

Brownfield Solar Conversion Leverages Unique Technical Capability

Ballasted ground-mount array gives new life to a capped landfill in Milwaukee. SunVest partners with We Energies to complete.



Solar installations on landfills have been a growing trend nationwide – which is no surprise to the solar experts at SunVest. Open, unused land with limited shade is always a great opportunity to produce clean, renewable energy for a community. But solar installations on landfills can be tricky.

These projects require extra engineering and a different installation technique for a few reasons. First, landfills are capped with a cover that isolates landfill waste and contaminated soils to prevent the spread of toxins. Solar developers need to guarantee that installations will not puncture this protective cap. Second, landfills are shaped like a dome or a large mound, far from the flat surface solar installations were designed for.

SunVest partnered with the We Energies Solar Now Program to design and develop a ballasted ground mount system at the City of Milwaukee College Avenue Landfill. The site is next to Mitchell International Airport, abutting the 128th Air Force Refueling Wing. In addition to the unique requirements of a landfill site, SunVest needed to obtain approval and documentation from the Federal Aviation Administration (FAA). We also had to pay extra attention to scheduling and site access.

SunVest has designed, developed, operated and maintained over 100 MW of solar power projects since 2009. The opportunity with We Energies was a challenge we gladly accepted. SunVest designed and installed a ballasted ground mount system, which uses concrete blocks to secure the array instead of penetrating the ground. Once all of the landfill considerations are solved, a ballast system is actually one of the easiest and cost-effective systems to install.

SUMMARY

We Energies contracted SunVest to construct a solar array on the College Avenue Landfill site next to Mitchell International Airport (MKE).

In a departure from traditional pile-driven ground mount arrays, solar needed to be implemented without penetrating the topsoil.

SOLUTION

Ballasted ground mount array designed by SunVest.

- 2.88 MW DC
- 2.25 MW AC
- 7,200 Trina Solar 400-watt panels
- 18 SMA Sunny Highpower 125 kW inverters
- Azimuth 180 (due south)
- Tilt angle: 25 degrees
- Row spacing: 18.2'
- 776 ballast anchor blocks measuring 20" x 114"

BENEFITS

- A brownfield site now generates clean, renewable energy
- Solar does not impact airport traffic
- 3,513,000 kWh of electricity generation per year
- Carbon offset of 8,000 tons annually



Extra fill and gravel were distributed and compacted over the top of the existing landfill cap on the north and west sides of the solar field to level out the surface. The back of the landfill had the most slope, so we added landscaping timbers to keep the gravel in place.

The system used 776 ballast anchor blocks – each measuring 20" x 114" and weighing 4,000 pounds – with embedded attachment points for solar racking. The racking involved angled panel supports bolted to vertical steel columns.



Once racking was in place, 7,200 Trina Solar 400-watt panels were installed and wired together using messenger wire. Messenger wire electrically grounds the entire array and supports CAB Solar hangers where solar conductors can be secured, routed, and organized.



DC power flows from panels to combiner boxes within the installation, then to 18 SMA Sunny Highpower 125 kW inverters at the north end of the array. AC power is routed to a switchboard and disconnect, then to a transformer provided by the utility.

The result is a once-abandoned brownfield site transformed into a solar field that will produce clean, renewable energy for decades.




541
Passenger vehicles driven
for one year



452
Homes electricity use for
one year



302,841,720
Number of smartphones
charged



41,166
Tree seedlings grown
for 10 years

