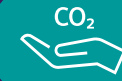


# Hydrogen Conversion

Applicable fleet SGT-400, SGT-300, SGT-200, SGT-100



## Reduction in Emission



Up to 3,247 tonnes less CO<sub>2</sub> per year\*

### SGT Hydrogen Gas Turbines for our sustainable future

The mission is to burn 100% hydrogen

- ✓ Carbon-free power generation
- ✓ Proven fuel flexibility
- ✓ Fast, efficient and reliable



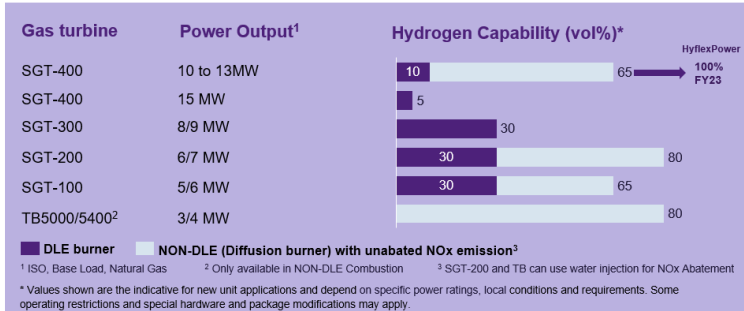
Power Utilities



Oil and Gas



Chemicals



SGT-400



SGT-300

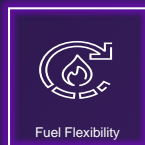


SGT-100

System/Procedures	H <sub>2</sub> Volume Impact on Package		
	0%	10% – 30% <sup>1</sup>	50% – 70% <sup>1</sup> 100%
		10% – 30% <sup>1</sup>	50% – 70% <sup>1</sup>
Burners and combustion chamber	No change	Modified burner may be required	New burner design
Fuel supply system	No change	Ensure all components Stainless Steel	Pipe diameter increase
Control/protection systems	No change	Additional gas detection	All hazardous area electrical equipment to Gas Group IIC
O&M Procedures	No change	Leak check of gas fuel system after maintenance inspections	Start-up/shutdown on conventional fuel
	No modifications needed	Smaller modifications may be required	Modifications needed



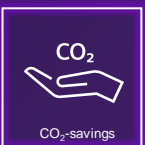
Life-Cycle Cost



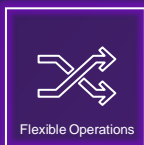
Fuel Flexibility



Efficiency



CO<sub>2</sub>-savings



Flexible Operations

### Product Overview

Siemens Energy are committed to the development of gas turbines with increased capability to burn hydrogen rich fuels, and this has been externally communicated in the declaration issued by the association of European gas and steam turbine manufacturers EU Turbine signed by Siemens in January 2019. (<https://powertheeu.eu/>)



The small gas turbine product line has accumulated high hydrogen experience of approximately 1 million operating hours, using diffusion flame combustion technology for mixes containing up to 90% H<sub>2</sub> by volume at installation such as refineries and coking oven plants.

### Improved Features

Increased fuel flexibility and the ability to increase hydrogen content.



### Benefits

- Significant CO<sub>2</sub> reductions at higher H<sub>2</sub> blends
- Maintain full power all the way up to 100% H<sub>2</sub>
- H<sub>2</sub> operation is possible with both DLE and non-DLE combustion technology
- Upgraded H<sub>2</sub> burners can still run 100% natural gas
- Minimal hardware upgrade



### Scope of work & Implementation

Scope will be based on the customers hydrogen content requirements, please contact M&U for a specific proposal

