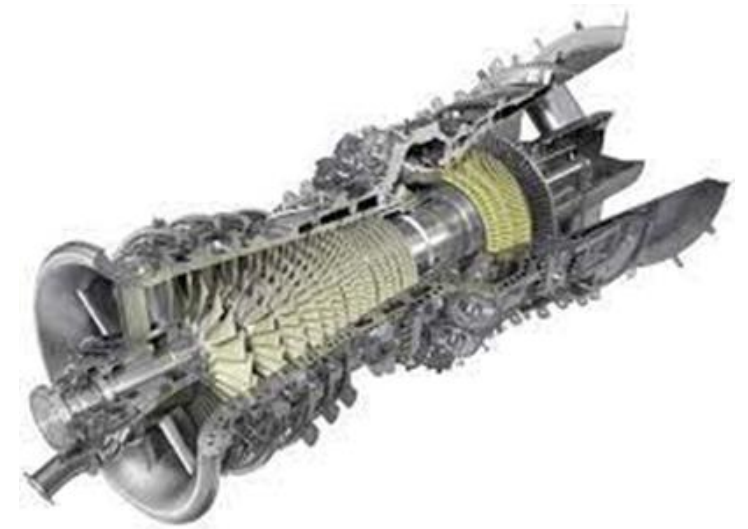


USEA: State of the Energy Industry 2023

Carlos Koeneke, GTA Vice Chair & Treasurer
Mitsubishi Power

Our Mission – Value of Gas Turbine Association

- **Educate and Inform**
 - The public and U.S. policy “decision makers”
- **Advocate**
 - Public policies that promote the use of gas turbine technology across relevant business sectors: power and energy production and industrial processes
- **Promote**
 - Essential for under-pinning and securing a sustainable, clean, efficient, and reliable generation mix
- **Strongly Support**
 - Synergy with renewable energy systems
- **Create Jobs & Knowledge Opportunities**
 - Key intellectual property that drives the economy (strong global competition)
- **Strong Synergy with Aviation Technology**



Gas Turbine Association Membership

Regular

GE Gas Power
Mitsubishi Power
Pratt & Whitney
Siemens Energy
Solar Turbines

Associate

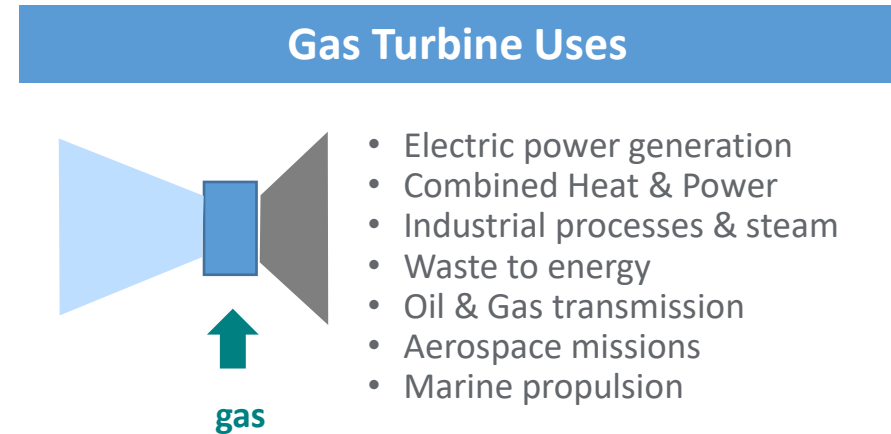
Camfil Power Systems
Hydra Service
Power Systems Mfg., LLC (PSM)
Strategic Power Systems, Inc.
Turbine Logic

Affiliate

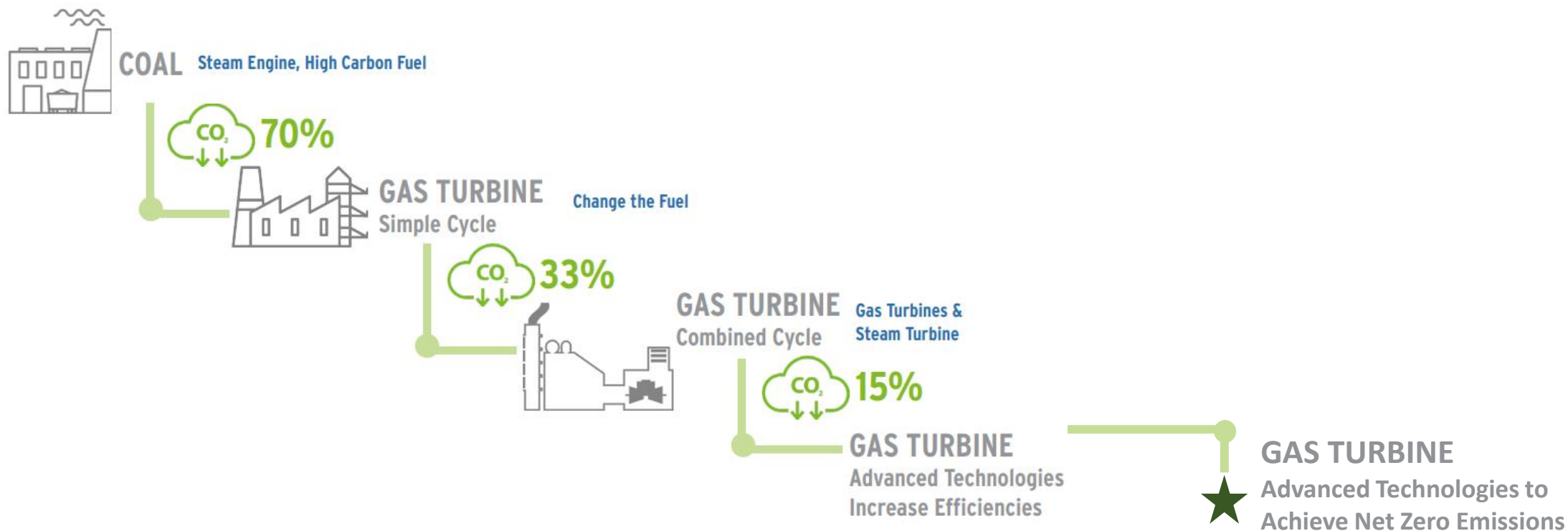
University of Central Florida (UCF)
University of Connecticut (UConn)
The Pennsylvania State University

A Few Important Points About Gas Turbines... Today

- Produce More Than a Third of Our Nation's Electricity
 - Installed base of thousands of operating assets
- Are a Cornerstone Energy Conversion Technology
 - Electricity & heat for industries and communities
- Are a Critical Part of the Clean Energy Solution for Today and for Tomorrow
 - Since 1970s focused on reducing Green-House Gas (GHG) emissions and next generation turbines will be able to use a range of cleaner fuels



Reducing CO₂ Emissions To Achieve Net Zero



Supporting Transition to Low Carbon Emissions with technology available today

Advancing technology to achieve Net Zero (H₂)/Negative Carbon

What is the Role of Gas Turbines in a World Focused on Decarbonization?

- **Balancing Renewables**
 - Value – Reliability and Sustainability
 - Grid Stability – Supporting Intermittent Renewables – “Dispatchability”
 - Operating Flexibility – Providing Fast Start & Ramp Rates to Meet Load Requirements
- **Meeting the Challenge of Reduced Emissions**
 - Increasing Thermal Efficiency to Drive Down CO₂
 - Design Readiness for Low and Zero Carbon Fuels
 - Carbon Capture Utilization & Storage (CCUS) Pre and Post Combustion

- H₂, Ammonia, or Other “Green” Fuels
 - Gas Turbine Readiness is Now – Working Towards 100%
 - Infrastructure Source – Where Does it Come From? Storage? and at What Volume?
- R&D Investment Required – DOE (Fossil Energy and Carbon Management) Plays a Major Role

Expectations for Legislative/Regulatory Actions in 2023

- Appropriations for the Department of Energy's Advanced Gas Turbines Initiative
 - These R&D dollars have aided in advancing gas turbine efficiency to considerably higher levels by increasing, among others the Firing Temperature
 - Materials Development
 - Cooling Enhancement (blades and vanes)
 - Coatings Development
 - Bipartisan support from Rep. Paul Tonko (D-NY) and former Rep. David McKinley (R-WV)
 - \$30 million in FY23 for advanced turbines initiative
- 118th Congress
 - Divided government and narrow margins in both chambers offer a unique opportunity for GTA to be a bipartisan solution
- Biden Administration
 - Ensuring GTA is part of the Biden administration transition to renewables

National Security

- Gas turbine power generation secure our country's ability to reliably dispatch power where and when needed

Ensure U.S. Leadership

- Sustain and enhance U.S. technical leadership in the engineering and manufacturing of gas-based generation systems despite increasing foreign investment

Economic Benefits

- Gas turbine advancements lower capital and operation costs spurring national energy infrastructure build out, U.S. high tech jobs and exports

Effective Decarbonization

- Improve the environment, enable renewables growth and lower greenhouse gas emissions along with other air pollutants. Expanded carbon free fuels capability including 100% hydrogen