Electricity Advisory Committee
Meeting
Washington, D.C.
September 26, 2008

Minutes

Members Present:
Linda Stuntz, Esquire, Stuntz, Davis, and Staffier, P.C. (Chair)
Yakout Mansour, California ISO (Vice Chair)
Paul J. Allen, Constellation Energy
Guido Bartels, IBM
Gerry Cauley, SERC Reliability Corporation
Ralph Cavanagh, Natural Resources Defense Council
Jose Delgado, American Transmission Company
Rob Gramlich, American Wind Energy Association
The Honorable Dian Grueneich, California Public Utilities Commission
Michael Heyeck, American Electric Power
Hunter Hunt, Sharyland Utilities
Susan Kelly, American Public Power Association
Irwin Kowenski, Occidental Energy Ventures Corp.
Barry Lawson, National Rural Electric Cooperative Association
Ralph D. Masiello, KEMA
John McDonald, GE Energy
Steve Nadel, American Council for an Energy Efficient Economy
David Nevius, North American Electric Reliability Corporation
Brad Roberts, Electricity Storage Association
Enrique Santacana, ABB Inc.
The Honorable Tom Sloan, Kansas House of Representatives
The Honorable Barry T. Smitherman, Public Utility Commission of Texas
Dr. Robert J. Thomas, Cornell University
Vickie Van Zandt, Bonneville Power Administration
Bruce Walker, National Grid
Jonathan Weisgall, MidAmerican Energy

Members Not Present:
Jeanne Fox, New Jersey Board of Public Utilities
Joseph Garcia, National Congress of American Indians
Tom Standish, CenterPoint Energy
Malcolm Woolf, Maryland Energy Administration

DOE Staff Present:
Michael Brairton, Office of Congressional and Intergovernmental Affairs
Patricia Hoffman, Office of Electricity Delivery and Energy Reliability
Kevin Kolevar, Office of Electricity Delivery and Energy Reliability
Eric Lightner, Office of Electricity Delivery and Energy Reliability
Steve Lindenberg, Office of Energy Efficiency and Renewable Energy
Larry Mansueti, Office of Electricity Delivery and Energy Reliability
David Meyer, Office of Electricity Delivery and Energy Reliability
Elliott Nethercutt, Office of Electricity Delivery and Energy Reliability
Ray Prince, Office of Policy and International Affairs
Mark Whitenton, Office of Electricity Delivery and Energy Reliability
Steve Widergren, Pacific Northwest National Laboratory

Others Present:
Stacy Angel, Environmental Protection Agency
John Crandall, Mizeur Group
Bob Howatt, Maryland Energy Administration
Heath Krakmuhs, American Transmission Company
Mark Maddox, Arcadian Networks
Terri Moreland, California ISO
Bruce Talley, ABB Inc.
Jonathan Tang, Electric Power Supply Association
Michele Tihami, IBM
Allison Trepod, SRI
Joe Waligorski, First Energy
Tenley Dalstrom, Energetics Incorporated
Mandy Warner, Energetics Incorporated
Peggy Welsh, Energetics Incorporated

Welcome and Opening Remarks

Linda Stuntz, Chair of the Electricity Advisory Committee (EAC or Committee), opened the meeting at 8:30 am EDT. Chair Stuntz thanked the EAC Members for their suggestions in the previous day's discussion of the Electricity Supply Adequacy Report. She explained that the discussions on this day would focus on the work products of the two EAC Subcommittees, with particular attention to coming to initial agreement on draft recommendations put forward by the two Subcommittees.

Overview of Draft EAC Report on Energy Storage Technologies

Member Brad Roberts, Chair of the Energy Storage Technologies Subcommittee, provided an overview of the Subcommittee's draft EAC report. He explained that the two central objectives of the Energy Storage Technologies Subcommittee's draft report are to meet the mandate of the Energy Independence and Security Act of 2007 (EISA) and to provide recommendations to the U.S. Department of Energy (DOE) on energy storage technologies. The draft report includes a discussion of the obstacles to deploying energy

storage technologies, the potential role and importance of plug-in hybrid vehicles, and the research & development needed to add significant amounts of energy storage capacity across the electric power supply system.

Mr. Roberts outlined the draft recommendations included in the draft report.

1) The first draft recommendation urges DOE to seek funds from Congress to undertake the activities authorized in Subtitle D in EISA.
2) The second draft recommendation urges DOE to enhance research and development (R&D) efforts through a large-scale, systematic project to evaluate potential materials for use in batteries, to establish separate centers of excellence for research in applications of storage technologies in the transportation sector and the grid-related sector, and to provide support for interdisciplinary storage research.
3) The third draft recommendation urges DOE to fund applied research and demonstration activities. Some specific activities in need of funding are studies focused on commercialization of advanced batteries for vehicle, stationary, and utility applications; improvements in battery size, weight, life, and cost; smart grid interactions between plug-in hybrid electric vehicles (PHEVs) and other storage technologies; the interactions between storage technologies and wind generation capacity; and measurement of grid performance improvements achievable through storage.

Mr. Roberts also outlined several suggested actions that are discussed in the report. The first proposed action deals with the need to create financial incentives for building and operating storage facilities in the grid. The draft report suggests that this can be aided by establishing market rules that allow cost recovery for benefits across market sectors. Mr. Roberts also indicated that the draft report includes a proposed action to consider using energy storage as a primary source of grid frequency regulation and other ancillary services. The third proposed action is to establish 5-year goals for improvement in fuel consumption and emissions via increased performance and penetration of PHEVs. Mr. Roberts indicated that although the Subcommittee is addressing broad and complex issues, it would try to make the report's recommendations specific and actionable.

EAC Discussion of Draft Report on Energy Storage Technologies

General Comments Concerning the Report

Member Sue Kelly expressed her concern that the draft report should address the environmental impacts of energy storage and PHEVs, including any problems related to the disposal of lithium ion batteries. Member Guido Bartels recommended that the Energy Storage Subcommittee review Denmark's work on PHEVs as well as Shai Agassi's work in Israel.

Member Jose Delgado urged that the report highlight the relevance of storage technologies to achieving more effective control over loads and use of "openings" in load shapes created by energy efficiency improvements. Member Ralph Cavanagh commented that storage is likely to be a crucial element in the integration of variable generation resources into a well-functioning grid. Member Robert Thomas commented

that implementation of energy storage technologies will happen in stages and that it will take considerable time before we see vehicle-to-grid applications.

Battery-Related Issues

Several EAC members emphasized the importance of funding incentives for PHEVs and research on battery chemistry (i.e. a "genome project"). It was argued that through systematic R&D related to battery chemistry there is potential for a 4- or 5-fold increase in battery efficiency and the development of massive batteries. Vice Chair Mansour suggested that the Energy Storage Subcommittee show how batteries offer different applications than generation resources. He contended that since batteries offer a wider range of capabilities than generation, it is unfair to evaluate them only as a generation source. Member Bruce Walker added that batteries are assets that can be used at the generation, transmission, or distribution level and can help meet many infrastructure goals. Vice Chair Mansour saw two changes as particularly important to facilitating broader use of energy storage: increasing manufacturing capacity so as to produce batteries in greater volume, and easing the interconnection process.

Incentives/Funding

Member Mike Heyeck argued that gasoline prices are volatile, and that some kind of tax incentives to consumers will be needed to get them to adopt this expensive technology (PHEVs) quickly and predictably. He added that it is essential to shorten the period required for a consumer to break even on the vehicles' additional cost.

Member Smitherman said it is easier to fund the implementation of energy storage technologies if the costs can be included as part of transmission and distribution rates. However, he pointed out that some consider energy storage technology chiefly as a substitute for generation, which in Texas means that its costs cannot be put into rate base. He added that he would distribute a recent Texas Public Utility Commission report on this technology to the Committee. Member Tom Sloan indicated that the EAC report should discuss whether providing incentives to consumers to purchase PHEVs or other energy storage assets would be more effective than supporting the development of related infrastructure, or whether both kinds of measures are needed.

Member Ralph Masiello suggested that the report should explain that the automobile industry is considering a "second life" for partially-degraded PHEV batteries by utilities, which would help both to reduce the cost of PHEVs to consumers and to relieve consumers of the problem of disposing of a used battery in an environmentally acceptable manner. Mr. Thomas pointed out that a recently passed U.S. Senate bill includes tax credits to purchasers of PHEVs.

Member Rob Gramlich suggested that some of the storage technologies for utilities could be helpful, particularly in certain constrained areas with pockets of wind power, if they were mobile sources. The storage technologies could be used temporarily in such areas until additional transmission capacity is built and then moved to other sites where it would be more useful. He recommended that any energy storage incentives should not

come out of the renewable energy production tax credit appropriation, but could come from the general budget. He also agreed that if the EAC was going to support a variety of incentives, it should be clear about its priorities, given the expectation of severe budget constraints ahead.

Mr. Cavanagh said that in many cases energy storage assets will have system-wide benefits, and that the recovering the cost of investment in such assets through electricity rates should be allowed. He also proposed that the report emphasize that although the early stages of PHEV deployment would not have immediate value for grid operations, the grid-related benefits would come at a later stage. Vice Chair Mansour pointed out that none of the projects within the California ISO system that deploy energy storage technologies have asked for cost recovery. He indicated that the ISO would be willing to pay more for such technology when needed because it costs less than generation in the spot market.

Value Proposition of Energy Storage Technologies

Member Vickie VanZandt stated that some applications of energy storage technology should be considered as transmission assets, because they would enable some important existing transmission lines to be loaded to a higher level, while still meeting safety requirements.

Mr. Gerry Cauley agreed and said that energy storage technologies have the potential to provide value at many locations across the electric power delivery system. He contended that the technology is another "sleeping giant" at the consumer end and that major benefits will be achievable through appropriate changes in commercial and residential building codes. He argued that the report should emphasize that the U.S. can be either a leader or a follower on battery technologies, but that it will not be a leader unless it makes a substantial investment in R&D related to battery materials and design. Member Jonathan Weisgall pointed out that Chrysler has already announced that it plans to use Japanese batteries – which means that the U.S. is probably not in the forefront on this technology. Mr. Roberts added that the Japanese government is very involved in battery development and that it will fund 30% of the costs of a storage system if it is tied to renewable energy.

Mr. Walker emphasized that some storage devices, particularly the smaller ones, have portability that enhances their flexibility and value. The States and FERC should regard them as tools in the toolbox and give them the same regulatory treatment that they allow for transmission lines, distribution lines, poles, etc.

Member Steve Nadel stressed that the report has to be clear to the reader about what technologies and applications are likely to be adopted in the near term, and which ones will come later. He is also concerned to ensure that any hard data cited by the EAC is accurate.

Mr. Delgado returned to the issue of priorities, arguing that the top priorities should be to increase energy efficiency and improve load control. The combination of energy

efficiency improvements and improved load controls enable additional demand to be served from the existing infrastructure with a minimum of new investment, which is beneficial to all.

Presentation by Eric Lightner and Steve Widergren on DOE Smart Grid Report

Eric Lightner of the DOE Office of Electricity Delivery and Energy Reliability and Steve Widergren of Pacific Northwest National Laboratory (PNNL) made a formal presentation on DOE efforts with regard to smart grid technologies. Mr. Widergren reported that EISA requires DOE to prepare a biennial report to Congress on the status of efforts to implement a smart grid. The report to Congress is due in December 2008 and every two years thereafter. EISA also directs DOE to solicit input for the report from the EAC Smart Grid Subcommittee and as such, Mr. Lightner will work with the EAC Smart Grid Subcommittee in drafting DOE's report to Congress.

Mr. Widergren reported that at DOE's direction, PNNL has research efforts underway pertaining to the 2008 Report to Congress. The report will include material showing that the current electric power grid is not a "dumb" grid. The report will clarify that the term "smart grid" means new applications and new technologies that are being implemented to make the grid more robust and interactive. Mr. Widergren reported that some of the specific issues being explored in the DOE report are the vulnerabilities of the system, regulatory policy and paths forward, the economics of the smart grid, interoperability, and operation and interaction principles. In addition, he indicated that the DOE report would clarify the meaning of "smart grid" by focusing on desirable applications rather than wordsmithing a specific definition.

Mr. Lightner reported that DOE sponsored the Smart Grid Implementation Workshop in June and is using metrics developed from that workshop in the 2008 Report to Congress. The report will identify barriers and challenges to implementation and will report on the status of smart grid activities. Mr. Lightner told the EAC members that this is probably the first of many DOE reports to Congress on smart grid implementation and that this report would measure how implementation is progressing and serve as a baseline for future reports. Subsequent reports may include an assessment of international progress in smart grid technologies and implementation.

Differences Between DOE's 2008 Report to Congress and the EAC's Smart Grid Report to DOE

EAC members asked how the Smart Grid Subcommittee report and the DOE report fit together. Chair Stuntz responded that the DOE report is being written under Congressional directive and will report on the status of smart grid technology deployment and development. The EAC will provide input to the DOE Report to Congress. The EAC is also drafting its own smart grid report to DOE, focusing on what should be done to advance implementation of the smart grid. She acknowledged that there would be some overlap between the two reports. However, Chair Stuntz does not expect the report to overlap completely since the EAC report will focus on recommendations.

Discussion of EAC Smart Grid Subcommittee Draft Report

Overview of Draft Report

Member Guido Bartels, Chair of the Smart Grid Subcommittee, indicated that the smart grid draft report is a work in progress and there are some redundancies that will need to be addressed. A revised draft will be published October 15, 2008. He outlined the various sections of the draft report, including opportunities, a smart grid definition, and value proposition of smart grid, impediments, and recommendations. Mr. Bartels then asked certain members of the Smart Grid Subcommittee to discuss the sections of the report.

On behalf of Member Tom Standish, who could not attend the meeting, Mr. Bartels outlined the introduction and opportunities section of the draft report**.** Members Dian Grueneich and Ralph Masiello described the value proposition section, which examines the value of the smart grid from the consumer, regulator, environmental, and economic perspective. The role and benefits of advanced meter infrastructure (AMI) as a key component of the smart grid were also discussed at length in this section.

Members Bruce Walker and Tom Sloan outlined the section on impediments. The draft report indicates that one of the key impediments to implementation of the smart grid is that it has significant capital costs. The business case must show that it will be cost-effective for consumers if utilities make these investments. The regulatory environment and the metrics may also have to be changed as smart grid technology is introduced. Mr. Sloan added that this section recommends that DOE identify and facilitate the use of best practices and support actions at the State or RTO/ISO level to reduce the risks for "first adopters" of new technologies.

Gaps in Draft Report

Member Ralph Cavanagh expressed concern over how the case is made for the smart grid in the report. He found that energy efficiency and cost savings, for example, are potential benefits of the smart grid that are not currently discussed in the draft report. Member Steve Nadel recommended that the report be more specific about benefits, support these assertions with citations, and avoid extreme assertions. He recommended that references to any relevant cost/benefit analyses be included in the report.

Member Barry Lawson echoed the concern expressed by others that the draft report has a marketing tone and needs to include more data to support its basic points and conclusions. He also asked that some discussion of cyber security issues be included in the report. Finally, Mr. Lawson asked that the report include data on likely costs to consumers.

Member Irvin Kowenski also expressed concern regarding the lack of detailed information about the costs of implementing smart grid technology. He suggested that the costs be broken down into transmission costs, distribution costs and costs to consumers.

Member Sue Kelly had concerns regarding specific wording in the draft report. She pointed out specific sections that need better data and citations to support the statements made. One issue that Ms. Kelly would like to see discussed in the draft report is the potentially restrictive impacts that patents could have on the adoption of smart grid devices and practices relying on those devices.

Member Vickie VanZandt suggested that new generation and transmission infrastructure will still be needed, even with the smart grid. She disagreed with the statement in the draft report that the existing grid is essentially static and suggested it be removed.

Support for pilots and demonstrations and analysis of their results was recommended for inclusion in the report. Attention to workforce shortages was also cited as a significant barrier to smart grid implementation. Member Paul Allen recommended that the report include a discussion of the potential value of dynamic pricing.

Member Hunter Hunt argued that the report should be very careful in discussing the benefits of smart grid technologies to end-use consumers. He pointed out that his utility is in a very poor region of Texas and many consumers there will not readily adopt complex new technologies. He supports the suggestion in the draft report that DOE should become a clearinghouse for information about smart grid activities. Concerning incentives, however, he believes there is a risk of giving people incentives to do things they have decided to do in any case.

Member Mike Heyeck argued that the report should support experimentation and demonstration and not look for or advocate a perfect national model of a smart grid. Beyond anything else Mr. Heyeck argued that increasing regulatory certainty should be the emphasis of this report rather than calling for incentives. He said that the recommendations as currently written are not precise enough.

Member Dian Grueneich recommended that the report be condensed and that the recommendations focus on how a serious smart grid program at DOE can support broader use of this technology.

Materials and Information to Use in Drafting the Report

Vice Chair Mansour recommended the DOE booklet on smart grid be used as a reference in the report. Members were also provided copies of the California Energy Efficiency Plan for reference when writing the report. Chair Stuntz encouraged members of the Subcommittee brief themselves on the Xcel Energy smart city project.

Discussion of the Recommendations in the Draft Report

Mr. Bartels briefly discussed the draft recommendations, which include urging Congress to fund the smart grid activities in EISA, and urging the creation of additional incentives to accelerate adoption of smart grid technologies. Discussion of these recommendations followed. During the discussion, it was pointed out that there is tension between the members that want further experimentation at the state level and the members that want

to see greater uniformity across the grid with respect to smart grid technologies. There was no consensus on how the report should deal with this tension.

Vice Chair Mansour expressed his concern that many people do not have a clear concept of what the term "smart grid" encompasses, and that as a result there were at least two kinds of problems to be concerned about. One is that various technologies that are now quite commercial could qualify inappropriately for subsidies if they are included under the smart grid label. The other is that large amounts could be spent on devices (such as smart meters) that are essential to a smart grid but not sufficient in themselves, and that without investment in the other key components of a smart grid, money spent on broad deployment of smart meters would be a poor investment. Mr. Allen agreed, saying that it was important to ensure that the broader system functioned in an integrated manner, and that some of the "low hanging fruit" was in the industrial and commercial sectors.

Member Barry Smitherman supported the recommendation of funding for education on the benefits of electricity, but he said the educational material should also focus on what determines electricity's costs, and show how the consumer can better manage and reduce those costs.

Comments Pertaining to All Three EAC Reports

Mr. Allen argued that whatever the EAC produces must be timely and relevant, and given recent events it must be expressed in the context of the entirely new world of capital formation. He said that the pressure on the Secretary of Energy to provide loan guarantees and other funding is going to be tremendous in this new world and that if the EAC does not recognize this in all three reports, the work products will not be relevant.

Mr. Cavanagh suggested that none of the EAC documents include requests for new subsidies, though not necessarily eliminating requests for continued funding of existing subsidies. Member Jonathan Weisgall suggested prioritization of recommended activities.

Assistant Secretary Kolevar commented that one topic that will be relevant for the next Administration is whether the right decisions are being made today to ensure that electricity will be as reliable in 2030 as it is now. Further, will higher reliability be required to serve a digital economy, and if so, is that being taken into account? The members of the EAC should decide how they wish to address these concerns in their reports.

Electricity Supply Adequacy Report

Chair Stuntz indicated that the EAC must refine its concept of adequacy in a way that both "connects the dots" and reflects the current financial and economic conditions. She suggested that Vice Chair Mansour and the drafting team leaders should work together to ensure that these concerns are addressed.

Mr. Nevius added that Chapter 1 should emphasize that energy policy is a long-term proposition and that the long-term benefits need to be considered, not just the short-term

costs. Mr. Weisgall thought that Chapter 1 needed to convey a sense of urgency about dealing with the problems discussed in the report, because addressing them was truly very important to the nation's future. Member VanZandt recommended that the concept of developing a range of possible templates for transmission cost allocation be discussed in the report.

Transmission cost allocation was discussed as an important problem in the chapter on transmission, but there was no discussion of the template approach. It was suggested that it might be valuable for the group to reach some more specific views about cost allocation. Mr. Heyeck and Ms. VanZandt will work together on this subject.

Themes for All Three Reports
Member Dave Nevius suggested that the reports should identify overall goals and then turn to a discussion of conditions needed to enable achievement of the goals. Mr. Cauley agreed that the reports need a broader context, such as what the country's energy needs are likely to be in 20 years. Mr. Hunt suggested that the need to ensure confidence should be another theme that runs through all of the reports.

Discussion of Next Steps

Timeline and Editing Process
October 3, 2008 is the deadline for the team leaders to circulate revised drafts to the EAC members for comment. The new drafts should incorporate comments and suggestions from this meeting.

Ms. Peggy Welsh commented that the timing for the editing process would be very tight, with little leeway. However, DOE would like the final products as quickly as possible after the December 11 meeting. Interim dates in the process can be moved, but the final due date is fixed. Energetics Incorporated has a team of three editors that will be working on the draft documents. The editors will not be rewriting content. They will look for redundancy, factual errors, consistency, etc. Citations and footnotes will need to be included by the EAC drafters. Energetics will provide a style guide to the drafting teams to make it easier to reach a common format.

Recommendations will be fine-tuned and near-final drafts will be sent to Energetics by October 17. Chair Stuntz asked members to be mindful of the time constraints and the fact that all of the documents are drafts and nothing is final or approved at this stage. In addition, no one is authorized to speak for the EAC.

To facilitate easier editing of future reports, Energetics suggests that the EAC consider using some document control software that some offices in DOE have recently adopted. These offices use the software in developing final rules, and in these situations, the office needs an efficient way to consider comments by many parties concerning a draft text. The software is very user-friendly and allows individual users to enter comments and suggest line edits. The advantages of the system are that it allows users to view an array of others' comments without having to juggle separate markups from each reviewer, and

it also avoids the visual clutter that can result when successive reviewers use conventional word-processing software (such as Microsoft Word) to mark up a document. [The EAC did not make any decision about whether to try using the new software.]

Treatment of Alternative Views

Mr. Heyeck indicated he would try to meet the deadline although he felt it might be necessary to present alternative views in the transmission chapter because transmission siting is a contentious issue within the Committee. Ms. Grueneich and Mr. Heyeck will work together to try to agree on a common text. Chair Stuntz commented that in case of disagreement, the section could express alternative views, rather than a majority position with dissenting views. However, she indicated that avoiding the need for alternative views would be best.

Vice Chair Mansour expressed concern about providing DOE with two opposing views. It would be more difficult for them to take action if there is not a clear recommendation. Mr. Nevius suggested the text could list the pros and cons of different views for DOE's consideration.

Adjournment

Chair Stuntz opened the meeting for comments from the public. No comments from the public were offered, and the meeting was adjourned at 1:33 pm EDT.

Respectfully Submitted and Certified as Accurate:

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Linda Stuntz, Esquire
Stuntz, Davis, and Staffier, P.C.
Chair
DOE Electricity Advisory Committee

_____November 28, 2008_____

Date