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AIR BRAYTON

COMPLETE GAS TURBINE DECARBONIZATION THROUGH TES

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GE Vernova's Gas Power business engineers advanced, efficient natural gas-powered technologies and services, along with decarbonization solutions that air to help electrify a lower carbon future.

GE Vernova's Advanced Research business is a hub for innovation where research and development meets strategy creation, partnership building, and engineering genius. We're accelerating a new era of available, affordable, and sustainable energy and ambitiously tackling decarbonization, renewables, and electrification with the pioneering spirit to enable a zero-carbon future.

This presentation relates to an exploratory project at GE Vernova Advanced Research with estimated projections and does not represent a product offering

TES Integration with Gas Turbine Overview

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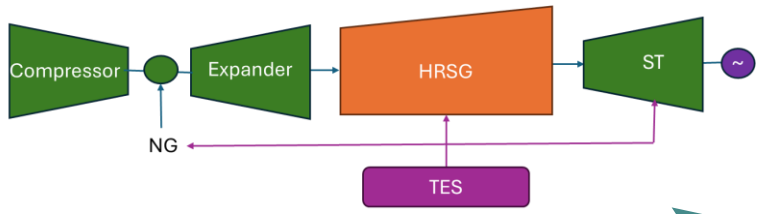
(Low pressure – lower risk implementations)

(High Pressure – higher risk implementation)

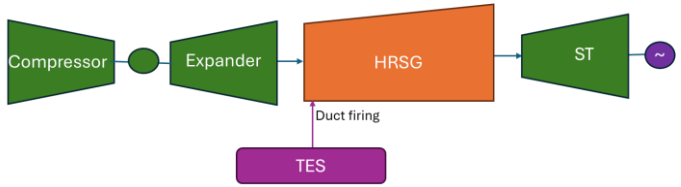
Bottoming cycle warming/Fuel heating

- Use TES steam output and connect into existing piping



TRL 5+

TRL 5+



TES replacing duct firing

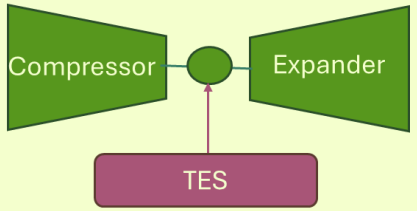
- Replace combustion air with TES hot air

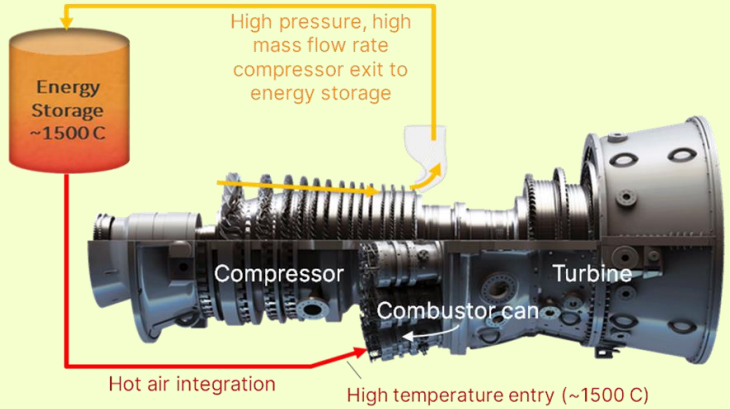
Current Presentation Content

TRL3

TES to replace combustion

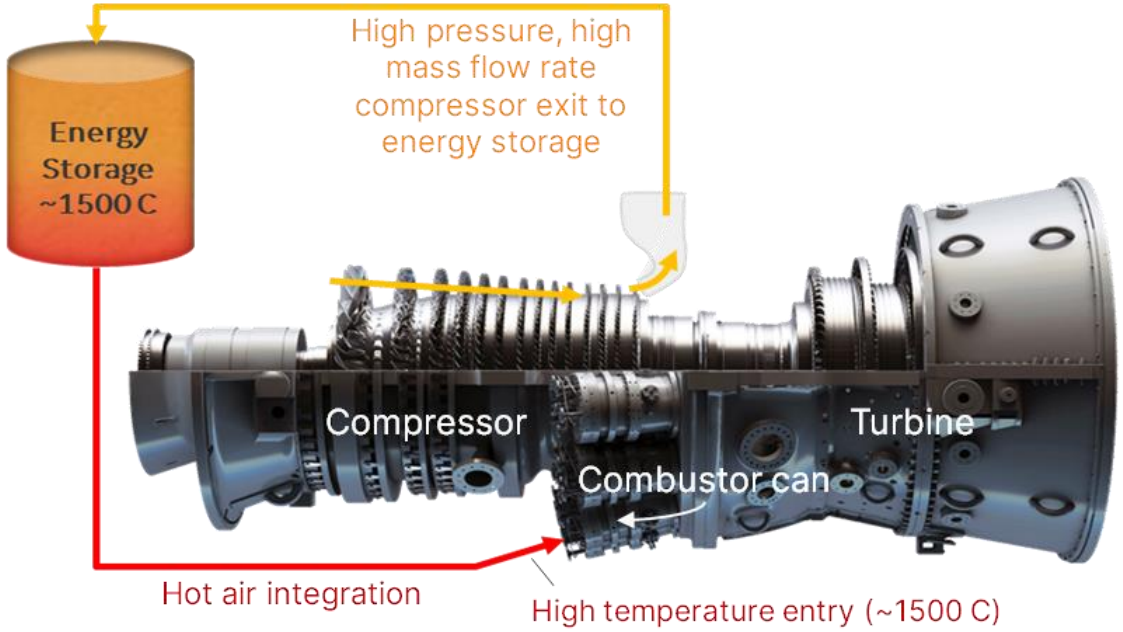
- Fully decarbonized





How does it work?

Compressor air is extracted from the GT, sent to the TES where it is heated to combustor temperatures and returned to the turbine section to be expanded and produce power.



- Large Installed base of older technology turbines
  - 6B >1000 units, low risk demonstration
  - 7E ~1000 units, prime application
  - 7F ~1000 units, more intrusive integration

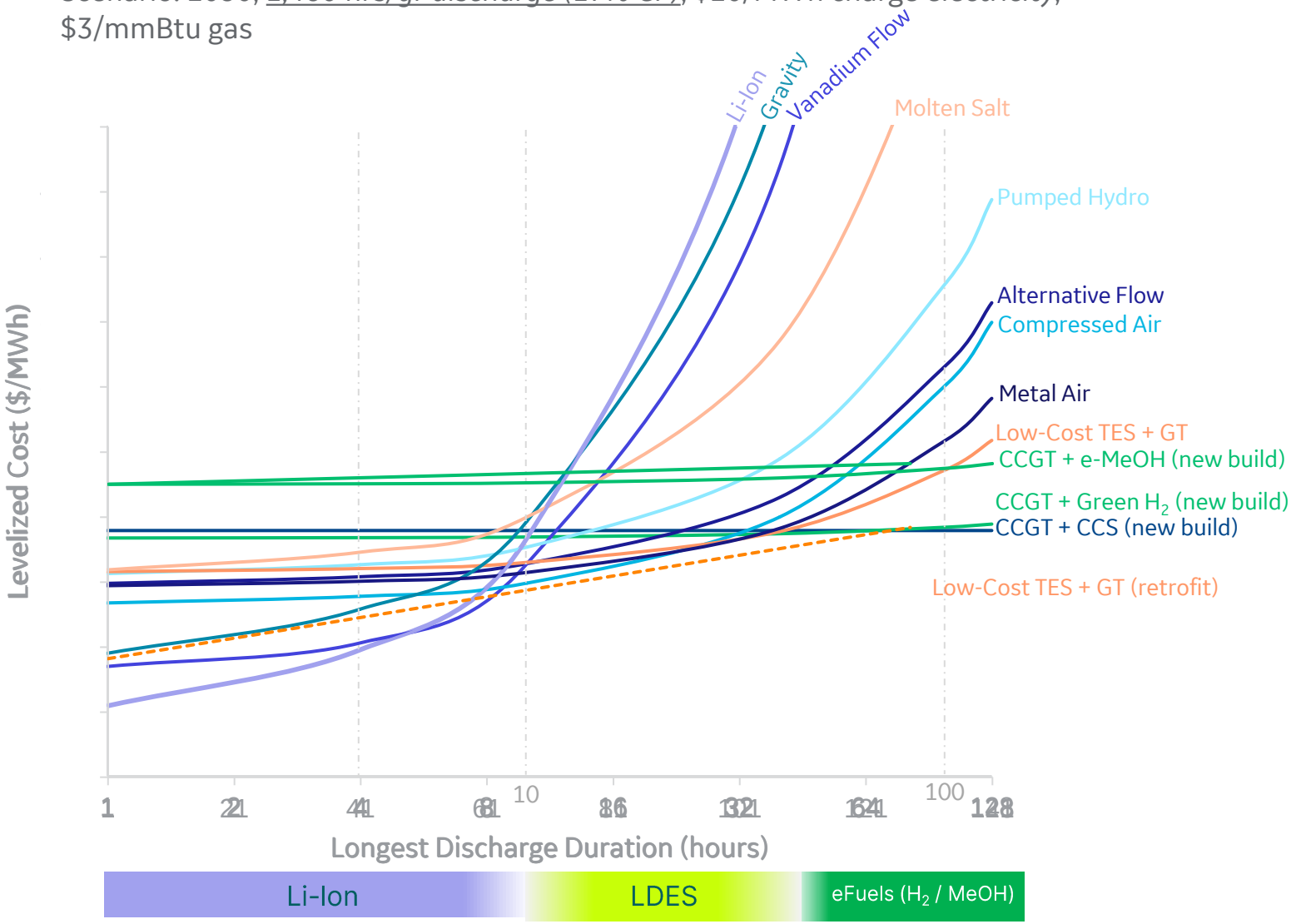
- >60% of LDES cost is contributed by heat-to-electricity conversion system (new unit)
- New turbines also enable pathway to cost target through materials & manufacturing optimization

- Strong utility support
  - ~ 12 expressed interest

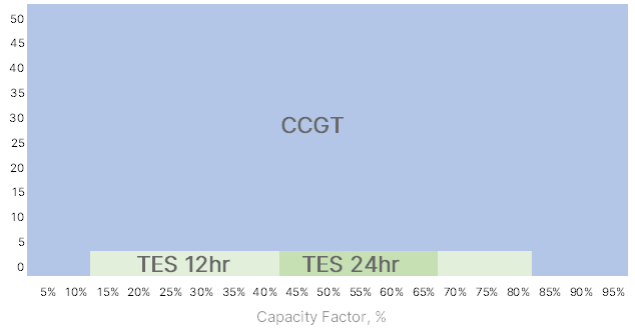
- Engagement with multiple LDES vendors
  - Mostly TES agnostic
  - Does require a high-pressure capable TES

LDES Landscape Technoeconomic Assessment

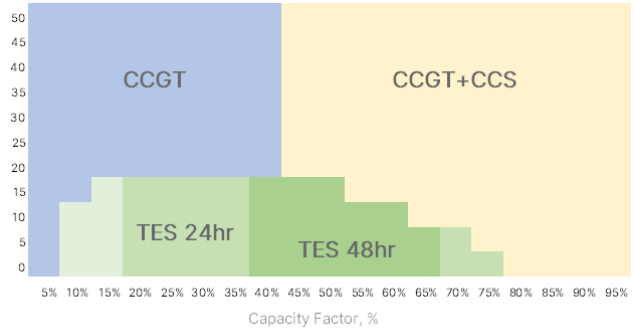
Scenario: 2030, *1,460 hrs/yr discharge (17% CF)*, $20/MWh charge electricity, $3/mmBtu gas



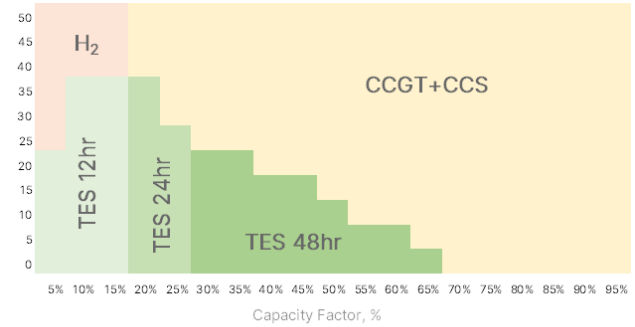
$0/t Carbon Tax



$100/t Carbon Tax



$250/t Carbon Tax



Current Effort: E-class GT Retrofit

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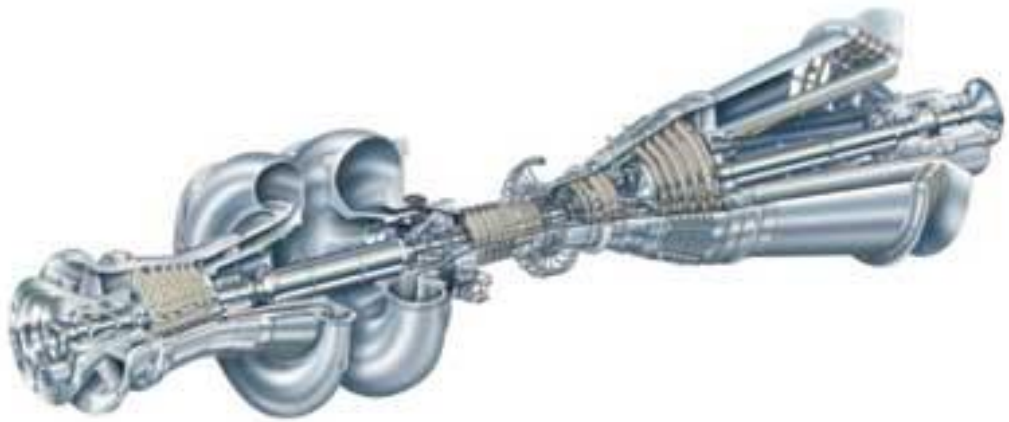
Goals:

1. CAPEX estimate:
    1. Conceptual design of volutes, leverage LMS100:
    2. Develop high temperature volute/pipe design
    3. Combustor integration
2. Use revised CAPEX to update value models

Challenges to be solved in 2025:

1. Return TES temperature is greater than metal melting temperature
2. Lower turbine space constraints with accessory base
3. Minimize turbine modifications
4. Combustor integration
5. Plant Space Availability

7E.03



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