**PRELIMINARY TECHNOLOGY ASSESSMENT – SEPTEMBER 2022**

# Single-Axis Solar PV Tracker

## Technology Overview

According to the U.S. Department of Energy (DOE), commercial buildings consume 35% of the electricity in the U.S. but produce only 15% of the nation's solar power. This single-axis solar tracker promises to increase commercial rooftop solar photovoltaic (PV) production by adapting a proven utility tracking technology with a new low-profile rocker design that reduces friction, motor size, and the cost of sun-tracking. Because of higher efficiency, 70% of solar utility fields use single-axis trackers, but until now, this technology has not been available for commercial rooftop solar. Tracking technology can address two obstacles to the uptake of commercial rooftop solar: return on investment (ROI) and roof liability. The single-axis tracker improves ROI by 22% over fixed-tilt systems by increasing PV energy yield up to 45% and using 30% fewer panels. It strengthens roof integrity by reducing system weight by 50% (< 3.0 pounds per square foot) and can use 75% fewer ballasts and penetrations than fixed mounting systems. This single-axis solar tracker allows for space between rows and is more portable and flexible than other mounting systems, which enables easier panel cleaning and roof maintenance. The panels are attached to a torque tube that can be adjusted to work around commercial rooftop features. One motor and controller can operate up to 100 panels and is rated for winds up to 120 mph and snow loads up to 20 PSF (higher upon request).

This tracker is a Round 4 finalist in the American-Made Solar Prize competition[1], directed and administered by DOE.

## Why is GSA Interested?

The single-axis tracker can increase solar PV production and help GSA reach its goal of net-zero greenhouse gas emissions by 2045. The system should provide an improved ROI for solar PV while at the same time reducing ongoing maintenance costs.

## How Will Success Be Measured?

The testbed will assess four manufacturer claims: greater than 30% increase in energy yield, 22% improved ROI over fixed mounting systems, a reduction in roof penetrations, and payback in less than 5 years. Additional criteria to be evaluated include ease of installation and ongoing maintenance.

## Deployment Potential

This single-axis tracker is applicable to flat roofs with maximum slopes of less than 6° and is ideal for highly reflective rooftops. The current target market is buildings that are less than 60 feet high. It is compatible with most monofacial or bifacial panels. Bifacial panels can increase PV production by 15%.

[1]U.S. DOE American-Made Solar Prize, https://americanmadechallenges.org/challenges/solarprize/index.html, accessed 06-2022.

*Green Proving Ground (GPG), in collaboration with the U.S. Department of Energy, is evaluating the real-world performance of single-axis solar PV tracking in federally owned buildings within GSA's inventory. The technology will be provided by Rocking Solar and coordinated with other ongoing evaluations of this technology.*