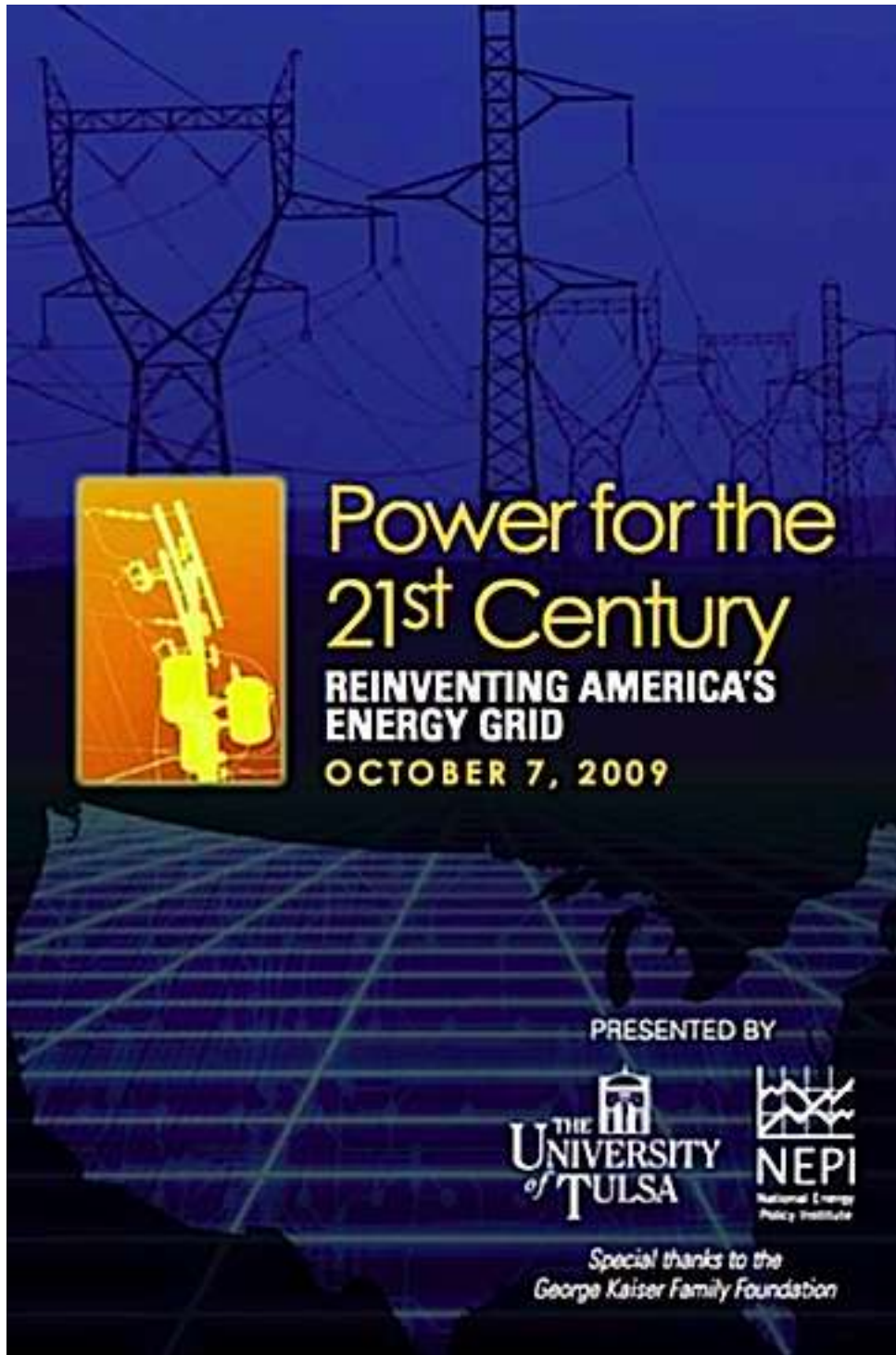


DEMAND PANEL



DEMAND: CONSERVATION, EFFICIENCY, DEMAND-SIDE MANAGEMENT – CAN LESS ENERGY REALLY COST LESS?

It's often said that the cheapest kilowatt is the kilowatt not needed, but how much of America's increasing demand for energy can be met with conservation, efficiency and demand-side management? This panel focused on recent successes and ideas for the future.



MODERATOR - MATT BAKER, Commissioner, Colorado Public Utilities Commission

Matt Baker was appointed as a commissioner of the Colorado Public Utilities Commission on January 15, 2008 by Gov. Bill Ritter, Jr. and was confirmed January 28, 2008. Before joining the commission, Baker served as the executive director of Environment Colorado, where he was the architect of Colorado's Renewable Energy ballot initiative, Amendment 37. Matt was a leader in efforts to double Colorado's renewable energy goals, implement policies to greatly expand utility energy efficiency programs and promote state goals to reduce carbon dioxide emissions. In addition, he was a leader on state transportation policy initiatives, including the successful build out of the Denver metro-area's light rail system. Before joining the Commission, Baker served as the vice chair of the Transit Alliance. He was appointed by then-Governor Bill Owens to the Colorado Pollution Prevention Partnership, and was vice chair of the Interwest Energy Alliance. Baker has a bachelor's degree from Penn State University.

PANELISTS



RICHARD SEDANO, Director, Regulatory Assistance Project

Richard Sedano is a director of the Regulatory Assistance Project (RAP). He is the facilitator of the Mid-Atlantic Distributed Resource Initiative, the Midwest Demand Resources Initiative, and the Pacific Northwest Demand Response Project. Recently, he has worked with a collaborative in Arkansas and Oklahoma to launch energy efficiency programs, with members and stakeholders of the Ozone Transport Commission to develop utility policies to address regional ozone policy, and the stakeholders developing the National Action Plan for Energy Efficiency. Prior to joining RAP in 2001, Sedano served as commissioner of the Vermont Department of Public Service (VDPS) for nine years, and in staff positions for seven more. The VDPS represents utility consumers in all regulatory matters, and is the state's energy office and consumer advocate. Sedano served as chair of the National Association of State Energy Officials from 1998–2000. He is currently a member of the Board of Directors of Northeast Energy Efficiency Partnerships, the ISO-New England Environmental Advisory Group, the investment committee of the Vermont Clean Energy Development Fund, EVERmont (an alternative transportation vehicle consortium), and the Energy Team for the City of Montpelier. He was a member of the Task Force on Reliability to the U.S. Secretary of Energy's Advisory Committee from 1997–1998, and a member of the Advisory Committee to the ISO-New England Board of Directors from 1999–2003. Sedano received his Sc.B. degree in engineering from Brown University, and his M.S. degree in engineering management from Drexel University.

Presentation Summary

Demand Resources: Conservation and demand side management can make a great difference without the costs of new capital.

Attributes of Distributed Resources: Energy Efficiency (EE) is consistently delivered at a cost that no new supply can match.

People are increasingly used to energy efficiency and expect help through cooperation with a “utility”. The recession has actually provided an opportunity for utilities to recognize this themselves.

Limitations on EE: Utilities can profit by committing to cost today to avoid large expensive assets in the future. Measuring the absence of sales requires some supply-oriented conversation about workforces, and codes and standards.

Aids for Efficiency: Some RTOs are using energy efficiency for reliable capacity. The local development of efficiency methods, the need for efficiency for national security, and for global environmental reasons all ease the way for EE.

Demand response addresses the most expensive hours, those when reliability is most threatened, or whenever curtailment is better than more usage. Customers learn to appreciate the value of their consumption. They can be operational resources, just like a peak or load following generator. It is cost effective now and smart grid will make the interface better.

There are curtailment service providers, although they are not allowed in some areas. Customers can voluntarily get involved in curtailing their use. Customers can get interruptible rates and can balance those with the potential of disconnection. The sign up is voluntary, but the control is up to the utility.

Distributed generation (DG): Government policy is critical in allowing this sort of demand resource to proceed. It includes stand by rates and feed in tariffs to flow energy back into the grid. One distributed generation is called combined heat and power (cogeneration). It can be used in supermarkets, etc. Energy efficiency block grants, including the use of biomass, can move the efforts forward. Further nudging from government through tax policy, recognition and project funding can build a marketplace to make distributed generation economical.

DG Varieties are as Diverse as Buildings: They include combined Heat and Power for industry, supermarkets and homes, using biomass fuel, sustainable practices, agricultural methane, wind, rooftop solar photovoltaic. They create additional enterprises such as a growth in fuel pellet production and other manufacturing, transportation and installation companies.

Barriers: Combined Heat & Power or Capturing Wasted Energy (or Cogeneration) face potential obstructions. The required return on investment of the host facility is often higher than that of a utility. Limited capital and competing investment opportunities often constrain the host facility’s ability to develop cogeneration. Energy savings benefits to the host facility may not be worth the hassle of installing and operating a cogeneration plant. Unless participating as an equity partner, the utility sees no return plus possible loss of load. Difficulty in establishing a guaranteed fuel supply for wood residue plants. Uncertainties regarding the long-term economic viability of the host facility. The locational value of cogeneration is often not reflected in electricity buy-back prices. The complexity of obtaining permits and meeting environmental compliance for small plants.

Innovations: Buildings can become small power generators! Smart grids can optimize on-site generation. Storage may relocate at the substation. Solar Thermal for space and water heating. Flatbed-based turbines used as temporary solutions.

All forecasts show distributed resources making a difference: The Regulatory Assistance Project is committed to fostering regulatory policies for the electric industry that encourage economic efficiency, protect environmental quality, assure system reliability, and allocate system benefits fairly to all customers.

Others think the reservoir of energy efficiency savings is deeper. The Pacific Northwest: 6th Plan says 90% of growth could be met by energy efficiency. Northeast Energy Efficiency Partnerships: projects that energy efficiency can turn the electricity load trend negative.

Big Wins in 6th Plan include water heating, building shell, HVAC (Residential, Commercial) commercial lighting, process energy, electronics, irrigation, food industries. The pace of retrofits is a big uncertainty, with big potential.

Demand Resources are quite valuable, plentiful, reliable and technology will help. They are economical, yet the power sector has a long way to go to make effective use of this potential.



PETER DELANEY, Chairman, President and CEO, OGE Energy Corporation

Pete Delaney is chairman, president and chief executive officer of Oklahoma City-based OGE Energy Corp., the parent company of OG&E, a regulated electric utility, and Enogex, a midstream natural gas pipeline business. He also serves as CEO of Enogex. Delaney joined the company in April 2002 as Enogex CEO and OGE Energy executive vice president, corporate planning and strategy. In 2003, he took on added responsibility for corporate finance and accounting; and In 2004, he was named OGE Energy chief operating officer. On Jan. 17, 2007, the OGE Energy Board of Directors named Delaney president and COO, and elected him to the board. He was named chairman, president and CEO on Sept. 23, 2007. Prior to joining OGE Energy, Delaney completed a 15-year investment banking career on Wall Street. His last position was managing director at UBS, a leading global investment banking and securities firm. He specialized in corporate finance and other advisory services to electric and natural gas utilities and other energy companies in the United States, Europe and South America. Delaney is actively involved as a member of several community and industry boards of directors including Allied Arts, Oklahoma City Chamber of Commerce, Oklahoma State Chamber of Commerce, Oklahoma City Museum of Art, United Way of Central Oklahoma, Oklahoma City Boathouse Foundation, Oklahoma State Fair Board, Association of Edison Illuminating Companies and Edison Electric Institute. Delaney holds a bachelor's degree in economics from the University of Virginia and a master's degree in business administration from Tulane University.

Presentation Summary

Peter Delaney, the second panelist speaking on the Demand topic said, "When I talk about Demand Side Management I'm talking about energy efficiency and demand response." His DSM goals are to minimize costs while planning to meet customer's needs over the next 20 or 30 years. He listed three things as factors in demand side reasoning. First, the forecasts indicate that the cost of electricity in the future will have significant increases. Secondly, the decarbonization of generating resources will have a profound effect on costs. Thirdly, the smart grid technology will be a great enabler for reaching cost-effective goals.

Delaney suggests that if we do our planning right, the marginal costs of incremental energy efficient demand response is going to be about equal to the marginal cost of generating power. Analysis shows that costs associated with energy efficiency programs are about \$28 per MWH, which is well below the cost of new gas fired or coal capacity. The big cost driver regarding customers on the demand side is the current big policy issue, CO2. Energy efficiency is a really important part of the equation faced with the CO2 reductions. Demand side management also requires that we reduce our load's carbon footprint with renewables such as wind and nuclear power. Wind is by far the most economical renewable at the present time.

In 2008, OGE announced the 2020 plan, which meant not putting ourselves in the position to need any additional fossil fuel generation until the year 2020. We are faced with technology in the U.S. that is behind other countries. We haven't made inroads in terms of improving safety or in cost effectiveness in dealing with the long-term storage issue involved with nuclear produced energy. We end up limiting our options. Delaney was emphatic about the importance of pursuing demand side management and keeping all options on the table.

In order to explore controlling demand, OGE piloted a program in 2008 with about thirty customers in Oklahoma City. 'Smart meters' were given to about 660 customers and put in about 30 home area networks. The home area networks allowed rate changes for time of use and in which customers could see within fifteen-minute intervals what they were consuming and what it was costing. During the summer, air conditioning requires the largest consumption and customers within this pilot knocked 10 to 11% off their usage. Behavioral changes, like turning down thermostats, were what Delaney was looking for. If you send the right price signals and make it painful enough to move people off the peak they will move off the peak Delaney stated. Our next step is to deploy 45,000 smart meters in Norman, OK, with 2 to 3,000 home area networks, which will determine how much energy efficiency these type of price signals will drive and also how much load shifting can result from the investments. Delaney thinks it will be substantial. We're now in the schools talking to 5th graders about making a change. Just as with seat belts or smoking, it will take a while.



DANIEL ELLIS, President, ClimateMaster, Inc.

Daniel L. Ellis is president of ClimateMaster, Inc. in Oklahoma City, Oklahoma. He has been active with geothermal heat pump technology since 1978, beginning in contracting and wholesale distribution, where he was one of the technology pioneers in northern climates. In 1983, Ellis cofounded WaterFurnace International, and served as its president and CEO before joining ClimateMaster in 1995. His technical contributions to the geothermal heat pump industry include the development of residential energy analysis and system design software, design procedures for commercial systems, and the development of advanced technology heat pumps. Ellis is chairman of subcommittee TC86/SC6 within the International Standards Organization (ISO), which is responsible for air-conditioner and heat pumps standards. He is also convener of ISO working group WG3 within TC86/SC6 that has established two international standards for water-source and geothermal heat pumps. Ellis is chairman of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Water- Source Heat Pump Sub-Section and is also a member of the Executive Committee of the AHRI Board. AHRI awarded Ellis the Richard C. Schulze Distinguished Service Award in 2005. Ellis is a member of the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and a member of the U.S. National Team for the International Energy Agency (IEA) Heat Pump Centre. Ellis is a member of the Advisory Council to the International Ground Source Heat Pump Association (IGSHPA). He is past chairman and has twice received the IGSHPA Leadership Award. Ellis also serves as a

director on the board of the Geothermal Heat Pump Consortium (GHPC), and received its Leadership Award in 2007. Ellis majored in physics at Purdue University.

Presentation Summary

Ellis spoke about specific solutions with geothermal units using onsite renewable thermal energy to displace thermal loads. He said buildings are the largest consumers of energy in the nation. They consume 39% of our primary energy, 70% of our electricity and 53% of our gas. The thermal loads, heating, cooling and water heating, account for 17% of all US energy consumption. These are the loads that a geothermal heat pump addresses.

Looking at the potential for carbon mitigation measures put together in a study by the International Energy Agency (IEA), they concluded that geothermal technology is the most effective for conditioning buildings with 65% of reduction coming from energy efficiency.

Geothermal is a form of a solar system. It creates a constant temperature anywhere in the nation from below the earth. Geothermal heat pumps tap into that energy and bring it into the building to provide heat in the winter. It sends heat in the natural direction of flow, which is hot to cold, using heat pump technology. It is part of the net zero energy solution, which is a combination of technologies. Geothermal has a 55 to 80% reduction rate of energy use. This technology is now available in our Habitat for Humanity project in Oklahoma City (220 homes) as well as to all consumers in that area. It produces a high rate of carbon reduction as well.

Geothermal can reduce the watts per square foot on monthly bills by 35% and is a technology that actually helps to unload the grid by getting rid of the energy at the end of the line. There are five to six million people a year buying new systems. Last year one out of 38 homes installed geothermal heat pumps, even at a time when housing growth fell. Geothermal heat pumps use existing ductwork in homes. As energy costs have risen, our industry more than doubled in sales in a two-year period.

Q&A

Q. Do we need decoupling to get to where we need to go?

A. Utilities are faced with a lot of uncertainty so when we looked at the throughput incentive we found we needed to provide a different way for revenue recovery for utilities thru fixed cost recovery. Decoupling accomplishes that on an enterprise basis without a post adjustment for weather normalization and a post adjustment for economic normalization focusing on energy efficiency programs. That doesn't just account for the energy efficiency program, it allows the utility enterprise to not worry about how many kilowatt hours it actually sells. Utility executives go into summer saying "boy we need a really hot summer to boost those revenues". This is not helpful! This is why we promote decoupling.

A. If you have the proper rate design and you allocate proper fixed costs or variable costs, is decoupling really necessary? I think decoupling is difficult. Who actually grows the energy efficiency reductions? Have all those adjustments been made to be paired to the right payers? Those are things that need to be looked at on a case by case basis. And how long does decoupling go on? We need to look at our business and see where we are and where we need to go.

A. There no question that decoupling will have to change. You will use what resources you have and use new technology, but you can't get away from the fact that if you're regulated, the only way to recover your costs is through the regulation process. From a commission standpoint we have to consider what the new business models are. It's a complex issue.

Q. When you look at the demand side, what do you think the workforce is going to look like coming from colleges and universities?

A. A top issue is the Smart Grid, which is comprised of communications technology. The fact that customers will be reading meters, the skills associated with managing a system will be required.

There are a lot of IT applications and you have to sell energy efficiency. There will be a lot of retirement in the next 5 years that will demand a lot of changing out. We are working with community colleges, OU and OSU to fill these needs.