BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

| | |
|---|---|
| Beverly Jones Heydinger | Chair |
| Nancy Lange | Commissioner |
| Dan Lipschultz | Commissioner |
| John A. Tuma | Commissioner |
| Betsy Wergin | Commissioner |

Mark S. Mitchell
Director of Operations and Chief Operating Officer
Southern Minnesota Municipal Power Association
500 First Avenue SW
Rochester, MN 55902-3303

SERVICE DATE: February 10, 2015

DOCKET NO. ET-9/RP-13-1104

In the Matter of Southern Minnesota Municipal Power Agency's Submittal of its 2014-2028 Integrated Resource Plan

The above entitled matter has been considered by the Commission and the following disposition made:

**Accepted the 2014-2028 resource plan of Southern Minnesota Municipal Power Agency (SMMPA), maintaining the plan's base case scenario for demand-side management energy savings.**

**Required SMMPA to file the following status updates (which may consist of a letter referring to other filings) in a compliance filing by December 1, 2016:**

**A. Its demand-side management efforts.**

**B. Its distributed generation efforts.**

**C. The effect, if known, of federal environmental regulations.**

**Required SMMPA to file its next resource plan no later than December 1, 2017.**

The Commission agrees with and adopts the recommendations of the Department of Commerce and SMMPA that are attached and hereby incorporated into the order. This order shall become effective immediately.

BY ORDER OF THE COMMISSION

Daniel P. Wolf

Daniel P. Wolf
Executive Secretary

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MINNESOTA DEPARTMENT OF COMMERCE

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March 27, 2014

Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147

RE: **Comments of the Minnesota Department of Commerce, Division of Energy Resources**
Docket No. ET9/RP-13-1104

Dear Dr. Haar:

Attached are the comments of the Minnesota Department of Commerce, Division of Energy Resources (the Department) in the following matter:

> Southern Minnesota Municipal Power Agency's (SMMPA) 2014-2028 Integrated Resource Plan.

The petition was filed on November 27, 2013. The petitioner is:

> Mark S. Mitchell
> Director of Operations and Chief Operating Officer
> Southern Minnesota Municipal Power Association
> 500 First Avenue SW
> Rochester, MN 55902-3303

The Department recommends that **the Commission accept SMMPA's integrated resource plan for planning purposes**. The Department's analytical team of John Kundert, Susan Peirce, Zac Ruzycki and myself is available to answer any questions the Minnesota Public Utilities Commission may have.

Sincerely,

/s/ CHRISTOPHER T. DAVIS
Rates Analyst

CTD/ja
Attachment

# BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

# COMMENTS OF THE MINNESOTA DEPARTMENT OF COMMERCE, DIVISION OF ENERGY SERVICES

DOCKET NO. ET9/RP-13-1104

## I. INTRODUCTION

### *A. OVERVIEW OF THE FILING*

Minnesota Rules parts 7843.0100-7843.0600 require electric utilities to file proposed integrated resource plans (IRPs) every two years. The present filing covers the period of 2014 through 2028.

### *B. AGENCY BACKGROUND*

Southern Minnesota Municipal Power Agency is a collectively owned electric generation and transmission agency with 18 member municipalities. SMMPA's main source of electricity is its 41 percent share of the 884 megawatt (MW) Sherco 3 coal generating unit located near Becker, Minnesota. Sherco 3 generates approximately 75 to 85 percent of SMMPA's energy. SMMPA also relies on the array of intermediate and peaking units of its members as key elements in the Agency's energy mix. In addition SMMPA has more than 110 MW of renewable resources.

## *C. SMMPA'S PLANNING PROCESS*

### *1. SMMPA's IRP Planning Process*

SMMPA used the following approach in its 2013 IRP planning process:

a. Forecasted SMMPA's energy and demand for years 2014 to 2028.[1]

b. Evaluated current resource capabilities including thermal, renewable, purchased power agreements, and demand side management (DSM) and subtracted member curtailments to determine future resource needs.

c. Selected Navigant Consulting to conduct a DSM technical potential screening to estimate technical, economic and market / achievable potential for the SMMPA system. Given that in the past, SMMPA's modeling had shown that all DSM would be chosen as cost-effective by its capacity expansion model, for this year, SMMPA included the maximum amount of economic DSM in its Aurora model and compared the cost of that plan to a plan without DSM.

d. Hired SAIC (formerly R.W. Beck) to determine technically viable supply-side resource options for consideration in SMMPA's plan, including capital and operating costs and performance characteristics for each potential resource, including:
   - Nuclear Power
   - Pulverized Coal (supercritical boiler technology)
   - Integrated Gasification Combined Cycle (IGCC)
   - Natural Gas Combined Cycle
   - Wind
   - Solar Photovoltaic
   - Biomass Technologies/Landfill Gas
   - Reciprocating Engines
   - Combustion Turbines
   - Short Term Capacity-Only Purchases

[1] SMMPA's forecasting approach and results are explained and discussed in Section Z below.

e. SMMPA input the following data into the AURORAxmp Electric Market Model[2] to model SMMPA's least-cost plan:

- Energy and peak demand forecast;
- Operating costs and characteristics of existing resources;
- Capital, O&M costs, and operating characteristics for supply-side options;
- Capital, O&M costs, and operating characteristics for demand-side option;
- Fuel prices for various fuel types and future escalations; and
- Externality and allowance costs for various pollutant emissions.

f. SMMPA's Aurora modeling included the following base case assumptions:

- 9.3 percent minimum installed capacity reserves;[3]
- Compliance with the Minnesota Renewable Energy Standard (RES); and
- DSM averaging 1.29 percent of retail sales over the 15-year planning period.[4]

g. SMMPA conducted scenario analysis which included different combinations of DSM savings, externality costs, gas costs, and location marginal prices (LMP), and

h. SMMPA also considered several contingencies, including sudden large load additions, failure or retirement of existing facilities, and increased competitive environment.

*D. SMMPA'S PROPOSED RESOURCE PLAN*

SMMPA's long-term proposed action plan is illustrated in Table 1 below.

[2] AURORA is a production cost model model using market fundamentals to forecast marginal prices in market zones over long-term planning horizons. Market economics are used to determine long-term resource potential under varying future conditions including fuel prices, available technologies, environmental constraints, and future demand forecasts.

[3] SMMPA states that the capacity accreditation for all generation resources in its modeling was updated to reflect current MISO UCAP process, which derates the capability of each generator based on their historical forced outage rate. The MISO reserve was 6.4 percent for 2013 and is 7.3 percent for 2014. For the instant IRP, SMMPA assumed a reserve requirement of 9.3 percent to allow for unforeseen changes in the MISO reserve requirements or individual generator forced outage rates over time.

[4] SMMPA incorporated DSM into its modeling by mapping the energy savings of all of the different types of conservation measures against a set of load shapes by sector and end-use to build a savings production shape that was subtracted from the Agency's load shape in AURORAOxmp.

**Table 1: SMMPA's Proposed Resource Plan**

| Year | Peaking Purchase (MW) | Combustion Turbine (MW) | Wind (MW) | New DSM (Peak MW) |
|---|---|---|---|---|
| 2014 | | | | 1.0 |
| 2015 | | | | 1.0 |
| 2016 | | | | 1.0 |
| 2017 | | | | 0.9 |
| 2018 | 30 | | 2.5 | 1.1 |
| 2019 | 30 | | 5 | 1.2 |
| 2020 | 20 | 50 | 7.5 | 1.5 |
| 2021 | 10 | | 23 | 1.5 |
| 2022 | 10 | | 23 | 1.6 |
| 2023 | 10 | | 23 | 1.6 |
| 2024 | 10 | | 23 | 1.6 |
| 2025 | 10 | | 23 | 1.6 |
| 2026 | 10 | | 23 | 1.5 |
| 2027 | 20 | | 23 | 1.6 |
| 2028 | 20 | | 23 | 1.5 |

Table 1 shows that the Company plans to purchase capacity beginning in 2018 and continuing through the rest of the planning period. In 2020 the Company plans to construct or purchase output from 50 MW of combustion turbines. The new wind capacity shown illustrates annual nameplate contributions.

## II. DEPARTMENT ANALYSIS

The Department did not conduct a separate Strategist analysis of SMMPA's 2014-2028 IRP because, even though SMMPA's proposed plan includes addition of more resources, SMMPA's long-term needs were not substantial and SMMPA does not use Strategist. It would not have been a reasonable use of limited resources for the Department to undergo the time- consuming effort to recreate SMMPA's system given that the Agency does not use Strategist, and the Commission's role in this proceeding is advisory.

The Department's primary goal was to ensure that the Agency plans to procure enough resources to ensure that its system remains reliable. Maintaining reliability is important not just for SMMPA's customers, but for all of the region. Inadequate resources can lead to higher regional prices and to reliability problems for SMMPA's surrounding utilities. In particular, the Department reviewed:

a. SMMPA's forecast
b. SMMPA's estimate of its future needs
c. Whether SMMPA's proposed plan would provide a reliable system
d. SMMPA's DSM planning
e. SMMPA's compliance with the Minnesota Renewable Energy Standard (RES)
f. SMMPA's progress in meeting Minnesota's greenhouse gas reduction goal.

Overall, the Department concludes that SMMPA used a reasonable planning approach. SMMPA identified its resource needs in the short-term and long-term, and considered a wide range of potential resources for satisfying those needs. DSM was included in the base case (business as usual) at 1.3 percent of retail sales and SMMPA conducted an additional analysis considering energy savings of 1.5 percent. SMMPA considered a variety of different scenarios including resource and capital costs, and future escalations in costs due to the market, along with environmental regulations. In addition, SMMPA explored numerous contingencies that may cause significant effects to its members, member's customers, and their electricity bills. Given these facts, the Department reached its conclusion that SMMPA's overall approach is analytically sound and presented logically.

## *C. ASSESSMENT OF ENERGY AND DEMAND FORECAST*

### *1. Overview*

SMMPA forecasts its energy requirements for 2013-2028 in several steps. First, SMMPA forecasted the annual retail load served across its members using econometric forecasts of customer counts and average energy use for the residential, commercial, industrial, and other customer sectors using annual data created from monthly member records.

SMMPA then adjusted these estimates to account for the historical impact of DSM programs on the growth rates of electricity demand while allowing SMMPA to estimate savings of new DSM programs on future electricity demand growth. Next, SMMPA adjusted for distribution losses, which yields the total delivered energy requirements across all of SMMPA's members. The total delivered energy requirements are then allocated to the members based on separate econometric forecasts of total delivered energy requirements for each member. These individual forecasts are basically used to determine the ratio of SMMPA's total delivered energy requirements that each member represents.

Using an econometric forecast of load factor and the forecasted energy requirements for each member, SMMPA estimated the contribution to its summer peak from each member using monthly data. This result is SMMPA's estimate of its system coincident peak.

Finally, to develop an accurate picture of what resources SMMPA will need in the coming years, resources such as conservation measures, direct load control, interruptible load, the Western Area Power Administration (WAPA) capacity and energy allocations, and generation resources

located behind the wholesale meter are netted away from the total energy requirements. In addition, SMMPA has one member, Rochester Public Utilities (Rochester), which operates under a partial requirements arrangement with SMMPA whereby Rochester agrees to a Contract Rate of Delivery (CROD) of 216 MW. Under a CROD agreement, SMMPA serves load only up to the CROD value, with the local utility covering any excess demand. In addition to the existing contract with Rochester, another CROD is set to go into effect with Austin Utilities (Austin) in 2016 with the cap equal to Austin's 2015 coincident peak demand. To provide the most accurate forecast, any load growth for these members above the CROD must be removed from SMMPA's forecasts.

SMMPA's forecast used monthly historical utility system data provided by SMMPA's member utilities and load data maintained by SMMPA. This data includes retail billing data by customer class, system metered energy requirements, system metered peak demand, the timing of peak demand, curtailment data, DSM impacts, load-side generation, and WAPA entitlements. Further, SMMPA used historical and projected economic and demographic data provided by IHS Global Insight and Woods & Poole Economics. SMMPA used historical weather data from the National Oceanic and Atmospheric Administration (NOAA).

*2. SMMPA's Forecast Results*

SMMPA forecasted its energy requirements, as described above, from 2013-2028 using econometric models. SMMPA then adjusted these forecasts for the impacts of DSM and transmission losses. The results indicate that SMMPA expects energy needs to grow at an annual average rate of 2.6 percent from 2013-2022, and 2.4 percent from 2013-2028. In terms of Summer Peak Demand, SMMPA estimated growth rates similar to its energy requirements forecast. These forecasts are presented in Table 2 below. This forecast shows the expected energy demand for SMMPA's system using the above stated adjustments including DSM, SMMPA's CRODs, direct load control, interruptible load, the WAPA capacity and energy allocations, generation resources located behind the wholesale meter, and transmission losses. Without the inclusion of these adjustments growth averages 1.5 percent from 2013-2022, and 1.4 percent from 2013-2028.

**Table 2: Adjusted Base Case Total Energy Requirement and Peak Demand**

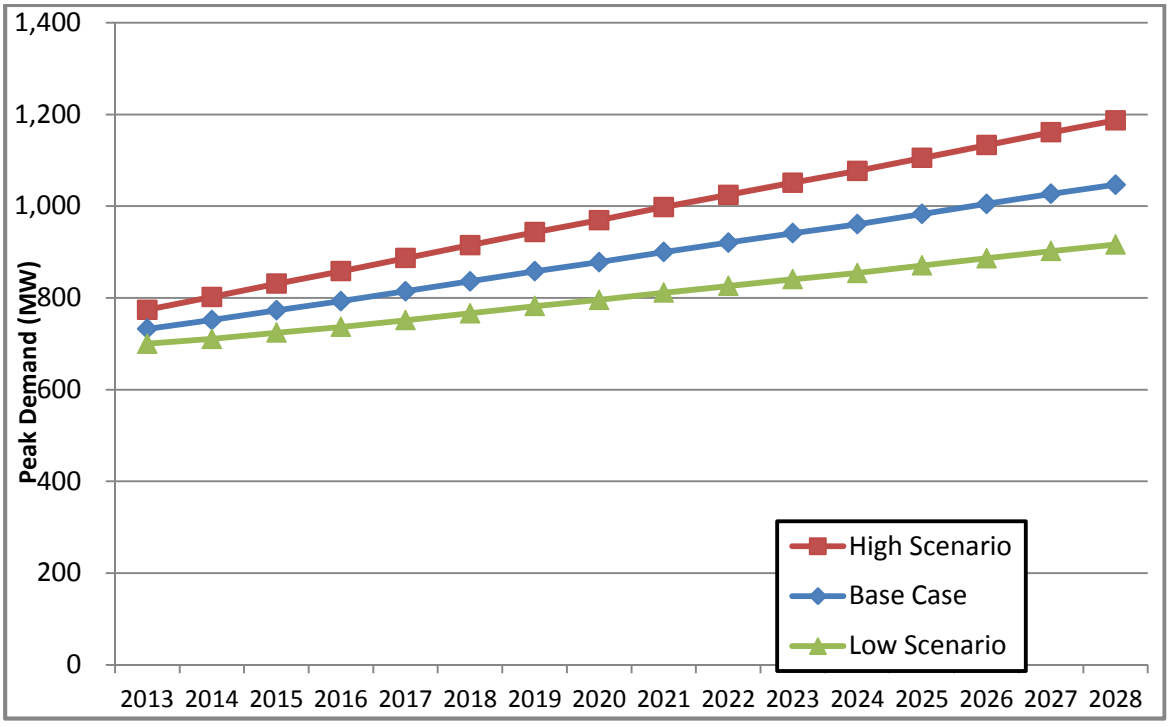
| | Base Case (MWh) | High Growth Scenario (MWh) | Low Growth Scenario (MWh) | Summer Peak Demand (MW) |
|---|---|---|---|---|
| 2013 | 3,280,744 | 3,452,724 | 3,108,689 | 732.5 |
| 2014 | 3,367,878 | 3,579,701 | 3,156,014 | 751.8 |
| 2015 | 3,461,546 | 3,709,241 | 3,213,962 | 773.1 |
| 2016 | 3,556,037 | 3,837,106 | 3,275,046 | 793 |
| 2017 | 3,635,342 | 3,946,737 | 3,324,109 | 814.6 |
| 2018 | 3,724,651 | 4,065,838 | 3,383,736 | 836.2 |
| 2019 | 3,822,137 | 4,192,806 | 3,451,870 | 858.1 |
| 2020 | 3,926,825 | 4,327,260 | 3,526,833 | 878.1 |
| 2021 | 4,019,239 | 4,447,441 | 3,591,459 | 900.1 |
| 2022 | 4,116,468 | 4,572,913 | 3,660,630 | 920.8 |
| 2023 | 4,211,847 | 4,695,975 | 3,728,266 | 941.2 |
| 2024 | 4,314,732 | 4,827,673 | 3,802,486 | 961 |
| 2025 | 4,402,714 | 4,942,018 | 3,864,176 | 983.3 |
| 2026 | 4,500,838 | 5,068,115 | 3,934,638 | 1005 |
| 2027 | 4,600,577 | 5,196,019 | 4,006,281 | 1026.9 |
| 2028 | 4,706,878 | 5,331,734 | 4,083,295 | 1047.1 |
| **Cumulative Avg. Growth Rates** | | | | |
| 2013-2022 | 2.6% | 3.2% | 1.8% | 2.6% |
| 2013-2028 | 2.4% | 2.9% | 1.8% | 2.4% |

Beyond its base forecasts, SMMPA also took into account variations in its economic assumptions. SMMPA relied on statistics published by Woods & Poole on the variation from 1984 through 2009 of various economic projections from actual results, as such data was not available from IHS Global Insight. SMMPA developed ranges for these trends of economic activity and population that represented 90 percent of potential outcomes. Using these estimations, SMMPA adjusted the Base Case Assumptions through 2028 to develop High and Low Economic Scenarios as shown in Table 2. SMMPA used these new forecast scenarios to estimate new summer peak demand values for each case. Figure 1 below shows the range of adjusted Inlet to Member System (IMS)[5] peak demand forecasts using these values from Woods & Poole. Inclusion of these scenarios allows SMMPA to create contingencies in the resource

[5] Inlet to Member System (IMS) energy demand is the total energy production necessary by SMMPA to meet all member demand after accounting for transmission losses, DSM, and other Generation.

plan to allow SMMPA to react easily to different levels of growth and maintain its ability to serve its members.

**Figure 1: Range of Adjusted IMS Peak Demand Forecasts**




*1. Department's Analysis and Recommendation*

The Department concludes that SMMPA's energy and peak demand forecasts are satisfactory for planning purposes. The statistical model, input data, and the econometric models used are all reasonable.

*D. RESOURCE NEEDS ASSESSMENT*

Two principal reasons for integrated resource planning are to: 1) ensure that a utility will have adequate resources to cover future demand, and 2) will be able to do so in a cost-effective manner. The first objective is necessary to ensure that service is reliable for the utility's ultimate customers and to avoid negative effects on other utilities and their customers. SMMPA's resource needs are shown in Table IV-1 of SMMPA's filing (2014-2028 Base Forecast & Capability Prior to Resource Plan Information) and repeated in Table 3 below. Table 3 also shows SMMPA's resource needs after implementation of the Association's long-term plan.

**Table 3: SMMPA's Estimated Resource Needs (Peak MW)***

| Year | Prior to Resource Plan (MW) | After Resource Plan (MW) |
|---|---|---|
| 2014 | 3.1 | 13.5 |
| 2015 | -7.8 | 8.6 |
| 2016 | -12.6 | 9.6 |
| 2017 | -18.0 | 9.8 |
| 2018 | -58.6 | 7.5 |
| 2019 | -69.8 | 4.9 |
| 2020 | -119.9 | 34.6 |
| 2021 | -131.1 | 7.2 |
| 2022 | -141.3 | 5.8 |
| 2023 | -151.3 | 4.8 |
| 2024 | -160.8 | 4.6 |
| 2025 | -171.7 | 2.8 |
| 2026 | -182.1 | 1.2 |
| 2027 | -192.5 | 9.9 |
| 2028 | -202.0 | 9.2 |

** A negative number indicates a capacity deficit*

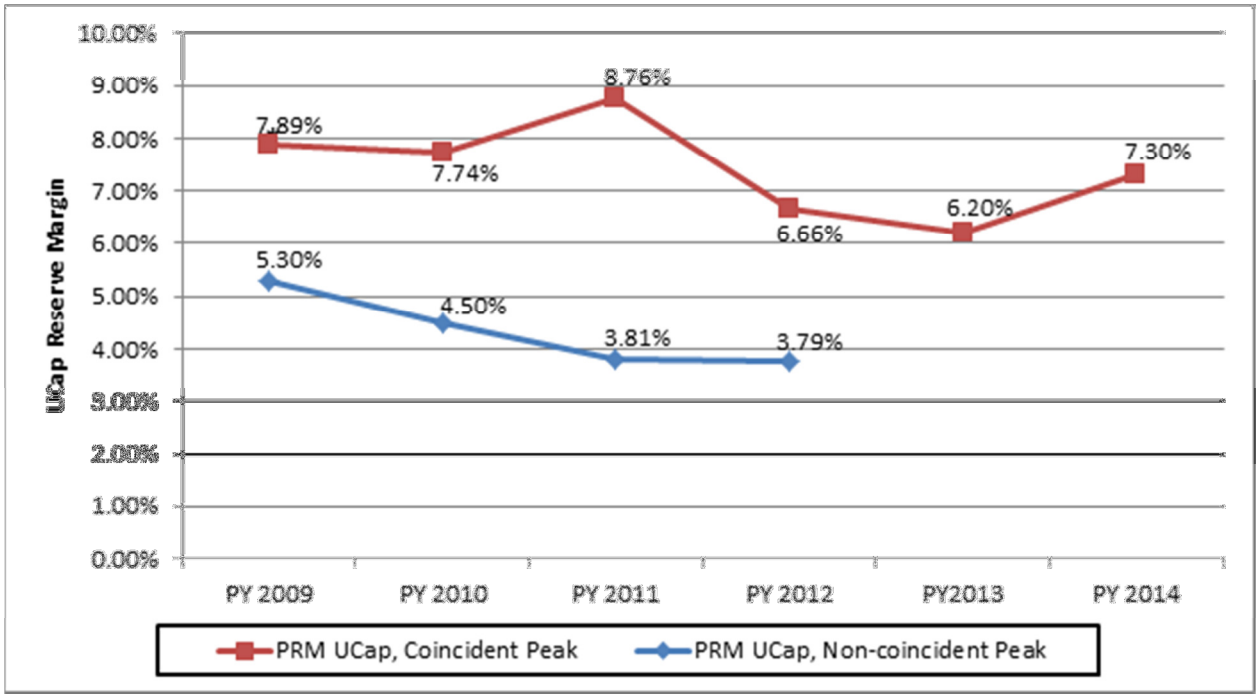
As can be seen, before adding resources, SMMPA projects a capacity deficit beginning in 2015 and has a capacity deficit of 202 MW by 2028. However, after implementing its long-term plan SMMPA would have no deficits throughout the planning period.

SMMPA's calculation of resource needs incorporated two important changes as compared to the Company's last IRP. First, SMMPA updated the capacity accreditation for all generation resources to reflect current MISO UCAP process as opposed to the previous MAPP URGE process. The MISO UCAP process derates the capability of each generator based on their historical forced outage rate.

MISO updates the capacity reserve requirement percentage annually. The MISO reserve requirement for planning year 2013 was 6.4 percent and increased to 7.3 percent for planning year 2014. SMMPA assumed a reserve requirement of 9.3 percent to allow for unforeseen changes in the MISO reserve requirements or individual generator forced outage rates over time. The Department agrees that this approach is reasonable, given current risks and uncertainty.

Figure 2 below shows the required reserve ratio as applied to the utility's own peak (non-coincident peak) and as applied to the utility's demand at the time of MISO's peak.

**Figure 2: Changes in Required Reserve Ratios**




The Department has been discussing internally what peak Minnesota utilities should plan for. Traditionally, the Department evaluated a utility's resource plant to ensure that the utility had adequate resources to cover its 50/50 system capacity forecast. Understandably, SMMPA incorporated changes MISO has implemented when calculating the value of its present resources and what its peak capacity needs are. However, the Department believes that the Commission should approve resource plans that ensure a reliable system. Planning for MISO's peak could result in adequate resources in the event that the assumed availability of regional resources and transmission are not available. Consequently, the Department believes it is reasonable also to examine what SMMPA's resource needs are assuming both the coincident and non-coincident peak demand. The Department asks that the Agency include in its reply comments:

- A calculation of SMMPA's annual capacity requirements based on its coincident peak demand and a reserve requirement of 7.3 percent, and

- A calculation of its resource needs based on the non-coincident (or system) peak rather than the coincident peak (or demand at time of MISO's peak).

The Department believes that these additional calculations will help inform the discussion that all parties should have with the Commission concerning planning for a reliable electric system.

## *F. DEMAND-SIDE MANAGEMENT*

### *1. Introduction*

One purpose of resource planning is to estimate the optimal amount of demand-side resources for meeting the Company's members' future needs. In the past, another factor used to assess the amount of DSM in a resource plan was whether it at least included the amount of energy and demand savings that would result from meeting the statutory spending requirements of the Conservation Improvement Program (CIP). The CIP statutes (Minn. Stat. §216B.2421) were changed in 2007; the statute now requires utilities to meet an energy-savings goal equal to 1.5 percent of a utility's retail sales.

In addition, Minn. Stat. §216B.2401 states:

> It is the energy policy of the state of Minnesota to achieve annual energy savings equal to 1.5 percent of annual retail energy sales of electricity and natural gas directly through energy conservation improvement programs and rate design, and indirectly through energy codes and appliance standards, programs designed to transform the market or change consumer behavior, energy savings…

In the Commission's Order accepting SMMPA's 2009 IRP, the MPUC ordered SMMPA to analyze energy savings equal to 1.5 percent of electric sales in its next filing.

### *2. Historical Performance*

Since the creation of an energy savings goal through the 2007 Next Generation Energy Act, SMMPA's annual energy savings as a percent of total retail sales has increased significantly. From 2010 (the first year of an energy saving goal) to 2012, SMMPA averaged annual energy savings of 1.56 percent of total retail sales, as compared to energy savings approximating 0.87 percent in 2007, the year the new legislation was passed, SMMPA's historical DSM conservation savings are listed in Table 4 below.

**Table 4: Historical DSM Conservation Impacts**

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|
| Energy Savings (MWh) | | | | | | | |
| Residential | 2,928 | 7,648 | 7,461 | 9,705 | 12,643 | 12,933 | 6,550 |
| Non-residential | 13,596 | 18,359 | 18,658 | 29,122 | 35,789 | 35,035 | 32,890 |
| Total | 16,524 | 26,008 | 26,119 | 38,827 | 48,431 | 47,969 | 39,441 |
| Total Savings Percentage of Retail Sales[6] | 0.56% | 0.87% | 0.88% | 1.40% | 1.69% | 1.66% | 1.38% |
| Demand Savings (non-behavioral) (kW) | 6,856 | 10,515 | 10,144 | 13,173 | 14,609 | 14,173 | 11,560 |

SMMPA estimates its installed non-behavioral DSM conservation capacity to be approximately 76.4 MW.

*3. DSM Modeling Approach*

*a. DSM Potential Study*

SMMPA hired Navigant Consulting to estimate the technical, economic, and market potential of new DSM programs for SMMPA's members. The study evaluated a total of 65 residential measures, 81 commercial measures, and 46 industrial measures; it also accounts for changes in energy codes and for re-participation of customers in energy savings programs after the useful lifespan of conservation projects. The study's detailed findings are in Appendix A of SMMPA's IRP. The cumulative technical and economic potential energy savings levels, shown in the replicated Figure 3 below, illustrate significant opportunities for DSM by SMMPA's members.

[6] The savings percentage of retail sales is different from SMMPA's CIP savings percentages because CIP achievements are measured as a percentage three year weather-normalized sales. SMMPA's CIP savings percentages are listed in table XII-1 in its IRP.

**Figure 3. Technical, Economic, and the Cumulative Base and 1.5% Scenario Market Energy Potential for All SMMPA Members (MWh)**

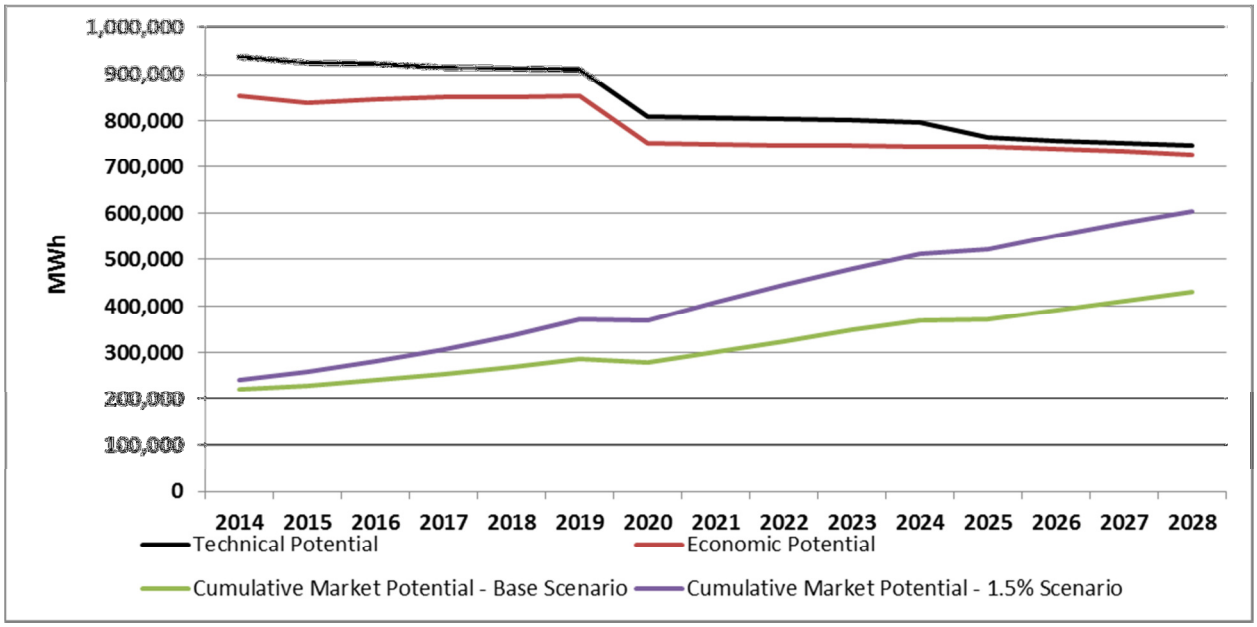


Figure 4 below shows SMMPA's incremental annual market potential by segment.

**Figure 4: Incremental Annual DSM Market Potential (MWh)**

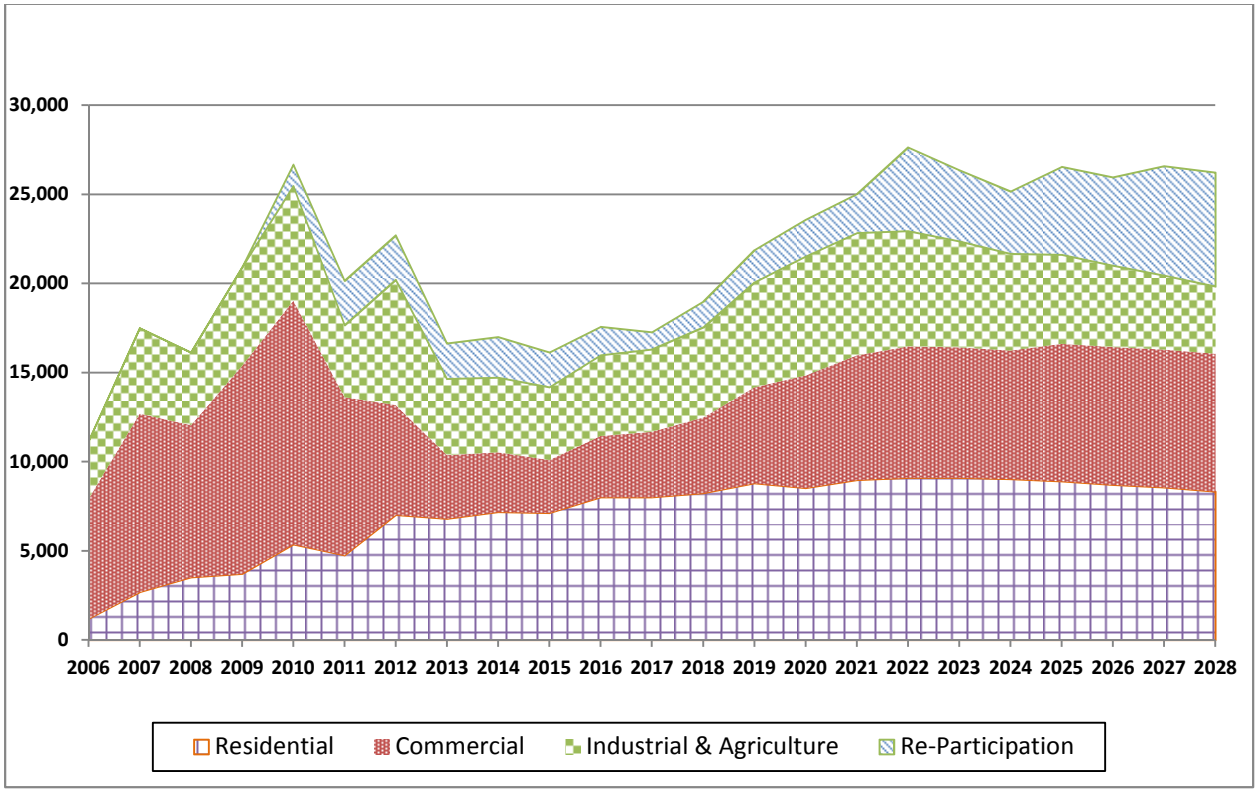



Figure 4 shows a sizable decline in incremental DSM market potential for the years 2013 through 2020. SMMPA states that changes in incremental annual savings by year are caused by the changes to codes and standards and by the addition of DSM measures as they become cost effective. If there are additional factors behind the decline in incremental savings the Department recommends that, in reply comments, SMMPA explain such factors. The Department believes that the DSM market potential study is reasonable. The Department's experience indicates that potential studies provide a way for utilities to learn about how technologies and processes will change in the future. Although they provide an estimate of potential, the Department has often seen that utilities can save higher amounts than DSM potential studies indicate.

b. Capacity Modeling and Embedded DSM

i. SMMPA's Contract Rate of Delivery (CROD)

SMMPA's Power Sales Contract with its members allows for the establishment of a Contract Rate of Delivery (CROD). After a CROD level is established (based upon the member's peak in the preceding year), the CROD Member is responsible for supplying their load each and every

hour in which it exceeds the established CROD level. SMMPA member Rochester elected a CROD beginning in 2000, and SMMPA indicates that Austin will establish a CROD in 2016.

When new efficient technology measures are installed in a CROD member system, essentially all energy savings continue to accrue to SMMPA but the capacity savings will not. Those capacity savings are realized by the CROD member. It was for this reason that SMMPA separated the current analysis into two load groups - one CROD (representing Austin and Rochester) and the other Non-CROD (representing the other 16 SMMPA members).

ii. Embedded DSM

SMMPA assumed that the average five year (2008 – 2012) DSM savings of 40,147 MWh are embedded in the forecast.[7] SMMPA made this adjustment to the retail energy forecasts to correct for the dampening effect on the load forecast equation parameters that were estimated from years where DSM programs were active. SMMPA similarly adjusted the demand forecasts through the downstream forecast process, which applies an estimate of distribution losses and forecast load factors to the energy sales forecast.

c. DSM and Supply Side Integration

SMMPA's AURORA model estimated DSM savings levels[8] for residential lighting, residential other, C&I lighting and C&I other. SMMPA used AURORA to evaluate two energy savings levels: a base case scenario that averages annual first year savings of 1.3 percent, and a full (1.5 percent) savings scenario to comply with the Commission's Order in SMMPA's last IRP.[9] SMMPA's full DSM scenario actually averages an annual savings level of 1.67 percent.

According to the Navigant DSM potential study:

> The base scenario estimated the achievable potential based on decision making response to measure payback using the current incentive levels provided by SMMPA member utilities. The current incentive levels, as expressed as a percent of incremental technology cost, vary, but in average are close to 50 percent of incremental cost. In the Minnesota Public Utility Commission (MPUC) Order accepting SMMPA's 2009 IRP, the MPUC stipulated that SMMPA analyze energy savings equal to 1.5

[7] The Department supports SMMPA's assumption and uses a similar approach when accounting for how much DSM is embedded in an econometric forecast.

[8] From Navigant's Energy Efficiency Resource Assessment Model (EERAM) model.

[9] The Commission's January 18, 2011 Order on SMMPA's 2009 IRP (ET-9/RP-09-536) states "SMMPA shall in its next resource plan include sensitivity analyses evaluating the cost-effectiveness of achieving various levels of energy conservation, including energy savings equal to 1.5 percent of retail sales."

> percent of electric sales in its next filing. That 1.5 percent scenario was based on more aggressive marketing activities starting in 2014 (designed to increase knowledge and willingness factors) and increasing the incentive levels to 75 percent of incremental cost beginning in the year 2016.[10]

The annual incremental DSM energy savings under each scenario are listed in Table 5 (base case scenario) and Table 6 (full DSM scenario) below.

**Table 5: Base Case Scenario Energy Savings, Budget, and First Year Costs per kWh**

| Year | Forecasted Annual Energy Potential (MWh) | As a % of Forecast Load | Estimated Budget (Administration + Incentives) | Cost of First Year Savings/kWh |
|---|---|---|---|---|
| 2014 | 37,438 | 1.23% | $ 4,303,369 | $ 0.115 |
| 2015 | 38,060 | 1.23% | $ 3,680,659 | $ 0.097 |
| 2016 | 36,144 | 1.14% | $ 3,588,405 | $ 0.099 |
| 2017 | 34,734 | 1.08% | $ 3,573,472 | $ 0.103 |
| 2018 | 35,566 | 1.09% | $ 3,695,064 | $ 0.104 |
| 2019 | 37,897 | 1.14% | $ 4,186,863 | $ 0.110 |
| 2020 | 43,980 | 1.31% | $ 4,441,710 | $ 0.101 |
| 2021 | 48,876 | 1.43% | $ 4,790,375 | $ 0.098 |
| 2022 | 53,234 | 1.54% | $ 5,032,130 | $ 0.095 |
| 2023 | 52,047 | 1.48% | $ 4,859,108 | $ 0.093 |
| 2024 | 51,214 | 1.43% | $ 4,890,609 | $ 0.095 |
| 2025 | 49,501 | 1.36% | $ 4,655,211 | $ 0.094 |
| 2026 | 49,125 | 1.33% | $ 4,644,883 | $ 0.095 |
| 2027 | 49,049 | 1.31% | $ 4,717,051 | $ 0.096 |
| 2028 | 48,579 | 1.28% | $ 4,708,571 | $ 0.097 |
| **Average** | **44,363** | **1.29%** | **$ 4,384,499** | **$ 0.099** |

[10] Page 1 of IRP Appendix A.

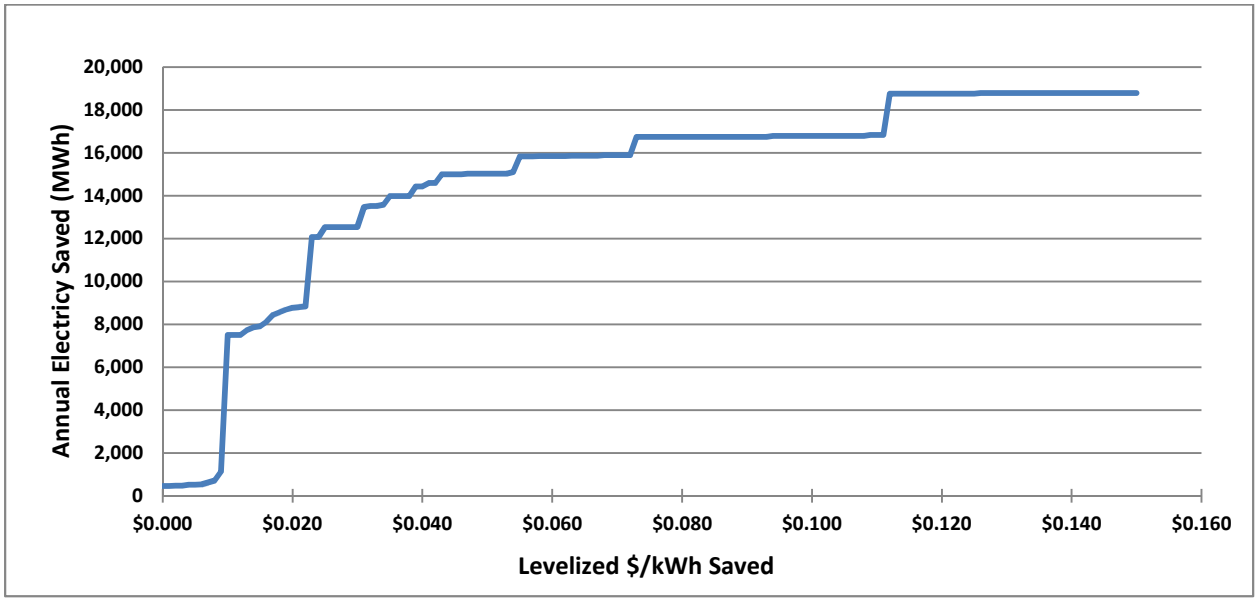
**Table 6: Full DSM Scenario Energy Savings, Budget, and First Year Costs per kWh**

| Year | Forecasted Annual Energy Potential (MWh) | As a % of Forecast Load | Estimated Budget (Administration + Incentives) | Cost of First Year Savings/kWh |
|---|---|---|---|---|
| 2014 | 45,547 | 1.49% | $7,310,336 | $ 0.161 |
| 2015 | 44,795 | 1.41% | $6,381,912 | $ 0.142 |
| 2016 | 47,877 | 1.51% | $7,127,866 | $ 0.149 |
| 2017 | 46,655 | 1.45% | $7,169,933 | $ 0.154 |
| 2018 | 49,181 | 1.51% | $7,827,972 | $ 0.159 |
| 2019 | 54,591 | 1.65% | $8,996,789 | $ 0.165 |
| 2020 | 62,013 | 1.84% | $9,687,053 | $ 0.156 |
| 2021 | 65,775 | 1.93% | $9,856,814 | $ 0.150 |
| 2022 | 68,104 | 1.96% | $9,655,366 | $ 0.142 |
| 2023 | 65,537 | 1.86% | $8,932,142 | $ 0.136 |
| 2024 | 62,986 | 1.76% | $8,540,453 | $ 0.136 |
| 2025 | 63,561 | 1.75% | $8,248,611 | $ 0.130 |
| 2026 | 61,393 | 1.66% | $8,004,746 | $ 0.130 |
| 2027 | 61,893 | 1.65% | $8,266,557 | $ 0.134 |
| 2028 | 60,572 | 1.59% | $8,120,417 | $ 0.134 |
| **Average** | **57,365** | **1.67%** | **$8,275,131** | **$ 0.145** |

*4. Conservation Energy Supply Cost Curve*

As part of its DSM potential study, SMMPA developed a Conservation Energy Supply Curve that compares the levelized costs over a DSM measure's useful life per kWh saved, and the annual energy saved at different cost levels. Figure 5 below comes from files used to create the Appendix A DSM Potential Study and sent by SMMPA to the Department through an information request.

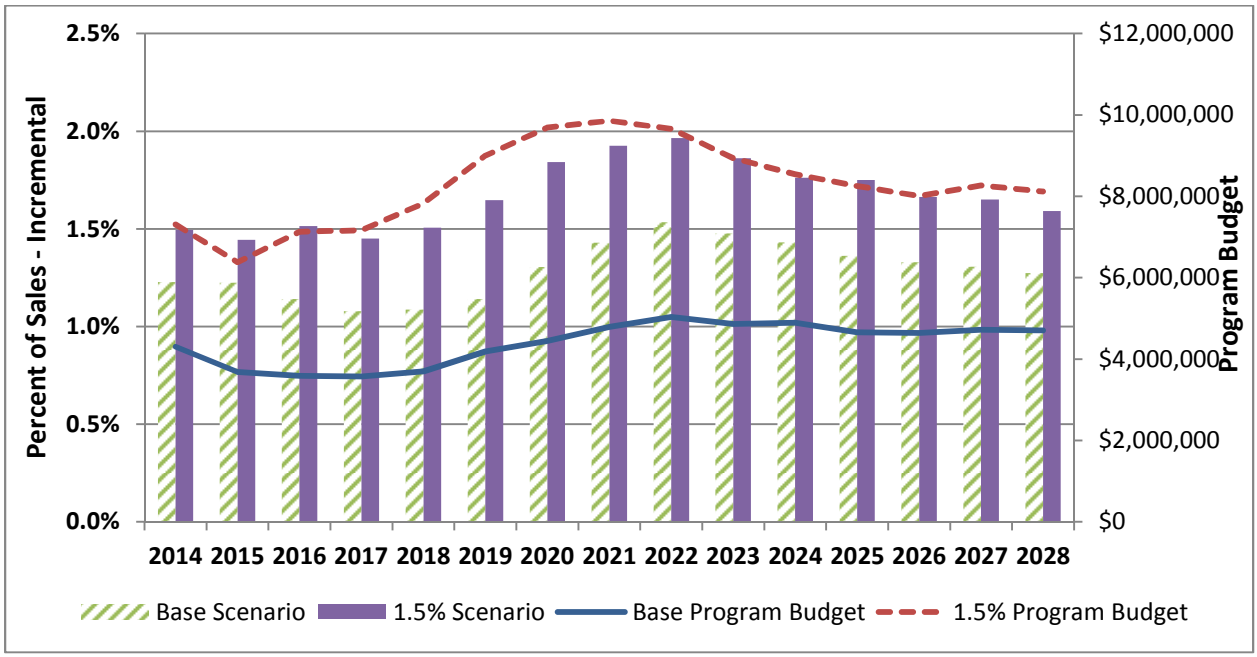
**Figure 5: 2028 Conservation Energy Supply Curve (MWh)**




The Department believes such supply curves could be useful in evaluating cost effective DSM levels, but it was difficult to compare the curve's levelized costs per kWh saved with the proposed DSM savings levels in the base case and full DSM scenarios proposed by SMMPA. The Department recommends that in Reply Comments, SMMPA identify the 2028 DSM Energy Savings on the Conservation Energy Supply Curve (both under the base case and full DSM scenarios).

Figure 6 below, copied from Appendix A, compares the two DSM scenarios' energy savings levels and program budgets.

**Figure 6: Base and 1.5% Scenario Incremental Market Energy Potential[11]**




While the full DSM scenario has a higher average budget and cost per first year kWh savings, it also has an overall plan lower net present value cost. SMMPA states that the full DSM scenario is 2.8 percent less expensive than the base case DSM with a net present value of savings of $36 million.

SMMPA supports the adoption of the base case DSM levels (represented by the green bars in figure 4 above). In support of the base case SMMPA cited the budget increase needed to achieve the full DSM scenario, and uncertainty surrounding whether SMMPA could achieve the higher level of savings of the full DSM scenario through increased marketing efforts.

*5. Department DSM Recommendation*

SMMPA should be commended for its historical DSM achievements and the DSM potential study it undertook to inform this IRP. The information from the potential study and SMMPA's existing DSM programs will be valuable in achieving higher levels of DSM savings for the next 15 years.

[11] Reproduced from Chart VII-3 of SMMPA's 2013 IRP.

Based on the information from Appendix A and the IRP's DSM sections the Department supports a DSM energy savings goal of at least 1.5 percent. The Department supports this higher-than-proposed energy savings goal for the following reasons:

1. Since the State 1.5 percent energy savings goal was first implemented in 2010, SMMPA has consistently increased its DSM savings as a percent of sales. In fact, for the last three years of data (2010-2012), SMMPA saved 1.64 percent to 1.70 percent of annual sales. Continuing to achieve these higher energy savings requires SMMPA to remain up to date with potential technologies and processes. SMMPA's new DSM potential study provides the Agency with some of the information that will be needed.

2. The full DSM scenario (approximating 1.68 percent of retail sales) is 2.8 percent less expensive than the base case DSM scenario plan. The lower cost of the plan based on the full DSM shows the cost-effectiveness of the higher energy savings levels.

3. Although SMMPA projects a nominal budget increase of $60 million over the planning period to achieve the higher energy savings goals, the investment will not be incurred all at once. Rather than set its sights low, on an energy savings goal of only 1.3 percent, and adjust according to how customers respond, the Agency should be at least aiming for the State's 1.5 percent energy savings goal, if not higher.

4. As discussed below, SMMPA is not on course to meet the State's greenhouse gas reduction goal. Increased energy savings is one of the most cost-effective means of reducing $CO_2$ emissions.

5. SMMPA's detailed DSM potential study identifies low levelized cost measures available to achieve a 1.5 percent DSM goal; these measures are included in the top 20 measures list included on pages 27 through 31 of Appendix A of the IRP.

## *G. COMPLIANCE WITH THE RENEWABLE ENERGY OBJECTIVE*

### *1. Background*

Prior to the 2007 Legislative Session, Minn. Stat. §216B.1691 required utilities to make a good faith effort to obtain 15 percent of their Minnesota retail sales from eligible energy technologies by 2015, and to obtain 0.5 percent renewable energy from biomass technologies. The 2007 Minnesota Legislature amended Minn. Stat. §216B.1691 to include a Renewable Energy Standard (RES) beginning in 2010. As amended, Minn. Stat. §216B.1691 sets forth the Renewable Energy Objective in place through 2010 and requires that:

> Each electric utility shall make a good faith effort to generate or procure sufficient electricity generated by an eligible energy technology to provide its retail customers or the retail customers of

> a distribution utility to which the electric utility provides wholesale electric service so that commencing in 2005, at least one percent of the electric utility's total retail electric sales to retail customers in Minnesota is generated by eligible energy technologies, and seven percent of the electric utility's total retail electric sales to retail customers in Minnesota by 2010 is generated by eligible energy technologies.

Minn. Stat. §216B.1691, Subd 2a establishes the Renewable Energy Standard utilities must meet through 2025 and specifically requires that:

> …each electric utility shall generate or procure sufficient electricity generated by an eligible energy technology to provide its retail customers in Minnesota, or the retail customers of a distribution utility to which the electric utility provides wholesale electric service, so that at least the following standard percentages of the electric utility's total retail electric sales to retail customers in Minnesota is generated by eligible energy technologies by the end of the year indicated:
>
> - 2012: 12 percent
> - 2016: 17 percent
> - 2020: 20 percent
> - 2025: 25 percent

The statute no longer requires that a portion of the renewable energy generation come from biomass technologies. An eligible energy technology is defined by Minn. Stat. §216B.1691, percent 1 as an energy technology that:

> Generates electricity from the following energy sources: (1) solar; (2) wind; (3) hydroelectric with a capacity of less than 100 megawatts; (4) hydrogen, provided that after January 1, 2010, the hydrogen must be generated from the resources listed in this clause; or (5) biomass, which includes without limitation, landfill gas, an anaerobic digester system, and an energy recovery facility used to capture the heat value of mixed municipal solid waste or refuse-derived fuel from mixed municipal solid waste as a primary fuel.

Minn. Stat. §216B.1691, subd. 2(d) directs the Commission to "issue necessary orders detailing the criteria and standards by which it will measure an electric utility's efforts to meet the renewable energy objectives of subdivision 2 to determine whether the utility is making the required good faith effort."

The Commission set forth the criteria for determining compliance with the RES Statute after taking comments from effected parties in a number of Orders.[12] Among the resources the Commission has determined to be ineligible for meeting the RES are resources used for green pricing, resources that do not meet the statutory definition of eligibility, and generation assigned to compliance for other regulatory purposes such as another state's Renewable Portfolio Standard Requirements (RPS)

The 2007 amendment to Minn. Stat. §216B.1691, required the Commission to establish a program for tradable Renewable Energy Credits (RECs) by January 2008, and to require all electric utilities to participate in a Commission-approved REC tracking system once such a system was in operation.

The Commission subsequently adopted the use of the Midwest Renewable Energy Tracking System (M-RETS), a multi-state REC tracking system, as the REC tracking system under Minn. Stat. §216B.1691, subd. 4(d) and required Minnesota utilities to participate.[13] Specifically, the Commission required utilities to complete the online registration process and sign the Terms of Use agreement with the M-RETS system administrator APX, Inc, and receive account approval from APX by January 1, 2008. In addition, the Commission directed utilities to make a substantial and good faith effort to create a system account and sub-accounts for its organization, and to register its generation units/facilities in the M-RETS system by March 1, 2008.

In its December 18, 2007 *Order Establishing Initial Protocols for Trading Renewable Energy Credits,* the Commission adopted a four-year shelf life for all renewable energy credits to be used for compliance with the Minnesota RES. A four-year shelf life allows a REC to be retired towards MN RES compliance in the year of generation and during the four years following the year of generation.

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[12] *In the Matter of Detailing Criteria and Standards for Measuring an Electric Utility's Good Faith Efforts in Meeting the Renewable Energy Objectives Under Minn. Stat. §216B.1691,* Docket No. E999/CI-03-869, Initial Order Detailing Criteria and Standards for Determining Compliance with Minn. Stat. §216B.1691 and Requiring Customer Notification by Certain Cooperative, Municipal, and Investor-Owned Distribution Utilities. (June 1, 2004)
*In the Matter of Detailing Criteria and Standards for Measuring an Electric Utility's Good Faith Efforts in Meeting the Renewable Energy Objectives Under Minn. Stat. §216B.1691,* Docket No. E999/CI-03-869; *In the Matter of a Commission Investigation into a Multi-State Tracking and Trading System for Renewable Energy Credits,* Docket No. E999/CI-04-1616, Second Order Implementing Minn. Stat. §216B.1691, Opening Docket to Investigate Multi-State Program for Tracking and Trading Renewable Credits and Requesting Periodic Updates from Stakeholder Group; (October 19, 2004)
*In the Matter of Detailing Criteria and Standards for Measuring an Electric Utility's Good Faith Efforts in Meeting the Renewable Energy Objectives Under Minn. Stat. §216B.1691,* Docket No. E999/CI-03-869, Order After Reconsideration (August 13, 2004)

[13] *In the Matter of a Commission Investigation into a Multi-State Tracking and Trading System for Renewable Energy Credits,* Docket No. E999/CI-04-1616, Order Approving Midwest Renewable Energy Tracking System (M-RETS) Under Minn. Stat. §216B.1691, subd.4(d), and Requiring Utilities to Participate in M-RETS (October 9, 2007)

Finally, in its December 3, 2008 *Third Order Detailing Criteria and Standards for Determining Compliance under Minn. Stat. §216B.1691 and Setting Procedures for Retiring Renewable Energy Credits*, the Commission directed utilities to begin retiring RECs equivalent to one percent of their Minnesota annual retail sales for the 2008 and 2009 compliance year by May 1st of the following year. Upon retirement, RECs are transferred into a specific Minnesota RES retirement account and, once retired, are not available to meet other state or program requirements, thus addressing the statutory prohibition against double counting the RECs and promoting the environmental benefits of renewable energy. The Commission further directed the utilities to submit a compliance filing demonstrating their compliance with the RES by June 1st.

In addition to amending the RES Statute, Minn. Stat. §216B.241subd. 1c(b) was added to establish an energy-savings goal as part of a utility's conservation improvement plan (CIP), and states:

> Each individual utility and association shall have an annual energy-savings goal equivalent to 1.5 percent of gross annual retail energy sales unless modified by the commissioner under paragraph (d). The savings goals must be calculated based on the most recent three-year weather normalized average.

The attainment of the 1.5 percent energy savings goal will reduce a utility's forecasted retail sales, and consequently lower the amount of renewable generation required to meet RES obligations.

*2. SMMPA's Renewable Obligation*

Table 7, below, summarizes SMMPA's RES requirement in MWh's over the forecast period. SMMPA's forecasted retail sales adjusted to reflect a 1.25 percent energy savings goal. If SMMPA fully complies with the energy-savings goal of 1.5 percent set forth in Minn. Stat. §216B.241 its RES requirement would be slightly reduced.

**Table 7: SMMPA's Renewable Energy Objective**

| Year | MN Retail Sales | RES Percentage | RES Requirement (MWhs) |
|---|---|---|---|
| 2013 | 2,865,441 | 12 | 343,853 |
| 2014 | 2,908,407 | 12 | 349,009 |
| 2015 | 2,957,605 | 12 | 354,913 |
| 2016 | 3,007,588 | 17 | 511,290 |
| 2017 | 3,043,085 | 17 | 517,324 |
| 2018 | 3,088,126 | 17 | 524,981 |
| 2019 | 3,140,967 | 17 | 533,964 |
| 2020 | 3,200,678 | 20 | 640,136 |
| 2021 | 3,248,680 | 20 | 649,736 |
| 2022 | 3,301,275 | 20 | 660,255 |
| 2023 | 3,352,106 | 20 | 670,421 |
| 2024 | 3,410,097 | 20 | 682,019 |
| 2025 | 3,453,872 | 25 | 863,468 |
| 2026 | 3,507,322 | 25 | 876,831 |
| 2027 | 3,562,312 | 25 | 890,578 |
| 2028 | 3,623,561 | 25 | 905,890 |

Over the forecast period, SMMPA's RES requirement increases from 343,853 MWhs in 2013 to 905,890 MWhs in 2028.

*3. Generation Resources*

*a. Existing Resources*

SMMPA has registered its renewable generation facilities in M-RETS. Table 8 summarizes SMMPA's ability to meet its future RES obligations with its existing resources. At present, SMMPA has approximately 376,000 MWh in annual renewable generation, which represents sufficient annual generation to meet its RES requirement through 2015. As noted above, RECs have a four year shelf life for compliance use. Currently, SMMPA has an unretired REC balance of approximately 1,439,000 MWh that may be carried forward and used for future RES compliance. With the unretired REC balance, SMMPA has sufficient renewable generation to meet its RES requirements through 2022. The Department reviewed SMMPA's unretired REC balance, and determined that the agency does not have unretired RECs exceeding the four year shelf life.

**Table 8: REO Compliance with Existing Resources**

| Year | REO/RES Requirement MWh | SMMPA Existing Renew. Generation (MWh) | Existing Generation less RES Surplus/ (Deficit) MWh | Cumulative Surplus/ (Deficit) |
|---|---|---|---|---|
| | | | | 1,438,988 Beg. Balance |
| 2013 | 343,853 | 376,283 | 32,431 | 1,471,419 |
| 2014 | 349,009 | 376,283 | 27,275 | 1,498,693 |
| 2015 | 354,913 | 376,283 | 21,371 | 1,520,064 |
| 2016 | 511,290 | 376,283 | (135,007) | 1,385,057 |
| 2017 | 517,324 | 376,283 | (141,041) | 1,244,017 |
| 2018 | 524,981 | 376,283 | (148,698) | 1,095,319 |
| 2019 | 533,964 | 376,283 | (157,681) | 937,638 |
| 2020 | 640,136 | 376,283 | (263,852) | 673,785 |
| 2021 | 649,736 | 376,283 | (273,453) | 400,333 |
| 2022 | 660,255 | 376,283 | (283,972) | 116,361 |
| 2023 | 670,421 | 376,283 | (294,138) | (177,776) |
| 2024 | 682,019 | 376,283 | (305,736) | (483,512) |
| 2025 | 863,468 | 376,283 | (487,185) | (970,697) |
| 2026 | 876,831 | 376,283 | (500,547) | (1,471,244) |
| 2027 | 890,578 | 376,283 | (514,295) | (1,985,538) |
| 2028 | 905,890 | 376,283 | (529,607) | (2,515,145) |

*b. Generation from Planned Renewable Resources*

*4. Compliance with REO Objectives*

SMMPA submitted its compliance report in Docket No. E999/PR-13-186 detailing its compliance with the 2012 RES requirements. SMMPA reports that it had Minnesota retail sales of 2,923,691 MWh, and retired 350,844 RECs in the M-RETS system to comply with its twelve percent 2012 RES requirement.

According to the IRP, SMMPA proposes to add small amounts of wind in the early years of its IRP, and 23 MWs annually beginning in 2021. Table 9 estimates SMMPA's ability to comply with its RES requirements assuming a 35 percent capacity factor for its wind additions. The Department concludes that with its proposed wind additions, SMMPA will have sufficient renewable resources to meet its RES obligations through the planning period.

**Table 9: SMMPA Estimated RES Compliance – Wind at 35% Capacity Factor**

| Year | REO/RES Requirement MWh | Planned Additions (MWs) | 35% capacity factor | Total Existing Generation + Planned Additions (MWhs) | Cumulative RES Surplus/ (Need) |
|---|---|---|---|---|---|
| | | | | | 1,438,988 Beg. Balance |
| 2013 | 343,853 | | | 376,283 | 1,471,419 |
| 2014 | 349,009 | | | 376,283 | 1,498,693 |
| 2015 | 354,913 | | | 376,283 | 1,520,064 |
| 2016 | 511,290 | | | 376,283 | 1,385,057 |
| 2017 | 517,324 | | | 376,283 | 1,244,017 |
| 2018 | 524,981 | 2.5 | 7,665 | 383,948 | 1,102,984 |
| 2019 | 533,964 | 5.0 | 15,330 | 399,278 | 968,298 |
| 2020 | 640,136 | 7.5 | 22,995 | 422,276 | 750,435 |
| 2021 | 649,736 | 23.0 | 70,518 | 492,791 | 593,491 |
| 2022 | 660,255 | 23.0 | 70,518 | 563,309 | 496,545 |
| 2023 | 670,421 | 23.0 | 70,518 | 633,827 | 459,952 |
| 2024 | 682,019 | 23.0 | 70,518 | 704,345 | 482,278 |
| 2025 | 863,468 | 23.0 | 70,518 | 774,863 | 393,673 |
| 2026 | 876,831 | 23.0 | 70,518 | 845,381 | 362,224 |
| 2027 | 890,578 | 23.0 | 70,518 | 915,899 | 387,546 |
| 2028 | 905,890 | 23.0 | 70,518 | 986,417 | 468,073 |

*H. ENVIRONMENTAL ISSUES*

The Department generally reviews utility resource plans for compliance with pending state and national environmental legislation that impacts the electric utility's operations. SMMPA provided information on the environmental regulations to which it is subject, and stated that it complies with these regulations.

In its IRP, SMMPA addressed several issues, including its:

- efforts to meet Clean Air Act and the Clean Air Interstate Rule on the reduction of sulfur dioxide ($SO_2$), nitrogen oxide ($NO_x$), and particulate matter;
- ongoing efforts to monitor regulations on mercury reductions;
- Greenhouse gas emissions, and
- Compliance with new standards for a reciprocating internal combustion engine.

Each of these issues is discussed below.

*1. Reductions in Sulfur Dioxide ($SO_2$) and Nitrous Oxide ($NO_x$)*

The Acid Rain provisions of the CAAA established fixed allowances for $SO_2$ and limits for emission rates on $NO_x$. Since its last IRP, SMMPA retired its Austin Northeast coal generating plant, one of two units subject to allowance requirements. Sherco 3 is the other unit subject to allowance limits, and is jointly owned by SMMPA (41 percent ownership) and Xcel Energy (59 percent ownership). SMMPA indicates that it expects Sherco 3 to meet $SO_2$ emission rates without major modifications. In 2008, low-$NO_x$ burners were installed in Sherco 3 to bring Sherco 3 into compliance with $NO_x$ emissions requirements.

*2. Mercury*

The Minnesota Mercury Emission Reduction Act of 2006 targeted reductions in mercury emissions from the largest facilities owned by Xcel Energy and Minnesota Power. Although SMMPA was not specifically subject to the Act, as part owner of Sherco 3, the agency worked with Xcel to comply with the mercury reduction requirements. Mercury reduction equipment was installed at Sherco 3 in 2010.

*3. Greenhouse Gas Emissions and Greenhouse Gas Reduction Goal*

While no state or federal regulation of $CO_2$ emissions is currently in place, SMMPA states that it continues to actively monitor potential greenhouse gas legislation, and to evaluate the potential impact of such regulation on its operations.

SMMPA states that it is in compliance with Minnesota's RES requirement, and CIP requirements for energy savings, both of which contribute to the agency's ability to reduce $CO_2$.

In 2013, the Minnesota Legislature passed amendments to Minnesota Statutes §216B.2422, subd. 4. The newly amended legislation now states (new language underlined):

> The commission shall not approve a new or refurbished nonrenewable energy facility in an integrated resource plan or a certificate of need, pursuant to section 216B.243, nor shall the commission allow rate recovery pursuant to section 216B.16 for such a nonrenewable energy facility, unless the utility has demonstrated that a renewable energy facility is not in the public interest. <u>The public interest determination must include whether the resource plan helps the utility achieve the greenhouse gas reduction goals under section 216H.02, the renewable energy standard under section 216B.1691, or the solar energy standard under section 216B.1691, subdivision 2f</u>.

On August 5, 2013, the Minnesota Public Utilities Commission issued a Notice of Information in Future Resource Plan Filings (Commission's Letter). The Commission Letter states, in part:

> **PLEASE TAKE NOTICE** that the Commission expects utilities to include in their resource plans filed after August 1, 2013 an explanation how the resource plan helps the utility achieve the greenhouse gas reduction goals, renewable energy standard, and solar energy standard as listed in the above-referenced legislation. Parties should also be prepared to discuss the matter in comments.

SMMPA discusses how its preferred resource plan would help the utility achieve the greenhouse gas reduction goals under 216H.02. However, the Company did not provide a quantitative analysis.

To improve the record regarding the State's greenhouse gas reduction goal, the Department sent the Company DOC IR No. 8 asking the following two questions:

a. Given SMMPA's preferred plan, what will be the percentage change in the Association's $CO_2$ emissions, comparing SMMPA's estimated 2015 $CO_2$ emissions to its 2005 $CO_2$ emissions?

b. Given SMMPA's preferred plan, what will be the percentage change in the Company's $CO_2$ emissions, comparing SMMPA's estimated 2025 $CO_2$ emissions to its 2005 $CO_2$ emissions?

The Department sent similar information requests to Otter Tail Power Company in Docket No. E017/M-13-961 and to Minnesota Municipal Power Agency in Docket No. ET6133/RP-13-1165. The Department appreciates the conversations with all three utilities on how to best present this information in a useful manner. Based on these discussions, the Department recommended that each utility calculate its $CO_2$ emissions the following approach:

- Start with emissions from utility-owned generation;
- Add emissions from utility purchases; and
- Subtract $CO_2$ emissions from sales from utility-owned generation.

Since the emissions from utility purchases is unknown (unless a bilateral contract exists), the Department recommended that utilities use the 2005 average emissions per MWh for the Midwest Reliability Organization (MRO) West region 2005 purchases, and the 2009 average emissions per MWh for the MRO West region for 2015 and 2025.

Table 10 below provides a summary of SMMPA's response to the Department's request.

**Table 10: Comparing SMMPA's Projected 2015 and 2025 $CO_2$ Emissions to 2005 $CO_2$ Emissions**

| Year | Energy Production (GWh) | Emissions Base Case (Tons $CO_2$) | % Reduction From 2005 Emissions | Emissions Case 2 (Tons $CO_2$) | % Reduction From 2005 Emissions | Emissions Case 3 (Tons $CO_2$) | % Reduction From 2005 Emissions |
|---|---|---|---|---|---|---|---|
| 2005 | 2,965,518 | 3,062,037 | | 3,062,037 | | 3,062,037 | |
| 2015 | 3,227,597 | 2,806,583 | 8% | 2,720,996 | 11% | 2,655,262 | 13% |
| 2025 | 4,135,900 | 2,782,904 | 9% | 2,633,346 | 14% | 2,478,366 | 19% |

Under the emissions base case SMMPA projects $CO_2$ emissions reductions, compared to 2005 $CO_2$ emissions, of 8 percent by 2015 and 9 percent by 2025. In the base case, SMMPA assumed that the 2015 and 2025 average emissions of purchases would be equal to the 2009 average emissions per MWh for the MRO West region. Since SMMPA forecasts that $CO_2$emissions from its own generation mix will fall 18 percent by 2015 and 35 percent by 2025, SMMPA reasoned that it is likely that the $CO_2$emissions of MISO's generation mix will also fall over the planning period. Consequently, SMMPA provided two scenario analyses based on two different assumptions at how much the average MISO $CO_2$ emissions will decline. In Case 2 SMMPA assumed that the stipulated emission rate for purchases in the analysis of 1,822 lbs/MWH of $CO_2$, will decrease by 1 percent annually between 2005 and the forecast years of 2015 and 2025. In Case 3, SMMPA assumed that that the stipulated emission rate for purchases in the analysis of 1,822 lbs/MWH of $CO_2$,will decline at the rates that SMMPA forecasts for its own generation—18 percent by 2015 and 35 percent by 2025.

The Department appreciates SMMPA's cooperation in exploring how best to portray the Agency's emissions over time. As SMMPA discusses in its IR response, the average emissions of MRO West generation are falling. For example, average $CO_2$ for MRO West in 2005 were 1,821.84 pounds per MWh and declined to 1,628.6 lbs per MWh in 2009, a decline of almost 11 percent. In its base case calculations SMMPA used an average emissions rate of 1,822 pounds per MWh. The Department recalculated MP's reductions in $CO_2$ emissions when comparing 2015 and 2025 to 2005 using the 2009 average MRO West emissions rate of 1,628.6 pounds per MWh. Under this scenario, SMMPA's $CO_2$ emissions are projected to decline 11 percent by 2015 and 12 percent by 2025. Consequently, SMMPA's assumption in its Case 2 may be reasonable. However, even if MISO's average emissions decline by the same average rate as SMMPA's generation, as depicted in SMMPA's case 3, the Agency will not be meeting the State's $CO_2$ reduction goal of 15 percent in 2015 and 30 percent in 2030. A big reason is that despite the significant decline in $CO_2$ emission rates between 2005 and 2025, SMMPA's projected energy sales are projected to increase from 2,969,518 GWh in 2005 to 4,135,900 GWh in 2025, an increase of 39 percent. This fact is another reason why SMMPA needs to strive to meet and surpass the 1.5 percent energy savings goal.

These are the first resource plan comments where the Department has explicitly evaluated progress towards meeting the greenhouse gas reduction goals. The Department invites other parties to submit comments on how to best analyze how a utility's resource plan is helping a utility meet the greenhouse gas emissions goal. One issue that the Department believes should be discussed is whether utility emissions of other greenhouse gas emissions, such as methane, should also be included in this analysis. The Department looks forward to continuing this discussion.

*4. Reciprocating internal combustion engine rules*

SMMPA has a number of facilities using reciprocating internal combustion engines (RICE). New standards for RICE resources have been established by the EPA. Rather than retire these facilities, SMMPA chose to implement the standards at its member "life-of-unit" RICE generators. Meeting the standards required installation of oxidation catalysts on each engine to remove in excess of 70 percent of carbon monoxide emissions. Additional changes included replacing the silencer and exhaust stacks, adding crankcase ventilation, and implementing formal operations and maintenance procedures designed to optimize operations and minimize emissions. SMMPA states that the cost of the upgrades was approximately $3.5 million.

The Department concludes that SMMPA is reasonably monitoring environmental regulations.

## III. RECOMMENDATIONS

1. The Department recommends that the Commission accept SMMPA's 2014-2028 IRP for planning purposes, with the recommendation in (2).

2. The Department recommends that SMMPA adjust its IRP so that it achieves annual energy savings of approximately 1.5 percent of retail sales.

3. In its Reply Comments, the Department recommends that SMMPA submit:

   a. a calculation of SMMPA's annual capacity requirements based on its coincident peak demand and a reserve requirement of 7.3 percent; and

   b. a calculation of its resource needs based on the non-coincident (or system) peak rather than the coincident peak (or demand at time of MISO's peak).

/ja

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July 25, 2014

VIA E-Filing and U.S. Mail

Dr. Burl Haar
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: In the Matter of SMMPA's 2014-2028 Integrated Resource Plan
Docket No. ET9/RP-13-1104

Dear Dr. Haar:

Enclosed for filing is SMMPA's reply comments to the Comments of the Minnesota Department of Commerce, Division of Energy Resources, in regard to the above referenced docket.

This reply is being submitted electronically and copies are being served to the attached service list. Please contact me at 507.292.6440 or by email at lw.johnston@smmpa.org if you have any questions regarding this filing.

Regards,

Larry W. Johnston
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LWJ:nw:2k14013
enclosures
cc: Service List

**STATE OF MINNESOTA**
**BEFORE THE PUBLIC UTILITIES COMMISSION**

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| Beverly Jones Heydinger | Chair |
| David C. Boyd | Commissioner |
| Nancy Lange | Commissioner |
| Betsy Wergin | Commissioner |
| Dan Lipschultz | Commissioner |

In the Matter of SMMPA's
2014 – 2028 Integrated Resource Plan

Docket No. ET9/RP-13-1104

## A. OVERVIEW OF THE FILING

This filing represents Southern Minnesota Municipal Power Agency's (SMMPA) reply comments to the comments of the Minnesota Department of Commerce, Division of Energy Services with respect to the above referenced docket – SMMPA's 2014 – 2028 Integrated Resource Plan (IRP).

## B. BACKGROUND

The primary goal of the Department's review of SMMPA's current filing, as stated by the Department, was to ensure that the Agency plans to procure enough resources to ensure that its [SMMPA's] system remains reliable. The Department states that maintaining reliability is important not just for SMMPA's customers, but for all of the region.

The Department reviewed and reached a conclusion that SMMPA's overall approach in developing its IRP was analytically sound and presented logically. Specifically the Department reviewed and concluded:

a. SMMPA's forecast – The Department notes, *"The statistical model, input data, and the econometric models used are all reasonable."*

b. SMMPA's estimate of its future needs – The Department notes, *"SMMPA [has] updated the capacity accreditation for all generation resources to reflect [the] MISO UCAP process... [and] SMMPA assumed a reserve requirement of 9.3% to allow for unforeseen changes in the MISO reserve requirement...over time. The Department agrees that this approach is reasonable, given current risks and uncertainty."*

c. Whether SMMPA's proposed plan would provide a reliable system, the Department notes, *"The Department agrees that this approach is reasonable, given current risks and uncertainty."*

d. SMMPA's DSM planning - The Department notes, *"The Department believes that the DSM Market potential study is reasonable."* The Department notes, *"SMMPA should be commended for its historical DSM achievements and the DSM potential study it undertook to inform this IRP."* The Department also notes that, *"...the Department has often seen that utilities can save higher amounts than DSM potential studies indicated."* The Department supports a DSM energy savings goal of at least 1.5% and suggests SMMPA adjust its IRP to reflect the 1.5% or "full DSM" scenario.

e. SMMPA's compliance with the Minnesota Renewable Energy Standard (RES) - The Department notes that, "SMMPA has registered its renewable generation facilities in M-RETS..." and *"With the unretired REC balance, SMMPA has sufficient renewable generation to meet its RES requirements through 2022"*, and *"The Department concludes that with its proposed wind additions, SMMPA will have sufficient renewable resources to meet its RES obligations through the planning period."*

f. SMMPA's progress in meeting Minnesota's greenhouse gas reduction goal - The Department references SMMPA's willingness to work on methodologies to best reflect greenhouse gas reductions. While how to best assess achievement of utility greenhouse gas reductions has not been finalized, the Department notes *"the Agency will not be meeting the State's CO2 reduction goal of 15 percent in 2015 and 30 percent in 2030."*

C. SMMPA ASSESSMENT

While the Department recommends acceptance of the Agency's Integrated Resource Plan, it has made the following observations, requests and recommendations regarding the plan.

- Utility System Peak vs. MISO Peak
  The Department has been assessing what peak Minnesota utilities should utilize in their system planning – the utility's system peak or system requirements at the time of the MISO Peak. To assist with that assessment the Department has requested that SMMPA provide two additional calculations illustrating annual capacity requirements with a lower reserve requirement using the MISO-coincident peak and a calculation of annual capacity requirements at the time of SMMPA's system peak. After further consultation with Department staff, the Department and SMMPA have concluded that no additional analysis is required. A discussion of the issues and resolution can be found in Section D, SMMPA CAPACITY REQUIREMENTS - MISO ALTERNATIVES, of this reply.

- Demand Side Management
  The Department stated that it believes that SMMPA's "...DSM market potential study is reasonable." However, they also commented that "...the Department has often seen that utilities can save higher amounts than DSM potential studies indicate." As a consequence, the Department recommends the Commission accept SMMPA's 2014-2028 IRP, but that SMMPA adjust its IRP so that it shows annual energy savings of approximately 1.5% of retail sales. Throughout the Department's review of the Technical Potential Study, while they commend SMMPA for their technical potential study, there seems to be a theme that the chosen base case (savings averaging 1.29% over

the 15 year study period) should not be the accepted base case because SMMPA would be "setting its sights or targets too low." SMMPA respectfully submits the following for the Department's and Commission's consideration.

- The new technical potential study was not developed to set a target or goal for SMMPA member CIP programming. That goal is established as a part of the CIP statute. The technical potential study was completed to provide and inform regarding what were to be likely outcomes of continued aggressive efforts. The technical potential study is not intended to seek a lower statutory goal for SMMPA members.

- SMMPA's strong performance beyond the 1.5% goal from 2010 to present is

| SMMPA Member Recent CIP Performance | | | |
|---|---|---|---|
| **2010** | **2011** | **2012** | **2013** |
| 1.70% | 1.64% | 1.70% | 2.08% |

  viewed by many as an indicator of future performance. But strong historic performance is not necessarily an indicator of future performance or success. In fact, it may mean just the opposite. Continued strong performance does not create technical potential, and may simply be an indicator of higher adoption rates and "eat-into" or reduce future potential. For example, there are only so many high-efficiency clothes washers that can be installed in our member service territories. Replacing one today simply means it will be many years into the future before there is the potential to replace it again.

- SMMPA remains committed to efficiency as a least cost resource. SMMPA has developed a comprehensive array of efficiency options for which it has been recognized by the U.S. Environmental Protection Agency (EPA) and Department of Energy (DOE) with three Energy Star® Awards. SMMPA has also been recognized by the EPA as one of a handful of utilities in the U.S. for its Commercial Food Service Efficiency Program.

- SMMPA does concur that utility initiatives may achieve more savings than a technical potential study might indicate. SMMPA has never curtailed program year offerings if the savings goal of 1.5% is reached, as is demonstrated by the program performance listed above. In evaluating our past program performance, the Department only has four years of program data to evaluate. Whether or not levels at or above the statutory goal of 1.5% are sustainable, (over a long planning horizon like the 15 years in the IRP), remains to be seen. Some years are likely to exceed the goal while other years may fall shy. A procedure for crediting savings during those years where the goal is exceeded, to those years where the goal is not met, remains to be developed. SMMPA looks forward to working with the Department on this process.

- How savings are accounted for also has a significant impact on whether or not goals are achieved. SMMPA's base case forecasts average savings over the planning horizon of 1.29%. Currently the Department limits behavioral program savings by prescribing a three year useful life and requiring that only one-third of the annual savings are counted. SMMPA has three member utilities which operate the OPower program and 14 members which operate a similar behavioral program developed by Enerlyte. SMMPA is required to complete measurement and evaluation on Enerlyte program savings, but then *only one third of measured savings can be claimed.* In table VII-17 of the IRP, we illustrate forecasted annual incremental savings over the planning horizon. *If the full annual incremental savings were to be counted over the planning horizon from our forecasted behavioral programs, savings in the base case would average 1.49%.* SMMPA recognizes that behavioral programs are a relatively new program offering across the country and that both regulators and utilities are engaged in developing the most appropriate ways to account for those program savings as part of an overall portfolio. SMMPA has been following the research in this area and would welcome the opportunity to work with the Department on measurement and crediting approaches and solutions.

- Both the base case and the 1.5% "full CIP" scenario includes forecasted savings attributable to known/planned codes and standard improvements. SMMPA is part of the SB 2030 Advisory Team and is supportive of efforts to improve codes and standards. While improving codes and standards is positive, it does often "crowd out" the ability of utilities to utilize rebate programs to drive increased savings. As a result, savings will accrue in the utility service territory, but as they are no longer a function of rebates, there will be no mechanism to report and credit these savings to the utility. However, identifying such savings is critical to the planning process. If such changes are not recognized, forecasted loads will be higher and utilities would plan to serve that load by building redundant generation. While the savings would accrue to customers and Minnesota would receive the environmental benefits, a methodology needs to be developed so utilities would receive appropriate attribution. SMMPA would welcome the opportunity to participate with the Department in developing procedures for that attribution.

- In the Department's recommendation that SMMPA should adjust its savings from the base case to the 1.5% scenario case, the Department additionally points out that the 1.5% scenario is actually a lower cost plan than the base case. SMMPA does not dispute those figures, and as stated previously, SMMPA recognizes that the more cost-effective DSM its members are able to obtain, the lower overall cost of that alternative. By illustrating the costs associated with the forecast scenario, we intended to raise several points:
    - To simulate the 1.5% savings scenario, we increased the upper bounds of the coefficients for customer awareness and willingness, recalibrated the model to higher savings in all market segments than we have experienced in recent periods and increased the incentive levels.

- Almost anything can be assumed in a model. The pragmatic question becomes can we conduct programing that will push our savings even higher than the base case results of our technical potential study over a 15 year period? We can increase incentives, but can we create a marketing program that significantly increases awareness and willingness to participate? What if our high historic savings are already the result of our existing sophisticated database marketing efforts?

- Spending more money provides a possibility for more savings, but it provides no guarantee the savings will be realized. We point out that if this even more aggressive scenario could be realized, the net present value between the two plans at the end of 15 years is 2.8% less expensive than the base case, a very small difference over 15 years. The real question is whether or not such aggressive savings levels can be sustained for 15 years into the future. If the savings do not materialize, the plan would not be at a lower cost. More importantly, reliability could suffer.

Again, perhaps to remove any confusion, SMMPA recognizes the statutory goal of its member utilities of 1.5%, as reported annually in CIP filings. The objective of the technical potential study was not an effort to lower our goal, but rather to determine our likely achievable savings and ensure reliability. We have been recognized in the past for our leadership in program design, and we will continue to strive in meeting or exceeding the goal as we have in the past.

As the Department indicates, the primary purpose of the IRP is not only to assist in the reliability of the specific utility, but the reliability of the region. Ensuring that reliability is done amidst a backdrop of allied objectives – meeting renewable energy standards, achieving efficiency goals, diversifying our resource mix, reducing greenhouse gas emissions, and ensuring transmission deliverability at minimum cost. In long term planning, the best estimates of integrating these objectives are considered. Most difficult amongst those is estimating DSM impacts. While conservation resources are the most cost effective, it is difficult to predict when they will actually occur. They are subject to much greater variability than constructing wind turbines, transmission, natural gas or solar generation, because efficiency resources require the additional willingness and commitment of the retail customer base.

Since 2010, Minnesota has embarked on one of the most aggressive conservation initiatives in the country. As described, SMMPA and its members have aggressively designed and implemented programming that have, thus far, exceeded state goals. The Department and Commission recommended that SMMPA conduct a new technical potential study to help guide our decision making. The results of that study are a base case that suggest achievable savings shy of the 1.5% goal and a higher simulation that attempts to push adoptions higher than our current aggressive programs. Ultimately, the question is, can the

retail customer's appetite sustain such aggressive utility efforts over a 15 year horizon?

The IRP provides SMMPA a generalized road map to follow in an effort to provide a least cost combination of reliable resources. When evaluating specific project opportunities; whether that be new wind, solar, natural gas, or DSM technologies, each of the projects needs to be evaluated in terms of the impact on reliably and cost-effectively meeting SMMPA's long term needs.

- The Department asked if there was any additional explanation for the decline in savings between 2013 and approximately 2020. In essence, there are four things that are ongoing simultaneously in Navigant's Energy Efficiency Resource Assessment Model (EERAM) that impact on that decrease.
  - SMMPA had significant penetrations in recent program years. As measures that pass the Total Resource Cost (TRC) test are implemented, the available stocks for those measures are declining. (This relates to the concept of higher than anticipated adoption impacts on future potential).
  - The Codes and Standards impact is particularly pronounced in the early years of the forecast.
  - The EERAM model estimates re-engagement at the end of measure life. The assumption is that 85% would re-engage and so they continue with their savings. However, 15% drop out at the end of measure life, and return to the pool of potential future participants. These non-re-engagers start to appear in the mid to later periods of the forecast.
  - The TRC screen is recalculated for each year of the forecast and measures which did not pass in earlier years may pass in later years, increasing in the later part of the forecast.

- The Department found the assessment of Levelized Costs for the various technologies analyzed by Navigant in the EERAM model to be an interesting way of visualizing the data and asked that SMMPA provide that data for 2028 for the base case and full DSM scenarios.

  - Navigant utilizes this data as an interim step in the EERAM model. The methodology is essentially another way of looking at program costs by looking at only incremental cost and savings. This analysis is used by Navigant for comparative purposes only, and does not determine what programs pass or are included in the set of available technologies. Decisions over what technologies are included in the set of measures are determined by the TRC test. The model data has been provided to the Department electronically, under separate cover.

- <u>Green House Gas</u>
  In 2013, the Minnesota Legislature amended Minnesota Statutes §216B.2422 requiring that resource plans identify how the plan helps the utility achieve the greenhouse gas (GHG) reduction goals under §216H.02. SMMPA provided a discussion of how the plan

would help achieve the goal. The Department pointed out that the discussion did not provide a quantitative analysis. As a result, the Department sent SMMPA an information request (DOC IR No. 8) asking SMMPA to provide a quantitative assessment. The Department sent similar requests to Otter Tail Power Company and Minnesota Municipal Power Agency in their respective dockets. For the purposes of this initial GHG investigation, the utilities used a prescribed methodology which made assumptions for the emissions rate for purchases from MISO. That emissions rate, based upon a 2009 study for the Midwest Reliability Organization (MRO) West region, was determined to be 1,822 lbs of $CO_2$ per MWh. That emissions rate was to be utilized in assessing not only the 2005 emission levels, but the 2015 and 2025 emissions levels. SMMPA pointed out that holding the emission rates constant was a significant limitation in the methodology. SMMPA mentioned that absent purchases, its own estimated emissions rate declines significantly over the period (see table below). While there was no available data to suggest an updated MISO emissions rate, it stands to reason that if SMMPA's rates change because of a different generation mix, that it is likely also the case across the MISO region.

| Year | SMMPA Emissions Rate (lbs/MWh) | % Reduction from 2005 Level |
|---|---|---|
| 2005 | 2,071 | 100% |
| 2015 | 1,705 | 18% |
| 2025 | 1,228 | 41% |

SMMPA provided two additional assumptions regarding a declining MISO emission rate - one based upon a 1% decrease annually and another declining at the same rate as agency resources; the later estimating an overall decrease of 13% by 2015 (compared to a 15% target under 216H.02) and 19% by 2025 (compared to a 30% target under 216H.02). The Department commented that even using the SMMPA resource mix reduction in re-estimating the MISO emission rate for 2015 and 2025, SMMPA did not meet the respective 15% and 30% reduction targets. The Department added that this was an additional reason why SMMPA needed to meet or exceed the 1.5% CIP goals.

The Department commended SMMPA for working on a methodology and invited other utilities to provide comments on how best to conduct such an analysis. Subsequent to the Department invitation, Xcel Energy has responded in the SMMPA docket also pointing out the significant limitations of the MRO West $CO_2$ rates. Xcel points out that with each release of eGRID (which lists the MRO West emission rates) the emission rates are revised downward – the latest released in 2014 shows an emissions rate of 1,536 lbs/MWh for 2010. This most current estimate of the 2010 emissions rate is approximately 16% less than the 2005 rate of 1,822 lbs/MWh and it is reasonable to expect that these levels will continue to decline when data reflecting 2015 is released. With the limitations in the methodology pointed out by us and others, it seems premature to conclude that SMMPA is not forecasted to meet its 2015 emission reduction targets.

SMMPA welcomes the opportunity to continue to work with the Department and peer utilities to refine a methodology which more accurately reflects utility GHG reductions.

In addition to the concerns regarding the MISO emission rates to be used to reflect purchases, SMMPA believes that the current methodology being used to estimate $CO_2$ impacts from CIP investments significantly understates the environmental impacts of those investments. (See Section E. CIP GHG IMPACTS).

## D. SMMPA CAPACITY REQUIREMENTS – MISO ALTERNATIVES

In section D. - Resource Needs Assessment - of the Department's comments, the Department expresses concern that planning for MISO's peak rather than SMMPA's own system peak could pose reliability issues in the event that regional MISO resources or transmission were not available at critical times. SMMPA shares that concern. For that reason, SMMPA prepared its IRP using its system peak forecast, not its peak at the time of the MISO peak. Because SMMPA already plans using its system peak, we were unsure how to address concerns raised by the Department. SMMPA consulted with Department staff to discuss the concerns. SMMPA was able to clarify that the IRP was developed using the SMMPA system peak forecast, which satisfied the Department concerns and both parties concluded that no additional analysis or further reply is required.

Because some utilities develop IRPs based on their peak load coincident with the MISO peak, we understand why the Department raised the concerns it did, and we believe that the use of the terms "coincident" and "non-coincident" in two different contexts may have caused some confusion. In the context of the Department's review of IRPs based on a MISO-coincident peak, the term "coincident" refers to a utility's peak at the time of, or coincident with, the MISO system peak. In that same context, the term "non-coincident" refers to that utility's individual system peak, without regard to when the MISO system peak occurs.

In the SMMPA IRP, we also use the term "coincident" when referring to our forecast, but in the SMMPA context that means the coincident peak load of SMMPA's members that results in SMMPA's system peak. The use of the term "non-coincident" in the SMMPA context refers to the individual peak loads of each of the SMMPA members, without regard to when the SMMPA system peak occurs. It is easy to understand how questions and confusion can arise when the context is not completely clear.

As stated above, once we were able to clarify for the Department what forecast was used for the SMMPA IRP, the supplemental question became moot and both parties concurred no further action is needed to satisfy the Department's request on this issue. Subsequent to providing the subject comments being addressed in this reply, the Department has issued additional Information Requests seeking information about MISO-coincident and non-coincident forecasts. SMMPA recognizes the Department's concerns over which load forecast is appropriate for use in planning by Minnesota utilities and will submit information responsive to the new information requests to help address these concerns.

## E. CIP GHG IMPACTS

The Department uses the useful life of a DSM technology in cost-effectiveness screenings, and measure lives of technologies are incorporated in most of the technologies included in

Minnesota's Technical Reference Manual. However, when it comes to accounting for CIP program savings and $CO_2$ impacts, the Department considers first-year energy savings only. As a result, the savings and associated $CO_2$ reductions are dramatically understated.

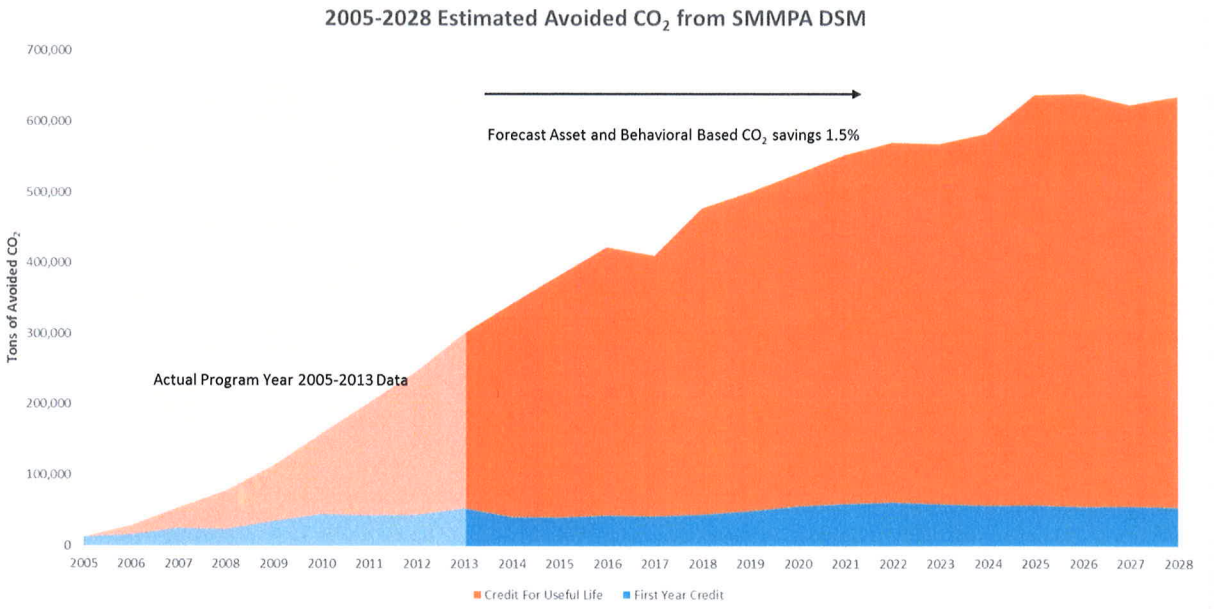
For example, in their 2011 CIP filings, SMMPA members reported annual savings of 47,944 MWh. To determine the $CO_2$ savings, the Department would apply a $CO_2$ rate per MWh to calculate the avoided $CO_2$ attributable to that CIP program year. For discussion purposes, assume those incremental 2011 CIP MWh savings were equivalent to 43,701 tons of avoided $CO_2$. If in 2012, the CIP filing reported energy savings of 48,748 MWh, then the avoided $CO_2$ (assuming the emissions rate had not changed) would be reported as 44,434 tons. Using the Department's current procedures, the avoided $CO_2$ savings for the two year (2011 and 2012) period would be reported as approximately 88,000 tons of $CO_2$. The problem with that assessment is that the CIP investment, the associated energy savings, and the subsequent $CO_2$ avoidance does not stop in the first year but continues over each and every year of the useful life of the installed technology. For example, a newly installed commercial high-efficiency chiller has a deemed measure life of 20 years, a residential Energy Star® clothes washer has a measure life of 11 years, residential high-efficiency central air-conditioning units have a measure life of 18 years, and so on. As mentioned, the Department uses these measure lives to assess the cost-effectiveness of efficient technologies and programs, but does not do so in accounting for program savings. CIP Program Savings and avoided $CO_2$ occur not just in the first year, but each and every year over the life of the equipment.

CIP tracking is designed to record annual savings measure by measure and program by program. Year to year, the measures installed in the CIP programs will vary, but there will be an average useful life for each year program bundle. Table 1 on page 11 illustrates this concept using actual CIP filed data for SMMPA members from 2005-2013, and a forecast (in blue) from the 2013 SMMPA IRP using the 1.5% savings scenario. Program useful life for SMMPA's asset-based programs ranges from a low of 11.9 years to a high of over 13.6 years. In the table, SMMPA separated out the behavioral programs (OPower and Enerlyte) beginning in 2013 because of the nuances of behavioral vs. asset-based programs and ongoing discussions regarding behavioral program useful life at the Department.

A $CO_2$ rate (lbs per MWh) is applied to the MWh savings, and the avoided annual $CO_2$ is shown in the last row of Table 1. The differences in the methodologies of simply adding the first-year avoided $CO_2$ and accounting for the $CO_2$ over the savings lifetime is dramatic. Table 3 on page 12 shows the $CO_2$ impacts from "aging" the CIP programs over the useful life of each CIP program year.

The dramatic results of the different methodologies are shown in Table 4 on page 12. The first row of Table 4 shows the results of the first-year avoided $CO_2$ which are summed in the far right column with a total over the analysis period of approximately 1.1 million tons of avoided $CO_2$. The bottom row shows the annual results of the avoided $CO_2$ (the first year and each subsequent year) over the useful life of the CIP program year investment. The column at the right shows that over the analysis period, approximately 9.1 million tons of CO2 will have been avoided by the CIP investment – a factor of over 8 times more.

The graph below provides a visual representation of the different approaches, with the blue area representing the first year only accounting, and the orange area showing the $CO_2$ impact over the useful life of the installed technologies.




The actual impacts in both methodologies are overstated due to the emissions rate used in the analysis. As mentioned earlier in the section on Green House Gas, we believe that the emissions rates are currently decreasing and will continue to decrease over time. As there has not been a consensus as to what emissions rate to use for analysis, and for how long into the future, we held the rate constant for this analysis. However, it is important to recognize that the emission rate will impact the results for both methodologies and does not impact the magnitude difference between the two accounting procedures.

While there remains much to learn about the newly proposed EPA Section 111d regulations, there have been indications that EPA has incorporated useful life calculations into the efficiency program budgets proposed for states. SMMPA believes accounting for the savings impacts over the useful life of the technologies most accurately reflects what is actually being accomplished. Additionally and importantly, for Minnesota utilities to be given fair recognition and credit

## Table 1 Actual (2005-2013) and Forecast (2014-2028 1.5% Scenario) SMMPA Incremental Program Year Efficiency Program Data

| | | SMMPA CIP Savings Data Reported to the DER (2005-2013) | | | | | | | | | Forecast Asset and Behavioral Savings from 2013 IRP (2014-2028)[3] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Year | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| First Year MWh Savings[2] | Asset Based[1] | 14,157 | 17,769 | 27,966 | 26,226 | 38,923 | 49,674 | 47,944 | 48,748 | 54,696 | 42,090 | 41,338 | 44,420 | 43,198 | 45,724 | 51,134 | 58,556 | 62,318 | 64,647 | 62,080 | 59,529 | 60,104 | 57,936 | 58,436 | 57,115 |
| | Behavioral[1] | | | | | | | | | 4,288 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 | 3,457 |
| | Total | 14,157 | 17,769 | 27,966 | 26,226 | 38,923 | 49,674 | 47,944 | 48,748 | 58,984 | 45,547 | 44,795 | 47,877 | 46,655 | 49,181 | 54,591 | 62,013 | 65,775 | 68,104 | 65,537 | 62,986 | 63,561 | 61,393 | 61,893 | 60,572 |
| % of Retail Sales | | 0.48% | 0.61% | 0.95% | 0.89% | 1.33% | 1.70% | 1.64% | 1.70% | 2.08% | | | | | | | | | | | | | | | |
| CIP Program Useful Life[4] | Asset Based Programs | 12.2 | 12.2 | 12.2 | 12.1 | 12.2 | 12.3 | 11.9 | 11.9 | 13.6 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 |
| | Behavioral | | | | | | | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| $CO_2$ Rate Per MWh (lbs/MWh)[5] | | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 | 1,823 |
| Estimated "First Year" CIP CO2 Reduction (Tons)[6] | Asset Based Programs | 12,904 | 16,196 | 25,490 | 23,904 | 35,478 | 45,277 | 43,701 | 44,434 | 49,855 | 38,365 | 37,679 | 40,488 | 39,374 | 41,677 | 46,608 | 53,373 | 56,802 | 58,925 | 56,585 | 54,260 | 54,784 | 52,808 | 53,264 | 52,060 |
| | Behavioral | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,908 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 | 3,151 |
| | Total | 12,904 | 16,196 | 25,490 | 23,904 | 35,478 | 45,277 | 43,701 | 44,434 | 53,763 | 41,516 | 40,830 | 43,639 | 42,525 | 44,828 | 49,759 | 56,524 | 59,953 | 62,076 | 59,736 | 57,411 | 57,935 | 55,959 | 56,415 | 55,211 |

1 Beginning with their 2013 CIP filings, MN utilities (including SMMPA) were required to use a discounted value for behavioral savings (1/3 of actual experienced and subject to Measurement and Evaluation [M&V]). The DER has stated that behavioral programs such as OPower and Enerlyte have a 3 year deemed measure life. Given that these programs may change, we accounted for the asset based savings separately from the behavioral savings starting in 2013 and use that same approach in the forecast.

2 The reported 2005-2013 MWH savings shown include 7-8% T&D losses to determine the savings @ the generator (determined by the Energy Savings Platform [ESP]). The forecast savings were adjusted to reflect an estimated (SMMPA system) 7% T&D loss.

3 The forecasted 2014-2028 MWH savings data is taken from SMMPA's 2013 SMMPA IRP.

4 The measure lives of the 2008-2013 reported Asset Based Programs represents the weighted average deemed measure life of the program savings for the respective CIP year (from ESP). For example, commercial high-efficiency chillers have a deemed measure life of 20 years. Residential ENERGY STAR® clothes washers have a measure life of 11 years. Residential high-efficiency Central AC units have a measure life of 18 years, and so on. The deemed measure lives of efficient technologies is a function of industry experience and is prescribed in the State of Minnesota's Technical Reference Manual. Measure life is critical to assisting utilities and regulators in determining the cost effectiveness of DSM measures. However, measure life analysis is equally critical in measuring and evaluating the savings from energy efficient equipment and the wise use of energy, and $CO_2$ savings as the measure does not only save in its initial year of installation, but continues to save each and every year over its life. As outlined in footnote 1, Behavioral savings uses the stipulated 3 year measure life as required by the DER. The average measure lifetime from 2008-2013 was used for the forecast period.

5 $CO_2$ emission rates used are the rates the DER utilized in its CIP and Carbon Dioxide Savings Report for 2010-2011 to the Legislature. Since the formula for determining $CO_2$ impact is currently being discussed as a part of the SMMPA IRP docket, the $CO_2$ rates were held constant for this analysis. As the generation mix changes and the amount of DSM savings and renewable resources continues to increase, the CO2 rates will actually decrease. The issue is complicated by the MISO market and limited data regarding overall emissions rates. Since there has not been consensus on the proper method for estimating future $CO_2$ rates, the rates remain static in this analysis.

6 Estimates of "Frist Year" CIP $CO_2$ reductions appy the $CO_2$ Rate Per MWh to the MWh savings in the first section of the chart.

**Table 3**

**SMMPA Actual $CO_2$ CIP Savings Impact (2005-2013) Forecast Impact (2014-2028) 1.5% Scenario**

Savings Stream From Useful Life Crediting

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2005** | 12904 | 12904 | 12904 | 12904 | 12904 | 12904 | 12904 | 12904 | 12904 | 12904 | 12904 | 12904 | 2044 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| **2006** | | 16196 | 16196 | 16196 | 16196 | 16196 | 16196 | 16196 | 16196 | 16196 | 16196 | 16196 | 16196 | 2967 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| **2007** | | | 25490 | 25490 | 25490 | 25490 | 25490 | 25490 | 25490 | 25490 | 25490 | 25490 | 25490 | 25490 | 4390 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| **2008** | | | | 23904 | 23904 | 23904 | 23904 | 23904 | 23904 | 23904 | 23904 | 23904 | 23904 | 23904 | 1204 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **2009** | | | | | 35478 | 35478 | 35478 | 35478 | 35478 | 35478 | 35478 | 35478 | 35478 | 35478 | 35478 | 35478 | 6309 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2010** | | | | | | 45277 | 45277 | 45277 | 45277 | 45277 | 45277 | 45277 | 45277 | 45277 | 45277 | 45277 | 45277 | 12527 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2011** | | | | | | | 43701 | 43701 | 43701 | 43701 | 43701 | 43701 | 43701 | 43701 | 43701 | 43701 | 43701 | 41285 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2012** | | | | | | | | 44434 | 44434 | 44434 | 44434 | 44434 | 44434 | 44434 | 44434 | 44434 | 44434 | 44434 | 39815 | 0 | 0 | 0 | 0 | 0 |
| **2103 Asset** | | | | | | | | | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 49855 | 31071 | 0 | 0 |
| **2013 Behavior** | | | | | | | | | 3908 | 3908 | 3908 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2014 Asset** | | | | | | | | | | 38365 | 38365 | 38365 | 38365 | 38365 | 38365 | 38365 | 38365 | 38365 | 38365 | 38365 | 38365 | 6138 | 0 | 0 |
| **2014 Behavior** | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2015 Asset** | | | | | | | | | | | 37679 | 37679 | 37679 | 37679 | 37679 | 37679 | 37679 | 37679 | 37679 | 37679 | 37679 | 37679 | 6028 | 0 |
| **2015 Behavior** | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2016 Asset** | | | | | | | | | | | | 40488 | 40488 | 40488 | 40488 | 40488 | 40488 | 40488 | 40488 | 40488 | 40488 | 40488 | 40488 | 6478 |
| **2016 Behavior** | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2017 Asset** | | | | | | | | | | | | | 39374 | 39374 | 39374 | 39374 | 39374 | 39374 | 39374 | 39374 | 39374 | 39374 | 39374 | 39374 |
| **2017 Behavior** | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2018 Asset** | | | | | | | | | | | | | | 41677 | 41677 | 41677 | 41677 | 41677 | 41677 | 41677 | 41677 | 41677 | 41677 | 41677 |
| **2018 Behavior** | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2019 Asset** | | | | | | | | | | | | | | | 46608 | 46608 | 46608 | 46608 | 46608 | 46608 | 46608 | 46608 | 46608 | 46608 |
| **2019 Behavior** | | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2020 Asset** | | | | | | | | | | | | | | | | 53373 | 53373 | 53373 | 53373 | 53373 | 53373 | 53373 | 53373 | 53373 |
| **2020 Behavior** | | | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2021 Asset** | | | | | | | | | | | | | | | | | 56802 | 56802 | 56802 | 56802 | 56802 | 56802 | 56802 | 56802 |
| **2021 Behavior** | | | | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 | 0 |
| **2022 Asset** | | | | | | | | | | | | | | | | | | 58925 | 58925 | 58925 | 58925 | 58925 | 58925 | 58925 |
| **2022 Behavior** | | | | | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 | 0 |
| **2023 Asset** | | | | | | | | | | | | | | | | | | | 56585 | 56585 | 56585 | 56585 | 56585 | 56585 |
| **2023 Behavior** | | | | | | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 | 0 |
| **2024 Asset** | | | | | | | | | | | | | | | | | | | | 54260 | 54260 | 54260 | 54260 | 54260 |
| **2024 Behavior** | | | | | | | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 | 0 |
| **2025 Asset** | | | | | | | | | | | | | | | | | | | | | 54784 | 54784 | 54784 | 54784 |
| **2025 Behavior** | | | | | | | | | | | | | | | | | | | | | 3151 | 3151 | 3151 | 0 |
| **2026 Asset** | | | | | | | | | | | | | | | | | | | | | | 52808 | 52808 | 52808 |
| **2026 Behavior** | | | | | | | | | | | | | | | | | | | | | | 3151 | 3151 | 3151 |
| **2027 Asset** | | | | | | | | | | | | | | | | | | | | | | | 53264 | 53264 |
| **2027 Behavior** | | | | | | | | | | | | | | | | | | | | | | | 3151 | 3151 |
| **2028 Asset** | | | | | | | | | | | | | | | | | | | | | | | | 52060 |
| **2028 Behavior** | | | | | | | | | | | | | | | | | | | | | | | | 3151 |

**TABLE 4**

**CUMULATIVE $CO_2$ SAVINGS BASED UPON INCREMENTAL FIRST YEAR SAVINGS AND USEFUL LIFE OF THE TECHNOLOGY (Actual 2005-2013, Forecast 2014-2028 1.5% Scenario)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | Total Cumulative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Incremental | 12,904 | 16,196 | 25,490 | 23,904 | 35,478 | 45,277 | 43,701 | 44,434 | 53,763 | 41,516 | 40,830 | 43,639 | 42,525 | 44,828 | 49,759 | 56,524 | 59,953 | 62,076 | 59,736 | 57,411 | 57,935 | 55,959 | 56,415 | 55,211 | 1,085,464 |
| Useful Life | 12,904 | 29,100 | 54,590 | 78,494 | 113,972 | 159,249 | 202,950 | 247,384 | 301,147 | 342,663 | 383,493 | 423,224 | 411,250 | 478,142 | 500,683 | 526,966 | 553,395 | 570,845 | 568,999 | 583,444 | 638,228 | 640,025 | 624,429 | 636,451 | 9,082,027 |

for their early and aggressive CIP programing, $CO_2$ avoidance needs to be tracked and accounted for over the useful life of the CIP investment. Anything less will disadvantage Minnesota compared to other states.

## F. CONCLUSION

SMMPA thanks the Department and Commission for the opportunity to provide comments. As shown by our historic performance and reiterated in these reply comments, SMMPA is committed to our DSM programming, recognizing that it is a key part of our road map for making least-cost planning decisions. Our efforts and success in our DSM programs not only improve our least-cost resource mix, but also provide us an important tool for mitigating $CO_2$ impacts and responding to proposed CO2 reduction requirements.

In closing, we reiterate that the objective of our recent technical potential study was not to establish, re-establish, or lower a savings goal, but rather to objectively inform our planning process. Based on our historical efforts, it should be clear that we have aggressively pursued CIP programming and we are committed to continuing to do so. We simply have concerns about whether we can sustain the high level of customer commitment and investment over the 15 year planning horizon. With that in mind, we believe that our base case represents the most realistic forecast. We concur with the Department that the primary goal of the IRP is to ensure reliability for our customers and the region. We want to ensure that the basis for our forecast is both sustainable and reliable.

Should you have any questions regarding these reply comments, please let us know.

Regards.

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Officer of Legislative & Regulatory Affairs