Northwest Power and Conservation Council

March 30, 2006

MEMORANDUM

TO: Power Committee

FROM: Ken Corum

SUBJECT: Discussions with the Regulatory Assistance Project about a demand response initiative in the Pacific Northwest

As part of the Council's 5th Power Plan's action plan, the staff has been working with a number of parties both inside and outside the region to monitor developments in demand response and to encourage the achievement of all appropriate demand response. This work has included participation in design and evaluation of research, participation in conferences on demand response, and the conduct of workshops here in the region.

The Regulatory Assistance Project (RAP) is a non-profit organization that has worked since 1992 in a wide variety of projects related to electricity utility regulation. Recently RAP has conducted two efforts that are particularly interesting to those of us who are working to stimulate demand response in this region. RAP worked on the New England Demand Response Initiative (NEDRI) and the Mid Atlantic Distributed Resources Initiative (MADRI). More information about these initiatives is included in the attached background paper.

A representative of RAP, Richard Sedano, participated by telephone in our most recent demand response workshop. He described the processes that RAP has conducted and some of the progress that has been achieved. An initiative along these lines has the potential to contribute to several of the Plan's action items for demand response: the expansion and refinement of existing demand response programs (DR-1), the evaluation of improved metering and communications technologies (DR-4) and the exploration of acceptable price mechanisms (DR-6). The initiative could also contribute to Actions GEN-1 through GEN-6, which are intended to encourage generation owned by non-utilities, including distributed generation.

The participants of the workshop expressed sufficient interest in further discussion with RAP that I have arranged a conference call for April 4 that will include at least one commissioner from each of the region's states, Mr. Sedano and Mike Weedall, VP of BPA Energy Efficiency.

Staff will report on results of the conference call at the Power Committee meeting in Whitefish.

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Background on RAP/NEDRI/MADRI

The Regulatory Assistance Project (RAP) has conducted two initiatives similar to the initiative under discussion for the Pacific Northwest. The first, the New England Demand Response Initiative (NEDRI), ran from February 2002 to July 2003. A summary description of the NEDRI process is at http://nedri.raabassociates.org/ and the final report is at http://nedri.raabassociates.org/Articles/FinalNEDRIREPORTAug 27.doc. The MADRI process began in June 2004 and is still underway. There's a lot of information about the process so far at http://www.energetics.com/madri/.

To give more succinct accounts of the processes, I've attached an excerpt from the introduction to the NEDRI final report and the testimony of one of the participants of the MADRI process at the FERC Demand Response and Advanced Metering Conference in January 2006.

The initiative processes RAP has conducted have been inclusive (40+ organizations represented in NEDRI, 30+ in MADRI) and extensive (16 meetings over 17 months for NEDRI, 35 meetings over 21 months so far for MADRI). This isn't to say that the same people go to all meetings -- MADRI has 7 different working groups. Products have ranged from an Advanced Metering Infrastructure (AMI) "Toolbox" that makes available information on numerous aspects of AMI (MADRI), to a set of model procedures for interconnecting small generators (MADRI), to 38 recommendations for the encouragement of demand response and energy efficiency programs (NEDRI).

Testimony of Rick Morgan
FERC Demand Response and Advanced Metering Conference
(Docket No. AD06-02-000)

January 25, 2006

Good afternoon. I'm Rick Morgan, Commission of the Public Service Commission of the District of Columbia, speaking on behalf of the Mid-Atlantic Distributed Resources Initiative known as MADRI.

I want to begin with some comments on why I, as a utility regulator, think that demand response is an idea whose time as come. DR is an essential component of a competitive electricity market. A supply curve without a demand curve is akin to one-hand clapping. That means that when the supplies are tight the generators hold all the cards as we witnessed in California a few years ago. And a sloping demand curve is actually a potent weapon against generation market power and price spikes.

DR offers a long list of other potential benefits that we've been hearing about today, such as operational savings, improved grid reliability, improved customer options and environmental benefits. But there are also formidable barriers that stand in the way of deployment of DR, such as the jurisdictional split between retail and wholesale markets, traditional rate designs that blend costs and dampen price signals, a ratemaking formula that rewards maximization of through-put, and particularly in our region a generation surplus that leaves little value associated with curtailing loads.

Finally, what we call the "fractured value chain," which is associated with unbundled competitive markets. As Chuck Goldman explained this morning, no single entity in an unbundled market has an incentive to pursue the benefits of DR, so we have to piece together benefits from different sources. It's this dichotomy between the potential benefits of DR and these formidable barriers that have inspired the creation of MADRI in our region.

MADRI is a collaborative effort of state PUCs, federal agencies and the PJM interconnection. It includes five state commissions from the original PJM footprint, and those are Delaware, D.C., Maryland, Pennsylvania and New Jersey, along with DOE, EPA and FERC. MADRI's goal is to remove institutional barriers that stand in the way of realizing the benefits of distributed energy resources, which is defined by MADRI to include demand response, distributed generation and energy efficiency.

MADRI has no office, no staff and no budget. It's just a commitment by a group of state, federal and regional decisionmakers to work together to solve problems.

We feel that we've made a lot of progress in less than two years since MADRI was formed. We've enhanced coordination of our states as well as with the federal government and PJM, and we've moved the ball forward on both technical and policy issues.

MADRI's heavy lifting is done by a working group which meets about every six to eight weeks. This consists of mostly commission staff, staffs of other state agencies as well as a variety of stakeholder representatives. They work with our MADRI policy advisors whose services are provided courtesy of DOE. A couple of those advisors are here today -- Brad Johnson and Wayne Shirley -- who many of you know.

MADRI is overseen by a steering committee that consists of five PUC commissioners and well as representatives from the federal agencies and PJM. Our emphasis is on providing decisionmakers with strategic data and analysis as well as with actionable items such as model rules and regulatory mechanisms.

MADRI is organized around five focus areas and I want to highlight three of those which are directly related to demand response. The first is the development of advanced metering tools. PUCs need to be acquainted with cutting edge, smart metering technologies. But, more importantly, with the policy implications of those technologies -- we held a workshop last spring where we brought in experts from across the U.S. and Canada. We turned that into a website that we call our "AMI toolbox."

Second, we're focusing on enhancing the business case for demand response, which involves assembly of the first set of benefits and getting those numbers to add up can be a real challenge given that fractured value chain associated with demand response. We're working to identify the unmonitized benefits of DR, including benefits associated with the distribution system and with mitigating price spikes.

Third, we are looking at the removal of regulatory barriers at the state level that prevent the benefits of DR from being achieved, such as replacing traditional rate designs with dynamic pricing and also tweaking the ratemaking formula with a revenue stability mechanism to remove the utilities incentive to maximize sales. We're now delivering those tools through a series of onsite briefings of the state commissions, which we began earlier this month.

The need for demand response in this region was driven home by a couple of events last year. We had a rude awakening on July 27th where we had a convergence of weather and system conditions that left us with a capacity shortage in the eastern portion of PJM and we had our first voltage reduction in many years. Indeed, we do have system constraints in some areas of PJM that can enhance the potential value of DR as a resource.

Another surprise last year was a sudden shutdown of the Potomac River plant just across the river from here in August related to environmental concerns. Fortunately, DOE and FERC have stepped in to make sure we keep the lights on in the downtown Washington area while we pursue a more permanent solution. The DOE's order has reminded us that we should be thinking of DR as a resource to help alleviate crises like this.

In conclusion, I want to mention a couple of factors that have made the MADRI approach effective.

Certainly, one is the active participation by four types of entities -- the state PUCs, federal agencies, our RTO, the PJM interconnection and a number of different stakeholders.

Secondly, the focus on actionable results and putting them in the hands of decisionmakers. MADRI still has a lot of work ahead of us. We know there aren't any easy answers, but we're convinced we have the right people in the room and they have a strong commitment to getting results. So I'm very optimistic about the prospects for demand response in the Middle Atlantic region.

Thank you.

Excerpts from NEDRI Final Report, Chapter 1: Introduction and Overview

Excerpt 1:

Demand Response Resources in Context

The **New England Demand Response Initiative** (NEDRI) was established to develop a comprehensive, coordinated set of demand response (DR) programs and policies for power markets and systems throughout the New England region. This effort grew out of a growing realization among market participants and policy makers that the efficient integration of demand response resources (DRR) would be central to the long-term success of restructured electricity markets, power portfolios, and delivery systems. This realization was based in part on early experience with wholesale power markets in New England, but to a greater extent was based on market and reliability problems in other regions, especially those in 2001-02 throughout the Western United States.

National setting. For much of the past decade, the U.S. electricity sector has been engaged in a complex process to bring increased competition to the business of electric generation, sales, and service delivery. The objectives of electric industry restructuring have been to harness the forces of competition to increase the efficiency of the electric system, to reduce costs, and to improve the services and choices offered to consumers. Initial legislative and regulatory efforts to promote competition have focused on the supply side of the market: creating trading floors for energy and capacity sales, removing barriers to independent generators and marketers, and promoting open and non-discriminatory access to the transmission grid. It was assumed by many that robust competition among a variety of **s**uppliers would be sufficient to ensure reasonable electricity rates and service options to customers.

However, the nation's experience to date with the introduction of supply-side competition has been mixed. On the positive side, competitive wholesale transactions and investment in independent generation have advanced rapidly, and some regions have seen competitive wholesale markets with a healthy balance of longer-term bilateral and short-term spot trading arrangements. But there have been problems as well, including unwanted price volatility, supplier market power, a boom-bust cycle in generation investments, little retail competition, heavy reliance on default pricing, and an underinvestment in energy efficiency and renewable supply technologies.

Lessons. A principal lesson from this experience is that competition among electricity suppliers alone (without an active demand response) is not enough to create efficiently competitive electricity markets. Electric systems face two challenges not faced by other commodity markets: (a) because storage is impracticable, load must be served instantaneously, even though demands on the grid vary considerably across time and geography; and (b) because customers are physically interconnected, and because electric service is central to economic and social well-being, continuous, universal service without interruptions has an extremely high value. Thus, the balance between demand and supply is critical *at all times*, and this balance must be assured over a *sustained period of time*. Moreover, the electric power system has a large environmental

footprint, and is crucial to the general public good. Demand response resources are an important response to these essential features of electric systems

Volatility, price spikes, worsened environmental impacts, and diminished reliability can be moderated through **actions on the demand side** of the market. Actions are needed to address two complementary needs: First, it is essential to develop active responses to market prices and system conditions on the demand side in order to enhance market efficiency and system reliability – that is, ***active load management*** by customers. Second, enhanced ***energy efficiency investments*** could lower market clearing prices, improve reliability and environmental quality, and lower the region's total cost of electric service over the long term. Furthermore, significant market barriers to cost-effective *active load management* and *energy efficiency investments* will remain, even in conditions of active wholesale competition. Thus, market and policy reforms that will call forth economic demand responses – both short-term load curtailments and longer-term reductions in consumption patterns – are needed.

NEDRI's Structure and Process

NEDRI builds upon the considerable experience of utilities, customers, service providers and governments in each of the region's states with demand-side management (DSM) over the past two decades. That experience had demonstrated the large potential for energy efficiency and demand response resources in the region, and the value of capturing those resources to serve consumers better, to reliably balance power systems, and to lower power system costs. NEDRI was created to develop DR programs and policies that would be appropriate in the region's new wholesale market structures, and within the retail structures evolving in each of the region's six states.[1] The recommendations embodied in this Report would affect both wholesale and retail markets and should result in lower prices, enhanced reliability, market power mitigation, and environmental enhancement.

The NEDRI Group's (Group) recommendations are the result of a broad-based, facilitated process involving more than 30 stakeholders representing all key electric market interests. Members that participated include ISO New England (ISO-NE), consumers, environmental and utility regulators, generators, utility companies, state energy offices, and other interested organizations (see Appendix A). The region's two neighboring ISOs (NYISO and PJM) and the key federal agencies – the Federal Energy Regulatory Commission (FERC), the U.S. Environmental Protection Agency, and the U.S. Department of Energy – also supported the process.

NEDRI first convened on February 26, 2002 and held 16 plenary meetings over 17 months, concluding in July, 2003. In addition to the plenary meetings, the Group convened several ad-hoc working groups to refine and prepare more detailed recommendations and supporting text

[1] Five states (Maine, New Hampshire, Massachusetts, Rhode Island and Connecticut) have adopted retail competition policies, with some similarities but important differences among them, while one state (Vermont) retains its historic franchise system. The entire region is served by ISO-NE, which operates the region's wholesale power markets, and conducts dispatch, operations, and reliability functions, and conducts a regional system planning process.

for consideration by the full Group. In September 2002, in cooperation with the FERC and ISO NE, NEDRI also convened a national workshop on demand response. This workshop focused on the needs and suggestions of DR providers and end-use customers, and provided valuable insight on DR policy topics from many market participants from across the nation.

The Group studied, discussed, and created program recommendations in numerous areas including: regional reliability, regional (short-term) demand response programs, retail pricing and metering, energy efficiency, load participation in providing contingency reserves, and power delivery. For each program area, the Group first established basic principles around which programs should be designed. It then deliberated and sought consensus on specific policy recommendations and program features.

Since DR resources necessarily involve the participation of a broad range of market participants and involve both wholesale and retail issues regulated by federal and state regulators, it is essential to coordinate the development and implementation of DR programs. NEDRI intends that these recommendations, most of which bear the consensus seal of approval of the NEDRI stakeholders, could serve as a model for other regions to follow

Throughout the process, NEDRI's work was supported by a team of expert advisors, who developed Framing Papers, draft recommendations and other guidance documents for the Group's consideration; a professional facilitation team who framed and guided deliberations; and a dedicated website which served as an archive and clearinghouse for all project-related documents. An extensive collection of materials related to Demand Response has been developed for this project.[2]

Principles for Demand Response Resources

The overall objective of NEDRI has been to devise an effective long-term strategy for demand responsiveness, which includes load response resources and efficiency investments, in New England's power systems and markets. The NEDRI members agree that such demand responsiveness is an essential component of the wholesale market, and can be compatible with both competitive and franchise retail markets. NEDRI participants envision a regional economy and environment enhanced by a more productive and less wasteful electricity system, and one that is more reliable and more vigorous due to broad-based competition among both supply-side and customer-located resources.

At the outset of the NEDRI process, the Group discussed in general terms the goals of demand response, and general principles that should guide policy and program development. The cross-cutting general principles that NEDRI concludes should inform the design and implementation of a wide range of demand-response programs and resources are set out below:

- **Efficiency and productivity:** New England's electric system is a complex web that includes generation, transmission, and distribution services, together with end-use applications and equipment at customer locations. The overall efficiency of this *entire*

[2] The most important background materials and supporting documents are set out in Appendix C.

network is a principal focus of public energy policy. The overriding objective of the NEDRI process is to develop energy markets and public policies that will maximize the value of electricity services in the region, while minimizing the total societal cost of electricity production, delivery, and use.

- **Using market forces:** As historic aspects of the vertically-integrated electric system decline, electricity markets in New England have become more competitive. The region's basic markets for electrical energy, capacity, and ancillary services should be designed so that they are workably competitive, and open to comparable demand-side resources on a level basis with more traditional supply-side resources. Wherever possible, end-use customers should be empowered to deliver distributed resources, including load management, energy efficiency resources, and clean distributed generation to regional electricity markets, at prices that reflect the value of those resources to the grid.

- **The role of public policy.** While the region's emerging electricity markets hold great promise in certain areas, market outcomes alone are not a substitute for public policy. Lacking a well-developed demand response, and with only modest retail competition, the region's power markets are not yet fully developed. In addition, market barriers still block many cost-effective end-use investments in load management and energy efficiency, and certain public costs, including environmental and reliability costs, are not fully reflected in today's market prices. For these reasons, public policy should intervene when market mechanisms alone do not capture the full value of demand-side resources.

- **Comprehensiveness**: One critical lesson from the region's *historic* experience with utility DSM programs is that multi-faceted DSM programs are needed to tap the efficiency and load management resources that are embedded in numerous, diverse end-use technologies and locations. One critical lesson from the region's *recent* experience with regional power markets is that divestiture and default service plans can create new barriers between wholesale costs and the retail prices that customers face. To maximize the value of demand resources within the region, decision-makers must view the electric system comprehensively, consider market rules, tariffs, and policies at both the wholesale and retail levels; and employ a variety of tools to develop and deliver demand response resources to the system.

- **Environmental Protection.** Beyond its economic and reliability benefits, demand response has the potential to provide long-run environmental benefits through greater investment and innovation in energy efficiency, decreased peak load energy and transmission requirements, and increased use of low or non-polluting small-scale supply resources. However, because of the possibility that demand response resources could increase air emissions associated with the provision of electric services, environmental impacts and policies are of primary concern in shaping demand response programs and opportunities. Demand response programs should ensure no net environmental harm in the short run, and in conjunction with electric supply resources should contribute to improved air quality over time.

- **Administrative Simplicity.** Experience with regulated programs of many kinds, and with market-based demand management options, teaches us that both market and regulatory transaction costs can create barriers to a more efficient power system. An overemphasis on regulatory process, participation preconditions, or on complex market rules may, on the whole, be counter-productive. Demand response market rules and programs should be designed to minimize transaction costs and regulatory requirements, consistent with principles of overall cost-effectiveness, market sensitivity, public accountability, and consumer equity.

Excerpt 2:

Structure of This Report

In the following chapters, NEDRI addresses the broad range of DR resources set out above. Chapter 2 begins with detailed discussion of program design elements for *regional DR programs*, administered by ISO-NE to address acute reliability problems and mitigate high prices. Chapter 3 focuses on policies for *retail pricing and metering* that would enhance both short-term and long-term demand responses at the customer level. In Chapter 4, we examine the role of long-term investments in *energy efficiency resources*, and emphasize their contribution to both capacity and energy savings Chapter 5 addresses policies and programs that could call forth DR resources to provide reliability-based *contingency reserves*, which would enhance the reliability of the wholesale electricity system. Chapter 6 focuses on *power delivery systems*, and presents recommendations for tapping DR resources to relieve congestion and promote reliability across the region's transmission and distribution grids.

In these chapters NEDRI participants present a broad view of the potential for DR resources to improve the reliability of New England's power system, and to lower its financial and environmental costs, by making customer-based resources available to energy resource portfolio managers, to energy and capacity markets, and to system operators.

NEDRI has adopted a total of 38 recommendations to support the comprehensive development of cost-effective DR resources throughout the region. These recommendations represent the consensus of all NEDRI members except in limited circumstances noted in the text.[3] [4] However, beyond the 38 specific recommendations, as with any consensus process, individual stakeholders may not agree with each specific example, specific wording or with an unintended implication that might be drawn from a particular recommendation.[5] In adopting these recommendations the NEDRI members recognize that their implementation by the states, regulated utilities, ISO-NE or

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[3] Consistent with NEDRI's ground rules, the following state agencies are abstaining from endorsing the final recommendations in the Report: Connecticut Department of Public Utility Control, Maine Public Utilities Commission, Massachusetts Department of Telecommunications and Energy, New Hampshire Public Utilities Commission, Rhode Island Public Utilities Commission, Vermont Public Service Board. See their letter of support in Appendix F.

[4] While unanimously supporting recommendation PD-6 in the Power Delivery chapter, NEDRI goes on to offer 3 alternative implementation paths supported by different members.

[5] National Grid, Northeast Utilities and United Illuminating have an overriding concern about statements in this report that can be interpreted to suggest that their independence could be compromised by directing their participation in demand response programs. See pages 122-123 for further details.

other affected parties is contingent upon approval by their respective governing agencies and that its members are free to present the particular views of their organizations in any proceedings in which these recommendations are being considered.