LaFrance Urges Industry to Support Highly Insulating Windows

Marc LaFrance

In fiscal year 2010 the administration is requesting $10.5 million for the Department of Energy's (DOE) Windows program—a $5.5 million increase from last year. This is according to the DOE's Marc LaFrance who spoke before members of the American Architectural Manufacturers Association in June during the association's summer meeting.

"That's a very significant increase," said LaFrance. And it's one that creates a lot of opportunities for manufacturers. He also mentioned that the Office of Energy Efficiency and Renewable Energy is requesting $2 billion for research.

"We're anticipating a large amount of that money to go toward windows research," he said.

LaFrance discussed a variety of subjects relating to the DOE's programs, including new products coming down the pipeline.

"In the future we're looking at an R10 window, maybe vacuum glazing as well," he said. "We will see dynamic windows as a viable option in the years to come."

He pointed out though that for the near term the DOE's goal is an affordable R5 window in the marketplace.

"We're trying to identify and organize buyer groups in the government and private sector," he said.

He also said that while the industry speaks in terms of U-factors, "for the

NBI, AIA Propose Changes to IECC to Help Buildings Save on Energy Costs

The New Buildings Institute (NBI) and the American Institute of Architects (AIA) are proposing comprehensive changes to the International Energy Conservation Code (IECC) for new commercial buildings that would help create buildings that are 20- to 25-percent more energy-efficient than what today's average standards require. The groups submitted their proposal to the International Code Council (ICC) June 1 for consideration in the current code development process.

According to an announcement from NBI and AIA, the proposed high-efficiency energy code is modeled on NBI's Core Performance protocol, a direct and prescriptive approach to achieving energy savings in commercial buildings. Building codes based on core performance have already been adopted by the Commonwealth of Massachusetts and are under consideration by other states and municipalities.

"In co-authoring this proposal, it was our intention to make sure that the new energy codes would be stringent enough to advance our stated goal of achieving carbon neutrality in buildings by 2030," says Christine McEntee, executive vice president and chief executive officer of AIA. "We feel it is important for the private sector to take a leadership position on this important issue that relates to the built environment."

The high efficiency energy code proposal contains specific measures and strategies designed to allow designers and builders to use widely available equipment and products. These include:

- **Building envelope:** The proposal incorporates insulation standards that have been used in utility programs or adopted into recent national model codes. The doors and windows are specified to provide a certain insulation value while also keeping out excess heat that increases air conditioning costs.
- **Heating/cooling:** The proposal provides for improved design of air distribution systems and increased efficiency levels in heating and cooling equipment.
- **Lighting:** Energy consumption is reduced by placing high-efficiency lighting fixtures, ballasts, and bulbs in work and public areas in commercial buildings. Lighting controls, such as occupancy and daylight sensors, also reduce wasted energy.
- **Quality assurance:** The proposal specifies testing or commissioning processes for key building energy systems.
- **Renewable power:** The proposal offers options for using renewable power to meet part of the energy savings objective.

layman, Congress, etc., they understand an R-value better."

In an interesting statement, LaFrance said that he disagrees with his colleague at the DOE, Richard Karney, program manager for the ENERGY STAR windows program, concerning phase 2 of ENERGY STAR.

"I personally think we should hold off on phase 2," LaFrance said. He said that doing so would allow the "triple-pane market to mature."

"It's time to move beyond double-pane," he added. "We need to support highly insulating windows beyond the tax credits."

Green Construction Code Could Reduce Carbon Footprint

Buildings consume approximately 40 percent of energy used and produce about the same amount of the nation's carbon emissions, so finding ways to increase energy efficiency has become top priority for many with ties to the commercial glazing industry.

The International Green Construction Code (IGCC) initiative, launched by the International Code Council (ICC), is just one opportunity designed to help reduce energy usage and the carbon footprint of commercial buildings. Titled "IGCC: Safe and Sustainable By the Book," the initiative is focused on developing a model code for new and existing commercial buildings.

"We believe the time has come for us to develop a code that will stand as a useful and credible regulatory framework for creating a greener commercial building stock," says ICC chief executive officer Richard P. Weiland. "We applaud and plan to utilize the good work of those who have developed systems, guidelines and standards to address green buildings."

Some glass industry organizations say the ICC's move to develop a green code is a positive step toward an increased use in energy-efficient glass.

"As the move toward energy-efficient green technologies continues with efforts such as this ICC green codes initiative, the opportunities for increased glass usage in construction will only expand," says Stanley Yee, chair of the GANA: Energy Committee. "We will continue to drive these opportunities through our own committee and look forward to providing the world with a better daylighting, energy efficient experience in the future."

www.iccsafe.org/IGCC

New Study Connects Energy-Efficiency to Green Building

According to a study recently released from management consulting firm McKinsey & Company, investing in the energy-efficiency of buildings, such as through high-performance glass and window materials, represents a powerful and strategic energy and climate solution that, combined with other non-transportation initiatives, could reduce the nation's energy consumption by 23 percent by 2020, save the U.S. economy $1.2 trillion and reduce greenhouse gas emissions by 1.1 gigatons annually. Titled, "Unlocking Energy Efficiency in Today's Economy," the study examines different means by which the United States could realize greater energy efficiency in several areas—including commercial construction.

According to the study, "the commercial sector will consume 20 percent of the 2020 baseline end-use energy [and] consumption is forecast to grow by 1.5 percent per year from a baseline of 6.7 quadrillion BTUs of end-use energy in 2008 . . ." In researching the commercial sector, the study looks at ten building types: Office; retail; education; lodging; healthcare; assembly; food service; warehouse; food sales; and other. These were then organized into five clusters based on shared barriers and attributes [to energy efficiencies]: Existing private buildings; government buildings; new private buildings; office and non-commercial devices; and community infrastructure.

Looking at existing private buildings specifically, the study says these structures will likely account for 2,866 trillion end-use BTUs of energy consumption by 2020. Of the barriers to greater energy efficiency in this segment, the study lists one as being "lack of awareness or information."

"Many facility managers are unaware of the energy efficiency potential with the belief that the building is already energy-efficient. Furthermore, they often possess limited knowledge of energy-efficiency measures and ways to deploy them within their facilities, including the critical role that proper design and installation play in capturing savings," the study says.

Creating value with voluntary standards is one solution the study offers for overcoming such barriers.

"Buildings meeting an efficiency standard show a 6-percent premium in effective rent and a 16-percent premium in valuation over similar non-energy-efficient buildings. The benefits provided by adherence to a voluntary standard, applied to both buildings and commercial equipment, could help manage agency issues by offering financial returns for investments through increased rent and raising awareness of the benefits of efficient buildings."

In the privately owned new buildings

segment, the study cites ineffective installation and lack of commissioning as barriers.

"Developers have little incentive to ensure that contractors install equipment optimally or commission buildings properly," the study reads. "As a result, some buildings perform below the levels called for in building codes: research has found that as many as 20 to 30 percent of buildings designed to meet the ASHRAE 1999 standard did not meet the building shell and lighting requirements."

The study suggests mandatory building codes as a solution strategy.

"Only two states have adopted the latest commercial building code, while 13 states have either not adopted a statewide code or continue to use codes that are more than three years old. The 2007 ASHRAE standard represents a 32-percent efficiency improvement over the 1980 level. States adopting the most recent ASHRAE standard, 90.1-2007, would reduce energy consumption in new buildings by 11 percent relative to the current code levels."

"Increasing our nation's energy efficiency is an economic, environmental and national security imperative that requires bold public policy," says Rick Fedrizzi, president, chief executive officer and founding chairperson of U.S. Green Building Council, a sponsor of the study. "As Congress debates climate change legislation, these findings make an overwhelming case that we must dramatically strengthen provisions that support and scale green building."

"Stretch" Energy Code in Massachusetts Could Mean More High-Performance Glazing Installations

A recently adopted code change, proposed by the Commonwealth of Massachusetts, could help spur increased use of high-performance glass and window systems in both commercial and residential applications. Appendix 120.AA, known as the "stretch" code, is an optional appendix to the Massachusetts Building Code 780 CMR that was applied as of August 1, 2009. The stretch code is similarly based on the 2009 International Energy Conservation Code (IECC), which will become the base energy code in 2010, but with approximately 20 percent greater building efficiency requirements, and a move toward third-party testing and rating of building energy performance.

The stretch code applies a performance-based code to commercial buildings, with a prescriptive code option for small- and medium-sized buildings (5,000 to 100,000 square feet). Buildings smaller than 5,000 square feet, as well as building renovations and "specialty" buildings such as supermarkets, warehouses and laboratories that are fewer than 40,000 square feet, are exempt. The prescriptive code option is based on Chapter 5 of the 2009 IECC and adds efficiency improvements to a number of areas, including the building envelope, as well as an option for onsite renewable energy, such as photovoltaics.

New residential buildings three stories or less will be required to meet an energy performance standard using the Home Energy Rating System (HERS). This index scores a home on a scale where 0 is a zero-net-energy home and 100 is a code-compliant new home (currently based on the IECC 2006 code). The stretch code requires a HERS index of 65 or less for new homes of 3,000 square feet or more and 70 or less for new homes below 3,000 square feet (including multi-family units in buildings of three stories or fewer). A HERS index of 65 means that the home is estimated to use 65 percent as much energy as the same home built to the 2006 energy code, or a 35-percent annual energy savings.

Under Section 502 - Building Envelope Requirements, the appendix sets a U-factor of 0.42 for metal framing with or without a thermal break (curtainwall/storefront); the solar heat gain coefficient for all building envelope fenestration products is set at 0.40. For skylights, though, the limit is set at 3 percent of the roof area, but can be expanded to 5 percent of the roof area in conjunction with automatic daylighting controls.

In addition, the appendix says curtainwall, storefront glazing and commercial-glazed swinging entrance doors and revolving doors must be tested for air leakage at a pressure of at least 1.57 pounds per square foot in accordance with ASTM E 283. For curtainwall and storefront glazing the maximum air leakage rate is 0.06 cubic foot per minute per square foot (cfm/ft^2) of the fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate is 1.00 cfm/ft^2 of the door area when tested in accordance with ASTM E 283.

In addition, the air leakage of window, skylight and door assemblies will be set in accordance to AAMA/WDMA/CSA 101/I.S.2/A440 or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Window and skylight air leakage cannot exceed 0.2 cfm/ft^2 at 1.57 pounds per square foot, or 0.3 cfm/ft^2 at 6.24 pounds per square foot. Door assembly air leakage must not exceed 0.3 cfm/ft^2 for all other products at 1.57 pounds per square foot. ■