

Chapter 3: Energy Efficiency

DSM Evaluation

A comprehensive DSM Evaluation was completed in June 2007. NorthWestern retained NEXANT, Inc. through a competitive bidding process to provide extensive services required for a thorough review and analysis of the design, implementation, operation and results of NorthWestern's DSM Programs during the 2004-2006 time period. The scope of the evaluation covered all energy efficiency and renewable energy programs funded either through default supply or the Universal System Benefits (USB) charge. NorthWestern interacted with the Electric Technical Advisory Committee (ETAC) at various phases of the design of the DSM Evaluation Request for Proposal, the selection of the final bidder, and review of the results of NEXANT's work.

In its Final Report, NEXANT included review of processes used by NorthWestern to administer the programs, energy savings impacts that resulted from customer participation, economic evaluation of the cost-effectiveness of the programs, and evaluation of the Lost Revenue Recovery Mechanism in use by NorthWestern. The full report produced by NEXANT is included in Part 2, Chapter 3.

NEXANT concluded that NorthWestern's DSM Programs are well designed and include several features that are consistent with Best Practices in the industry for utility-sponsored DSM Programs. NEXANT's analysis demonstrates that NorthWestern's default supply DSM Programs are cost-effective, with a benefit/cost ratio of 1.64 for the total portfolio of default supply DSM Programs.⁹ NEXANT concluded that NorthWestern should continue with the programs as presently designed, and consider its recommendations for further improvements. In 2008, NorthWestern intends to work with ETAC or a subset of interested

⁹ Evaluation of NorthWestern Energy's DSM Energy Efficiency Programs; Nexant, Inc. June 2007, Table 3-16, page 3-13.

ETAC members to obtain advice regarding the recommendations from NEXANT for modifications and improvements to the DSM Programs.

DSM Programs and Expected Energy Savings

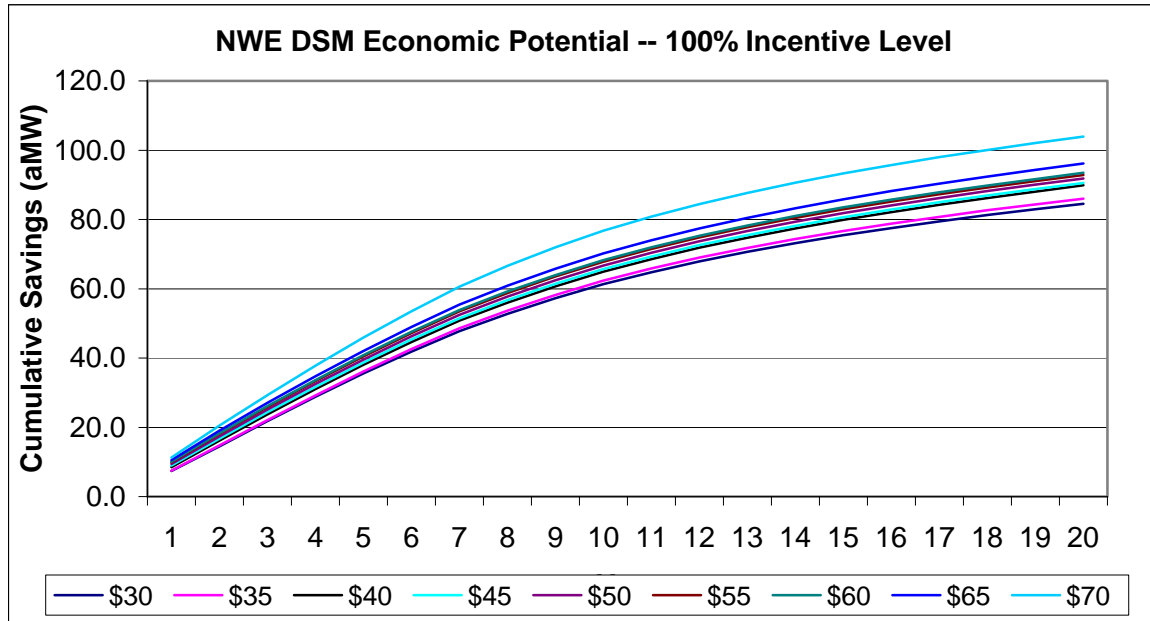
The value of DSM Programs, and which individual DSM measures are included in each program, is based upon future electricity avoided costs. The outlook for future electricity supply costs has changed since the last update of this Plan. NorthWestern has been using \$45/MWH avoided cost for the past two years, but an updated electricity supply price forecast indicates that a higher avoided cost is appropriate for DSM Programs and DSM measures. NorthWestern will use \$62/MWH avoided cost¹⁰ for the next two years for various analytical purposes associated with its DSM Programs.

DSM potential is affected by NorthWestern's assumed avoided cost. In its 2005 Plan, NorthWestern presented DSM Supply Curves constructed based on work performed by KEMA, Inc.¹¹ In this work, KEMA screened DSM measures and computed DSM potential at various avoided costs ranging from \$35/MWH to \$70/MWH. From this data, NorthWestern constructed DSM Supply Curves as shown in Figure 3-1 below.

¹⁰ Calculations of levelized avoided cost, and the supporting electricity supply forecast, are provided in Volume 2, Chapter 3.

¹¹ DSM Assessment Update, KEMA, Inc., April 16, 2006.

Figure 3-1, DSM Supply Curves



The DSM Supply Curves show that the 20-year potential for DSM remains in the range of 90-95 aMW at an avoided cost level of \$62/MWH. This may seem somewhat counterintuitive; higher avoided costs (\$45/MWH to \$62/MWH) should cause higher DSM potential. However, as energy prices increase, price-induced energy conservation actions by customers (outside of NorthWestern Energy’s DSM Programs) increase also, and have the effect of tempering or moderating the amount of DSM that can be captured by NorthWestern’s DSM Programs.

With long-term DSM potential remaining at approximately 90-95 aMW (less the amounts of DSM acquired to date), NorthWestern will continue to follow its DSM Plan now in the fourth year of its 20-year DSM acquisition schedule. Annual DSM goals remain at 5.0 aMW/year. Early in 2008, individual DSM measures for each of the programs will be re-evaluated using the \$62/MWH avoided cost. Also, incentive and rebate levels for programs and specific measures will be reviewed and adjusted as appropriate with an aim toward increasing participation in NWE’s DSM Programs. By the end of 2009, NorthWestern will complete a new electric DSM Assessment to refresh the data on cost-effective DSM measures and DSM potential, and will revise its long-term DSM Plan accordingly.

The default supply DSM Programs to be offered in 2008 and beyond include those now in place:

- E+ Home Lighting Rebate Program
- E+ Commercial Lighting Rebate Program
- E+ Residential Electric Savings Program
- E+ Residential New Construction Program
- E+ Electric Motors Program
- E+ Business Partners Program
- Northwest Energy Efficiency Alliance

In addition to incorporating appropriate program modifications and improvements recommended by NEXANT, NorthWestern is intensifying its efforts to market its DSM Programs and recruit participants. Additional contractor staffing is now in place to contact commercial customers and market the E+ Business Partners Program. Additional resources and funding are being directed to marketing and outreach activities in support of each specific program, and for all DSM Programs in general. NorthWestern has entered into a multi-year contract with the National Center for Appropriate Technology (NCAT) for DSM Program services. This provides NCAT with additional business stability needed to hire additional staff devoted to NorthWestern Energy DSM Program work. NorthWestern has recently included motor rewinding as an approved measure for the E+ Electric Motors Program and additional motor training seminars are planned for dealers, contractors, installers and building operations/maintenance personnel.

The Northwest Energy Efficiency Alliance (NEEA) will be in a transitional period during the next two years. Some of the energy efficiency markets have been substantially transformed, and NEEA is in the process of changing its customer sector initiatives, focusing more on very large commercial and industrial facilities that are not typical of NorthWestern default supply customers and markets. NorthWestern's funding cycle with NEEA continues through 2009. At the end of

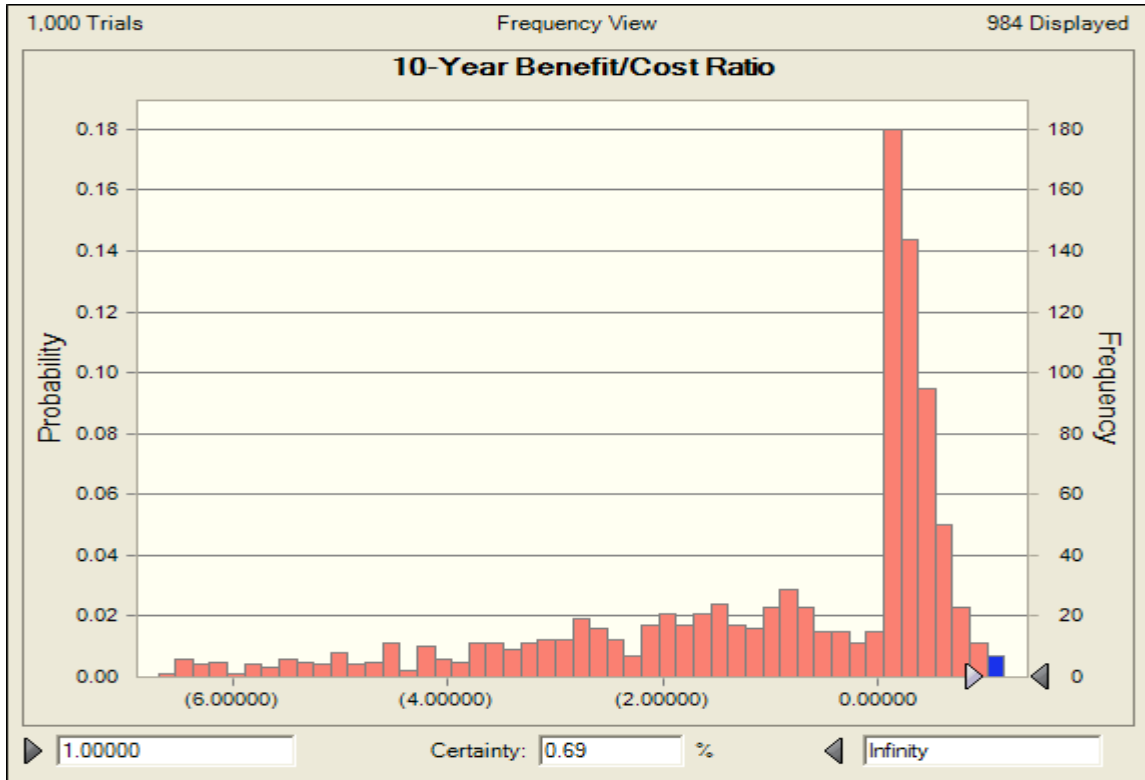
that period, NorthWestern will evaluate its future association with NEEA and make a determination whether or not to continue.

Demand Response

Analysis of a proposed Residential Time of Use (TOU) Pilot Project was completed in 2007.¹² The scope of this project was a 500-point residential customer trial to be conducted in Missoula, MT during a two-year period. Extensive preliminary work was completed with ITRON, Inc. to identify technology to be used and estimate costs that would be incurred to deploy systems, advanced metering infrastructure (AMI), and customer communication activities needed for the project. Dynamic benefit/cost analysis was performed to simulate multiple possible outcomes against key input variables related to on-peak and off-peak energy prices, amounts of load shifting and/or energy conservation effected by pricing signals, customer participation levels and many other variables. The results of this work are summarized in the following Figure 3-2, which shows that the contemplated TOU Pilot Project is expected to produce a benefit/cost ratio of 1.0 or greater in only 0.69% of the cases (combinations of values for key input variables) that were analyzed.

¹² See Volume 2, Chapter 3: NWE RES TOU – Version 7.xls

Figure 3-2, Residential Time of Use Pilot Program Analysis Results



NorthWestern’s initial conclusions from this analysis are that the pilot project economics are not favorable under any reasonable combination of key input variables. The primary factors contributing to this analytical outcome are:

- 1) Energy supply price spreads between on-peak and off-peak time periods are not large enough
- 2) Insufficient customer density
- 3) Insufficient load density
- 4) The value of the “Demand Response” savings (amount of load shifting from peak to off-peak periods) will not support the infrastructure costs

NorthWestern believes that a Residential Time of Use Pilot Project as originally envisioned is not sufficient to produce enough information needed for decisions

about broad application of AMI, TOU and other related Demand Response capabilities and associated benefits that AMI communications technology could make possible. Specifically, the potential operational savings¹³ are not available in a pilot project with limited duration. Permanent business changes that result in operational savings are not likely to happen as a result of a pilot project. In view of the limited useful information that a pilot project would yield and the unfavorable benefit/cost analysis findings, NorthWestern has decided not to pursue the Residential TOU Pilot Project.

AMI is an enabling technology for TOU and several other possible Demand Response Programs. To seek a clearer answer to the principal underlying question of whether combined Demand Response savings and operational savings can offset the cost of the required AMI infrastructure, a comprehensive study of a full-scale, system wide implementation of Demand Response would be necessary. Effects of different rate designs could be incorporated into such a study, or done separately as part of the allocated cost of service/rate design process. NorthWestern looks forward to MPSC comments on whether or not a system wide Demand Response study and its associated costs is appropriate.

Lost Transmission and Distribution Revenues

The potential for lost transmission and distribution revenues (Lost Revenues) resulting from NorthWestern's DSM Programs remains a concern. The MPSC ordered, on an interim basis, the use of a Lost Revenue Recovery Mechanism that adjusts default supply rates annually to account for Lost Revenues and eliminate this disincentive. This mechanism also incorporates a self-correcting true-up feature with each successive annual electric tracker filing to adjust the prior year forward-looking Lost Revenues with observed results from DSM Programs. The true-up is again performed following a comprehensive DSM Program Evaluation performed every few years. Interim approval of the Lost

¹³ Operational savings include improvements in billing, dispatch, meter reading, outage detection, theft detection and prevention, transmission/distribution system planning, Call Center workload, capital deferral, and other items.

Revenue Recovery Mechanism was ordered by the MPSC until the results of a comprehensive DSM Evaluation could be reviewed and a determination made about whether to continue with the existing mechanism, an alternative mechanism or no mechanism.¹⁴

In its Final Report, NEXANT referenced a recent federal initiative¹⁵ that recognized the significance of policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments. Elimination of the “throughput incentive”¹⁶, as well as simple recovery of allowed delivery service costs, is closely associated with recovery of Lost Revenues, and the specific mechanics of a Lost Revenue Recovery mechanism matter less than the existence of a satisfactory mechanism.

NorthWestern believes that the Lost Revenue Recovery mechanism that has been approved by the MPSC on an interim basis and is currently in use, together with recovery of DSM Program costs through the electric supply tracker, is satisfactory and effective in eliminating financial disincentives to DSM Programs under current ratemaking practices.

Various documents, studies and reports are used to support the DSM and Demand Response activities incorporated into this Plan. These sources and reference materials are provided in Volume 2 of this Plan, and include the following:

¹⁴ Order 6574e, Docket D2004.6.90.

¹⁵ *National Action Plan for Energy Efficiency*; US Department of Energy and US Environmental Protection Agency, July 2006.

¹⁶ With traditional ratemaking where a utility’s revenues and profits are dependent on the amount of energy sales, a utility has a financial incentive to increase energy sales (or energy throughput over the transmission/distribution lines) in between rate cases when transmission and distribution rates are set.

- Evaluation of NorthWestern Energy's DSM Energy Efficiency Programs; Nexant, Inc. June 2007 (Summary Findings and Final Report)
- Summary list of NEXANT's recommendations for DSM Program changes
- 2008 Electric Default Supply Levelized Avoided Cost for DSM
- DSM Assessment Update, KEMA, Inc., April 16, 2006 (file name: Results 4-13-06 with Supply Curves.xls)
- NorthWestern Energy Residential Time of Use Rates - Analysis (file name: NWE RES TOU – Version 7.xls)
- National Action Plan for Energy Efficiency; US Department of Energy and US Environmental Protection Agency, July 2006 (Executive Summary and full report)