This abstract will be presented during LNG2023 conference on 10-13 July in Vancouver, Canada among many other innovative projects, ideas and outlooks. LNG2023 will provide a unique platform for the global LNG industry and key stakeholders to discuss, debate, and showcase the latest industry developments and opportunities.

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UTILIZATION OF LNG REGASIFICATION COLD ENERGY IN CO2 POWER CYCLES

Cold energy from LNG regasification can increase the output of transcritical CO2 (tCO2) power cycles. One embodiment is a combined cycle plant located on a floating storage and regasification unit (FSRU). Here the exhaust gas from a gas turbine (GT) serves as the heat source to a tCO2 bottoming cycle, while the cold regasification energy is used as coolant. This GT-tCO2 combined cycle plant is a compact configuration that enables significantly higher efficiencies than conventional plants by leveraging the unique thermodynamic properties of CO2. Specifically, the cold energy serves as a sink to condense the CO2 at low temperatures, allowing more power to be generated from a given heat source. The development and demonstration of CO2 power cycles has gained attention recently as a process for turning heat into power. Benefits include higher efficiencies, more compact turbomachinery, smaller plant footprints, ability to recover cold energy below 0°C, working fluid global warming potential of 1, and non-flammability/toxicity. The technical development of CO2 power cycles has advanced recently and is being demonstrated at the 10 MWe supercritical CO2 STEP Demo pilot plant in San Antonio, TX which GTI Energy is leading with prime funding from U.S. DOE and many project partners. This paper discusses the benefits of a GT-tCO2 cycle co-located with LNG regasification, and the development status of key tCO2 components, many of which will be demonstrated at the STEP Demo plant.