

Presidential Address

Greater Efficiency Today, Blue Skies Tomorrow

Innovation for a Sustainable Built Environment

By **Kent W. Peterson, P.E.**, 2007–2008 ASHRAE President

I would like to take you on a journey through possibilities for the built environment.

First, I would like you to think back to when you were a child. These were the times you dreamed about the many possibilities of the future or the unique mark you wanted to leave on the world. Dreaming allowed your imaginations to roam freely. Chances are that those dreams provided some sense of direction in your lives.

As adults and professionals, I believe we must continue to dream of possibilities. These dreams can create our vision of the ideal future we seek. We can only

realize these dreams by pursuing the possibilities.

Dream of the difference we can make in this world by working together.

I dream of the day when the building industry realizes that what is possible is far beyond the minimum performance the general market demands today;

I dream that we unleash the spirit of innovation to break through existing boundaries and deliver the elegant sustainable buildings society is beginning to demand;

And I dream that we apply our discoveries to significantly improve building energy performance, comfort and safety

without compromising our natural environment.

I, like many of you, became an engineer and joined ASHRAE because I wanted to help make a difference. As ASHRAE members, we are fortunate to be able to work with some of the best and brightest minds in our field to advance the built environment. The synergistic energy of ASHRAE members working together, sharing ideas, and advancing the standards of practice provides tremendous value to our members and the public.

Everybody is affected in one way or another by buildings—we are born in them, we live in them, we work in them, and in many cases we are healed in them. Collectively through our work, we have

About the President

Kent W. Peterson, P.E., Fellow ASHRAE, is vice president and chief engineer of P2S Engineering, Long Beach, Calif.

As ASHRAE's president, Peterson directs the Society's Board of Directors and oversees the Executive Committee. Through his theme, Greater Efficiency Today, Blue Skies Tomorrow, Peterson emphasizes innovation in the quest for sustainability in the built environment. He notes that "energy efficiency should always be the elegant alternative to fuel consumption." As such, he encourages ASHRAE members to become more radical in their ideas, more daring in their creativity, and dedicated to delivering innovative systems, methods and technology.

Peterson has served on the Board as president-elect,

treasurer, vice president, and Region X director and regional chair. Past service includes chair of Technology Council, Members Council, the Advocacy Committee, the President-Elect Advisory Committee, the ASHRAE Learning Institute Board of Trustees, the Finance Committee, the Planning Committee, the Region-at-Large Transition Committee and the Student Activities Committee.

Peterson was president of the Orange Empire Chapter. He is a recipient of the Exceptional Service Award and the Distinguished Service Award.

He was awarded a bachelor of science degree in mechanical engineering from California State University at Long Beach.

Peterson resides in Cypress, Calif., with his wife, Carolyn, and three sons.

been able to provide comfortable, healthy and safe buildings that have substantially improved the quality of our lives.

On the flip side, the energy consumed by these buildings is helping fuel a new crisis—a crisis of global energy availability and increasing greenhouse gas emissions. And in the words of Stanford Economist Paul Romer, “a crisis is a terrible thing to waste.”

The U.S. Energy Information Agency recently reported that world energy consumption is projected to grow by 71% from 2003 to 2030. Oil is forecasted to remain the dominant energy source with coal forecasted as the primary fuel for generating electricity. Energy use is also increasingly shifting away from developed countries and becoming more carbon-intensive.

While energy prices are continuing to rise, the true costs of using energy are even higher when considering the impacts on our children’s future and the environment.

Most of us know how fuel-efficient our automobiles are, whether it is expressed in mpg or km/L. But what about the buildings we design, operate, or use; who has a clue on how much energy they consume in a year per square foot or square meter? I suspect very few.

The fact is, the buildings and systems we provide consume enormous energy—both for construction and operation. Residential and commercial buildings already account for a vast amount of total primary energy use; roughly 40% in the United States and the European Union. And the built environment continues to expand around the world.

Today, more and more people are seeking to improve their quality of life as our world population has quadrupled to more than 6 billion people over the past 100 years. This outlook, along with global concern regarding climate change, has created a sense of urgency for positive action.

The path to global sustainability is forcing us to seek dramatic building energy performance improvements. We can reduce building energy consumption to help reverse the forecasted trends.

Because we have such tremendous strength in the technical knowledge of our membership, I view this crisis as a tremendous opportunity for ASHRAE. We have the opportunity to show the world we can provide the innovation needed to substantially reduce energy consumption in the built environment.

Energy efficiency should always be the elegant alternative to fuel consumption.

ASHRAE understands the importance and need for action, and we are becoming an engine for positive change. We have publicly stated our vision to continually improve building energy performance with the ultimate goal of market-viable net-zero-energy buildings by the year 2030.

We have set an aggressive goal and that is what we must work toward.

As I see it, we need to be part of the energy solution and not the energy problem. I believe we have a responsibility to use our leadership and apply our knowledge and experience to provide effective, practical, and innovative solutions for a sustainable built environment.

No challenge is too great for engineers and scientists. We are trained to be creative problem solvers. And when it comes to solutions, simple is better. Elegant is better still. Elegance is simplicity found on the farside of complexity. It is the elegant solutions that we must seek to provide high-performance buildings that can be operated and maintained efficiently.

Elegant solutions are all around us, waiting to be discovered. But they do not come easy. They require a working

knowledge of the forces at play and the obstacles in our way. There is no question; we as an industry face some daunting challenges as we move in this new direction:

- We find ourselves in an industry that has traditionally been slow to change.
- Many building decisions are made today without recognizing the life-cycle benefits of improved efficiency.
- We neglect to benchmark the performance of most buildings we build and operate.
- Most current design methods emphasize major component selection over system performance.
- Our current project delivery methods do not typically reward innovation and reduced consumption of resources.

The fact is, obstacles will always be in the path of progress. Uncertainty, risk and failure are all part of innovation and sometimes the price for the wisdom we need to gain. We must question the status quo, rally our engineering skills to investigate the possibilities, and use the need for greater energy responsibility to vastly improve new and existing building performance.



Kent W. Peterson, P.E.
2007–2008 ASHRAE President

ASHRAE has a long history of improving building energy efficiency. Automatic temperature regulation to achieve efficiency was a topic of discussion back in the 1890s. In the 1930s, energy savings from the use of storm windows and doors were investigated.

In the mid 1970s, ASHRAE mounted an extraordinary effort to develop the United State's first energy conservation standard for new buildings. There is so much in our history to commend, but there is also a need for us to avoid self-satisfaction.

“Overshadowing everything else is the question of conservation of natural resources. For how much longer are we going to waste ... resources to save first-cost only of buildings?”

A question posed by S.R. Lewis, the president of ASHVE in 1914—almost one hundred years ago. How would we answer him today?

I would tell Mr. Lewis that we have no more time to waste; that ASHRAE is again invigorated about its duty in promoting responsible use of our natural resources and the advancement of sustainable buildings.

We are working to reduce allowable building energy consumption in our minimum code-intended standards, such as 90.1. We are developing a new high-performance building standard for commercial buildings.

We are continuing to publish best-practice methods for reducing building energy consumption beyond code requirements in our expanding series of advanced energy design guides.

We are working toward developing better building performance metrics. We are continuing to develop commissioning guidance to help ensure buildings perform as intended. We have ramped up our advocacy efforts to assist with the implementation of aggressive yet responsible energy policies.

ASHRAE is working toward these improvements by collaborating with more organizations than ever before.

Our current Strategic Plan helps move the Society closer toward fulfilling our vision of a better future, and I will be pushing us to accomplish our strategic objectives. I will also be putting special emphasis this year on some key areas to improve building energy performance:

We need to develop better benchmarking of buildings based on their actual energy use. Buildings rated on their actual peak and annual energy performance would trigger better design, construction and operational decisions.

We also need to develop a more effective means to communicate the measured performance of innovative practices and technologies used in high-performance buildings. I believe we need to inform decision makers, designers and operators on high-performance successes in both new and existing buildings if we

Advertisement formerly in this space.

are to change the status quo and transform the building market.

We need to expand our education programs to cover integrated building design practices and improved operations and maintenance techniques. Both designers and building operators need training in these new methods to enable them to deliver better buildings.

The future we seek will only happen with a sustained effort from all in the building industry—each and every one of us.

It is time for us to move beyond simply selecting right-sized HVAC systems. Today, building design engineers must improve their knowledge in building envelope performance, thermal mass effects in buildings, passive solar, daylighting, human comfort and much more. We must become the experts in delivering high-performance buildings.

The time has come for us to be more innovative in our thinking, more daring in our creativity, and more dedicated to our pursuit of best practices that will dramatically improve building energy performance.

We have a responsibility to consider the possibilities.

What if energy was treated as a valuable limited resource and not as a commodity that simply follows the laws of supply and demand?

What if we were able to drive innovation through improved building research and development?

What if we could incorporate the ethics of energy responsibility and environmental responsibility into every building decision we make?

What if we could provide a culture for continuous innovation in each of our organizations?

What if building owners were to set clear energy performance goals for all projects?

What if we could meet those goals by working together with the entire building team to integrate the building envelope, lighting and HVAC systems to meet the indoor environmental needs of the occupants?

What if these buildings also provided for simple and effective operations and maintenance?

What if we actually measured and reported the energy performance of all buildings?

What if we were able to educate our peers in the new processes and practices we develop to attain these goals?

And finally, *what if* beginning today, each of us accepts our responsibility to aggressively incorporate energy efficiency and could deliver better energy performance, year after year?

Then collectively, building by building, city by city, we will substantially change how buildings use energy, to the point of dramatically reducing building energy use and carbon emissions.

Mankind has begun to understand that this crisis before us transcends our personal and business agendas, and the time to act is now.

Remember this, *our greatest advances will not be in our discoveries—but rather in how we apply those discoveries to benefit mankind.*

I believe all of us are fortunate.

Consider the Possibilities

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We find ourselves at a pivotal point in the history of the built environment—that is exciting, daunting and challenging. A period of necessary change; when the old and the new are forced to stand side by side to be compared; and when our accomplishments of the past will soon be replaced by our possibilities of the future.

Each of us must be willing to explore the possibilities.

With an atmosphere of innovation, there are no limits on the impact we can have on the greater good of society and the wellbeing of individuals and industry alike.

Think about the difference we can make.

That leads me to ask one final question that only you can answer.

Are you willing to help change the world and become more *innovative* in your thinking, more *elegant* in your solutions, and more *determined* to delivering outstanding building performance?

If so, please join me in demonstrating leadership, as we unleash the spirit of innovation to transform the built environment so mankind can enjoy more blue skies in the future.●