

# DISTRIBUTED TRIGENERATION

**REDUCING CARBON EMISSIONS WHILE PROVIDING RELIABLE ENERGY SERVICES**

## **EXECUTIVE SUMMARY**

Cities around the country recognize the impact building emissions have on their overall emissions profiles and are taking actions to reduce these emissions. Distributed trigeneration systems can help to reduce carbon emissions from large commercial buildings in major metropolitan areas while maintaining reliable energy services. Modern distributed trigeneration systems are highly efficient and resilient, providing reliable energy services.

Trigeneration is a technology that is used to generate electricity while also providing heating and cooling. Trigeneration uses some of the heat produced by a cogeneration plant to generate chilled water for air conditioning or refrigeration. Trigeneration differs from combined heat and power (CHP), or cogeneration, in that the waste heat is used for both heating and cooling, typically using an absorption chiller for the cooling equipment.

Distributed generation systems can serve large commercial properties including offices, residential high-rise buildings, hotels, universities, and mixed-used buildings. Distributed generation systems can also serve critical infrastructure facilities such as data centers, hospitals, labs, and military installations.

Businesses, companies, and residents are impacted by climate change, and building owners and managers must reliably meet their occupants' energy needs while minimizing their environmental impact. A changing climate leads to changes in weather extremes, and extreme weather is the leading cause of electric power outages with events such as ice, high winds, flooding, and lightning strikes causing about 78% of the major power interruptions in the U.S. power distribution system.

Distributed trigeneration can allow commercial buildings to maintain energy services during a utility electric grid outage. Because distributed trigeneration resources generate electric and thermal energy on-site, typically using gas resources that are less likely to be impacted by severe weather, buildings that are connected to distributed trigeneration systems are more resilient in the face of a changing climate.

Distributed trigeneration is a proven technology that is commercially available, immediately deployable, and can cost-effectively reduce emissions. Trigeneration systems provide a near-term pathway to reduce emissions through increased energy efficiency while providing a long-term opportunity to reduce emissions even further using lower-carbon fuels.

Commercial building owners and managers are faced with the dual challenges of reducing their GHG emissions while maintaining reliable energy services for their facilities. While an optimal solution for this challenge will include many energy conservation measures, trigeneration should be the core because it is proven to be resilient, economic, and able to reduce emissions, making it a sustainable and viable measure.

DGA developed and prepared this landscape assessment and analysis for Secure Source Energy

