Improving Energy Efficiency in Existing Buildings

- ☑ Building enclosure retrofits
- ☑ Alternative energy sources
- ☑ Building energy codes
- ☑ Benefits of LEED certification
- ☑ Federal incentives for energy-efficient buildings

For building owners and managers, facility designers and builders, and utility program managers

October 22–23, 2009
Madison, Wisconsin

THE UNIVERSITY of WISCONSIN MADISON

Department of Engineering Professional Development
432 North Lake Street Madison, Wisconsin 53706

Please route this brochure to colleagues who would also benefit by attending.

THE UNIVERSITY of WISCONSIN MADISON

College of Engineering
Department of Engineering Professional Development

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Enroll today to succeed tomorrow

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Energy Efficiency: Today's Imperative

Our homes, workplaces, and commercial and public buildings consume nearly 50% of the nation's total energy. The energy needed to make up for its loss through the building enclosure, resulting from heating and cooling requirements, accounts for the bulk of the consumed energy.

Existing buildings, especially older ones that generally are energy-inefficient, are posing major challenges to energy-conscious building owners who rely on designers and builders for solutions to improve building enclosure and building systems performance. Excessive and wasteful energy use affects not only costs of building operation and future energy costs but also the rate of energy consumption and depletion nationwide.

Attend and Benefit

This practical course is your opportunity to focus on key areas contributing to efficient energy use in existing buildings. Building owners and managers must be familiar with the benefits derived from efficient energy use. Utility program managers must understand energy demand and distribution issues. Designers and builders must have a clear understanding of energy technology and possess skills in its implementation.

While addressing energy-use issues in new construction can be dealt with in a relatively straightforward manner, improving energy use in existing buildings can be highly challenging. Due to the many existing buildings, however, responding to this challenge can result in the most significant gains in energy use and conservation.

What You Will Learn

Our expert instructors will share with you highly pertinent and practical information pertaining to:

- Increased thermal resistance, vapor permeability behavior, and airflow networks
- Energy-efficiency upgrades in mass wall, frame wall, and roof construction
- Foundation repair and retrofit for energy-use effectiveness
- Performance of mechanical systems to support efficient energy use
- Energy sources for existing buildings
- Codes and other regulatory constraints governing the energy use in existing buildings
- Benefits of LEED-EB certification
- Federal incentives for improving energy efficiency in existing buildings

Who Will Benefit

This practical course will upgrade the proficiency of individuals involved in improving energy efficiency of existing buildings. The course addresses key energy use and conservation aspects of importance to decision makers at all levels of project design and construction. It also provides effective guidelines to individuals who are responsible for implementing energy conservation measures in existing facilities. The course is geared specifically to

- Building owners and managers
- Facility designers and builders
- Consultants in building systems
- Utility demand-side program managers

Valuable Take-Home Materials

As an attendee you will receive a course notebook containing materials relating to the course sessions. These materials will serve as a useful reference to you and your organization.

Expert Faculty

Your course instructors are nationally recognized, highly experienced practitioners and consultants on energy use and conservation issues. They will share with you their many years of experience gained from their extensive involvement in developing energy use policies and from numerous energy retrofit projects.

During the course question-and-answer periods, you will have an opportunity to bring up your own energy-related problems and issues. You will also be able to exchange ideas with the speakers and your fellow participants during the refreshment breaks and the luncheon periods. Take advantage of this opportunity to learn from leaders in the field and from other participants.

Continuing Education Credit: This Course

This course qualifies toward professional licensing requirements in many states: check with your local state licensing board.

University of Wisconsin:
1.2 Continuing Education Units (CEU)

American Institute of Architects (AIA):
12 Learning Units (LU); qualifies for HSW credit

Engineering Professionals: 12 Professional Development Hours (PDH)

About Us

For 60 years, leading practitioners in architectural engineering and construction have been attending the University of Wisconsin–Madison's Engineering Professional Development continuing education courses. Our courses are designed for professionals at all levels who seek the knowledge and skills necessary to increase their effectiveness or advance their careers. Our in-house faculty members direct our courses. Experienced professionals from private and public sectors serve as instructors. While the majority of our courses are held in Madison, Wisconsin, we do structure customized courses for different organizations when requested.

Improving Energy Efficiency in Existing Buildings

Course Outline

Thursday, October 22

8:00 Registration
The Pyle Center
702 Langdon Street
Madison, Wisconsin

8:30 Welcome and Introduction
Raymond C. Matulionis PhD, AIA
Program Director
Engineering Professional Development
University of Wisconsin–Madison

8:45 Understanding the Physics of Retrofits—Factors Dominating Retrofit Strategies for Institutional, Residential, and Commercial Buildings
- Significant increases in thermal resistance
- A reduction in vapor permeability of external and internal linings
- An increase in the water and mold sensitivity of materials
- An order of magnitude reduction in the hygric buffer capacity of enclosures
- The presence of complex three-dimensional airflow networks that couple building enclosures to the breathing zone of conditioned spaces

Joseph Lstiburek PhD, PEng
Principal, Building Science Corporation

Mass Wall Retrofits—Internal Retrofits and External Retrofits
- Understanding changes to the energy and moisture balance
- Addressing osmosis and freeze-thaw concerns
- Possible implementation approaches

Joseph Lstiburek PhD, PEng

12:00 Lunch

1:00 Frame Wall Retrofits—Re-skinning Residential Buildings
- Adding insulation
- Dealing with openings
- Placement of air barriers or vapor barriers

Joseph Lstiburek PhD, PEng

Foundation Repair, Rehabilitation and Deep Retrofit
- Approaching the problem from outside or inside
- Methods for slab insulation

Unvented Roof/Attic Retrofits
Joseph Lstiburek PhD, PEng

Rethinking Mechanical Systems
- Understanding the interaction of mechanical systems with the building envelope
- Addressing heating/cooling, humidity, and ventilation requirements
- Recommendations for retrofitting HVAC systems to improve energy efficiency in existing buildings

Joseph Lstiburek PhD, PEng

5:00 Adjourn for the Day

Friday, October 23

8:00 Applying Renewable Technologies to Existing Buildings
- Integrating energy use with building envelope improvements
- Sorting out biomass alternatives
- Ground source heat pumps – using the earth's mass
- Considering solar, thermal, and photovoltaic systems
- When does the use of wind power make sense?

David L. Osborn MEPP, CEM
Engineering Specialist/Sustainability Program Manager, Wisconsin Division of State Facilities

10:00 Building Energy Codes—Past, Current and Future for Existing Buildings
- A brief review of past energy codes and enforcement
- Current status of national and state energy codes for existing buildings
- International Energy Conservation Code
- International Existing Building Code
- ASHRAE 90.1
- New codes – 2009 and 2010
- Future code directions

John A. Spalding
HVAC and Energy Matrix Chief, Wisconsin Safety and Buildings Division

12:00 Lunch at The Pyle Center

1:00 Energy Efficiency's Connection to LEED for Existing Buildings
- Why is LEED-EB certification beneficial?
- What the LEED-EB process is
- How energy efficiency improvements tie into LEED-EB
- Other key factors to consider when thinking about LEED-EB

Dirk Mason LEED AP
Director, LEED Services, Leonardo Academy

2:30 Federal Incentives for Energy-Efficient Buildings
- Available tax deductions and tax credits to support the construction or retrofitting of buildings to improve energy efficiency
- Understanding federal incentives
- Approaches to obtaining federal support

David J. Jenkins
Director of Commercialization and Market Development, Wisconsin Office of Energy Independence

4:00 Final Adjournment
Note: There will be midmorning and midafternoon breaks both days.

Course Speakers

David J. Jenkins, Director, Commercialization and Market Development, Wisconsin Office of Energy Independence, Madison, WI

Mr. Jenkins' current responsibilities include expanding markets for renewable energy in Wisconsin, assisting entrepreneurs and businesses in commercializing new fuel and power technologies, and helping to direct federal and state funding to increase Wisconsin's renewable resources. Formerly, he managed the state's second-largest chain of independently owned fuel outlets and convenience stores. He also served as the manager of the Wisconsin Electric Cooperative Association.

Joseph Lstiburek PhD, PE, ASHRAE Fellow, Principal, Building Science Corporation, Westford, MA

Dr. Lstiburek is a building scientist who investigates building failures and is internationally recognized as an authority on moisture control related to building problems and indoor air quality. He is a contributor and reviewer of Ch. 21 and 22 of *ASHRAE Fundamentals* and serves on a number of its committees. He is one of the world's foremost authorities on energy-efficient construction techniques and heads one of the four Building America program teams for the U.S. Department of Energy. Mr. Lstiburek is a building science researcher affiliated with the Centre for Building Science, University of Toronto and is former director of research of the Housing and Urban Development Association of Canada. He is the author of numerous books and technical papers.

Dirk Mason LEED AP, Director, LEED Services, Leonardo Academy, Madison, WI

With a focus on LEED for existing buildings, Mr. Mason manages the delivery of Leonardo Academy's gap analysis, implementation, certification and technical consulting services to the United States Green Building Council. He has conducted LEED-EB gap analysis on more than 24 million square feet and has managed the certification of approximately 10 million square feet. Mr. Mason brings to this course 10 years of project management experience in planning, development, and construction in the public, private and non-profit sectors with a focus on implementing sustainable building technologies and practices within the built environment.

David L. Osborn MEPP, CEM, Engineering Specialist/Sustainability Program Manager, Division of State Facilities, Wisconsin Department of Administration, Madison, WI

Four Easy Ways to Enroll

Internet:
http://epd.engr.wisc.edu/webK935

Phone:
800-462-0876 or
608-262-1299 (TDD 265-2370)

Mail to:
Engineering Registration
The Pyle Center, Dept. 106
702 Langdon Street
Madison, Wisconsin 53706

Fax:
800-442-4214 or
608-265-3448

Course Information

- ❑ Please enroll me in **Improving Energy Efficiency in Existing Buildings**
  Course #K935 October 22–23, 2009 in Madison, WI Fee: $995
  Team Discount: $895 each when two or more enroll from the same organization
- ❑ I cannot attend at this time. Please send me brochures on future courses.

Personal Information (Please print clearly.)

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone (_____) _____ Fax (_____) _____

E-mail _____

Additional Enrollees

Name _____

Title _____

E-mail _____

Name _____

Title _____

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With extensive experience in energy management and as sustainability program manager, Mr. Osborn is involved in solar, wind, geothermal, and energy efficiency projects for state facilities. Formerly, he led one of the most successful energy conservation programs in the Department of Defense (DOD) and contributed significantly to major energy efficiency and renewable studies in partnership with three DOE labs, the Army's Construction Engineering Research Lab (CERL), and numerous consultants. His awards include four Federal Energy Management Program awards and an individual award from the Secretary of the Army. He was recognized as federal energy champion in 2008.

John A. Spalding, HVAC and Energy Matrix Chief, Safety and Buildings Division, Wisconsin Department of Commerce, La Crosse, WI

As matrix chief for Safety and Buildings, Mr. Spalding provides code interpretation and code development for statewide building plan review and inspection of all commercial and residential buildings. Prior to working for the State of Wisconsin, Mr. Spalding spent 35 years as an architect in private practice. He serves as an instructor at the UW–Madison workshop, *Wisconsin Commercial Building Code Refresher*, the region's largest forum bringing together architects, planners, and engineers.

Need to Know More?

Call toll free **800-462-0876** and ask for

Program Director:
Raymond C. Matulionis PhD, AIA
matulionis@engr.wisc.edu

Program Associate:
Sherry Daly

Or email **custserv@epd.engr.wisc.edu**

General Information

Fee Covers Notebook, course materials, break refreshments, lunches, and certificate.

Cancellation If you cannot attend, please notify us by October 15, and we will refund your fee. Cancellations received after this date and no-shows are subject to a $150 administrative fee. You may enroll a substitute at any time before the course starts.

Location The Pyle Center, 702 Langdon Street, Madison, Wisconsin. Phone messages: 608-262-1122.

Accommodations

We have reserved a block of sleeping rooms at a reduced rate for course participants at the Campus Inn, 601 Langdon Street in Madison. To reserve a room, call 800-589-6285 or 608-257-4391 by September 25 and mention group code #89951, "Improving Energy Efficiency".

A second block of rooms at a reduced rate has been reserved at the Madison Concourse Hotel and Governor's Club, One West Dayton Street in Madison. To reserve a room, call 800-356-8293 or 608-257-6000 by October 3 and mention group code #41021.

After room block expiration dates, rooms will be subject to availability, although accommodations should be available in these or nearby hotels until the course dates.

We strongly recommend that you reserve a hotel room without delay. You can always cancel your reservation without penalty by notifying the hotel 24 hours before your arrival (check hotel for specifics). For those not staying at the above hotels or other hotels in the area, there is a parking garage on Lake Street, one block from The Pyle Center.

Your enrollment confirmation will include other hotel information.