

MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.

Before the Public Service Commission of North Dakota

Case No. PU-13-___

Direct Testimony
of
Brian J. Giggee

1 **Q. Please state your name and business address.**

2 A. My name is Brian J. Giggee and my business address is 400 North
3 Fourth Street, Bismarck, North Dakota 58501.

4 **Q. By whom are you employed and in what capacity?**

5 A. I am an Electrical Systems Engineer III with Montana-Dakota
6 Utilities Co. (Montana-Dakota), a Division of MDU Resources Group, Inc.

7 **Q. Please describe your duties and responsibilities with Montana-**
8 **Dakota.**

9 A. I have responsibility for the evaluation and development of
10 Montana-Dakota's resource expansion modeling, compiling the Integrated
11 Resource Plan, and following the Midcontinent Independent System
12 Operator's (MISO) resource adequacy requirements.

13 **Q. Please outline your educational and professional background.**

14 A. I hold a Degree of Bachelor of Science in Electrical Engineering
15 from South Dakota School of Mines and Technology. My work experience
16 includes more than five years as an engineer for Montana-Dakota's
17 System Operations and Planning Department.

1 Q. **Have you testified in other proceedings before regulatory bodies?**

2 A. No, I have not.

3 Q. **What is the purpose of your testimony in this proceeding?**

4 A. The purpose of my testimony is to describe the resource
5 expansion modeling that selected the Lewis & Clark baghouse project as
6 part of the Company's least-cost modeling results as presented in the
7 Supply Resource Analysis in Exhibit 2.

8 Q. **What is your experience with developing resource expansion
9 planning models?**

10 A. Over the last five years, I have been responsible for the resource
11 expansion modeling that has been included in both the 2009 and 2011
12 Montana-Dakota Integrated Resource Plans along with several other
13 Company projects.

14 Q. **What information did you use to prepare your model in this
15 proceeding?**

16 A. The information used in the model included all Montana-Dakota's
17 existing and committed units, MISO energy market, and contracts. Also
18 included in the model were new alternative units that the model could
19 select on a least-cost basis to meet customer needs for demand and
20 energy. New resource options included: natural gas fired units (simple
21 cycle combustion turbines, combined cycle units, and internal combustion
22 engines), coal units (with and without CO₂ capture), wind (self-built and
23 contracted), solar, landfill gas, biomass, and geothermal. All units included
24 the following information: operating characteristics, maintenance schedule

1 and operational and maintenance cost. Committed and new units also
2 included capital costs. Four different options for the Lewis & Clark Station
3 were also analyzed. Three of the options converted the unit to generate on
4 natural gas only and the other option was the Lewis and Clark baghouse
5 project. Lastly, the resource expansion model used Montana-Dakota's
6 50/50 summer peak demand forecast with a 90 percent MISO summer
7 peak coincident factor along with Montana-Dakota's annual energy
8 forecast.

9 **Q What assumptions did you make regarding the Lewis and Clark**
10 **Station in your modeling analysis?**

11 A. The resource expansion model assumed the Lewis & Clark Station
12 retiring at the end of 2014, so the model would have the option of
13 selecting the Lewis and Clark baghouse project, converting the unit to
14 natural gas fired only, or selecting a different resource to replace the
15 Lewis and Clark Station. The model assumed a capital cost of \$27.42
16 million for the Lewis and Clark baghouse project along with an additional
17 \$3.46/kW-yr for fixed O&M, an additional \$0.59/MWh for variable O&M,
18 and an increase of station service of 0.3 MW.

19 **Q Why did you only assume a five year life for the Lewis & Clark**
20 **Station baghouse project?**

21 A. The five year life was chosen to test if the Lewis and Clark
22 baghouse project would still be a least-cost resource even if a future
23 requirement would force the unit to shutdown in 2020. There are no known

1 requirements which would affect the ability of the Lewis & Clark Station to
2 operate beyond 2020 except for the MATS Rule.

3 **Q What were the results of your least-cost modeling analysis?**

4 A. The least-cost or Optimal Resource Case selected the Lewis &
5 Clark baghouse project, a 50-100 MW wind purchased power agreement
6 (PPA), 110 MW of internal combustion engines (73 MW in 2015 and 37
7 MW in 2017), partnering for 200 MW of output from a large combined
8 cycle unit in 2020, and constructing 20 MW of self-built wind in 2032. The
9 combined cycle project was selected to meet the Company's future
10 customer growth after the possible retirement of Heskett Unit 1 and the
11 Lewis & Clark Station at the end of 2019.

12 **Q What sensitivity scenarios did you analyze with the model?**

13 A. The resource expansion model included eleven sensitivity
14 scenarios besides the Base Case and Optimal Resource Case. There
15 were three different options to convert the Lewis & Clark Station to
16 generate on natural gas only, low and high natural gas price, low and high
17 customer growth, a \$30 and \$50 carbon tax, a high capital cost for natural
18 gas fired alternatives, and a last scenario which assumed Montana-
19 Dakota's current MISO coincident factor of 80.6% compared to the
20 modeled 90% coincident factor.

21 **Q Was the Lewis and Clark baghouse project selected as a least-cost
22 resource alternative in all of your modeling runs?**

23 A. The Lewis & Clark baghouse project was selected as a least cost
24 resource in all scenarios except the low customer growth scenario. The

1 low growth scenario has a lower customer peak in 2032 (500.2 MW) than
2 Montana-Dakota's peak customer load in 2012 (573.6 MW). The low
3 growth scenario is highly unlikely due to the projected growth levels that
4 the Company is experiencing. As shown on Table 3-1 in Exhibit 2, the Net
5 Present Value of the revenue requirement, over the 50 year study period,
6 is 3.15 percent lower (approximately \$115 million) under the Optimal Case
7 including the installation of pollution control equipment at the Lewis &
8 Clark Station than the Base Case that assumed retirement of the Lewis &
9 Clark Station.

10 **Q. Does this conclude your direct testimony?**

11 **A. Yes, it does.**