Testimony of Graham Edwards

Acting President and CEO of the

Midwest Independent Transmission System Operator, Inc.

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Good morning, Chairman Bingaman, Ranking Member Murkowski, and members of the Committee; thank you for inviting me to speak to you today. I am Graham Edwards, Acting President and CEO of the Midwest Independent Transmission System Operator, Inc. The Midwest ISO is a non-profit, independent, member organization serving members in all or parts of 14 states and one Canadian province, from western Pennsylvania to eastern Montana and Missouri to Manitoba. In 2001, we were the first Regional Transmission Organization approved by the Federal Energy Regulatory Commission. The Midwest ISO operates day-ahead and real-time energy markets and an ancillary services market. In addition, we provide transmission scheduling and reliability services. Relevant to this hearing, the Midwest ISO performs a regional planning function for the members in its footprint.

Transmission Planning at the Midwest ISO

The Midwest ISO performs transmission planning at several different levels – from individual generator interconnections to smaller sub-regional transmission plans, to an annual expansion plan for the entire Midwest ISO footprint. We are also part of a coordinated effort to look at transmission planning on an Eastern interconnection-wide basis. Last month, the first report from this effort was issued: the Joint Coordinated System Plan or JCSP. The JCSP looked at two future energy scenarios for the Eastern interconnection: a reference future reflecting existing laws and about 5% wind penetration, and a wind future in which 20% of the energy in the Eastern interconnection was provided by wind. Another goal of both scenarios was to bring the lowest delivered cost of power to consumers. Other participants in the study included PJM, the Southwest

Power Pool (SPP), TVA, the MidAmerican Power Pool (MAPP), entities in the southeast and input from the New York and New England regions. All of the work was done in collaboration and coordination with the Department of Energy. The JCSP was a first step, and more work needs to be done.

I look at the JCSP as a great success. It was the first joint transmission process that looked at the entire Eastern interconnection and it used new planning tools and techniques to perform its engineering analysis. The results reflect the fact that it was an open process to gather stakeholder input, visiting a dozen cities in all regions of the Eastern interconnection with over 300 entities attending the open meetings. Briefly, the JCSP found that for a 20% wind future, about 15,000 miles of an extra high voltage transmission overlay would be needed for the Eastern interconnection. The cost of this new transmission would be about $80 billion, but the early estimates show that benefits of the system exceed the costs.

Congress is now discussing how to promote new transmission for various goals such as improved renewables access, carbon reduction, national security/energy independence, and improved reliability. All of these are important goals and new intelligent transmission can help to achieve them all. Having just completed the JCSP, I would like to discuss some of the lessons learned from that 15-month open process that Congress should consider in the legislation being reviewed today, and in any related legislation.

I wish to offer five points today:

- Interconnection-wide planning is appropriate and achievable.
- Interconnection-wide planning is best accomplished with policy goals and expectations stated up front and important 1st level questions already assessed.

- The best and most useful plans come from open, inclusive, robust sessions to develop and vet key assumptions.
- Plans, once developed, must be revisited to keep them relevant.
- To build projects that will fulfill the plan, siting and cost issues must be addressed.

Interconnection-wide planning is appropriate and achievable.

Because the issues being addressed in our nation's energy debate involve topics of at least regional and often national scope, it is crucial that they be addressed on the right level. Renewable resources such as wind, solar and geothermal are most often at their peak capacity in areas remote from the nation's major load centers. The electrical grid for the lower 48 states operates in three "interconnections." In the Eastern and Western interconnections, harvesting the most vibrant renewables will mean moving energy over distances of hundreds of miles through an intelligent extra-high voltage grid overlay. To ensure that overlay can integrate renewables with an end goal of the lowest delivered cost of energy, the planning must be over comparably large regions. In our region, moving large amounts of wind energy from the Great Plains to population centers cannot be done with the existing transmission system, or even a slightly improved system – it will require an intelligent extra high voltage grid overlay.

In the West, the folks at WECC have shown that such plans can be produced. In the East, we in cooperation with other entities like TVA, SPP and PJM, among others, have shown an interconnection-wide plan can be accomplished through the JCSP. This plan evaluated what would be necessary for a 20% wind integration by the year 2024. The plan is a good start. Additional efforts are underway to run more scenarios and to consider off-shore wind resources and Canadian resources in the plan. Moreover, we

believe that an intelligent EHV overlay could be self-healing and not significantly affect the existing transmission planning processes of utilities, RTOs and ISOs used for transmission that is not part of the overlay. The important news is that interconnection-wide planning can be done in the Eastern interconnection. The draft legislation appropriately requires that planning for an intelligent extra high voltage grid be done on an interconnection-wide basis.

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What policy goals one wishes to serve will be reflected in an intelligent grid-overlay plan. It is not enough to say the goal is to integrate renewables. The more Congress can inform the planners in advance, the less they have to make up or decide for themselves and risk frustrating the policy makers who gave them the job in the first place. For instance, what other factors are to be considered – maximum CO_2 reduction, lowest cost of wholesale electricity, national security/energy independence through plug-in electric vehicles, or others? The answers to these questions are likely to result in different grid overlay plans. I am not saying that these goals are mutually exclusive, but the planners need to know what the goals for the grid are so those goals can be reflected in the plan. The draft legislation attempts to provide this clarity to the planners. Further clarity regarding levels of renewables requirements and details of carbon policy would be helpful, but those issues may be addressed in other legislation.

It is also especially valuable if the determination of where the renewable resource zones are located is already made or if the criteria for choosing the zones are set. Planners know generally where the load centers are (the cities); however, identification of the areas where the renewables will come from is just as important in planning the

intelligent transmission grid overlay. A process needs to be in place to identify where the renewable resources will be located. This could be done through either a state or federal process or a combination of both; but a process should be identified. The draft legislation does not provide a framework for the process to identify the renewable energy zones. I believe that a collaborative state and federal process could quickly identify those regions where large quantities of renewables are present. DOE has already done much of this work on a national level. The states of the upper Midwest (North and South Dakota, Minnesota, Wisconsin and Iowa) are working together with the Midwest ISO to identify those particular regions in their states (based on the broader DOE work), where wind development is most appropriate. We understand that California, New York and the New England regions are engaged in a similar process. Congress should allow those processes to come to fruition and then allow that work to be incorporated into a national plan. Incorporation of state plans into a national plan will give greater credibility to the national plan.

The best and most useful plans come from an open, inclusive, transparent, nondiscriminatory, robust process used to develop and vet key assumptions and explain the tools and processes that will be used by the modelers.

Because siting and cost issues will arise from the implementation of any plan, it is crucial that the plan be credible and respected by not just policy makers and investors, but by the people and state authorities whose land will be crossed by the projects that implement the plan. When assumptions are arrived at out of sight, they become secrets and the motivation of the planners is questioned. The draft legislation appropriately requires an open stakeholder process to develop the interconnection-wide transmission plan.

The interconnection-wide planning you are considering will be valuable because it will produce an answer; not justify a predetermined path of action. The JCSP was conducted in such a manner. Our experience shows that the values of openness, transparency and inclusion do not have to paralyze a process. Willing people can produce valuable work that is thoughtful and respectful of others within time frames still suited to action.

Another important consideration is the choice of the planner. It should be an independent entity (which could be a joint venture of entities) with experience in large scale transmission planning. These requirements should be added to the draft legislation. Independence is critical so that the planner is not beholden to any party interested in the outcome and persons can have confidence that the planning process was fairly run. Experience is critical because Congress appears to want this process to begin soon. Transmission planning is a very arcane subject and it could take an entity without experience too long to gain the experience and produce a credible plan. Independence and experience will provide greater credibility to the planning entity and its work product.

Plans, once developed, must be revisited to keep them relevant.

Planning is an ongoing process. At its best, it is flexible enough to adapt to new developments, like evaluating out of sequence projects, and prudent enough to reconsider assumptions and incorporate new developments on a periodic basis. The Midwest ISO's own regional plan is a biennial plan. From our experience with the JCSP and our own transmission expansion plans, we have found that no matter what "future" is looked at in the plan, there tends to be a "core" of transmission projects that will be required no

matter what. Identifying the core projects allows plan flexibility in the future and helps prevent building a system (or parts of it), that could become obsolete. Flexibility in the plan will build public and stakeholder confidence in the plan and the planning process. This confidence may also aid in the eventual siting and cost allocation issues that will arise. You should consider adding requirements that the plan be updated on a regular basis. This will allow the plan to be updated as conditions change and new technologies are developed.

To build projects that will fulfill the plan siting and cost must be dealt with.

The Committee will be considering various siting and cost recovery proposals. It is critical, in my view, that they be addressed; for without their consideration, the state-by-state review of regional projects will be fraught with difficulty. That is not to say that the state role should be eliminated – states have important knowledge that will be valuable to the siting process.

It is also important that the cost recovery mechanisms for the projects not be based on membership by companies in voluntary organizations like RTOs. Recovery should be pursuant to rules that cannot be sidestepped by withdrawing from an organization. The Midwest ISO has its own costs allocation and recovery rules, but those rules are not the same across different RTOs or ISOs or various utilities. It would be very difficult to try and apply different cost allocation and recovery rules for different areas to an intelligent extra high voltage grid overlay that seeks to achieve national goals. However, in our footprint, the states in the upper Midwest are also working collaboratively to reach consensus on cost allocation principles for transmission for renewables. The draft legislation appears to allow this process to continue and be

incorporated into a proposal to the Federal Energy Regulatory Commission. We believe that this flexibility and recognition of state efforts in the draft legislation is good. If these state efforts do not succeed, then perhaps a federal solution would be required.

In conclusion

- Interconnection-wide planning is appropriate and achievable.
- Interconnection-wide planning is best accomplished with policy goals and expectations stated up front.
- The best and most useful plans come from an open, inclusive, transparent, nondiscriminatory, robust process used to develop and vet key assumptions and explain the tools and processes that will be used by the modelers.
- Plans, once developed, must be revisited to keep them relevant.
- To build projects that will fulfill the interconnection-wide plan siting and cost must be dealt with.

Finally, recall that Congress has the power to change all laws, except the laws of physics. I do not see that problem in this draft legislation, but as the bill moves through the legislative process, please do not forget this. Thank you very much for this opportunity to speak to you today. I look forward to your questions.