

# Project Title: **Hydrogen Storage for Load-Following and Clean Power: Duct-firing of Hydrogen to Improve the Capacity Factor of NGCC**

• **Award Number: DE-FE0032008**



**Prime Recipient: GTI**



**PI: Jeff Mays**



**Sub-Recipients: Southern Company, EPRI**  
**Cost-Share Partners: PG&E, LCRI**



**Location: Des Plaines, IL**

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**DOE: \$199,931**

**Non-DOE: \$92,064**

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**Total: \$291,995 (31.5% COST SHARE)**

## Objectives

- Advance H<sub>2</sub> energy storage solutions for addressing VRE impacts on fossil-fueled assets
- Use low-cost electricity to generate hydrogen from fossil energy and store for utilization during peak demands in duct-burning application

## Relevance and Outcomes/Impact

- Improves capacity factor for existing fossil assets by providing low-cost energy storage with low-carbon hydrogen from fossil fuels
- Project will demonstrate
  - Economical, low-carbon H<sub>2</sub> production from natural gas
  - Capability of the system to store H<sub>2</sub> and utilize in response to VRE impacts
  - Also assess excess renewable energy utilization in H<sub>2</sub> production without electrolyzers



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- 1) H<sub>2</sub> Duct-firing of an NGCC via Blue Hydrogen and >150 MWh H<sub>2</sub> in above ground storage
  - a) Existing NGCC with duct-firing capability
  - b) GTI Compact Hydrogen Generator (CHG), 11-22 MW<sub>th</sub> (3-6 MMSCFD of H<sub>2</sub>)
  - c) 2.0M SCF usable H<sub>2</sub> above ground storage
  - d) Electric Boiler
- 2) Target storage duration is 24+ hr for this proof of concept
- 3) Gaps/Challenges
  - 1) CHG – Scaleup is biggest gap
  - 2) Dual fuel capable duct burners
- 4) Use existing technology, but provides greater operational data



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What is needed to be able to pilot **a demo plant by 2025?**

**Create funding opportunity ahead of Phase II completion of this project for the detailed FEED and implementation to complete the demo plant including 1-year operation by 2025**

What does NETL need to consider in regard to a **low-carbon future?**

**Recommend NETL evaluate VRE-augmented, fossil-based hydrogen with existing fossil assets**



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