MIDWEST WORKSHOP PROCEEDINGS

On November 4 and 5, 2003, the Pew Center on Global Climate Change, under a grant from the Joyce Foundation, held a workshop in Chicago, IL, on State Policy Solutions to Climate Change. This workshop brought together state officials from Ohio, Illinois, Indiana, Iowa, Minnesota, Wisconsin, and Michigan. State agencies represented included Agriculture, Commerce, Natural Resources, Environmental Protection, Administration, Energy, and Transportation. The purpose of the workshop was for state officials to share their experiences in implementing programs that reduce greenhouse gases and for them to reflect on the lessons learned. This volume includes a summary of the workshop proceedings and presentation materials.

Session Highlights

First Panel: Highlighting Alternative Energy and Technologies

- State ethanol programs boost the farm and rural economy by turning a low-value product into a higher-value product and capturing that value-added in state. They also reduce reliance on foreign energy sources and reduce air pollution from automobiles.
- Several Midwestern states are doing something to promote ethanol, but each is approaching it somewhat differently. Minnesota requires that all gasoline offered for sale be a ten percent ethanol blend and offers in-state ethanol producers an incentive payment (this subsidy will end in 2010). Iowa does not have a mandate, but it does offer some incentives.
- Ohio and other Midwestern states have efficiency programs to work with companies to help them stay competitive and remain in-state. Each state funds its program differently. The Ohio Distributed Energy Resources (DER) program is funded by oil overcharge money from the mid 1980's and from the state's systems benefit charge.
- The environmental benefits of growing and harvesting switchgrass and co-firing it with coal include decreased soil erosion and water contamination, improved wildlife habitat, and reduced conventional pollutants and greenhouse gas (GHG) emissions.
- Methane recovery has proven to be an effective way of reducing odors from dairy and swine farms while producing energy for the farms and reducing emissions of methane into the atmosphere.

Second Panel: Using Energy Efficiency to Reduce Greenhouse Gas Emissions

- Several Midwestern states are implementing energy efficiency programs that deliver multiple benefits: they minimize environmental impacts associated with energy use, enhance the economy, make industrial processes more efficient and competitive, improve reliability of the electric grid, and decrease dependence on imported energy resources.
- These efficiency programs spend less money to save energy than consumers do to buy it. States receive value from the programs that far exceeds expenditures, especially when non-energy benefits are taken into account.

- Partnering with the federal Low Income Heating and Energy Assistance Program allows states such as Michigan to simultaneously assist low-income electric customers and conserve energy, but the program faces challenges on several fronts.
- Funding stability is an obstacle for efficiency programs, as budgets and funds are taking a hit during the state fiscal crises. When the economy is slow, reducing energy use is not the highest priority, and support for these programs is harder to build.
- States take various approaches to funding their energy efficiency programs. In Wisconsin, a system benefits charge on each residential bill provides money. In Minnesota, a statute requires that utilities spend a percentage of their gross operating revenues on energy efficiency and conservation. This system has the advantage of not being part of the state's budget. Utilities in Iowa have a similar requirement to put aside a certain percentage of revenue for efficiency and conservation projects. In Ohio, some low-income assistance and education programs are funded by a rider on each electric bill.
- To build broad support for these programs, especially during tight budget times, it helps to point to their multiple benefits. Program evaluation is also crucial. If it isn't measured, it's as though it didn't happen.

Third Panel: Promoting New Technologies to Address Climate Change

- The Midwest faces the challenge of transitioning its economy from an aging manufacturing base to a more dynamic economy based on research and innovation. States want to attract new, high technology jobs while retaining existing jobs. Indiana's Department of Commerce runs several industrial efficiency, alternative energy, and alternative transportation fuel programs that help accomplish this goal. Ohio's Third Frontier Project aims to expand research capabilities and offers incentives for advanced technology companies to locate within the state.
- Funding for this type of program is drying up. In the last legislative session, Indiana secured revenue from vending machines to fund its programs. Environmental groups want a systems benefit charge to collect money for renewable energy and energy efficiency, but utilities are resistant. In Ohio, voters recently defeated a bond issue for the Third Frontier Project.
- One challenge that Indiana and Ohio face is that they generate a lot of low-cost electricity from coal. The states want to maintain low energy costs, but they want to improve their environmental conditions as well. A big impediment to energy efficiency is the fact that energy is inexpensive. The departments that work on energy efficiency are also tasked with keeping energy prices low.
- Each of the Midwest states has begun to pay attention to hydrogen, whether in the context of fuel cells for transportation or electric generation, and all are at infancy level on the issues. Hydrogen presents an opportunity for Midwest states to work together.

Fourth Panel: Reporting, Registering, and Trading Greenhouse Gas Emissions

- Wisconsin, as part of a state effort to begin to address climate change, requires large carbon dioxide (CO_2) emitters to report their emissions. The state has also established a voluntary reduction registry. The Department of Natural Resources committed to being a strong advocate for granting baseline protection to companies that register reductions, if mandatory reductions come into effect. Neither the mandatory reporting nor the registry has been controversial.
- The Chicago Climate Exchange (CCX) is a voluntary GHG emission reduction and trading program for emission sources and offset projects. The CCX is a demonstration project, with the goal of learning the best way to build the systems and infrastructure needed for the long term: How is this going to work, and what is it going to cost?
- Companies have several reasons for participating in projects such as the Wisconsin reduction registry and the CCX: to get ahead of the curve, to build management and trading skills, to receive public recognition for their environmental leadership, to reduce the long-term cost of GHG mitigation, to have a say in the development of the framework, and to receive baseline protection for their efforts. Companies such as Wisconsin Energy understand that to be where they want to be in 50 years, they have to get started now.
- Companies are motivated to participate in climate policy at the state level because they want programs and policies from different states to be as compatible as possible, and also as cost-effective and efficient as possible. Trying different things is not optimal for a consistent national program, but having states experiment and learn will ultimately lead to a more robust national policy.

Fifth Panel: Sequestering Carbon in Soils, Forests, and Geologic Formations

- Minnesota has a goal of reducing GHG emission intensity (emissions per dollar of real gross state product) by 18 percent by 2010, which would translate into a 12 to 13 percent reduction relative to business-as-usual predictions.
- Minnesota recognizes that a major investment is needed to develop the supporting infrastructure for GHG control. Actions can be taken now in their own right that will also reduce GHGs. The challenge for state agencies is to get programs in place to ease the cost of transition to a mandatory control system.
- Ohio's Coal Development Office helps coal maintain its competitive edge within environmental limits. While CO_2 is going to be a long-run problem, Ohio is looking at options to address it now, such as geologic sequestration. The state is pursuing a dual strategy of addressing the needs of the existing power plant fleet while transitioning to the new fleet.
- Minnesota's ReLeaf program, which helps communities to plant and manage trees, addresses climate change while delivering other benefits. For example, community trees under management curb residential energy use by providing windbreaks and shade; they also provide living snow fences. To create support for the program and to share its cost, the ReLeaf program partners with various public and private entities.
- Illinois formed an advisory committee to investigate the potential to sequester CO_2 in the state. The committee identified geologic sequestration as Illinois'

greatest potential for sequestration, and recommended that further research be conducted in several areas.

- Efforts to sequester CO_2 in agricultural systems will generally have positive impacts on other key natural resources such as air, water, and wildlife. The greatest environmental co-benefits are likely to occur on the soils that also have the greatest potential for sequestering carbon, namely low organic carbon soils.
- The Midwest Regional Carbon Sequestration Partnership, one of seven regional partnerships selected by U.S. DOE, will evaluate the technical feasibility and cost of sequestering CO_2 in soils and geologic formations.

Lunch Panel with Businesses

- Companies are acknowledging the risk of climate change and the need to take action. Both American Electric Power and Baxter are members of CCX, through which they have committed to a 1 percent reduction in CO_2 emissions each year from 2003 through 2006. SC Johnson has adopted a target for its U.S. facilities through EPA's Climate Leaders program of an 8 percent reduction by 2005.
- AEP supports research on the science of climate change, and is pursuing policy, research, technological, and business opportunities to address climate change. AEP advocates market mechanisms and flexibility to address the problem, including trading, banking, offsets, and early action credits. It is AEP's position that any successful strategy to address climate change must be comprehensive, cost-effective, realistic, verifiable, and technology oriented.
- SC Johnson feels that it makes good business sense to deal with climate change and wants to be a good corporate citizen while still improving profitability. The company has set goals for all of its manufacturing facilities around the world, and has enlisted partners to help in this effort.
- Baxter estimates the GHG emissions associated with all aspects of its business, including employee commuting and travel. The company also has an aggressive energy management program, in which it tracks and reports energy use from all locations every 3 months. There is also a push for green buildings within the company.

Sixth Panel: Policy Tools to Encourage Low-Carbon Energy

- Minnesota's comprehensive energy strategy is designed to reduce all environmental impacts, but does not specifically target GHG emissions. The state wants to maintain reliable low-cost electricity, but also wants to reduce the environmental impacts of energy generation and delivery.
- Minnesota has adopted a goal to move toward a hydrogen economy, a key component of the state's strategy on climate change.
- Settlements with utilities can provide funds for energy programs. Illinois' Clean Energy Community Foundation was endowed as part of a settlement with Commonwealth Edison. Commonwealth Edison set aside $225 million to endow a foundation to fund renewable energy and energy efficiency projects.
- "De-siloizing," meaning looking at things all across state agencies, is a challenge for states. All of the agencies have different programs to help with waste

reduction, energy efficiency, and pollution prevention, and sometimes they don't know about each other.

- Several participants agreed to report back to the workshop participants regarding options for discussing a Midwestern Renewable Portfolio Standard Agreement. The Organization of Midwest Independent System Operators is a possible forum. Such an agreement could involve trading of renewable energy credits between contiguous states with an RPS of some certain level.

Opening Remarks

The workshop began with opening remarks from Eileen Claussen, President of the Pew Center on Global Climate Change. Ms. Claussen's remarks included the following points:

- The scientific community has reached a strong consensus on global warming, despite some remaining uncertainties. If the world continues to emit greenhouse gases at a high rate, the world will warm between 2.5 and 10.4°F over the next century. The goal is to find ways to address climate change that are effective and that do not do serious harm to the economy.
- At the international level, the Kyoto Protocol of 1997 is awaiting Russian ratification. The odds are that Russia will ratify eventually, but it is far from certain. Most of the parties, such as Europe, who have ratified are taking action on climate change in the meantime. The U.S. decision not to ratify has many ramifications. It is important to think about what the United States can and should do at the national level.
- There has been a lot of activity recently at the national level. Over the last couple of years, much more climate change legislation has been introduced into Congress than ever before—scores of bills of different kinds, involving carbon sequestration, GHG reporting, how to develop a strategy for the United States as a whole, and technology.
- The most interesting of these efforts was sponsored by Senators Lieberman and McCain and would cap U.S. GHG emissions and keep them capped at 2000 levels through 2010. October 2003 was the first time that a bill that would reduce emissions had come up for a vote in the U.S. Congress. The headlines after the vote were along the lines of "Lieberman and McCain Bill Fails," but getting 43 votes on the first try is remarkable. A bill of this sort, which is relatively modest, but strong enough to send a signal to the market, is probably the way this country will move forward.
- A lot is going on in industry. Twenty-seven of the thirty-eight companies that work with the Pew Center have already set quantitative targets to reduce their emissions, many of them more stringent than the Kyoto Protocol. A group of them, 7 or 8, has already achieved these targets. Not a single one of them has found that it cost them money. These are efficiency improvements for the most part, a first set of emission reductions that do not incur costs.
- Most interesting is what's going on at the state level. State-level action is very diverse, covering a huge range of activities. New Hampshire, Oregon, California, Washington, and Massachusetts have or are developing rules that impose a limit

on some types of GHG emissions. Maine is developing a mandatory reduction program. Several Northeast states have come to an agreement with the Eastern Canadian provinces to reduce emissions. Thirteen states have renewable energy mandates. These programs exist across the country. On a regional basis, ten states in the northeast are going to work toward a regional CO_2 cap and trade program for power plants, and there is also a regional initiative on the West Coast.

- From Washington, D.C., this state and regional activity is exciting, because what is going on the states as a whole is going to change the political landscape of the U.S. Congress. It is exciting that states are getting together and talking things through to get improvements in policy. Each state is trying to find what makes sense, and this will vary from state to state. Getting people to exchange information and work on policy at state level is very important. Comprehensive policy at the national level is the eventual goal, but a lot of the learning can take place at the state level.

Detailed Session Descriptions

First Panel: Highlighting Alternative Energy and Technologies

Presenters:

- Sharon Clark, Deputy Commissioner of the Minnesota Department of Agriculture, on "Minnesota: Oxygenated Fuel Requirement and Ethanol Market Development."
- Tony Sutor, Program Manager for the Ohio Department of Development's Office of Energy Efficiency on "Ohio's Distributed Energy Resources Program."
- Angela Chen, Environmental Programs Supervisor of the Iowa Department of Natural Resources, on "Iowa's Biomass Energy Projects."

Sharon Clark's presentation included the following points:

- Nationwide ethanol production has expanded by a factor of 12 since 1980; Minnesota's ethanol production has expanded by a factor of 200 since 1987. In 2002, production in Minnesota reached 335 million gallons of ethanol. The turning point for ethanol production in Minnesota was the passage of the Oxygenated Fuel Requirement, which aimed to bring the Twin Cities in line with federal air quality standards. It mandated that all gasoline offered for sale in Minnesota contain at least 2.7 percent oxygen by weight. In 2003 this law was amended to specify that a ten percent blend of denatured ethanol be used.
- Historically, the ethanol program has pursued several goals. The first of these is boosting the farm and rural economy by turning a low-value product into a higher-value product. This value-added is captured in state. A second objective of the program is to reduce reliance on foreign energy sources, and a third objective is cleaning up the environment by reducing toxic auto emissions.
- In addition to reducing reliance on foreign oil, ethanol provides an opportunity for Minnesota, which has no coal or oil, to produce energy. By 2000, Minnesota was producing all of the ethanol consumed in the state.

- Minnesota also offers an incentive payment to state ethanol producers of 20 cents per gallon on the first 15 million gallons produced each year. This subsidy will end in 2010.
- When the oxygenated fuel requirement was put into place, critics predicted many serious problems would ensue. They predicted burdensome enforcement responsibilities, damage to underground tanks, product shortages, increases in gasoline prices, and a lack of consumer acceptance. None of these dire predictions came to be; in fact, in the case of gasoline prices, E10 blends today cost 7 cents less on average than normal gasoline. People also complained that the requirement would force consumers to use ethanol against their will, basing their objection on a false assumption that an ethanol is an inferior product to gasoline. The Department of Agriculture established a hotline to address specific questions and concerns about ethanol, but the volume of calls is light.
- Since the imposition of the ethanol requirement, corn prices have been boosted 30 cents per bushel, air quality is better in the Twin Cities area, and Minnesota imports millions of gallons of oil fewer than it would otherwise.

Tony Sutor's presentation included the following points:

- The Office of Energy Efficiency works with companies located in Ohio to help them stay competitive and remain in Ohio. The Ohio Distributed Energy Resources (DER) program is funded by oil overcharge money from the mid 1980's and from the state's systems benefit charge.
- The first part of the DER program involves increasing awareness about DER technologies. With electric deregulation, the Department began to have some workshops and conferences to get out information about the benefits of DER. They invited the Public Utility Commission and EPA to work with them on the project. They held electric deregulation workshops to address regulatory, environmental, and technological issues. They also held onsite energy seminars, which exhibited various technologies, presented case studies of DER applications, and provided information on utility requirements, permitting, and financial resources.
- The second part of the program is technology implementation. The Department realized that no company wanted to be the "guinea pig" to test DER technology, and so they developed a request for proposals (RFP) on DER projects. Generation technologies eligible for the grant include wind turbines, photovoltaics, building-integrated photovoltaics, passive solar design, and combined heat and power (CHP) with microturbines, gas turbines, and gas reciprocating engines. Residential, commercial, industrial, and institutional applications are all eligible. Five grants have been awarded for CHP projects, and 21 have been awarded for renewables. The $925,000 disbursed in grants has leveraged over $15 million in projects.
- Grant recipients are required to develop case studies of their projects, and they must agree to showcase their DER installations. The RFP includes a section where applicants must address the economic and environmental benefits of the project, and DER grants awarded to CHP applications must meet California emissions standards.

Angela Chen's presentation included the following points:

- Iowa houses 20 percent of the nation's ethanol production capacity. The state does not have an ethanol mandate like Minnesota, but Iowa does offer some incentives for ethanol. For instance, ethanol is taxed at a lower rate than is gasoline (19 vs. 20 cents/gallon), and fueling stations that sell 60 percent E10 are given a tax refund. The state also maintains a fleet of flexible fuel vehicles, capable of running on E85, which is available at 15 retail and state sites in Iowa. The E10 blend is often a few cents cheaper than gasoline, and when gas prices are high, people often call the Department to ask if their vehicles can run on E85.
- Biodiesel production is also increasing in Iowa. Two plants currently produce 15 million gallons per year in the state, and additional plants are in the planning stage. Biodiesel creates more demand for soybean oil.
- Methane recovery projects are also taking place in the state. Methane recovery has proven to be an effective way of reducing odors from dairy and swine farms while producing energy for the farms and reducing emissions of methane into the atmosphere. To encourage this kind of project, the Department formed an advisory committee, provides funding, and provides education and demonstrations. Case studies of the projects are posted to the Department's website and mailed to those interested by request.
- The Department is also involved in the Chariton Valley Biomass Project, in which switchgrass is grown, harvested, and then co-fired with coal. The Department has sponsored studies that show the environmental benefits from the project to include decreased soil erosion and water contamination, improvement in wildlife habitat, and a reduction in conventional pollutants and GHG emissions. There is an estimated reduction of 360 pounds of CO_2-equivalent for each MMBtu produced.

Discussion

- On whether there had been problems with the co-firing configuration, Angela Chen answered that the test burns went fine, but that some problems were encountered in grinding the switchgrass.
- In response to a question, Sharon Clark said that Minnesota uses 60 percent of its ethanol and exports 40 percent.
- On how much a farmer personally has to invest in an ethanol project, one commenter noted that agricultural financing is tapped out, and to obtain other financing requires that a good case be made for the project, because financers won't invest on the basis of benefits to corn farmers.
- Sharon Clark commented that after the farm crisis of the mid 1980's, farmers were ready to invest in ethanol, since they needed the added value. They lobbied their legislators, who understood the economic benefits, but the hardest part was convincing the metropolitan area legislators, who were finally persuaded of the air quality benefits.

Second Panel: Using Energy Efficiency to Reduce Greenhouse Gas Emissions

Presenters:

- Angela Chen, Environmental Programs Supervisor of the Iowa Department of Natural Resources, on "Iowa's Building Energy Management Programs."
- Pat Meier, Director of the Wisconsin Energy Efficiency Bureau, on "Reducing GHGs with Energy Efficiency."
- Laura Chappelle, Commissioner at the Michigan Public Service Commission, on "Using Energy Efficiency to Reduce Greenhouse Gas Emissions: Michigan's Low-Income and Energy Efficiency Fund."

Angela Chen's presentation included the following points:

- The state started two building energy efficiency programs in 1986, the State of Iowa Facilities Improvement Cooperation (SIFIC) and Energy Banks. They were established to use energy more efficiently, to minimize environmental impacts associated with energy use, to enhance the economy of the state, and to decrease the state's dependence on imported energy resources.
- SIFIC is a non-profit corporation formed to carry out the state facilities program. SIFIC is staffed by Department employees. Establishing a non-profit corporation to implement the program was easier than running the program directly through the Department, because the non-profit does not affect the state's credit-worthiness. It is also easier for a non-profit to hire consultants and engineers. To obtain the initial capital for the first group of energy improvements, a bond was issued.
- SIFIC sends outside engineering consultants to perform energy analyses of state facilities, and then SIFIC staff and the agency's representative select projects to implement, choosing only projects with an aggregated payback period of six years or less. SIFIC then funds the installation of the improvements. SIFIC leases the improvements to the facility, and the state agency receives an annual appropriation for energy cost at the same level as before the energy improvement installations. With the savings, the agency pays back the lease.
- The marketing and administration of the Energy Banks program is funded mostly by oil overcharge funds, and it finances energy efficiency improvements in schools, local governments, hospitals, and non-profit organizations. The program has saved a total of $103 million.
- The initial bond issue for SIFIC realized 106 percent of projected savings, To date, the building energy efficiency programs have saved more than $77 million, and 3.4 million tons of CO_2, 7,100 tons of NO_x, 72,000 tons of SO_2, and 8,500 tons of particulates have been avoided.

Pat Meier's presentation included the following points:

- The Focus on Energy program develops and operates energy efficiency and renewable energy programs. Its objectives include reducing the amount of energy used per unit of production in Wisconsin, while improving reliability, expanding the ability of markets to deliver energy efficient and renewable energy products,

delivering financial returns on public investments in energy improvements, reducing the environmental impact of energy use, and enhancing economic development. The program tracks the direct energy savings, the economic impacts (using the REMI model), and the costs of the program's implementation.

- Results: In the first six months of 2003, the program has saved 214.8 million kilowatt-hours (kWh) of electricity. Through June 30, 2002 the program has avoided emissions of 1,806,448 lbs of NO_x, 2,893,464 lbs of SO_2, 375,367 tons of CO_2, and 10 lbs of mercury. In the same time period, it has created 2,778 full time equivalent job years. It costs the program 1.8 cents to save a kWh, whereas the average retail price of a kWh ranges between 4.3 and 8.1 cents. Since the program spends less money to save energy than consumers do to buy it, it is a good deal for the taxpayers. Counting only direct energy benefits, the state receives savings valued at $3.00 for every $1.00 spent. Including all energy and non-energy benefits over the lifetime of the measures installed, the state receives savings valued at $5.70 for every $1.00 invested.
- Challenges: Environmental and economic issues are long term. There has been pushback on the objective of market transformation. Funding stability is another obstacle, as the public benefits fund has taken a substantial hit. The program is unable to guarantee energy savings when its budget is cut. When the economy is slow, reducing energy use isn't the highest priority, and support for the program is harder to build.
- Program evaluation: Usually 5 to 7 percent of the budget is devoted to evaluation. Focus on Energy is trying to document a lot of different impacts from the programs, and emission reduction metrics have to be created in some cases. If it isn't measured, for all practical purposes it didn't happen.
- Wisconsin has a voluntary emission reduction registry for CO_2. The Focus on Energy program is investigating how emission reductions from the program could be registered. For example, 105,538 compact fluorescent light bulbs were sold through the Focus program in 2001. Together, they save 66 kWh per year, avoiding 16,730,000 lbs of CO_2 emissions.
- It may be possible to register those avoided emissions, and eventually it may be possible to trade them. Establishing the ownership of the indirect emission credits is a difficult issue, however. Monitoring and verifying reductions is also a challenge. If the reductions can be established, however, Focus on Energy would want to make sure that the value of the reductions accrues to the taxpayer. In 5 to 10 years, the value of reductions could approach $5 million. The Department's role would be as "aggregator of last resort," since it's not possible to trade savings from one light bulb. Even if the price of carbon is $1 per ton, that would still be $375,000 for the program.

Laura Chappelle's presentation included the following points:

- The Public Service Commission was pleased to hear that $844 million in federal Low Income Heating and Energy Assistance Program (LIHEAP) funding would be released to help low-income citizens with their heating bills this winter. Michigan is the fourth largest recipient of LIHEAP funds nationally. Since natural gas prices are high, the average bill will be $109 higher than normal, even

if temperatures this winter are normal. In mid October, the Michigan Public Service Commission approved almost $7 million in low-income energy efficiency grants to eight organizations.

- The Low Income and Energy Efficiency Fund was a result of the electric restructuring of 2000. Utilities were allowed to securitize their stranded costs up front, with a goal of giving a 5 percent rate cut to all consumers, with the extra money going to the Low Income and Energy Efficiency Fund. The Fund provides shut-off protection to low-income customers and promotes energy efficiency in all customer classes. Approximately 75 percent of the funds are used for low-income energy assistance, and the other 25 percent is used for the benefit of all customer classes. The program was created to run for 6 years.
- In designing the RFP for the Fund, other state agencies and private companies were allowed to provide input. They were careful to make sure the RFP process was consistent with OMB procedures. The program requires selected grantees to provide data regarding their accomplishments and any problems encountered in completing the grant requirements. The Commission uses this information to assess how the grant distribution should be modified in the future. Grantees that have demonstrated success in their projects are given preference when the Commission is considering awarding new grants. The process is a staff-intensive but worthwhile endeavor.
- The program faces several challenges. Detroit Edison has filed a petition with the Commission to stop funding the program and to instead use the money to establish a low-income energy assistance credit for residential electric customers. There is also a push to undo electric restructuring in Michigan, which would eliminate the source of the funding. State legislators are also interested in using the money for other purposes.

Discussion

- Wisconsin doesn't have an answer to the question of additionality under an emissions trading regime, but the free rider issue is part of it.
- How do other states fund their energy efficiency programs?
  - In Wisconsin, a system benefits charge of $1.40 a month on each residential bill provides $20 million a year. Also, anything that the utilities spent in 1998 would over three years be transitioned into the public benefits fund ($43 million). The fund, however, has been reduced a lot by the budget cuts.
  - Minnesota has $80 million a year going to energy efficiency and conservation, though they do not have a fund like Michigan or Wisconsin. A statute requires that utilities spend a percentage of their gross operating revenues on energy efficiency and conservation. Utilities submit the information to the state for review, and the state reviews their projects. The utility will specify a type of improvement category, such as lighting or air conditioning. While some people may be skeptical about how the utilities use the money, this type of system has the advantage of not being part of the state's budget. Because of this, it has survived state budget cuts.
  - Utilities in Iowa have a similar requirement to put aside a certain percentage of revenue for efficiency and conservation projects.

- The utilities are perhaps becoming more powerful on the legislative front. If the utilities are successful at opening up electric restructuring again, the environmental benefits will be pushed aside.
- It is surprising that Minnesota and Iowa didn't face lawsuits after requiring utilities to fund energy efficiency and conservation programs.
  - In Minnesota, the programs are treated as a direct ratepayer expense, an item listed on electric bills.
  - In Wisconsin, utilities say that they don't want to operate public programs, because they are not part of the utilities' core mission. They are especially reluctant to do so under competition, when they aren't given the same protections as when they were under regulatory control.
- In Ohio, some post-deregulation programs that provide money for low-income assistance and education are funded by a rider on everyone's bill. The low-income portion of the program was $17 million in the hole in March, and the state has a hard time getting information from the utilities on what the low-income program costs are. Just because a program is run efficiently doesn't mean that there will be enough money to run it. Another program funded in the same way is the Energy Revolving Loan Fund, which was originally set up for small customers who obtained loans through banks. The program now has a hard time getting banks involved, and the state doesn't make direct loans for the projects. The Fund is now trying to get the legislature to allow the state to make the loans.
- The idea is emerging that as a society we don't value energy conservation for itself. Energy costs as a fraction of net disposable income are small now, relative to when a lot of these programs were set up in the 1980's. Maybe the issue to emphasize is not how much the average customer can save from energy conservation, but what improvements in air quality, etc., will result from the program.
- Some low-income customers are still hit hard by energy costs. Subsidizing bills for lower-income customers, however, doesn't address efficiency and conservation. It's hard to tell low-income customers to weatherize their homes rather than take subsidies offered right now.
- What is a good strategy for making the argument that efficiency and conservation programs are worthwhile?
  - For non-attainment areas, the argument can be made that efficiency and conservation programs can help bring the area into attainment.
- How do you convince people to conserve energy in their own homes?
  - Education is critical.
  - A lot of education on energy conservation is taking place in public schools.
  - While education is important, incremental pricing is necessary. The first and thousandth kilowatt have the same price, but the thousandth has more actual impact on costs. Electricity should be treated like other goods: the greater the demand, the higher the price should be.

Third Panel: Promoting New Technologies to Address Climate Change

Presenters:

- Niles Parker, Director of the Energy Policy Division at the Indiana Department of Commerce, on the industrial efficiency, alternative energy, and alternative transportation fuel programs at the Department of Commerce.
- Amy Kuhn, Deputy Director of the Community Development Division in the Ohio Department of Development, on "The Ohio Third Frontier Project."

Niles Parker's presentation included the following points:The goals of the program are to (1) increase energy and economic efficiency to improve environmental quality, (2) support diversity of domestic energy resources to ensure energy reliability, (3) improve and strengthen energy distribution, (4) expand the use of innovative and clean energy technologies, and (5) expand energy education and communication.

- One of the challenges is that the state is part of the Illinois coal basin, and 95 percent of its electricity comes from coal. Many of those coal plants are old, but they are paid off, and they continue to operate. The state also has very low-cost electricity. The state has not opted for deregulation, and it does not have a system benefit charge.
- The Indiana Recycling & Energy Development Board (REDB) is a legislatively created board that oversees funding for energy efficiency and recycling programs. The projects it approves must meet certain qualifications, including that the proposed technology is highly energy efficient and that the energy savings will cover the cost of the project.
- The building efficiency program is one of the state's strongest. It includes a public facilities program, the Rebuild America program, and the U.S. EPA Energy Star program. The public facility program provides $100,000 in zero interest loans and guarantees energy savings. Eventually the energy savings pay back the amount of loan. Funding for these programs is drying up, and in the last legislative session, the state used revenue from vending machines to fund them.
- The Alternative Power and Energy program provide up to $30,000 or 30 percent matching funds for renewable energy projects. The Alternative Fuel Transportation program provides up to $30,000 or 30 to 80 percent matching funds for alternative transportation fuel projects. These grant programs fund demonstration projects that wouldn't have been undertaken without the assistance.
- The Department administers several industrial energy programs. The purposes of the programs are to help Indiana businesses by focusing attention on energy management, to encourage manufacturers in Indiana to increase the energy efficiency of their manufacturing operations, and to promote high-efficiency distributed generation (including cogeneration) and cutting-edge energy technologies. The Industrial Energy Efficiency Fund provides zero-interest loans of up to $250,000 or 50 percent of project cost for industrial efficiency projects. The Distributed Generation Grant Program (DGGP) provides grants of up to $30,000 or 30 percent of project cost for distributed generation projects that are high efficiency, renewable energy, or fuel cells, and that are not for peak shaving

or backup. DGGP grants are not available for residential and transportation purposes.

- Environmental groups want a systems benefit charge to collect money for renewable energy and energy efficiency, but Indiana utilities are resistant. One source of money for those programs in Indiana is the Vectren settlement. A new program, the Advanced Energy Technologies Initiative, will provide grants of up to $250,000 for new projects that deploy new advanced manufacturing processes and equipment that are energy efficient, and/or manufacture advanced and innovative products that will save end users both energy and energy costs. The non-government cost share must be 50 percent or greater. The guidelines are still under development.

Amy Kuhn's presentation included the following points:

- There is a shift in focus in Ohio—instead of creating new jobs, Ohio wants to retain existing jobs. The state is losing manufacturing jobs, people are leaving, and new technology businesses are not starting up. The challenge is to transition Ohio's economy from an aging manufacturing base to a more dynamic economy based on research and innovation. Ohio is an economically diverse state with a base in agriculture and industry, but it is not perceived as a technology state, and it is not as efficient as possible in transforming research into economic development. It has highly skilled workers, but those skills may not be the ones needed in the coming years.
- The Third Frontier is a $1.6 billion economic development project and Ohio's largest effort ever to expand research capabilities and promote start-up companies. The state's investment aims to leverage $6 billion in private and federal support. While the Third Frontier is talked about as "the" economic development program in Ohio, it is actually part of a larger strategy. Ohio already had several programs that were being directed separately, and the Third Frontier brings them together.
- The state contracted with Battelle, which identified Ohio's strengths as (1) advanced materials, (2) biosciences, (3) information technology, (4) power and propulsion, and (5) instruments, controls, and electronics. The project is designed to encourage collaboration among industry, government, and universities. The state is committing resources to build world-class research facilities, to support biomedical research, and to provide loans to support high growth industries, high-paying job opportunities, and advanced manufacturing.
- A bond issue to support the Third Frontier project was on the ballot on Election Day 2003. The bond was to help with operating costs, but 52 percent of the voters voted against it. Ohio voters have just gone through a year of hearing how poor the economy is and seeing cuts everywhere, and although the bond issue was not designed to raise taxes, voters may have seen it as a potential increase in taxes. Also, term-limited state legislators may not have had enough time to fully appreciate the project and its history. The bond issue not passing is not the end of the Third Frontier. It was money that Ohio would have used to attract good researchers, but work is still continuing on other pieces of the project. It's a tough issue for a lot of people, when there are so many other issues to think about. It is

important to get the average voter to understand that education, research, and high-tech is the way to get to the next level of economic development.

- Energy is part of the Third Frontier project. Reliable and low-cost energy attracts business. One goal is to nurture existing and new energy businesses. Developing renewables is another goal. Ohio wants to continue to have reliable and low cost energy as in the past, but with renewables in the future. Some businesses do come to the state with new methods of providing energy and new processes, and the goal is to get all of them to collaborate and come up with an overall strategy for the state.

Discussion:

- A few participants were interested in how specific aspects of the Third Frontier project, such as fuel cells, are funded.
  - Amy Kuhn: Some of it comes from the oil overcharge money, and some of it comes from the tobacco settlement. There are a few pots of funds, but it is difficult to get coordination between them.
  - Tony Sutor: Some of the oil overcharge money is going toward direct installation of fuel cells at demonstration sites. They are working with the emergency management people in Ohio to utilize fuel cells as a potential source to power emergency communication towers during blackouts.
- All the Midwestern states are in similar positions to Ohio. Every governor wants his or her state to be the technology capital of the world.
  - While everyone is talking about doing regional collaborations, it's hard to compete with one another with tax incentives one minute and turn around the next and cooperate. It's not necessarily the same people who work on both. Everyone says states should do away with tax incentives, but no one wants to go first.
- People who do energy efficiency work frequently say that a big impediment to energy efficiency is the fact that energy is cheap. One problem is that the departments who have to work on energy efficiency are also tasked with keeping energy prices low.
  - Some argue for raising the cost of energy because it is such a valuable commodity that people should use it wisely. The counterpoint is that this country's global advantage is its low-cost energy, which is a raw material in every good and service, so it is an issue of U.S. competitiveness.
  - The goal is not to keep energy price low, but rather to keep it at a market-clearing price. It is not in anyone's long-term interest to subsidize energy. Economists argue that the goal is a market-clearing value.
  - A lot of people don't earn $50,000-100,000 a year, and they can't easily pay more for energy.
  - Keeping the bill low and keeping the rate low are two different things. Insulation, for example, will lead to a lower bill but not lower rates.
  - Many people cannot afford to make modifications like that on their own.
  - That's when the state steps in and helps.
  - If the rates go up, jobs leave. Of course, no one should think that lower-cost energy is an endorsement of pollution.
- There are certain events such as the blackout that raise awareness of how critical energy is. It is unclear whether the states represented here have gotten together and

talked about this as a region. Last month state agricultural offices and state energy offices got together to talk about biomass energy. Communication is a big area for improvement.

- One common theme is using new energy technologies and sources to address climate change. One of these is hydrogen. Each Midwest state has begun to pay attention to it. All are at infancy level on the hydrogen issues. Hydrogen is going to be a localized specialty because of the difficulty in production and delivery. A "Big 10" hydrogen initiative, to work on hydrogen, production, delivery, and storage has an extraordinarily valuable potential for all of the states here. Both Ohio and Michigan are looking at fuel cells for transportation components, and Minnesota is looking for it more in electricity. How does this region work together? It's a great opportunity, and it overlaps with DOE's region.
- Moving to new types of energy generation is important, but some improvements in 30-percent efficient old coal plants would be enormous.
  - The states can't afford to choose one approach or the other; but rather have to do both at the same time.
  - The blackout was the result of the old system, which was not designed to handle today's load. DG, different types of grid structure, maybe a smart grid, a whole new system—these things are going to attract a company. One company, Gentech, had a 20-minute blackout and lost millions of dollars of research. Some companies will pay a premium for higher quality power. To attract new industries, a state has to provide that new infrastructure, not just concentrate on fixing the old.
- The typical time scale for a new energy system to pick up 50 percent market share is 50 years. There are enormous time lags and costs.
  - The 50-year time window is arcane. Nobody predicted the evolution of the microchip. Deployment of R&D is an unknown science. Industrialists say that capital stock turnover is in the 20-year range, rather than in the 50-year range. The development of new technologies, linked to what other states are trying to do, will pan out in less than 50 years.
  - Moderator: The Pew Center has an initiative called 10-50. The idea is that dealing with climate change and changing energy infrastructure is a 50-year endeavor, and that the United States has to start now, look ahead 50 years, and make progress one decade at a time. Set the stage now in order to meet these challenges within 50 years. Shifting the whole energy system will take a long time, but there are plenty of opportunities for substantial progress in the interim. The Pew Center is having a workshop on this in the spring and will be sharing that work with the states.

Fourth Panel: Reporting, Registering, and Trading Greenhouse Gas Emissions

Presenters:

- George Meyer, former Director of the Wisconsin Department of Natural Resources, on Wisconsin's voluntary emissions reduction registry and the mandatory CO_2 reporting rule.

- Michael Walsh, Senior Vice President of the Chicago Climate Exchange, on the Chicago Climate Exchange, issues in emissions trading, and possible state involvement.
- Kris McKinney, of Wisconsin Energy, on his company's approach to climate change and its experiences with greenhouse gas reporting.

George Meyer's presentation included the following points:

- Back in 1991, the DNR staff made a concerted effort to take a look at the issue of greenhouse gases. At that time, the staff presented a recommendation to the board to start dealing with GHG emissions. One of the first actions required an emission inventory, which required CO_2 reporting. Any facility over 100,000 tons a year has to report. As demonstrated by the Toxics Release Inventory, having companies look at what they're emitting does lead to the reduction of pollutants, even without reduction requirements.
- The DNR worked during most of the 1990s with industry, nonprofits, and academic staff to come up with a climate change action plan for the state. They tried to find opportunities where GHG reductions might even reduce costs for industry. They came up with plan in 1998, which was approved by the Natural Resources Board.
- Companies needed assurance that if they went ahead and made reductions, they wouldn't be penalized for going first. As a result of that need, there was a call for a registry for voluntary emission reductions of GHGs. That law was passed in May 2000 by the state legislature. It was not controversial, and was viewed as a very positive way to protect industry and still encourage reductions. It is in fact a multipollutant registry and the only one in existence. The program is strictly voluntary, but if a company gets involved with reporting other reductions, it has to register greenhouse gases.
- Many types of things that can be taken into account for purposes of showing reductions including energy efficiency measures, replacing traditional energy sources with renewable energy, and carbon sequestration projects. In accordance with the terms of the Kyoto Protocol debate, it allows entities to register reductions back to 1991. Rules for the registry have been developed over the last two years.
- Anyone may register emission reductions, though generally the registrants are companies. Only reductions made within the state of Wisconsin are eligible, and the entity must have taken action to reduce emissions, rather than the reductions being a result of other factors. The entity must establish a baseline, using the average of the two previous years' emissions. Project-, facility-, or entity-wide reductions may be reported. Only one company has entered the registry so far, but training has just taken place, and there ought to be a substantial increase in participation.
- Companies can find out information about the registry online. They can also do their calculations through the website. Most of the education and outreach has to be done through the website, due to lack of funds.
- Why do companies want to join? They want to get ahead of the curve, and they want public recognition, showcasing their environmental efforts. In addition, they

want baseline protection for their efforts. The DNR made the commitment when encouraging entities to register that when mandatory reductions come into effect, the state would be a strong advocate for them, and would argue that they should be granted baseline protection.

Michael Walsh's presentation included the following points:

- The Chicago Climate Exchange (CCX) is a voluntary pilot GHG emission reduction and trading program for emission sources and offset projects in North America, with limited offset projects in Brazil. More than 30 companies and high-level international dignitaries helped to design the CCX. The CCX is a demonstration project and is self-regulatory. It's important to get going now to build the systems and infrastructure for the long term, and to obtain price information. The CCX can help provide predictability. The founding members of the exchange include Ford, Bayer, Dupont, the City of Chicago, WRI, and Amtrak. The total emissions of the members are equal to about half of Canada's emissions.
- Participants in the CCX must set an emissions target. Tradable allowances equal to the target are then assigned to sources. Each year, the required reductions increase, and the emission allowances decrease. Someone who makes an extra cut has extra tons of emission allowances that can be sold to somebody else, or saved for later. Somebody who can't make the target can purchase extra allowances from somebody else who did more than was required. This give and take is what sets the market price.
- The electric sector creates one third of U.S. emissions, but it's not right to put all the burden of emission reductions on them. The electric power sector needs some guidance. The public sector is also an emissions source, and CCX would welcome the public sector to take a serious look at the benefits of participating now, building the necessary institutions, and getting the learning going.
- The SO_2 program reduced acidification exactly where it was needed, and the cost to the consumer was far below most of the predictions. A one percent higher production cost resulted in 50 percent emission reductions. The market was opened up to the public. Groups of schoolchildren bought emissions allowances: 12 year olds can understand emissions trading.
- The financial sector is asking what companies are doing to manage this risk. Companies that are not doing anything are not meeting their fiduciary responsibilities.
- The initial list of eligible offset projects includes landfill and agricultural methane destruction, reforestation projects, and agricultural soil sequestration projects. Certain projects in Brazil involving energy, methane, and forestry are also eligible. The Iowa Farm Bureau recently announced that it would like to serve as an aggregator of sequestration credits for Iowa farmers.
- Benefits of participation in the CCX include the first mover advantage, the opportunity to build management and trading skills, the reduction of long-term GHG mitigation costs, and an enhanced reputation among stakeholders. The CCX welcomes state operations into the program.

Kris McKinney's presentation included the following points:

- Wisconsin Energy Corporation (WEC) looks at GHG emissions in a multi-emission context. The company has been taking direct action to reduce greenhouse gases since the mid 1990s. Executives at the top levels of the company, including the Board of Directors, are involved in the effort. The company has participated in programs in Belize and the Czech Republic to gain experience in emission trading. It also participates in local, state, and national initiatives and organizations. To be where it wants to be in 50 years, and to be responsive to change, the company has to get started now, rather than trying to do it all at once later. The company supports low- and no- cost initiatives, as long as they're consistent with and support WEC business practices and strategy.
- Because most climate change activity is occurring at the state level, Wisconsin Energy works at the state level and encourages groups like the participants in this workshop, so that when programs are developed, they'll be as flexible and consistent as possible. The company operates in only two states, so it's not as complicated for WEC as for some other companies.
- State and national programs (registries and reporting) encourage action before regulations take effect—it's not so much getting out ahead of regulations, but anticipating regulations. State programs, such as reporting requirements and registries, provide incentives for technological innovation, spur capital spending, and support the development of an emissions trading market. Wisconsin Energy is working with the DNR and other stakeholders to try to make any framework work as well as possible. The company would like to be able to register credit for reductions made outside Wisconsin. That may not be possible, but WEC wants to bring that to the debate.
- The company has reported CO_2 emissions for 10 years now at the state and federal level. As an electric utility, Wisconsin Energy was required to start reporting CO_2 at the federal level (under the 1990 Clean Air Act Amendments). It is also required to install emission monitors for other emissions, and has had monitors in place since 1993. In terms of voluntary reporting, the company has done so for the past decade. Through DOE's Climate Challenge program, it has reported 31 million tons of CO_2 reductions since 1995. WEC also committed to reducing SF_6 emissions through EPA's sulfur hexafluoride (SF_6) program, and by the end of 2002, the company had exceeded its goal by reducing annual emissions of SF_6 by nearly 95 percent. As part of Climate Leaders, the company is also working with EPA to establish a GHG reduction target next year.
- Last year the company completed its first report including financial, social, and environmental performance, and is moving forward this year to issue another report. The report looks not just at the utility but at all the companies within the holding company. GHG emissions are reported on both a mass and rate basis. This information is available on the company's website, www.wec-performancereport.com.
- Wisconsin Energy produces 140 MW of renewable energy, and intends to buy more wind from a large plant in Wisconsin, if siting goes through. The company also own the largest natural gas vehicle fleet in Wisconsin. Coal ash byproducts can be used in cement production, which avoids GHG emissions. The national

average for reuse of coal byproducts is about 30 percent; in Wisconsin, the reuse rate is greater than 100 percent, by using all ash byproducts from power plants and recovering ash from landfills.

- Energy for Tomorrow is WEC's green pricing program. Green pricing was first offered to residential customers, and has now been expanded to all customer classes. It is the eighth largest for total number of customers and sixth for energy sales in the country. Customers can choose to buy 25, 50, or 100 percent renewable energy. The renewable energy comes from a mix of 75 percent biomass, 18 percent wind, and 7 percent small hydropower.
- The company's broad business strategy includes (1) a commitment to build new generation (2,800 MW), (2) investment of $1.3 billion in improving performance of its existing power plants, and adding emission controls, and (3) an investment of $2.7 billion in the distribution system. The company has been granted permission to retire 325 MW of coal, which will be repowered to 1,100 MW of natural gas combined cycle. WEC hopes to receive an order soon to add more coal-fired generation at an existing plant, to maintain diversity. The company is also increasing its investment in renewable energy, demand side management, and carbon sequestration, to reduce the environmental impact of the business. WEC would like to build a plant that uses integrated gasification combined cycle (IGCC), a technology which the company believes to have a lot of potential, since it is hard to see how it is possible to meet the demands of the economy and new technologies without using coal (and also nuclear).

Discussion

- Some companies report their emissions voluntarily, even though they fall below the Wisconsin emission threshold for mandatory reporting. Are there lessons to take from the program?
  - George Meyer: At the time mandatory reporting was implemented, there was no controversy or opposition to it. Many companies do want to provide that kind of information, especially if they want to start making reductions. With some industries, it's easier to reduce. In the pulp and paper sector, for instance, companies started finding ways of reducing energy use by reducing inefficiencies. CEOs see that shareholders are interested in these issues.
- Don't the reductions have to be verified? How can the companies go to CCX or some place like that?
  - George Meyer: They can be self-verified. In the rulemaking process, there were some companies that wanted to be involved in the registry but not go through verification. There is a verification protocol, and most who are serious about it will go through the process.
- How does the CCX handle aggregators?
  - Mike Walsh: CCX certainly needs aggregators, since it doesn't have the capacity to do a contract with each of a thousand farmers. CCX needs a verification regime to inspect some of the farms. So far, CCX has just seen sequestration projects, but expects to see some methane projects that will need aggregators.
- A state energy efficiency program is in the process of registering credits with the DNR registry and is trying to figure out how it could come to CCX and trade credits.

    - Mike Walsh: CCX will go through a fairly rigorous process to find out if these are real reductions.
- (1) About the baseline, what if what is being offered is a new building or factory being built from scratch or a rebuild of an old plant? (2) What if the company retires nukes and replaces them with efficient coal burning plants? Do they have to register that?
    - Mike Walsh: Those are hard questions, and CCX hasn't tried to answer them all. In general, building a new emissions source creates a liability. Sometimes a new power plant is a solution. In that case, a certain amount of emissions will be waived, while some will have to be offset. The company will have to buy from someone who made an extra cut. Absolute emissions count, not emissions per kWh. CCX looks at a four-year baseline, which is going to cost some people some money. It may or may not be the absolute right approach. Should CCX penalize the addition of a super-efficient new building? Right now it is penalized, but probably it should not be.
- An energy efficiency program for the last 15 years for state facilities has been monitoring reductions to see how much they have saved. Would this kind of reduction be cumulative? For instance, a new boiler in a state prison will be saving energy for years.
    - Mike Walsh: It goes year by year, which may not be the right answer, but it's the starting answer.
- Who owns the credit? Kris McKinney will say the utility owns it, Pat Meier will say the taxpayers own it.
    - Mike Walsh: It's a very sticky issue. There are some very compelling stories from the city of Chicago and from Ford that their projects reduce emissions from the grid. CCX is trying to have a very simplified structure using U.S. average emission rates. CCX doesn't have an answer to the double counting problem. If the city's electric consumption drops below its one percent per year reduction schedule, the city gets credits that it can sell.
- Regulators can't do the job if they don't have the underlying data. It's easy for utilities to say, this is a competitive market and we shouldn't turn over data. Wisconsin Energy is impressive; why do you think that other utilities are not doing the same, or if they are, why aren't they getting credit?
    - Kris McKinney: There is a 50/50 split between states that are deregulated and states that are not. Wisconsin is not deregulated. Power of the Future is more about "reregulating." To deal with anticipated issues, the company has to make the case that it is right to spend ratepayer money on these improvements. It is more straightforward to do that in a state that is still regulated.
- The contract with the Iowa Farm Bureau says that reductions can be verified by entities designated by the Exchange. Are you giving your blessing to various organizations? Also, do you have any thoughts on implications for the redistribution of wealth on a global scale?
    - Mike Walsh: CCX needs to have the ability to tell the public that project reductions are real, and so will engage some verifiers. CCX has to try out a methodology. It's been ten years since the Framework Convention, and it's time

to get some experience. On a global basis, the United States is the richest and most innovative country.

- There may be states that are interested in participating in the CCX but would like to see a more intensive schedule of reductions, and want to see credits retired, but not traded. Could states participate and retire the credits?
  - Mike Walsh: Yes.
- Maine has been interested in joining the CCX, but there has been criticism from environmentalists about the state's involvement. What's your take on that?
  - Mike Walsh: Anybody who's thinking about legislating in this area would be well served by getting involved and figuring out how this works. If many of the NGOs are right, that many of the reductions are made at negative cost, why deny that benefit to a taxpayer-funded organization?
    - There was skepticism about disclosure, about how CCX is working and will work.
    - Mike Walsh: Anybody who wants the rule book can get it. The public sector has every reason to be deeply engaged.
  - To provide some background on Maine, some environmentalists were concerned that CCX would be perceived as an alternative to the legally binding legislation that Maine was in the process of enacting to reduce GHG emissions.
  - Mike Walsh: CCX views its initiative as working with every other initiative being discussed, not in conflict with any of them.
- Economy and weather affect emissions most in the short term. How do you sort out those short-term factors from real actual reductions?
  - Mike Walsh: We don't sort them out. If somebody gets lucky one year, they may not want to sell some of those credits and save them for a bad year.
- What incentives are there for buyers to participate in the Exchange?
  - Mike Walsh: Businesses care about their branding and their reputation, and they want to be recognized as leaders. Being a leader in this area through this program can cost pennies. Emission buyers have a huge interest in this issue being addressed in a cost-effective way, and they need to learn hands on, and they can take these lessons overseas—the buyers are there for strategic reasons.
- Moderator: The Pew Center's view is that all of these experiences are useful, that they can complement each other and feed on each other. Having different states doing different things is not optimal for a consistent national program, but having states experiment and learn will ultimately lead to a more robust national policy.
- If the CCX method of verification proves viable, it may set the benchmark and become the national and international standard. Verification is so important, and it's to everyone's benefit to see if it works.
- Waiting for absolute certainty will make it too late to address the question.

Fifth Panel: Sequestering Carbon in Soils, Forests, and Geologic Formations

Presenters:

- Mark Shanahan, Director of the Ohio Air Quality Development Authority, and Jackie Bird, Director of the Ohio Coal Development Office, on "Ohio R&D and Field Efforts in CO_2 Reduction, Capture, and Sequestration."
- Ken Holman, Community Forestry Coordinator at the Minnesota Department of Natural Resources, and Peter Ciborowski, Senior Pollution Control Specialist at the Minnesota Pollution Control Agency, on Minnesota's climate change policy and the ReLeaf program in particular.
- Mike Beaty, Division Administrator for Natural Resources at the Illinois Department of Agriculture, on "Carbon Sequestration Potential in Illinois."

Mark Shanahan and Jackie Bird's presentation included the following points:

- Through the Air Quality Development Authority (AQDA), businesses can finance projects that address air pollution control, pollution prevention, energy efficiency and conservation, ethanol production, and biomass/biofuel facilities. Tax exemptions are available when financing through the AQDA. Since July 1, the AQDA also houses the Coal Development Office.
- The coal office deals a lot with supply side issues. One of the state's objectives is to keep Ohio's cost of electricity less than national average. The purpose of the Coal Development Office is to help coal maintain its competitive edge within environmental limits. It is endowed with a $100 million bond, which is the maximum amount of loans to be outstanding at any one time. Currently the Office has $50 million in outstanding debt. The Office has financed a total value of nearly $700 million in 268 projects since 1984.
- What's going to affect Ohio coal use and development down the road? As an example, mercury was a challenge to overcome—5 to 7 years ago there were no technologies to address the problem, but now there are, and the Coal Development Office helped to develop that technology. CO_2 is going to be a long-run problem, but the state should look at it now. The science on sequestration is very nascent. The state needs a two-track approach—to address needs of the existing power plant fleet while transitioning to the new fleet.
- The Coal Development Office is involved in several projects that are investigating sequestration. One project with Ohio State University, the Coal Development Office, Los Alamos National Laboratory, and American Electric Power (AEP) is looking at terrestrial sequestration at reclaimed minelands. Most soils are CO_2-deficient in the Midwest, and more carbon can be sequestered in soils in the Midwest than in plants. Another project testing CO_2 sequestration in deep geologic formations is being run by Battelle, with support from the Coal Development Office, the U.S. Department of Energy, and AEP. The Office anticipates being able to store 80 to 160 million tons of CO_2 in a site in Ohio and West Virginia next to AEP's Mountaineer plant. In another project, the Coal Development Office is working with OSU, Ag Spectrum, Kohlpyr, and Cinergy to investigate the use of gypsum to enhance soil sequestration and no-till agricultural production.

- Ohio is part of the Midwest Regional Carbon Sequestration Partnership, one of seven regional partnerships selected by U.S. DOE. Most of the entities involved are working on a part of the project; very few are merely cofunders. It is an ambitious consortium and partnership. It will determine GHG sources in Ohio, Indiana, Kentucky, West Virginia, and Pennsylvania. The partnership will attempt to determine the technical feasibility and cost of sequestering CO_2 in soils and geologic formations. It will investigate the regulatory and political challenges to sequestration and recommend solutions.
- The Ohio Coal Research Consortium is a coordinated coal research program at Ohio universities. Currently, six universities in the state participate in the Consortium.
- The Coal Development Office is also involved in projects that use coal fly ash, a byproduct of coal combustion that can replace cement in concrete and can also be used in the making of aluminum foams. Using fly ash in aluminum foams in vehicles can make a vehicle lighter, thus increasing fuel efficiency. In concrete production, every ton of cement displaced by fly ash displaces almost a ton of CO_2. A facility to test concrete pavement has just been built in Ohio, and this facility will allow ten years of data to be collected within 6 months time. Fly ash is not a new material: it has been used in concrete since the Pantheon in Rome. Perhaps policies should require more use of this material nationally.

Ken Holman and Peter Ciborowski's presentation included the following points:

- Minnesota has a goal of reducing GHG emission intensity (total emissions per dollar of real gross state product) by 18 percent by 2010. This would translate into a 12 to13 percent reduction relative to business-as-usual predictions. The state recognizes that climate change is a problem, but that there are substantial uncertainties about the effectiveness and economics of available control options. Climate change is a long-term problem that won't be resolved over a few years or even a few decades.
- The state recognizes that a major investment is needed in developing the supporting infrastructure for GHG control, including emission inventories, emission forecasting tools, improved understanding of the relationship of climate change policy initiatives and economic development, early credit systems, and improved understanding of carbon sequestration. The state also recognizes that there are actions than can be taken now in their own right that will also help with GHG control. Many actions that the state has taken since 1985 for other reasons have had GHG reduction benefits. The challenge for state agencies is to get programs in place that will ease the cost of transition to mandatory controls.
- The Minnesota Department of Natural Resource's ReLeaf program is a community forestry program started in 1991 with oil overcharge funding. When the program began, its focus was on energy conservation, but now the impending influx of the Gypsy Moth is shifting the focus of the program to community forest health and management, to help communities manage their trees rather than letting them become liabilities. Since its inception, the program has provided grants to help more than 300 communities start or expand their tree management programs.

- Community trees under management provide several important benefits. They help to curb residential energy use by providing windbreaks and shade in appropriate places. Community managed trees also provide living snow fences and windbreaks for drift management. The benefit to cost ratio of windbreak/snow fence projects is estimated at 27:1. "Rain gardens" can help to recharge aquifers and to control and cleanse storm water runoff. Trees also serve along lakes and rivers to reduce erosion from storms and wave action and to improve water quality and fish habitat. In addition, planting trees can increase the retail value of a property: wooded home sites generally sell for 20 to 30 percent more than similar non-wooded sites.
- Publicizing the program and educating the public is invaluable—slogans such as "West is best" and "Let the sun shine in" promote proper design, selection, and maintenance practices.
- To create support for the program and to share its cost, the ReLeaf program partners with various public and private entities. For instance, FEMA shares funds for snow fences/community windbreaks projects. The Minnesota Lake Homeowners is a major partner and political force on lakeshore and riparian buffer projects. The agency also works with developers and local planners to develop best management practices.

Mike Beaty's presentation included the following points:

- The Illinois legislature passed the Carbon Sequestration Study Act in 2001, creating a carbon sequestration advisory committee to study and investigate the potential for carbon sequestration in Illinois. After the conclusion of its work, the committee was to report to the General Assembly on how best to proceed with the study of carbon sequestration, taking into account air quality and the preservation of agricultural resources. The Committee was mainly composed of representatives from Illinois state agencies and departments at the University of Illinois.
- Illinois is a major source of GHG emissions, but the state also has a large potential to sequester CO_2. Geologic sequestration offers the largest land-based, verifiable potential to sequester CO_2. In agricultural systems, grasslands contain the state's greatest potential to sequester carbon, followed by forests and certain cropland.
- Efforts to sequester CO_2 in agricultural systems will generally have positive impacts on other key natural resources such as air, water, and wildlife. The greatest environmental benefits are likely to occur on the soils that also have the greatest potential for sequestering carbon, namely low organic carbon soils. To maximize these benefits, we need to design sequestration programs in concert with other programs to protect and enhances those resources.
- The Advisory Committee recommended that research be conducted in several areas, including researching baselines for soil, grassland, and forest carbon in the state; researching agricultural sequestration and soil management; studying the use of CO_2 to enhance oil recovery and identifying oil fields that would offer both economic benefit and a repository for CO_2; and researching the costs of various sequestration alternatives.

Discussion

- Several participants asked questions about geologic sequestration, such as the fate of the carbon stored, the potential amounts of carbon that could be stored in geologic formations, whether it is a feasible long-term solution, and what the cost may be.
  - While stored CO_2 takes up a lot of space, there is enormous space available potentially for storage. Different kinds of formations have different storage potentials, and much more investigation is needed.
  - Sequestering carbon emitted from today's power plants would be difficult and expensive, but the real promise for geologic sequestration is with future IGCC technology.

Lunch Panel with Businesses

Speakers:

- Bruce Braine, American Electric Power
- Lewis Falbo, SC Johnson
- Ron Meissen, Baxter

Bruce Braine, American Electric Power:

- AEP is the largest electricity generator in the United States and the largest U.S. consumer of coal. It is also a leading consumer of natural gas and the second largest generator of wind power in the United States in 2002. It serves 5 million customers in 11 states.
- Five years ago, AEP's fuel mix was 88 percent coal, 9 percent nuclear, and 3 percent hydro; today, coal accounts for 70 percent, natural gas for 20 percent, nuclear for 7 percent, hydro for 2 percent, and wind for 1 percent. The national fuel mix is 56 percent coal, 22 percent nuclear, 10 percent natural gas, 6 percent hydroelectric, 4 percent petroleum, and 2 percent other renewables.
- AEP acknowledges the risk of climate change and the need to take action. The company is actively engaged in the GHG issue. It supports research on the science of climate change, and is pursuing policy, research, technology, and business opportunities. It has also published a position paper on climate change. AEP advocates market mechanisms and flexibility to address the problem, including trading, banking, offsets, and early action credits. AEP also advocates the reform of New Source Review to allow for efficiency improvements.
- In the short run, AEP seeks opportunities to cost-effectively reduce GHG emissions; the company's long run strategy to address the problem is technology development and deployment. Near-term measures include improving the efficiency of the existing energy system and including the price of carbon in investment decisions. Interim measures include developing renewable energy technologies such as wind, co-firing biomass with coal, and implementing terrestrial CO_2 sequestration. Long-term measures include researching, developing, and globally deploying low-carbon technologies and carbon capture and disposal technologies.

- AEP participates in several initiatives related to climate change, including EPA's Climate Challenge program, the Business Roundtable initiative, the Pew Center's Business Environmental Leadership Council, and the CCX. As a member of CCX, AEP has committed to reducing CO_2 emissions 1 percent per year for four years, from 2003 to 2006. By the end of 2006, this will result in a 10 percent cumulative reduction of about 17 MMT of CO_2 by 2006. AEP views the CCX as an opportunity to reshape the debate on climate change and set policy precedents. It is also a learning opportunity, a way to directly incorporate GHG risks in company decisions, and a chance to be a socially responsible investor at a relatively low cost.
- Developing renewable energy is one aspect of AEP's approach to addressing climate change. Renewables have zero emissions and vast technical potential, but they are constrained by their high capital costs, their intermittency of production, and transmission restrictions. Terrestrial CO_2 sequestration is another part of AEP's strategy. Terrestrial sequestration can involve protecting forests from logging and planting new trees in deforested areas. It has the benefits of enhancing agricultural practices, improving air and water quality, preserving biodiversity, and promoting sustainable economies.
- It is AEP's position that any successful strategy to address climate change must be comprehensive, cost-effective, realistic, verifiable, and technology oriented.

Lewis Falbo, SC Johnson:

- SC Johnson feels that it makes good business sense to deal with climate change, and wants to be a good corporate citizen. In the 1990s, the company concentrated on eco-efficiency, on reducing waste, and realized a cost savings of $125 million. Eco-effectiveness was the next step, as the 1990s drew to a close. At that stage, SC Johnson eliminated chlorine-based materials. The next evolutionary step is becoming advocates and practitioners of sustainable development. The world is depleting finite resources. The company is continuously evaluating its products and processes and is taking a leadership role globally in sustainable development.
- The climate change strategy of SC Johnson is a generational issue for a family company. CO_2 buildup in the atmosphere is a scientific fact. SC Johnson feels there is no need to argue about its implication. Business can lead the way. Energy-related operational improvements and efficiencies can create big possibilities. SC Johnson is now in its third 5-year strategic environmental plan, and sustainable business practices are one of its 7 corporate goals.
- SC Johnson focuses on its operations first, on its largest facilities. The company has set goals for all of its manufacturing facilities around the world. These targets were set with the help of external stakeholders and senior management. One of the company's goals is a 5 percent greenhouse gas intensity reduction, per kilogram of product. In the first year, the goal was met with a 6.2 percent intensity reduction, with an absolute reduction of 5 percent. In year two, the company did not achieve the intensity goal, although there was a drop in total emissions.
- SC Johnson has adopted a goal through EPA's Climate Leaders program of an 8 percent GHG reduction by 2005 in U.S. facilities. In one project, landfill gas is

being piped to a boiler to create steam, "turning trash into cash." Goal setting is the key to improving practices, and the company has enlisted partners to help. The company's international operations are better prepared for eventual GHG regulation if the locations are already required to meet the company's GHG target. The company's aim is still to improve profitability.

Ron Meissen, Baxter:

- Baxter is a health care company with $9 billion in sales and 55,000 employees. Baxter estimates the GHG emissions associated with all aspects of business, including employee commuting and travel. The company also has an aggressive energy management program, in which it tracks and reports energy use from all locations every 3 months. There is also a push for green buildings within the company. In some cases, a green building will pay back its additional cost in one year. The company is involved in a number of outside organizations, like the Pew Center, the Chicago Climate Exchange, and Climate Leaders. More information can be found in the company's sustainability report.
- Fossil fuels formed over hundreds of millions of years. In just a few hundred years, we are burning them up, and this will have impacts for thousands of years. Concentrations of greenhouse gases are now the highest in the last 420,000 years, probably in the last 20 million years.

Discussion

- What's the feedstock for the biomass co-firing?
  - Bruce Braine: Waste wood here, and olive pits in the UK. AEP has forested lands that it can also use.
- Have you run into a problem with fly ash? If you use biomass, you don't get usable fly ash by product.
  - Bruce Braine: Fly ash issues do constrain how much co-firing you can do. AEP can only do 15 percent so far because of capital constraints.
- Your companies come from states that haven't stepped up and done things on climate change and GHGs explicitly. Yet your companies are. What are you telling state policymakers?
  - Ron Meissen: The world is entering into a carbon-constrained economy. The EU's trading program will have 25 member nations. Baxter participates in the CCX: this an opportunity to voluntarily join an organization, to influence how this mechanism will work, to participate, to learn. It demonstrates that there are solutions, and it saves money.
  - Lewis Falbo: SC Johnson is a global company and is trying to prepare the company for the carbon-constrained economy. There aren't any single solutions here, and what the company has done is try to prioritize what to be involved in, what best fits its need.
  - Kris McKinney: To use the example of Wisconsin, while the state is not explicitly dealing with climate change, there are things in that state that are part of a package that would be used to respond to climate change. CO_2 is not yet defined as a pollutant. Wisconsin Energy is tracking it and keeping an eye on it, as on a number of environmental issues.

    - Bruce Braine: The area in which states, in coordination with the federal government, can do the most is R&D. Moving forward and getting technologies deployed that will lower GHGs is really the only answer in the long term. It takes money, effort, companies, and states. That is much more important than having a specific short-term policy. Yes, what the company is doing is a voluntary cap and trade with the CCX, but the longer-term goal requires developing the technology and R&D to get there.
- Do you think that Ohio needs to create its own voluntary registry?
    - Bruce Braine: It's a good idea.

Sixth Panel: Policy Tools to Encourage Low-Carbon Energy

Panelists:

- Edward Garvey, Deputy Commissioner of the Energy and Telecommunications Division in the Minnesota Department of Commerce, on "Minnesota's Energy Policy and Actions: How They Indirectly Address Greenhouse Gas Emissions."
- Hans Detweiler, Deputy Director and Administer of the Bureau of Energy and Recycling within the Illinois Department of Commerce and Economic Opportunity, on "Illinois' Policy Tools to Encourage Low-Carbon Energy."

Edward Garvey's presentation included the following points:

- Minnesota energy policies do not specifically target GHG emissions. All state energy goals are designed to reduce all environmental impacts. One objective is to maintain the state's current reliable low-cost electricity to meet the state's economic needs, to promote jobs and economic growth. This includes being a low-cost provider of electricity compared to the rest of the nation. Another objective, which often competes with the first, is lowering the environmental impacts of energy generation and delivery. To achieve these objectives, the state of Minnesota follows seven energy strategies:
- (1) Continue operation of energy facilities that provide safe, reliable, and low-cost power and that comply with air pollution regulations. Minnesota has 1500 MW of nuclear power, which is very low cost, reliable, and does not emit any pollutants. Nuclear power is controversial, but Minnesota needs to keep it going.
- (2) Encourage coal-burning facilities to convert to less polluting fuels or retrofit with state-of-the-art emission control technologies. Retrofitting is very expensive, and converting to natural gas brings up the issue of price volatility, because of fluctuations in natural gas prices. While Minnesota believes that the benefits outweigh the costs, these approaches remain controversial.
- (3) Encourage generation from reasonably priced, environmentally superior fuels and technology. This brings up the question of what is renewable and what isn't, but the important thing is to improve. Minnesota has been running a conservation improvement program since the 1980s, with a 3:1 benefit to cost ratio; the ratio is 7:1 when you consider not building new generation and transmission. A lot of money is going to these programs, which are all being handled by the utilities, as is required of them.

- (3A) As part of an agreement that will allow the continued operation of a nuclear power plant, Xcel Energy is required to develop 425 MW of wind energy, and the PUC has the option to require an additional 400 MW by 2006 and 300 more by 2010, for a total of 1100 MW by 2010. Xcel's August peak is 8300 MW. By the end of this decade, more than ten percent of Xcel's generation is going to be from wind power. How to deal with the variability of wind is an issue when such a high percentage of total generation is coming from wind.
- (3B) A renewable development fund controlled by Xcel Energy spends $16 million on renewable energy development, on promoting small state-of-the-art projects that need a little extra push. Minnesota has a unique 1.5 cent per kWh production incentive for windmills on farmland so that individual farmers can have small wind projects; the state has 200 MW of small wind power. There is a 100 MW cap for the credit, which was met in 2003. The state also has sales tax exemption for energy-efficient products, including EnergyStar products, fluorescent light bulbs, and heat pumps.
- (3C) Minnesota has a renewable portfolio objective (rather than a required standard) of 10 percent by 2015. Utilities are to start in 2005 and increase by 1 percent a year. The utilities have to show that they're making a good faith effort to reach the objective, though the PUC has not yet determined yet what "good faith" means. The expectation is that they'll meet it. Xcel is the only utility that has a mandate.
- (3D) Green pricing: each of the utilities is required to offer renewable energy packages, for which they may charge a premium. Between 1 and 2 percent of the customers buy it. The utilities must offer it at least once a year. The utilities must build the renewable generation or buy it from someone else.
- (4) Enhance delivery infrastructure to assure reliability while providing access to power from low-cost and environmentally superior sources. Minnesota believes that it will need more transmission and has approved every transmission project seriously proposed. In addition, the state is supporting distributed generation through net metering and interconnection tariffs.
- (5) Support R&D for environmentally superior technologies. The state supports R&D in several ways. For instance, the University of Minnesota has a new initiative for renewable energy and the environment. The state also has adopted a goal to move toward a hydrogen economy. This goal is being supported by a new Renewable Hydrogen initiative. This program is a key component of the state's strategy on climate change. If the state doesn't move forward with hydrogen, it won't be able to address climate change. The state is working on a mission to be a national leader by 2012 in production and use of hydrogen from renewable bio-based and wind energy sources, thereby achieving state-wide economic development, reduced environmental risk, better public health, and enhanced national security. 2012 is far enough away so that the goal is achievable. It is a coordinated effort, and will require participation by the government, academic institutions, NGOs, and industry.
- (6) Support the state's energy conservation program. The program is continually under pressure, because some people don't want to pay for it. The Governor is opposed to funding cuts, because the money spent delivers a lot of benefits.

- (7) Reduce regulatory and governmental barriers to implementing the first six strategies.

Hans Detweiler's presentation included the following points:

- Illinois does not have any specific climate change programs, but it has programs that address other concerns and that also have climate change benefits. The state collects $3 million annually, as part of its 1997 deregulation law, toward residential energy efficiency programs. The state collects $5 million under the same law for renewable energy.
- As part of a settlement, Commonwealth Edison set aside $225 million to endow a foundation, the Illinois Clean Energy Community Foundation, to fund renewable energy and energy efficiency projects. The Foundation has not been spending the money as rapidly as hoped. Recently the legislature reclaimed $100 million from the fund. To avoid problems like this, it is important to understand what the exact structure of a program will be at the outset.
- The new governor is the first Democratic governor in Illinois in 25 years. Dramatic restructuring is going on in state departments. The state is trying to focus on market transformation opportunities. The energy efficiency program through which non-profit housing developers could get grants for green buildings was very competently run, but it never had a vision for ending that subsidy. Instead of perpetually subsidizing the market, it needs to be transformed.
- "De-siloizing," meaning looking at things all across the state agencies, is a challenge. All of the agencies have different programs to help with waste reduction, energy efficiency, pollution prevention, and sometimes they don't have anything to do with each other. Still, they should know about each other and be able to reference each other.
- New policy initiatives: the state legislature is discussing adopting an RPS for the state, and the state is considering a statewide energy efficiency code for residential and commercial buildings. 34 states already have similar codes.
- Illinois' biofuels program resulted from unique legislation. SB 46 extends partial tax exemption for 10% ethanol blends and exempts E85 from state sales tax, making Illinois the first state in the nation to do this for E85. HB46 assists small developers to construct, modify, alter, or retrofit IL renewable energy plants.
- Policy proposal: Midwestern Renewable Portfolio Standard Agreement. Exelon has stated public interest in a regional agreement. What kind of possible construct can we come up with for this? To what extent would people be interested? It could involve contiguous states with an RPS of some certain level (or goal, like MN, maybe). Governor Vilsack from IA says the state will have 1000 MW of renewable energy by 2010. One concern in Illinois is that if Illinois has a standard, but Iowa just has a pledge, then Iowa power could be serving the Illinois RPS, and Iowa sources would be double counted. For an RPS to work, there would likely have to be a very narrow definition of renewables. States won't want to subsidize MSW generation in other states. Most states could find a benefit in this, depending on the individual state's strengths: Illinois, for instance, has a lot of load and transmission lines, but the state is not as windy as others.

Wind from Illinois may be more expensive, but the state can plug into major transmission lines.

Discussion

- In response to the regional RPS proposal: Public utility regulators do have the first regional state advisory committee, called the Organization of Midwest Independent System Operator States. They are trying to work with neighbors on issues such as resource siting and transmission. This is a possible venue to discuss the Midwest RPS proposal.
- Some would like to see a new RPS passed in Iowa. The state has already met the requirement for the previous RPS. Lots of renewable associations are trying to get something introduced in the legislature, but there is strong resistance from other entities. A regional or national strategy would be interesting and useful in moving things forward.
- Minnesota has a renewable development fund? Is Xcel in control of the fund?
  - Edward Garvey: The renewable fund is annually ceded by Xcel. A quasi-autonomous board puts out an RFP. Projects inside Xcel territory are preferred.
- Without using the word RPS, Minnesota does require utilities to increase renewable energy generation?
  - Edward Garvey: We expect them to make a good faith effort. If they meet it, great. If not, they should have a good reason. The PUC has to issue rules on what "good faith" means by June 2004.
- Hans Detweiler: Illinois has a large load, and bundling with other states makes that total market even larger. Iowa, Minnesota and the Dakotas have a sophisticated understanding of the potential economic development value of renewables. Being able to go after the Illinois market may make a renewable energy standard more attractive to some states.
- Do you think having this done regionally makes it less controversial?
  - Edward Garvey: Not all utilities are equal, and to make it as economical as possible, you need a trading scheme simultaneously with an RPS.
  - Hans Detweiler: Wisconsin's RPS only allows trading among the utilities, but trading could be much broader. Any farmer's co-op could put credits on the market.
- Edward Garvey: If Minnesota is subsidizing renewables, Minnesota will want that economic development in-state. The state doesn't allow Xcel to get its wind from South Dakota, because it doesn't help Minnesota farmers.
  - Hans Detweiler: That concern will be very common among all of the states. Will each of the state look at their situation and think that they'll be the winner? That they'll be the net exporter?
    - Nobody wants to be the importer. That'll be the driver.
    - Illinois is the state with the huge load and lesser wind resources, so it seems like Illinois would be the hardest one to include. If Illinois is interested, it shouldn't be that hard to get the others.
  - Hans Detweiler: Credits allow renewables to come online even without local demand. Power generated in an isolated pocket of Northwest Minnesota can't be used locally, and credits allow the power to be moved where it's needed.

    - A Midwestern RPS could have a smaller goal than what the states have established individually.
    - Michigan does not have an RPS—that word in a lot of states, certainly in Michigan, has become very controversial. It is interesting that Illinois is embarking on this, but the states to the east would see this as too much government. They'd feel it was forced on them; they believe that the free market knows best. Places like Michigan don't like a one size fits all standard, but would be interested in getting a renewable energy trading market going. Something like "Advanced renewable credits" would sound better than "Renewable Portfolio Standard Agreement."
- Is the goal to bring in renewable energy to Illinois, or is the goal to sell to Indiana, etc? There are all sorts of transmission constraints to getting Illinois power into Minnesota. Are you proposing trading of renewable energy credits?
    - Hans Detweiler: Economic development and environmental protection can occur at the same time. If all states do it together in a market-based system that reduces cost, then all will be able to capture greater economic benefits. None of the states (but Ohio and Indiana) here are using Midwest coal; most use Wyoming coal. If the Midwest can use its own energy resources, it will come out ahead.
- Moderator: Maybe Edward Garvey, Laura Chappelle, Hans Detweiler, and Pat Meier can go offline and propose something to the group via e-mail about how to discuss this further. (They all agree.)
- What about clean coal with carbon sequestration?
    - Edward Garvey: Minnesota will need a new coal plant, and it's likely to be IGCC with carbon sequestration.
- What does Minnesota have in place that is a government or regulatory barrier?
    - Edward Garvey: There are a lot of transmission barriers. Is the government helping or hurting the transmission siting process? The state might also be concentrating on the wrong things in energy conservation, spending $80 million a year, but it is dribbled across the state. Maybe the best approach is to do big things for the ones who use 25 percent of the load, versus giving $100 rebates for EnergyStar refrigerators.

Closing Remarks

Barry Rabe of the University of Michigan gave the final address to summarize the outcome of the workshop and draw lessons from it. Mr. Rabe's remarks included the following points:

- Almost every presentation supports the conclusion that climate change policy does not take place solely on an international and national scale. Many people assume that climate change is handled in Kyoto, Marrakesh, and Milan. Again and again in the discussions here, however, that is not the case. The presumption is that states would not be doing what they are doing. Given the responsibilities that states have in agriculture, energy, transportation, and air pollution, it makes sense for states to act on climate change. Much of what is now embraced in federal policy started in the states. The Toxic Release Inventory began in New Jersey and Maryland. It will not be surprising in 10 to 30 years that whatever

climate change policy looks like in the United States, a lot of it will have developed here in the states.

- The states here represent huge GHG emissions. Ranking the states against nations worldwide, Ohio would rate twenty-second, ahead of Taiwan and Indonesia. Illinois and Indiana would be tied for twenty-ninth and thirtieth. Collectively, the emissions of the states generated here are higher than Japan's and would be the fourth largest emitter in the world. Combined with Ontario, the Midwest vaults into third place.
- There have been various combinations of Democrats and Republicans in leadership nationally, and one constant theme is that it has been impossible to pass climate change legislation. The states are filling the void. The presumption might be that environmental groups are scripting this, but in fact a lot of this is intra-agency policy development and policy entrepreneurship. In that sense, the Midwest is typical of what is happening nationwide.
- States are very creative in framing this issue. In the presentations, there was a very strong link between climate change programs and economic development programs. This linkage lends a certain momentum to the programs.
- There is a huge growth rate in the number of policies adopted by the states; not a race to the bottom, but a race to the top. This cuts across partisan and regional lines and is a unique development. There is almost a competition with each other to show who can do the most. The fact that Texas would implement an RPS is a major step. States are engaging some of the most reluctant institutions, cutting across organizational boundaries, and setting targets that put them on track to meet Kyoto-level reductions. States have an opportunity to define how to do this.
- Some problems and challenges are ahead. One is the sustainability of the programs. Part of this is political: half of the states have governors in the first term of office. Twenty-six percent of legislators are in their first term because of term limits and redistricting. Incoming legislators and governors are not necessarily hostile, but they may not even know that this is going on. Will they support it? When resources get tight, will governors who haven't heard of these programs stand up for them? This relates to the fiscal conditions. Every state has played every fiscal gimmick to buy time. At least two years are left of absolutely draconian fiscal circumstances. It is tempting to raid funds and cut staff, and this is happening at the same time political leadership is changing in these states.
- There is also a question of how much state-by-state innovation is too much. At what point does it become problematic to have 50 different sets of rules and policies? This is less of a problem for a utility that operates only in one place than it is for companies that operate in many states and countries. They want consistency.
- One likely outcome is the continued growth of innovation and diffusion of policies. Illinois has a carbon sequestration program, and 4 other states have almost identical programs. There will be new policies enacted because of this workshop. At what point should states begin to work cooperatively, not necessarily to get around the "patchwork quilt" effect, but because there may be certain efficiencies? There were mentions of "regionalism" in 5 different

presentations during this meeting. Whatever form this takes, there is more than a trivial chance that regional strategies will be discussed.

- There is in this region enormous precedent for states working together in the Great Lakes basin, such as in the International Joint Commission. For many of these states and Canada, there has been virtually no discussion of their relationship vis a vis GHGs. Canada has ratified the Kyoto Protocol, and it needs clean energy credits through trade with the United States. These states should think about this not as a single state issue, or how they might work together in a two or three state partnership, but look at the entire basin and think about how to work together. As the blackout showed, the region is incredibly interconnected on energy issues.
- This underscores a remarkable transformation of the discussion of American environmental and climate change policy. A lot of people are not aware that this is going on. This does create dangers, but it also creates opportunities. There are many jurisdictions here in the United States arguably doing more on real policy development than some nations that have already ratified Kyoto.

Discussion

- During discussion of regional cooperation, one commenter noted that while the Midwest has a history of sharing ideas, it does not have a history of joint policy initiatives, such as the Northeast states.
- On the value of meeting with more companies to talk about the issue, the participants who spoke were generally open to the idea, but some cautioned that companies might be discouraging because they may not want to see action in many different states.
- Several participants expressed an interest in further meetings of this type, with a focus on specific issues, such as carbon trading, and with involvement from other agencies and sectors, especially transportation.