

# Compete: Energy

Regional Energy Summit Series

## Midwest Energy Summit Investing in a Midwest Renaissance: The Future of Energy Security and Sustainability

May 13–14, 2009



**Compete.**

Council on  
Competitiveness

Energy Security, Innovation & Sustainability Initiative

In 2007, the Council on Competitiveness launched the Energy Security, Innovation & Sustainability (ESIS) Initiative to explore the linkages between the United States' need for greater energy security, the global imperative for environmental sustainability and U.S. economic competitiveness at the enterprise and national levels. Through a series of Progressive Dialogues, the ESIS Initiative brought together high-level experts from industry, labor, academia and the policy community to form conclusions and ideas on how to create the enabling conditions to stimulate and accelerate private sector innovation and investment in sustainable energy solutions. Leveraging the insights generated at the dialogues and the wisdom of the ESIS Initiative Steering Committee, the Council crafted *Prioritize: A 100-Day Energy Action Plan for the 44th President of the United States*. *Prioritize* was released at the National Press Club on September 9, 2008, and has since had a significant impact in shaping U.S. energy policy and priorities.

In an effort to broaden understanding of the drivers for innovation and investment in sustainable energy solutions in specific areas, the Council is holding a series of four regionally-based energy Summits around the United States during the first half of 2009. The Midwest Energy Summit was the third of this series.

The following are the highlights and key points captured at the Summit, which was held on May 14, 2009, in Argonne, Illinois at Argonne National Laboratory.

The Council would like to express its gratitude to: Robert J. Zimmer, president of the University of Chicago; James W. Owens, chairman and CEO of Caterpillar Inc.; and Eric D. Isaacs, director of Argonne National Laboratory for cosponsoring the Midwest Energy Summit; Shirley Ann Jackson, president of Rensselaer Polytechnic Institute, vice chairman of the Council and co-chair of the Council's ESIS Initiative, for her leadership and vision in conceptualizing the Regional Energy Summit Series; Robert Rosenberg, associate vice president for Public Affairs Communications for the University of Chicago; Timothy L. Elder, director of corporate Public Affairs for Caterpillar; Norman D. Peterson, assistant to the director at Argonne National Laboratory; and the Chicago, Caterpillar and Argonne teams for their strong support in planning and executing this event.

**Compete: Energy  
Regional Energy Summit Series**

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## Energy Security, Innovation & Sustainability Initiative Regional Energy Summit Series



**February 13, 2009**  
**Houston, TX**

Clarence P. Cazalot Jr., president and CEO of Marathon Oil Corporation, hosted a regional summit on the path to achieving sustainable energy supplies and the impact of the economic stimulus package on U.S. energy security. This meeting was held in concert with *CERAWeek 2009*, the annual conference that brings executives from around the world together to discuss global energy issues.



**April 15, 2009**  
**New Brunswick, NJ**

Ralph Izzo, chairman, president and CEO of Public Service Enterprise Group; and Richard L. McCormick, president of Rutgers, The State University of New Jersey, co-hosted a regional summit on ways to promote energy efficiency in the utility industry and lessons for the nation that can be learned from the rollout of the Regional Greenhouse Gas Initiative (RGGI).



**May 13–14, 2009**  
**Chicago, IL**

James W. Owens, chairman and CEO of Caterpillar Inc.; Robert J. Zimmer, president of The University of Chicago; and Eric D. Isaacs, director of Argonne National Laboratory, co-hosted a regional summit focused on using the Midwest's unique energy resources and infrastructure to reduce greenhouse gas emissions and improve our nation's energy security.

# Compete: Energy

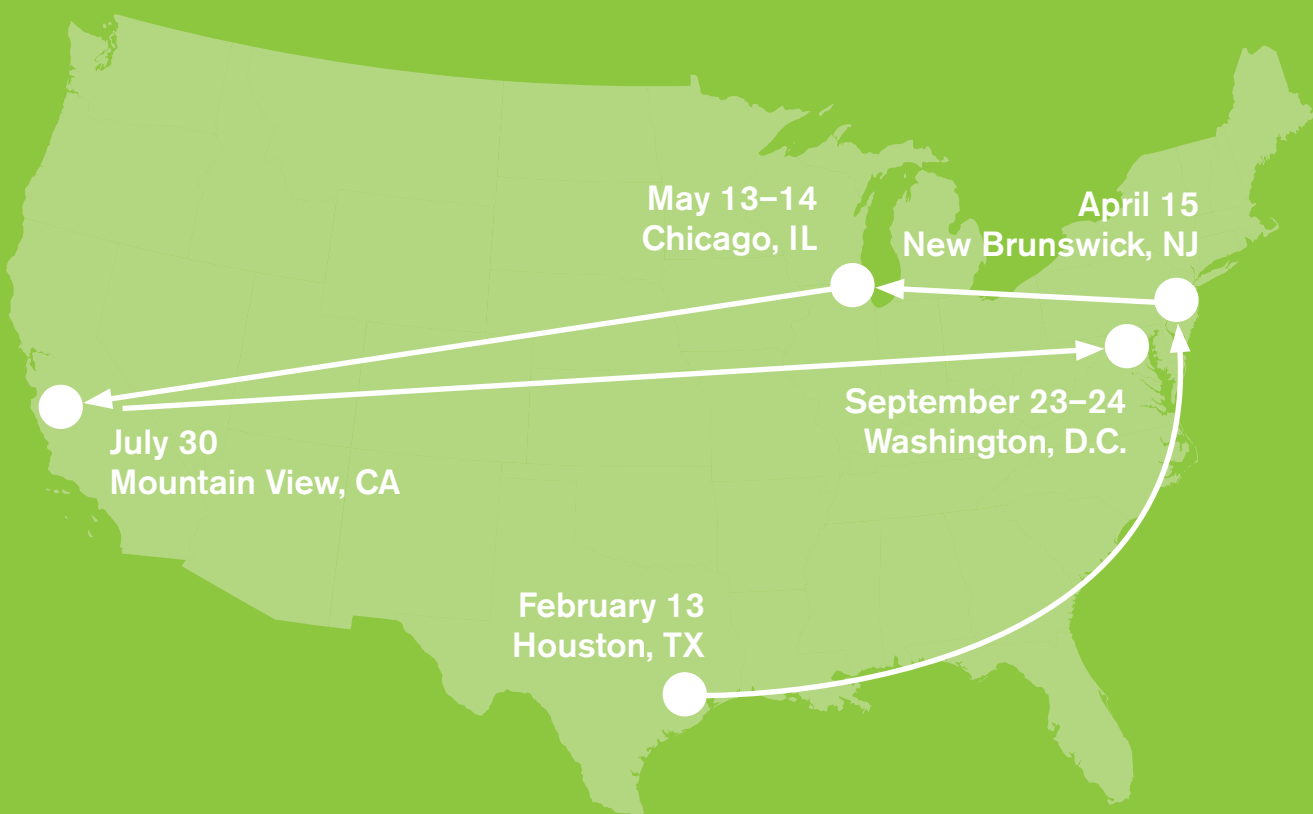
## The National Energy Summit & International Dialogue

**July 30, 2009**  
**Mountain View, CA**

S. Pete Worden, director of NASA Ames Research Center; Mark G. Yudof, president of the University of California; George H. Miller, director of Lawrence Livermore National Laboratory; A. Paul Alivisatos, interim director of Lawrence Berkeley National Laboratory; and Thomas R. Baruch, founder and managing director of CMEA Capital; co-hosted a regional summit on lessons that can be learned from the successes of California and other western states as front-runners in the development and deployment of sustainable energy technologies.

**September 23–24, 2009**  
**Washington, D.C.**

The Council will convene its top experts in the energy field and representatives from countries around the world to address the interconnected challenges of energy security, innovation and sustainability. The Council's agenda for change will be rooted in a new relationship between the public and private sectors to deal with a defining challenge of the millennium.



# Midwest Energy Summit Participants List

## CO-HOSTS

### Eric D. Isaacs

Director  
Argonne National Laboratory

### James W. Owens

Chairman and Chief Executive Officer  
Caterpillar Inc.

### Robert J. Zimmer

President  
The University of Chicago

## PARTICIPANTS

### Rosemarie Andolino

Executive Director  
O'Hare Modernization Program

### Hardik V. Bhatt

Chief Information Officer  
City of Chicago

### Linda Blair

Executive Vice President and Chief Business Officer  
ITC Holdings Corp.

### David C. Carroll

President and Chief Executive Officer  
Gas Technology Institute

### John J. Cuttica

Coordinator, Energy Programs  
Energy Resources Center  
University of Illinois at Chicago

### Gregory L. Geoffroy

President  
Iowa State University

### Craig A. Giffi

Vice Chairman and National Industry Leader, Consumer & Industrial Products,  
Deloitte & Touche, USA LLP

### Leonard J. Guarraia

Chairman and Chief Executive Officer  
World Agricultural Forum

### James Hagedorn

Chairman and Chief Executive Officer  
The Scotts Miracle-Gro Company

### Richard H. Herman

Chancellor  
University of Illinois at Urbana-Champaign

### David Hobbs

Vice President and Managing Director of Global Research  
IHS Cambridge Energy Research Associates, Inc.

### Richard B. Jarman

President and Chief Executive Officer  
National Center for Manufacturing Sciences

### Michael Krauss

President  
Market Strategy Group, LLC

### Steven F. Leer

Chief Executive Officer  
Arch Coal, Inc.

### Donald H. Levy

Vice President for Research and National Laboratories  
The University of Chicago

### John W. McCarter

President and Chief Executive Officer  
The Field Museum

### Sidney R. Nagel

Stein-Freiler Distinguished Service Professor in Physics  
The University of Chicago

### Douglas R. Oberhelman

Group President  
Caterpillar Inc.

### Mil Ovan

Senior Vice President and Co-founder  
Firefly Energy, Inc.

### David E. Rodgers

Director of Strategic Planning and Analysis  
Office of Energy Efficiency and Renewable Energy  
U.S. Department of Energy

### Natalie Rolph

Chief Economist and Project Manager  
Black & Veatch

### John W. Rowe

Chairman and Chief Executive Officer  
Exelon Corporation

### Alan Schriesheim

Director Emeritus  
Argonne National Laboratory

### Vic Svec

Senior Vice President, Investor Relations and Corporate Communications  
Peabody Energy

### Pamela Tate

President and Chief Executive Officer  
Council for Adult and Experiential Learning

### Robert H. Topel

Professor of Economics  
The University of Chicago

### James M. Utterback

David J. McGrath, Jr. (1959) Professor of Management and Innovation and Professor of Engineering Systems  
Massachusetts Institute of Technology

### Joseph T. Walsh

Vice President for Research  
Northwestern University

### B. Joseph White

President  
University of Illinois

### Deborah L. Wince-Smith

President  
Council on Competitiveness

### Scott Wiseman

Senior Vice President, State Affairs  
American Coalition for Clean Coal Electricity

# Executive Summary

**Participants discussed which energy technology and infrastructure investments would have the greatest impact on the region's—and the nation's—sustainability and competitiveness.**

Energy experts, corporate leaders and academics met at Argonne National Laboratory outside Chicago on May 14, 2009 for the third in a series of four regionally-based energy Summits held by the Council on Competitiveness under the auspices of the Environmental Security, Innovation & Sustainability Initiative. This Midwest Summit was co-hosted by the University of Chicago, Argonne National Laboratory and Caterpillar Inc.

Robert J. Zimmer, president of the University of Chicago, opened the meeting with an explanation of why Argonne National Laboratory was such a fitting location for the deliberations. Argonne has long been a place where people have come together to address significant technological challenges, dating back to the development of the first atomic bomb. The intertwined challenges of energy security and sustainability, he noted, would require a similar degree of collaboration.

In a keynote speech, John W. Rowe, chairman and chief executive officer of Exelon Corporation, explained the stubborn facts associated with the economics of energy and carbon emissions. The challenge of reducing emissions is complex, and a price signal on carbon—while critically important—does not solve all the problems. Well regulated competitive markets, he concluded, offer the best mechanism for encouraging economically sound solutions and innovation.

Participants in the Summit's plenary sessions agreed on the need for increased research and development



*Eric D. Isaacs, Argonne National Laboratory; Deborah L. Wince-Smith, Council on Competitiveness; and David Hobbs, IHS Cambridge Energy Research Associates, Inc.*

activity, as the current menu of available technologies is inadequate to meet the nation's energy security, sustainability and competitiveness challenges. To that point, two of the Midwest's greatest energy resources—coal and shale gas—both require enabling technologies that have not yet been perfected. A third, wind, relies largely on technology that has matured but is limited in its capacity to meet future clean energy needs.

There was a general consensus among participants that more R&D funding is needed, but money is only part of the problem. One challenge is to use scarce resources to develop a diverse portfolio of energy technologies, rather than picking winners and losers. Another is to make sure that R&D projects have clear commercial application. With the latter point in mind, a number of participants recommended that technologies be developed in collaboration with private-sector partners.

Participants generally agreed that a cultural shift was taking place around energy issues, particularly among the young, but there was disagreement over its import. Some equated it to changing mores associated with smoking, which led to significant changes in behavior. Others questioned the depth of commitment behind the rhetoric, and suggested that behavior is more likely to change in response to clear price signals.

There was universal agreement that the United States is falling behind the rest of the world when it comes to the manufacturing of clean energy technologies—an issue of particular importance in the industrial Midwest. No consensus emerged as to how to address this problem, but a few participants advocated copying the aggressive industrial policies instituted by several other countries in their efforts to grab market share.

On the infrastructure side, the O'Hare Modernization Program was offered up as an example not only of how to build greener infrastructure, but also of how green infrastructure improvements can improve regional competitiveness. There was, however, general agreement that federal leadership is necessary to overcome financial and jurisdictional challenges to building the kind of large-scale infrastructure projects that would meaningfully advance the nation's energy security and sustainability goals. A number of participants also pointed out that meeting these goals will require that the nation's energy challenges be examined at the systems level, rather than simply considering the particulars.

# Midwest Energy Summit Highlights

## Answering Big Questions at Argonne

*Remarks by Dr. Robert J. Zimmer, President,  
The University of Chicago*

Argonne National Laboratory, the site of the Midwest Energy Summit, has a proud history of helping to solve big problems, and the intertwined challenges of energy security and sustainability are big problems indeed.

Energy issues are global in scope and exceedingly complex. No single solution—whether technological, political or cultural—can solve America's, or the world's, energy challenges. They will instead be solved over time, and only by integrating a variety of approaches. In that respect, Argonne is a fitting place to convene thought leaders from a variety of fields, disciplines and sectors to explore possible energy security and sustainability solutions.

Argonne grew out of the Manhattan Project. The University of Chicago produced the world's first self-sustained controlled nuclear reaction, and the lab was established after World War II to develop the peaceful use of nuclear energy. Since then, Argonne has maintained a major research program in both nuclear energy and nuclear reactor design, and over the years it has evolved into a multi-purpose laboratory—including the evaluation of a broad range of technologies to improve energy production, storage, transmission and efficient use.

The development of these technologies is critical not only for our economic growth, but for our national security. There are two billion people in Asia who are in the midst of pulling themselves out of poverty. This process has major implications for world energy demand, international trade and global geopolitical stability.



*James W. Owens, Caterpillar Inc., and Robert J. Zimmer, The University of Chicago.*

As it has in the past, Argonne will continue to be a place that engages in the broad collaborative effort to develop technological answers to the world's biggest problems. Seventy years ago, it was the effort to harness the power of the atom. Today, it is the effort to find better, cleaner ways to produce and use energy.

As we search for solutions to these problems, we should keep in mind a concept that underlies all successful inquiry: questioning, not deference, is the route to clarity. The challenges we confront are not simple, and as wise and expert as some of us may be, successful answers will require the infusion and integration of multiple perspectives.

## Facts Are Stubborn When It Comes to the Economics of Energy

*Remarks by John W. Rowe, President and CEO, Exelon Corporation*

Someone once said that facts are very stubborn things. What makes facts in the energy marketplace particularly stubborn is that some of them change very slowly, and some change every time you turn around. They are very uncooperative, and they greatly complicate the challenge of addressing climate change.

The United States is heavily dependent on fossil fuels, and thus a major contributor to the increased concentration of greenhouse gases in the earth's atmosphere. If this dependence is to change, we will need to reinvent our energy infrastructure—which will not be easy and certainly will not come cheap.

### *Complexity and Changing Circumstances*

The economics of reducing carbon emissions is complex, and under current regulatory conditions not very encouraging. Incumbent coal-fired power is cheap, and without a price on carbon, every alternative is more expensive—most of them considerably so. Accordingly, a price on carbon is essential, and the sooner one is instituted, the better.

But even if a clear and consistent price signal is put in place, the cost of competing power generation options will continue to vary, due to changing commodity prices, improvements in technology, new economies of scale and of course, fluctuations in



*John W. Rowe, Exelon Corporation.*

the price of carbon. As a result, it will remain difficult for utilities to make wise decisions when it comes to building new energy infrastructure, most of which represents thirty-to-fifty-year investments.

Even straightforward investments can be problematic. Several years ago, for instance, Exelon pursued a gas-fired cogeneration<sup>1</sup> project with Argonne. Argonne looked like the ideal customer. It needs steam, it needs electricity, it uses natural gas and it is a public-spirited operation. But in the end, Argonne rejected the deal due to concerns that a new combined heat and power system might compromise the reliability of its operations. In principle, it should have worked. But it is hard to get from principle to engineering, and from engineering to good economics.

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1. Cogeneration is the use of a heat engine or a power station to simultaneously generate both electricity and useful heat.

### *The Role of Competitive Markets*

The fluidity and complexity of energy economics underscore the value of keeping and expanding competitive energy markets. While deregulation has led to some high-profile problems, competitive markets create an ongoing test for what actually works economically. This is not to say that there is not a place for regulation. Indeed, the only way competitive markets will result in lower emissions is if the external costs of those emissions are built into the price of electricity. But markets will also unleash far more creativity than any central planner ever could, no matter how smart that central planner might be.

The competitive marketplace creates great opportunities for ingenuity—in trying and testing new approaches, and in creating and destroying new products. If you have the market in place, the questions become: How much do we regulate? How much do we tax? How much should we spend developing new technologies? And how much should we leave for the marketplace to decide? We will need to incorporate all four of these approaches, but it will be very hard to get the right mix.

## Plenary I: What Investments in Energy Production, Storage and Transportation Technologies Will Have the Greatest Impact on Regional and National Competitiveness?

### Key Takeaways:

- Focused research and development is critical for simultaneously addressing all three legs of energy's "triangle of needs": security, sustainability and competitiveness.
- The Midwest's regional strengths are coal, wind and shale gas—but each has limitations or liabilities.
- Cultural norms related to energy use appear to be changing, particularly among young people, but the significance of this shift remains unclear.
- Additional education and training will be needed to prepare workers for the energy jobs of the future.
- The goal of federal energy funding is to develop a diverse portfolio rather than focusing on a single winning technology.



*Deborah L. Wince-Smith, Council on Competitiveness, David Hobbs, IHS Cambridge Energy Research Associates, Inc., and other participants at the Midwest Energy Summit discuss energy technology and infrastructure.*

### **The Role of Research and Development**

David Hobbs, vice president and managing director of Global Research at IHS Cambridge Energy Research Associates, Inc., framed the competing priorities in the energy space as a triangle. One leg of that triangle represents energy security, a second leg represents environmental sustainability and the third represents economic competitiveness. In this conception, you can move towards any two of those legs, but not without moving away from the third. The only solution is to find a way to make this triangle into a pyramid, in which all three goals meet at a central point. The best hope for finding this solution is the development of new technologies.

Accordingly, increased investment in energy research and development activities is a must. Major research universities—including many located in the Midwest—have an important role to play in conducting the long-term basic research necessary to spur game-changing innovations. These research ef-

“We need to invest seriously in research that probably won’t fully mature today, tomorrow or within five years, but will lead to a real solution to the problem in eight or twenty or 25 years.”

**B. Joseph White**  
University of Illinois

orts, according to a number of Summit participants, should also be undertaken in partnership with private sector enterprises. Private sector firms can provide a unique perspective on the risk-reward ratios of each research option, and can help identify real-world applications for emerging technologies.

### **Government Research and Development Efforts**

When it comes to allocating federal funding for energy projects, the government is not seeking to pick winners and losers. Instead, it is trying to develop a diverse portfolio of energy technologies, according to David E. Rodgers, director of Strategic Planning and Analysis in the Department of Energy’s Office of Energy Efficiency and Renewable Energy. Part of this approach requires looking not only at the risk profile of certain technologies, but also at their potential impact. Carbon capture and storage (CCS) technology, for instance, is risky, but if it is successfully developed, the benefits would be enormous.



*Deborah L. Wince-Smith, Council on Competitiveness, and Richard H. Herman, University of Illinois at Urbana-Champaign.*

A number of participants agreed that applied research is especially critical in the energy space, and that research efforts ought to be conducted in concert with private-sector partners. In many cases, states and localities can play an important role in this area, since they are critical gatekeepers when it comes to the siting and rollout of new technologies.

### **Midwest Strengths: Coal, Wind and Shale Gas**

The Midwest's industrial economy was built on the abundance and affordability of coal. Coal-fired power is still the dominant source of electricity across the region, as many Summit participants noted, and efforts are underway to develop and test a variety of CCS technologies. The successful commercialization of CCS is critical if coal is to continue to play a major role in the U.S. economy under carbon caps.

However, CCS is expected to be very expensive. Capturing and compressing CO<sub>2</sub> is itself energy intensive, requiring 20-40 percent of a plant's energy

output—a dramatic loss of efficiency. Questions also remain about the efficacy and impact of long-term geological storage, including the possibility of leakage and corresponding liability issues. Demonstration projects currently under construction will provide some answers, but it is unclear how the economics of CCS will ultimately play out.

Wind is the Midwest's best hope for large-scale renewable power generation, absent technological breakthroughs in other areas. But the siting of commercial-scale wind farms is almost always contentious, and the best wind resources are generally located far from population centers and are isolated by a lack of transmission infrastructure. Additionally, wind is an intermittent resource that is most abundant at night, when demand is low. Thus, while wind will clearly have a role in the energy future of the Midwest and the nation, that role is likely to be limited.

Shale gas—natural gas that can be produced from coal shale—is also a major Midwestern resource,

“Applied R&D and the linking of basic sciences have to be informed by the end results that we need and the solutions that we desire, and those in turn must be informed by business and manufacturing needs.”

**David E. Rodgers**

U.S. Department of Energy



Steven F. Leer, Arch Coal, Inc.

and is seen by many of the Summit participants as playing a critical role in the region's economy while new technologies are developed. As David C. Carroll, president and chief executive officer of the Gas Technology Institute, commented, natural gas can have a big impact on the Midwest and the nation, and offers a bridge to a sustainable energy future.

Shale gas is abundant regionally and nationally, and perhaps most importantly, it produces half the CO<sub>2</sub> emissions per megawatt that coal does when burned for power generation. Nevertheless, shale gas has its drawbacks. The use of hydraulic fracturing<sup>2</sup> to release natural gas from shale may be having a negative effect on groundwater in some areas. Moreover, natural gas' carbon footprint is still considerable, making it a resource that will buy time in the race to

develop lower-carbon energy technologies, rather than a long-term solution for carbon reduction.

Natural gas is abundant in North America, and it has roughly half the carbon intensity of other fossil fuels. Wind is already cost competitive with coal in some locations, and has a negligible carbon footprint. Both have their drawbacks, however. Natural gas' low density makes it difficult to transport and store, and new drilling techniques may negatively impact groundwater.

### A Cultural Shift?

Summit participants argued that a change in cultural norms is an important step towards a more sustainable future. As B. Joseph White, president of the University of Illinois, pointed out, cultural norms have shifted dramatically in the past, and may be shifting on energy use right now. Cigarette smoking was once an acceptable practice, but it became less socially acceptable and behavior changed. The same sort of cultural pressures appear to be building when it comes to energy issues as well, especially on college campuses.

"We are going to use a lot of coal around the world. We will use it all, ultimately. The question is: will we use this coal in a low carbon way? That is Peabody's focus. It's time to get serious about research funding and actual applications for carbon capture and storage."

**Vic Svec**

Peabody Energy

2. Hydraulic fracturing is a technique used to create fractures in rock or coal formations. These fractures allow the oil or gas to travel more easily from the rock where the oil or gas is trapped to the production well. Typically, in order to create fractures, a mixture of water, sand and chemicals (some of which may be toxic) is pumped into the rock or coal formation.

“I am not sure we are teaching our kids the full story when it comes to energy issues. It is wonderful to be so committed to sustainability, and it is great to talk about changing the world. But we need a serious intellectual debate about the choices we face and their potential costs.”

**Douglas R. Oberhelman**  
Caterpillar Inc.



*John T. Disharoon, Caterpillar Inc., and Douglas R. Oberhelman, Caterpillar Inc.*

Douglas R. Oberhelman, group president of Caterpillar Inc. seconded the notion that new ideas on energy are prevalent among students, but expressed concern that only part of the story is being told. He recalled a discussion he had with a group of graduate students who were committed to environmental change, but balked at the idea of \$4 per gallon gasoline as a means of reducing carbon emissions. Oberhelman lauded the commitment of these students, but pointed out that there needs to be a serious intellectual debate regarding the costs and choices involved in environmental sustainability.

Another participant agreed and suggested that a clear and compelling price signal would ultimately drive behavior. Market solutions, the participant continued, can have a huge impact, since a lot of this comes down to fundamental economics.

### **Workforce Investments**

Consumer education was not the only educational issue brought up by Summit participants. They also identified the need to train workers for the low-carbon energy economy. Pamela Tate, president and chief executive officer for the Council for Adult and Experiential Learning, noted that efforts have been underway for years within the energy industry to train members of the existing energy workforce to work on new energy technologies and to provide pathways for workers looking to transition into energy careers. Nevertheless, even people working in energy-related fields lack a good understanding of what new skills they need to learn to prepare themselves for the future.

There is a need to invest not only in technology, Tate said, but in people, from students to adult workers. People at every rung will need to learn and develop new skills to achieve the goal of a clean energy future.

## Plenary II: What Investments in Infrastructure Will Have the Greatest Impact on Regional and National Competitiveness?

### Key Takeaways:

- The O'Hare Modernization Program provides an example of how infrastructure can be built to be greener and lead to more sustainable outcomes.
- The United States is falling behind many other nations when it comes to the manufacturing of alternative energy technologies.
- Systems thinking needs to be applied to the overall energy impact of proposed infrastructure investments.
- Federal leadership is required to overcome barriers to large-scale infrastructure projects that would benefit the region and the nation.

“There were no LEED standards or comparable energy efficiency guidelines for a heavy civil construction project like ours, so the O’Hare Modernization Program team developed its own. We ended up creating a green design manual that incorporated sustainability into every stage of our project, from concept design through construction.”

**Rosemarie Andolino**  
O’Hare Modernization Program



*Midwest Energy Summit attendees participate in a roundtable discussion.*

### **The O’Hare Modernization Program: An Example of How to Build Greener Infrastructure**

The multi-billion dollar effort to modernize O’Hare International Airport in Chicago began without much concern for environmental impacts, but when Rosemarie Andolino was appointed by the Mayor to head up the project, she made them a central focus of the initiative.

When the modernization team searched for LEED-quality standards by which to measure their proposals, they found none. So they created their own, which became the O’Hare Modernization Program Sustainable Design Manual (SDM). This manual is now being used in similar construction and remodeling projects looking to improve environmental performance.

According to Andolino, the O’Hare Modernization Program incorporated sustainable practices into both design and construction, and addressed every

facet of the operation—earth movement, the placement of concrete, onsite recycling, building the control tower, water storage and lighting. Just as importantly, the project was completed on time and under budget.

The infrastructure improvements have also made O’Hare a more fuel-efficient airport for airline operations. O’Hare is one of the most delayed airports in the country, and its increased capacity has improved reliability by fifteen percent—which means less fuel wasted by airplanes forced to circle waiting to land or to sit on the tarmac waiting for takeoff.

Aside from its obvious commercial and environmental impacts, this improvement has had a positive effect on the entire Chicago region. Airlines are more likely to treat O’Hare as a hub, and retaining those flights makes Chicago and its surrounding areas more economically competitive.

## The Manufacturing Gap

For solar, wind, nuclear or any of the other energy alternatives, there is a significant gap between the manufacturing capabilities that the United States has today and what we will need in the near future, according to Craig A. Giffi, vice chairman and national industry leader for Consumer & Industrial Affairs with Deloitte & Touche, USA LLP.

Many participants, including Giffi, believe the federal government can play an important role in closing that gap. He noted that other countries have instituted aggressive policies designed to develop and retain critical manufacturing capacity, but in the United States this effort is left to states, localities and private sector actors. As an example, he cited Germany's successful effort to develop its photovoltaic industry, which has become a major source of job growth in a nation not previously known for its solar resources.

Policy formation at this level also needs to include consultation up and down the industrial supply chain, according to Richard B. Jarman, president and chief



*Craig A. Giffi, Deloitte & Touche, USA LLP, and David E. Rodgers, U.S. Department of Energy.*

executive officer of the National Center for Manufacturing Sciences. Manufacturers and end users should be part of the research and development decision-making process, and every new investment should have clear technology users, developers and providers.

## Systems Thinking

A number of Summit participants noted a lack of systems thinking when it comes to energy investments. Solutions for most energy-efficiency problems are designed in isolation from the larger energy production, delivery and end-use systems. Addressing these issues at a systems level can yield greater overall efficiencies and more scalable solutions.

As one participant noted, the energy-related components of most buildings—windows, lighting, layout, heating and air-conditioning—are designed independently. Coordinating these features offers the prospect of greater savings than would be realized by optimizing each feature individually. The same holds

“Manufacturing executives across the country say that they would rather stay in the United States. But manufacturers are looking for leadership at the highest level to coordinate the next generation of capabilities that are necessary, from an energy standpoint, so we can build out the solutions we need to be truly competitive.”

**Craig A. Giffi**

Deloitte & Touche, USA LLP



James W. Owens, Caterpillar Inc.

true at a macro level, for a large company with many different facilities, or even for the design and execution of regional transportation infrastructure.

### Prospects for the Future

There was universal agreement among Summit participants that investments in infrastructure and innovative capacity can boost the Midwest's economic prospects. But these investments need to be well conceived, well coordinated and well financed.

The scale of these challenges requires federal leadership. Only the federal government can end the balkanization of authority that is holding back large-scale initiatives that could benefit the entire region. The federal government is better positioned than any individual state or locality to provide financial support for projects that will not only benefit the region, but serve the national interest as well.

But even in the absence of that leadership, regional players have and will continue to make advances. The O'Hare Modernization Program is one such accomplishment. Another success story in the works is ITC Holdings Corp.'s "Green Power Express," a high-voltage power transmission network that has been designed to move up to 12,000 megawatts of renewable energy from wind-rich areas in the upper Midwest to the region's major population centers. According to Linda Blair, executive vice president and chief business officer of ITC Holdings, the Green Power Express will also result in a reduction of up to 34 million metric tons of carbon emissions—the equivalent of the annual emissions of about seven to nine 600 megawatt coal plants, or nine to 11 million automobiles.

But even here, a lack of supportive public policy is a problem. The \$12 billion project is facing numerous siting issues, and cost-sharing among its regionally and sectorally diverse stakeholders is still a work in progress.

"We know we need smart grid infrastructure. We know we need transmission. We know we need energy storage. We know we need better, stronger fuels, processing and transportation facilities, particularly here in the Midwest. If the ethanol industry is to grow, we need more feedstock-handling systems. We need the solar and wind manufacturing facilities, and we need the whole supply chains that feed each of those. The challenge is to turn those aspirations into reality."

**David E. Rodgers**

U.S. Department of Energy



*Eric D. Isaacs, Argonne National Laboratory.*



*Summit participants tour Argonne National Laboratory and learn about its cutting-edge research.*



*Robert H. Topel, The University of Chicago.*



*Donald H. Levy, The University of Chicago.*



## About the Council on Competitiveness

### WHO WE ARE

The Council's mission is to set an action agenda to drive U.S. competitiveness, productivity and leadership in world markets to raise the standard of living of all Americans.

The Council on Competitiveness is the only group of corporate CEOs, university presidents and labor leaders committed to ensuring the future prosperity of all Americans and enhanced U.S. competitiveness in the global economy through the creation of high-value economic activity in the United States.

### Council on Competitiveness

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### HOW WE OPERATE

The key to U.S. prosperity in a global economy is to develop the most innovative workforce, educational system and businesses that will maintain the United States' position as the global economic leader.

The Council achieves its mission by:

- Identifying and understanding emerging challenges to competitiveness
- Generating new policy ideas and concepts to shape the competitiveness debate
- Forging public and private partnerships to drive consensus
- Galvanizing stakeholders to translate policy into action and change

### FOR MORE INFORMATION

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The Council on Competitiveness launched the Energy Security, Innovation & Sustainability (ESIS) Initiative in July 2007 with the firm belief that the crucial role of the private sector demand in driving the way America produces and uses energy has gone largely unrecognized in prior policy initiatives. The ESIS Initiative, which was called for in the Council's 2004 seminal report *Innovate America*, is led by a CEO-level steering committee comprised of approximately 40 chief executives from U.S. industry, academia, government laboratories and organized labor. The distinguished steering committee is led by James W. Owens, chairman and CEO of Caterpillar Inc.; Shirley Ann Jackson, president of Rensselaer Polytechnic Institute; and D. Michael Langford, national president of the Utility Workers Union of America, AFL-CIO. The goal of the Initiative is to enhance U.S. competitiveness and energy security by developing a public-private action agenda to drive private sector demand for sustainable energy solutions and create new markets, industries and jobs. It is underwritten by the U.S. Department of Energy and has benefited from the guidance of more than 200 executive-level energy experts.

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