PRELIMINARY TECHNOLOGY ASSESSMENT – NOVEMBER 2023

Roof Edge Mounted Wind Turbine

Technology Overview

Many solar installs on commercial buildings maximize the roof's solar potential but still cannot meet the building's total energy demand. Using complementary renewable energy technologies, like wind, can meet more of the energy demand and address the intermittency issues experienced when implementing these technologies independently.

The edges of building roofs offer a promising space for wind energy generation. As wind travels over the edge of a building surface, its speed increases significantly. However, effectively harnessing this wind energy has been challenging due to the complex flow patterns, including a mix of high- and low-speed winds, at the roof edge.

The Roof Edge Mounted Wind Turbine tackles this challenge by employing spoiler technology. This technology shapes the airflow closest to the roof, which is naturally faster at the edge. Airfoils on the turbines passively increase wind speed, maximizing energy production.

Why is GSA Interested?

The roof edge mounted wind turbine is engineered to minimize structural impact by attaching to the roof edge without penetrating the building membrane. The wind turbine is designed to complement and supplement solar installations, so the existing network of solar installers can be leveraged and trained to install the turbines, reducing installation costs.

Deployment Potential

This technology is best suited for buildings that are at least two stories tall and have roofs with a length of at least 85 feet. Energy production will be highest for sites with an annual average wind speed greater than 12 miles per hour and where the wind predominantly comes from one direction at least half of the time.

Green Proving Ground (GPG), in collaboration with the U.S. Department of Energy, is evaluating the real-world performance of Roof Edge Mounted Wind Turbines on federally owned buildings within GSA's inventory. The technology will be provided by Accelerate Wind and coordinated with other ongoing evaluations of this technology.