Midwestern Governors Association

Detailed Summary of State Energy Challenges and Opportunities Gathered through Surveys and Interviews

ILLINOIS

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
    - Initiating cost-effective deployment of pricing incentives (e.g., Clean Coal Portfolio Standard) to begin replacing baseload in-state generation that is falling, or about to fall, out of the generation picture, especially in the MISO region.
    - Need to ensure that rules give credit for changes that facilities have already made. Companies that own older power plants will be impacted the most and will have decisions about retirement and replacement choices.
    - Good working relationship with EPA is essential. Providing information about what is already happening on the ground and early communication can help identify practical solutions.

- Energy Efficiency
    - Continuing to achieve energy savings targets under our Energy Efficiency Portfolio Standard, given the spending caps on the program
    - Combined heat and power (CHP) and waste energy recovery (WER) are specific industrial energy efficiency strategies, but the challenge is determining which barriers to focus on and how to put effective incentives in place. Ratepayer programs cannot fund CHP because it is a trade-off question of how you track the saved energy.
        i. One option for creating an incentive for CHP and WER is to allow electricity generated by these technologies to receive renewable energy credits (RECs) under a Renewable Portfolio Standard (RPS)—either through a tiered structure or a separate category—but there are proponents and opponents of this type of policy design.

- Transmission
    - Implementation of Illinois' new Smart Grid legislation

- Renewable Energy Development, Including Distributed Generation
    - Continued cost-effective compliance with our Renewable Portfolio Standard; sustaining incentives for in-state generation of renewable power to meet the RPS; determining whether/when/where transmission upgrades are necessary to support the RPS.

- Natural Gas Development
    - The low cost of natural gas makes investment in base load versus coal facilities a difficult decision. Natural gas prices are likely to go up in the future and will need cleaner coal technologies such as carbon capture and storage (CCS).

- Since the new EPA rule requires CCS on new coal facilities, does that help Illinois build clean coal projects? The CAA will encourage fuel switching – and has – from IL to WY. These rules will encourage a switch from coal to natural gas; eventually natural gas prices will come up and we will need clean coal again and want the technology deployed (CCS). For example, if Prairie State could do CCS, it would be as clean as natural gas.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  Implementing a rebate program for electric vehicle charging station installation but it is a challenge to determine how to optimize the locations. Do you build out corridors or do a more clustered approach in densely populated areas?

Opportunities

- Impacts of a Rapidly Changing Electric Generation Mix
  - What are expectations in other states for fueling newer, cleaner baseload electric generation –clean coal, natural gas, nuclear?

- Energy Efficiency
  - Design and implementation of innovative energy efficiency programs and incentives to meet our Energy Efficiency Portfolio Standard, e.g., opportunities for savings in industrial processes, combined heat and power, and behavior change; design and implementation of evaluation, measurement, and verification protocols for these programs.
  - Built a trade ally program for energy efficiency in public buildings and working to enhance the program. Building a network of contractors that can also take on some of the logistics and procurement tasks.

- Transmission
  - Implementation of Illinois' new Smart Grid legislation; ensuring that it results in increased energy savings, long-term cost savings, and reliability

- Renewable Energy Development, Including Distributed Generation
  - Build incentives for in-state generation of renewable energy or develop approaches for increased in-state generation.
  - Momentum has been gaining for solar energy, the state RPS has a carve-out for solar. In Smart Grid legislation there is a carve-out for distributed generation. The Illinois Power Authority is gathering input from stakeholders to develop an effective implementation plan for the carve-outs.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - Strong rebate program for alternative fuels and vehicles.

- Enhanced Oil Recovery (EOR)
  - Advancement of carbon capture and sequestration technologies through FutureGen, ADM Decatur, and/or other demonstration projects. These technologies and infrastructure can be applied to the Midwestern ethanol and oil industries.

- Energy Technology Investment and Manufacturing
    - Working to create incentives for manufacturing of electric vehicle technology, such as charging stations and vehicle components. Midwest has a competitive advantage with existing vehicle manufacturing base.

INDIANA

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
    - Electric utility compliance with the current set of U.S. EPA regulations is anticipated to cause many retirements and retrofits in a compressed period of time. Many entities – from utilities to transmission system operators to state regulators – have expressed concerns regarding reliability and ratepayer cost increases. These same entities will need to work with each other on a regional basis to coordinate work to avoid localized or regional capacity and/or transmission deliverability problems. Rate shock and affordability will also be a shared concern.

    - Increasing reliance on natural gas to generate electricity means the gas industry and the electric industry must develop better means to coordinate their operations so as to maintain the reliability of the electric industry. Is enough being done in this area or can more be done and, if yes, then by whom?

    - It is significant that all the items listed in this section involve significant federal-state interaction. This highlights the changing circumstances as electricity markets increasingly become regional in character and these regions grow in geographic size. How can states work together to make better long term resource decisions within the broader regional and even national markets? What kind of new institutions must develop or evolve, and what might they look like? Of course, these questions are significant for the next few years, but extend beyond this limited time frame.

- Transmission
    - Building the appropriate transmission infrastructure and the recovery of related costs remains an issue even in RTO regions. Transmission is at times a substitute for generation, but needs to be thought of more commonly as a complement to the development of other resources and their more efficient use.

- Natural Gas Development
    - Additionally, increased reliance on natural gas for electric generation will contribute to pipeline capacity and; therefore, the question as to whether the current infrastructure can meet the additional demand. Or, will new infrastructure be needed?

Opportunities

- Impacts of a Rapidly Changing Electric Generation Mix
    - What happens to load growth over the next several years? Indiana utilities project very slow growth for an extended period of time while the State Utility Forecasting Group (SUFG, http://www.purdue.edu/discoverypark/energy/SUFG/) projects considerably higher growth even if it is still low by historical standards. Higher or

lower growth over time will have significant implications for the level of additional resource investment and also the type of investment.

- The changing energy markets and rapidly evolving technology present both problems and opportunities. How can long-lived capital investments be made in this environment while maintaining a reasonable degree of flexibility? The real question is what type of federal and state policies are necessary to promote efficient and robust resource decisions? Again, this ties back to the unavoidable interplay between federal and state policy decisions.

- Natural Gas Development
  - Impact of shale gas production on natural gas prices and stability. [This issue involves a related concern noted in the previous section: Will growing demand for natural gas have an impact on pipeline capacity? Will additional pipeline infrastructure be needed?]

IOWA

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
  - Regulations on existing generation/compliance with proposed EPA regulations affecting the use of coal to make electricity.
  - Pushing back on some of the EPA regulations. The private sector should have more time, the current timeline is not realistic or cost competitive. Need to be more sophisticated about how we go about this.
  - Uncertainty in the energy market – uncertainty of production tax credits, market competition for wind with low natural gas prices, transmission costs.

- Transmission
  - Timely energy transmission infrastructure development.

- Renewable Energy Development, Including Distributed Generation
  - Stable market for renewable energy and how to avoid overreliance on natural gas given potential future volatility in price and uncertainty of supply.
  - Challenges with wind around siting and permitting. Feel that wind is more of a challenge than solar.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - How do you figure out what is the demand for different types of alternative fuels? IA has not strongly pursued EVs, because they are not sure of the demand. What is the market for different fuel types? Assets and gaps, target investments to fill the gaps. How many consumer groups are demanding EVs? Are there consumers who would use the transportation alternative fuel?

Opportunities

- Energy Efficiency
  - Continued development of energy efficiency, especially in conjunction with renovation of existing homes, businesses, institutional buildings and factories.

- Transmission
    - Continued development of transmission facilities to improve reliability and carry new generation, such as wind, to market.

- Renewable Energy Development, Including Distributed Generation
    - Distributed generation/net metering. Distributed generation is viewed as smaller sources of energy that provides power as opposed to large central generators. Doesn't have to always be renewable.
    - Increased deployment and development of renewable energy production, particularly wind.
    - Economies of scale if everyone can own a piece of it. Might make sense to implement a 1 to 2 MW facility instead of putting individual solar panels on individual roofs.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
    - Working to create a brand for biorenewables such as biofuels, bioproducts and biobased chemicals. This can help to work towards the goal of increasing biofuels penetration in additional markets.
    - Increase the use of biofuels. Iowa has done a lot of work on eliminating barriers to accelerate the adoption of E15. Private sector doing some grants for infrastructure to help build it out. Need to make sure the infrastructure can match the fuel type capabilities. Education campaigns are also important in this effort, for consumers but also industries that service vehicles, such as mechanics, to ensure these groups also have the right information about E15.
    - Showing leadership on increasing the use of 20 percent biodiesel blends.

- Energy Technology Investment and Manufacturing
    - Improved supply chain for renewable energy manufacturing

KANSAS

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
    - Actively monitoring EPA and promulgation of various rules. The timeframe for meeting new regulations presents a sheer challenge for utilities to handle all the contracting that needs to be done.
    - Commission jurisdiction is only over IOUs. Also have municipal and cooperative utilities. EPA rules are a one-size fits all. KS is a very rural state and has very small plants in rural areas and this makes it very difficult for small generators to absorb the costs of EPA regulation compliance. The activity of monitoring is also adding a significant challenge. KS dept. of health and environment has been forging collaboration among utilities to address these issues.
    - Changes to base load sources need to be transferred into the rate-making model.. Wrestling with how to reform the ratemaking model (unbundling etc) to make it more efficient for consumers and generators. Requires consumers (industrials and residents) to pay back those changes faster. The current model is cumbersome and the KCC is taking steps to streamline that model. Current rate structure does not capture the realities of today's more market.
    - Costs have already gone up in KS.

- This issue is broader than just rate setting, also includes certificated areas. Community wind development projects have had difficulty (not in KS) but have heard of challenges in other certificated areas.
- Use riders to recover costs and help with cost transference earlier in the process.

- Transmission
  - Challenge in transmission is related to wind development. Every state is an individual state and might belong to a geographic region, but they also interact with other types of regional groups. The complexity of how to collaborate is complicated.

Opportunities

- Transmission
  - Transmission is being addressed and it is an issue that needs to be addressed. KS electric transmission authority, moves into the SW power pool. When trying to export wind, they need to deal with the seaming issues of all RTOs. Also have collaborations with eastern interconnection.
  - New regional transmission, see it as an economic highway. They have had challenges, but have navigated those challenges effectively.

- Renewable Energy Development, Including Distributed Generation
  - Optimize wind resources in terms of wind development. There has been favorable tax treatment. Are very active in promoting wind through wind siting, funding and other activities. Building wind energy to meet RPS, but now starting to export wind to other states. This is a real positive for KS.

- Natural Gas Development
  - Oil and gas - in the early stages of Mississippian play, an oil play in the SC region of KS. Taking advantage of new drilling and extraction technologies (horizontal drilling and hydrologic fracturing). Early stages of ramping up. Planning and infrastructure challenges, how big will that play be? Interagency workgroup. The oil play is an opportunity.
  - Economic impact to the oil and gas play.
  - Natural gas out of the same well as oil, they lack the piping and transport system for the gas. Some of the gas depends on the company and their business model. Some are looking at pipeline development, but some are going to ahead and flare the gas. Primarily an oil play in KS, but can't speak for all the companies.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - KS is a great state for ethanol. There is a lot that is produced here. KS ethanol plants have survived. E15 is a fantastic opportunity. There has been a steady supply of ethanol and many plants using a variety of different feedstocks.
  - An ethanol plant is developing a methane digester project at the plant, funded by a KS state agency. Will help the plant keep advanced status under the renewable fuel standard.
  - Several plants export ethanol to other markets outside of the region.

- Enhanced Oil Recovery (EOR)

- There might be a little bit of activity, but most of the activity is happing around horizontal drilling and hydrologic fracturing.

- Energy Technology Investment and Manufacturing
  - Manufacturing opportunities to supply components. Operation and maintenance jobs.

MICHIGAN

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
  - Cost. EPA rules are forcing us to transition rapidly out of an infrastructure that was built over a two decade period. This front-loads cost at a time of economic hardship.
  - Reliability. The closure of a plant in the Upper Peninsula due to EPA rules has the potential to create a reliability crisis. Want time to examine all of the options, including repowering and transmission. But timing is causing a crisis.
  - Need to improve regional decision making process so results have buy-in.

- Energy Efficiency
  - Funds from the American Recovery and Reinvestment Act (ARRA) provided assistance to states for energy efficiency investments, new approaches and sources of funding will be needed in order to continue to make progress on energy efficiency.

- Transmission
  - Distribution of cost across the region is a key issue and is supportive of regional decision-making by those interests who are responsible for paying for transmission

- Natural Gas Development
  - Prepare to manage natural gas storage in a way that effectively accommodates an evolving landscape with new centers for supply and demand

Opportunities

- Impacts of a Rapidly Changing Electric Generation Mix
  - Work with other states to ask for more time.

- Energy Efficiency
  - Developing an effective model for addressing energy efficiency in public buildings.
  - One percent energy efficiency mandate on all utilities.
  - Recently completed a combined heat and power (CHP) project at a state facility.
  - Examples of energy efficiency financing programs, such as revolving low-interest loan program, which will continue to make progress post ARRA funding. Opportunity to continue developing innovative financing mechanisms. Have been successful at securing private funding to advance energy efficiency.

- Transmission
  - Interested in advertising how robust the grid is in order to improve the marketing ability and attract new businesses.

- Separating transmission from generation and supply helps to alleviate a conflict of interest regarding how best to manage congestion.

- Renewable Energy Development, Including Distributed Generation
  - Supporting universities in their work on offshore wind.

- Natural Gas Development
  - Natural Gas – production but especially storage. We have great storage and as natural gas becomes a more important fuel, we need to keep our national leadership in this area.
  - Michigan has more natural gas storage capacity than any other U.S. state, supporting the distribution of natural gas within the region. There is an opportunity to invest in the storage infrastructure that can benefit other states within the MGA.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - Innovation. Vehicle electrification, fuel economy, and our engineering talent make Michigan a great place to innovate and keep innovating.
  - Working to approach transportation from a corridor perspective, but also state fleet re-fueling.

- Enhanced Oil Recovery (EOR)
  - We also have the potential to generate a great deal more gas and oil using new methods (both fracking and enhanced oil recovery using CO_2). Example of an advanced oil recovery project that has been very successful, project is co-located with an ammonia plant.

- Energy Technology Investment and Manufacturing
  - Examined ways to support the renewable energy supply chain and are interested in further work.
  - Currently working to identify areas of the business climate that may be hindering investment. Trying to right-size incentives and make them more appealing.

MINNESOTA

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
  - Implementation of EPA regulations on existing coal plants, but MN has taken voluntary steps already to work towards developing cleaner energy sources
    For the older facilities, there will be facility specific decisions, but those are not numerous. These decisions will involve important issues including impact to local employment.
  - Large communications challenge and lack of education about what the policy changes are and what they mean. How can we better explain this to the public? What are the decisions that need to be made and how will we be impacted by what our neighbors are doing?

- Transmission

- Allocation of costs when customers do not see a direct benefit from a transmission line that may serve regional or multi-state needs.
- Concerns from local communities may arise as more densely populated areas become candidates for wind development.

- Renewable Energy Development, Including Distributed Generation
  - Siting wind projects: As more densely populated areas become candidates for wind development, how are local concerns best addressed?

- Natural Gas Development
  - Need to look at local impacts and regulatory development for new areas of natural gas development.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - Encountered serious obstacles (mostly market-based) related to local infrastructure.
  - Do not have the blending capacity to go from a 5 percent to 10 percent biodiesel blend and infrastructure issues are difficult to address for independent retailers.
  - Ethanol does not have the same blending issues as biodiesel, but are currently maxed out in terms of ethanol capacity and there are concerns – voiding car warranties etc – about increasing ethanol blends to 15 percent.
  - Electric vehicles are seen as more a challenge because of the colder climate.

- Energy Technology Investment and Manufacturing
  - Increasing private investment in clean energy development.
  - Ensure there are sufficient training opportunities to meet the needs of the clean tech industry.

Opportunities

- Impacts of a Rapidly Changing Electric Generation Mix
  - Know there are changes coming and we want to understand the impact. We want the outcome that produces low rates, clean energy and continued employment in the energy sector. Our approach is to be systematic about looking at what the alternative futures look like, and then select which has the best likely outcome.

- Energy Efficiency
  - Increasing energy efficiency in public buildings. Have had success in using performance contracts for state-owned building efficiency investments.

- Transmission
  - Communicate the economic benefits achieved through transmission infrastructure build-out, including job creation, increased reliability, and ability to carry Midwestern energy to the market.

- Renewable Energy Development, Including Distributed Generation
  - Expanding distributed generation.
  - Distributed generation is defined as anything that is renewable (wind, solar, biomass, CHP etc.) and is under 10 MW. State has been hearing from consumers that they want a choice to generate their own energy from a range of available

technologies. Current policies are outdated and limit the choices available to consumers. Policies are cost prohibitive for individual consumers. The state sees it as critical to get the cost-share right to avoid the feeling that one consumer is subsidizing another consumer's choice to generate clean energy. The opportunity is greater choice for rate-payers and more renewable energy production, if all parties can agree on a fair way to account for the costs of connecting to the electric grid.
    - Net metering as a strategy to help increase the amount of distributed generation.

- Natural Gas Development
    - State supplies sand needed for hydraulic fracturing. While this represents new economic opportunity, sand mining has also raised new concerns for some in the communities in which it takes place.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
    - Advanced biofuels, like biobutanol, is a new opportunity for the state. A corn ethanol plant is being converted to produce biobutanol and will be operating in the near-term.
    - Interest in examining electric vehicles issues, but not likely to be a big push in the very near-term.

- Energy Technology Investment and Manufacturing
    - Attracting/expanding clean energy and energy efficiency manufacturing supply chain.
    - Working with economic and workforce development and private investment stakeholders. On the private investment side, we are working with both those in angel firms and private equity to try to understand why we aren't seeing more capital deployed in this area. We are asking questions such as, what factors related to medical technology created a cluster that we can replicate in clean technology? We have a tremendous amount of interest across a wide array of stakeholder groups to pursue this.
    - The guaranteed energy savings program is an example of bringing the private sector in. We hope that these initial investments and success stories can create a snowball effect. We need to establish metric to help determine what progress and success looks like in this area. Companies, banks, investors, or other sources of capital don't necessarily look at state borders as something of consequence. There could be some advantage for states to pool resources.
    - Another component is workforce development . In order for companies to come here, they need to know the workforce exists to meet their needs. What are the training opportunities to develop the workforce to meet the needs of the clean tech industry?
    - The solar supply roundtable is a good example improving the manufacturing supply chain, the Department of Employment and Economic Development is coordinating the roundtable and meets once every quarter. This is another area that is similar to the private investment issue in terms of the need and broad scope. There is a lot of potential here to understand the supply chain better.

MISSOURI

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
    - Aging coal plants, regulatory uncertainty, lack of diversity in energy mix, questions regarding the state's direction beyond these coal retiring plants.

- Energy Efficiency
    - Combined heat and power (CHP) and waste energy recovery (WER) are specific industrial energy efficiency strategies, but the challenge is determining which barriers to focus on and how to put effective incentives in place.
    - Funds from the American Recovery and Reinvestment Act (ARRA) provided assistance to states for energy efficiency investments, new approaches and sources of funding will be needed in order to continue to make progress on energy efficiency.
    - Relatively low electricity rates make it difficult to attain utility buy-in for energy efficiency when there is not much cost advantage over business as usual.
    - Uncertainty about how to implement cost recovery for energy efficiency measures is an also a near-term challenge.
    - Determining the best approaches to improve energy efficiency in new and existing construction.

- Transmission
    - This is a challenging issue for the state.

- Renewable Energy Development, Including Distributed Generation
    - Determining if there is the amount of actual power generation needed in the state or if you Renewable Energy Certificates (RECs) are needed.
    - Cost allocation and customer payments for distributed generation.
    - Moving past the log jam on Renewable Portfolio Standard (RPS).

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
    - Determining the right alternative transportation approaches in a mainly rural state with only a couple of large metropolitan centers.

- Enhanced Oil Recovery (EOR)
    - Additional oil and gas permitting presents a challenge when the price of oil goes up.

Opportunities

- Impacts of a Rapidly Changing Electric Generation Mix
    - Looking at ways to address EPA rule implementation and how the state is positioned.

- Energy Efficiency
    - Energy efficiency in the residential sector is important.
    - Working with utilities to determine effective approaches for cost recovery is an area of tremendous opportunity, along with overall energy efficiency measures.
    - Governor issued an executive order for a 2 percent energy reduction per year for 10 years in state buildings. ARRA funds are being used to implement the order. Opportunity to determine future financing approaches to meet the goal.

- Interested in industrial energy efficiency in the context of how to address future energy needs in the face of coal plant retirements. CHP is an opportunity for the state.

- Renewable Energy Development, Including Distributed Generation
  - Solar carve-outs have been a topic of discussion.
  - Experiencing a solar boom. Utilities are required to provide rebate.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - Biofuels is the dominant interest area for alternative transportation. Algae-based biofuels present an opportunity.
  - Interest in compressed natural gas vehicles (CNG).
  - State promotes fuel diversity and there are a lot of eligible fuels to meet state goals. Interest in addressing fuel diversity through the state fleet and vehicle purchase (flex fuel vehicles, electric vehicles, etc.).

- Enhanced Oil Recovery (EOR)
  - Not a driving issue but there are some opportunities in the state.

- Energy Technology Investment and Manufacturing
  - Economic opportunity associated with renewable energy technology manufacturing.
  - Supplying raw materials, such as lead, for energy storage technologies is also an opportunity area.
  - Strategies to promote solar manufacturing.

OHIO

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
  - Power plant closures are a challenge and may result in congestion and price hikes.
  - EPA regulations and how they will impact coal driven states, the impacts will be dramatic.
  - Ohio wants to have a diversified portfolio, but wants the marketplace to drive where that generation comes from and competition that drives the market for a low cost provider. There are RPS and EE standards to give market signals, but do not want to be in a situation where they are picking winners and losers.

- Energy Efficiency
  - Combined heat and power (CHP) and waste energy recovery (WER) are specific industrial energy efficiency strategies, but the challenge is determining which barriers to focus on and how to put effective incentives in place.

- Transmission
  - Need to address interconnection issues, congestion, the cost of transmission, and ensure facilities can meet their load requirements as an economic development priority.

- Renewable Energy Development, Including Distributed Generation

- RPS policy identifies advanced energy and is currently examining whether strategic modifications are needed to address barriers that might be limiting some of the most interesting opportunities from moving forward. The challenge is keeping the policy relevant to reflect new technologies and opportunities.
- RPS policies and other standards, can help to create the market, but it might not be enough to have the right price signals for increased investment.

- Natural Gas Development
  - Some of the existing pipeline infrastructure is not currently structured in a way that can meet the increasing development in the Utica and Marcellus shale (e.g., the current direction of flow in the pipelines may need alteration given future areas of production and demand).
  - Need to look at local impacts and regulatory development for new areas of natural gas development.
  - Have had historical boom and bust cycles. Need to make sure Ohio is diversified enough across all the sectors to avoid the boom and bust cycles. Ohio is looking downstream and upstream for opportunities and at long term investments to the state.

- Energy Technology Investment and Manufacturing
  - Solar and wind manufacturing. There is a lot of foreign competition and the loss of tax credits and federal support is having an impact on this sector.
  - Amazed at how little venture capital is flowing into OH and is likely true in other states. How do we get more venture funding flowing into the region? How do you extract the intellectual property from the Universities to make it attractive to venture capitalists?

Opportunities

- Impacts of a Rapidly Changing Electric Generation Mix
  - OH needs to be a competitive state from a capacity perspective. OH is in a regional market that goes east. Fuel diversity is great but the market needs to drive that.Energy Efficiency

- Energy Efficiency
  - Energy efficiency standard give a signal to the market.
  - Closely examining the potential for waste energy recovery and combined heat and power, trying to determine how to close the gap and identify appropriate incentives.

- Transmission
  - Addressing transmission issues is viewed as an economic development priority.

- Renewable Energy Development, Including Distributed Generation
  - Strong interest in having a diversified portfolio and renewable energy generation is a part of that approach. Want a marketplace that drives where the generation will come from and competition drives the market for a low cost provider. Also pushes economic development for the state.

- Remove barriers to facilitate adoption of interesting opportunities and new technologies.

- Natural Gas Development
  - Presents an enormous economic and workforce development opportunity, from chemicals manufacturing to the electric power industry. About half of the natural gas resource in Ohio is "wet" gas that mixes with other valuable liquids that Midwestern industries can use and capitalize on to create other products, such as in chemical production. There is a multiplier effect on top of developing the natural gas resource for other industries. This positions Ohio and other Midwestern states to create more jobs and support Midwestern industries.
  - Economic development opportunities and research at the university level to identify future opportunities. Refineries and pipelines are important to the whole region.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - Given the scale and scope of natural gas development in the state, CNG vehicles and needed infrastructure is of interest.
  - There is also interest in providing opportunities for biobased CNG and LNG such as from landfill gas or animal manure. This is a small, but growing area.
  - Will look to private companies for determining appropriate opportunities from other transportation options, such as electric vehicles or fuel cells.

- Enhanced Oil Recovery (EOR)
  - Remains an issue of interest for OH. There are a few projects that are ongoing. Joint effort between DNR and Battelle. A private effort with one of the oil and gas companies. EOR with water flooding project in east canton oil field and the other is using CO_2. Ohio previously attended the MGA Gulf Coast EOR Delegation and it is an interest for the state. Value seen in efforts to support the concept of using CO_2 that generated by some of the coal facilities and using it for some level of CO_2 sequestration. For some of the EOR projects in OH, they are buying CO_2. There are logistical and money issues for cleaning up the CO_2.

- Energy Technology Investment and Manufacturing
  - Solar supply chain-manufacturing.
  - Ohio is very good at making things.
  - Ranks high among states to make components for the wind and solar supply chain.

WISCONSIN

Challenges

- Impacts of a Rapidly Changing Electric Generation Mix
  - Cost: Wisconsin is not only striving to keep rates competitive for businesses and families. Several new EPA rules, most imminently the Cross-State Air Pollution Rule, will require dramatic emission reductions, cost jobs, and drive up rates, especially in Wisconsin. Mandates and the forthcoming EPA rules are forcing some utilities to purchase power from more expensive generation sources when a cheaper alternative exists.
  - Difficulty offering competitive rates to spur economic growth: To stay competitive with other states, the Public Service Commission of Wisconsin needs the legislature

to approve tools like Economic Development Rates in order to efficiently work with utilities and businesses to spur job growth and keep electricity prices low.
    - Coal generation is going to go down from where it is right now. The potential is there for an uptake in hydro. There is about 5000 new MW of hydro in Manitoba. Gas will be one of the larger challenges, including the need to have the right infrastructure capacity in place to get the gas where it needs to go.
    - There is a question of tradeoff between natural gas and other sources of electricity.
    - The uncertainty of all the EPA regulations and constant new regulations has resulted in the less ability for utilities to plan what stays and what goes. Utilities need to be able to broadcast out for a longer period of time in order to make decisions.

- Energy Efficiency
    - Determining the most cost effective approaches in order to ensure the commercial sector can remain competitive in a global marketplace.

- Transmission
    - Siting transmission lines: Managing the transition to a regional transmission system has brought challenges. Like many other states, Wisconsin has had significant issues with siting new infrastructure; including both generators and transmission lines, especially if residents do not see a direct local benefit.

- Renewable Energy Development, Including Distributed Generation
    - Working to mitigate costs to consumers who are paying for compliance with statewide renewable mandates.

- Natural Gas Development
    - State supplies sand needed for hydraulic fracturing. While this represents new economic opportunity, sand mining has also raised new concerns for some in the communities in which it takes place.

Opportunities

- Impacts of a Rapidly Changing Electric Generation Mix
    - Collaboration: Opportunities exist for utilities to work more closely with one another and with local industry to help spread the costs and risks of new generation facilities.

- Energy Efficiency
    - Efficiency: In difficult economic times, it may be easier to convince customers of the value of energy efficiency, a relatively low-cost solution to some energy production needs. Wisconsin does currently have excellent conservation and efficiency programs in place.
    - Performance contracting for state-owned buildings. Engaging the best from the private sector and not compete with the private sector. Leverage the low interest rates the states can get through bonding.
    - Develop loan loss reserve programs to help lower the risk for the investment community. Goal is to build experience in the private sector and decrease the public investment overtime. Interested in building on this approach in the future.

- Interested in finding the most cost effective means, particularly in the private sector so they can compete in a global marketplace.

- Transmission
  - Exporting energy to benefit customers**:** Selling excess generation capacity and participating in an open, robust, regional transmission system offers benefits to Wisconsin ratepayers. With some new generation in the state, Wisconsin has the opportunity to be a significant exporter of energy into other markets.

- Diversifying the Transportation Fuel Mix and Building the Needed Infrastructure
  - Wisconsin is installing CNG stations. Opportunity for significant cost savings between CNG and diesel.
  - Also sees BioCNG as an opportunity as a near-term opportunity. BioCNG is a biomass-derived natural gas equivalent that can be generated from several types of resources. It will be a bit more expensive, but as resource development ramps up, it can become more cost competitive with fossil CNG and can offer better price stability.
  - Wisconsin is currently in the process of completing a biogas assessment of potential resources in the states. A base source of information can be useful to companies and project developers that are making decisions about where to locate a project. It can be very discouraging, very quickly for companies that are looking to put a project together, but have to find where all the available feedstocks are in a given area. This type of effort helps to support bioCNG development.