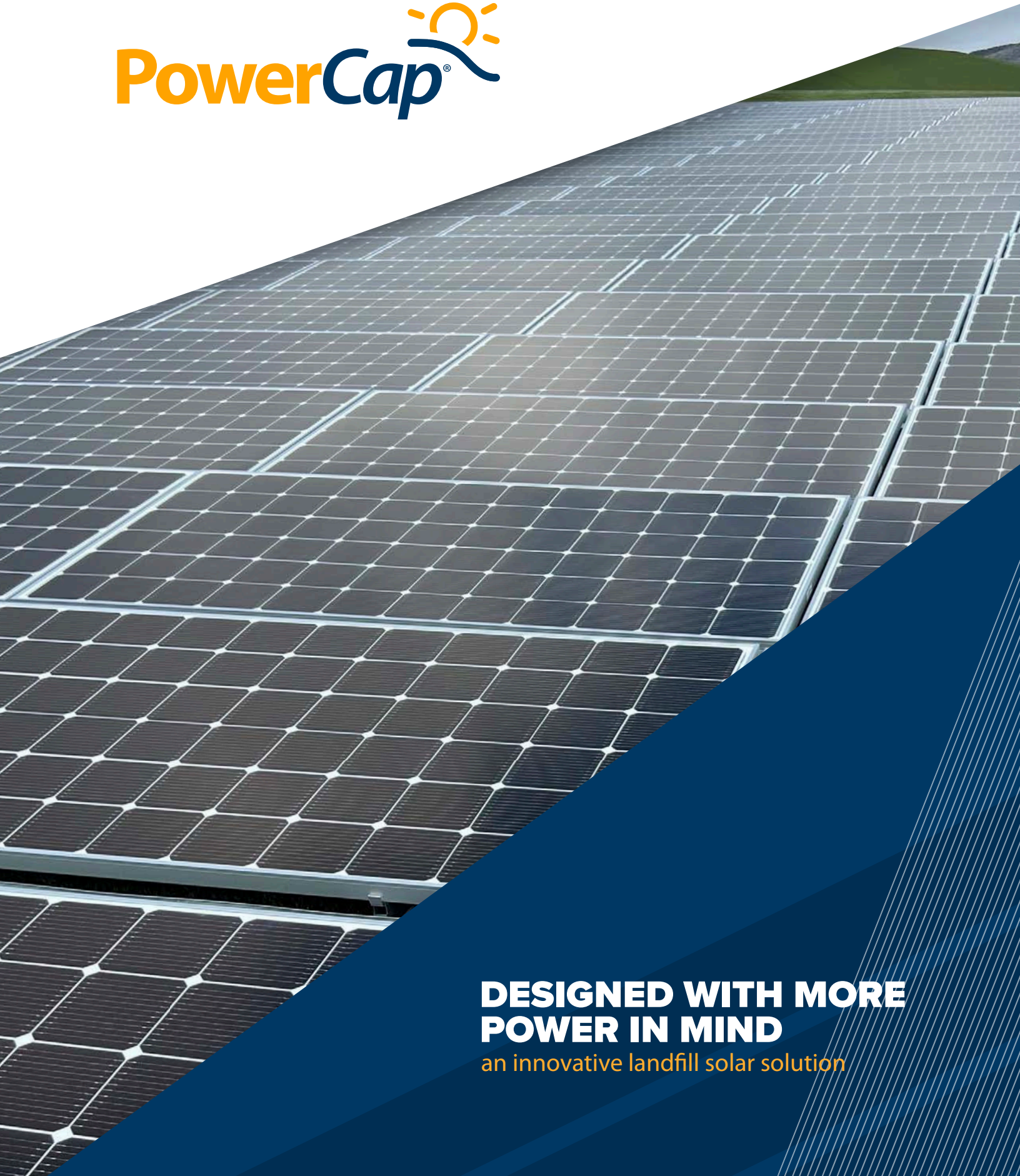
PowerCap®



DESIGNED WITH MORE POWER IN MIND

an innovative landfill solar solution

Scan here for a detailed look at the PowerCap® System.

DESIGNED WITH MORE POWER IN MIND

PowerCap®, the first of its kind in renewable energy technology, is a unique solar innovation that was developed to produce solar energy on previously undevelopable land, such as landfills, brownfields and topographically challenged land. The system's unique design has high power potential per unit area and can be installed on steep slopes creating a greater utilization of space.

PowerCap® Patent Pending System Provides:

- Significantly higher power per acre for various surface slope angles (approx. 1MW / 2 acres)
- Converts a potential financial and environmental liability into a renewable energy generating asset
- Fast and easy installation
- Easily removable with a minimally ballasted system
- Custom to the site racking system options ranging from flat to 5 degree and 10 degree fixed tilt systems
- Significantly reduced maintenance due to no mowing or erosion repairs
- Potential project savings under the Inflation Reduction Act (IRA)



TVA Shawnee Fossil Plant Landfill in Paducah, KY
Phase I - 130 MWdc



Shaw Plant T1 in Adairsville, GA
4:1 Steep Slope Application

ClosureTurf®: The Ideal Foundation

Installing solar energy generation on capped landfills has proven to be an effective way to deploy systems on typically unused space. ClosureTurf is a patented, Subtitle D compliant, final closure system that provides the ideal foundation for the PowerCap solar system. It provides a predictable benchmark of performance when capping environmental waste and significantly reduces the O&M expenses related to vegetation and erosion as well as provides clean runoff with very low turbidity. No rebuilding of slopes, mowing or seeding is required. PowerCap's panels operate in a clean environment and are easily accessible. Best of all, ClosureTurf allows for installation of PowerCap's panels on slopes in addition to top decks for maximum output.

PowerCap® Surface and Slope Technology



The PowerCap system is a unique geotechnical approach to creating a highly stabilized solar system for landfills and impoundments. PowerCap provides a direct attachment method from the panel to the ClosureTurf surface with no penetration of the cover system. The entire system is based on friction. Friction strips are simply laid on the ClosureTurf surface (no penetrations), while the railing and solar panels are mechanically fastened to the strips. The unique, v-shaped anchor studs of the strips significantly increase the friction between the PowerCap and ClosureTurf systems, resisting any potential shearing or sliding on the top deck or slopes of the landfill. The PowerCap system is not mechanically connected to the underlying geomembrane, eliminating concerns of creeping or mechanical expansion of the geomembrane component of the ClosureTurf system.

Extensive laboratory testing has been performed on ClosureTurf® and PowerCap®, including:

- Rainfall erosion
- Ultraviolet (UV) resistance
- Fire resistance
- Creep tests of ClosureTurf
- Interface shear strength test of ClosureTurf and PowerCap system
- Wind tunnel test of ClosureTurf and PowerCap system



Metabolon Research Center in Leppe, Germany
2:1 Steep Slope Application

PowerCap®



PowerCap® is a Four-Component System:

1. **Friction/Anti-Creep Strips**
   - No penetration of geosynthetic material
   - Prevents sliding on slopes and shearing on the top deck
   - Friction strip ballast trays below the panel may offer an additional factor of safety

2. **Grid Rail Design**
   - Gives the array a clean, smooth look
   - Strengthens the array and lowers ballast requirements

3. **Solar Panel**
   - Versatile panel options for traditional and larger platform framed panels
   - Flat design for slopes as well as tilt options for the top deck
   - Adjustable attachments allow for various panel types and frame thicknesses to be securely attached to the rail

4. **Wind Deflector**
   - Protection against high speed winds
   - Improves wind performance to reduce ballast

Friction/Anti-Creep Strips – Showing V-shaped Anchor Studs



Grid Rail Design



Adjustable Mounting System



Wind Deflector





Faster & Simpler Installation

Integration of PowerCap® provides many benefits to reduce costs and simplify installation. The system allows for optional integrated wiring management hardware and simplifies installation. PowerCap also reduces engineering time, project management costs and associated overhead.

High Quality Solar Panels

Due to consistent changes in frame configurations, PowerCap was designed with versatility in panel configurations. PowerCap's design flexibility accommodates various types of panels. Depending on procurement requirements, panels can be sourced internationally or domestically.

Unique Design Options

The PowerCap patented technology optimizes an array by increasing density through:

- Utilization of typically unused slopes
- Maximization of power production on nearby flat surfaces through panel tilt
- Tighter panel density and inner-row spacing
- Less panel shading

Increased Density = More Power Per Area

The PowerCap® system is capable of providing:

- 2 acres per MW
- Up to 300% larger capacity compared to a ballasted racking system
- Up to 60% greater fill factor due to the slope and panel density per unit area
- More energy per unit of area compared with standard installation at optimal angle





- **130** MW DC
- **100** MW AC
- **245,910** SOLAR PANELS
- **250+** ACRE CLOSURE

TVA Shawnee Fossil Plant Landfill
Paducah, KY
Future Phases

Rendering courtesy of TVA

TVA Shawnee Project Phoenix

Project Phoenix is a first-of-its-kind solar generation project on a closed coal ash site at the TVA Shawnee Fossil Plant in Paducah, Kentucky. The future scale of this project is a planned 100 MW solar generation facility that is helping TVA to build a sustainable energy future, meet carbon reduction goals and preserve farmland and greenfield space.





BENEFITS TO TVA

- Supports decarbonization goal of becoming 80 percent carbon free by 2035
- Access to harvest ash, if needed
- Saved over 1,000 acres of land
- Eliminated over 40,000 truck trips of soil on community roads
- CCR clean runoff

PowerCap®

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WG Watershed Geo® Unearthing Solutions

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