



CECO BUILDING SYSTEMS

PHOTOVOLTAIC TECHNOLOGY





The United States is the leading consumer of energy in the world. While greenhouse gas emissions negatively impact the environment, our dependence as a country requires us to rely on foreign suppliers, as our individual usage rates force each of us to pay excessive costs. Whether social, political or purely economical, a call for innovation has been made. Fortunately, forward progress is already underway and can be found in the resurgence of an old idea. **SOLAR.**

**SOLAR TECHNOLOGY** has advanced since its inception decades ago especially in the era of photovoltaic or PV systems. Federal and local governments are adopting tax incentive programs to encourage companies and individuals to install solar power systems on their property and many utility companies are buying unused energy at preset rates.

The systems still require exposure to the sun, making a building's roof one of the more favorable installation locations. CECO's metal roofs provide an ideal substrate for solar arrays as well as offer unique environmental and performance advantages such as:

- Long-lasting durability that factors into an overall low lifetime cost while outliving currently available PV systems
- A nearly maintenance free system
- Superior warranties
- Virtually 100% recyclable material and comprised of 20 to 30% post-consumer recycled steel
- A wide array of vibrant cool roof colors that are highly reflective, reducing the heat island effect in urban areas while contributing to energy efficiency in southern climates.



# PHOTOVOLTAIC





## THE FLAT SURFACES INCORPORATED INTO VARIOUS PROFILES ALLOW CECO'S METAL ROOF PANELS TO SUPPORT TWO PV OFFERINGS:

- Glass-Based Crystalline Silicon, a rigid photovoltaic module, which can be installed on standing seam roofs using a non-penetrating clamp assembly, offers the highest energy conversion efficiency but also weighs 3 pounds per square foot.
- Flexible Thin Film, a lightweight (approximately  $\frac{3}{4}$  pound per square foot) module that is typically adhered to the metal roof panel in a factory environment, allows the photovoltaic array to be installed as the roof panels are installed. Though less efficient than crystalline modules, flexible thin film is sometimes preferred due to its lighter weight and discreet appearance.

Existing and new standing seam metal roofs make ideal substrates for PV systems since they can be attached to the roof without penetrations.

*Furthermore, a metal roof is poised to outlive the solar equipment, saving removal and replacement costs associated with roof materials with shorter life spans.*

A Federal income tax credit of 30% of the solar array's cost is available through 2016. In addition, many states and local utilities offer incentives and rebates. Visit [www.dsireusa.org](http://www.dsireusa.org) to find current information on incentives and rebates.

# TECHNOLOGY

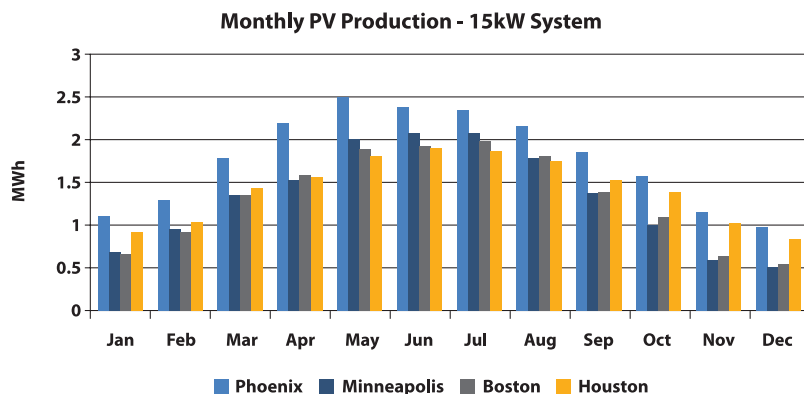
## TYPICAL COMMERCIAL ROOF INSTALLATION EXAMPLE:

### PV System:

- 15kW with polycrystalline modules

### Roof Application:

- Metal Roof
- South-facing
- $\frac{1}{2}$ " : 12" slope



*CECO has the expertise to model PV systems in this fashion for most locations in the United States and Canada as well as perform payback calculations for those systems taking advantage of the latest incentive programs.*





An electrical contractor, knowledgeable about solar PV installations will be required to install the electrical components of the PV system. The contractor will also decide the best location for the inverter and provide wiring and conduit to run from the combiner boxes on the roof to the inverter and from the inverter to the meter box, as well as all disconnects and any other equipment required by the local utility company. The electrical contractor will contact the local utility company to determine all requirements for the PV system to be connected to the grid.

Before installing a solar array on any roof, a registered professional engineer should be consulted to determine if the roof is capable of accepting the additional loads. A crystalline array will weigh approximately 3 pounds per square foot. A flexible thin film array will weigh approximately  $\frac{3}{4}$  pounds per square foot.

To aid in determining which type and size solar array is best for a particular project, the following information is offered:

- The best direction for the solar array to face is south, though roof areas facing east or west can also be used.
- Usually about 75% of a roof area can be utilized for the solar array, unless there are obstacles on the roof such as skylights or rooftop equipment. Shading of the solar array should also be investigated.
- Solar modules cannot be installed to the roof edge. Adequate distance must be left at the roof edges for roof access.
- A crystalline array will provide about 10 watts per square foot of roof area while a flexible thin film array will provide about 5 watts per square foot of roof area.

## CECO BUILDERS – THE CONSTRUCTION PROFESSIONALS



**Eastern Region** | P.O. Box Drawer 2387, 100 Red Iron Rd., Rocky Mount, NC 27802 | 252-977-2131

**Midwestern Region** | P.O. Box 72, 305 N. Iris St., Mt. Pleasant 52641 | 319-217-4000

**Southern Region** | P.O. Box Drawer 911, 2400 Highway 45 North, Columbus, MS 39703 | 662-243-6400

1-800-474-2326 (CECO) [www.cecobuildings.com](http://www.cecobuildings.com)



Ceco® is a registered trademark of Robertson Ceco II Corporation, an NCI company.