

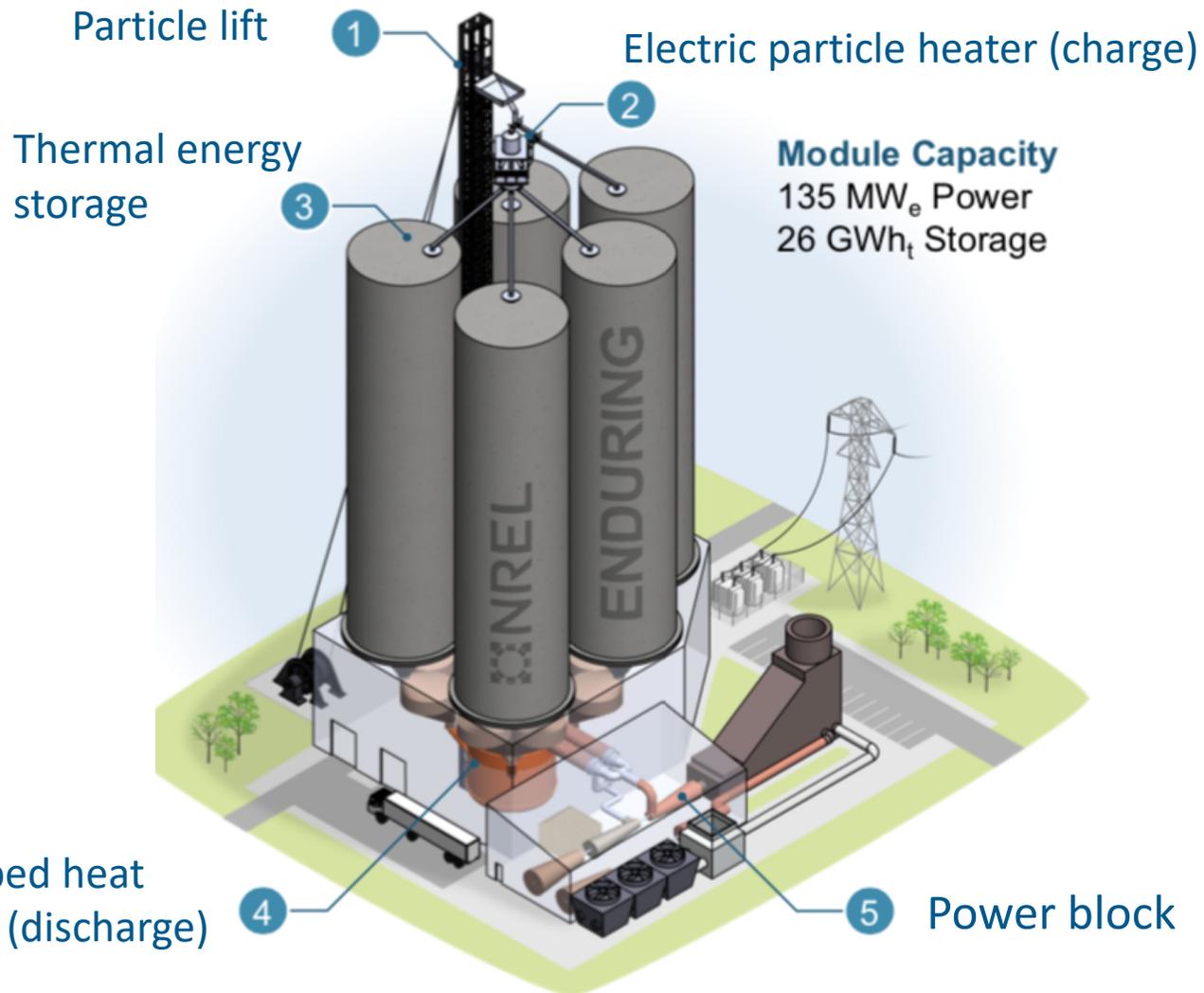


NATIONAL LABORATORY OF THE ROCKIES

NLR Industry Energy Technology and Tool Development

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National Laboratory of the Rockies
February 10, 2026

NLR Economic Long-Duration Electricity Storage by Using Low-Cost Thermal Energy Storage (ENDURING) Technology Update

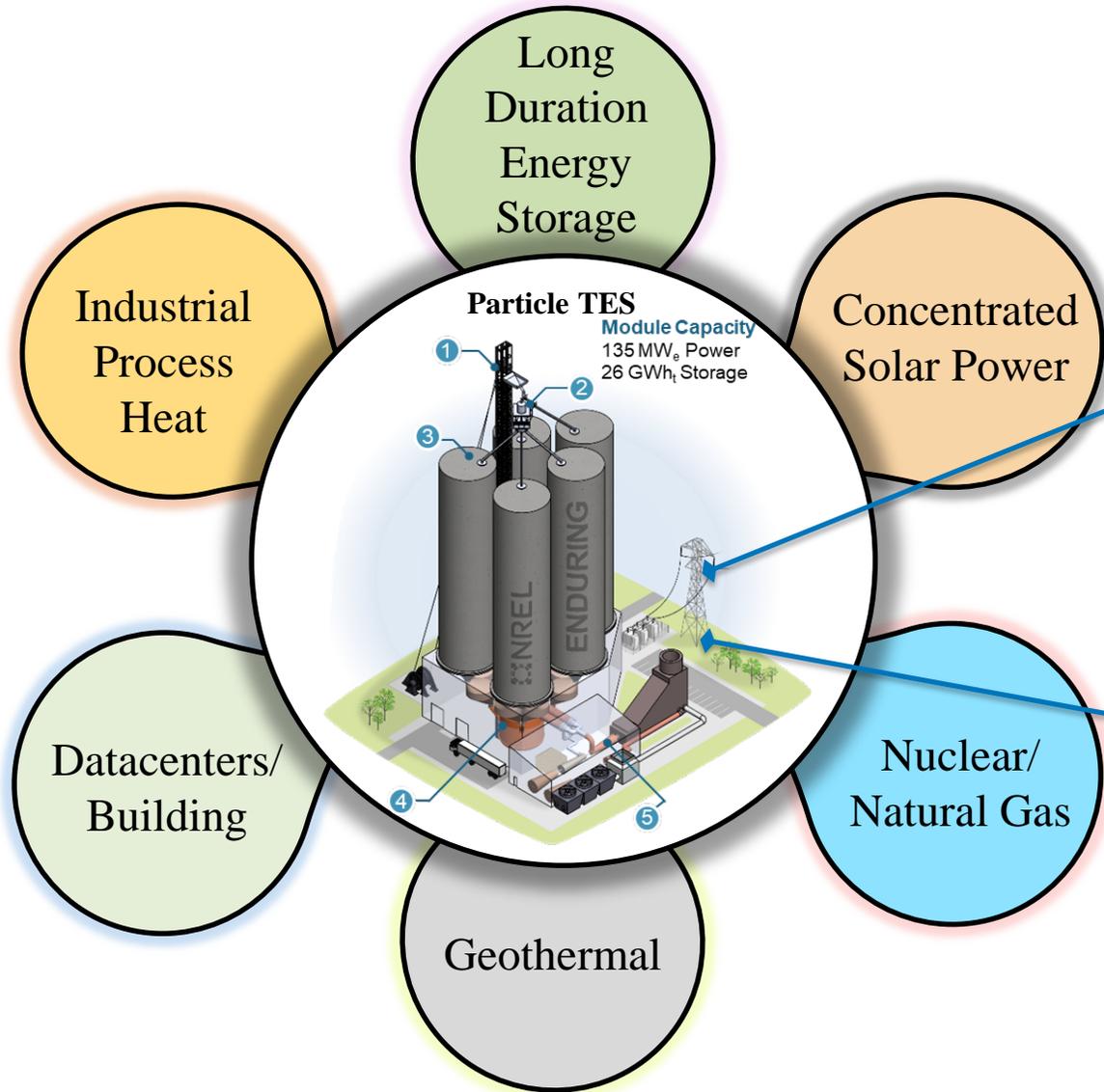


ENDURING System:

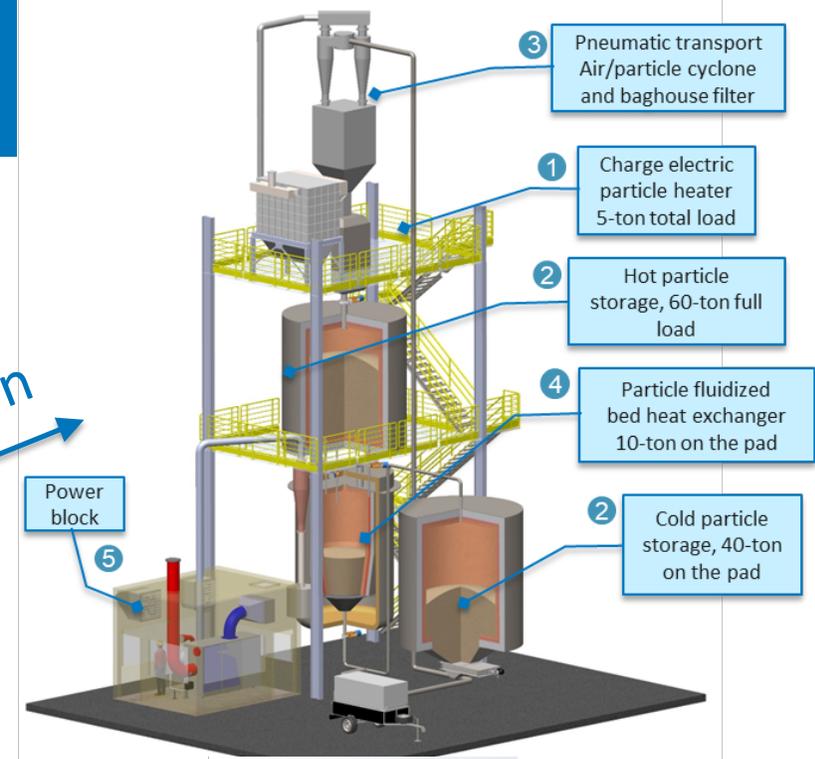
- Particle thermal energy storage for low-cost, large capacity long-duration energy storage.

ENDURING technology was developed for long duration energy storage (10-100 hours).

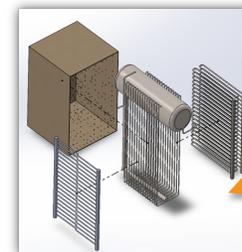
Electro-Thermal Energy Storage Use Cases



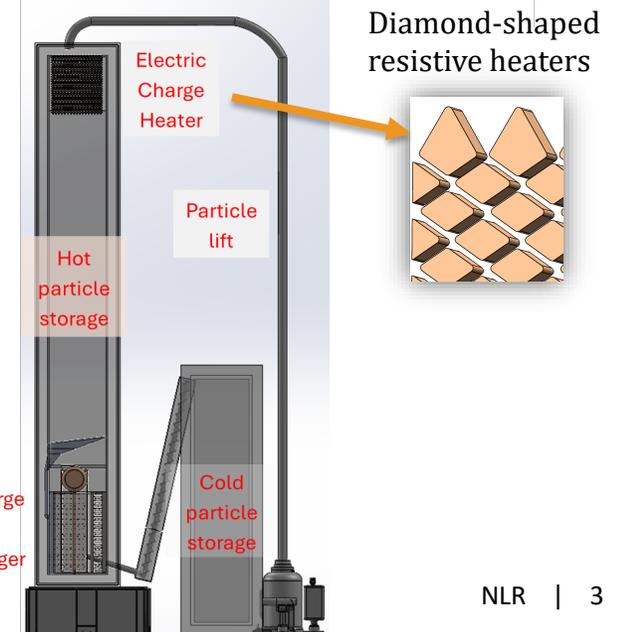
Continuing design of pilot test station



Package Pilot into a Modular TES System



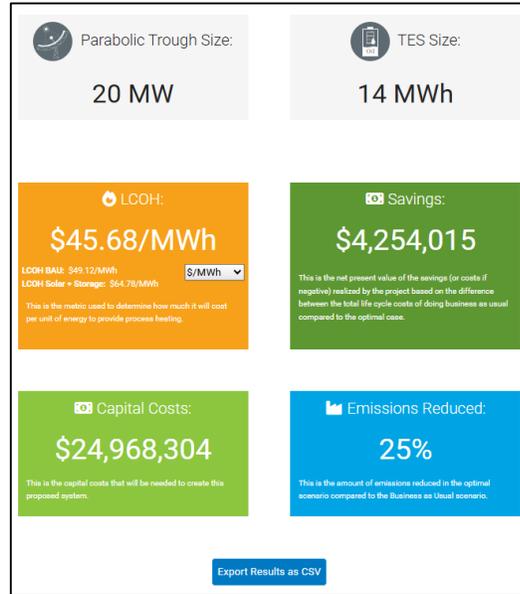
Discharge Heat Exchanger



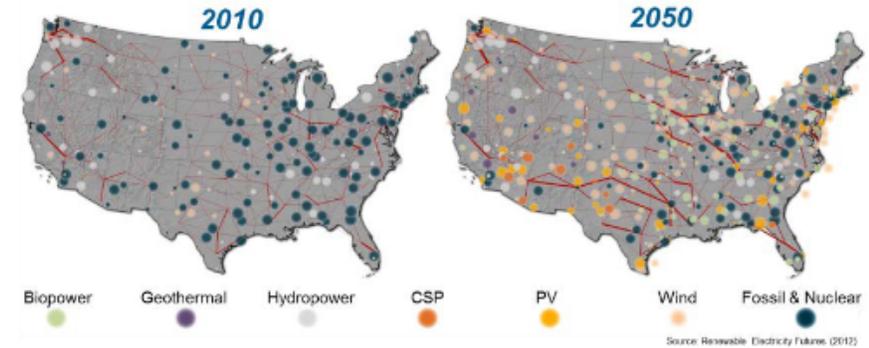
Grid and Industry Heat Modeling tools



STEP 1 builds upon existing expertise in solar thermal system performance modeling in SAM and TEA +Optimization in REopt



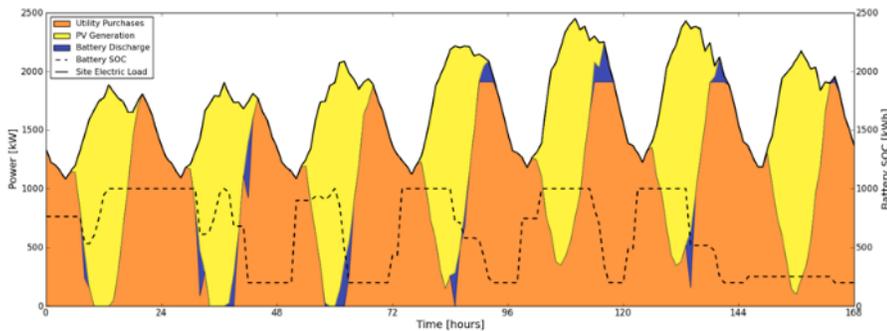
ReEDS: models grid capacity expansion for new loads (e.g. data centers) and generator retirements



<https://docs.nrel.gov/docs/fy24osti/89903.pdf>



REopt : Optimizes technology mix, sizing, and operation of distributed energy/storage

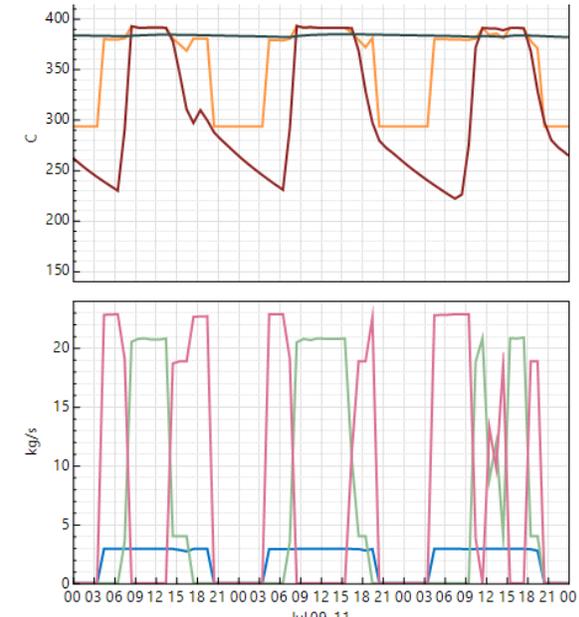


<https://docs.nrel.gov/docs/fy14osti/62320.pdf>



SAM: First-principles time-series performance modeling of renewable energy and storage technologies. Evaluate non-linear off-design performance with high level dimensional inputs

- Solar thermal, ETES, PTES



STEP1 Program for Industry Heat Technoeconomic Analysis

Site

Legend

- Roof Polygon
- Ground Polygon
- Location Marker
- Heat Input Marker



8380 Pedrick Road, Dixoi

Map Satellite

Land Unit Price \$/acre

Emissions Reduction Goal 25%

Utilities

Energy and Demand Rates from URDB Upload Electricity Energy and Demand Rates CSV

Pull Fuel Costs from EIA Upload Fuel Costs CSV



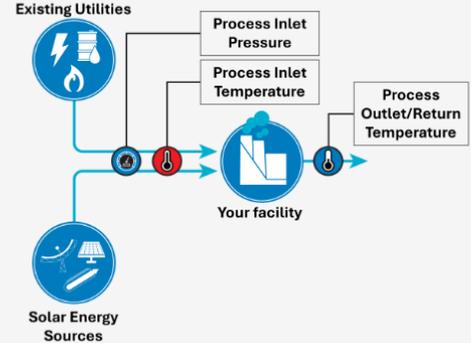
Process Fluid Media

Process Inlet Temperature F

Process Outlet Temperature F

Existing Fuel Type

Preferred Technologies



Thermal Load Profile Builder

Fuel Bill Fuel Consumption Energy Demand State Points Custom Load Profile

Maximum Thermal Demand MWt

Shift Schedule

The National LDES Consortium

The National Consortium for the Advancement of LDES Technologies

130+ Teaming Partners



Period of Performance:

10/2023 - 9/2026

200+ partners

13 Tiger Teams

6 National Labs:

Sandia, ANL, INL, NREL, ORNL, PNNL



<https://ldesconsortium.sandia.gov/>

Thank You!

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