SOLAR ENERGY
TECHNOLOGIES OFFICE
U.S. Department Of Energy

Gen3 CSP Kickoff Overview

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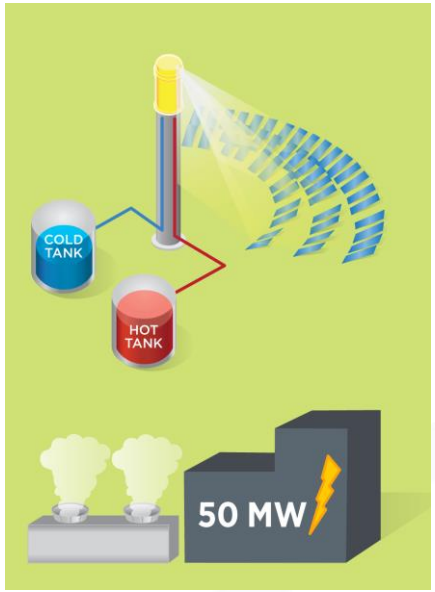
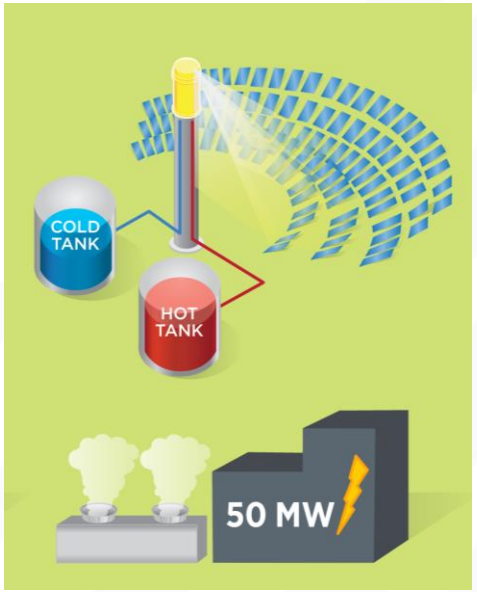
CSP: Flexible Designs for an Evolving Grid

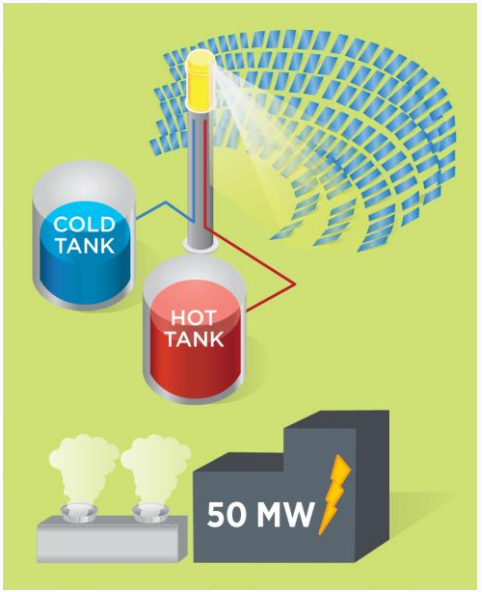
'Peaker'
(≤6 hours of storage)



'Intermediate'
(9 hours of storage)

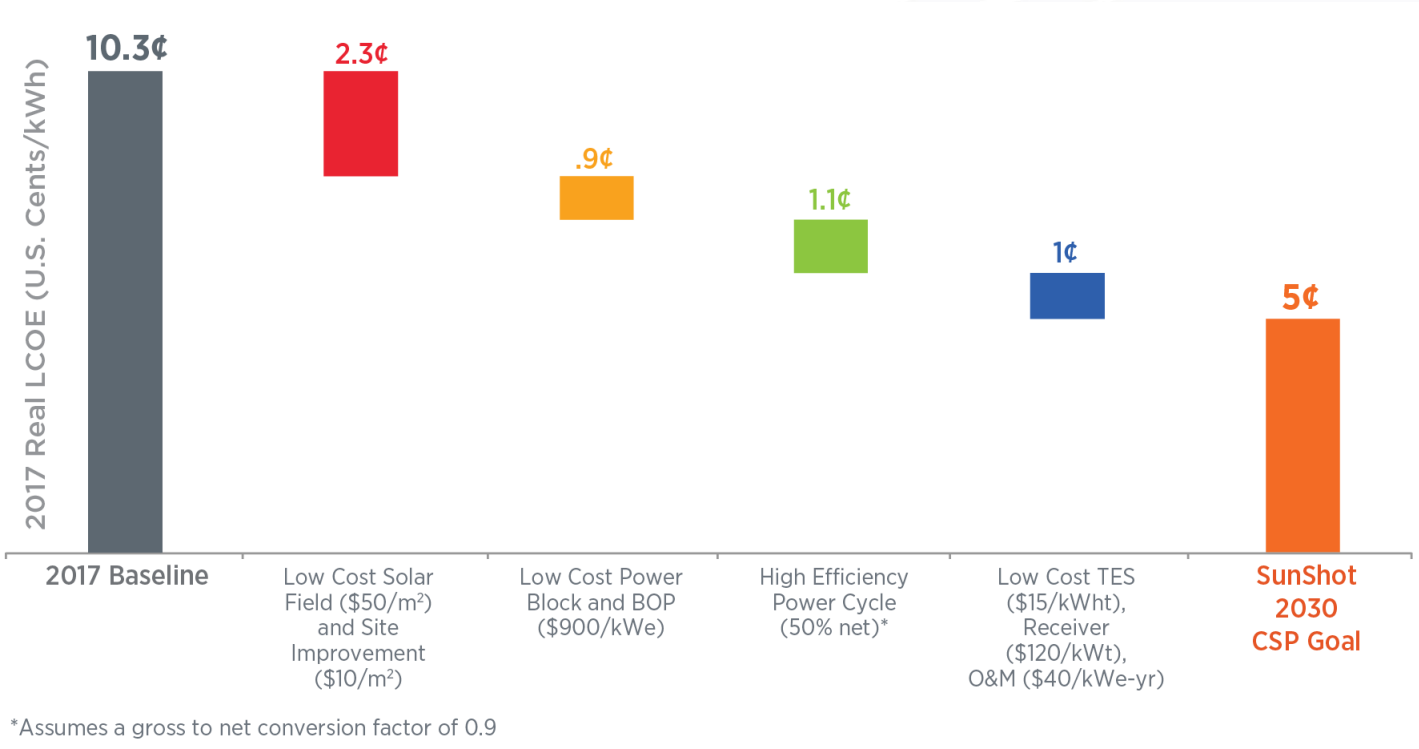


'Baseload'
(≥12 hours of storage)



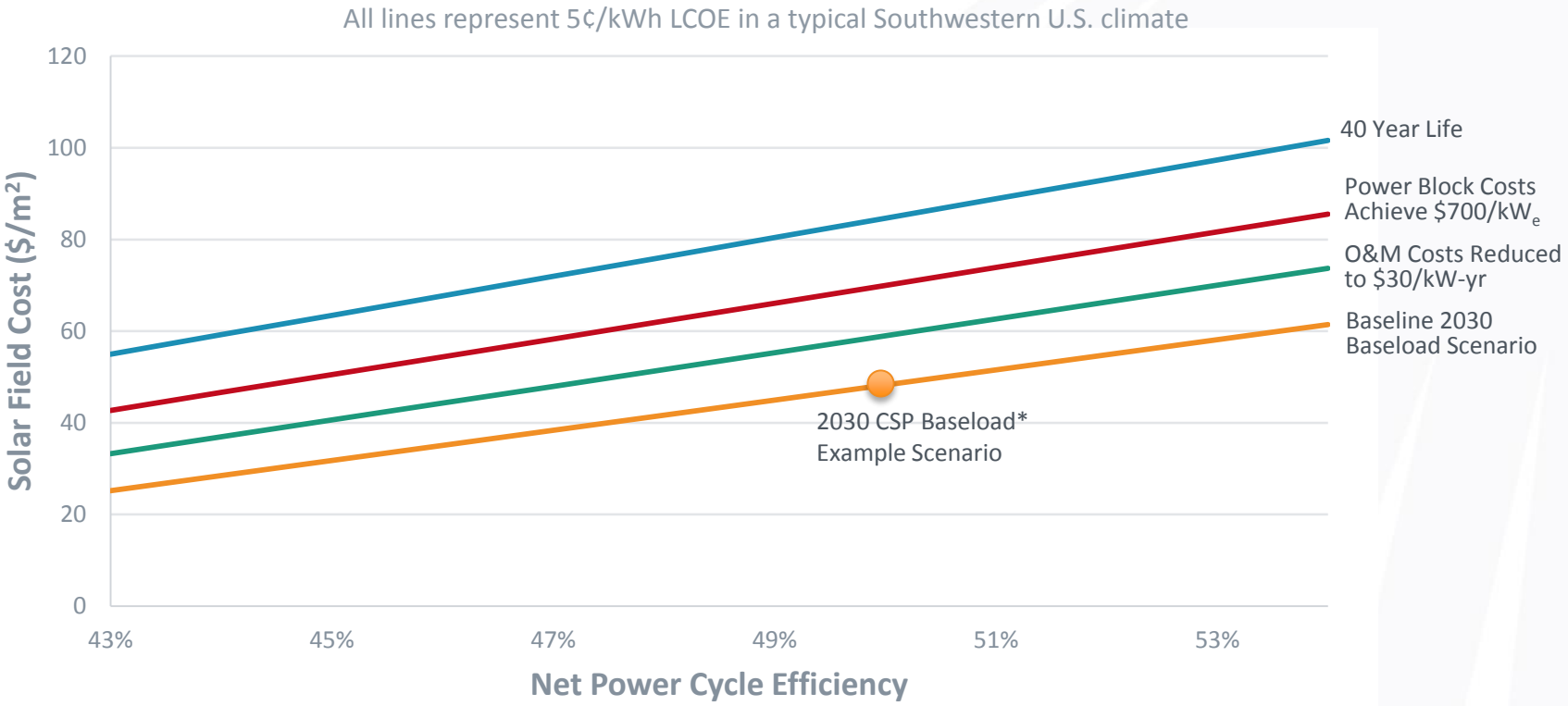
By choosing the size of the solar field and thermal energy storage, the same CSP technology can be configured to meet evolving demands of the future grid

A Pathway to 5 Cents per KWh for Baseload CSP



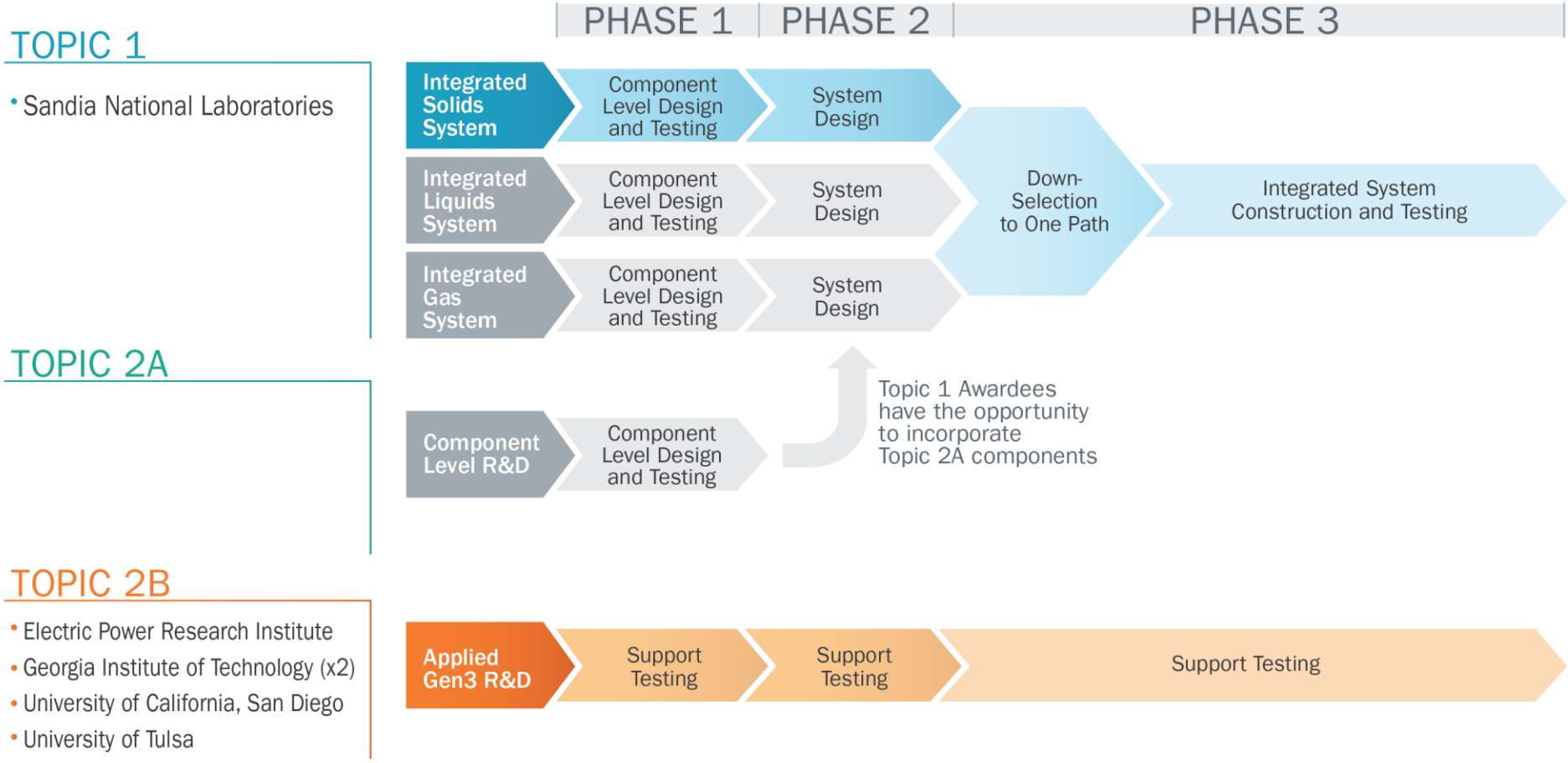
*Assumes a gross to net conversion factor of 0.9

Pathways to Achieving SunShot 2030 Goals



*Baseload power plant is defined as a CSP plant with greater than or equal to 12 hours of storage

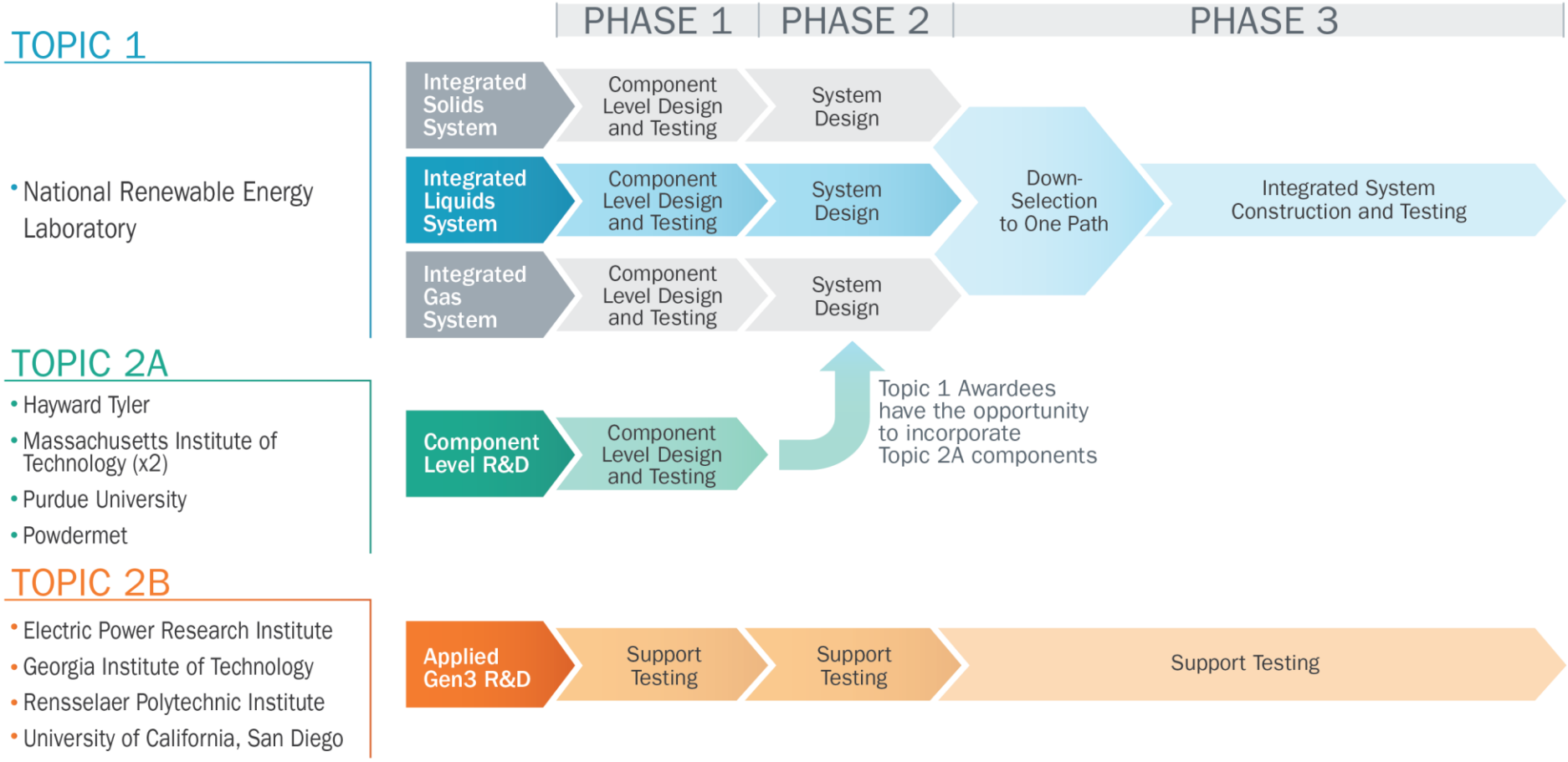
Gen3 Particle Pathway



Particle Pathway – Topic 2s and Lab Support

Awardee	PI	Project Title
Georgia Institute of Technology	Peter Loutzenhiser	Advanced Characterization of Particulate Flows for CSP Applications
U. of Tulsa	Todd Otanicar	GEN3D – Experimental and Numerical Development of GEN3 Durability Life Models
Sandia NL	Cliff Ho	Characterization and Mitigation of Radiative, Convective, and Particle Losses in High-Temperature Particle Receivers
Sandia NL	Kevin Albrecht	Quantifying thermophysical properties and durability of particles and materials for direct and indirect heat transfer mechanisms

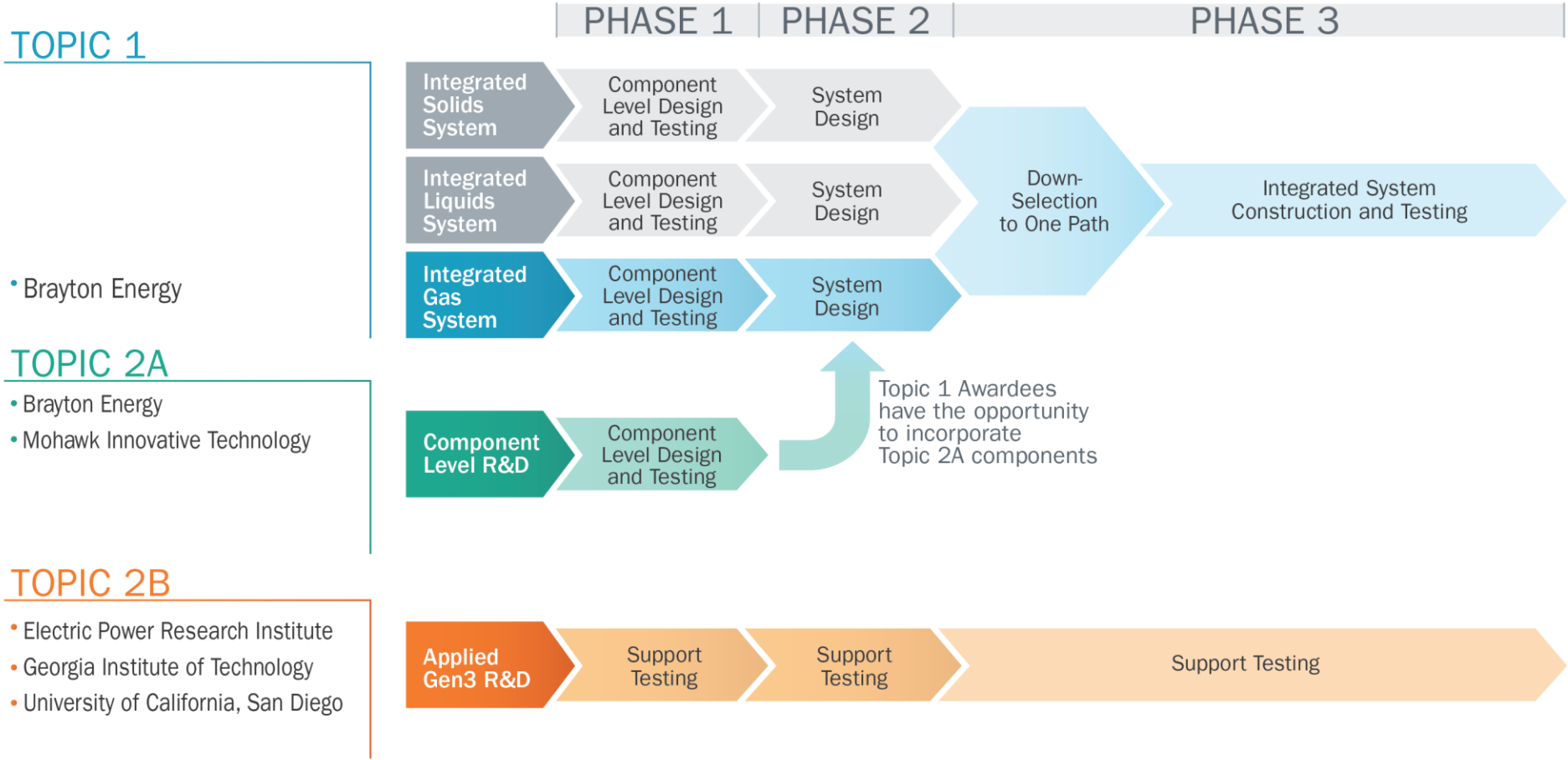
Gen3 Liquids Pathway



Liquids Pathway - Topic 2s and Lab Support

Awardee	PI	Project Title
Hayward Tyler	Benjamin Hardy	Development of High Temperature Molten Salt Pump Technology for Gen3
MIT	Asegun Henry	Ceramic Castable Cement Tanks and Piping for Molten Salt
MIT	Asegun Henry	High Temperature Pumps and Valves for Molten Salt
Purdue	Kenneth Sandhage	Robust High Temperature Heat Exchangers
Powdermet, Inc	Kurt Gilbert	High Toughness Cermets for Molten Salt Pumps
Rensselear Polytechnic Institute	Emily Liu	Development of In-Situ Corrosion Kinetics and Salt Property Measurements of salts and containment materials
Savannah River NL	Brenda Garcia-Diaz	Full Loop Thermodynamic Corrosion Inhibition and Sensing in Molten Chloride
NREL	Judith Vidal	Molten Chloride Thermophysical Properties, Chemical Optimization, and Purification
Oak Ridge NL	Kevin Robb	Enabling High-Temperature Molten Salt CSP through the Facility to Alleviate Salt Technology Risks (FASTR)
Oak Ridge NL	Bruce Pint	Progression to Compatibility Evaluations in Flowing Molten Salts
Oak Ridge NL	Sheng Dai	Comparison of Protecting Layer Performance for Corrosion Inhibition in Molten Chloride Salts through Interfacial Studies at the Molecular Scale

Gen3 Gas Pathway



Gas Pathway and Cross-cutting – Topic 2s and Lab Support

Awardee	PI	Project Title
Brayton Energy, LLC	James Nash	Development of Integrated Thermal Energy Storage Heat Exchangers for CSP Applications
Mohawk Innovative Technology, Inc	Hooshang Heshmat	Oil-Free, High Temperature Heat Transfer Fluid Circulator
Idaho NL	Michael McMurtrey	Creep-fatigue behavior and damage accumulation of a candidate structural material for a CSP thermal receiver
Georgia Institute of Technology	Shannon Yee	Thermophysical Property Measurements of Heat Transfer Media and Containment Materials
UC San Diego	Renkun Chen	Non-contact thermophysical characterization of solids and fluids for CSP
EPRI	John Shingledecker	Improving Economics of Gen3 CSP System Components Through Fabrication and Application of High Temperature Ni-Based Alloys
Sandia NL	Matthew Carlson	Design and Implementation of a 1-3 MWth sCO2 Support Loop for Maturation of Molten Salt, Particulate, and Gas phase Thermal Storage Primary Heat Exchangers