Thermal Energy Grid Storage (TEGS): Electricity → Heat → Electricity

Liquid Silicon Hot Tank
~2400°C

Multi-junction Photovoltaic (MPV) Heat Engine

Liquid Silicon Pump

Liquid Silicon "Cold" Tank
>1400°C

Presenter: Caleb Amy

PI: Asegun Henry
GWh Concept

Graphite Radiative Heater

Storage Tank

MPV System

Graphite Tank Made of Bolted Sections

Liquid Silicon Pump
Cost of TEGS

**Cost Per Energy**

Size: 1GWh-e

- Si medium: $40
- Fe medium: $30

**Cost Per Power**

Size: 100MW-e

- III-V MPV: $0.40
- MOVPE: $0.30

**Cost Components**

- MPV Cells
- Inverter
- Graphite
- Heater
- Cooling for Base
- Tungsten Foil
- Construction
- Insulation
- Pumps and Piping

**Graphite Insulation**

- Medium Graphite Insulation
- Medium Tank Material
- Medium Alumina Insulation
- Medium Tank Base
- Medium Inert Containment

**Medium**

- Graphite Insulation
- Construction
- Fiberglass Insulation
- Cooling for Base

**Fe medium**

- Graphite Insulation
- Construction
- Fiberglass Insulation
- Cooling for Base
Challenges

Liquid Containment

Pumping

PV efficiency and Protection

Sweeping noble gas curtain prevents condensation