MINNESOTA
PUBLIC UTILITIES COMMISSION

Staff Briefing Papers

Meeting Date	September 27, 2018		Agenda Item 3*
Company	Southern Minnesota Municipal Power Agency (SMMPA)		
Docket No.	ET9/RP-17-753		
	In the Matter of Southern Minnesota Municipal Power Agency's Submittal of Its 2018-2032 Integrated Resource Plan		
Issues	What action should the Commission take on SMMPA's filing?		
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✓ **Relevant Documents**	**Date**
Commission Order Accepting 2014-2028 Resource Plan ET9/RP-13-1104	February 10, 2015
Initial Filing - SMMPA 2018-2032 Integrated Resource Plan	November 27, 2017
Comments of the Minnesota Department of Commerce	March 26, 2018

I. Statement of the Issues

What action should the Commission take on SMMPA's resource plan?

II. Background

Minn. Stat. §216B.2422, subd. 1 requires any entity serving at least 10,000 customers and capable of generating 100,000 kilowatts of electricity file an integrated resource plan. Pursuant to Minn. Stat. § 216B.2422, subd. 2, municipal utilities, cooperatives, or wholesalers, however, Commission resource plan orders are merely advisory. 216B.2422, subd. 2 is as follows:

> **Subd. 2.Resource plan filing and approval.** A utility shall file a resource plan with the commission periodically in accordance with rules adopted by the commission. The commission shall approve, reject, or modify the plan of a public utility, as defined in section 216B.02, subdivision 4, consistent with the public interest. In the resource plan proceedings of all other utilities, the commission's order shall be advisory and the order's findings and conclusions shall constitute prima facie evidence which may be rebutted by substantial evidence in all other proceedings. With respect to utilities other than those defined in section 216B.02, subdivision 4, the commission shall consider the filing requirements and decisions in any comparable proceedings in another jurisdiction. As a part of its resource plan filing, a utility shall include the least cost plan for meeting 50 and 75 percent of all new and refurbished capacity needs through a combination of conservation and renewable energy resources.

Sothern Minnesota Municipal Power Agency (SMMPA) filed its 2018-2032 resource plan with the Commission on November 27, 2017.

SMMPA describes itself as a municipal joint action agency formed in 1977 by thirteen Minnesota cities, all of which operate municipal electric utilities. SMMPA stated that its membership increased to eighteen cities when SMMPA merged with United Minnesota Municipal Power Agency in 1984.[1] SMMPA stated further that it is one of several joint action agencies in Minnesota, including Central Minnesota Power Agency/Services, Minnesota Municipal Power Agency, Missouri River Energy Services, and Northern Minnesota Municipal Power Agency. Services provided by SMMPA, and other joint action agencies, are equivalent to services provided to distribution cooperatives by generation and transmission cooperatives such as Great River Energy.[2]

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[1] This is the first SMMPA IRP that extends beyond 2030, a date that marks a significant change in the Agency's power supply requirements. Sixteen of the Agency's eighteen members have contracts that extend to 2050. Two of the Agency's members, the cities of Austin and Rochester, which combine to represent over fifty percent of the Agency's resource requirements, currently have contracts that terminate on March 31, 2030. After that date, SMMPA has no obligation to provide capacity and energy to those two members. SMMPA Initial Filing, p. 1-1.

[2] Initial Filing, p. 1-2.

SMMPA joined forces with Northern States Power in 1982 to develop Unit 3 at the Sherburne County Generating Station (Sherco 3), with construction being completed in 1987. According to SMMPA, federal law limited new baseload generation fuel sources to either coal or nuclear at that time due to concerns with long-term oil and natural gas supplies. SMMPA stated that Sherco 3 is the newest coal-fired generator in Minnesota and has been equipped with systems that allow it to meet or exceed all environmental requirements. SMMPA stated further that Sherco 3 continues to be the Agency's largest resource.[3]

According to SMMPA, its resource portfolio has diversified over the years and currently includes a mix of Demand Side Management (DSM) programs, renewable resources, natural gas, diesel, coal and periodically, power purchase agreements. SMMPA stated further that it added the first utility scale solar project to its mix with a 20-year power purchase agreement (PPA) for the 5 MW Solar project in 2017. In addition, SMMPA stated it has worked with its members to launch a community solar program, and renewable resources currently comprise over 17 percent of its resource mix.[4]

SMMPA also stated it has contracted for the addition of a new 100 MW wind project slated for commercial operation in 2020, which, in combination with SMMPA's existing renewable resources, will allow the Agency to meet its obligations under the state's renewable portfolio standard beyond the period of this IRP.[5]

SMMPA developed its first DSM program in 1993, and successfully developed and employed a growing number of DSM-Conservation programs ever since. According to SMMPA, since the state's Conservation Improvement Program (CIP) savings goal of 1.5 percent took effect in 2010, SMMPA and its members have collectively saved an annual average of 1.74 percent of energy sales through DSM programs. [6]

Listed below is some summary background information about SMMPA:

Number of Members	18 Municipal utilities
Number of Minnesota retail customers served through MMPA's members.	Approximately 118,000
Record peak load	537 MW (July 12, 2018)
Primary Resources: Base Load	Sherco 3 - 362 MW
Primary Resources: Intermediate Load	4 generating units Fairmont, MN - 26.1 MW 4 new generating units Owatonna, MN - 38.8 MW
Primary Resources: Peaking Facilities	A mix of peaking facilities consists of:

[3] *Id.*

[4] *Id.*

[5] *Id.*

[6] *Id., p. 1-3.*

	one SMMPA combustion turbine (16.5 MW), 2 SMMPA-owned 6 MW dual fuel reciprocating internal combustion engines and 54 member owned duel fuel reciprocating internal combustion engines totaling 125 MW. Total Member-owned Peaking units is approximately 140MW
Primary Resources: Renewable Resources	Wind PPA - 100.5 MW Wind Owned - 8.5 MW Hydro member owned - 0.5 MW Biomass PPA - 1.0 MW Biomass Owned - 1.6 MW Solar PPA - 5.0 MW Total Renewable - 117.1 MW

III. Initial Filing

SMMPA included the following in its IRP:

- **Reference Guide**.[7] This section lists IRP requirements by Minn. Statutes and Rules, in addition to Minnesota Department of Commerce recommendations.
- **Summary**.[8] This section provides a non-technical summary of SMMPA's 2018-2032 Integrated resource plan, including an overview of SMMPA, the Plan's development, Load Forecast, Resources, Demand Side Management (DSM), Renewable Resources, Preferred Plan, Sensitivity Cases, and its Environmental Stewardship.
- **Plan Development**.[9] In this section, SMMPA described the Plan objectives and Planning Model, including model inputs and assumptions.
- **Load Forecast** .[10] SMMPA based its load forecast on the Agency's 2017 long-term load forecast, which was developed with the assistance of nFront Consulting, LLC – a utility industry consulting firm based out of Orlando, Florida. The forecast is primarily based on an econometric approach, which uses forecasting equations to explain variations in load as a function of a series of explanatory variables. SMMPA stated that this is essentially the same methodology used in previous SMMPA IRP filings. The following steps define the process used to arrive at SMMPA's forecasted demand and energy requirements, which reflect the gross power requirements that would need to be served from supply and/ or demand-side resources:

[7] *Id.,* pp. iv-v.

[8] *Id.,* pp. 1-1 to 1-6.

[9] *Id.,* pp. 2-1 to 2-3.

[10] *Id.,* pp. 3-1 to 3-15.

1. The annual retail load served across the members is forecasted by combining econometric forecasts of residential customer counts and average energy use and adding the resulting estimate of residential sales to similar forecasts of total retail sales to commercial and industrial customers and other customers, such as lighting classes and government facilities.
2. The forecasts of total retail sales by class are adjusted upward for the historical impact of DSM-Conservation programs on the growth rates projected by the econometric models.
3. After adjusting for distribution losses, the resulting total represents the total delivered energy requirements across all of SMMPA's members.
4. Total delivered energy requirements are then allocated to the members based on a separate econometric forecast of total delivered energy requirements for each Member
5. The contribution of each member's load to SMMPA's peak demand (i.e., coincident peak, from the member's perspective) is forecasted based on an econometric forecast of load factor, combined with the forecasted member energy requirements.

- **Resources**.[11] SMMPA has a variety of resources available to meet the energy needs of its members. SMMPA and its members operate entirely within the footprint of MISO and the Agency is required to own or control enough generating capacity to serve its forecasted load, plus a reserve requirement percentage determined by MISO. SMMPA is also a transmission owning member of MISA and this section describes SMMPA's Transmission Assets and Development.

  SMMPA does not run its own generation to serve its load, and instead, offers all of its generating resources into the MISO market. The generation is dispatched by MISO based on economics and operational needs of the entire MISO system, without direct consideration of SMMPA's load requirements. SMMPA, in turn, purchases all of the energy needed to serve its members' load from the MISO market.

  SMMPA purchases its total energy requirements from MISO. While SMMPA owns or controls sufficient generating resources to generally serve its total load, much of the time, MISO is not calling on SMMPA generation to run at that level. Essentially, SMMPA is serving its load with a combination of its own generation that is being run by MISO and purchases from other generators being run by MISO. Chart 1 below shows the diversity of SMMPA's current generation capacity portfolio by resource type:

[11] *Id.,* pp. 4-1 to 4-9.

Chart 1: Current Resource Capacity Mix[12]

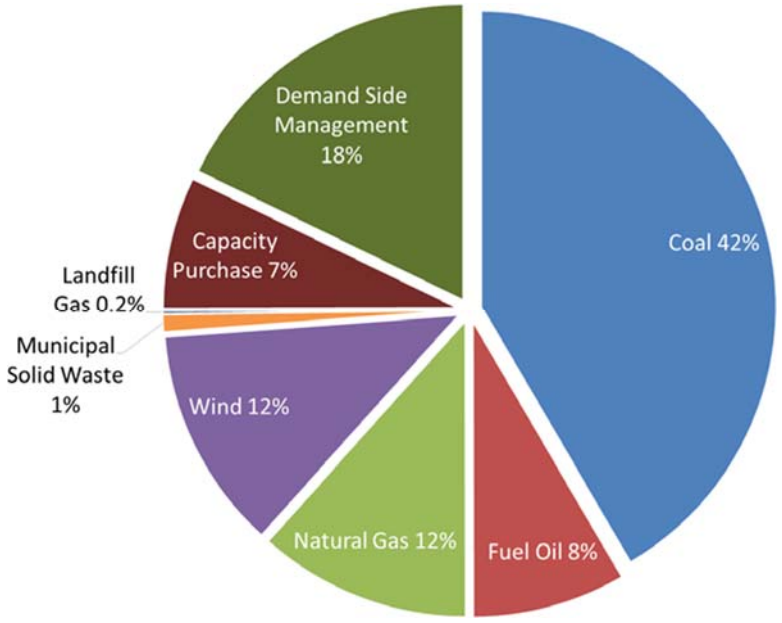
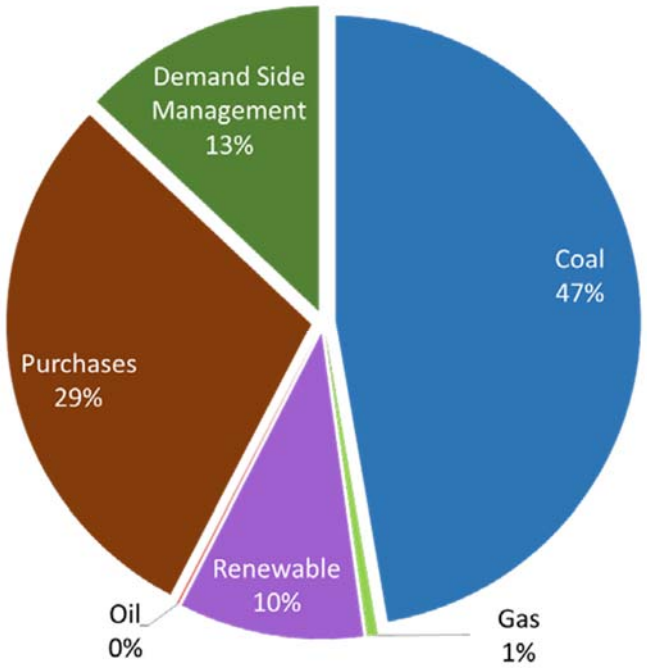


Chart 2 shows an approximation of the combination of Agency resources and market purchases used to meet SMMPA's energy needs in 2016, including energy consumption eliminated by DSM.

Chart 2: 2016 Energy Mix[13]



[12] *Id.,* Chart 4-1, p. 4-2.

[13] *Id.*, Chart 4-2.

- **DSM Resources**.[14] This section of the IRP describes SMMPA's DSM resources and its commitment to conservation. SMMPA stated its energy efficiency programs have been ongoing for over two decades and will continue to take a prominent and strategic resource planning role as SMMPA looks to the next 15 years and beyond.

  SMMPA's goal is to continue to achieve at least 1.5 percent of total retail energy savings in each year of the planning period. SMMPA and their members intend to accomplish this by continuing to develop new demand-side programs, while also obtaining energy efficiency savings through new supply-side efficiency initiatives. SMMPA lists several current DSM-conservation programs it provides to its members' customers, in addition to its continuing efforts to develop new DSM-Conservation initiatives.

- **Renewable Resources**.[15] This section of SMMPA IRP describes the Agency's renewable resources. SMMPA is currently required to provide 17 percent of its energy from renewable resources. The Agency's Renewable Energy standard (RES) benchmark increases to 20 percent in 2020 and 25 percent in 2025. SMMPA has maintained compliance with the RES since commencement of the standard in 2007. SMMPA stated it will continue to comply with the renewable energy standard throughout the planning period.

  SMMPA's renewable resources represent the production from several small scale Agency and member-owned (under contract to SMMPA) qualifying renewable resources located within the state of Minnesota and include the following:

  - Agency Wind/Hydro/Biomass:
    - 8.5 MW of SMMPA-owned wind turbines
    - 1.6 MW of SMMPA-owned landfill gas generation
    - 500 kW hydro unit owned by a municipal member
    - Renewable production derived from the blending of bio-diesel in member-owned diesel generators
  - Olmsted County Waste to Energy Facility Biomass – 8.7 MW combined heat and powered facility, located in Rochester, MN, that is owned and operated by Olmsted County. The facility utilizes municipal solid waste to produce steam for electric generation.
  - Wapsipinicon Wind – a 100.5 MW electric generating wind facility owned and operated by EDF Renewable Energy, located in Mower County, Minnesota. The facility's energy output and environmental attributes are sold to SMMPA under a 20-year PPA running through 2029.

[14] *Id.,* pp. 5-1 to 5-8.

[15] *Id.,* pp. 6-1 to 6-5.

- Lemond Solar – 5 MW AC / 6.58 MW DC solar facility owned and operated by Enerparc Inc., located near Owatonna, MN and commissioned in 2017. SMMPA has a 20-year PPA, and has contracted with Central Minnesota Power Agency/Services to sell a small percentage (5.6 percent) of the project. SMMPA also utilizes the facility as a springboard for a community solar program called Solar Choice.
- Stoneray Wind - Stoneray Wind Project is a planned 100 MW electric generating facility to be built, owned, and operated by EDF Renewable Energy. SMMPA has entered into a 20-year PPA with EDF Renewable Energy for the energy and environmental attributes of the facility starting in 2020. The facility will be located in the Pipestone and Murray counties.
- Solar Choice Program – This program is designed to provide customers an alternative to rooftop solar by allowing residential and business customers the opportunity to subscribe to the output of panels in this large solar garden and receive credit for solar generation on their energy bills each month. Initially, the solar energy will come from the five-megawatt Lemond Solar Center near Owatonna, MN, that is contracted to SMMPA for twenty years, and began operations on June 30, 2017. SMMPA will contract for an additional three megawatts of solar energy from a new facility, if at least 25 percent of the new facility (2,481 panels) is subscribed to by retail customers of participating SMMPA members for the full twenty-five year term of the anticipated PPA by October, 2018. The exact timing and location of this project is pending. The new solar array, if constructed, is anticipated to generate 5.8 million kWh of renewable energy each year.

- **Preferred Plan**.[16] This section of the filing identifies and describes the SMMPA's preferred plan for meeting its capacity and energy obligations into the future. SMMPA's 2017 load forecast shows the energy need increasing by only 0.5 percent well into the future and the Agency's demand slightly decreasing over the next 15 years by 0.1 percent per year. The slight decline in SMMPA's forecasted demand demonstrates that there is no need for new resources well into the future. Therefore, SMMPA's short term or five-year plan is to continue to operate and maintain the Agency's existing fleet of generation resources as safely, cleanly, reliably, and cost-efficiently as possible while continuing to offer demand-side management (DSM) and energy conservation programs in order to meet Minnesota's Conservation Improvement Program (CIP) annual energy savings goal of 1.5 percent. Similarly, since there continues to be no assumed load growth for SMMPA well into the long term, SMMPA will continue its short term strategies into the future. A large part of the Agency's generation fleet is fairly new and will not require any major projects or investments over the long term.

  According to SMMPA, the most significant change in the long range plan over that of the short term is the expiration of the Agency's power sales contracts with Austin Utilities

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(AU) and Rochester Public Utilities (RPU) on March 31, 2030. Their departure cuts the Agency's load by more than 50 percent beginning April 1, 2030. Aside from the option of adding new members, SMMPA's need for future generation declines significantly after 2030. SMMPA plans to manage this load loss by selling its surplus capacity bilaterally or in the MISO capacity market. If the needs of the capacity market are insufficient to absorb enough of the Agency's surplus capacity, a strategic termination of generation contracts with SMMPA members could be implemented. Since the member generators are rather small in size, these terminations can be done in small increments until the proper mix is obtained.

SMMPA believe the preferred plan meets the objectives established for Commission review of resource plans because the plan will:

(A) Maintain or improve the adequacy and reliability of utility service;
(B) Keep the customers' bills and the utility's rates as low as practicable, given regulatory and other constraints;
(C) Minimize adverse socio-economic effects and adverse effects upon the environment;
(D) Enhance the utility's ability to respond to changes in the financial, social, and technological factors affecting its operations; and
(E) Limit the risk of adverse effects on the utility and its customers from financial, social, and technological factors that the utility cannot control.

- **Sensitivity Cases**.[17] This section of the filing discussed situations that SMMPA feels have the potential to cause noticeable effects to its members and members' customers. Several potential events or circumstances that deviate from the base case assumptions were evaluated to determine their impact on the preferred plan. Variables considered in the sensitivity analysis included:

  - Load forecast – base, low, high;
  - Externality costs – low, high;
  - Locational marginal prices (LMP) – base, low, high;
  - Natural gas prices – base, low, high;
  - No future demand-side management (DSM);
  - No renewable resources;
  - No future renewable resources;
  - Sudden loss of a generating resource; and
  - Sudden large load addition.

[17] *Id.,* pp. 8-1 to 8-9.

All sensitivity cases were compared against the base case in terms of net present value cost to SMMPA. The more significant scenarios are discussed in more detail in this section.

- **Environmental Stewardship**.[18] This section describes a number of federal and state environmental initiatives and regulations that affect the cost and/or ability of SMMPA to provide power to its members. SMMPA discusses each of the following initiatives and regulations in this section:

    - Acid Rain Program
    - Cross State Air Pollution Rule
    - Regional Haze rule
    - Mercury and Air Toxics Standards rule
    - Clean Power Plan
    - Minnesota Next Generation Energy Act
    - MACT for Reciprocating Engines

- **Exhibits 1-6:**

    - Ex. 1: Trade Secret Generating Resource Data
    - Ex. 2: Future Supply-Side Resource Data
    - Ex. 3: 2016 SMMPA Member DSM-Conservation Savings
    - Ex. 4: 2016 and 2017 SMMPA Direct Load Control Notifications
    - Ex. 5: 2016 SMMPA Member Direct Load Control Participation
    - Ex. 6: Demand and Resource Balance Preferred Case

IV. Department of Commerce Comments

The Department recommended that the Commission accept SMMPA's 2018-2032 IRP for planning purposes.[19] The Department reviewed and analyzed SMMPA 2018-2032 IRP broken into the following 5 subcategories:

- **Energy and Demand Forecast**[20] - The Department concluded that SMMPA's statistical model, input data, and the econometric models used were all reasonable and that the Agency's energy and peak demand forecasts were satisfactory for planning purposes.

[18] *Id.,* pp. 9-1 to 9-8.

[19] The Department of Commerce Comments, p. 26.

[20] *Id.,* pp. 5-9.

- **The Resource Needs**[21] – The Department stated that the 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 Department determined that SMMPA met the first objective by demonstrating the Agency would have no capacity deficits throughout the planning period after adjusting for planned DSM additions.

- **Demand-Side Management**[22] – The Department noted that SMMPA surpassed Minnesota's 1.5 percent of retail energy savings every year since 2010 and that SMMPA plans to continue to meet this goal over the planning period. The Department recommended that the Commission accept SMMPA's proposed energy savings.

- **Modeling and Supply-Side Resources**[23] – The Department stated that it did not create its own model of SMMPA's system using Strategist, but it briefly reviewed SMMPA's modeling efforts.

  The Department noted that SMMPA used "a detailed hourly production cost model AURORAxmp Electric Market Model" developed by EPIS, LLC to evaluate resource needs and alternatives for this proceeding. The Department concluded that AURORAxmp can be used as a capacity expansion model and AURORAxmp's use will allow SMMPA to potentially determine the least-cost expansion plan in the IRP, including the size, type, and timing of resource additions.

  The AURORAxmp searches for the lowest overall cost resource option by performing multiple iterations using each resource option until it achieves the lowest overall cost and the Department concluded that minimizing total system costs is reasonable as long as the calculations include the Commission's externality values and CO2 internal cost estimate in some of the modeling. However, the Department stated that given the limited nature of the current IRP, the Department did not explore the details of AURORAxmp's operation or SMMPA's modeling efforts.

  The Department reviewed SMMPA's modeling inputs and, based upon its review of this information the Department concluded that SMMPA's modeling inputs regarding existing and future generation resources are reasonable.

  The Department also reviews SMMPA's scenario modeled and the model outputs. The Department noted that SMMPA ran relatively few scenarios and sometime varied multiple inputs with each scenario, which can make it difficult to determine the impact of any one change on the expansion plan.

[21] *Id.,* pp. 9-10.

[22] *Id.,* pp. 10-13.

[23] *Id.,* pp. 13-18.

However, based upon review of AURORAxmp's outputs, the Department concluded that SMMPA's five-year action plan is reasonable and potential actions beyond the five-year action plan can be reviewed in future IRPs.

- **Compliance with the Renewable Energy Standard**[24] – The Department determined that SMMPA will have sufficient renewable resources to meet its RES requirement throughout its planning period.

- **Environmental Issues**[25] – The Department concluded that SMMPA is reasonably monitoring environmental regulations.

V. Staff Analysis

Given SMMPA's resource plan and the recommendation of the Department, staff recommends the Commission accept SMMPA's 2016-2032 Integrated Resource Plan.

The Commission may also consider the designated date for SMMPA's next resource plan. The resource planning statute does not specify how often resource plans should be filed, leaving that to Commission discretion. The Commission's rules specify biennial filings, but as resource plans have become more complex the Commission has sometimes altered that requirement. The record in this proceeding does not contain a proposed date for SMMPA's next resource plan filing. In discussions with staff, the Department and SMMPA have agree that December 1, 2021 would be a suitable date for the Commission to designate for SMMPA's next resource plan. Staff believes this date is reasonable.

VI. Decision Options

A. What action should the Commission take on SMMPA's 2016-2032?

1. Accept SMMPA's 2018-2032 Integrated Resource Plan for planning purposes.

2. Do not accept SMMPA's 2016-2032 Integrated Resource Plan for planning purposes.

B. What date should the Commission designate for the filing of SMMPA's next resource plan?

1. Require SMMPA to file its next resource plan no later than December 1, 2021.

2. Require SMMPA to file its next resource plan no later than two years from the date of the Commission's Order in this matter.

3. Choose some other designated date for SMMPA file its next resource plan.

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[24] *Id.,* pp. 18-23.

[25] *Id.,* pp. 23-26.