Workshop
Supercritical Carbon Dioxide Brayton Cycle Energy Conversion R&D
September 11, 2014

Approach to: Session II - **Objectives and Approaches to R&D Supporting the Development of Supercritical CO_2 Based Power Cycles**

Discuss DOE's Supercritical Carbon Dioxide Brayton Cycle Energy Conversion R&D to better define and execute the actions needed to support the wide-scale commercialization of power cycles based on supercritical CO_2 as the working fluid. This discussion will support the continued R&D and the President's FY 2015 Congressional Budget Request that includes $27.5 million for a pilot-scale demonstration facility. Specifically a straw-man approach to conducting the required R&D and demonstration projects will be presented in terms of the government's draft objectives. Discussing these objectives and potential options or approaches to these objectives will provide an opportunity for additional comment and discussion relative to the technical and engineering execution of the program. Stakeholder input will help to inform DOE's preliminary planning, pending authorization from Congress to launch a demonstration project.

Presented below are potential objectives and options or approaches derived from information gathered from the June 2014 Workshop (hosted by DOE EERE) and the DOE NE RFI (DE-SOL-0006998). The purpose of the workshop will be to further establish the objectives and discuses potential options and approaches to these objectives in terms of cost, technical feasibility and execution relative to the DOE applications for nuclear, concentrated solar and fossil energy power generation.

Table 1.0 Objectives and Options or Approaches to the Nominal Pilot Plant(s) (straw-man)

Objective	Option(s) or Approach
1) Size / Scale of Pilot Test Facility	
	1.1) Significantly less than 10 MWe
	1.2) Nominal 10 MWe facility
	1.3) Larger than 10 MWe facility
2) Design Test Temperatures (^oC)	
	2.1) High – 700, 760
	2.2) Low – 500, 550, 600
	2.3) High and Low
3) Heat Source	
	3.1) Dedicated natural gas fuel heat source
	3.2) Waste / exhaust heat source (Gas turbine and or others)
	3.3) Waste / exhaust heat source augmented for high temperature
4) Component Validation and Cycle Validation	
	4.1) Component testing
	4.2) Integrated cycle testing
	4.3) Dynamic modeling
	4.4) Trans critical point operation
	4.5) Heat rejection temperatures