

eBook

Ballast Project Spotlights



GEMS Landfill (Blackwood, NJ)

The Gloucester Environmental Management Services (GEMS) landfill covers 60 acres in Gloucester Township, Camden County, New Jersey.

The PV facility covers 19 acres at the GEMS landfill site with a total DC capacity of 4,499 kWp and a 3-MW AC output. There is a “cap” on the top areas of the landfill that is five feet thick in total, it consisting of two feet of clay and a 40-mil HDPE liner, overlaid by a 12-inch drainage layer, 18 inches of soil, cover and 6 inches of vegetated topsoil. The landfill cap must remain undisturbed, leading to the ballasted foundation choice. All construction methods were designed to be non-intrusive to the soil cover and to be protective of the existing remedy.

Terrasmart partnered with CS Energy to provide structural drawings and calculations, as well as the dual post racking material with 1,366 precast ballast blocks.

After years of planning and permitting, construction began in December 2021 and was completed in April, 2022. Annually, the solar park is expected to produce nearly 6.1 million kWh of “clean zero emissions power,” enough to offset 4,313 metric tons of carbon dioxide emissions. Over the course of 25 years, the facility will yield approximately \$1 million in lease revenue to the Gloucester Township.

This project was awarded the 2023 Project of the Year by the American Society of Civil Engineers (ASCE).



Project Specifications	
Location	Blackwood, NJ
Product Type	GLIDE Wave
System Size	4.5 MW
Foundation	Precast ballast

Mount Olive (Budd Lake, NJ)

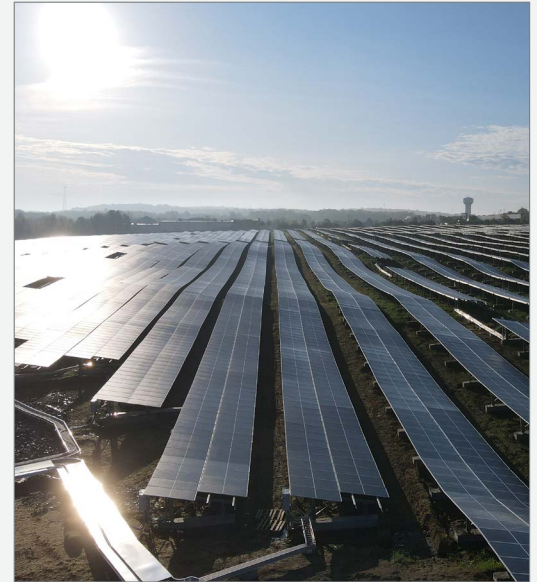
There are over 10,000 closed landfills in the United States, and it has been determined that closed landfills could host more than 60 GW of solar capacity—enough to power 7.8 million homes. CEP Renewables currently has 16 landfill or brownfield solar projects under development, and most recently completed the 25.6 MW Mount Olive project, which is the largest landfill solar project in North America.

CEP was selected by the Township of Mount Olive, New Jersey, to redevelop the former Combe Fill North Landfill Superfund site into a revenue generating, solar energy asset.

Landfill solar projects often require fixed-tilt, ballasted mounting solutions that do not pose a risk of piercing or otherwise damaging the landfill cap, which could result in the spread of hazardous contaminants. In order to ensure that the myriad integration and delivery deadlines for the skid mount system were met, close collaboration with project partners was paramount.

Leveraging its experience on several other large-scale landfill solar projects in cold weather locations, Terrasmart was able to successfully design and engineer their GLIDE ballasted mounting solution for this project so that the cost of the blocks was reduced by 50 percent. From wind studies to countless solar generation analyses, Terrasmart determined the optimal tilt and block size to help CEP meet its project budget and energy production goals—all while protecting the sensitive landfill cap.

The project won the 2021 Award for Innovation in Governance from the New Jersey League of Municipalities, and it now serves as a financial and legal model for the myriad other closed landfill sites throughout the U.S. to follow.



Project Specifications	
Location	Budd Lake, NJ
Product Type	GLIDE Wave
System Size	25.6 MW
Foundation	Precast ballast

Sibanye Stillwater Smelting (Columbus, MT)

With operations all around the world, Sibanye Stillwater is one of the world’s largest miners and producers of platinum and gold. The Stillwater Mine and Smelter facility located in Columbus, MT, became the grounds for the company’s first step towards its commitment to environmental stewardship in the form of solar energy.

As there is a lot of crew and equipment movement at a mine, it was an important design requirement that the array would be able to move in the future if need be. This ruled out any ground penetrating design. Terrasmart proposed to designs a ballasted system that could be disassembled and reassembled elsewhere.

The ballast blocks were engineered to be cast-in-place on-site due to the remote location being far away from a precast facility. This project was the “first behind the meter” solar system in the state of Montana. Being Stillwater’s first successful solar project, it will serve as a case study for future plans of integrating renewable resource projects at their many worldwide facilities.



Above: The ballast blocks were formed on site with lifting anchors on them so that they could be moved easily, with standard construction equipment, in the future.

Project Specifications	
Location	Columbus, MT
Product Type	GLIDE Wave
System Size	100.80 kW
Foundation	Precast ballast
Tilt	25°

Solean Landfill (Olean, NY)

This array in Olean, NY, is a collaboration between state, school, and developer to provide clean electricity for St. Bonaventure University and the Olean General Hospital. The project, called Solean, is part of the NY-Sun initiative.

The site, a state brownfield, was previously used as an oil refinery. The array is laid out in two separate 5.4-MW sites to fit the over 25-acre area that is split by Interstate 86.

Terrasmart was tasked with designing and engineering a system that didn't disturb the brownfield surface and was strong enough to withstand the heavy wind and snow loads of Western New York. As a brownfield, the site required special preparations and land tests to ensure safety during and after installation.

The foundation was manufactured with precast ballast blocks to reduce the amount of time required to install the system on-site. Ballasts were delivered to the site, with structural posts attached, for installation crews to quickly place foundations and install the racking.



Above: Though the site was split into two locations, installation crews planned to unload all of the ballast blocks in one mobilization.

Project Specifications	
Location	Olean, NY
Product Type	GLIDE Wave
System Size	5.42 MW
Foundation	Precast ballast
Tilt	25°