

2.0 continuing education hours for engineers, contractors, designers and energy professionals

## Course Description

Many engineers, contractors and designers recognize solar panels to see them but may not understand the many different kinds of solar applications, including some which involve no solar panels. **Solar Options** begins by introducing and discussing many types of solar in the Ohio Valley. Photos are presented showing many local solar space and water heating systems, daylighting and passive solar installations, summer shading options and solar electric systems. The course focuses mostly on solar heating (air and water) and solar electricity (PV). In describing how to site and orient solar collectors for better solar outcomes, a compass is demonstrated for measuring azimuth and an inclinometer is demonstrated for measuring vertical angles. Passive solar principles are also discussed, including thermal outcomes and shading challenges with different window orientations and glass types with different "solar heat gain coefficients" or SHGC. Several solar heating and solar electricity estimation methods are presented and described, including NREL's online "PVWatts" program for estimating solar electricity and SRCC's online solar ratings for manufactured thermal collectors. The instructor also explains why it is usual for higher levels of energy efficiency to be implemented in solar heating and electricity projects to achieve better financial "paybacks," especially since conventional energy prices and renewable energy subsidies have waned in recent years.

## Learning Objectives

- Understand how to recognize and estimate outcomes of different solar strategies & equipment, including solar panels for heating or electric and solar windows for heating or shading.
- Become familiar with solar siting and orientation tools for aiming solar equipment, like a simple compass and inclinometer or more complex devices. Understand how to use a sunpath diagram which describes the yearly paths of the sun through the Ohio Valley sky. Become familiar with resources and methods for estimating solar collection, both thermal and electric, including when collectors, windows or panels are angled or oriented differently.
- Learn about major components in solar electric, solar water heating and passive solar systems, including how much storage is recommended for solar water heating. Also learn where to look for solar ratings and evaluations on manufactured solar panels and windows.
- Compare different ways to mount and locations to place solar collectors.
- Understand how most solar energy production compares to typical energy needs and timelines for residential, light commercial and electric utilities
- Gain a general understanding of possible financial paybacks from investments in solar, especially how paybacks have lengthened in recent years due to lower energy prices and fewer incentives.
- Learn about technical solar publications, non-commercial solar websites and regional solar associations.