Metal Roofing + Solar Arrays: The Perfect Combination

PHOTOVOLTAIC TECHNOLOGY

THE CHALLENGE:

Well-known Fact: Americans are too dependent on oil and natural gas. We're also the leading consumer of energy in the world, second only to China in carbon dioxide emissions, making us one of the largest polluters in the world. Our impact on the environment is detrimental. So, it's time for Americans to step up to the plate, compete with European markets and become a leader in renewable energy.

ACCORDING TO THE NATIONAL RENEWABLE ENERGY LABORATORY (NREL), more energy from the sun falls on the earth in one hour than is used by everyone in the world in one year. Solar cells, also referred to as photovoltaic (PV) cells, convert sunlight directly into electricity. Single solar cells are combined to create a solar module. Solar modules are combined to create a solar array, which is the PV system used to generate power.

The solar modules can be installed on a metal roof system with no penetrations into the roof, allowing the metal roofing warranty to remain intact.

GLASS-BASED CRYSTALLINE SILICON

THE PERFECT BLEND:

The combination of metal roofing systems with PV systems provides a number of benefits for the building owner.

- The PV system's efficiency typically improves when it's installed on a cool metal roof increasing the energy output of the solar modules.
- The solar modules can be installed on a metal roof system with no penetrations into the roof, allowing the metal roofing warranty to remain intact.
- Nearly 80% of PV installations occur on existing construction. The service life of a metal roof system is compatible with that of a solar array.
- PV systems typically last 25 years or more. Why install a system on a roof that will only last 15-20 years? Instead, choose an MBCI metal roof that will last 40 years or more, allowing you to remove the existing solar array to install a new one on the same roof.

THE SOLAR SOLUTIONS:
MBCI OFFERS TWO TYPES OF PV SYSTEMS FOR YOUR BUILDING'S ROOF

› **GLASS-BASED CRYSTALLINE SILICON** - The crystalline solution is a rigid module which can be installed on standing seam roofs using a non-penetrating clamp assembly. This option provides the highest energy conversion efficiency at 13-18%, which is about 10 watts per square foot. The glass-based crystalline module weighs 3-4 pounds per square foot. The modules perform best during peak sunlight hours.

› **FLEXIBLE THIN FILM** - This lightweight option, approximately ¾ pound per square foot, is typically adhered to the metal roof panel in an MBCI manufacturing facility, allowing the solar array to be installed as the roofing system is installed. Thin film is less efficient than crystalline modules with a 5-10% efficiency rate at about 5 watts per square foot. Flexible thin film does perform better than crystalline modules in low light conditions.

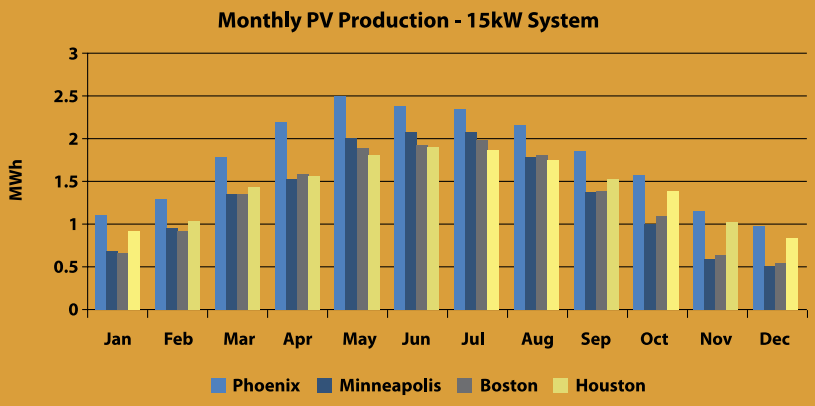
TYPICAL COMMERCIAL ROOF INSTALLATION EXAMPLE:

PV SYSTEM:

› 15kW with polycrystalline modules

ROOF APPLICATION:

› Metal Roof
› South-facing
› ½":12" slope



FLEXIBLE THIN FILM

The PV system's efficiency typically improves when it's installed on a cool metal roof , as opposed to other roof types, increasing the energy output of the solar modules.

HOW TO REACH THE PERFECT COMBINATION:

The combination of metal roofing systems with PV systems provides a number of benefits for the building owner. Below is a breakdown of the support to these benefits:

METAL ROOFING

- Low maintenance during its more than 40 year lifespan
- Durability for wind, fire, hail and U.V.
- Virtually 100% recyclable, allowing for reduced landfill mass and comprised of 25% to 35% post-consumer recycled steel
- Cool roof colors of metal panel systems
- Unsurpassed warranties compared to both conventional roofing companies and solar module manufacturers

NEARLY 80% OF PV INSTALLATIONS OCCUR ON EXISTING CONSTRUCTION. THE SERVICE LIFE OF A METAL ROOF SYSTEM IS COMPATIBLE WITH THAT OF A SOLAR ARRAY.

SOLAR

- An ecological resource with a low carbon footprint that harnesses the sun's renewable energy
- A sustainable resource that will produce 85% of rated energy production 20 years after installation
- A diverse resource, available in a variety of technologies including modules of polycrystalline and thin film
- A reliable resource, producing energy anywhere the sun shines at a fixed and known cost that is not subject to the fluctuation of fuel costs and utility rate escalations
- An economical solution as federal and local governments are adopting tax incentive programs to encourage companies and individuals to install solar arrays. A Federal income tax credit of 30% of the solar array's cost is available through 2016. Additionally, many states and local utilities offer other incentives and rebates. Visit **www.dsireusa.org** to find current information for your regions.

PRE-DESIGNED GRID-TIED KITS

From 700W to 60kW, MBCI kits are ideal for existing or new commercial construction projects. MBCI will provide the education, guidance, technical support and most of the materials needed for a successful solar implementation.

Each MBCI solar kit contains:

- Leading brand name polycrystalline or amorphous silicon PV modules
- Inverter
- DC electrical wiring (DC fuses and 50' wire whips for each string sized to meet the requirements of the National Electric Code (NEC) to connect the solar modules to the combiner boxes)
- DC & AC disconnects
- Combiner boxes
- Lightning arrestors
- Mounting hardware for PV modules
- One-line electrical drawings
- Electrical specifications for the contractor's installation
- Module and inverter installation manuals

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 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.

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.

ENERGY STAR PARTNER

For complete performance specifications, product limitations and disclaimers, please consult MBCI's Paint and Galvalume Plus® warranties. Upon receipt of payment in full, these warranties are available upon request for all painted or Galvalume Plus®, prime products. Sample copies can be found at **www.mbci.com** or contact your local MBCI Sales Representative.

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