GE VERNOVA

Matt Davidsaver, P.E.

CCS Product Line

Gas Power

GE Vernova

PURPOSE-BUILT

Launched as an independent company on April 2, 2024

SCALE, BREADTH & TECHNOLOGICAL DEPTH

to be a leader: Power, Wind, Electrification & Digital businesses supported by Advanced Research, Consulting Services & Financial Services

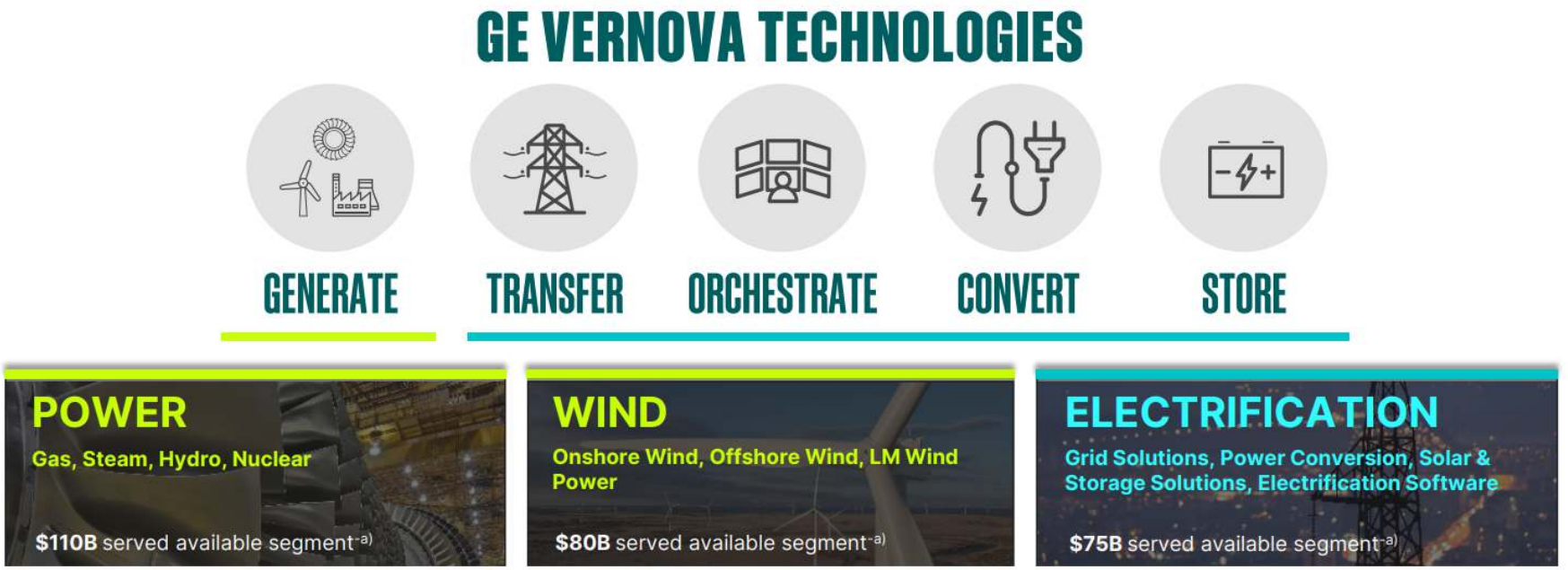
NEARLY 30%

of world's electricity today generated by our technology

THE ENERGY TO CHANGE THE WORLD

Electrify and decarbonize the world

GE VERNOVA



We provide essential products & services for the world's electricity systems

a- GE estimate of served available segment, capex and services

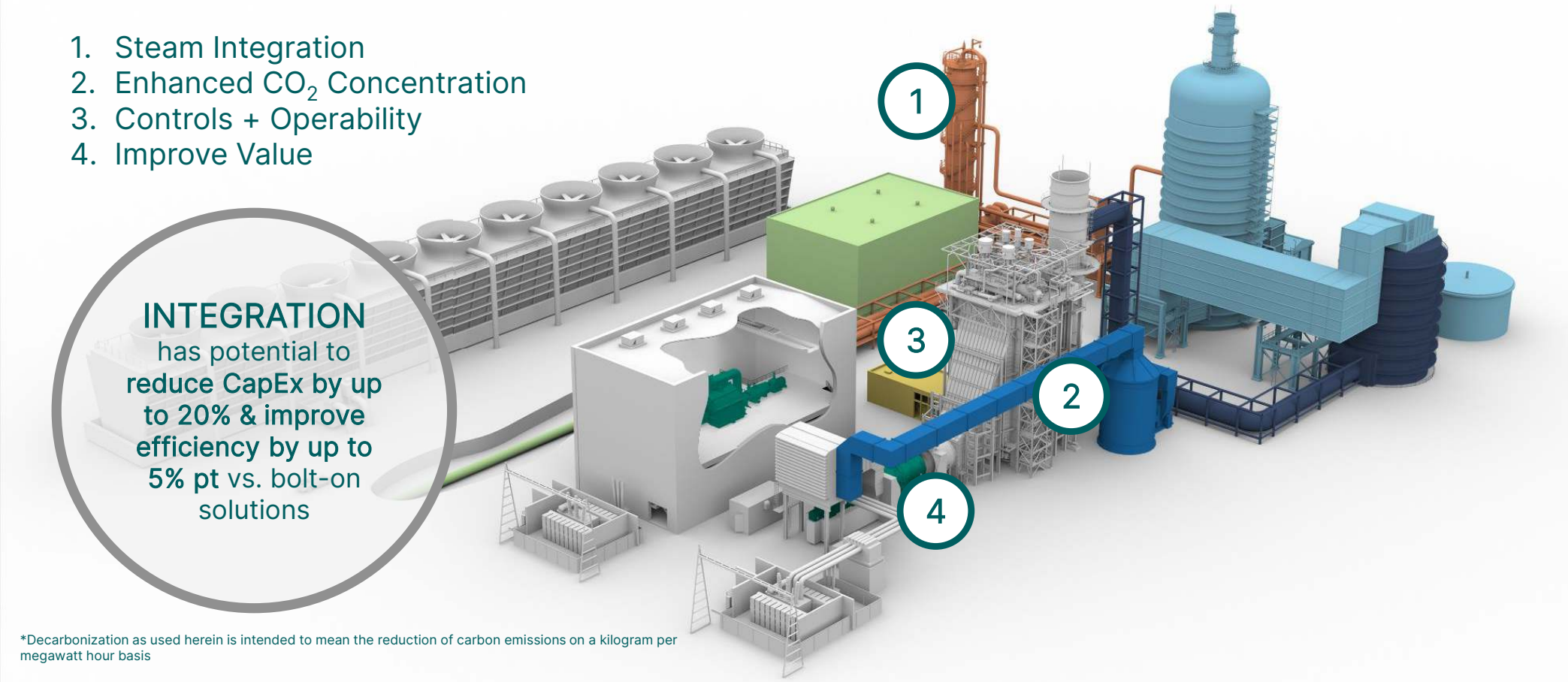
GE Vernova's Carbon Capture Solutions

GE VERNOVA

Reduce overall decarbonization* cost while maintaining availability and reliability

1. Steam Integration
2. Enhanced CO_2 Concentration
3. Controls + Operability
4. Improve Value

INTEGRATION
has potential to
reduce CapEx by up to 20% & improve efficiency by up to 5% pt vs. bolt-on solutions



*Decarbonization as used herein is intended to mean the reduction of carbon emissions on a kilogram per megawatt hour basis

GE Vernova's carbon capture product offerings

Reduce overall decarbonization* cost while maintaining availability and reliability

GE VERNOVA

Steam Integration

- ✓ Using steam produced in HRSG results in lower capital costs
- ✓ HRSG can provide reliable steam for the capture plant
- ✓ GE Vernova improves steam path and controls to provide best performance-value trade

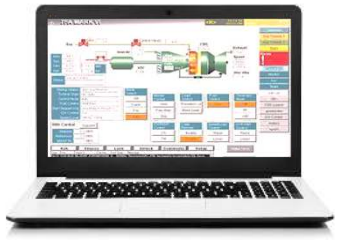
− Capex
+ Efficiency

Enhanced CO_2 Concentration

- ✓ Using GE Vernova's GT combustions' capabilities to increase CO_2 levels
- ✓ Increased CO_2 concentration helps reduce size of capture plant
- ✓ GE Vernova can manage the risk of elevating the CO_2 in our GTs

− Capex
− Risk Exposure

Controls and Operability



- ✓ Extending predictive model-based controls into the CCS plant
- ✓ Advanced simulation of integrated NGCC & CCS improves commissioning time and training
- ✓ GE Vernova can manage the risk of GT & ST operability as well as CCS (e.g., grid, response, fast ramp, etc.)

+ Reliability

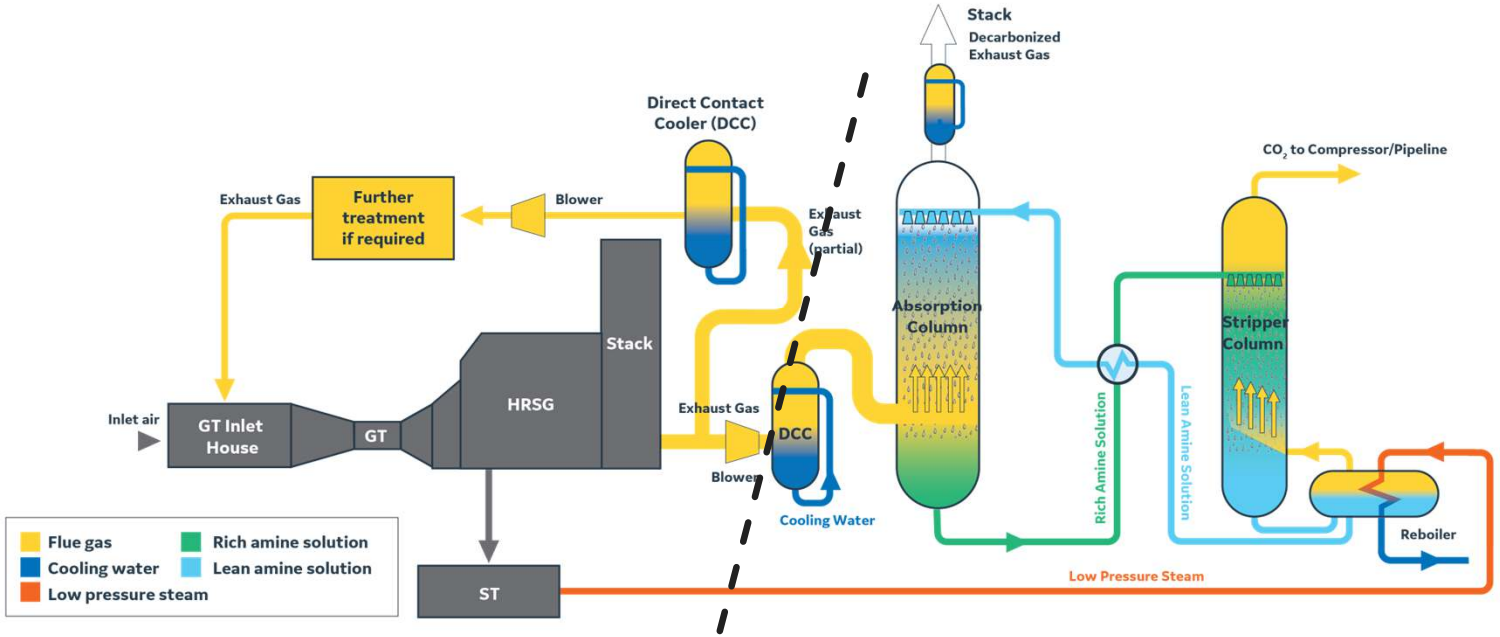
Improve Value

- ✓ Using proven GT modifications to improve functionality
- ✓ Recover MW to compensate for CCUS operation
- ✓ Potential increase in GT operability (e.g., grid response, fast ramp, etc.)

+ Output **+ Reliability**
+ Efficiency **+ Operability**

*Decarbonization as used herein is intended to mean the reduction of carbon emissions on a kilogram per megawatt hour basis

Enhanced CO_2 concentration with EGR



- ↓ Gas flow to CCS
- ↑ Conc. of CO_2

→

- ↓ Absorber size
- ↓ Reboiler duty

- ↓ CapEx and OpEx
- ↓ CCUS Footprint
- ↑ Power Output
- ↑ Efficiency (base load and part load)

Note: the estimated benefits must be confirmed with the capture provider as part of the specific FEED study, and they will vary with the amount of Exhaust Gas Recirculation

Steam extraction location shown at steam turbine but could vary depending on project requirements

Enhanced CO_2 concentration with EGR

GE VERNOVA

From FEED studies GE has led or facilitated

- ↓ 15% Solvent Makeup (reduced O2 results in reduced solvent oxidation)
- ↓ 4+% TPC CAPEX (CCS piping, absorber size and materials)
- ↓ 27% kg/hr reduction SOx
- ↔ No Change to plant auxiliary loads

Southern Company Plant Barry FEED Study

Final Report to DOE on June 28

https://www.powermag.com/ge-led-carbon-capture-project-at-southern-company-site-gets-doe-funding/

↓ Gas flow to CCS
↑ Conc. of CO_2

→

↓ Absorber size
↓ Reboiler duty

↓ CapEx and OpEx
↓ CCUS Footprint
↑ Power Output
↑ Efficiency (base load and part load)

Note: the estimated benefits must be confirmed with the capture provider as part of the specific FEED study, and they will vary with the amount of Exhaust Gas Recirculation

We are Ready to Quote

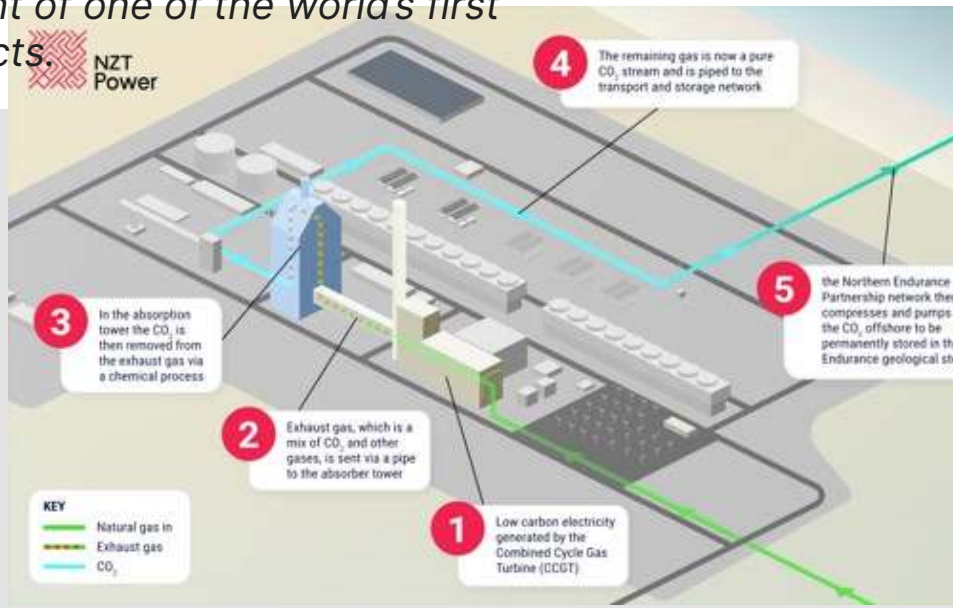
- 7HA.03
  - 564MW Net, ISO, 1x1 Single Shaft with up to 95% Carbon Capture
  - ~1.6M tonne CO2 annually at 90% capacity factor
- 9HA.02
  - 730MW Net, ISO, 1x1 Single Shaft with up to 95% Carbon Capture
  - ~2M tonne CO2 annually at 90% capacity factor
- Other Gas Turbines based on project-specific feasibility analysis

Note: the estimated values must be confirmed with the capture provider as part of the project specific FEED study, and they will vary with the amount of Exhaust Gas Recirculation

Net Zero Teesside Power (NZT Power), UK

bp selects Technip Energies and GE Vernova for development of one of the world's first commercial scale gas-fired power and carbon capture projects.

- Technip Energies with GE Vernova, and construction partner, Balfour Beatty, received a Letter of Intent from bp for the execution phase of the Net Zero Teesside Power (NZT Power) in the United Kingdom.
- Landmark project in the UK expected to capture up to 2 million tonnes of CO_2 per year
- Earlier Technip Energies and GE Vernova Gas Power developed a front-end engineering design (FEED) study to integrate carbon capture solution with a H-Class natural gas fired power plant
- GE Vernova Gas Power will provide expertise in combined cycle plant engineering, operability, and plant integration while Technip Energies will focus on carbon capture and compression plant using Shell's Cansolv® carbon capture technology.



How Else to Integrate?

GE VERNOVA

GE is Ready to Find Novel Integrations!

- Heat Integration
- Electrical Integration
- Controls Integration
- Mechanical Integration

THE ENERGY TO CHANGE THE WORLD

GE VERNOVA

CUTTING CARBON PODCAST