

COMMISSION STAFF:

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BACKGROUND

1. In December of each odd-numbered year, NorthWestern Corporation, doing business as NorthWestern Energy (NorthWestern), must file a comprehensive, long-term electricity supply portfolio management and resource procurement plan (as well as a near-term action plan) with the Montana Public Service Commission (Commission). Admin. R. Mont. (ARM) 38.5.8226 (2015). After providing an opportunity for public comment, the Commission must issue written comments that identify any concerns and ways to remedy those concerns. Mont. Code Ann. (MCA) § 69-8-420 (2014).

2. The planning and procurement rules are intended to facilitate: (1) Provision of adequate and reliable electricity supply services, stably and reasonably priced, at the lowest long-term total cost; (2) economic efficiency and environmental responsibility; (3) NorthWestern's financial health; and (4) a process through which NorthWestern identifies and cost-effectively manages and mitigates risks. ARM 38.5.8203. The rules describe objectives for assembling and managing a supply portfolio, assessing portfolio needs, allocating costs and designing retail rates, acquiring resources, system modeling and analysis, demand-side resources, and affiliate transactions. *Id.* at 38.5.8204 *et seq.* A utility must thoroughly document its portfolio planning, management and resource procurement activities in order to justify the "prudence" of supply-related costs. *Id.* at 38.5.8201(3), 38.5.8220(2), 38.5.8226(2).

3. On December 20, 2013, NorthWestern applied for preapproval to acquire eleven hydroelectric facilities, a storage reservoir, and related assets (hydro facilities) from PPL Montana, LLC. Three days later, on December 23, NorthWestern filed its 2013 Electricity Supply Resource Procurement Plan (2013 Plan). The Commission issued notice of the 2013 Plan on January 10, 2014. On February 3, 2014, the Commission determined that the application for preapproval of the hydro facilities lacked adequate modeling of alternative resource portfolios. NorthWestern remedied the deficiencies by modeling several additional portfolios. As a result, on February 14, 2014, NorthWestern filed a *Supplement* to the Plan.

4. On March 7, 2014, the Commission received written comments from: Montana Consumer Counsel; Montana Environmental Information Center; Montana Renewable Energy Association; Natural Resources Defense Council, Human Resource Council District XI, and Renewable Northwest Project; NW Energy Coalition; and Lee Tavenner of Boulder Hydro.

5. One year after NorthWestern announced it, the Commission preapproved the acquisition of the hydro facilities, which are expected to provide 439 megawatts (MW) of long-term generation capacity. Or. 7323k, Dkt. D2013.12.85, ¶ 185 (Sept. 25, 2014). This resource acquisition substantially changes the need for resources that NorthWestern identified in the 2013 Plan. *See* 2013 Plan vol. 1, ch. 4 (Dec. 23, 2013).

6. On February 3, 2015, the Commission held a public meeting to receive additional public comment regarding the 2013 Plan; no comments were offered.

2013 PLAN CONCLUSIONS

7. In the 2013 Plan, NorthWestern modeled projected loads and existing and potential resources using a new analytical platform, PowerSimm, developed by Ascend Analytics, rather than the GenTrader modeling software used for prior plans. Due to the timing of its switch to PowerSimm, NorthWestern relied on Ascend Analytics to manage inputs and operate the PowerSimm model during development of the 2013 Plan. The Commission engaged Evergreen Economics (Evergreen) to help evaluate NorthWestern's proposed resource acquisition; Evergreen specifically assessed the capabilities of the PowerSimm model, the completeness of NorthWestern's resource cost comparisons, and the reasonableness of using the PowerSimm model as a tool for evaluating the costs and benefits of the hydro acquisition. *See* Evergreen Final Assessment, Dkt. D2013.12.85, (Mar. 27, 2014).

8. PowerSimm uses a stochastic modeling approach that accounts for uncertainty and allows NorthWestern to quantify the risk attributes of a portfolio in addition to its expected long-term total cost. 2013 Plan at ch. 6. The PowerSimm modeling occurred in two steps: First, hourly prices were developed for the period 2015 through 2043 by projecting current market prices into the future while also simulating structural relationships between weather, load, wind, hydro generation, and market prices (based on historical observations). Second, the output of all supply resources in each portfolio was simulated based on the market prices simulated in step one and any operational constraints defined in the model (e.g., limitations related cycling,

minimum run time, or air quality permits). This approach enables PowerSimm to quantify the expected costs and a “risk premium” for each portfolio. 2013 Plan at ch. 6, p. 4. NorthWestern ultimately evaluated six alternative resource portfolios, which are briefly described in the table below:

Portfolio	New Resources	Base NPV*	Risk Premium*	Total NPV*
Current	None - existing NWE owned and contracted assets	\$5,770	\$457	\$6,227
Current + CC	GE 7FA.04 combined-cycle turbine, online 2018 (239 MW)	\$5,853	\$384	\$6,237
Current + Hydro	PPL Montana hydro assets (633 MW)	\$5,602	\$249	\$5,851
Current + LMS 100 2018	LMS 100 combustion turbine, online 2018 (97 MW)	\$5,852	\$442	\$6,294
Current + LMS 100 + Wind 2025	LMS 100 and 100 MW new wind above RPS, online 2025	\$5,806	\$429	\$6,235
Current + CC + Wind 2025	GE 7FA.04 (239 MW) and 100 MW new wind, online 2025	\$5,790	\$393	\$6,183

*in millions of dollars

9. According to the 2013 Plan, in 2012 the Northwest Power and Conservation Council’s Resource Adequacy Forum identified a 350 MW regional capacity deficit by 2017. 2013 Plan at ch. 4, p. 12; *see also* N.W. Power & Conserv. Council Power Supply Adequacy Assessment for 2020-21, <https://www.nwcouncil.org/energy/powersupply/2015-05/> (May 6, 2015) (finding that adding 1,150 MW of gas-fired generation by 2021 would achieve adequacy standards). NorthWestern’s 2013 Plan acknowledged potential regional load and resource imbalances in upcoming years due to the expected closure of several coal plants, such as Centralia and Boardman, and plans by some regional utilities to rely more heavily on market purchases to meet loads. According to the 2013 Plan, potential regional capacity constraints suggests a need to re-evaluate NorthWestern’s historical practice of relying on market purchases to meet peak load obligations. 2013 Plan at pp. 12-13. NorthWestern intends to move towards capacity-based planning in future plans. *Id.* at ch. 1, p. 4.

10. According to the 2013 Plan, NorthWestern does not expect the Mercury and Air Toxics Standards, regional haze requirements, or coal ash regulations to negatively affect operations at Colstrip Units 3 and 4 during the planning period. However, NorthWestern intends to closely monitor regional haze regulations. NorthWestern expects the Climate Action Plan currently being implemented under Section 111(d) of the Clean Air Act to increase market prices. The 2013 Plan accounted for these risks by modeling a tax on carbon dioxide (CO₂) emissions that increases projected market prices. NorthWestern concluded that uncertainty and risk surrounding environmental regulations and their effect on market prices makes it prudent to invest in resources like the hydro facilities. 2013 Plan at ch. 3, p. 3.

11. The 2013 Plan included a three-year action plan “in anticipation of owning and operating the Hydros,” key elements of which included:

- Shifting resource planning and procurement strategies towards periods of heavy load and times of peak demand;
- Continuing to adhere to the monthly hedging targets in the 2011 Electricity Supply Resource Procurement Plan (2011 Plan);
- Evaluating dispatch of Basin Creek to determine whether operational changes could provide greater overall value;
- Continuing “to diligently pursue the acquisition and integration of renewable resources” necessary to meet the renewable portfolio standard, including community renewable energy projects (CREPs);
- Developing internal capability and expertise in the use of PowerSimm software and providing “opportunities for stakeholders [such as ETAC] to become more familiar with the software, its functionality, and the results it produces”;
- Maintaining a 6 aMW demand-side resource acquisition target;
- Providing retail customers and other stakeholders with electric resource information as part of NorthWestern’s “annual strategic communications plan.”

See 2013 Plan at ch. 7.

COMMISSION COMMENTS

12. The 2013 Plan fell short of the comprehensive resource planning described in the Commission’s planning and procurement rules. *See e.g.* ARM 38.5.8213(f) (requiring scenario and sensitivity analyses); *see also* Notice of Commn. Action, Dkt. D2013.12.85 (Feb. 5, 2014) (determining hydro application was inadequate). NorthWestern initially analyzed market purchases and a combined cycle combustion turbine in 2018 as alternatives to the hydro facilities in the 2013 Plan, but questioned the viability of relying on market purchases for long term resource adequacy due to risk. 2013 Plan at ch. 4, pp. 12-13; *see also* Direct Test. of Joseph Stimatz, Dkt. D2013.12.85, p. 42 (Dec. 20, 2013). Such limited analysis does not help NorthWestern “explore a wide variety of alternative electricity supply resources” as is required under Commission rules. ARM 38.5.8212(1). In fact, NorthWestern eventually supplemented its 2013 Plan with additional portfolio modeling analysis that revealed two lower-cost alternatives to the 2018 combined cycle alternative. The Commission expects future plans to compare more than three scenarios and to include sensitivity analysis for variables such as CO₂ costs and market prices.

13. The Commission is not convinced that the stochastic modeling approach alone adequately captures future uncertainty and risk. Although stochastic modeling is useful,

NorthWestern's results appear dependent on subjective judgments regarding key inputs, such as forward market price escalation and the timing and cost of CO₂ emissions regulation. According to Evergreen:

[S]tochastic modeling and deterministic sensitivity analysis need not be mutually exclusive. Instead, we believe careful use of both approaches can produce better insight into risk than using one or the other alone.

Evergreen Assessment at p. 22. The Commission agrees with Evergreen's assessment of stochastic modeling, and anticipates that NorthWestern will complement stochastic analysis with scenario analysis in future plans based on input from ETAC.

14. The 2013 Plan assumed that existing resources include 41 MW of community renewable energy project (CREP) capacity that had not been acquired, in anticipation that it would be acquired. 2013 Plan at ch. 2, pp. 20-24. The 2013 Plan did not separately analyze the portfolio cost and risk impacts of this CREP resource compared to the status quo or other resource alternatives. This approach is not consistent with Commission rules, which require NorthWestern to make RPS compliance an integral part of the overall resource planning and procurement process. ARM 38.5.8301(1); *see also* Written Comments, Dkt. N2010.6.57, ¶ 95 (Nov. 22, 2011) (NorthWestern should not hard-wire resources into portfolios to model RPS compliance). In future plans, NorthWestern should assess the possible portfolio cost and risk impacts of RPS compliance. If such an assessment is not possible, it should explain why.

15. The Commission's comments on the 2011 Plan urged NorthWestern to evaluate preferred portfolios under alternative long-term market price forecasts, such as those developed by the Northwest Power and Conservation Council or Energy Information Administration. Written Comments, Dkt. N2011.12.96, ¶ 17 (Sept. 28, 2012). The Commission has twice rejected NorthWestern's in-house forecasting methods. Or. 7108e ¶¶ 65-70, Dkt. D2010.7.77 (Oct. 13, 2011); Or.7199d ¶¶ 24-28, Dkt. D2012.1.3 (Nov. 20, 2012); *see also* Or. 7338b, Dkt. D2014.1.5, ¶ 37 (Apr. 24, 2015). The Commission renews its comment on the 2011 Plan and cautions against ignoring multiple Commission orders and comments in future filings.

16. The mean CO₂ cost projection and its associated triangular probability distribution were key assumptions in the 2013 Plan and significantly impacted the selection of preferred resources. Even with stochastic modeling, however, the single CO₂ price trajectory scenario did not adequately account for the uncertainty of this key input, and did not demonstrate the sensitivity of modeling results to the assumed CO₂ prices. Given ongoing uncertainty regarding

the timing and effect of CO₂ regulations on regional wholesale markets – and the fact that NorthWestern’s management routinely relies on the preapproval process to make resource decisions – the Commission expects a more rigorous evaluation of potential CO₂ costs in future filings. Specifically, evaluating alternative CO₂ price trajectories and alternative ways of defining the price distribution is essential; NorthWestern should consult with ETAC for specific guidance in this regard.

17. The PowerSimm model is capable of defining an optimal capacity expansion plan, but NorthWestern did not use this capability to develop the 2013 Plan. In retrospect it is clear that NorthWestern’s 2013 Plan failed to identify the best alternatives to the current + hydro portfolio, based on the net present value of risk-adjusted total portfolio costs. First, its *Supplement* to the 2013 Plan revealed two portfolios with lower costs than the current + CC alternative. A separate analysis also indicated that adding a CC resource in 2033 would actually reduce the total cost of the current + hydro portfolio. Direct Test. of John Bushnell, Dkt. D2014.1.5 (Jan. 22, 2014); Data Response PSC-003d, Dkt. 2014.1.5 (May 2, 2014). These subsequent analyses underscored how much the timing of resource acquisitions can affect the value of a portfolio. Unless the costs are prohibitive, NorthWestern should use PowerSimm’s optimal capacity expansion planning capabilities in its next plan.

18. In order to adequately assess resource needs, NorthWestern’s ongoing planning and procurement activities should account for net metering, as well as other forms of distributed generation. ARM 38.5.8210(2)(a). Nevertheless, and despite the company’s arguments in other venues that it is a major public policy dilemma, the 2013 Plan did not address the impacts of distributed generation technologies in NorthWestern’s service area. Many proposals were submitted in the 64th session of the Montana Legislature to expand net metering. That debate has resulted in a study of the Energy and Telecommunications Interim Committee. In order to facilitate that legislative initiative and the Commission’s own ratemaking and planning obligations, the Commission expects NorthWestern to perform a far more detailed analysis of existing and potential issues in the next plan, as well as a discussion of ways to remedy any concerns. Such an analysis will require detailed and current information, including participant demographics and the mix of generating technologies, their installed capacity and production patterns. Such an analysis should compare load factors, coincident peak demand, noncoincident peak demand, and regulation service demand for net metered customers and non-net metered

customers. The analysis should attempt to quantify not only costs but also benefits, such as avoidable line losses and other delivery costs. The analysis should be transparent, and any given type of cost or benefit should be isolable, and supported by clear citations to source information in order to ensure the analysis can be meaningfully scrutinized. The analysis should consider the potential for different rate designs depending on a net metered customer's size and location. In its work with Powersimm, NorthWestern should consider modeling several resource portfolios in its next plan with an aggregate net metering capacity of two to three percent of system peak load (e.g., 25 to 45 MW) by the end of the planning horizon, based on input from ETAC. Depending on the quality of NorthWestern's analysis and the direction of the legislative process, the Commission may consider using its statutory authority to hire professional services related to net metering as a topic within the plan.

19. In response to the 2011 Plan, the Commission specifically endorsed two actions that NorthWestern identified in its three-year action plan: Defining resource adequacy and improving strategies for wind integration. With respect to resource adequacy, the Commission "strongly endorse[d] its commitment to define its own system-specific resource adequacy standards," and recommended exploring this issue with ETAC. Comments, Dkt. N2011.12.96, ¶ 13. With respect to wind integration, the Commission urged NorthWestern to "describe how it is promoting efficient use of limited Dave Gates Generating Station (DGGS) wind integration capacity," and "attempt a more sophisticated representation of the regulation needs that may result from diverse generators and loads." *Id.* at ¶ 22 ("avoid one-dimensional representations of regulation needs."). The 2013 Plan demonstrates little, if any, progress on these action items. NorthWestern's inability to demonstrate the amount of capacity needed to integrate its existing wind fleet is not acceptable. Now that it owns most of the resources used to serve load – including DGGS – NorthWestern should conduct the kind of integrated planning that recognizes interactions between transmission and supply assets in order to minimize the total, integrated cost of service. Integrated resource planning should measure resource capacity value in various ways (e.g., effective load carrying capability, exceedance, etc.).

20. At the public meeting on the 2013 Plan, NorthWestern described on-going work on two separate studies, each of which involves evaluating the service capabilities of existing resources and how to optimize those capabilities. The next plan should thoroughly describe these studies, their methods, and how results affect system planning and operations. All written

reports, such as the E3 study of Basin Creek's energy and capacity capabilities, should be attached to the next plan. NorthWestern should also provide a status report on the load variability study the Commission required in Order 6943e and whether results from that study have any planning impacts. Or. 6943e, Dkt. D2008.8.95, ¶ 94 (Mar. 20, 2012).

21. In addition to the changing nature of NorthWestern's asset portfolio, the way in which energy, capacity, and ancillary services are procured in the wholesale market is evolving. One example is the centrally dispatching real-time energy market that PacifiCorp has joined, which NV Energy, Puget Sound Energy, and Arizona Public Service Corp. also intend to join. NorthWestern should study the benefits and costs of joining this market, in addition to explaining the findings and results of the Northwest Power Pool Market Assessment and Coordination Initiative in which it is engaged. These initiatives not only involve the ways that assets are dispatched into the market (as well as related tariff issues that could impact NorthWestern's business), but also the ways that an entity's resource sufficiency is measured. PacifiCorp, additionally, has indicated that it may join as a full Participating Transmission Owner of the California ISO. This would have even farther-reaching implications. In its next plan, NorthWestern should more closely examine how changes in the wholesale market affect its retail business.

22. The 2013 Plan maintains NorthWestern's 6 aMW annual DSM acquisition goal, which was set following an energy efficiency potential study completed in 2009. Energy efficiency technologies, markets, and NorthWestern's avoided costs have changed since 2009. NorthWestern should consider reassessing energy efficiency potential in its service area, including the reasonableness of its annual 6 aMW DSM acquisition goal. In addition, NorthWestern's DSM programs should be responsive to changing markets and avoided costs even if overall acquisition goals remain appropriate. In that regard, NorthWestern should reassess whether residential lighting has been transformed by federal lighting standards for alternative bulb types, and consider whether the utility's role in continuing to incent this technology is useful.

23. The Commission's planning and procurement rules emphasize transparency, stakeholder involvement, and diligent documentation of decision-making. Admin. R. Mont. 38.5.8201 *et seq.* Future plans should include a glossary of key terms included in the plan, especially terms used in PowerSimm reports and used to explain PowerSimm operations and

outputs. Additionally, future plans should contain key model input and output data electronically, including forward price information, simulated monthly electricity and natural gas prices, CO₂ costs or adders, resource production, and average and peak demand information with and without DSM impacts. Finally, stakeholders should have reasonable opportunities to test NorthWestern's modeling assumptions and results, both before a plan is filed (through ETAC) and subsequently where NorthWestern seeks to recover costs, obtain preapproval or set avoided cost rates (through data requests). Ideally, robust analysis preceding a resource plan will reduce the need for subsequent analysis in contested cases.

BY THE MONTANA PUBLIC SERVICE COMMISSION

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