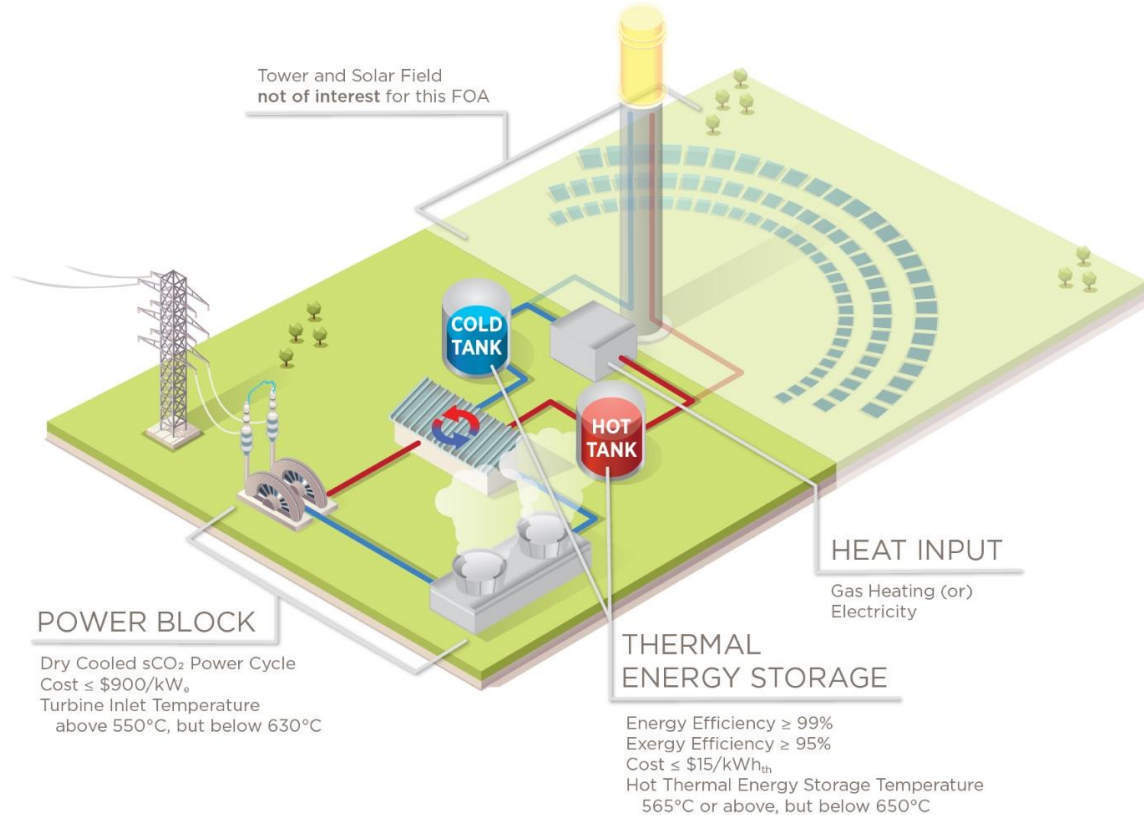
The Solar Energy Technologies Office (SETO) intends to release a [funding opportunity announcement](#) (FOA) to promote early-stage research and development of solar technologies that support use and integration of solar technologies onto the electric grid.

## Potential areas of interest:

- Photovoltaics Hardware Research
- Integrated Thermal Energy Storage and Brayton Cycle Equipment Demonstration (Integrated TESTBED)
- Solar Energy Evolution and Diffusion Studies 3 (SEEDS 3)
- Innovations in Manufacturing: Hardware Incubator
- Systems Integration: Resilient Community Microgrids, Addressing Cybersecurity Gaps, and Inverter-Based Hybrid Plants
- Solar and Agriculture: System Design, Value Frameworks, and Impacts Analysis
- Artificial Intelligence (AI) Applications in Solar Energy with Emphasis on Machine Learning
- Small Innovative Projects in Solar (SIPS): PV and CSP



# Integrated Thermal Energy Storage and Brayton Cycle Equipment Demonstration (Integrated TESTBED)



# SETO Newsletter – Stay in Touch

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The 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)

# Questions?

*Avi Shultz*

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