CENTER FOR ENVIRONMENTAL INNOVATION IN ROOFING

THE ENERGY-EFFICIENT COMMERCIAL ROOFS ACT OF 2009

As an incentive to reduce the energy used in commercial buildings, the Center for Environmental Innovation in Roofing and the Polyisocyanurate Insulation Manufacturers Association (PIMA) support legislation that would provide a new, 30 percent tax credit for energy-efficient roofs installed on new and existing commercial buildings and high rise residential buildings. Commercial buildings account for 18% of the energy use and CO_2 emissions in the United States. The tax credit would cover energy-efficient roofs placed in service from 2009 through 2013. Also, the credit would be available to low-slope roofs where the insulation is installed entirely above deck, a roof category that covers approximately 62% of the existing commercial building floor space.

Under this legislation, a qualified roof is defined to require minimum R-values that, on average, are at least 75% more stringent than the R-values required under state and local building codes used today. R-value is a measurement of thermal resistance and is commonly used to describe the level of insulation in building walls and roofs – the higher the R-value, the greater the insulating effectiveness. Most state and local building energy codes currently require low-slope roofs to have R-15. Under this legislation, the required R-values would range from R-20 in the far south to R-35 in the far north. Buildings in Baltimore (climate zone 4), for instance, would be required to have R-25 in order to qualify for the tax credit. The R-values chosen for this legislation are set at levels to achieve maximum energy efficiency without being so costly that building owners would ignore the credit.

A recent report prepared by Bayer MaterialScience using DOE's EnergyPlus simulation software and modeling 10 categories of commercial buildings in 13 different climates concludes that significant energy savings and CO2 emission reductions can be achieved through higher insulation levels in commercial building roofs. 1/ Based on the Bayer report, the energy saved over a 5- and 20-year time period would be 0.08 quads (0.17 quads of source energy) and 0.47 quads (1.03 quads of source energy), respectively. The 5- and 20-year cumulative energy cost savings would be $1.2 billion and $10 billion, respectively. 2/ The reduction in CO2 emissions, based on source energy, over a 5- and 20-year time period would be 12.2 million metric tons (MMT) and 73.5 MMT, respectively. The 73.5 MMT is equal to

1/ Energy and Environmental Impact Reduction Opportunities for Existing Buildings with Low-Slope Roofs (April 2009), Jerry Phelan (Project Leader), George Pavlovich, Eric Ma.

2/ One quad is equal to one quadrillion Btu, about 1% of the total U.S. energy consumption in 2005.

816 Connecticut Ave, NW
Fifth Floor
Washington, DC 20006
Toll Free 866.928.CEIR
Phone 202.380.3371
Fax 202.380.3378
www.RoofingCenter.org

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the CO2 emissions from an average coal-fired power plant over 16 years. The Bayer report only considers the impact of roof replacements on existing buildings. However, the legislation would cover new and existing buildings, which would result in benefits that are approximately 15% to 25% higher then what is estimated in the report prepared by Bayer MaterialScience.

In addition, two reports published in 2007 by the National Renewable Energy Laboratory (NREL) for the Department of Energy support Bayer's findings. The first report, Assessment of the Technical Potential for Achieving Net Zero-Energy Buildings in the Commercial Sector, determined that building energy use could be reduced approximately 6.6% by following roof and wall insulation levels required under the proposed ASHRAE Standard 189, which are similar to the levels required under this bill, instead of the levels that are in common use today. 3/

The second report, Technical Support Document: Development of the Advanced Energy Design Guide for K-12 Schools—30% Energy Savings, shows that energy use in a typical K-12 school could be reduced by 6% to 11%, depending on climate area, by increasing roof R-values to levels similar to what would be required under the proposed tax incentive. 4/ Although school buildings would not be affected by this incentive, these findings are relevant to other one- and two-story commercial buildings (65% of all U.S. commercial floor space is in buildings under three stories high).

As demonstrated in these reports, roof insulation levels have an important impact on the amount of energy used in our commercial building stock. However, the roof insulation levels required under almost all of the state and local building energy codes currently in use were set two decades ago. Progress in this area is on the horizon, but the pace of change is likely to be slow. If policy makers want to promote the rapid improvement in building energy efficiency that is necessary to achieving the net-zero energy goals for commercial buildings that were set out under section 422 of the Energy Independence and Security Act of 2007, then a tax incentive like the one proposed here is key.

3/ Assessment of the Technical Potential for Achieving Net Zero-Energy Buildings in the Commercial Sector (December 2007), B. Griffith, N. Long, P. Torcellini, R. Judkoff, D. Crawley, and J. Ryan (pages 74-75)

4/ Technical Support Document: Development of the Advanced Energy Design Guide for K-12 Schools—30% Energy Savings, (September 2007), S. Pless, P. Torcellini, and N. Long (pages 141-145)