

HOUSES THAT WORK FOR EXISTING HOMES --
Remodeling for Energy Efficiency Workshop
Description and Activity Plan

Title:

**Houses That Work for Existing Homes
"Remodeling for Energy Efficiency"**

This workshop will explore cost-effective opportunities to implement energy efficient and green technologies and strategies into remodeling projects for existing homes. The fundamentals of building science - air, heat and moisture flow – will be applied to help participants understand how elements of a house all work together as a system and how this knowledge can be used by remodelers to reduce risks and find the most cost-effective energy improvements for individual homes. The workshop format recognizes that many remodeling projects are done as specific and discreet projects such as window replacement, roofing, siding or a kitchen remodel. Participants will learn to identify energy efficient and green opportunities for specific sectors of the remodeling industry of interest to them, but always in the context of whole house opportunities and embracing building science best practice. Throughout the workshop, strategies, techniques and products will be demonstrated that simultaneously improve the comfort, durability, safety, health and energy efficiency of existing homes. The workshop will also help participants identify key process changes that are required to take advantage of green opportunities and the resources available to them to assist in those process changes such as utility, industry and government programs, supportive manufacturers, energy raters and other training opportunities.

By the end of the session participants will have a thorough understanding of how to implement energy efficiency improvements properly and cost effectively into every remodeling project they undertake.

Relevance to Attendees:

The workshop will be of most interest to at least the following groups:

- General contractors who focus their business on the residential remodeling sector
- The many specialty or specific remodeling sectors:
 - Kitchen and bath replacement companies
 - Siding and roofing contractors
 - Foundation and waterproofing remediation contractors
 - Insulation and weatherization contractors
 - Window replacement contractors
 - HVAC replacement contractors
- Real estate agents
- Building supply and manufacturing sales people who sell components to remodelers
- Utility and housing program officials who promote weatherization programs.

This workshop has been developed to recognize and adapt to the needs of the varied climatic regions and business practices across the United States.

The workshop is based on widely accepted industry information such as the ENERGY STAR Home Advisor program, LEED for Homes, local weatherization programs and manufacturers' best practice guides. The products, techniques and strategies presented adhere to industry best practice principles.

Learning Objectives:

- Learn the fundamentals of air, heat and moisture flow and see how they can be applied to remodeling existing homes to make them more efficient, safe, healthy, durable and comfortable.

- Apply the building science to common remodel projects such as roofing, re-siding, weatherization, kitchen & bath replacements, windows, foundation & basements and HVAC upgrades.
- Identify process changes needed to cost effectively implement energy efficiency in remodel projects
- Learn about the successes of other remodelers who have benefited from implementing energy efficiency objectives into remodel projects.

Houses that Work for Existing Homes– Remodeling for Energy Efficiency
Curriculum Outline & Activity Plan

6.50 Hours of teaching time

Segment	Activity Plan	Timing
<p><u>Introduction to EEBA and the Remodeling Workshop</u></p> <ul style="list-style-type: none"> • What EEBA and the ENERGY STAR Advisor programs do • Relevance of the Houses That Work Program • EEBA publications and education • The EEBA Conference • Introduction of speaker and sponsors 	<p>Facilitator has sponsors and participants introduce themselves and asks participants what prompted their interest in today’s session.</p>	<p>15 min</p>
<p><u>The Basics – Building Science Principles</u></p> <ul style="list-style-type: none"> • In this segment participants learn how each change in existing homes over the years impacts other parts of a home and affects overall performance. These effects are very important as more and more houses will undergo significant energy efficiency improvements. This segment outlines the basic building science physics of air, heat and moisture flow that everyone involved in remodeling needs to know to avoid risks and take advantage of opportunities presented by energy efficient remodeling projects. <p>Topics covered in this segment include:</p> <ul style="list-style-type: none"> • Local Issues and the complicated business of remodeling • Looking to Building Codes as the Answer • The Forces of Nature • The Definition of Durability • What Rules Must Be Followed • Building Science Fundamentals <ul style="list-style-type: none"> Heat Flow - Conduction, Convection, Radiation Air Flow - Wind, stack, mechanical Moisture Flow - Liquid, solid, vapor Air Tightness & Moisture Flow <p>Case studies of remodel projects that affected the performance of seemingly unrelated other parts of a home will be discussed by participants.</p> <p>Participants will be reminded of the need to always consider the total system effects their work may have on the overall performance of houses.</p>	<p><u>Small Group Exercise:</u> Participants work in groups to identify changes that may be undertaken in existing homes over the years.</p> <p><u>Lecture:</u> Facilitator will review the building science principles</p> <p><u>Small Group Exercise:</u> Groups answer questions related to typical remodel projects & the effects they have on other parts of homes.</p>	<p>75 min</p>

<p><u>Common Remodel Projects & Opportunities for Energy Efficiency Upgrades</u></p> <ul style="list-style-type: none"> In this segment building science principles will be applied to the most common remodel projects that houses of various ages undergo. The common project list will vary by region and by type of participants. The facilitator will ensure that the list offers a fair representation of the overall remodel industry. <p>Remodel Projects to be Covered Include:</p> <ul style="list-style-type: none"> Re-roofing and Re-siding Window replacement Additions and major structural changes Foundations, basements & crawlspaces Weatherization and insulation Kitchen and Bath replacements HVAC replacements and upgrades Landscaping projects <p>For each project, the facilitator will outline the building science principles that apply and the important elements needed to ensure the project enhances safety, durability, health, comfort and efficiency of the home. The facilitator will help identify performance measures that can be applied to each project to ensure success. The facilitator will help identify technologies, products, strategies that are most appropriate for each remodel project and how they can be integrated into the process. This could include demonstrations of products from sponsors.</p> <p>Participants will complete a chart and discuss the most important energy saving opportunities for each type of remodel project.</p>	<p><u>Large Group Exercise:</u> Participants will help identify the most common remodel projects undertaken in existing homes in their area.</p> <p><u>Lecture:</u> Facilitator will review each project & the building science principles that apply</p> <p><u>Demonstrations:</u> Products & techniques that are useful.</p> <p><u>Small Group Exercise:</u> Groups identify the most cost effective energy efficient measures for common remodel projects.</p>	<p>150 min (15 min per project + 15 min. for intro. & review)</p>
<p><u>Lunch</u></p>		
<p><u>Common Remodel Projects</u> (Continued)</p>		
<p><u>Evaluating Energy Efficiency Opportunities in Remodeling</u></p> <ul style="list-style-type: none"> In this segment participants will learn the basics of how energy efficiency audits and performance measures can be used to evaluate and prioritize energy efficiency upgrades to use in individual homes <p>Topics covered in this segment include:</p> <ul style="list-style-type: none"> The role of energy raters and building performance contractors The role of Building Performance contractors The role of testing such as blower doors, IR cameras, duct leakage and HVAC performance measures The use of HERs ratings and other objective measures of performance 	<p><u>Lecture:</u> Facilitator will review the various performance measures that can be used to help prioritize energy upgrades.</p>	<p>30 min</p>

<p><u>Avoiding Pitfalls – the Risks and Challenges of Remodel Projects</u></p> <ul style="list-style-type: none"> • In this segment participants will review the important risks to avoid when remodeling that could compromise health, safety or durability of buildings. • Participants will be given case studies of various issues that have cropped up as the result of a remodel project and be asked to resolve them 	<p><u>Short Lecture:</u> Facilitator outlines risks and challenges</p> <p><u>Case Studies:</u> Participants are given examples of remodel issues they have to resolve.</p>	<p>30 min</p>
<p><u>Deep Energy Retrofits</u></p> <ul style="list-style-type: none"> • In this segment participants will learn about very deep energy retrofits on existing houses. The facilitator will outline what are the priorities to deep energy retrofits and how participants could learn to create a plan for such a project. • An example of a deep energy retrofit will be reviewed 	<p><u>Short Lecture:</u> Facilitator outlines a deep energy project</p>	<p>30 min</p>
<p><u>The Economics of Energy Efficiency Upgrades</u></p> <ul style="list-style-type: none"> • In this segment participants will learn how energy efficiency upgrades offer an excellent return on investment. They will be given examples of remodel project costing showing the incremental cost of adding energy efficient upgrades. They will be asked to calculate the ROI for the upgrades. • The facilitator will engage the audience to identify local or national incentive programs that are available to improve the ROI of energy efficiency measures. 	<p><u>Small Group Exercise:</u> Participants work with project costing examples to identify ROI.</p> <p><u>Short Lecture:</u> Facilitator outlines incentives available</p>	<p>20 min</p>
<p><u>The Process Changes Needed to Implement Energy Efficient Upgrades</u></p> <ul style="list-style-type: none"> • In this segment participants will see examples of successful remodel projects and how the contractors implemented the energy efficiency upgrades. • The facilitator will help participants identify resources available to them, such as utilities, energy raters, manufacturers, etc. 	<p><u>Short Lecture:</u> Facilitator outlines implementation strategies</p>	<p>20 min</p>
<p><u>Summary and End of Workshop</u></p> <p>Participants are asked to consider what next steps they will need to take to ensure they practice and use the information presented.</p>	<p><u>Question & Answer:</u></p>	<p>10 min.</p>