



NORTHEAST SUSTAINABLE ENERGY ASSOCIATION

Sustainability Workshops

serving professionals, building knowledge



PROPOSED TOPICS FOR NESEA'S 2010 SUSTAINABILITY WORKSHOPS

Topic: Residential Retrofits for Energy Efficiency & Sustainability, Air Sealing and Insulation

Notes: This workshop includes a detailed review of air sealing and insulation techniques designed to significantly reduce energy consumption in existing buildings. This full day workshop continues to be the most popular at NESEA for the last four years. One of the nation's most experienced and possibly most animated presenters walks the audience through a nuts and bolts approach to making existing 1-4 family homes in cold climates more energy efficient. Join Larry Harmon in his no-nonsense approach to air barrier sealing, tighter envelopes, better insulation, and finding the energy waste in homes. Learn how to get the most bang for the buck and reap substantial increases in comfort, affordability, resource efficiency, health, safety, and durability. The presenter asks participants to send in their recent projects for use in the capstone part of the workshop. At the end, participants and the presenter brainstorm on the ways to fix the issues presented: this allows the participants to apply what they have learned.

Topic: DEEP Energy Retrofits(DER)

Notes: This workshop discusses effective deep energy retrofit strategies and the energy impact of each, involving super-insulation on the exterior of buildings. Strategies are also assessed on a cost-benefit basis. The workshop outline includes: What do deep energy retrofits look like? Why do we need to think about deep energy retrofits? What is the business model? Who's on the team, and what are their roles? Also, how to sell a deep energy retrofit, and planning the project. (Optional) hands-on case study.

Topic: Scorekeeping: Benchmarking and Monitoring Energy Performance

Notes: This workshop includes a discussion of the measurement of building energy performance, a review of rating systems (e.g., HERS, etc.), data collection and verification, modeling software (e.g. THERM, WUFI), and establishing a baseline for monitoring performance over time. It is intended to show how to reduce energy consumption to basic verifiable units that allow for easy cross-comparisons and accountability.

Topic: Strategic Energy Planning

Notes: This workshop includes taking a long-term look at the steps necessary to dramatically improve building energy performance and how a building or campus can realistically achieve an 80% reduction in energy usage by 2050. It examines the real cost of decisions by looking at the financial and environmental impact of these changes, moving the discussion away from a focus on "payback" as the dominant decision making criterion. It may also address balancing of energy efficiency and renewable power sources to achieve the most cost effective use of energy resources.

Topic: Solar Thermal

Notes: The workshop presentation will cover solar basics, solar water heating and solar space heating. As solar PV is an electrical system, solar thermal can be understood as a plumbing system or as a complement to the hot water systems in commercial and residential buildings and homes. The focus of this one-day workshop is on small to medium sized thermal systems specifically excluding large centralized thermal, concentration thermal or utility scale thermal projects. We look at flat-plate and evacuated tube thermal systems, and compare and contrast technology and applications. Solar thermal systems use the sun to heat fluids. In most cases the fluid is water, but students learn of large-scale applications where concentration techniques and convection medium other than water are required. The course begins with a look at the parts and nomenclature of non-utility thermal systems along with the related configuration of pumps, heat-exchanges, sensors, and tanks working together in productive thermal systems. The workshop focus is on learning fundamental design variables for sizing collectors, tanks and components to meet a thermal design output level for domestic hot water, space heat, or industrial hot water application. The solar portion studies methods for optimizing the solar resource for thermal systems. Collector orientation and tilt, expected energy projections, solar windows, plumbing work, use of the pathfinder tool for thermal, and other site analysis tools are introduced and passed around the class for examination. Students learn formulas and techniques for array orientation, row spacing, and where and how tracking systems should be applied. The mechanical portion of the PV workshop includes installing and constructing the thermal on the roof or ground where the collectors will be installed. Mounting hardware systems for both rooftop and ground racks are covered.

Topic: PV System Design

Notes: Designing solar photovoltaic systems requires expertise across three separate disciplines, electrical, solar, and mechanical. Photovoltaic (PV) systems are electrical systems. During this one-day workshop the electrical focus is on learning how PV modules generate electricity and how the PV designer uses series and parallel wiring techniques to manage voltage and amperage to meet the electrical goals of the system. The lesson includes I/V curves, grid-tied, off-grid systems with batteries, as well as inverters and charge controllers, meters, and performance monitoring software packages. The solar portion studies methods for optimizing the available solar resources. Lessons include solar pathways, solar windows, orientation of PV modules, Standard Test Conditions (STC), shadow analysis, use of the solar pathfinder and other site analysis tools. Students learn formulas and techniques for array orientation, row spacing, and where and how tracking systems should be applied. The mechanical portion of the PV workshop includes installing and constructing the PV system. Three mounting systems and designs are covered: ballast and bolt-down roof mounting, ground rack mounting, and pole mounting.

Topic: Passive House Training (PASSIVHAUS)

Notes: This training is on Passive House design and construction techniques that reduce heating energy consumption by roughly 90%. The training reviews site orientation and design to maximize passive solar gain, avoidance of heat gain through shading and window orientation, super-insulated air-tight envelope design, limitation of thermal bridging, high performance triple-glazed windows and day-lighting, miniature heating and cooling systems, energy recovery ventilators and a host of other strategies to deep energy reduction. In this workshop, the presenters (both Certified Passive House consultants) will:

- Describe the context and principals of Passive House design and construction;
- Provide an overview of the Passive House Planning Package and compare it with other residential modeling software;
- Present representative details of New England-appropriate Passive House design;

--Offer an overview of major components such as windows, mechanical equipment, and insulation materials that play critical roles in Passive House construction.

Topic: Home Energy Rating System (HERS) Training

Notes: This workshop teaches how to conduct a HERS rating of a residence, yielding a HERS Index rating score. The training includes how to conduct an energy analysis of a home's design and an on-site analysis, including a blower door test and duct test. The rating is based on the new HERS Index scoring system established by the Residential Energy Services Network (RESNET). The training is a prerequisite to the HERS certification.

Can be changed to be a broader topic such as:

"Picking a Path to Green: Residential Programs and Standards Compared" In this workshop, the presenters will: provide an overall context for the green building movement; compare the major green standards, programs, and concepts currently in the marketplace, such as LEED-H, Passive House, Energy Star, and Zero Net Energy; present case studies for each of several strategies and describe important resources required to implement these programs, such as software (REM/Rate, PHPP), hardware (data loggers, diagnostic tools, infrared), and essential websites and training opportunities.

Topic: Introductory Thermography

Notes: This training is a hands-on workshop on thermography—or infrared scanning—to detect thermal defects and air leakage in building envelopes. On-site thermographic inspections will demonstrate how energy auditors and contractors can best decide what method will yield the best result in insulating and air-sealing a building. They also serve as a quality control tool to ensure that insulation is installed correctly.

Topic: Must Do Green

Notes: This training discusses 10-20(?) profound changes that we must make in high performance building design and construction. It is the "Must Do" list if we are to achieve major reductions in energy consumption. Failure to do any item on the list and your client will literally be paying for it for decades. The training also addresses the flip side-of the 10-20(?) stupidest practices that we should retire forever, including over-sized HVAC systems, etc...