

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF SOUTH DAKOTA

*In the Matter of the Complaint by Oak Tree Energy LLC against  
NorthWestern Energy for refusing to enter into a Purchase Power Agreement*

EL11-006

---

Responsive Testimony of

**Steven E. Lewis**

On behalf of NorthWestern Energy

---

Submitted February 24, 2012

## Table of Contents

Introduction .....	1
Purpose of Testimony .....	1
Fundamentals of Electricity Market in South Dakota .....	1

1 **Testimony**

2 **Introduction**

3 **Q: Please state your name and business address.**

4 A: My name is Steven E. Lewis. I am a principal and employee of Lands Energy Consulting. My  
5 business address is 2719 California Avenue SW Suite 5, Seattle, Washington 98116.

6 **Q: Are you the same Steven E. Lewis that has previously filed testimony in this docket?**

7 A: Yes.

8 **Purpose of Testimony**

9 **Q: What is the purpose of your responsive testimony?**

10 A: My testimony is in response to the Prefiled Direct Testimony of Brian P. Rounds, particularly the  
11 portions regarding the electricity market price forecasts.

12 **Q: Please summarize your testimony.**

13 A: This response provides additional details regarding the forecast of electricity market prices as  
14 applied to South Dakota for purposes of computing incremental costs and avoided costs.

15 **Fundamentals of Electricity Market in South Dakota**

16 **Q: Starting on page 10 line 17, Mr. Rounds states, "I would prefer some discussion of what  
17 fundamentals WAPA's market prices are based upon . . . ." Does the forecast methodology  
18 employed by Lands Energy incorporate such fundamental considerations?**

19 A: While electricity markets are ultimately based on the underlying fundamentals of the system,  
20 using the existing and transparent markets is a legitimate method for assessing these  
21 fundamentals. A range of factors has impacts on the prices, including the composition of the  
22 broader resource supply stack, how that composition may change over time due to resource  
23 retirement and additions, the actual demand or loading on the system, the construction of new  
24 transmission into or through the region, the cost of fuel inputs such as natural gas and coal, and  
25 so on. One approach to forecasting the market prices is to build complex computer simulations  
26 that attempt to model all of these different moving parts in a way that produces reasonable  
27 results. This method requires a significant amount of overhead as all the inputs needed to  
28 accurately run such a complex simulation must be continuously reviewed and the inputs and

1 assumptions monitored and updated on a continual basis. Using the actual forward markets as  
2 the basis for a forecast is not only straightforward, it actually incorporates the combined  
3 thinking of the marketplace regarding the various fundamental factors that impact spot market  
4 pricing and is arguably a better benchmark against which to measure long-term resource  
5 options than a complex fundamentals-based model.

6 **Q: Mr. Rounds indicated that he would like more discussion of the fundamentals driving the**  
7 **WAPA area market. Can you provide a basic summary?**

8 A: Yes, although a summary provided here will necessarily be very basic, I can provide some insight  
9 into the fundamentals influencing this region.

10 It is useful to get a sense of scale at the outset. NorthWestern Energy serves an electric load in  
11 South Dakota that is approximately 341 MW at maximum peak and approximately 170 aMW  
12 energy consumption. NorthWestern Energy contracts to the Western Area Power  
13 Administration (“WAPA”) to balance the generation to load on an hourly basis. WAPA operates  
14 a Balancing Authority within the Midwest Reliability Organization (“MRO”), but is not part of the  
15 Midwest Independent Transmission System Operator (“MISO”). MISO manages transmission  
16 and provides market clearing services for a large portion of the MRO as well as parts of the  
17 ReliabilityFirst Corporation, SERC Reliability Corporation, and Southwest Power Pool regions. The  
18 2012 expected peak load for WAPA/Basin is reported by the MISO as 3,629 MW or about 11.7  
19 times greater than NorthWestern Energy, and the expected peak load for MISO is 100,838 MW,  
20 or about another 28 times greater than the WAPA/Basin peak load, so NorthWestern Energy is a  
21 relatively small portion of the overall electrical system in the region.

22 NorthWestern Energy serves its load in South Dakota region with the output from the following  
23 generating projects:

- 24 • Coal Plants
  - 25 ○ Big Stone
  - 26 ○ Coyote
  - 27 ○ Neal Unit No. 4
- 28 • Other Thermal
  - 29 ○ 9 standby/peaking units
- 30 • Titan I Wind project

31 The output from these units supplies the bulk of NorthWestern Energy’s needs, and WAPA sells  
32 any surpluses and purchases any deficiencies on behalf of NorthWestern Energy. As the bulk of  
33 these resources are baseload output, it is reasonable to expect that they will generate relatively  
34 flat and that NorthWestern Energy will typically sell during low load hours and typically purchase  
35 electricity during higher load periods unless the use of the peaking units is warranted.

1 WAPA is a federal agency providing power and transmission services throughout the Western  
2 United States. Their Upper Great Plains Region serves the South Dakota area as well as parts of  
3 Montana, North Dakota, Nebraska, Iowa, and Minnesota. WAPA sells the output of 8 federal  
4 hydro electric projects in this area and operates a substantial amount of transmission and  
5 transmission services. WAPA's hydro-electric resources within the MRO total over 2,300 MW in  
6 generating capacity and are on the Missouri River system. They include:

- 7 • Garrison
- 8 • Oahe
- 9 • Big Bend
- 10 • Fort Randall
- 11 • Gavins Point

12 Hydro-electric projects are typically more flexible than thermal generators and therefore can be  
13 dispatched up and down in a more flexible manner to meet change loads or increasingly to  
14 counteract the intermittent nature of renewable resources.

15 WAPA provides balancing and marketing services to NorthWestern Energy as well as other  
16 regional utilities. Among these utilities are Basin Electric Cooperative, Heartland Consumers  
17 Power District, and the Missouri River Energy Services. Of these, Basin Electric Cooperative is  
18 the largest. Basin's resources within the MRO are approximately 2,500 MW with the following  
19 approximate composition:

- 20 • Natural Gas Fired: 300 MW
- 21 • Coal Fired: 1500 MW
- 22 • Diesel Fired (primarily grid reliability): 100 MW
- 23 • Wind and renewables: 600 MW

24 Missouri River Energy Services is a bit smaller, controlling approximately 600 MW of resources  
25 with the following composition:

- 26 • Natural Gas Fired: 140 MW
- 27 • Coal Fired: 282 MW
- 28 • Nuclear: 32 MW
- 29 • Diesel Fired (primarily grid reliability): 65 MW
- 30 • Wind and renewables: 82 MW

31 Heartland Consumers Power District is substantially smaller with about 230 MW of resources  
32 within the WAPA and MRO footprints with the following composition:

- 33 • Coal Fired: 131 MW
- 34 • Nuclear: 45 MW
- 35 • Wind and renewable: 51 MW

1 In addition, WAPA operates 3 DC tielines connecting the MRO to the Western Electricity  
2 Coordinating Council (“WECC”). These tielines have a combined total transfer capability of  
3 600 MW. Because WECC and MRO operate their AC system independently, the  
4 interconnections must be DC facilities to keep the two AC systems separate from one another.  
5 Because of the losses of such an electrical transformation and the transmission costs, the  
6 tielines rarely operate at or near their rated transfer capability.

7 Based on this basic summary of the region’s resources, it is fair to say that the greater  
8 WAPA/Basin Electric resource stack does have a significant amount of hydro-electric resources,  
9 but also has significant amounts of fossil fuel resources in the form of coal and natural gas, as  
10 well as base-load nuclear plants. Although there are tielines to WECC, those tielines probably  
11 do not play a significant role in the dispatching of plants in the MRO nor in the ultimate  
12 wholesale prices in the MRO.

13 Besides WAPA, MISO provides a market-clearing function in the MRO as well as the other  
14 reliability sub-regions listed earlier. MISO indicates 114,356 MW in installed generation within  
15 its market area, with at least 70 percent of that total generated by coal or natural gas units.  
16 They also indicate approximately 1400 MW in transfer capability with WAPA, which will link the  
17 effective prices seen in the MISO regions and WAPA.

18 In general, the resource in the region should be dispatched economically, with the units with the  
19 lowest incremental costs dispatched first followed by the higher-cost units. The highest cost  
20 unit to run at any given time is the marginal unit, or the unit that sets the market prices. Due to  
21 their relatively higher cost to run, the natural gas plants tend to set the market prices. While  
22 neither NorthWestern itself nor WAPA has appreciable natural gas fired generation, MISO has  
23 an abundance, indicating nearly 35,000 MW in the MISO region alone or about 30% of the  
24 projected peak need for MISO.

25 **Q: Does this conclude your Responsive Testimony?**

26 **A:** Yes.

**Affidavit of Steven E. Lewis**

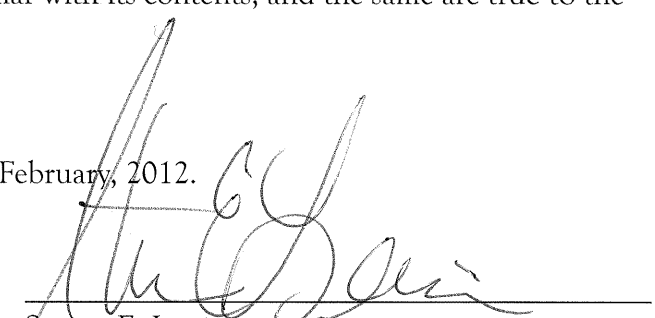
STATE OF OREGON            )  
  : ss  
COUNTY OF MULTNOMAH)

Steven E. Lewis, being first duly sworn upon oath, states and alleges as follows:

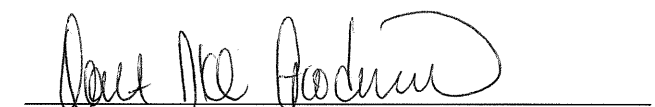
- 1) I am a principal and employee of Lands Energy Consulting.
- 2) I have read this document and am familiar with its contents, and the same are true to the best of my knowledge and belief.

Further affiant sayeth naught.

Dated at Portland, Oregon, this 23 day of February, 2012.

  
\_\_\_\_\_  
Steven E. Lewis

SIGNED AND SWORN to before me this 23<sup>rd</sup> day of February, 2012, by Steven E. Lewis.

  
\_\_\_\_\_  
Notary Public, Oregon  
My commission expires: Nov. 14, 2014

