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P R O C E E D I N G S

(1:12 P.M.)

CHAIRMAN WOOD: I'd like to call this open meeting of the Federal Energy Regulatory Commission to order, to have our hearing out here today on the state of the energy infrastructure in the Midwest, which is defined broadly as the region encompassed on the map that's floating around in the back.

I'd like to welcome particularly our colleagues from the State Commissions in the Midwest and want to encourage all of you today to feel free to just interact. Rick Miles is our MC, to please interact with our panelists today that are presenting on a number of items. We want to thank the nice turnout in the audience and just encourage that at the appropriate time any questions you may have as well for our panelists as we go through the day.

The purpose of today's hearing, as it has been for the prior three hearings in other parts of the country, in Seattle, in New York and in Orlando, is to focus on that critical piece of making markets work. And that is to have a sufficient energy infrastructure. Along with having balanced market roles and vigilant market oversight, having a sufficient energy infrastructure is a crucial part of what FERC's mission

is and certainly, by extension and from the ground up, the states' as well, to make sure that our customers in this region of the country are well served by the providers of the energy and the infrastructure that delivers that energy to the end user.

We have found, as we cross the country, that there are a lot of permutations of this issue. There are definite differences as we go to the different regions, and the resource mix and the needs and the surpluses and the deficiencies. We generally start each day, as we will today, with a factual survey of the infrastructure from our staff and from an objective analysis of a lot of the public available data, and then move into a broader analysis of some of the demand trends in the future that are projected by our local experts. And then today we're going to move into a series of more region focused panels to focus on particular issues of interest out here in the midwestern part of the United States.

So I want to welcome you again and thank you for your participation in advance, and turn it over to my colleagues for any further thoughts.

COMMISSIONER BROWNELL: I join you in your statement, and I welcome all of our friends.

CHAIRMAN WOOD: Great. Mr. Miles.

MR. MILES: Our first speaker is Jeff from the Office. Jeff Wright.

MR. WRIGHT: Good afternoon. My name is Jeff Wright of the Office of Energy Projects. With me today is Mike McLaughlin from the Office of Markets, Tariffs and Rates.

Now, the purpose of today's presentation is to give a snapshot view of the current energy infrastructure in the Midwest regarding electric and gas, as well as taking a look at oil and coal. For the purposes of this presentation the Midwest consists of the 15 states seen here, along with two Canadian provinces of Manitoba and Saskatchewan. The NERC regions that generally lie in these midwestern states are MAAP, Maine, ECAR and SPP.

This slide briefly shows how the population, gross state product and energy use grew in the U.S. and in the Midwest between 1990 and the year 2000. In all three of these areas the U.S. as a whole grew faster. Now, if we compare various regions of the U.S., we see that the Midwest is the most populous region in the U.S. and it is also the leading region in the U.S. in generation capacity, net generation and electric consumption. Per capita electric consumption in the Midwest is just above the average for the lower 48

states of 12,184 kilowatt hours.

Now, turning our attention to the electric infrastructure in the Midwest, we first look at plant generation in the Midwest. As of July, construction of all plant generation projects at all stages of development would add 43,600 megawatts of generation capacity, a 17 percent increase over the current level of generation capacity. Over 90 percent of this potential capacity is gas fired, and the map notes the proximity of proposed gas fired plants to the interstate pipeline grid. An additional 22,700 megawatts of new capacity has been tabled or cancelled since the beginning of 2002. Those gas fired generation projects under construction and at the advanced planning stage would add over 33,000 megawatts of capacity. This does not include those plants that are in the planning or early development stage. The gas demand needed to serve this load would total over 1.6bcf per day.

Now, looking at the existing generation in the Midwest, there's been an increase in capacity since 1997, from about 237,000 megawatts to 256,000 megawatts, an eight percent increase. Coal fired generation capacity constitutes an overwhelming majority of the total Midwest generation capacity. Coal's share Midwest generating capacity has declined slightly since 1997,

from about 66 percent to 62 percent. Natural gas has increased its share of Midwest generating capacity from 12 percent to 17.6. Natural gas accounts for almost the entire increase in generating capacity since 1997, and as the previous slide showed, gas should continue to increase its share of Midwest generation capacity.

Generation output increased by ten and a half percent from 1997 to 2001, from just over a billion megawatt hours to about 1.2 billion megawatt hours, the highest output of any other U.S. region. Coal accounted for 80 percent of the generation output in 1997, and almost 76 percent in 2001. Generation from nuclear sources increased from 13 and a half percent of output in 1997 to almost 17 percent in 2001, while natural gas constituted about five percent of 2001 output. While a small amount, this still represented a doubling of natural gas' generation output since 1997, and since almost all new generation is gas fired, it can be expected that natural gas' share of net generation will become more significant in the years to come.

Now, the Midwest imported 10,000 gigawatt hours from Manitoba and Saskatchewan and exported a little over 1,500 gigawatt hours to those same provinces in 2001. This approximate 8,500 gigawatt hour net import was 38 percent of total net imports from Canada

to the U.S., and represents slightly less than one percent of total Midwest consumption.

Now, this slide shows the combined reserve margin, and that is the amount of generation resources or capacity in excess of the expected peak demand for the four NERC regions, MAAP, Maine, ECAR and SPP, that comprised the Midwest. By 2005 the reserve margin for the Midwest is expected to be at 15.8 percent, and the projected 2005 reserve margins for each NERC region are as follows: ECAR at 11.1 percent; Maine at 27.4 percent; MAAP at 15.1 percent; and SPP at 12.8 percent.

Now, while the reserve margin appears to be comfortable, transmission congestion is a serious issue in the Midwest. Congestion events, as shown here on the graph, are defined as transmission loading relief procedures at level 2-C and above. The number of TLRs are increasing in Maine, MAAP and SPP. ECAR did decline from 2000 to 2001, but it remained at the same level in the summer of 2002. The trend here shows that based on TLRs, congestion is getting worse.

Now, this slide shows that the location of congestion can vary for different reasons. It can be the season of the year; there can be temperature differentials between the Midwest and Southeast; and for example, in the summer of 2000, the South stayed much

hotter than the North, resulting in congestion in flows from the Midwest to the Southeast. Also time of day can affect flow patterns, as people turn on lights and heat in different regions of the country.

Here are further examples of significant congestion points in the summers of 2000 and 2001. It should be noted that power prices at hubs do not indicate where congestion occurs. Prices are determined today for power delivery the next day when the congestion actually occurs. The TLR procedure does not reflect the true cost of congestion. It merely reschedules or reallocates load. So congestion's true impact is not evident. The lack of price signals does not give any indication of the cost of business lost due to congestion and there are no signs or incentives to construct transmission facilities.

This map shows several projects in the Midwest that are designed to alleviate congestion; however, these projects are designed to resolve immediate problems that may affect reliability, especially in Michigan and Wisconsin. These projects do not reflect the addition of new transmission technology, demand response mechanisms or of generation that is sited to remedy congestion.

The lack of adequate transmission projects

cannot only be blamed on the lack of price signals but also on the difficulty in siting new facilities across multiple jurisdictions. Environmental and landowner concerns can lead to project delays. RTOs, such as Midwest ISO starting in 2004, will help to mitigate inefficient curtailment of service and, along with locational marginal pricing, will highlight the cost of congestion and encourage appropriate projects to relieve congestion.

Turning now to gas infrastructure, total Midwest gas consumption increased 13.4 percent, from 5tcf in 1990 to over 5.7tcf in the year 2000. The residential and industrial sector is the largest gas consuming sectors in the Midwest, had little growth between 1990 and 2000. Most of the growth in Midwest gas consumption was due to the growth in electric generation's consumption of gas. Electric generation's gas usage increased by 250 percent over this ten year period, accounting for 57 percent of the Midwest growth in gas consumption.

This chart of gas facts shows that while the Midwest accounts for a quarter of the United States' gas consumption, its own regional production which is 15 percent of total U.S. gas production, cannot cover its usage. This difference is made up from production from

other regions of the U.S., from Canada and from underground storage.

You see here that total pipeline capacity flowing into the Midwest was about 30bcf per day in the year 2000. Pipeline capacity flowing out of the Midwest to Canada, the Northeast and the mid-Atlantic was approximately 12bcf per day. From 1990 to 2000 pipeline capacity in the Midwest grew 26 percent, from 26.8bcf per day to about 33.8bcf per day.

Now, the most significant pipeline development in 2000 was the construction of the Alliance pipeline from Canada to Chicago, with a capacity of about 1.6bcf per day, which went into service at the very end of the year 2000. Also the Vector pipeline, from Chicago to Detroit, with a capacity of 1bcf per day, went into service near the end of 2000 as well. These two pipelines allow large volumes of Canadian gas to flow into the Midwest and back into Southern Ontario. Now, this capacity, along with the capacity additions discussed in the next slide appears adequate to serve the gas demand in the Midwest.

Since the beginning of 2001 FERC has approved projects to transport gas in the Midwest totalling more than 1.9bcf per day. Two of these projects, the Horizon and Guardian pipelines, total

about 1.1bcf, and they move in the states of Illinois and Wisconsin. Two other projects would deliver almost half a bcf per day to electric generators in Ohio and Wisconsin. And the last approved project, the expansion of the Trailblazer System is in service and transports gas from Rocky Mountain production to the Midwest.

Now, currently there are three pending projects that would move about a bcf per day of gas into or out of the Midwest. A&R is proposing to expand its system in Illinois and Wisconsin. Wolston Basin is proposing to expand its system to bring Rocky Mountain gas to its service areas that include North Dakota and South Dakota. And the Greenbriar pipeline project proposes to transport 600,000mcf per day from West Virginia, into Virginia and North Carolina.

Now, there are seven projects that could be filed with the Commission within the next couple of years that have a capacity of approximately 6.7bcf per day. The largest of these would be the Alaska project, which has the potential to deliver four and a half bcf per day. Now, realistically not all of this gas would come to the Midwest but one could assume a large portion would be directed to the Midwest for consumption or transport to other regions. And almost a bcf per day capacity in the future would be utilized to increase the

existing capacities of two pipelines. And over 1.2bcf per day of capacity would be proposed in three new projects to move gas from the Rockies to the Midwest.

Taking a brief look at coal and fuel oil, coal fired plants accounted for 61 percent of the Midwest generation capacity and over 75 percent of its net generation in 2001. 92 percent of all coal consumption in the Midwest, between 1991 and 2000, was by electric utilities. West Virginia was the largest producing state in the Midwest region and the region itself produced about 38 percent of the total U.S. coal production. The total consumption in the Midwest has stayed about 470,000 million tons per year for the past five years.

Now, electric utilities, use of fuel oil accounted for only ten percent of the total fuel oil consumed in the Midwest for 2000. Of this amount, residual fuel oil accounted for only three percent. Distillate fuel oil is the fuel oil of choice in the region for two reasons. It is used as flame stabilization in coal fired burners and it is used in smaller peaking units, about one to two megawatt capacity, all over the Midwest. 21 percent of total U.S. refinery capacity is in the Midwest. The majority of the crude oil that is shipped to the Midwest

refineries originates from the Southeast, Canada and Texas. Illinois serves as a hub for many interstate oil pipelines that traverse the Midwest.

In summary, there is adequate pipeline and storage capacity, as well as electric generation capacity, to meet the Midwest market needs for the present and near future. An abundance of coal and nuclear fired generation should serve to stabilize prices in the region. Electric transmission appears to be the weak link in the Midwest energy infrastructure. It appears that price signals are needed to provide incentives for transmission expansion to relieve congestion. The near term consequences of inadequate transmission are moving from limiting the movement of electricity at appropriate market prices to compromising reliability in the future if investments are not made.

Important steps towards enabling the necessary investment in transmission facilities will be the full integration of the Midwest ISO and SPP and the implementation of locational marginal pricing.

That concludes my presentation. I'll be available for the next few minutes for questions.

MR. MILES: Are there any questions?

MR. WRIGHT: Our next speaker will be Rick Mattoon from the Chicago Fed, and he will speak on his

forecast for energy use and energy infrastructure in the Midwest.

MR. MATTOON: Thanks very much, Jeff. Thank you, Mr. Chairman and Commissioners, and thank you very much for asking me to participate in this meeting this afternoon of FERC. If nothing else is demonstrated, I think by the type of agenda that's been laid out, this is perhaps the most time efficient conference in U.S. history, and it certainly shows that FERC runs a tight ship, if nothing else.

I also have to begin with a standard caution, which is the remarks I'm about to give are not the position of the Federal Reserve Bank of Chicago or that of the Federal Reserve system. And basically this afternoon what I'd like to do is sort of quickly touch on sort of three issues. First, what is the forecast of the electricity demand for the Midwest. Second, what are the electricity issues facing the region. And third, what the investment climate right now for expanding the region's electricity resources.

First, what is forecasted demand? Anyone who has done forecasting, knows that it's more of an art than a science. In fact, as probably most of you know, one of the standard forecasting jokes is, when doing a forecast you should always provide a number and a date

but not both in the same forecast.

With that being said, I'll say electricity demand forecasting is particularly tricky. Since it's an interaction of a number of sort of highly volatile factors, they may get very difficult to predict, particularly what demand is going to be like on peak days, which is of course what people are extremely interested in.

For example, some of the factors that will affect any sort of electricity forecast, and these are things that a forecaster would be looking for, are things such as population growth. Now, as Jeff already pointed out quite well in his initial presentation, population growth in the Midwest has been slower than most of the rest of the country, particularly slower than the Pacific Northwest, California or in the Southeast. So that being said, that's one of the things that will probably put a little bit of a damper on Midwest electricity needs in the future.

Another factor is intensity of energy use. This is really sort of a national phenomenon. When you think of this, it's essentially all the electricity devices that we tend to use are becoming more and more efficient in the way in which they operate. However, we are demanding to use more and more of these gadgets in

our every day life and in our work place. So there's kind of push-pull between sort of the efficiency of these devices and the energy they need to power them. So that's something to be considered in looking at a forecast.

Another, of course, is weather. Obviously that's one of the most unpredictable here in the Midwest. As any of you that have been in Chicago recently have know we've gone from 60 degrees last Saturday to it's supposed to be snowing by this Saturday. So those sorts of factors and the fact that you have an extremely difficult sort of heating season in the Midwest, where you have very hot summers, very cold winters, are things that again can really play havoc with any of sort forecasted need.

Another is the economy. Clearly right now, in a slow economy, need for electricity has really gone down significantly. In fact, the Energy Information Administration has predicted that for all of 2002 total energy use in the United States will only grow by about .4 percent. They anticipate that next year, with a more vigorous expansion, we'll be looking at about a 2.2 percent growth rate. So that sort of thing is, again, another one of these factors you want to take into consideration.

Another obviously is fuel type and price. And again I think Jeff did a great job at sort of touching on this. The area that everybody is interested in right now is natural gas prices and exactly what they're going to do and how they'll behave. Of course, this is because again, as Jeff pointed out very well, almost all of the marginal capacity that's coming on line is going to be gas fired. In addition, if you look at various estimates, it's suggested that gas is going to expand to being the fuel of choice for generation, from about 16 percent in 2000 to about 32 percent in 2020. So this is the type of thing that again you really should pay some attention to and again, it's going to affect these things in the future.

Another is technology. This is one of these ones that again is really something that will drive any forecaster nuts, because again you're sort of trying to anticipate the future. For years there have been predictions of fuel cells and other sorts of things allowing essential users to fall off the grid. That's one of those things that again isn't going to affect what the total demand, though it will obviously affect who is providing that demand. If you don't think this is a realistic type of thing that happens, all of you are familiar with the telecommunications industry saw

this happen with fiberoptics, when the fiberoptics system was being laid out, sort of in the middle of it there was engineering advances that were made that allowed 200 times the amount of data to be traveling over the same single strand of fiberoptic. And because of that we today have a significant glut in the market of fiberoptics, because again, this sort of occurred in the middle of laying this out.

So essentially why this litany of factors? What this demonstrates is that we haven't been very good at forecasting electricity demand because so many variable factors need to be taken into consideration. It's not surprising, therefore, that prudent policy has suggested building significant capacity margins to be able to handle all the adverse circumstances that might occur. However, of course, economists loath this kind of system, any system that is built to handle simply peaks rather than utilizing sort of demand side management tools or real time pricing that might shave some of the top off these peaks is something that economists would prefer, and with that, I'll get off my soap box.

So what can we say about the Midwest? If you look at first the internal summer capacity margins, I'm looking at this a little bit differently, because

I'm just looking at the internal summer margins, not the total margins. What you see is sort of an idea of all electricity generation or all power systems are local, to sort of paraphrase from Tip O'Neill, and what you find is there's sort of a very different pattern in terms of when you're looking at these things by region as to exactly what sort of capacity is available region to region. And what this also suggests again is perhaps the need to again be able to transfer some of this capacity from region to region more efficiently, suggesting that the transmission system has a major role to play here.

My next slide is one that I'm a little bit more nervous about because, as Jeff pointed out, so much has changed in terms of our building capacity, and I'll touch on that when I get to the financing environment right now. But essentially if you look at this at various times, there is capacity under construction or completed, and in some states in particular, there have been some real success stories. Iowa, for example, has just broken ground on their first new power plant in 19 years, and much of that was credited to a very innovative regulatory plan which essentially sort of pre-approved the project and guaranteed a rate of return, and that was seen as something that was sort of

ground breaking in that capacity.

So if you look at this again, as I said, you would see that there's sort of, very much of a variation depending on what part of the Midwest you're located in. Now, if you look at the historic trend growth for summer demand, again you'll see that essentially summer demand has been rising, but capacity has been lagging. Again, that's been putting pressure on these margins.

Now, not to pick on a specific state, but Michigan provides extremely good information, very complete information on its electricity needs. What this chart shows is an estimate for electricity, the electricity forecast through 2010. What it demonstrates is essentially they expect electricity demand to grow somewhat below trend during this period of time. The forecast expects annual electric sales to increase about 1.9 percent during the period 2000 to 2010. And this is in comparison to a 1990 to 2000 growth rate of about 2.5 percent.

This forecast seems pretty much in line with what the U.S. Department of Energy expects, which is expecting sort of residential demand to be growing at around 1.7 percent from 2000 to 2020, commercial demand to be growing somewhat faster at 2.3 percent and industrial demand to be growing at only about 1.4

percent over the same period.

However, what the next slide will show you is again this recurring theme of all these things are local. If you look at specific utilities, in Michigan what you'll see is the difference between Detroit Edison and consumers in terms of what they're seeing in terms of forecasted growth. The consumers service area is going to grow at about 2.4 percent, where the Detroit Edison is only about 1.5 percent, indicating again this sort of variation and sort of, in some ways, the Balkanization within different utility markets.

If you're looking again sort of from a forecaster's perspective, the types of things that you would be most interested in, in sort of determining whether or not these things are going to come true, the things I would key on, the key factors would be, first of all, commercial floor space. This would give you a good idea of what sort of demand there is in the commercial sector which again is this very rapidly growing need for energy. So watch where your commercial floor space forecasts are.

For household growth it's fairly easy. For retail you essentially look at household growth and trends in that. And when you look at industrial, the industrial sector, industrial production will pretty

well cover that. USDOE, to give you some idea of where these things are falling out right now, estimates the household growth is going to be about one percent per year, commercial floor space at about 1.7 percent and industrial output at about 2.6 percent.

The next area I'd like to turn to is one that's really been significantly in the news recently, and that's the investment climate. Depending on who you talk to, the investment climate right now ranges from anything from uncertain to the worst on record. From a utility company perspective there really is a host of questions that need to be answered before you decide whether or not you want to build new facilities or even to know how it is you're going to recover the cost of these facilities once they're built.

There's really a litany of things that you can look at, some things including the electricity market you're going to be selling into. Is it going to be a national market, regional market or just your local market. What are fuel prices doing? Is gas price volatility going to show up again and how is this going to affect what you're planning on in terms of what your generation costs are going to be. And there's environmental issues. Again, as it was very pointed out by Jeff, this is a very coal intensive region. If you

actually have some clamping down on coal emission standards or things like that, coal could become a significantly more expensive fuel to be using. So these are all things to consider.

Then there's also the external factors, which this slide will begin to show you. The Dow Jones utility index, since its peak, has dropped about 47.8 percent. This is a during a period of time in which the Dow Jones industrials were dropping about 30 percent. Clearly, this is a very different environment than the past. These are not the old state utilities that grandma put her money in and expected to get a high dividend from. Utility debt right now is a major, major problem. A recent report from Standard & Poor's presented a very tough picture for utilities.

Essentially 11 percent of the 320 utility companies that they follow are now at junk status in terms of their debt rating. 50 percent have debt ratings of triple B or essentially two notches above junk right now. And ratings downgrades are coming fast and furious. If you look at this figure, there have been 136 downgrades in 2002, and just since July there have been 57. So they really are coming very quickly.

Maine utilities are finding that their only avenue for securing debt or for borrowing is to

essentially pledge assets or at least pledge cash stream from assets. And ironically, as one person in my office was joking about, Enron was famous for championing the asset light strategy and today main utilities are being forced into an asset light strategy, but certainly not as part of sort of a profit motivation.

When you look at this in terms of what it's showing is utilities are essentially having to either dedicate cash flow or dedicate their actual operations to be able to secure money, and essentially -- sources or capital from banks have pretty much evaporated except for a handful of companies.

So in conclusion, is there enough energy available? I think Jeff pointed it out pretty well. Yes, there is. Yes and no, depending on where you are. Again, probably less has to do with generation capacity than it has to do with transmission and the ability to get the energy where it's needed. So that really isn't all that different than the national situation. And to give you some examples of that, DOE has pointed out that in areas such as Texas, essentially the congestion is costing about $250 million and California, $222 million. And here in the Midwest the corridor between Minnesota and Wisconsin is highly congested and it's seen as preventing cheaper energy from getting to the Chicago

area.

So these are all things to be watching. The other is its volatility is probably going to have a little bit less to do with supply than it's going to do with price, particularly price for fuel. Again, I would particularly point out for natural gas in this case.

Another area is again, when you're looking at natural gas it's the marginal producer at times of high demand, so again, I can't emphasize enough that watching these natural gas prices is something you're going to want to pay attention to in the future.

And then finally I'd like to make again another plea for demand side management. For many economists, still believe, and maybe this is just more article of faith, this is still sort of low hanging fruit out there. Nobel Prize winner William Vicory, who is famous for his work in congestion pricing, really tried to demonstrate that one of the most efficient ways to meet some of these needs is simply shaving the peak off demand. That is something that again I think that more can be done in this area and I think it's something that bears some paying attention to.

Finally, I guess I just want to end with one question, which is going back to the investment slides that I was showing you. Electric utilities, as all of

you in this room know, are among the most capital intensive industries in the country. It takes long planning horizons to bring new power plants on line. It takes long planning horizons to build new transmission, and these are very expensive things to do. In the current environment in which there is so much uncertainty, essentially it's very hard to figure out a business case right now for how utilities are going to need to behave to be profitable. So given those things, I think this is one of the real challenges right now that's facing, not only the national utility industry, but also utilities here in the Midwest.

So with that, I'll conclude, and I'll take any questions anybody might have.

MR. BERG: I'm Jim Berg, Commissioner from South Dakota. You mentioned several times the uncertainty and the lack of rules of the road. And this comes up in everything that we talk about. When and why did that occur, if those rules disappeared and that there's this uncertainty?

MR. MATTOON: Well, from my perspective, I guess it's in part because there's obviously competing regimes right now for where to go in terms of regulatory policy. You either have a more open or free market perspective or you have a more back to regulated market.

Unfortunately, as I think probably all the people stay aware of this, have noticed the last couple days in Ontario you've had a situation where the Ontario government has reversed -- has put on price caps and essentially eliminated what was going to be their open market experience. And the for the companies that were involved in that, a number of the retail marketers, they essentially said we're out of business at this point.

If you're put into a position where, again, you have that much uncertainty in your planning horizon, particularly in a capital intensive industry, it's a very difficult place to be in.

MS. WEFALD: On slide number two, internal summer power capacity margin, it looks like ECAR and Maine, for example, Maine in 2003, it looks like there was about 22 percent capacity margin. But you look at MAAP and it looks like it's down to about a two percent capacity margin. Would you care to comment on what things we should be looking at the in MAAP region?

MR. MATTOON: Again, I think some of that can have differences in sort of seasonal patterns, which is in some cases if you took a different time, not summer necessarily, the capacity margin would be better and healthier. So it's not necessarily as critical. What I wanted to illustrate was just again sort of this

very specific regional variation, and in many cases, what you want to be able to do is again transfer the power more effectively from region to region rather than necessarily assume that you want to build up capacity to some given level just as sort of a safety margin.

MS. WEFALD: So what you're saying is there may be opportunities to transfer energy in from Maine or from ECAR to the MAAP region to help solve that capacity margin problem. But the transmission capacity is not there at the present time due to the congestion?

MR. MATTOON: I believe that's true, yes.

FEMALE SPEAKER: Richard, you talked a little bit about the higher percentages of those at junk bond status, according to the rating agencies, and a greater percentage also just above that junk status. The rating agencies have in fact changed some of their standards. Is there a certain percentage that fall into these categories because of those changes or is it diminimus at this point?

MR. MATTOON: I think it's pretty much diminimus. I think that, as you said, obviously all analysts are under great pressure right now to sort of tighten up their standards on how they're doing things. But I think they're also seeing essentially a sector that as a whole, that they are again -- they're nervous

because they don't know what the business model is for them to be as profitable as they once were, particularly those that are in the merchant sector or those that had trading operations or those who have holding companies plus other operations. So you have this -- it's very hard because it's not a unified sector any longer. You don't have a bundled utility you're looking at. You're really looking at very different business models and trying to evaluate all of them.

MR. HADLEY: David Hadley from Indiana. Forgive me for not being an economist. But you had a slide that said volatility will have less to do with supply than with the price of fuel to generate electricity. We're very concerned about volatility in the market. As an economist you tried to describe some supply and demand issues. If supply and price and how they affect that volatility is different than -- it's backwards of what we would normally think. Would you care to describe that a little further, please?

MR. MATTOON: What I was essentially saying was that I think a lot of the supply issues, essentially there's the generation capacity is out there, so it's less a concern of, that because of extremely tight conditions you're going to see changes in energy prices or in demand. But what you might see, because of fuel

prices, either gyrating or whatever else, you may see demand being affected by higher prices, being driven by those fuel prices for generation. So essentially that's sort of the relationship. Essentially it's sort of the Pacific Northwest story which is when gas prices spiked, you saw essentially conservation measures come into effect that brought down the demand but price still kept going up in those areas despite that.

MR. MASSEY: I have a question. Am I recalling correctly that one of your points about the uncertainty is uncertainty about recovering transmission investments? Talk more about that, please.

MR. MATTOON: Well, again, I think right now for any of these, part of the problem is you don't know exactly what regime you're building these under. So it's whether or not you're doing this as a regulated utility who's expecting a rate of return from a public utility commission, whether you're building this under a different model that assumes that they're going to be part of a regional transmission system and maybe regulated by FERC. There's different models right now for how they're going to assume this.

I think again whenever you have uncertainty, you're just not going to have a conducive investment environment. So I think that's again clearing up that

uncertainty, allowing you again to build sort of a business model for how you can do this and make money is one of the things that certainly analysts are looking for right now.

MR. MILES: Any other questions from the audience? Thank you very much.

With that, we'll move to our first panel presentation. Ron, if you want to come up.

Ron is going to be substituting for Kelly Hunter. Unfortunately, Kelly Hunter's plane was turned around. I'm not quite sure why, but let's hope it's all safe.

Our first panel today will talk about cross corridor issues; future energy relations and energy transfer with Canada. We ask the panelists to think about the following questions.

What are the transmission constraints which inhibit the flow of Canadian electricity in and out of the Midwest? How much additional electricity could be exported to the United States if these constraints were relieved? What is needed to relieve congestion? Are scheduling procedures between Canada and the U.S. a problem? Are there infrastructure solutions to existing loop flow problems between the two countries? And finally, how can pipelines be expanded to deliver Artic

gas to the Midwest?

Our first speaker is Glen Booth. He's the chief economist for the National Energy Board. Glen, welcome.

MR. BOOTH: Thanks a lot, Rick, and I'd like to say thanks to Chairman Wood and the Commission for inviting us here. Solutions to our future energy needs will take a lot of work in both our countries, and I think ongoing dialogue and discussion can only be a good thing for both of us.

First of all, I just always have to tell folks here who we are, the National Energy Board in Canada. We're a bit equivalent to the FERC. We approve energy exports from Canada. We approve pipeline projects in Canada, and we also approve electric power -- between Canada and the United States. One thing we don't have, though, in Canada, is a national regulator with respect to electricity commerce. The National Energy Board has no jurisdiction over the tariffs or terms and conditions of transmission in Canada. So it evolves to the provinces. So when you're talking about electricity in Canada, you're forced basically to talk to all ten provinces.

Now, Rick, I saw that you're first six questions were all electricity ones, but because the

National Energy Board doesn't have a lot of jurisdiction over electricity, I'm going to talk mainly gas.

Now, the National Energy Board's objective is basically to promote economically efficient outcomes in the Canadian public interest. With respect to infrastructure needs, we agree with FERC, as Chairman Wood alluded to or indicated in his opening comments. For efficient markets to work you have to have adequate infrastructure. So the National Energy Board believes that firmly, that we want to promote adequate infrastructure.

To do that as a regulator our main modis operandi or strategy is to try to be as predictable as possible. We just heard that uncertainty is a huge dis-incentive to investment. So as a regulator, we try to provide predictability and stability wherever we can. Of course, I'm sure we're accused of not doing it all the time, but that's our goal.

Now, in Jeff's opening comments today, he kind of went over the gas situation. What I got out of that is that the gas infrastructure situation for the moment looks pretty good. It looks like there's a lot of pipe coming into the U.S. Midwest, particularly from Canada, and for the moment there's lots of gas supply.

So I'd like to just talk for a moment about

the gas supply on a go forward basis. If you look at generally in the last three years in Western Canada -- Basin it's been three record years. In spite of that, production has actually just flattened off and it's expected to drop off a little bit this year. So that's after 16 straight years of pretty significant, year after year, increases in production. A lot of that incremental production was coming to the United States, into the U.S. Midwest and the U.S. Northeast. The way things look right now, it's going to be difficult to grow supply any further from Canada, at least from the west coast.

So looking forward in the longer term, where is the gas going to come from? Well, there's lots of source of gas supply if you're looking on a continental basis, but I won't talk about L&G or East Coast Gas or Deep Water Gulf of Mexico, etcetera, but looking at the sources in Canada, in the north, people are usually looking to Alaska and McKenzie Delta. But I'd like to just mention real briefly cold bed methane in Canada. Recently the Canadian geological supply of Canada completed a study and announced they estimate there could be up to 135tcf of economically recoverable gas reserves in Alberta and in the basin there. That's a lot of gas, if it's possible to produce it. There's some

technological things to work out yet. Coal bed production in Canada is in its seminal stages and there may be some technical barriers. If it works out, I'd just like to point out, it's lot closer here than Alaska or the Canadian north.

Turning to the McKenzie Delta, as a regulator we've spent 18 months working really hard to lay out a regulatory road map for anyone who comes forward with a pipeline application. There's three first nation groups, there's an Inuit group, there's basically 14 agencies that have different jurisdictions and regulatory responsibilities that would have to approve such a pipeline. Industry would really like to have a single window. So we work really hard to achieve that, again trying to lay out the road map ahead of time. And we've just recently signed a number of cooperation agreements between all the agencies so that's sorted out.

If you look at Alaska, I won't say much about it. Maybe there will be more discussion further on. Compared to the McKenzie Delta gas, we think McKenzie Delta, we're definitely going to get an application, probably next summer. We feel we're going to be going through a regulatory process and there's a real project there. As I understand with respect to

Alaskan gas, the producers haven't declared. There's possibilities there, but it's still uncertain. Our goal, if the Alaskan gas project starts to become more concrete, we will prepare for it, as we have for McKenzie Delta gas pipeline.

On that note, I think I've concluded, except to say that the more dialogue and discussion we can have between the different agencies in preparation for a major project like that, the better.

MR. MILES: Thank you, Glen. Our next speaker is Ron Mazur from Manitoba Hydro. Ron, I understand you're the director of the transmission planning unit or something to that effect.

MR. MAZUR: Good afternoon. My name is Ron Mazur. I'm standing in for Kelly. I think deregulation has hindered the airline industry as well. I don't think he's made it yet.

I am the manager of the system planning department for Manitoba Hydro. I just should also give you a little background on Manitoba Hydro. We're a Crown corporation with a mandate to serve load in Manitoba. We have about 5,400 megawatts of generation connected; however, our load is about 3,800 megawatts. This is the nature of a predominately hydro system where 95 percent of our energy comes from hydraulic resources.

We plan for low flow years in order to serve our load. So in normal median flows we have a lot of export energy.

Our interconnection capability south to the U.S. is about 2,100 megawatts. East and west to our neighboring provinces, it's considerably less. It's in the order of 300 megawatts. And I think history will show, almost in any industry, the reason for that. There seems to be a north-south natural trade for a lot of reasons and, as an engineer, I won't begin to explain them.

Forty percent of our sales of electricity come from external, out of the province sources and mostly in the U.S. I think we supply about ten percent of the state of Minnesota's energy needs. We have recently built a new interconnection. It was shown on one of the slides of one of the earlier speakers. It was a 230kV line, in the order of about 150 miles. In the system today it was a battle. It just went into service at the end of October.

We have a coordination agreement with the Midwest ISO and that makes Manitoba Hydro look like a MISO member from a tariff perspective. However, we obtained some autonomy as required by some of our legislation.

There's a question on the constraints that inhibit the flow of Canadian electricity in and out of the Midwest. I guess I would have to assess our transmission capability into the Midwest from Manitoba as being adequate to meet the long term contractual needs that exist today. And certainly we have some capability to our provincial neighbors that also cover some of the long term needs. However, I would have to admit that there's likely a fair amount of shorter term commerce that's inhibited and could be enhanced if there were more interconnections capability. In fact, the new line we just built was primarily to be able to get power into Manitoba for the low water flow conditions.

It was asked how much electricity could be exported -- how much more could be exported to the United States if constraints were relieved. I guess at the present time our experience is that a lot of the constraints that exist in the system are constraints that are primarily further south of the Manitoba Canadian-U.S. border. Getting beyond the Minneapolis area from our aspect is certainly difficult and there's a lot of competition for the transmission system.

There is about 4,000 or 5,000 megawatts of economically and environmentally developable hydro in Manitoba that's still available. However, that

development would require major interconnections into the U.S. or into our neighboring provinces. And those interconnections coming into the Midwest would at least have to get up to Minneapolis but perhaps further.

In order to accomplish and invest in this type of climate, we think we'd need some long term power sales agreements with some certainty in that investment. Additionally, any type of transmission that would be built, we would need to able to have some indication that we could be able to use it for the generation we develop.

As to the question what is needed to relieve congestion, I suppose we've been battling or discussing in many task forces what are some of the barriers to congestion and building transmission. I was part of a NERC task force that looked at some of this. Certainly things like siting and regulatory approval is one of the big ones. I think another one in my own mind is lead time. Just as an example, I'll cite the -- Westin transmission line that's being built or being in the process of going through the approval and construction stage. I believe it was first announced in April of '99. It's been going through some regulatory approval and construction is still not started. I think the costs have gone up about $250 million to I believe about

395 or $396 million. I just saw that in a brochure outside the door here. We're not quite sure when the in service date may be now, typically eight or ten year period. Vector pipeline was a 350 mile pipe into Chicago, from Southern Ontario I believe. The concept was started in '97 and it was under construction, in service in December, four years.

Certainly lead time and the investment and risk investment in projects like that have to be a major impact on the infrastructure, and decisions to build transmission. While many people are putting a lot of faith in new technology to be able to increase the transfer capability of our transmission infrastructure, I believe that in the Midwest, at least in many parts of the Midwest that I'm familiar with, we probably use the majority of technology and the system is being used at or above its maximum. Wires need to be built.

What are some of the other issues that need to be addressed, to try and relieve some of the congestion. We think the climate for cost recovery and allocation has to be fair and I would believe that the benefit of infrastructure have to pay. In addition we need a siting process that paves the way for inter-provincial, interstate and international transmission. Right now, the process is multi jurisdictional. We just

went through a process for our new international tie line and dealing with the provincial, the Canadian NEB, the state regulators and the presidential regulators on the U.S. side, just to give you an idea of the higher level jurisdictional and regulatory frame work, in addition to that, there are other municipal and landowner issues that also come to bear.

There's a question on scheduling procedures between Canada and the U.S. We believe that, through the coordination agreement between Manitoba Hydro and MISO, -- issues are virtually eliminated. We think the coordination agreement is unique and makes us look like another MISO member. The only issues that we're aware is that anyone wishing to export energy from Canada over our international tie lines would have to have an export permit from the NEB and then meet some of the economic requirements as far as qualifying as a transmission entity.

The last question dealt with loop flows and are there infrastructures in place to deal with loop flows. Most of the Canada/U.S. interconnections in our region are controlled by phase shifters with the exception of the Manitoba Hydro ties. There are some minor loop flows from North Dakota through Manitoba back into Minnesota through our ties. At this point there

really hasn't been any economic incentive to correct the problem and they're recognized in setting the day to day operating limits.

I think that's all I have to say for now. Thank you.

MR. MILES: Thank you, Ron. Our next speaker is Dennis Prince who's the vice president for Regulatory Strategy at Alliance Pipeline.

MR. PRINCE: Thanks, Rick. Good afternoon, Commissioners. Thanks very much for inviting me to participate.

I believe Alliance Pipeline brings a truly unique perspective to the consideration of the adequacy of the gas infrastructure in the Midwest, and probably to the U.S. as a whole, and the ability of that infrastructure to grow as required.

Alliance is a 1,900 mile pipeline system originating in Western Canada and extending into the Chicago area. It's only been in service for a mere two years. It was a Greenfield project, the magnitude of which really dwarfs virtually any pipeline project undertaken over the last 30 years, costing nearly three and a half billion dollars. Despite being Canadian, those are U.S. dollars. And it has the capability to deliver nearly 600 billion cubic feet a year, which

represents almost two and a half percent of U.S. consumption; however, interestingly, about 40 percent of our through-put today is actually being reverted back into Southern Ontario through the Vector pipeline, I think illustrating the integrated nature of the energy market across North America.

Alliance was successful because of a number of factors. First, it employed state of the art technology, where a high pressure rich gas system which resulted in lower unit cost. It had a customer constituency, primarily Canadian producers willing to make long term contractual commitments, totally nearly $5 billion. Alliance embraced virtually every pro-competition policy available before the FERC. We were an optional certificate pipeline. We employed negotiated rates, etcetera. And we used those tools to implement creative and innovative commercial approaches which allowed us to put the entire commercial deal together.

On the strength of the pro-competition environment before the FERC and before the National Energy Board in Canada and on the strength of the commitments of those contracted shippers, Alliance was able to attract equity capital and 46 international banks to provide the financing for its construction.

Alliance was the largest ever project financing in North America.

At the time that Alliance filed its application before the FERC way back in 1996, long term gas consumption forecasts indicated a need to construct an Alliance size project virtually every year in perpetuity. Those forecasts are no less bullish today, yet few large scale projects have been constructed. Why? Well, a number of reasons.

First, the ultimate source of the new gas supplies are uncertain. Second, precise identification of the end use market remains vague and quite scattered. And large sectors of the industry, such as LDCs and industrials, appear to behave like they believe they have been relieved partially of the responsibility for their long term planning for their own energy requirements.

In addition, and importantly, regulators are undertaking fundamental reviews of policies, both on the electric and the gas side, creating great uncertainty. For example, Alliance embraced the pro-competition policies and committed to a 25 year structure with banks, equity owners and customers. Only two years into that 25 year structure, the prospect is raised of abandonment of the very policies that underpin that

project and underpin those financings, such as negotiated rates.

That structure actually facilitated the creative and innovative commercial approaches adopted by Alliance. I'm not truly concerned that those reviews will have an impact upon Alliance. But the lack of consistent policy environment could well create a development chill or at the very least cause a step backwards for some of the projects that are on the drawing boards. To be very clear, Alliance happened because of the FERC's pro-competition policies. The next Alliance may well be delayed or deterred by uncertainty over the FERC's and other agencies' dedication to such policies.

Alliance Gas targeted the Midwest market, not because of identified demand in the Midwest, but rather, the breadth of the markets ultimately accessible from the Chicago hub, including the Midwest itself, the Northeast, the Mid-Continent, and indirectly the Southeast, and even Southern Ontario.

I believe this same logic will similarly guide future expansions from Canada and the North, driven at some point by Alaskan production. That additional gas will end up in the Midwest, at least as a staging area for ultimate delivery into more distant

markets. Accordingly, an appropriate consideration of the adequacy of the Midwest gas infrastructure really needs to include considerations of the impacts created by the development of that hub, and that's going to be a hub that I believe will become the most significant gas marketing hub in North America. The Midwest will definitely be affected by demands from regions well beyond its defined borders.

Now, Alliance itself has the ability to provide large scale additions to pipeline capacity into the Midwest. We are actively considering expansion scenarios anywhere from 400 million cubic feet a day to over seven billion cubic feet a day. We believe that all of that can be done at unit cost below the current cost of transportation. We also believe that the pure efficiencies of the technology employed by Alliance will dictate that significant and long distance capacity additions will employ this technology.

Such large volumes and the technology employed will create transitional issues on many existing systems and affecting many existing users and consumers in the Midwest and beyond. FERC and state commissions will undoubtedly be faced with an ever increasing number of issues related to such impacts. That's just a reality of growth. I would encourage all

of those commissions to anticipate and prepare your organizations to address what will be very difficult policy issues. That will be essential to facilitate growth. And I hope this session helps to prepare you to move forward on those issues. Thank you.

MR. MILES: Thank you, Dennis. Our next speaker is Mark Graham. He's the director of transmission business development for Hydro One. Mark.

MR. GRAHAM: Thanks. I'd like to thank the Commission for the opportunity to speak. As strange as it may sound, Hydro One is a wires business. That goes back in to the historical root of electricity, in my province anyway, is referred to hydro, when people talk about the electricity going out, it's the hydro going out, and we hung onto the name.

I'm going to do a brief commercial, talk a little bit about some projects we've got underway, talk about some of the issues with respect to getting electric transmission infrastructure built, and then talk as little as possible about the Ontario market.

We're structurally separate from generators and we don't have a competitive retail business, although we have what we call a standard supply business, which at this point, passes through the spot market price in Ontario to end users. We own no

generation and competitive of that. We own virtually all of the electricity transmission in Ontario, and we operate the system under the direction of the independent market operator.

The market opened in May, 2002. It's about 150tw hours of wholesale sales. There's potential for substantial two-way trade between Ontario and adjoining markets. Some of the interconnections are shown on the slide that's up here. And in fact, this past summer we relied on imports to meet demand in the province. At times ten to 15 percent of our demand was being met by imports, primarily from the United States, and to some extent Quebec.

As the map shows, we're strategically located with respect to imports into the Midwest, which may come from Quebec or from New York, although as I've said, again recently we've been an importing jurisdiction. We have substantial interconnections and we're in the process of upgrading them. Together, with an international transmission company which is currently a subsidiary of DTE, we're enhancing the Michigan interface. We're putting in three phase shifters and an auto transformer there that will increase export capacity from Ontario by up to 1,000 megawatts and import capacity into the province by about 500. The

phase shifters also allow us to control the circulatory flow around Lake Erie.

As well, Hydro One is working with the transmission arm of Hydro Quebec to develop a new 1,250 megawatt DC, back to back interconnection between Ontario and Quebec, and we have all the approvals for that in Ontario. Something to mention here is that large hydro-electric producers such as Quebec and Manitoba do provide an interesting benefit in the ability to store energy in the water and the utilization of ties with jurisdictions like that for what we call banking is an interesting possibility.

We see benefit in the longer term from increased wheeling into Ontario and we are trying to work in the new market regime to that regard. We do have a development project underway with partnership with Trans Energy US, looking a merchant link, potentially to go under Lake Erie, between Ontario and either Ohio or New York.

Transmission is a key to robust markets and I think this is well known; there's been a shortfall in transmission investment in North America over the last few years. I think some of the factors inhibiting that I'm going to talk about here. We believe the transmission investment can be fostered by mechanisms

which transfer economic benefits to those who invest in the infrastructure, and we think the planning process should provide for merchant and market based solutions. In that regard we do agree with the direction of the FERC with respect to implementation of locational marginal pricing and associated financial rights to indicate where investment may take place and to provide for at least one tool to support investment.

However, as the Commission is aware, at least to this point there are difficulties in utilizing those mechanisms to actually get infrastructure built. And we don't think that they will necessarily, at least in the immediate future, be such to capture the full value of transmission in the long term. We've learned through the Lake Erie project that, at this point particularly, it's difficult for customers in the market to make long term commitments such as would be necessary, at least from the point of view of Hydro One, to underwrite the financing and construction of such projects.

I think it's an understatement with respect to Ontario to say that the evolution of regulation and market rules has also -- the uncertainty around that is also a big difficulty at this point in time.

So we think that in order to get beneficial

new investment there's a need to supplement market mechanisms with an effective integrated planning process and appropriate returns to investors and rate based transmission. We believe pro-active transmission companies can bring benefits to the market and to end customers. Relegating rate based transmission to simply a last resort role we feel will result in beneficial transmission not being built or at least being built later.

One final point, and this maybe relates back to something that was said about the Alliance. We believe that new transmission infrastructure is more likely to occur if there's a regime that allows it to be supported by contracts for transmission service with customized terms and conditions. In particular, we believe that negotiation of those terms and conditions should be permitted where the deal is between entities that aren't affiliated.

I'll spend a minute or two discussing some of the current issues between the Ontario market and adjoining markets. I'll do a bit of a -- that I'm not in market operations so I'm not an expert in this area. Ontario's ability to obtain the necessary imports to meet demand over this past summer certainly indicates that we can do transactions effectively between the U.S.

and Ontario. However, we do have things that are still standing in the way of transactions occurring, at least as people envision them.

We have differences in market design and the capabilities of systems. I think these are often exacerbated by difficulties in communication. One indication that there is a problem is that at this point congestion payments in Ontario are less then congestion rents collected primarily because of failed transaction and a lot of those are across the seams with American markets. There are initiatives in place within Ontario and with other jurisdictions to try and address this.

For example, the IMO has some memorandum of understanding with the New York ISO and the New England ISO to address seams issues and we would certainly expect that to continue with any forming Northeast RTO. In the case of the MISO, the market has not fully evolved so negotiations, discussions are at a more preliminary stage, but we would expect those to ramp up as the form of the MISO market becomes clear.

In sum, we certainly have an objective to do as much as we can to enhance trade and smooth the seams. Ontario will be looking at opportunities such as the following for more effective interaction. I think things like shared reserves, coordinated scheduling of

transactions, elimination of export transmission tariffs. As a transmission company I would like to say that comes with some proviso that we don't lose our revenue and in fact, that there is some mechanism to incent us to build additional infrastructure to support wheeling. Coordinated planning, dealing with circulating power, joint assessment of interconnection projects, closer coordination of outage plants and combatible energy markets. One thing, Ontario does not have a day ahead market but I think that's something we'll certainly be looking at. We also do not have a capacity market at this time, although there is provision in the market rules to look at such a thing.

Finally, I'd like to make a pitch that as much as possible we come up with a consistent design and a design that gets full value for transmission rights. In looking at the Lake Erie project, the differences in the market design between transmission rights is one difficulty with respect to convincing customers that in fact they'll be able to transact over such a link. Again, I'd like to thank the Commission for this time and I guess we're ready for questions.

MR. MILES: Thank you. We have about 30 minutes to have an engaging conversation among the panelists, if they have any observations or comments or

questions of each other, as well from the audience and the Commissioners.

Let me start it off. In order to have a sound infrastructure in place to allow Canadian interest to be met when it comes to energy supply, energy transmission or transportation, if you had a wish list, what would be the top two? Glen, what would you suggest?

MR. BOOTH: The top two for?

MR. MILES: If you had some authority today to insure that there would be a sound infrastructure in place to meet the Canadian interest, what would be number one on your list?

MR. BOOTH: I think we talked a lot about certainty. I work at a regulator and we provide as much as possible on the gas side. I think on the electricity side, as we've heard over here from Mark, there's changes in the rules. Dennis has the same concerns about it. So I think I'd just come back to that, as much certainty as possible is I think what we keep hearing is people want. Standard market design, electricity, fine; let us know what it is.

MR. GRAHAM: I'll add a couple of C's to that, although one is probably a bit of repetition. Consistency and continuity. Consistency of market

structures and continuity of the rules and regulations.

MR. MILES: Dennis.

MR. PRINCE: I guess the two things I talked about in my remarks, the first was negotiated rates. I'm not speaking solely to what's viewed as negotiated rates before the Commission. But the concept that a pipeline could be constructed or developed under a regulatory contract that's different from the standard contract that says you're not going to be subject to changes down the road; you can project financing for 25 years and that includes negotiated terms and service, terms and conditions of service and those sorts of things.

The other is, which is probably something that's front and center in the minds of the Commissioners, is guaranteed time lines on the processing of applications. One of the things that kills applications or projects themselves is long lead times. There's a certain amount of work that needs to be done, but those lead times can affect whether a project can actually come to market at the time it needs to. To give you an example of Alliance, we were waiting for the National Energy Board approval. We already had FERC approval. And we spent a billion dollars rolling pipe and stockpiling it, guessing that we were going to get

what we wanted out of that application. I doubt that there are going to be many projects in the future, large scale projects that are going to do that, which means that once you get your approval, you're still looking as much as two years before you can go to the field and actually construct those large scale projects. I think the market is much less likely to take the kind of risk that Alliance did in the future. Having assured time lines, when decisions are going to be taken would be a big help.

And I know the Commission has done some work in terms of refining the environmental -- consolidating environmental authority over the environmental portion of the certificate application. I think that's a good move, and I think that those kinds of things will assist projects with certainty.

MR. MILES: A couple points, and the we'll talk to -- Commissioner Nelson, do you have a question?

Ron, did you want to make a point?

MR. MAZUR: I think I would almost echo my co-panelists here. Certainty and, in our view, that might be something like a long term bilateral contract, which gives us a revenue stream for our investment. I believe the second one is reduction in lead times. That most likely is related to a more efficient regulatory

process for permitting.

MR. MILES: If I could ask the audience members if they have a question to identify themselves. We have a court reporter here so we want to make sure we know who's asking a question.

COMMISSIONER NELSON: Bob Nelson from the Michigan Commission. Mark referred to the three phase shifters that are being installed along the Michigan-Ontario border and we're delighted that that's happening. But he didn't mention how long it's taken to get to this point. We've known the need for that for many, many years. It's my observation that these kind of improvements are done on an ad hoc basis across international boundaries and I think Ron referred to some of the projects over there in Manitoba.

At any rate, in the United States, we're looking now at an NGA proposal regarding MSE's, multi state entities, which thankfully, the FERC has blessed in their -- which I think holds great promise for resolving these problems across state boundaries.

What would be the legal, political or cultural problems with creating an MSPE, which includes provinces. I know DOE would be involved and others would be involved. But what are the impediments to something like that?

MR. GRAHAM: First off, I think I can say, and I think the Commission will see soon in the Canadian Electricity Association comments on S&D that we are supportive of more cooperation and the involvement of Canadian entities and regional planning councils, if you will. The impediments I think are just as you'd normally expect given that you've got an international situation. There would be other agencies that would have to be involved and give their approval. Certainly as has been mentioned here, you've got ten provinces over there, as opposed to FERC, but we're talking states here anyway, so in fact there's less provinces than states.

I think the will is there. I think the impediments can be overcome. And I think we're in a mood in Canada to cooperate in that regard.

MR. MILES: Any other comments? Any other questions?

COMMISSIONER MASSEY: I have a question. Do you feel that U.S. policies are fair to Canadian concerns? Do you feel welcome to the United States market? Do you feel like there's a level playing field with fair rules?

MR. GRAHAM: I guess I would tend to say, without stepping into the realm of a governmental

jurisdiction, that overall I think things can be worked out. I don't think that we've seen any real impediments that can't at least be talked out. Of course, there are ongoing issues and so on, between the states and the federal government and so on. Certainly I've been spending a lot of time in the U.S. over the last two years and I think most of those discussions have been basically on a commercial, entity to entity basis with no particular international impediment standing in front of them.

MR. PRINCE: Commissioner, I'd offer that -- gas has been a growing part of the U.S. market for some time. Clearly, the markets are integrated. We have gas moving both directions. Alliance Gas is going to Chicago, ending up in Southern Ontario and probably through Southern Ontario into New York on some days. So I think the whole market is integrated.

I do think, though, that there are differences between the way that National Energy Board does certain things and the way the FERC does, that cause difficulties for companies like ours. We try to be borderless. Our shippers nominate from a gas plant in Alberta, for receipt of gas and allocation and delivery into Chicago. We don't even have a meter station at the international border. We have

jurisdiction change. There's a title transfer change that's required. We have all of those things.

I think that it's difficult for the FERC who regulates so many entities solely in the United States to remember that things like NASBE, which is my pet peeve. NASBE has gone nuts. We spend a lot of our time trying to implement NASBE policies in Canada, at the well head in Canada, only because we want to be borderless, so we have to go the lowest common denominator required to implement those policies in the U.S. which requires us to implement it in Canada. And it looks odd to people but that's the only way we can make the border go away is to implement U.S. rules in Canada. And at the end we spent a lot of time implementing policies that really aren't providing any real value to anybody, but it's the only way to get rid of that border.

So there is some jurisdictional difficulties there, but I think there also pretty difficult to get rid of and in the end there are ways of working through those. I don't think that in the certificate process, for example, there are any real significant obstacles there. Timing is an issue. Interestingly enough, going into the Alliance project we would have expected to be sitting on pins and needles waiting for the FERC's

certificate approval before we went to construction. It turned out we were waiting for the NEB approval. So much for our forecasting abilities.

MR. MILES: As I recall we moved that pretty quickly.

MR. GRAHAM: It went relatively quickly and I think you were true to the policies in place. It's always the National Energy Board, the opposition candidate was much more vigorous than it was in the U.S. and Canadian pipelines hadn't experienced competition before. U.S. pipelines, while they resisted, they'd seen competition before.

MR. MAZUR: I guess I would have to say that we think that there has been fairness. I think our ability to work as a member of the MAAP RTG, in those days before the Midwest ISO came into being, there was one example where we were able to participate, although our jurisdictional and legislative needs were different. We believe the coordination agreement that we have with the Midwest ISO is kind of a landmark process for being able to make operation between an entity like Manitoba Hydro and the MISO seamless. I guess if we have one concern it's the -- and whether that would allow us to continue to do that or will they have to revert to some other means of operating in the sort of Canadian-U.S.

Midwest market.

COMMISSIONER MASSEY: Will you participate in the MISO LLP dispatch?

MR. MAZUR: I guess that's one of the issues we're evaluating right now. Within the province we see really no benefit in trying to go to an LLP system. I guess our question would be to try and work out a mechanism so we can participate.

MR. MILES: Glen, did you want to say something?

MR. BOOTH: I'm hesitating because it's from the regulator point of view. Of course, we're not investors so I haven't personally run into any issues. But where I see issues arising, there's an example of a case before us now where there's a power plant planned on the U.S. side of the border, and because of the configuration it's simplest to run a power line across into Canada, hook into the Canadian grid. It's clearly what makes commercial sense, but we're charged with approving the interdesign and there's an enormous local opposition to interdesign on the Canadian side. It's just one of these issues where the state commission that looked at it from the U.S. perspective, I could see why they'd say it looks like it's in our interest. There's minimal environmental impacts. But from the Canadian

side it doesn't appear there's a lot of benefits, and if you just look at it from the Canadian public interest, which is what we're charged to do, you can be challenged to say, why would we want to be approving this purely from the Canadian perspective. But if you look at it in a continental perspective, you might look at it differently. So I see some areas where there's challenges. I don't know that there's any clear issues, because we both have to respect each other's respective jurisdictions.

On the commercial side I think normally everything goes fairly smoothly from what I can see. But it's where you got sort of the -- thing and then environmental concerns arising and they impact differentially across the border, it becomes pretty difficult to deal with. In terms of solution I think all we need for the short term again, is we should talk to one another about these things. We meet with your staff twice a year and I think that's a start.

CHAIRMAN WOOD: Mark, I have a question for you. At the end you mentioned something akin to negotiated rates on transmission. Talk to me about that. Is the IMO supportive of that?

MR. GRAHAM: It would probably be out of place for me to say. They certainly are supportive I

think of a regime which allows for commercial sale of rights to support merchant transmission. When it comes to negotiated rates I think there are concerns on the IMO right up to the Board level with respect to non-discriminatory issues and there needs to be some dialogue there that hasn't occurred yet. Certainly we're getting signals from customers that that would be beneficial to them in terms of finding a way to support the infrastructure. And my personal opinion at least is that to the extent those negotiations are between unaffiliated entities there should be way to get through that.

MR. MILES: Any other comments from the panelists, or questions of each other. If not, I'll turn it to the audience. Anybody in the audience that have any questions of this panel? We have a few minutes left.

If not, we'll go ahead and thank the panel very much for their presentations.

(Applause.)

MR. MILES: We're not going to take a break. If I could have the next panel members please step up. We'd like to start our next panel. Let's start the panel that's been characterized as Power - a New Generation. And what we'd like to achieve is a

roundtable discussion of infrastructure limitations in the Midwest and the delivery and production of natural gas, electricity and renewable energy, for example, barriers to siting, construction and investment. We have four speakers who are very knowledgeable in those areas. Our first speaker will be Jim Cleary who is the president of ANR Pipeline Company.

MR. CLEARY: At ANR I think we bring a good message about gas infrastructure. The fact is, is that we are serving significant new gas fired generation in the Midwest today. We currently have about 11,000 megawatts of gas fired generation connected to our system. This has quadrupled in the last five years. This represented peak usage on our system last summer of about 1.1bcf a day and we plan to serve more in the future. My guess is that we'll probably have about 15,000 megawatts total connected to our system by 2005 or 2006.

Now, ANR's ability to successfully grow its infrastructure to serve these new loads, we really require a regulatory environment that supports three things. First, investment, to put the money into our system for laterals or major expansions, tens, 20, 30, 40, $50 million a pop. We seek long term contracts with solid investment grade companies. What we need from the

regulatory community is a sense of regulatory stability and predictability. In essence, to enable us and our customers to enter into long term contracts with a high degree of confidence that they will remain in place for the term of the contract.

And things like reconsideration of policies, such as negotiated rates, which calls into jeopardy not only deals we would like to do but deals that we've already done is troublesome to us. At the state level we seek and ask for a regulatory oversight that permits LDC's and electric utilities to enter into long term contracts as part of their portfolio, particularly when necessary to support capital investment. So that's item number one.

Item number two is prompt and efficient authorization review and permitting of pipelines. Most of my experiences at the federal level, and I guess the message for us to the federal regulators is really to keep up the good work. We found, at least in our projects, the staff has been very responsive and the Commission has been very, very responsive to the preliminary determination deadline that we request for total certification deadlines that we request. We would urge the Commission to continue its work at the federal level and on the state level of streamlining wherever

possible the regulatory process, consistent of course with NEPA mandates and NGA mandates and other statutes that apply.

One very good example of this is the recently signed inter-agency MOU, executed by FERC and nine other federal agencies and departments that basically sets a protocol for dealing with NEPA review of pipeline projects, and it has things like early consultation among the agencies, sharing of information, sharing of data. A big thing is simultaneous permitting. So if you have multiple agencies that have to sign off, it's done concurrently rather than one after another. We think that's very possible.

At the state level we certainly appreciate state commissions intervening in our cases in support of infrastructure investments, like we've seen from the Wisconsin Commission in a recent proceeding. We're big supporters at the federal level of the landowner notification procedures. Indeed we at El Paso Pipelines go far beyond what is required. It's our firm belief that the more work we can do with landowners and other stakeholders up front the more timely the project will be and the better the project will be.

The third item we ask and pitch to you as regulators is to keep a balanced approach to service

issues. ANR is very, very confident that we can serve the needs of our existing customers, our traditional customers, if you will, and new generators. We're doing it today. Generation loads, to be sure, may vary significantly, particularly the combustion turbines. They may ramp up and ramp down, but I guess my message is that we find them to be very manageable, particularly with a system like ours with lots of pipe and lots of market area and storage. We've been very successful in working out these issues along the way with our customers. The key has been communication, not only with the new customer, but with the existing customers to make sure everyone understands what will be the effect of these new loads and when we design expansions we take into account the needs of our existing customers not just the new customer.

We ask this, that you continue to let us work out these matters with our customers. We don't think we need a regulatory mandate or a generic rule to do this. With these three things we'll be ready to continue to support infrastructure for the Midwest. Thank you.

MR. MILES: Thank you, Jim. Our next speaker is Jacob Williams who is vice president for Generation Development, Peabody Energy.

MR. WILLIAMS: Thank you. I appreciate the opportunity to be here. For those of you who don't know, Peabody Energy is the world's largest coal company. And its impact on the U.S. electric market is nine percent of all the electricity in the United States is derived from Peabody Coal. So we have a significant role in this stake.

Coal represents 50 percent of all the electricity generated in the United States, and it is the reason we have affordable electricity in the United States, pure and simple. We have a map to point out the role of coal. If you can see that, the green areas -- and there's actually three shades of green there -- the green areas represent the low cost states of the U.S. with the exception of the Pacific Northwest which is, of course, hydro based. But if you look at all the green areas throughout the middle part of the country, you'll see one striking phenomenon and that is that they all have a large percentage of their generation from coal based generation.

You'll see the lowest cost states, and the top number is the average cost for kilowatt hour for the state and the number below is what percentage their generation is coal based generation. You'll notice that if you did the math, states that have less than 33

percent of their electricity from coal based generation pay 57 percent more for their electricity than states that have 66 percent or more of their electricity from coal.

Coal is the reason we have low cost electricity. Five of the lowest seven cost states all have 94 percent of their electricity or more from coal based generation, including Midwest states of Kentucky, Indiana and West Virginia. Now, if you focus on the middle U.S. for a moment on that map, there are two colors of green there. There's the darker green which represents the Kentucky, Missouri, Illinois, etcetera area, and then there's the southeast area. Notice that the middle U.S. or that Kentucky, Illinois area in green is the lowest cost area of the Eastern U.S. Its electric rate for the customers in that area are ten percent below that of the Southeast and the Northeast customers pay 61 percent more for their electricity than do the middle U.S.

It's important to note that coal represents 76 percent of the generation in that area, compared to much lesser percents in the other regions. Why is that important? When planning future transmission systems you have to start with where the low cost resource is because a transmission system will tend to want to move

low cost resources to the customer. In the existing system the asset is already on the ground. The low cost assets are in the middle part of the country. And that's where the excess is in this country, is in that middle part. It is not in the southeast and the northeast, and you want to move the cheaper power south and to the northeast.

Peabody is working on two projects in that area which are mine -- when you think about that and look to the forward, think about the wires and the infrastructure needed, here's an example. We need to overcome some of the transmission barriers. This is a section of the middle part of the country. In the upper left is the state of Illinois. Prairie State is where that is in Southern Illinois; Thoroughbred is our other project in Western Kentucky. This map goes all the way over to the Carolina coast. The lines represent the high voltage grid of the U.S. The red circles represent where all the coal plants are, and there's an interesting thing about that. All the circles are essentially above the solid black line.

If you look at the solid black line, that traces an 800 mile path where there are only four high voltage interconnections north-south, across an entire 800 mile stretch of the country. Essentially the middle

U.S. is separated electrically from the Southern U.S. All the low cost resources are north of that line and to the south is where the growth is. So not only now, but in the future the low cost resources will want to move south. If you think about that, we talk about constraints in the middle part of the country that are well known. I came from the state of Wisconsin, there are five high voltage transmission lines in the state of Wisconsin and it's considered constrained. There are only four high voltage lines over an 800 miles stretch of this country. That is even more constrained.

You think about Michigan and Florida, two well known constrained areas. They have more high voltage transmission lines than does this section of the country. It's truly a bottleneck that has to be dealt with. You have similar constraints into the northeast and out of the North Dakota area, and Jim will probably talk about that.

Even though there's excess coal in this region, without the wires it cannot benefit the load that's out there. If you think about, if you look at the pricing in the off peak market which is a real key indicator of fuel price competition, you'll see the northeast prices are about $30 a megawatt hour, the Florida prices are in the mid-20's, the southeast is in

the high teens, and this middle part of the country is in the low teens. Fundamental reason, the low cost resource sits in the middle of all that and it can't get to the loads and benefit customers. After all, that's what we should all be in the business, to provide customers with low cost power.

Even in Illinois, and on that map it shows you a couple solid black lines in Illinois. If you look at the two black lines there, between that is where all the coal in Illinois sits, in between those two black lines, and yet there's only one high voltage line to the north out of there and one to the south. So a state that has the second most abundant coal resource in the nation, there's very little access to get a plant that could be sited there and move the power out. And the economics are clear, -- generation is far superior to putting the coal on rail and moving it around, even when you include the transmission cost.

The other thing to think about is that a lot of these projects we're working on are actually going to end up solving some of the national interest bottlenecks. Our Thoroughbred project, we're going to spend about $200 million in network upgrades in that area. Essentially we'll build two-thirds of the high voltage interconnect between ADP and TVA. We'll create a

fifth high voltage path in that 800 mile stretch. It will be a 3,000 megawatts pipe that will be part of an interconnection to our network upgrade on the interconnection. We'll have two-thirds of that done with our project. You would think that there would be parties who would want to finish that off and resolve that issue and it's slow coming to get parties to want to resolve that, in an area that's clearly going to be a problem going forward.

With that, I think I'll stop for now and come back to solutions later.

MR. MILES: Thank you. Carol Holmes is our next speaker. He's a representative from the state of Kansas. I understand, Carl, you've been in charge of their Utility Committee for the last 11 years.

MR. HOLMES: Thank you. It's a pleasure to be here this afternoon. I'd like to point out that I've left the outlines of some of the comments I'm going to make, outside where you picked up some of the other materials. If we could have the first map.

On that map you'll see the left hand side of it is the darker blue. That's Class 4 wind, and the best wind is what's yellow on that map. You'll note that where a wind resource is we don't have adequate transmission. We have one wind farm now down in the left

hand corner where it says Dodge City, it's 110 megawatt wind farm. The gas generation that's around that, that it feeds into is 300 megawatts. When we have a front that comes through, a ramp up rate on that wind farm is ten to 12 megawatts per minute. You cannot vary the gas generation that much to take care of that stress, so we get a lot of load problems with that.

In the eastern part, right east of Wichita, they're running north and south, you'll see some narrow yellow strips in there. That's where they're wanting to put the wind farm because the red lines are 345kva. They're getting into some problems there because of the flint hills and people feel like that will disturb the flint hills. They want it built in Western Kansas; there's no transmission.

I might note while we have that map up there, in the southwest corner, the line coming from Oklahoma up to kind of a cross there and then going west out to Colorado, that line is 345 was ordered by FERC. The state of Kansas went through the siting procedure on that 153 miles. From the day they received the application, they approved it in 80 days. I've heard problems in other states but in Kansas we are expedient with processing applications. I want to compliment the Commission. We have one of the Commissioners here now;

we had a couple others, but it's through their hard work that we can do things like that and it takes cooperation among the entities.

The question deals with new generation, both traditional and renewables, come on line if there's significant transmission in place. Every electric utility in Kansas emphatically states that there's inadequate transmission capacity to meet today's dispatch needs, let alone tomorrow's. It's almost impossible to add new generation to the western part of Kansas because of the high voltage disconnect between the eastern and western parts of the state. I think that you'll find this, most wind resources are in the Dakota's, Nebraska, Kansas, Oklahoma. That's not where the load is. The load is in the Chicago-Detroit area, so the problems we have in Kansas of where the wind is at and where the load is, can be expanded to the point that the high plains states where the wind and the load is to the east of there.

Without new transmission lines, construction, expansion of all systems sales by existing utilities are not possible. And without new transmission, real economic development is stymied in our part of the state. I'm sure most of you know the situation the farm economy is in with the drought right

now.

Again, trying to respond to these questions, KCC cooperated with my request and Corporation Commissioners, Corporation Commission staff, a couple legislators and all the utilities sat down around the table talking about these transmission issues. One of the issues they discussed was slow decision making process within the SPP MISO to obtain transmission pass. In a folder that I made available to the Commission staff and to the Commissioners, and they may make copies for you, goes into a lot more detail of some of these things that I'm talking about.

Another is uncertainty regarding recovery of investment and new transmission. A need for expedited process to verify need, determined most responsible course of action and authorized rate recovery from appropriate parties on necessary investment. Another concern is incorrect estimated wind generation probability in Kansas, in MISO's projections. We go back out to where that cross is on the southwest corner of the state, right now there's applications for over 300 megawatts of new wind generation. Unfortunately they want to put that on a 115kva line that's not going to work. There's other farms being proposed in the Dodge City area, and the point is that the projections

that I'm aware of right now with MISO and what is in the works, if they get transmission capacity which you're not going to get, the projects would be exceedingly more than what's going to be a capable supply.

Another concern is inability to obtain financing by companies due to uncertainty in cost recovery. When a company goes in to build transmission, they've got to have a cost recovery in order to meet the financial requirements and a timing. A wind generation project, you go in quickly. A major transmission takes a long time. For example, the Great County Wind project out by Dodge City of 110 megawatts, from the time they made a decision to build that 110 megawatts in southwest Kansas, six months later the wind generation is in operation. We have absolutely no siting requirements or anything in Kansas for renewable energy. If they want to build, they can come in. It doesn't have to go through KCC approval or anything.

Factors that promote and hinder diversified energy sources, again a lack of high voltage transmission capacity to link the Midwest load centers. A lot of this stuff that you can go through. I want to point out that in Kansas, in the last four years we've taken a lot of steps to try to promote and make it easier for utility companies to build generation and try

to get transmission into place.

Rather than go through this, like I say, it's available outside. I want to just make some closing comments. Down in my part of the country in southwest Kansas we had the -- gas field that was developed in the 1920's. In the 1940's pipelines were built from southwest Kansas to the Chicago-Detroit area to supply the war effort, and after that additional pipelines went in, in the late 40's and early 50's. Again, all of them to supply gas to the upper Midwest. We have the same challenge before us today, and that is that the wind is located in the high plains states, the good wind. That's not where the load is. If we're going to develop this resource, it's going to take a commitment by states and by the federal government in order to put the transmission lines in to move the electricity, the same decisions that were made in the 1940's and 50's, to move the natural gas.

With that, I'd just as soon leave the rest of it for later discussion.

MR. MILES: Thank you, Representative Holmes. Our next speaker is Jim Torgerson. He's the president for the Midwest Independent System Operators.

MR. TORGERSON: Thanks. It's a pleasure to be here. Some of the questions that were asked were,

with new generating plants coming on, is there sufficient transmission capacity in place? Well, our belief is no.

In general, relative to the needs, limited transmission has been built for decades. Transmission, I'll define that as 230kv and above. The investment has declined actually at a rate of almost 120 million a year for the past 25 years. This information was provided to EEI in a study that was done about a little over a year ago.

Currently our queue has 144 active interconnection requests and this does not include the Great America companies that total 48,000 megawatts. We're seeing several congested areas where new requests will not be accommodated without significant new transmission. Constraints exist for delivery of both renewable and non-renewable resources, particularly for new developments located in remote or congested areas.

This shows -- and you have the red dots or cross-hatches which show the 19 most congested flow gates based on the number of TLR's that have been called over the last year. You also see where the transmission owners -- this is from their plans -- through 2007. So over the next five years, they're planning on spending about $750 million in local plans. And we believe that

will help reduce some of the TLR events, and you'll see some increase AFC and provide access to new generation a little bit.

Most of the spending, and I think Jeff put the slide up much earlier, that showed that most of this spending was going to be on 345kv and much of it on 230 and 138. So it's not really the EHV they're probably looking for. Stakeholders have told us, if transmission were in place, we would see developments of new coal and wind that tends to be located more remotely from load centers and this would increase fuel diversity. The American Wind Energy Association, they have plans for wind development in the Midwest that includes projections of as much as 10,000 megawatts that could be available to markets in the Midwest.

The highest transmission voltage in the Midwest is generally 345kv, in most areas of MAAP, SPP and Maine. Unlike PJM, Eastern Econ in the south where you have 500kv and 765kv, the transfer capability comparisons at 500kv or higher versus 345 are significant. The 500kv is less than half the cost of 345 on a per megawatt mile of capacity. We believe the wires allow the country to arbitrage between the lowest fuel costs, including wind.

Now, we have the next slide. These are

things the Midwest ISO planning group is exploring with our stakeholders on some long term regional expansion concepts. Keep in mind, these are concepts at this point. We don't know if they're economically even justified. This came from the vision, a MAAP vision that was done in some other conceptual studies. It looks at a 500kv system that would run from Manitoba down into Oklahoma and then loop through Minnesota, Wisconsin, Iowa and Illinois. Also some build out of 765kv in Michigan, Ohio, Illinois and Indiana, and down into Missouri. We think this would help further reduce TLR events, increase the AFC and provide access to new generation which could ultimately then link the markets together. Again, I just want to emphasize this is something that's going to be explored and it's not anything we've determined yet, but we will be looking at with our long term planning.

What are the impediments to securing sufficient regional transmission capacity? One is the cost recovery policy; who pays? Do you socialize it versus looking at the cost causation, participant funding may be appropriate where participants could be generation developers, driving an upgrade or it could be loads that derive a benefit, net benefit from the transmission that enables the new generation supply. I

think RTO's or ITP's can help define the beneficiaries of individual projects. Roll in loads that benefit or assignment of developers that benefit or a combination could be equally appropriate.

The sequential queue process is another problem that can result in a huge financial barrier to entry to the next in line. There's no sharing of cost either among end users or among developers. It's not consistent with an expansion plan. Our expansion plan should consider all seriously planned uses of the system. It develops an efficient plan to accommodate the combination or the combined uses and then it allocates the cost among the beneficiaries. The present queue largely reflects quick to market resources with fuel supplies near load centers which need a minimum of transmission upgrades. This is a prescription for gas. That's okay in meeting near term supply adequacy. But it's not going to necessarily produce reduced costs and price stability that diversified supplies would.

I think wind supplies are location dependent and tend to more remote from the load centers. Coal developers, they're telling us that the -- plants -- and Jacob mentioned this today -- delivered by wire will produce the lowest cost coal derived energy and transmission is the key to accessing these potential

benefits.

So what do we need to help things? First off, we believe we need to overhaul the queue process. We're considering an aggregate study process for generation of interconnections in the near future, and we're going to be talking to our stakeholders and to the Commission about this. As the planning process matures, the aggregate interconnection study process could evolve to an aggregate need expansion planning process, where all demands on the grid capacity are analyzed in a single expansion planning process by an independent entity. Such a process applied over a large regional market, as it should be, will necessarily need to depend on the ongoing local areas planning of it by the transmission owners, including the merging ITC's in meeting local needs. Local area plans are the starting point for the regional planning process.

Permitting issues could be streamlined by endorsement by a multi-state entity of these regionally developed plans where a vehicle to insure speedy local permitting processes. I think the Midwest ISO can also facilitate the development of resources within the MISO that could contribute to meeting external needs. For example, the coal industry in Illinois and Kentucky could provide for meeting some of the load serving needs

of southern states. State support for this type of development could provide net benefits to the economies of the Midwest that provide energy resources to others. I think MISO can facilitate this type of development fast by working with the developers of the resources within MISO, to identify transmission needs, developing close coordination practices with adjacent system operators, and finally, by working with the states within the MISO on the most beneficial and equitable cost sharing of associated facilities.

With that, I'll stop and wait for a question.

MR. MILES: Okay. Thank you, Jim. Normally it's the moderator that hands it off to the panelists, but Jake, you sort of left us hanging by saying that you want to talk about some solutions. I think, Carl, you also left us hanging. Jacob, why don't we start with you and what are your solutions? You heard what Jim had to say.

MR. WILLIAMS: Sure, a few solutions to the problems. First of all, we need to view transmission in a different light. I've heard it for the last five years, and I came out of the electric industry, that transmission and generation are interchangeable, that's not true. Generation is something at a point --

transmission can be viewed as an enabler of the market, as Dale Langren said last week. Or another way, it's a great insurance policy. It's an insurance policy against weather patterns, fuel price spikes, market abuse, regulatory and environmental changes. I remember when the nuclear units in the upper Midwest were down back in '96, '97. What limited transmission we had was the only saving grace we had to serving load. No one would have planned it that way, but a little excess transmission came in real helpful, otherwise the lights were out in Wisconsin. And I ran the control center then.

Transmission also deals with catastrophic events. We just can't plan transmission generation; they're not synonymous at all. We need to view them as an insurance policy, and start our policy thinking that way. If you think about, we were under-insured, woefully under-insured right now over the last 20 years, and if we don't do something about it immediately, we're going to reap the benefits, or in this case, the detriment, the next time gas prices are a million btu. There will be no alternative for many parts of the country. They'll just have to run the gas units and pay whatever it costs. That will hurt both industry, and it will hurt the low income families all in the same --

that's issue number one and how you view transmission.

Second of all, as was talked about earlier today, planning is important. I'm not talking about the full blown integrated resource plans. I did them in Wisconsin, and heaven forbid, don't want to go back and do that. But there is some planning of the system that needs to be done because we can't wait until LLP's identify problems and then take seven to ten years to solve them. We have to see those problems ahead of time and deal with those problems right now. There is a role for planning and we need to take advantage of it.

Third of all, and Errol David mentioned it today, we need to remove dis-incentives for building transmission. There are many dis-incentives out there. Some of them are conflicts of interest that are out there. Some of them are just the regulatory regime and differences in state and federal regulations. We need to remove the dis-incentives and then we need to find some incentives to actually get some build, because at the end of the day, it's for the best of the customer that we get some transmission built and right now it's tough to find out who's actually doing things for the customers' interest, who's sitting in the discussion.

And finally, we need to have a bias, knowing we're starting at a deficit of transmission. We need to

have a bias to try to build more. I don't think we'll get there, but we need to have a bias to try to build some and go to the high side. We'll never get there, but the bias can't be, well, let's just do little bits. We've got to have some aggressive plans. Inevitably, as the regulators you go through, that's not going to happen. Public process will not allow it. But the bias needs to be actually towards action as opposed to waiting for something else to happen.

One other point I wanted to raise and left it out, if you looked at the map that showed -- and Jim pointed it out -- the southeast has the need for this. It's kind of interesting in the policy issues that came up that some of the southeast states were concerned about having to build transmission to move gas based power out. I think the fundamentals of the market would actually say quite the reverse is going to happen. If some of those wires get built, it's going to be the low cost coal that comes down and helps reduce prices in the southeast. At least fundamentally, that's what the analysis should say. The middle U.S. has quite a bit more excess -- capacity. The southeast will run out of it in the next five or so years. So it's really important that we start working on the Midwest to Southeast barrier as soon as we can.

MR. MILES: Representative Holmes, you sort of left us dangling. I'd like to know what your secret was to getting it done in 80 days. Was there one reason?

MR. HOLMES: I'll go back to my notes here. As a legislator working in concert with the Kansas Corporation Commission of Kansas Utilities, we need to promote innovative statutes to administrate decisions to provide incentives for transmission line development and for development of wind resources. Again, we've done a lot in Kansas. You need to take a look at it. We've done away with the siting process for generation, except for nuclear. We've done away with the siting process for -- of the power lines. Some still have to go through it, but we've cut that red tape. New high voltage transmission lines must be constructed to open up the Midwest renewable markets. Regulatory rate of return and operating rule, uncertainty must be eliminated. One of the things is that uncertainty must be done away with in order for the financial markets to come forward with the finances to build the new ones.

Another thing we have to do is the state and political leaders and public utility commissioners must work for the benefit of solutions for siting increased transmission capacity, to recognize the benefits of

everyone doing this together, -- the growing cost of doing nothing. These are not easy solutions. We're still partnerships. We've got to work both between the state and the federal government, likewise, we need to work within our ISO's, MISO. We need to work as states adjacent to each other. Each state cannot be independent, but we're going to have to remember the most transmission was built for native load. Most of our generators in Kansas, between 85 and 90 percent of the electricity generated stays within our system. Only ten to 12 percent moves out. The system was not designed for that. We've got to take a whole new look at it and develop ways that we can move electricity from one area to another.

MR. MILES: Okay. Thank you. Jim, you heard what Jacob had to say as far as his solutions. You had given us your thoughts on what you thought were good solutions. Any comments, any thoughts on what Jacob had to say?

MR. TORGERSON: I think they're fairly consistent. If we're going to get new generation to market, you're going to have to build more transmission. It's just simply not there today. When we look at the constraints throughout the system in the Midwest, that transmission system can't support new generation in

certain areas. I tend to agree with him.

MR. MILES: Any questions?

MR. HOLMES: Well, we all talk about the need for new transmission, but somehow it doesn't get built. As a federal regulator, when I go back to the office tomorrow, what should I do? I'm looking for suggestions. Give me the three top things I can do to get transmission built.

MR. TORGERSON: There's a couple things that come right off the top. One is to make sure the planning happens in the ISO's or RTO's, and identify where the transmission should be. The things we're exploring, I'm not sure those are the ultimate answers but they are projects that could go forward. If those get through the planning process and determine that those are going to be the ones to do, then we need to push them. We need to get people to build it. So there's three things you're going to need to focus on. One is the planning and making sure the economics work for it. Then you're going to have to provide -- I don't know that incentives are the right word, because I think the rate of return that we have in the Midwest ISO I think is probably a pretty decent rate of return for projects.

But then we've got to make certain that

siting happens. And we're going to have to coordinate with all the states to get it done. I think that's a good proposal. We got to drive that forward so that there is a regional solution to resolving the siting issue.

MR. WILLIAMS: I would tend to agree with Jim. The planning has got to be done. And the planning has got to be done in a way that, for you as regulators, you can go to your communities, to your state and say, this is the economic benefit over a large region. That kind of analysis, to show that if I build these wires, prices actually go down. That's a useful exercise that's got to be done.

Second of all, how you pay for it. Clearly many of these what I'll call national interest bottlenecks, they've got to be paid for on a regional basis. So to the extent we can resolve the participant funding debate, but it's got to be spread over those who benefit and in some of these it's very large areas that benefit, useful forums or the RTO pricing. If we could get at driven home.

I agree with Jim that the incentives are there within the ISO. And then finally the siting is important. But I think those are the three things that got to get done and it starts with telling the story so

that everyone can buy into why these lines need to be built.

MR. HOLMES: Planning has to be a part of it. Cost recovery, one of the things that companies keep repeating is changing the rules. Make the investment, four, five years from now rules change and it hinders them in recovering the investment in outer years, the cash flow. Another thing is cutting the red tape. Making application for transmission, 16, 18 months it's still pending. That's way too long because everything else is on hold until those requests are made. I think the other states probably need to look at what we've done in Kansas in regards to transmission siting. We've opened up where any company can come in and upgrade their existing facilities without even going to the KCC and going through siting. They can just go in and do it. Again, I emphasize 80 days for 153 miles, 345kva line. The other states need to pick up the tempo, instead of going ten to 12 years, like I've heard in some states, whatever they need to do, that needs to be done. But I think it needs to be done at the state level. I'm not really in favor of the federal government taking over siting.

I'll stop there.

MR. MILES: Questions from the audience?

MR. RANDAZZO: If I might, my name is Sam Randazzo. I work with customers in the midwest and in the PJM Region. And CERA, Cambridge Energy Research Associates, recently issued a discussion paper that talked about the financial turmoil in the electric industry and characterized the problems being due to companies that were over leveraged, companies that bet on high growth allusions. And Mark had not perceived accurately market trends.

And in the context of discussions about incentives and how we need to get transmission built, I would like to suggest that we do have a glowing example in the midwest that some of us know as ATC. It has not asked for incentives. It has pursued a business model that looks as transmission as a core business. It is not dependent on vertically integrated enterprise in order to address the conflicts that exist within that structure.

And I would like the panel to comment on whether or not, to this point, we're counting on the wrong business model to get the job done and whether the experience of ATC might ride some useful information on how we need to proceed. Thank you.

MR. TORGERSON: I think the business model that's advocated, that's actually being employed right

now by ATC is a very solid one. And they're in the midwest ISO. We have four other transmission only entities that are being formed in the various stages. I think that those that have the transmission only viewpoint, that is their only business. And they are the ones that are encouraging development. And I think Sam's right that the ATC has not sought additional incentives for building transmission.

They're doing it on, you know, with the greater return they can get. They're doing it by borrowing money and they're finding very successfully that Wall Street isn't advancing them the funds they need. I think, in my opinion as a former CFO, I've found that if you have a solid project you can take to Wall Street, show that it's, will get a return, will get its money recovered and is, particularly in this case where there is strong regulation. I mean, and the regulation it's not being generation which is being deregulated.

We're talking transmission which is regulated and will be into the future. Then Wall Street will look very favorably on those type of projects. So, I think those that are transmission only entities do have the incentive to invest in these projects and get a reasonable rate of return. I mean, you've got, I look

at TransEelect, who's buying assets and transmissions, that is their only business. ITC that's their only business. Great America is going to be, that will be their only business, as will TransLink. So, we have five in the midwest that are going to be pursuing that model and I think it's a very attractive one.

MR. WILLIAMS: I tend to agree with Jim. I think it is a very healthy model and it's one that can allow things to get built especially when the state, federal issues in terms of making sure that those assets then get a recovery mechanism that it's in place. And many of those projects, and I'm familiar with the Wisconsin one, you know, we're trying to do the project -- and it's for, as much for affordable energy as anything and it's nice to see projects being justified on more than reliability. You know, we need to be concerned about being reliably affordable as well. And that affordability is always there.

So, I think that's a great model and it'll keep some of the independence that's needed.

REPRESENTATIVE HOLMES: Excuse me, Kansas is kind of behind the curve on this. And we are going to be looking at legislation for the next session dealing with independent transmission companies. We don't have that in place today but the problem is anything we pass

in Kansas, the Kansas Pacific gets, it's not broad based. But we are going to look at it in Kansas to allow independent transmission companies to form, specifically to build new transmission in Kansas, take care of some of the bottlenecks.

MR. CLEARY: I would just add as a gas transmission company by analogy, we are very incentivized to continue to reinvest in our business and grow it.

MS. WARD: Hi, Alicia Ward with the Midwest Energy Efficiency Alliance. Just a comment to what it is that federal regulators and state regulators can do and then a question for the committee here.

I think it's really important, as Representative Holmes pointed out, for us to start developing partnerships across service territories and across state lines to promote a variety of things including a good pool of resources for generation, a good balance portfolio of transmission options that help to get that energy to the right places as well as a really good portfolio of demand side management, market transformation and energy efficiency programs. And I think it will require the cooperation of commissions, of utility companies, of state energy offices and of departments of natural resources thinking about these

issues from a regional perspective and through all three of those paradigms of generation transmission and end use customer conservation and efficiency programs.

And I don't want to lose track of Rick Mattoon's plea this morning to increase amounts of energy efficiency as a reasonable strategy to kind of control for these generation short falls and for these transmission bottlenecks that are existing out there. And the midwest, however, despite the fact that energy efficiency remains the first most cost effective strategy for preventing additional generation capacity and for mitigating the problems associated with those transmission congestions in the midwest, it's still only slightly more than two dollars per person annually that's invested in energy efficiency programs in the midwest. Whereas in the northwest, it's about $11 per person and $12 per person in investments.

And I know that Nicerta and the Northeast Energy Efficiency Partnerships and even some of the California folks have been on record that the difference between lights on and lights off in those areas of the country has been those ten years, 11 and 12 years of investments in energy efficiency.

So, while this discussion I think is very valuable for long term transmission questions, I'm

curious about the panels response to balance portfolios of end use as well as balance portfolios for generation for renewable energies and other options. Could you comment?

MR. MILES: Who would like to go first?

MR. TORGERSON: Let me give a quick comment. In the, our planning process, when we look at alternatives, we look at is transmission, we look at transmission. We look at the generation and we look at the demand side response and try to find the economical alternatives there. We are just starting our planning process and it's just begun in the last, well, since we've been operational in February. Our first plan will be to the Board in April. And we have incorporated demand side response into that, so we're including it.

REPRESENTATIVE HOLMES: Politically, we tried some energy efficiency legislation in Kansas last year and we were unsuccessful. That's the way politics goes. You try it again next year if you're not successful this year. We did get established this summer through executive order an energy coordinating council in Kansas. And that group will be looking all the way from production of energy clear to energy efficiency and everything in between in trying to deal with that. And they're required to make a report back

to the legislature on the opening day of January next, 2003, another two months.

The one problem we have with renewables is that they're not dispatchable, of course. But anytime, the wind we have in Kansas is by far cheaper than what the natural generation is when you take into consideration the federal credits that come back for renewables. But we can coordinate to a certain degree the wind with gas generation to make it so it's not exactly dispatchable but a replaceable so when the wind's not there you can call up the gas to balance it.

Also, there's been one proposed project in Kansas to build a wind farm and put a combustion turbine adjacent to it to make it so it become close dispatchable, working except when you have a rapid front come through and you can't make that adjustment.

MR. WILLIAMS: We need a balanced portfolio, no doubt about that.

MR. MILES: Okay, the gentleman over here.

MR. LARSON: Yeah, my name is Mark Larson. I'm with Natural Resource Group. And I have a question for Mr. Cleary primarily. To what extent does the electric transmission constraints that we've been hearing about, how does that affect the expansion plans for natural gas pipelines? Do they have to build more

to kind of get around it? And then secondly, if the constraint problem doesn't improve appreciably in the near future, what will happen to the mix of natural gas and electric generation percentage? Will it continue to grow or what are your thoughts there?

MR. CLEARY: I think two things. One, there probably is an impact between the transmission constraints and the siding of generation. And if there were, let's say double the transmission access, you might find generation from one region moved to another. Without that we have more plants going up in certain locations. My guess is you wouldn't see some of those plants if you had unlimited transmission access.

I think our projection when I said we're at 11,000 mega watts served today. We expect to be at 15,000. That assumes no major changes in transmission policy. To the extent the transition constraints grow considerably worse, that number may go up. If they alleviated maybe the growth rate isn't quite as strong.

MS. TEZAK: Commission Massey, I have an answer to your question.

COMMISSIONER MASSEY: Oh, good.

MS. TEZAK: Earlier this year for 2001, which is the quarterly data collection on generation and transmission. And I think if there's one thing that

FERC could do to help state commissioners as well as investors understand what is really going on in the market would be to keep moving on that program and get that data out and available and train people at the state commission staff level as well as the general public to understand what are the resources out there. Otherwise, we're going to have the continuing dually my cost benefit studies says this and your cost benefit study says that. And I think that it would be helpful when we start to see the real data out there, what are the generation prices.

The consumers can be educated as to knowing that they have more alternatives out there than perhaps they realized previously that as utilities roll off their long term contracts with assets they might have owned previously, that they can see that maybe it is prudent for a low serving entity to change suppliers. That maybe it is okay to divert things, you know, in and out of rate base depending on what the situation is. And I think that that's a real opportunity for FERC, that you guys are really on the eve of and if you can help us learn how to use that data, I think that would be very helpful.

MR. MILES: Can we have your name and who --

MS. TEZAK: Oh, I'm sorry. Christine Tezak from Charles Schwab.

MR. MILES: Thank you.

MR. WEAVER: I'm Tom Weaver with IUSI and we talked a lot about the need for new transmission and there is a big need for new transmission. But one of the things we haven't talked about is the aging infrastructure that's out there right now. And there's a lot of transmission that's 50 or 60 years old, which I'm concerned about as well.

And I guess I'd like to ask the people up on the panel there if they had any thoughts on that, as to how that's going to be taken care of because we haven't done anything in that area for 20 years either.

REPRESENTATIVE HOLMES: You're absolutely right. A lot of the old transmission is 115 or 69 or 38. And that's the reason in Kansas we passed the legislation that allows a company, if they got a 69 KV line and they want to put a 345 in, they can either rebuild or tear out and go in with a 345 and never go to the KCC for siting. Yeah, they'll have to go to the KCC for cost recovery but they don't have to go the KCC for approval to do it. They just go ahead and upgrade any line they, any line where they can upgrade without going through any requirements. And that's a step we've taken

in Kansas try to encourage it.

MR. MILES: I think we have time for two more questions. The gentleman on the right and then Commissioner Hadley. Okay, sir.

MR. VANDENETTI: Good afternoon, I'm Jerry Vandenetti. I'm with Great Northern Power Development. We're attempting to develop a couple of linked base low coal and wind projects in the upper Great Plains. One of them co-funded with the State of North Dakota. And we run up against the problems of developing new generation. Now, to the extent that we got an understanding of the standard market design -- there appears to be a procedure in place to take care of TRL transmission upgrades. But I guess we would advocate or have a concern for a different class of transmission upgrades and construction to serve new product, to serve new products or new projects such as our own. And I guess my question for the panel and to some extent for the FERC Commissioners is how does one go about prioritizing which project gets billed? Is this something that it should be handled on an RTO planning basis? Is this something that should be handled by DOE via the National Interest Transmission bottleneck concept? Your comments.

MR. MILES: Who wants to go first? Jacob,

how about you?

MR. WILLIAMS: Certainly to the extent that, as a part of the regional plan, these are -- providing customer benefit. Those ought to move up the list by providing low cost electricity. You know, I don't know if the DOE shouldn't kick off a project that says we're going to build some transmission. Here are the lines that are badly needed and move to do that using federal power authorities or whatever tools are available, something to get off the dime. I don't know. Those mechanisms may be out there. And unfortunately, I'm not sure that that can be enacted. That has to go through Congress as opposed through the FERC.

COMMISSIONER WOOD: I guess the only thing I would add is I really hope that we do get moving toward the multi-state entity concept that the National Governor's Association has strongly endorsed, that we also endorsed in the NOPER. That would do this kind of planning for all these type of projects on a regional basis with the people that really ultimately have to make the decision on the siding at the table and doing the regional analysis and the trade offs and the benefit study all at the same time. I think that's an efficient and effective forum to do that.

I do think until those get set up, the DOE,

my understanding at least when the study came out this last January, that they will continue to do that process until what are, what are now the MSE concept gets up and going across the country. So, I think DOE will fill that void until we get more mature institutions in place to do that. So, you know, hopefully we can get to the institutions sooner, but I think both of those, and I'll ask the gentleman there but, they are, both of those vehicles are pretty good conduits that I would suggest you follow up.

MR. MILES: Okay. One more question. Commissioner Hadley.

COMMISSIONER HADLEY: Dave Hadley from Indiana. And you've answered part of the question. It was almost a tag along with the one that was just asked. But I put it in a different way created by Commissioner Massey's question. When we look at the map about planning and planning and planning is three of the things that were the top three that you should think about when you go back to your office. When we think of the map that you've drawn and we've heard a plan from one RTO, we've talked about the number of cues that you have, and if I misheard, about 144 that you mentioned. But within that map there are other RTO's planned, it's recently approved, virtual RTO's. And how many of those

cues in C-trans or how many cues in other regions like PJM as well as your own do you see and does that have an impact on planning if they're not all visible at the same time?

MR. TORGERSON: One of the things we said we would do with working with PJM on this scene that's been created in the midwest is to share our planning cues, which we're going to do, share the planning process in a long term basis so that we are addressing the needs on both sides of an RTO. So we have to almost have a, not almost, we need to have a joint planning process with the other RTO's. When you get real far away, I mean, like what's going on in New Jersey is of a less to concern to me. What happens in this city here is a big concern. And the planning process has to incorporate what happens in the Chicago with the rest of the midwest because anything that goes through Chicago is going to drive most of the midwest.

And so our planning with PJM, and we're working with them, we haven't sat down and other than had like a scoping process with what we will do on planning. But we haven't actually sat down and done a joint plan yet, which we have to get to. Otherwise everything we're talking about today, they could do something entirely different which could totally ruin

what we may be doing and vice versa.

So, and it's not just PJM. As you said, we have TVA, which we are, we do have a coordination agreement to work with them directly on that. It will also have to be C-trans and IMO, which we're working with. IMO, we have a lot of good flow that goes through to the Michigan peninsula that has to be, we have to work jointly with. So, it's not just doing a midwest ISO plan. It is doing a plan for a very large region and looking at all of the seams.

I agree with you Commissioner, that's what's got to happen.

MR. WILLIAMS: I agree and being on the other side of the process from my cell, they're actually taking steps to put in generators that are in the PJM little donut hole in the middle and they're asking for people to insert that in so that they get the whole State of Illinois modeled up as a reasonable thing as opposed to ignoring the fact that, you know, the State of Illinois is cut in half and Wisconsin's cut off in the back side. And that's got to happen.

The same with C-trans. They have to be at the table on some of these things because the bias of power flow is going to be to the south. And that's a fundamental fact. And if they aren't at the table,

we're never going to solve that problem.

COMMISSIONER MASSEY: I have a quick question for Jim Cleary. You made, I think, an important comment and I wanted you to expand on it. You just threw it out very quickly and you said that you felt a very strong incentive to expand your business. And I wanted to ask you, what are the elements of the incentive that you have? And in contrast to some of the transmission owners that may not have those same incentives in place right now?

MR. CLEARY: I think one of the first elements is a fair rate of return and the ability to invest and recoup that return based on long term contracts with willing market participants, preferably strong credit ratings. And that is the sort of, that is, in essence, the pipeline business. We are basically a connector between supply regions and market regions. And so the essence of our business is to transmit gas from point to point. It is a business that is, as you know, very important to El Paso, a large portion of our total enterprise and something that we feel very committed to. But it is really the prospect of earning a sustainable, reasonable return on our investment that drives us through this.

MR. MILES: Okay. Well, our time's up. Why

don't we take, we're scheduled for a 15 minute break. Let's get back at 4:20. Can we start exactly at 4:20, if possible? There are people that have air flights they'd like to catch. Thank you.

(Off the record at 4:03 p.m.)

MR. MILES: Thank you very much. Our last panel before we get to the presentation by the State Commissioners and their round table discussion, this panel is called New Technology. We've asked the panelists to discuss ways of promoting new technologies to ensure energy reliability.

And we have a very distinguished panel here today. And our first speaker will be Dr. Schainker, who is with EPRI. Dr. Schainker, please? Thank you.

DR. SCHAINKER: Thank you very much. I'm with the Electric Power Research Institute in Palwalto, California and I work in the Power Delivery and Market Sector of the company.

Just a few view graphs here just to set the stage. The first view graph indicates an interesting phenomenon. And that is that we are in a second silicon revolution that, in fact, can provide a lot of technology, among others, in terms of reducing bottlenecks and improving transmission through put.

Certainly in some of the previous speakers

today we've heard about the various congestions in the midwest. So, I really don't have to talk too much about this particular view graph. The only thing that is important, though, is that the top right plot shown here really indicates that the transmission bottlenecks have been increasing steadily not only by month with the summer months being the most congested but actually by year. You can't quite see it but, and ultimately the handouts that you'll get from this meeting; back in '97 we had very few transmission load relief events that reduced the number of successful transactions we could have. And in the year 2002 we have the highest number of transmission load events occurring. The bottom right chart indicates that within the midwest the MAIN Region, the MAIN Region is the one with the most bottlenecks.

Now from a technological viewpoint, there are a variety of technologies. Many of them are existing and available today. There are some that have to be further developed. And then there are ways to operate the system that requires new technology or even application of existing technology. What I've shown here is a whole variety of technologies and I'll just mention them briefly.

The first from the existing category is what we call Flexible AC Transmission Systems, which, in

fact, use salstate silicon devices to control the voltage and through put direction of electric power flows. It's the first type of technology we've ever had that can actually specify the transmission line, if we install it properly, over which transmission flows will occur. Usually we have to follow so called Kirkoff's Electric Laws and electricity flows basically under the least resistant path. But with FACTS technologies we can actually control which lines get various power flow levels.

Secondly, there are technologies in existing category we call Dynamic Thermo Circuit Rating Tools. Basically transmission lines are limited by their through put, ultimately by the thermo capability of the transmission line to radiate heat away from the line itself so it won't literally burn up when its under overload conditions.

And what happens is engineers rate the various transmission lines around the country based on a seasonal average usually, sometimes an annual average of what the thermo rating can be. And in many cases, transmission lines are under utilized in cold weather, so to speak, and, in fact, probably over utilized and threatened in terms of their integrity if we don't know the temperature on the lines. These tools called

Dynamic Thermo Circuit Rating allow us to better utilize those existing assets.

Another area that was briefly mentioned earlier by one of the speakers is energy storage. Energy storage cannot only off load some of the peaks on transmission lines, they have just not been implemented here in the United States but they certainly could be. But they could also greatly impact the use of renewable resources. So energy storage is something that we should consider as technologies.

In the new category, and one of the speakers will talk about it a little bit, is so called low sag composite conductors. These are new types of transmission line conductors that allow the owner and the operator of the line to actually operate a transmission line at higher temperatures than so called non-low sag conductors.

There's such technologies as high temperature super conductors you probably read about in newspapers and the Wall Street Journal. These have yet to be used for transmission high voltage applications and certainly should be. High voltage AC and DC transmission lines, these are existing technologies but in our re-regulated industry, we probably have to go back and upgrade and update some of those technologies.

Third, lastly, in this category, I call it Hierarchal Control Systems. The transmission system is very complicated and very complex and can destroy itself literally at the speed of light if we don't operate it properly. So we probably have to look at new methods to control the system, this complicated system in a hierarchal fashion. In fact, that particular technology should go all the way down to what we call digital type loads where we have, the new requirement the transmission system has on it is to serve a whole new type of customers that really demand more reliability. And there's a lot of activity going on in that area in the research arena. And some of it is already being applied.

Then we get into real time controlling networks. Today, because of the fast responding requirements of transactions, we need to monitor and do data analysis on actually how the grid works rather than how we think it should work or how we thought it would work. And the real world actually behaves much more differently than what we, even our best plans consider. So, we really have to take advantage of some of the new technologies and monitoring our system and then operating it effectively under very extreme conditions.

There are such things a self healing grid

tools that are being developed. And of course, with terrorism out there, we have to operate the grid to accommodate emergencies. So there's a lot of new things that the grid has to do.

The main intent of this view graph is to indicate that there are a lot of technologies available. They haven't really been implemented at full strength here in the United States and in Canada and they really should be. And as the famous philosopher Tonto use to say to his sidekick, there is no silver bullets left in his gun. And we really have to realize that one technology isn't going to solve all our problems.

So, what I would suggest is that we have to re-build and build our system differently than we have in the past. We have to simulate the grid, how it would perform when we implement new technologies. And then understand that we can alter those technologies during the planning and simulation stages to take full advantage of what we think the grid, how the grid would behave when we install these new technologies. We have to run the grid differently and we have to be prepared for uncertainties.

Clearly, there are a lot of unanticipated consequences that can occur in our marketplace. California, of course, is one example of that. And no

matter how best we plan, how best we simulate, we have to build enough reserve and energy storage into our system to accommodate these uncertainties because the law of unattended consequences are quite severe when it comes to electric grids. If things go wrong, and they go wrong at the speed of light and we can literally destroy our systems and our infrastructure if we don't have enough uncertainty planning done in the design of the grid.

That's all I wanted to present. Thank you.

MR. MILES: thank you.

MR. HOWE: Rick, while you turn that on I can just get started --

MR. MILES: Yes, please.

MR. HOWE: -- in the interest of time. Actually, my name's John Howe. I'm with American Super Conductor. I want to first off thank the Commission very much for the opportunity to be here. My role is going to be to talk about some applications of super conductor technology that are today, or will soon within the next few years, be available to address transmission problems in some very innovative ways.

My first view graph is simply a discussion of the --

MR. MILES: John, hold on a second.

MR. HOWE: Okay.

MR. MILES: I've got to figure out what I'm doing wrong here.

MR. HOWE: All right.

MR. MILES: I don't think I'm --

MR. HOWE: Okay. Well, I just want to basically recap what Dr. Schainker has already said and that is that power grids are subject to limitations both in terms of their thermo capabilities as well as their stability characteristics. And we are using Super Conductor Technology in different ways to address these problems.

First off, from a thermo perspective, if you put too much power down a line you can over heat it, cause it to sag. If it's an underground cable you can cause it to burn out or shut down, as we saw in some of our major cities over the past couple of years. So thermo limits are very real. And we're looking at advances in super conducting cable to address those absolute thermo limits.

But in addition, as Dr. Schainker mentioned, there are stability limits that are even more binding. The typical power line in our grid operates on an annual cycle to about 30 percent of its thermo capacity. And that's not inefficiency. That's because of utility

prudent operating practice. Any planners know that you can't operate your grid to a point where if you had a failure, the other elements of the grid couldn't pick up the slack instantaneously. Otherwise you're at risk of fast collapse and black outs. So, we actually are using Super Conductor technologies today with several utilities around the country to address this issue using a technology called Distributed Super Conducting Magnetic Energy Storage or Distributed SMES.

And why don't we jump right to the next slide, Rick? Basically, I want to put up a photograph to show you what SMES device looks like. This is from a substation in northern Wisconsin, American Transmission Company has seven of these devices on its grid at WBS and Alliance Substations. It comes in a mobile trailer and it basically, it contains a super conducting magnet that can store several mega watt seconds of power. And it also has a bank of investors that can take that power, invert it from direct current into AC and inject it into a three phase AC grid literally on a milla second basis in order to support voltage.

So, what this does is it protects against voltage drops. If you think of the grid as being a super highway, imagine if you knew that there were potholes and speed bumps down that road, you were

naturally drive more slowly. But if you were assured that the road was smooth ahead, you could go at a higher speed. That basically is what this technology allows utilities to do and depending upon the characteristics of a brig, you can get 60, 80, up to 100 mega watts of additional through put capacity over existing lines by applying these devices. That's what we have found. We have a couple of systems on the Energy Grid in southeast Texas. We've got several here in the midwest. We actually manufactured these devices, by the way, in Wisconsin.

But I think some of the characteristics of this technology goes specifically to the concerns that Ron Mazur was talking about a couple of panels ago. What are the obstacles to transmission? There's siting obstacles, there's lead time, there's cost. And the fact is this is a technology that can be sighted very rapidly. We actually get these in in a matter of, from first study to finish installation can be about six to eight months. And the actual installation is about two days. The cost is very competitive. These are about 1.2 to 2 million dollars per unit, depending on how they're outfitted.

And because they have wheels, I think the wheels on that trailer are one of the most important

feature. There's essentially no risk of stranded investment. In the event that the needs change in a given area, these devices can be wheeled away to another location.

In terms of application in the midwest, we are today in advanced discussions with several utilities in the midwest for possible deployment of distributed SMES for the summer of 2003. We're getting a very good reception for this technology in the midwest region. We have a, one of these devices in British Columbia, another in eastern Canada. And we're in discussions in central Canada for possible deployment. So, this is a technology that is really gaining attraction in the marketplace to address this issue with stability.

Now, as Ron Mazur mentioned, eventually wires need to be built and I'd like to go on to the next slide and talk for a moment about the longer term solution to constrained grids and that is a much higher capacity underground cables, super conducting cable in which a new type of wire that you see pictured in the lower left of that slide forms the conductor element.

We manufacture this wire at our, the world's first commercial scale HTSC Wire Manufacturing facility in central Massachusetts. It carries about 140 times more current than copper wire of the same dimension.

And it is used, can be used in motors, generators, as well as this very high capacity cable. I think a couple of very important points to make about the cable, you're looking at a cable design there in the upper left. It says VLI for Very Low Impedance.

One of the important insights about super conducting cable that's really received more emphasis in the recent past is that these cables, because they have such high power density, the conductor elements and the shields can be placed very closely together and the cable can have an impedance of about one sixth to one twentieth of conventional overhead lines and cables.

And what that means is that you can actually control the flow on these cables with relatively small phase angled regulators and series reactors and so forth. So, what it essentially leads to is the possibility of a controllable AC element in a grid. One of the obstacles to the use of direct current transmission is that it involves moving power from Point A to Point B and it's very difficult to tie into DC power line. Well, here's a solution that could be available within the next few years that would allow you to essentially control flows on the grid and not, and not have to go to DC.

As I think about the possible use of this

cable and power grids, I'm drawn very much to the analogy to the highway system. I learned the other night listening to an Alamo ad that there's four million miles of road in Alamo country. There's about 50,000 miles of interstate highway. Yet, the one percent of our roadways that is interstate carries 40 percent of the vehicle mileage in the United States. And because of the characteristics of this cable, they will tend to attract power flow.

Imagine inserting these cables into congested urban areas where they can literally draw the flows off of the other elements of the grid. It becomes a life extension strategy. It becomes an asset utilization strategy. So, we see this as a very strategic technology for the country that if it can be accelerated, if it can made commercially available within the next three, four, five years, it could help us to avoid the need for significant overhead transmission line expansion.

We've been at this now with cable companies and other partners for about a dozen years. And we're very close to the point of having these cables being commercially available. This program had a set back with the Detroit Edison cable demonstration, which had a failure in a conventional aspect of the installation.

But I think one of the important things that was learned in that cable demonstration was that the electrical, the wire characteristics were not degraded at all in the course of the installation into a substation in Detroit. So, we've learned some important things there despite the disappointment that the project cannot be operated today.

There are six or eight other HDS cable demonstrations that have been undertaken around the world. So this is a technology that is tantalizingly close to being real.

Rick, if I could go to my final slide. I just wanted to make really a few points in conclusion. What really are the chief challenges facing energy and environmental regulators today? There's the issue of siting, of course. And we believe that this higher capacity and lower voltage underground cable could break the siting log jam. This challenge of reliability and asset utilization, by strategically inserting these low impedance cables into existing grids, we believe we can extend the life and defer the need to replace large parts of the existing system.

Obviously, by strengthening the grid, we're going to enhance competition and provide, what I see as a structural solution to the problem of market power. I

frankly have to confess to you commissioners, I'm skeptical that we're going to be able remedy market power of uses strictly through behavioral solutions. To the extent we can put in place structural solutions with stronger infrastructure, I believe we'll have healthier competition in the long run.

And then finally, although there's a lot of focus on the efficiency aspects of super conductor cable that it will reduce loses in the transmission system, I think what's more important is that loosening up congestion on the grid, we'll be able to dispatch our generating resources more efficiently and that's going to translate into significant fuel efficiency, savings, as well as air quality improvements.

So, we really see both this cable as well as the SMEC technology as being key new tools that can help to address some of the most important challenges in today's industry phases. Thanks very much.

MR. MILES: Thank you, John. Our next speaker is Scott Castelaz. He is Vice President of Marketing and Corporate Development for Encorp. Scott?

MR. CASTELAZ: Thank you. It's a pleasure to be here today and I will try to echo my two prior panelists here and try and also reflect what we heard earlier today.

First of all, just a few words about Encorp for those of you that may not be aware of our firm, and why that would enable me to be on a panel such as this. First of all, what we do is we are a technology company that is focused on technologies for the communication, control and networking of distributed energy. And when I define distributed energy, I mean unit sizes that go from 20 mega watts on down. Some people think distributed energy isn't here yet. It's field cells and things like that. Well, it's been here forever like diesel backup generators. Well, the fact is, it's both and many other things, including renewables.

But we focus on that on a technology neutral basis and in the last five years we've been able to en masse over 600 mega watts of distributed generation that our products control throughout the world, mostly North America. Of that, approximately three fourths of it is interconnected to the grid so we understand on purpose what interconnection is all about from both technical and an institutional process and policy matter.

Our long term vision is to create virtual power plants whether it be for end use customers, whether it be for utilities. The analogy would be a local and wide area network for telecom. Why not create the equivalent of that to provide different sorts of

ancillary services as well as customer value, for example, those who need more than 99.9 percent reliability.

The mix of our business is approximately four areas: standby market emergency power, those who need lots of power and high reliability and quality of power; peaking resources, those who need to worry about keeping the lights on in times of distress on the grid, notably hot weather; merchants and IPP type facilities that are providing wholesale value particularly at the sub-transmission level. And then of course the demand response where you essentially can create pools of mega watts as opposed to mega watts to alleviate stress on the grid and low pockets, et cetera.

So, what I'd like to talk about is essentially how do you combine innovative technologies with market structure to create end value both for customers and for society as a whole. What we're talking about, and this is a prelude to a speech I will be giving next Monday to the U.S. Conferences of Mayors, their Energy Committee gets together a few times a year to make sure they have policies and plans that are consistent with where, you know, with where they should be.

What we're talking about is sufficient,

reliable and cost effective and cleaner energy supplies. So, as an earlier practitioner of distributed generation for my company, I can say that the path to the future that we're all talking about here today is paved by solving real problems. So, look for problems to solve. And one of the problems that I've tried to focus on is how do you keep the lights on? And really, what are the policy matters that address that at institutional level. And it all comes down to local, local jurisdictions, local politics, meaning states, meaning municipalities, towns, villages, cities.

There are three projects I'm going to quickly talk about that I will hope to illustrate the examples. The third one I will have a slide on. First of, two projects that our company has done in the last year and-a-half were two 50 mega watt wholesale and merchant IPP Plans but constructed with three mega watt gas engines huddled together to produce peek capacity and energy into the -- markets. Those are real time economic dispatch and we provided what we do up through the 69KV sub-transmission lines and then connecting that into the trading software for the IPP developer that is owning and operating those plants. So that's really T & D value for the investor owned utilities, which indirectly benefits all of us.

Project No. 2 would be a project that has to do more with the customer side of the meter to improve reliability, grid security and peak capacity. And that is with Fort Bragg. We em massed 15 seldom used backup generators spread throughout thousands of acres of that entire base that were just sitting there, almost not running very often. And they were not meant to work together. They were not networked. So we provided the technology to network them for real time control and monitoring of those assets.

First of all, it better work. Second of all, it better be very secure. This is where some of our defense, you know, systems come out of or various special operations, et cetera. So, really that system is essentially a quasi micro grid where you have a connection point to the local utility Carolina Power and Light. But it's essentially acting as its own system for the benefits that Fort Bragg needed in that case. So that was a retro fit project of different makes, models, types and sizes and vintages of existing assets.

The last project, which I will talk about in my slides now, is right here in Chicago where I live sometimes when I'm not traveling. That had to do with, if you go back a few years in Chicago right here, you know, the city here was dealing with a lot of issues

first of all related to peak capacity resources. And then in 1999 having to do with not capacity but delivery constraints due to the failure and meltdown of a whole cable system throughout greater Chicagoland area, particularly the Loop.

So, taking that problem and turning it into an opportunity, working with Mayor Daley's Energy and Environment staff and working with Com Ed locally, how could you take existing seldom used backup power assets, by the way make sure that they're not dirty diesel, either clean them up with dual fuel technologies and run them mostly on natural gas or simply pick natural gas assets. They're often located where you actually need the power delivered. How about in downtown Chicago?

These were assets that the City of Chicago already owned in police stations. We put our technology into those systems, working with a few other companies named there who had the equipment already there, and turn that into a networked more reliable system. Again, you better hope that the 9-1-1 calling center and the police stations work when you need them. And how about also making some money for the demand response value of those power systems? So this is real world stuff and it's happening, you know, at the grassroots and user level.

This will be a little bit hard to read but I was trying to fit it into four slides. So, what we're talking about here is a virtual power plant. And that's a quote from the Commissioner of Environment from the City of Chicago providing additional backup power in case of an outage but also alleviating pressure on Com Ed's grid particularly on hot days with high humidity. But the whole notion of expanding more virtual power plants throughout the country, not just Chicago, is what it's all about in my view.

And this isn't to say that the existing grade infrastructure is not needed. No, this is to supplement it. So, the picture there is very hard to read but I was forced to fit this on four slides. But I can provide this in larger detail later. This is a pictorial that shows the existing infrastructure of gas and electric and then telecom. And how do you network this together in the same way we do this for wide area networks of telephany every day?

Next slide please.

So, what are we talking about here in terms of who do we give this legs? Well, in my view the future infrastructure should possess a high degree of locational value, meaning ancillary services in particular recognizing that the grid is not created

equal nor customer needs for improved reliability and quality of power. Low costs via leveraging of existing resources. For example, backup power flakes to the extent that those are just sitting there doing nothing. By the way, there are 40 giga watts of backup power systems installed throughout the U.S. So, it's not small.

Quickest deployment. This goes to the notion of you don't worry about siting all that kind of stuff if it's already there. And let's worry that we can be flexible for the future and not just create technology that's going to have to be changed over and over again. And then lastly, scale-ability. It's important to recognize that eventually we're talking about an intelligent grid that's going to recognize on the directional flow of power, not just mostly one way flow of power.

So, but when I think about this, how can distributed energy be a catalyst for a new energy infrastructure? Quickly, energy independence. How can we have fuel diversity? Grid security, the notion of what is the vulnerability of one 1,000 mega watt power plant versus 1,000 one mega watt power plants. That's important.

How about good reliability in terms of

constraints and risk of black outs. I've already touched on that earlier. Environmental sustainability, particularly renewable energy. Of course, as mentioned earlier, many renewable resources are not themselves dispatchable in real time. But with hybrid plants that may combine natural gas plants and other forms of distributed energy, you can improve the dispatchability.

And then lastly, the notion of energy efficiency, particularly co-generation. To the extent that customers have thermo needs as well as electrical needs, why not combine that into systems that can also add value on the other side of the meter through demand response in particular.

And wrapping up my comments, the last slide, this one I particularly put together for the U.S. Conference of Mayors; power to the people, for the people and by the people. So, at the end of the day, all right? We're talking about the standard market design here at the federal level along with interconnection standards at the federal level that are both taking place as we speak with the process. What about new rates? What about performance based rate making? How about interconnection standards so that we don't have the equivalent of more than a hundred ways of interconnecting both technically in terms of

institutional process.

What about real time price signals? The airline industry offers you different levels of service in ways in which you can obtain price signals to match supply and demand. We need to do the equivalent of that for energy. Not necessarily so that my grandmother can figure out whether she wants to run her toaster at 9:00 a.m. versus 8:00 a.m. but something like that for at least businesses and those who really care about it at the end use level.

And relating to that, demand response programs and making sure that those are plugged into the RTO vision of FERC. And then, again, integrating the renewable energy resources into essentially an intelligent interactive grid. That is the vision that I care about. Thank you.

MR. MILES: Thank you, Scott. Our next speaker is Tracy Anderson. He is the Business Project Manager for 3M. Tracy?

MR. ANDERSON: Great, thank you very much. It's a pleasure to be here today and I would like to, before I begin, thank the FERC for the opportunity to address everyone.

At 3M we're working on development of a new type of overhead power cable. Basically, the innovation

is a change in the materials. And we believe this is a very promising approach to solving a number of the problems we talked about during the course of the afternoon on thermo bottlenecks.

What I'd like to do is spend a little time talking before I go into the technology about what's being done today out there and what are the options to address thermo strain lines. This is something that the transmission engineers are dealing with on a daily basis. So, why don't we start with the first slide?

What I'm going to do here is take a look at the options that are being pursued relative to situations where we want to make the most out of our existing right of ways. So, I'll leave out the case where we are looking at essentially new lines on new right away. And if I take a look at the transmission options that are pursued today, they fall generally into two classes. And I'm dealing again with overhead solutions here.

The solutions that have to do with no tower modification and then those that deal with tower modifications. There's quite a bit that can be done to get modesty and capacity gains, and again, that's the measure of the current, the maximum current you can put through a transmission system before you exceed either

the properties of the materials or you exceed the sag limits. But we can get, some are between ten to 40 percent with existing transmission systems by simply taking the slack out of the few critical spans, revisiting the original design assumptions, particularly with respect to wind loading or reconductoring with a slightly larger conductor or some of the conventional steel conductors. And these are things that are being done today to get the system improved and get some additional gains. Again, you can -- capacity increase of about ten to 40 percent in the best case.

The next set of options that are being pursued by transmission engineers have to generally with tower construction, tower modification on existing right of way. Here we are talking about solutions that provide significantly larger increases and capacity on the order of 50 percent to maybe 80 percent to 100 percent increase in capacity. The utilities can reductor existing lines with larger diameter conductors and rebuild or reinforce the towers. In some cases they'll even raise some structures, and that certainly is an option that's being pursued in various locations, including the midwest.

If large gains are required, utilities typically are required to tear down the existing towers

and put up significantly larger diameter conductors or even go from a signal conductor to what's called the bundle conductor. It's a fairly expensive option and certainly impacts the environment more than the first one but it is something that's being pursued.

And the third option that's available today is voltage upgrades, where you actually can, we do see utilities that are increasing the voltage in order to remove thermo bottlenecks.

The new technologies need to exist in this space. That is to say they need to have a cost performance point that makes sense for utilities. So there is competition for the ones I've listed here and there's a more extensive set that Robert covered earlier. A couple that I want to mention here, real time rating is something that I think most transmission engineers are strong components of because we really need to understand where the lines are at today. I mean, basically there's a lot of room on the system for us to optimize. And the other one I'll be talking about in a moment is the composite conductor, which essentially is a change in the materials.

The options that are here and aren't mutually exclusive, that is to say these are different tools in the tool box for the transmission engineer and

they need to have different tools. You can't have one cookie cutter approach to all solutions. And I think most lines will go through a life cycle, go through a number of these. There's a very good source of information available to everybody called the National Transmission Grid Study. It's on the U.S. Department of Energy website and I highly recommend anyone who has an interest in understanding more about the transmission options to visit that.

Next slide, please.

If you step back for a moment to first principles and you ask yourself, what is it about the transmission system that causes, why do we have thermo constraints to begin with. Well, the answer is because we have limitations due to the materials that are used in the overhead conductors. While the overhead conductors may not sag very much under every day conditions, as shown here, the transmission engineer needs to design the line for the worse case situation where the worst case is either the worse case ice loads or the worse case sag that can occur under peak electrical loads when the conductors get hot. In either case, the sag is determined by the properties of the materials in the overhead conductors.

Of course once the line is designed and

built and we have line up and operational, the spacing of the towers and the stress that the towers can handle become a future constraint that we have to deal with. And this is the situation that we're in in the U.S. today. We have a lot of lines that are in place. A number of them are aging as we brought up earlier. And we're trying to figure out how to get more power through these.

At 3M we've spent considerable amounts of time understanding how the material properties impact these various constraints and also in developing new materials that can essentially operate high temperature without sagging very much.

The next slide, please.

As a result, we have developed and created what we call composite conductor, which essentially is innovation and materials. It looks very much like ACSR in that there's two materials involved. There's a core material that's a composite that's manufactured by 3M. Each of those seven strands inside the center of that conductor are aluminum and they are reinforced with thousands of ceramic fibers, structural ceramic fibers that run the length of the wire.

Surrounding the composite core, we have a high temperature aluminum. So it's conceptually very

simple, it's innovation materials and the result is that this conductor can allow for an increase in the thermo rating of a line by somewhere between 50 to 200 percent through a simple reconductoring operation. That is, we can take down the old conductor, put this conductor in its place and get an immediate impact. And at the same time there's no additional structural loads on the towers or foundations. So it's a very simple elegant solution. This technology's a tieback to the midwest as well in that the group that's developed this is located in the midwest.

Next slide, please.

I'm often asked how this works and people usually think it's strictly due to the improved conductivity. But, in fact, it's due a number of properties that the material has. And if we look here at the relationship between the sag of a transmission line and the conductor temperature, which essentially reflects the amount of current going through the line, you'll see the blue line is an existing steel reinforce conductor that initially is installed at about 33 foot of sag. And as current is put through it it eventually heats up reaches its sag limit. That's what limits the line. That's why we can't put more power through that line. That's its limit.

If we can use new materials like the ones that 3M's developing, we can put a new conductor of the same size, same construction, same diameter in its place, initially it's going to have less sag because it has better strength and weight characteristics. And then when current passes through the conductor and it begins to get hot, it follows a different curve, as you can see from the red, and essentially can operate at a much higher temperatures and therefore allow more current to go through it without reaching that sag limit.

Next chart.

So, graphically, on the left we have an existing line. This is a very typical 954 ACSR Conductor on the 1100 foot spans. It has 1200 amps, that's its rating. You can replace that conductor with a, by just changing the materials using the same tower and get a hundred percent increase in the impassity. So, it's a very simple proposition, no increase in the tower loads.

While the conductor is not yet released as a standard project, 3M is leading a group of ten companies and organizations in its development under the sponsorship of the U.S. Department of Energy. We are working on manufacturing the various sizes as is shown

here. You can see some of the sizes that have been manufactured and deployed. There's a significant amount of laboratory testing that's going on that has confirmed the performance of this conductor. And there is fielding testing under way. We have installation of 46 KV in Hawaii. We have 115 KV in Minnesota. We have recently installed at Oakwood National Laboratory in Tennessee and then about four weeks ago we installed 230 KV line outside of Fargo, North Dakota, five spans of this conductor. There's all sorts of sensors on it that will tell us how it performs and so for the data looks very, very good. The line in Minnesota has actually been installed for two years. So this is important for us to validate the performance, have confidence, reliabilities is the most important thing to the utilities.

The second aspect is work that we've been doing with utilities and you must understand the value of proposition. And we've been looking at specific lines in their networks where this can provide value. And what we're seeing is that there are costs savings associated with this at the same time that are significant. And in the words of the utilities that we're working with, it's a compelling value proposition for them.

So, in summary, I think we have a lot of opportunity to improve the U.S. transmission system by looking to new materials and I'd like to thank you for your time.

MR. MILES: Thank you, Tracy. We have about ten minutes, 12 minutes for questions.

COMMISSIONER BROWNELL: This is the neat stuff. This is what markets are all about. Tell me, each of you, what you have experienced in terms of barriers to introducing this, to what already exists, to our markets. What we can do at the federal level and the state level to make sure that those barriers to entry are eliminated.

MR. SCHAINKER: Okay, I'll attempt to answer your question. It's a very good question. I'm Robert Schianker from EPRI. I think the leading barrier generally is cost because anytime you bring a new technology into the marketplace, it doesn't have the economy of manufacturing scale that the older technologies have, in one aspect. In another aspect there are risks that the new owner is taking on being serial number 1, so to speak, or number two, using that new technology. So, if we could provide some kind of financial incentive to first of a kind owners and people that are willing to take the risk of new technology,

that would be extremely helpful to getting these implemented more widely and quicker.

And like anything, I think we also have to understand that new technologies may not work the very first time. And it does take some patience and some extra money to do field testing and to get experience. There will, everything is not rosy. There will be failures and we learn from those failures. So, any of the planners and government people have to understand that.

COMMISSIONER BROWNELL: But you mentioned, I think, in your presentation some technologies that are being used elsewhere that seem to be proven. I think energy storage might have been one of them that we're not using. And I guess that concerns me.

MR. SCHAINKER: Good memory, thank you. Energy storage, in particular, is being used in other countries. Some not necessarily for transmission but some are. The U.S. has been very slow in that particular area especially. As an example, in the grid in this country we only have about two percent of whole generation mix, which is energy storage plants. And in Europe and in Japan, it's more like 15 to 20 percent. So, we're almost -- magnitude worse.

And this goes back to planning, cost issues,

risk issues, a lot of issues, a lot of things that we're behind on. We're not the leaders in the world any more in electricity. And we lost it. So we need to use regulatory incentives to get back even to par with some other western countries. That's my opinion.

MR. ANDERSON: I might give a little input on this as well. I think that the first point is you need to have reliability. And you have new technology and you need to have confidence, the customer needs to be confident that even though this could save them money, that it's going to reliable and they're not going to have problems. And on our program, what we've done is taken a very aggressive stance on the testing. We've done very extensive lab testing and very extensive field trials.

But by definition, some of these technologies are deployed in the critical bottlenecks. So, that's also the point where if there is a problem it's the highest risk place to deploy it. But yet that's where the need is. So, that's confidence and essentially making sure that you have a solution that's going to be reliable, I think is the first thing.

One of the things that we are driving towards at 3M is once we have the confidence, we want to have what I call good showcase installations that we can

point to and say, here's the value proposition for the customer. It saved them money. It provided whatever value was important and be able to point to that. And I think that's really needed. Utility transmission engineers tend to be a little conservative and there has to be a strong drive there and I think these technologies need to work their way in based on economics and that's how it should be.

I also want to bring up another point that there needs to be, we talked about certainty earlier. There needs to be certainly also with respect to the companies that need to invest in the technologies and manufacturing plants to make this new technology because if there is uncertainty, that creates a little bit of difficulty as well for those technology providers. So, that's another piece I would add to it.

But I think, bottom line, there needs to be a strong economic value proposition for these technologies. And there needs to essentially be confidence that they will provide. One thing I would add along with this is I don't think we want cookie cutter approaches to solving transmission problems and as a general statement, and I deal a lot with transmission organizations, they are pretty thin. And a lot of the organizations that own the lines will

subcontract out a lot of the engineering aspects. And there's essentially a depletion of people out there with the knowledge and expertise to design lines and things of that sort. So there's education that's needed to attract people to get into the field. We need people to really champion these technologies.

MR. HOWE: Commissioner Brownell, I'd like to say that one of key barriers we faced is inefficient price signals and I think what you're doing with standard market design and locational pricing is exactly in the right direction. We had an example of a transaction. We were negotiating with an eastern utility where they couldn't see the clear value proposition of installing this technology. A couple of years ago during a heat wave in that region of the country, there would have been a payback of three days for an installation of several of our -- units.

But there was no clear reason for them to make the investment because it was money out of their pockets to allow low cost power to flow from their region to an adjacent region. Once we get SMD in place then there will be a clear value proposition because of the locational pricing difference. So I think it absolutely is going in the right direction.

With regard to the HDS cable, I think really

the key thing that needs to be done is to give this technology a chance to go through its paces and if we had three or four demonstration projects over the next three or four years, I think we could bring forward the commercialization of this technology. Instead of being ten years in the future, it could be three or four years in the future.

We need to, I mean, my approach to when problems occur with new technology, the sooner you encounter the problems, the sooner you come up with the fixes. And the fact that we have not had this solution available and over the past several years we have seen in this country, we spent tens of billions of dollars on new generating investment in locations that were not adequately connected with the grid. If one tenth of one percent of that capital had been put into accelerating the commercialization of some of these technologies, I think we'd have solutions in hand that could avoid a lot of that capital meltdown that we've experienced.

MR. CASTELAZ: If I could answer in a slightly different manner. I'm going to assume that the cost and performance curve of the technologies are not an issue. I mean, they are an issue but let's assume that that's solved for a moment. So, from a standpoint of particularly what our firm does, the biggest overall

issue is really what we're dealing with here is an institutional framework that has valued mostly large central generation tied to large transmission assets with a one way flow of electrons, not really envisioning an inner connected two way flow with smaller resources out there, such, you know, distributed generation.

So, that whole policy discussion needs to flow right down into the state level PUC's. In fact, when Pat was running the Texas Commission, a little over two years, well, gees, three and-a-half years ago we all started off with, boy, the reserve margins are running low. Peak capacity constraints are existing. Lots of digital economy needs more watts per square foot. And so how can we address all those issues and to what extent is distributed power part of that solution.

So, specifically, one of the things that came out of the Texas workshops was a standard interconnection framework, meaning that you'd know who to talk to, when to talk to, how long to talk and have a whole framework for what that's going to look like both technically and from a, you know, day to day policy standpoint.

And then as John's already mentioned, real time and locational pricing. Because, again, not all electrons are created or used equally. And then lastly,

a more robust demand response programs that will value the notion of energy efficiency in creating other ways of keeping the grid flowing more efficiently.

MR. SCHAINKER: Just one other item because it was mentioned briefly there but standards for interconnection at any voltage level, also reliability standards would be very, very helpful. It's been talked about for many years which we still do not have reliability standards at the transmission level. And we need that as a regulatory mandate. There's lots of papers but nothing's really been done on that. So, what you've heard is money, money, money, the top three items and standards and to promote demonstrations for new technology.

COMMISSIONER WOOD: NERC has standards, right? Is it just that they're not in the statute?

MR. SCHAINKER: They're not in the statute. They're a nice piece of paperwork but there's no legal legislative mandate that people have to follow those standards right now.

COMMISSIONER WOOD: So, are they not being followed then?

MR. SCHAINKER: I can't; some yes, some no. But if you've got laws and there's no police force out there to make sure those laws are abided by, then it's

as if the laws aren't even important. There's nobody enforcing the reliability standards because they aren't mandated as legally relevant right now.

MR. MILES: Any other questions? If not, we'll thank our panel for their fine presentation and we'll start with the next panel. Thank you very much. And if I could have the State Commissioners who are going to appear on this panel, can you bring your name tags too, please?

(Off the record at 5:12 p.m.)

MR. MILES: Again, we're very fortunate to have a very distinguished panel. And the procedure and protocol is each will be given an opportunity to make a short statement or a long statement or raise questions to each other, to be interactive.

Why don't we start with President Wefald, please?

MS. WEFALD: Thank you very much. It's so nice to be here and to be with you. And we appreciate that opportunity.

I noticed that we started out with looking at the gas pipelines that are coming across the country and taking a look at the natural gas system and taking a look at the power plants that are being built using natural gas. And it occurred to me, as I'm assured has

occurred to many of the people sitting in this room, that if we don't do anything about electric transmission by default, we're going to have many more natural gas plants being built. So, then we limit our options for our energy development in this country just to building additional natural gas plants around the country for additional electric generation.

Now, I know that there are many people who would think that that could be an excellent result and I understand many of their, the reasoning that they use and I know that it can, that certainly is a wonderful resource and I don't want to poo-poo it. But I also know that we have other wonderful resources that are waiting to be developed in our country, especially in North Dakota, because we each have a chance to talk about our own state. We have wonderful wind resources that are waiting to be developed and we have additional coal resources that are waiting to be developed that can contribute very much to a very low cost of energy production, especially base load for coal and also, of course, the wind has so much to offer to our environment that can compliment what we already have in our country. So, it is so important that we work on the transmission issues that we spent a great deal of time on today. Some of the things that I thought were very interesting

as I heard the comments of Jim Torgerson with MISO is that the planning process seems to be moving nicely through MISO right now on a plan for the midwest. And he mentioned that as there is in April, there will be a plan presented to the Board that is going to highlight the transmission needs of our region. And what I'm hoping that that plan will do is two things, among others, is that they will consider the use of all of the new technology that we just heard about in this last panel so that when they make that presentation to their board, they have considered all of the new technology that is available as well as all the options and that those will all be incorporated into that plan.

And I'm also hoping that they will be looking at their cue process because as he also mentioned, right now any new generation facility needs to go into the cue. He mentioned that there's 144 projects that are in the cue right now waiting for action. Another piece of information I received before this meeting showed 260 projects waiting in the cue. So everyone agrees that the cue process needs some attention in order for generation projects to be considered for connection to the transmission system.

I would challenge this group with me at the table and the other people in this room that as soon as

MISO acts on that plan, which is going to be presented to the Board, and let's say it's presented in April. My challenge would be that as soon as their Board acts on that plan, let's say they act on it by June and they have that, they say, yes, this is the plan that we want for transmission for MISO Region, that the commissions working with the National Governors Association should have our multi state entity up and ready and ready to go because we do not want anyone saying, well, here we have a plan and now look at these states. They can't get their act together and work together on this multi state group.

So, it will take a great deal of work for us to put together processes and such in six, seven months. But I think that we need to be ready to go as soon as that plan is ready so that we can effectively then move forward on building the needed transmission in our region. Thank you.

MR. MILES: Our next speaker is Chairman Jim Burg with the South Dakota Public Utilities Commission.

CHAIRMAN BURG: Thank you very much. I, too, am very pleased to be here and I appreciate all the people that have stayed because this has been a long session for a lot of us.

A couple of points that I'd like to make.

My concern both about the RTO, the Midwest ISO and the SMD NOPR as we first saw it, is getting the pricing right for the transmission. South Dakota, as you can see, had very little generation, had very little resources in place now but we're a transit area for almost anything can happen. Coal in Wyoming, coal in North Dakota, water, hydra out of Canada, wherever it might be.

We do not object to probably getting the transmission lines through the state if it's done right. But we're very concern that we have a pricing method that our people won't have to give up their property for a resource we do not need and still have to pay for that property, which the license plate pricing and the socialized pricing would do to some extent. We need to make sure that there's a way that we do not get penalized in our transmission costing by the way that's done.

Secondly, it's been my observation that there are several reasons why we've had a difficult time getting investment in transmission recently. The first one is if I were a transmission investor, especially an integrated company, is we don't know if we build it, if we're actually going to get to keep it. We may have to divest. Secondly, if we do get to keep it, it's going

to be managed and operated by somebody else. We aren't going to have control of it. Thirdly, that it's been told me and this isn't an area that I'm an expert in, that the returns on the investment are not adequate for the higher risk that has to be taken today. In other words, in the past that's been rolled into rates. There's been an automatic return for that investment. But today you're not sure whether that's going to happen. So there's a higher risk and the returns need to be greater. And lastly, under the paradigm we're talking about now, if you build excess capacity and you really have to make it available to anybody else. So, under those conditions I'm not sure that it's unusual that nobody be willing to invest. I think we need to clear those kind of things up.

I'd like to throw out some thoughts that I have on getting transmission for new generation. And I think that's one of the real goals that you've had. And I think the person from Natural Gas had a model, sort of the point to point. I'd like to, I'm a farmer by background. I have two sons that are operating our family farm now. And we have a pretty good system in our rural states of getting our crops from our farm to the market. We first take them on a dirt road or gravel road. They may get to a highway to get to an elevator

to go onto a train or a barge or something like that. And yet, if they said you're going to take all the grain out of Canada, you've got to move it through that system as well, that system couldn't take it.

And that's a little bit what's happening right now. We're trying to take a system that was designed for farmer to market use or hub and spoke use for the consumers of that particular area and we're trying to make it something it isn't. And yet trying to build this system up enough to do that seems to be a very expensive and a very difficult and long term process.

And I think that perhaps, and I refer to the people that were talking about the wind and the resources. If you look at where a lot of the resources are today, whether they be the Wyoming and North Dakota coal again or the wind in Kansas and South Dakota, North Dakota, the other states, we talked about being where the load is not. What I think may be a little different way is to say, should we build some point to point transmission lines. We really don't need to dump power off in between very many places.

And do those as -- lines that you would have the contracts before they're built. You'd have investors that would be willing to build based on those

contracts. And you would not be having, having to build the system to get on or off at any point because what we really want to do is to move that bulk generation from Point A to a low point, which in many cases is 500 to 1,000 miles away in our part of the country with very little -- to get, to dump that at any place along the ling. Those will probably, may entail DC lines, maybe the most efficient ways to do those.

But it's something I think we ought to look at to immediately get some more generation into the load centers without having to beef up this whole system in order to get it done and then all the complications that I think go with that.

The last one that I, well, I want to quickly mention another one because I spend a lot of my personal time on seeing a way that we can develop our wind resource because as I've said in South Dakota we don't have any of the fossil fuels but we have a really good wind resource. And then working with quite a few people that have. One of the things that's being proposed by people that are smarter than I in engineering wise and that, is what they want to call a curtailable firm capacity. In other words, the ability for the wind to have a firm access to the capacity except when it's fully loaded. Most of our lines are only at capacity

very short periods of time. In other words, you'd be curtailed during those times but you would get, you would get firm availability of that transmission availability during those times. And that's one of them that we've been talking about to bring into it.

And the last one that I guess I would quickly throw out is I think we also need to look at new methods of compensating for the siting. Siting hasn't been talked about here but it always is. How do we get adequate siting? And I've had numerous developers of wind call me and say we're willing to make the investment. We think we've got the markets. We see the need. We absolutely don't know how we can get the transmission. I'm saying through a state like ours, I think we need to look at a different way to compensate. We need to compensate the people impacted.

In the past, the systems were built to serve individuals and to serve our neighbors and we accepted the impact of those lines. But the large transmission lines that are going to be transit lines are going to be making cheaper power available to somebody else. I think we need to look at annual compensation to that land owner, that farmer like myself, that is being continually impacted into that community that has to put up with that. And I think doing that we're going to

have a lot easier way to get some of those sitings done.

And with that, I thank you very much for the opportunity to make the comments.

MR. MILES: Thank you, Chairman Burg. Our next panelist is Commissioner David Hadley. He's a Commissioner with the Indiana Utility Regulatory Commission. Commissioner.

COMMISSIONER HADLEY: I also thank you and appreciate the opportunity for the dialogue, for your willingness to listen. And listening is what we've been doing for the last several days here and the panel this afternoon has really offered a lot of thoughts.

It's amazing to what we heard just a short time ago when I listened today and I heard so much discussion from the different panelists from different perspectives, tell us that long term contracts were needed to help put certainty into the market when just a short time ago we would have heard about letting the markets dictate that. And that they want regulators to assist them in taming the markets so that they can have automatic returns, as Chairman Burg just indicated.

One of the things that contributed to a lot of that discussion has been the volatility of the market. And we heard the idea about LDC's and gas industry at the beginning of the discussion not spending

as much time anymore on long term planning because they don't think it's their job anymore and that also utilities are dedicating funds to debt retirement rather than operational funds, both leading to a problem of the crisis and the volatility kind of in a cyclical pattern that bears some concern.

I think we pretty well all agree that socially the up and down spikes and the volatility that are extreme are not socially acceptable and that probably they lead to a hostile environment at the retail level when they occur at the wholesale level. And that ends up translation consumers are in trouble.

What I also heard was virtually every change that takes place within a transmission system or a generation unit or a distribution unit, impacts somebody else in some other manner. So, when I heard the discussion about how many plans are in the cue, and it's done by one RTO with a need to check with other RTO's, I think we need to be vilagant with our effort to insure that those virtual RTO's that we talked about are able to translate into reality in a real RTO planning system that encompasses all of the changes in an equal manner so we can understand when precious dollars and resources are spent they make the maximum benefit for consumers at the end. That maximum benefit also means we have

utilities or those who will generate electricity transmit electricity or our fuel sources in a way they can be viable utilities as well.

Which gets us to the entire problem of the boom bust cycle. Now, we just finished that irrational exuberance of throwing money at a quick fix, which was a lack of supply generation for peaking units. Now, there's been a rapid withdraw, as we saw illustrated, of capital and of value of those very utilities. It was interesting to note the stabilizing impact that coal as a fuel source had brought to the market. It was also interesting to see some of the opportunities that we have going forward for demand response programs, for distributive generation.

When we talked about some of those issues, it boiled down for a confidence in the markets are needed to get the investment that we need going forward and how to do that. And you heard a lot of different concepts. But I think at the heart was trying to attack that boom bust cycle so that we can have more consistency, plan as we need to plan, not a reaction, but in true planning And that reliability standards help that, that interconnection standards help that and that somebody can watch what's happening with the recognition that our borders, as an individual state that kind of

some how we have drawn politically, are not as big as the markets and the electricity and our utilities by regional in nature. So I would just add the market monitor that's already been dialogued in other sessions as a very critical component of restoring the confidence that helps us attack that cycle that we've been in.

Thank you again for the opportunity and for our continual dialogue here.

MR. MILES: Thank you, Commissioner Hadley. Our next speaker is Alan Schriber, Chairman of the Public Utilities Commission of Ohio.

CHAIRMAN SCHRIBER: Thank you and good afternoon, one and all.

Let's assume for a moment that there's not going to be any new transmission next week, next month, probably not next year. As an economic determinist, it should come as no surprise that demand side management or demand response, whatever you might want to call it, is paramount in my mind. And there's all types of demand side management. There are lots of subsidies that get you there. In fact, when I think about regulation I always think about subsidies. Who is subsidizing who and where. But, for example, you know, weatherization or credits for consumption, low consumption lights, what have you.

But to me the ultimate form of demand side management or demand response management, if you will, is creative pricing. I think it's something that we need to pound on. We need to educate a lot of people on. There's a lot of utilities that do embrace it. But those that do not, need to. And I'm talking about peak shaving, I'm talking about the creative type of pricing that goes beyond just interruptable rates for large consumers of electricity. I'm talking about the type of rate structures that, in fact, and they go by different names, proprietary names, by different companies where companies will literally sell their power back to the utility during times of peak demand. And, in fact, there are companies I know who make more money selling the electricity back to the utility than actually producing at certain times.

I think real time metering, although there are those who say that, well, we haven't had a lot of success with this, we don't think it works. To me the technology is such, we know it's there and it's inconceivable that I cannot have in a commercial establishment, a small commercial establishment or even in my home, if I wanted to, it's inconceivable to me that I can't have a device that tells me how much I'm consuming at what price and if you'll take it a step

further and give me some time of day pricing so I can do what I want to do and when I want to do it. If we want to, you know, if we want to do the laundry at night, we will. We won't, but we would have that opportunity. But on a commercial scale, on a small industrial scale I think that type of initiative is absolutely vital.

In the longer term, we're going to talk about wholesale for a moment, a very brief moment. I think the pricing mechanisms for access to the transmission facilities and the mechanisms for congestion that are embodied near -- are really right on. And I just want to say that and you'll find it in our comments, I can assure you of that.

And then all of the time I think we need to take a strong, hard look at uniform power siting. It seems to be quite allusive, as I have participated in the, and some of the others have, in the MGA's Multi State Entity with respect to power siting. And I think Ohio has an excellent power siting statute. I chair that because I do chair the Commission but I have nothing to do with the quality of the statute. That was done by the legislator. I promise you it wasn't me. We do have a good statute.

And listening to the representative from Kansas who, I think, fairly clearly, at least to me said

they don't have to site, get permission to site certain types of facilities. I would be willing to bet that there are a lot of communities and a lot of people where they're not going to build a power plant in Kansas, that they don't want it there. So, I think that, I think that in reality statutes need to be in place that accommodate siting and that more importantly, if not most importantly, allow a state to work in conjunction with other states so that we can truly have a multiple, a multi state jurisdiction.

And then finally and I think most importantly when it comes to power siting, one of the things I heard a lot of and I think, again, this is just purely an educational process, a lot of states objected to the fact that a power line, a transmission line running across their state without any interconnection was going to be a huge cost to them with no redeeming benefits. And I think it's incumbent upon all of us to point out, to educate, to demonstrate that, in fact, everybody benefits, no matter where they are if there's a power line going from one place to another because obviously a power line from Point A to Point B, a new one, is going to give the state that gets crossed some relief in terms of congestion.

So, I think we need to take all of those

things into consideration. We call it General Equilibrium Analysis. That's what we have to look at. And so I spoke about, I have spoken about power siting and about pricing and I will stop at that and yield to my friend from Michigan.

MR. MILES: Thank you, Chairman Schriber. Our next speaker is David Svanda, Commissioner with the Michigan Public Service Commission.

COMMISSIONER SVANDA: Thank you very much, Mr. Chairman and Commissioners. I would ask that you help me by instructing your court reporter to remove the comments that I'm about to make from the record. And I do so as the relatively new leader of the free world state regulators and I do so because I would like to indicate to you that at the end of this afternoon and following five wonderful days of -- conventioning, my brain is pretty mush and I'm tired of sitting in hotel rooms talking about these things.

But seriously, you asked us to participate in your Midwest Energy Infrastructure Conference and I guess I would summarize my thinking after hearing just great panels and hearing what my much smarter colleagues on my right and coming up on my left have to say by way of summary. The midwest energy infrastructure, we need two things. We need physical infrastructure and we need

investment in physical infrastructure. And we need institutional infrastructure and wee need investment in institutional infrastructure.

And I would ask you to use your creative talents to combine those so that we get our institutions correct and we get them quickly and we get them in time so that they can service well. And also that we get the physical infrastructure that we need on a timely basis. And I think we all desperately need to get on with the investment in technology that you heard about in the last panel.

We have ignored and left that whole area of bedrock investment in this country ignored for way too long. And whether it's incentives that you can provide or if it's funding through sister organizations with which you work closely in Washington or however else you need to free up some resources so that we can blend public and private resources to possibly create a model regional system for smart infrastructure and smart transmission systems. And probably in an earlier day I would have suggested a region to you but I won't suggest one to you that you might select to invest in the physical infrastructure as well as the institutional infrastructure.

I concur with earlier comments made by a few

people that we burned off, we wasted a good number of years when we were in a go go economy and we didn't make investments in transmission infrastructure and other important American infrastructure pieces in the name of, gee, we can make better money by investing elsewhere. And today with some of the lowest rates that any of us have seen in our adult lives, we are burning off the bad days of the economy by also not making investments and not figuring out how we can utilize those low rates in order to invest in our infrastructure.

I would encourage you to link the deployment of new technology with the operation of new market places and make sure that we bring those up simultaneously to create a very good regional model that others would be envious of and want to duplicate. Thank you.

MR. MILES: Thank you, Commissioner. Our next and final panelist today is Diane Munns, Chairman of the Iowa Utilities Board.

CHAIRMAN MUNNS: Thank you and thank you for putting this together this afternoon. I'm not going to bore everybody a lot because I spoke earlier. Chairman, I know that you were here and the other two weren't and maybe you can share with them. To give it to you in brief I support a regional approach and in trying to

figure out how to do this.

This is an energy infrastructure conference. There's been several references made about what Iowa has done with respect to pre-approval and regulatory assurances to get some power plants built. And we did that through legislation. It was fairly amazing at how quickly it was responded to. We changed the system from regulatory review after investment had been made in power plants to giving some regulatory assurances up front and then striking a bargain. Once we gave those assurances then the companies could say if they were willing to invest under those conditions. And we have had several plant commitments made with the benefit of that law.

I say, you know, we gave a return on those plants. I said, I don't know in the long run whether people are going to look at us and say you were brilliant or you were idiots. But at least we have defined the parameters of our risk for the future and we're getting some plants built.

The concern that I have, and I think this is something that Dave eluded to is we go through cycles, you know, and we are in a cycle where we, some of us are needing generation and that the transmission, our transmission assets are old and will need to be

replaced. And we need new transmission assets. And when things reach a crisis proportion, we resort to what we know. I mean, we've heard about some wonderful new technologies today that are being tested and on the horizon. And I hope that we have the opportunity to utilize those and don't fall back on the things that we know just because we need to do things in a hurry.

And the same thing, we are talking about regional planning so that we can have more efficient use of assets. And I hope we can get in that place again before we feel in a crisis and we fall back to the way that we've been doing it in the past.

So, with that I'll stop and I only have one more statement and that's that Iowa has great wind, too.

CHAIRMAN WOOD: I just want to say listening to you all sure makes me miss Mark. You folks get it. I appreciate you all hanging around to do this with us. We, you know, think it is a serious part of our responsibility. But quite frankly the infrastructure's so, you know, front and center of you all, and we have certainly on the gas pipeline side, a more of a primary role. But a lot of our focus today did devolve to electric transmission. I think we heard from looking at the map and looking at the studies that Jeff presented at the front end of the day, that the power plant

situation looks pretty solid. And that's great.

It's a transmission; Jim, I was fascinated by your idea and I was noticing this odd light that I'm sitting in, that there are some DC lines which would be pretty akin to the point you mentioned, that being an alternative. They run from, it looks like mid North Dakota over to Minnesota. What's the history behind those?

MS. WEFALD: That's Great River Energy. They needed to have that line installed, I believe it was in early '80's. And so a DC line was constructed and it was well accepted in the region. And it does, it's a DC line point to point service from Washburn, just north of Bismark, over to the Twin City area, 400 some miles.

CHAIRMAN WOOD: That really just takes and does what Jim was saying, kind of without having to upgrade the entire grid along the way, it takes them and dumps that power right into the population centers over --

MS. WEFALD: Basically a private line.

CHAIRMAN BURG: And, I think, and Nora, you might know this better than me. I had the opportunity to visit the James Bay area and the power that comes into the northeast. And I believe those are DC too,

aren't they?

CHAIRMAN WOOD: That's the one I was thinking of.

CHAIRMAN BURG: There's so many efficiencies when you're going long distance. And the way I looked, well, and Nora reminded me again was that the gas pipelines that come out of Canada are basically that. It's extremely difficult to get into one of those. I'm aware of a community that tried to get into those large pipes because it's costly and they're high pressure until you get to the distribution system, and this would be the same thing. It would be from going from a generation site to the distribution system of a load area. And I think it might streamline what we're trying to accomplish is what I'm talking about.

CHAIRMAN WOOD: And just thinking out load here, one of the things we've seen over more in the east coast where the people kind of avoided the big siting battles by going underwater. They've got a couple of proposals for merchant private lines that, because they had the property rights and had the pricing differential and kind of took advantage of that arbitrage, that helped really pay for those lines or is paying for them. They're under construction, under a process now.

But it seems pretty -- here on Atlanta just

having thought of places where that would work until you really mentioned the whole deal here is that you've got a long distance you got to run. There are beneficiary issues that come from that about, you know, if you had to go across a state that you're not getting any benefit there, does a local utility have to spend the money to do the upgrade. You get around that pretty quick by doing a DC line.

CHAIRMAN BURG: And I think you'd get around a lot of the challenges of the investment because that's a merchant investment line. It would all be under contracts in most cases or I'd like to look at it as a toll road. I invested in a toll road and, you know, people that want to get on then would pay.

MS. WEFALD: And my understanding is that the FERC sets the tariffs for DC lines and that those don't go through the RTO's.

CHAIRMAN BURG: I would add one thing, though. My concept is I think the RTO's ought to determine that need, how to certify and perhaps FERC as well, certify that that's the right, you know, that that concept or that that route, there's a need there because then I think we avoid doing what's uneconomic or things that don't work.

COMMISSIONER BROWNELL: The Midwest

Commissioners have been so substantive and helpful in their comments and the leadership that they provided. It would be great if you would also be the model for how we might work together in partnership with DOE, if necessary, to really introduce some of these new technologies because I think that you have the will and you have the vision. And we would love to work with you because I think that's the piece, we're missing lots of pieces but that's the piece that we're far behind in. It makes me -- enough to say that when I hear other countries are ahead of us in an infrastructure that is so important to our economy, I think we need to kind of get moving. So, love to work with you because you've been terrific.

MR. MASSEY: What I hear from your comments is that you share our goal for well functioning wholesale markets that provide benefits to your states and to consumers. You seem all very enlightened. You have very insightful comments. I've learned a lot here today from all the panels. And hearing you make your comments and sort of wrapping up this session gives me hope that working together we can actually achieve some consumer benefit going forward. Thank you.

MR. MILES: Any questions? Final comments? Otherwise we'll set it down and thank everybody for

their cooperation and thank the members of the last panel. Thank you.

(Whereupon, at 5:50 p.m., the conference was adjourned.)

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached transcription of the MIDWEST ENERGY INFRASTRUCTURE CONFERENCE

Place: Chicago, Illinois

Date: WEDNESDAY, NOVEMBER 13, 2002

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Official Reporter