

**Daniel J. Desmond
Deputy Secretary for Energy and Technology Deployment
Pennsylvania Department of Environmental Protection**

**Testimony before the
House Environmental Resources and Energy Committee
September 13, 2005**

Chairman Adolph, Chairman George, and members of the committee, on behalf of Secretary McGinty, I would like to thank you for inviting me to offer testimony regarding the increasingly important topic of "Green Buildings" and for inviting the Department of Environmental Protection to share our thoughts with you.

In this age of spiraling energy costs, we believe adherence to Green Building standards can prove extremely valuable for government agencies, residents, businesses, and others grappling with the increased burden that rising energy costs place on their maintenance and operating budgets. That burden will likely continue to rise. Even before Hurricane Katrina, the US Energy Information Administration was predicting a 16% increase in national heating oil costs this winter over last year. Now, with substantial damage to the nation's oil producing and refining capacity in the Gulf of Mexico as a result of the hurricane, that figure has risen. As of the week ending Sept. 9, six oil refineries along the Gulf Coast were still shut down with several others running at reduced capacity, while 60 percent of the crude oil and 40 percent of the natural gas produced by off-shore rigs in the Gulf was shut-in because of the storm. The industry will need several more weeks to develop a full picture of damage caused to underwater pipelines in the Gulf. The damage and reductions in operable energy infrastructure for both oil and natural gas will likely have enormous impacts on heating costs this winter for every sector, including business, government and residential. In the wake of the storm, EIA has revised its predictions, and is now forecasting that the national average natural gas price will almost double by the end of this year over 2004's price (while gas prices are expected to settle somewhat by the end of 2006), and the national average retail heating oil price is expected to increase about 37 percent over 2004's price.

While some of these issues will likely be addressed in the months ahead as repairs are made, the situation caused by Katrina dramatically demonstrates how vulnerable the global energy markets have become to individual disruptions, such as a hurricane in the Gulf of Mexico. This vulnerability stems from a general tightening of supplies and lack of refining capacity that has developed in recent years.

There is an economic peril inherent in these rising costs. While historically energy costs have not been a significant portion of building maintenances and operations budgets, in future the ability to control energy costs could determine the financial viability of an entire project. In light of this trend, it is more important now than ever to find ways to reduce energy costs, and adhering to energy efficiency measures and Green Building principles are a very effective place to start. Adherence to Green Building standards can help dramatically reduce energy

costs, which can decrease one's vulnerability to energy price spikes that may occur in the future. For instance, Green Buildings reduce operating costs by being energy and water efficient. With proper siting, buildings reduce energy loads up to 50% by:

- Maximizing natural lighting, heating and cooling,
- Using energy efficient insulation and windows,
- Using high performance heating, cooling and ventilation equipment to meet the remaining load, and
- Using updated technologies to cut water use.

We believe that any expense of public funds for building space in the future needs to be protected and enhanced by adhering to Green Building precepts. In the past, energy expenses were not a significant percentage of the total maintenance and operating costs for buildings and capital projects, and when funding such projects, we would take for granted that the resulting building would last for a long time. However, that is not the same as making a building useful and useable for a long time, and today's rising energy costs are beginning to significantly impact operating and maintenance budgets, therefore threatening to reduce the long-term usefulness of such buildings. We are convinced those impacts will continue in the future, making Green Building design precepts even more important to ensure that buildings are useable in the long-term by virtue of low operating costs.

The Commonwealth has provided its own examples of how adhering to Green Building standards can dramatically reduce energy costs. The DEP Laboratory building located in the former Health America building on Interstate Drive in Susquehanna Township is a LEED Gold-certified building, the first Gold-certified laboratory in the US. In 2002, DEP opened the new Cambria District Mining Office, the first gold rated building under LEED Version 2, within the conventional cost range at \$93 sq.ft³. The National Renewable Energy Laboratory has verified that the building uses 52% less energy than comparable conventional buildings and uses slightly less water than two average homes. In 2000, it reaped national notice as one of the American Institute of Architect's Top 10 buildings and represented the US in the international Green Building Challenge. The Commonwealth has other buildings that adhere to Green Building Standards as well, including the Southcentral Regional Office, one of the initial 16 US buildings to be certified green by the US Green Building Council, and the Pa. Turnpike Commission's headquarters, which is LEED certified. All told, Pennsylvania has 23 buildings certified under the US Green Building Council's LEED™ rating system, and a further 110 registered for LEED certification. (The Leadership in Energy and Environmental Design [LEED] rating system is a voluntary program which has become the de facto national standard for labeling a building as truly green.)

With the price of fuels increasing and becoming a larger part of maintenance and operating budgets, we should understand that it is within our grasp to move beyond current building standards and move closer to achieving "near-zero" energy buildings, or those buildings that have almost no energy expenditures due to their adherence to Green Building standards plus their adoption of energy efficiency techniques, on-site power generation through renewable technologies such as solar PV arrays, and energy storage in batteries to store excess power generated by such alternative energy systems. Furthermore, we have been active with

developers of advanced conditioning systems, such as solar desiccant air conditioning systems, that are driving down the cost of conditioning these buildings even further.

But we believe that reducing energy costs may not be the only measurable benefit to stem from adhering to Green Building standards. We also believe there may be health benefits for those who work in such buildings, and those standards may be calculable through reductions in health insurance claims. Since my last testimony, we have actively pursued this topic by meeting with at least one major health insurer to determine if there is an actuarial basis for reduced health care claims for occupants of Green Buildings. The data so far that we've seen is encouraging. According to "Health and Productivity Gains from Better Indoor Environments and their Relationship with Building Energy Efficiency," by William J. Fisk, the estimated potential annual savings and productivity gains from green building technology are \$6 to \$14 billion from reduced respiratory disease, \$1 to \$4 billion from reduced allergies and asthma, \$10 to \$30 billion from reduced "sick building syndrome" symptoms and \$20 to \$160 billion from direct improvements in worker performance unrelated to health.

Carnegie Mellon University's "Building Investment Decision Support Tool" software further asserts that improved building air quality can increase productivity by as much as 11%, better lighting control can result in as much as a 23% gain in worker productivity, and daylighting studies indicated as much as an 18% gain in productivity.

While reducing energy costs and creating healthy workplace environments are achievable goals, we recognize that certain barriers still exist that prevent people from incorporating Green Building standards. Such barriers have traditionally included:

- The popular belief that the first cost of a green building is much higher than for a conventional building,
- Local code and zoning regulations often do not take into account current Green Building strategies and technologies, and
- The level of design professionals' fees and the historical disconnect between capital and operating budgets in the accounting systems of both the public and private sectors. While many organizations recognize the benefits of life cycle costing, bidding and procurement practices still default to the lowest first cost.

The Commonwealth is taking numerous steps to address these barriers, particularly the cost issues. On a national level, Pennsylvania has worked with the US Green Building Council to develop protocol to make Green Building certification less cumbersome and costly.

Pennsylvania is also continuing its partnerships with the Pennsylvania Environmental Council, the Sustainable Energy Funds, and various professional organizations to increase our support of Green Buildings, and we continue to provide tools – often web-based to reduce costs – to design professionals and developers and local zoning and building code officials in order to increase their knowledge about current Green Building techniques. For example, we are continuing to:

- Conduct workshops and presentations on Green Building techniques,
- Make available new "how to" videos on technologies and strategies to educate local regulators, as well as a series of six educational videos on the importance and value of

building green. Two videos have won national awards, are in demand across the country, and are used by the US Green Building Council in its LEED training,

- Make various tools available to encourage others to follow our example, including publications such as *Model Green Office Leasing Specifications* and the nationally recognized *Guidelines for Creating High Performance Green Buildings*, available on the GGGC's website, www.gggc.state.pa.us,
- Incorporate green concepts, to the extent possible, into renovation projects, since the number of existing buildings which can be upgraded far outstrips new building opportunities. This activity ties in with the Commonwealth's guaranteed energy performance program and reflects the fact that 80% of state funding for school construction goes for renovation and expansion,
- Incorporate the federal Environmental Protection Agency's Energy Star™ program into the GGGC's broader green building activities,
- Work with DGS to begin benchmarking the performance of state buildings as a first step in a comprehensive energy management program,
- Support state agencies demonstrating leadership in building healthy spaces to maximize employee productivity. Currently seven state-owned buildings are certified under LEED while five buildings are registered for LEED certification – DCNR's Tom Ridge Center at Presque Isle, the Pennsylvania Housing Finance Agency's headquarters in Harrisburg, West Chester University's Performing Arts Center, Penn State's School of architecture and Landscape Architecture in State College, and three other offices.

By taking these steps, we hope to convey the message that adherence to Green Building design standards can not only result in environmental benefits, but in energy cost savings and increased worker performance and satisfaction as well.

Again, I would like to thank you, Chairman Adolph, Chairman George, and the members of this committee for this opportunity to discuss green buildings. I would be happy to answer any questions you may have.