

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

Prefiled Direct and Rebuttal Testimony of

Steven E. Lewis

On behalf of NorthWestern Energy

January 12, 2012

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1 Testimony

2 Introduction and Qualifications

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. Briefly describe your education and business experience.**

7 A. I hold a Bachelor of Science degree in physics with a minor in math from Gonzaga University in
8 Spokane, Washington. I graduated in 1989. I started working in the electric utility business as a
9 summer intern in 1987 at the Bonneville Power Administration and commenced full-time
10 employment in the utility sector in 1990. Between 1990 and 2001, I held positions with both
11 Puget Sound Energy and Seattle City Light, where I was responsible for managing utility power
12 supplies in a reliable and economic manner. I have been with Lands Energy as a principal since
13 2001. During my time with Lands Energy, I have advised a variety of utilities, power producers,
14 and energy trading companies on their activities in the energy markets. I have worked since
15 2001 on projects on behalf of NorthWestern Energy, working for both their South Dakota and
16 Montana offices. The work with the South Dakota office included providing a wholesale
17 electricity price forecast and facilitating two Requests for Proposals (RFPs). My curriculum vitae
18 is included as Exhibit SEL-01.

19 Purpose of Testimony

20 **Q What is the purpose of your testimony?**

21 A. To provide information related to the price forecast for wholesale electricity in South Dakota, to
22 rebut certain parts of the testimony of J. Richard Lauckhart, and to provide information
23 regarding NorthWestern Energy's recent solicitations for renewable energy.

24 **Q. Please summarize your testimony.**

25 A. My testimony includes:

26 ♦ A review of the methodology Lands Energy used to prepare a price forecast for wholesale
27 electricity in the South Dakota region;

28 ♦ Rebuttal to the Prefiled Direct Testimony of Mr. J. Richard Lauckhart on behalf of Oak Tree
29 Energy, particularly to the Black & Veatch price forecast provided therein; and

- 1 ♦ Observations derived from the solicitations we have conducted for NorthWestern Energy for
2 generating resources in South Dakota.

3 **Electricity Price Forecast for South Dakota**

4 **Q. Did Lands Energy provide NorthWestern Energy with an electricity price forecast for South**
5 **Dakota?**

6 A. Yes. In October 2011, we prepared a price forecast for NorthWestern Energy for wholesale
7 power prices for South Dakota. The forecast provided the prices NorthWestern Energy would
8 expect in the wholesale spot market for any purchases or sales of electricity during the forecast
9 period. The forecast Heavy Load Hour (HLH or “On-Peak”) price was \$32.32/MWh for calendar
10 year 2012 and rose to \$61.58/MWh in 2031. The forecast Light Load Hour (LLH or “Off-Peak”) price
11 was \$20.02/MWh in 2012 and rose to \$37.60/MWh in 2031. The forecast is included as
12 Exhibit SEL-02.

13 **Q. Briefly describe the process you use to forecast electricity prices.**

14 A. The process we employ with customers is to use forward electricity markets to the extent
15 possible into the future. By “forward electricity markets,” we mean markets where electricity is
16 transacted for delivery at a specified later date. This gives the clearest indication of what the
17 combined market valuation is for electricity at that later time period. Beyond that date, we
18 supplement the forecast by using forward natural gas markets, which are similar to the forward
19 electricity markets; but natural gas trades further into the future than electricity so the curve
20 can be built out further in time. Beyond that, we employ a fixed yearly escalator to project
21 those forward prices further out into the future. In this case the forecast was developed in this
22 manner for the following time periods:

- 23 ♦ Forward Electricity Prices: November 2011 – March 2013
24 ♦ Forward Natural Gas Prices: April 2013 – September 2015
25 ♦ Long-Term Escalation: October 2015 – December 2031

26 **Q. Is this the process you used to forecast South Dakota prices for NorthWestern Energy?**

27 A. Yes. In this case, though, we had to account for the fact that there are no points on the power
28 grid in South Dakota where electricity market prices are easily available or transparent.

29 **Q. What did you do to obtain forward electricity prices?**

30 A. We considered which points on the grid are nearest to South Dakota electrically and provide
31 good market price transparency. We concluded that the Minnesota Hub, which is operated by
32 the Midwest ISO (MISO), was reasonably close, and we could obtain price history for that point
33 from the MISO website. Unfortunately, the Minnesota Hub, while having good transparency for

1 historical market prices, does not have similar transparency for forward prices; so we had to
2 look a bit further geographically. In this case, we used Cinergy, which is also operated by MISO
3 and is a trading point in Indiana. Both the historical and forward prices are readily available for
4 the Cinergy delivery point. The price histories for both Cinergy and the Minnesota Hub were
5 analyzed for the period October 2010 through September 2011 to determine the relationship
6 between those two points. The Minnesota Hub consistently prices lower than Cinergy. The
7 monthly historical comparison of the two points is included as Exhibit SEL-03. The forward
8 prices for Cinergy were obtained from Argus Media, a third-party market price provider. A copy
9 of their October 16, 2011 ARGUS US ELECTRICITY publication is included as Exhibit SEL-04. These
10 forward prices were then adjusted using the historical relationship to arrive at a forward price
11 for the Minnesota Hub through March 2013.

12 **Q. Where did you obtain forward natural gas prices?**

13 A. Forward natural gas prices were obtained for AECO¹, a trading point on the gas pipeline network
14 in Alberta, Canada. The AECO prices are readily available on the Internet. As with the forward
15 electricity prices, the forward natural gas prices are for contracts being put in place now for later
16 delivery of natural gas. As such, they reflect the market's current thinking on the supply and
17 demand dynamics for that period of time. The AECO natural gas prices from October 17, 2011,
18 are included as Exhibit SEL-05.

19 **Q. How were the natural gas prices used?**

20 A. For the period when both electricity and natural gas prices were available, which was November
21 2011 through March 2013, the relationship between the two was established by computing a
22 monthly market Imputed Heat-Rate (IHR), which is the electricity price divided by the natural
23 gas price. The monthly IHR was then used to compute a forecast of the electricity prices for the
24 longer period for which we had natural gas prices, through September 2015. This is a
25 reasonable approach because natural gas units are typically the most expensive units running in
26 a region and these units operating at the top of the supply curve set the electricity wholesale
27 prices based on a combination of their operating efficiency, the natural gas prices, and
28 incremental costs. Therefore, it is reasonable to use this relationship between the two energy
29 markets to extend the electricity natural gas prices. By applying the natural gas market in this
30 manner, the electricity market forecast was extended through September 2015.

31 **Q. How was the forecast beyond September 2015 generated?**

32 A. An annual escalator of 2.7% was applied to the final year's prices to extend the forecast through
33 2031. The 2.7% was computed from national GDP values for the period 2006–2008. More
34 current GDP values could have been incorporated, but inclusion of the economic numbers from

¹ AECO stands for Alberta Energy Company.

1 the last few years would have decreased the annual escalator to at least 2.1% and resulted in a
2 lowering of our forecast. The GDP and annual inflation values are included in Exhibit SEL-06.

3 **Q. Is this a reasonable method to forecast prices for South Dakota?**

4 A. Yes. Using the forward markets for electricity and natural gas grounds the forecast using actual
5 transactions for future delivery of the two commodities. It therefore incorporates the collective
6 wisdom of all the market participants at the time a forecast is prepared. Lands Energy has used
7 this method of price forecasting to advise numerous clients on the wholesale energy markets
8 and specifically to support resource management decisions. This method provides a sound basis
9 for making resource planning decisions.

10 **Q. Don't energy prices change dramatically at times?**

11 A. Yes, wholesale energy prices—and particularly electricity prices—are notoriously volatile. It is
12 reasonable to expect that prices will change, perhaps even drastically, during the forecast
13 period. It is also reasonable, however, to expect that prices would change in a downward
14 direction just as much as they might change in an upward direction. Any consideration of price
15 changes should consider the potential for both upward and downward changes. Most recently,
16 the development of extraction methods to access shale gas combined with the overall slowing
17 of the U.S. economy produced a significant downward shift in prices between 2008 and today.
18 The understanding of the impact of the shale gas extraction methods will have on natural gas
19 and electricity markets has been unfolding over the last couple years. Exhibit SEL-07 is the Time
20 magazine article from April 2011 that had the advances in shale gas as the cover story.

21 **Observations of the Black & Veatch Forecast**

22 **Q. Have you reviewed the material provided by J. Richard Lauckhart in his direct testimony**
23 **submitted on behalf of Oak Tree Energy?**

24 A. Yes, I have.

25 **Q. Specifically, did you review the price forecast provided by Mr. Lauckhart?**

26 A. Yes. I reviewed the Black & Veatch electricity price forecast for WAPA for 2011 through 2035.
27 This forecast is found in the Excel workbook titled "EL11-006_Oak Tree_EX 3_Summary and
28 BrownValue_AvoidedCost.xls" on the tab labeled "WAPA Monthly." This would be an alternate
29 forecast of wholesale electricity prices to the one we provided to NorthWestern Energy.

30 **Q. Do you believe this forecast should be used to set avoided costs and ultimately purchase**
31 **power prices for NorthWestern?**

32 A. No. The Black & Veatch forecast provided in Mr. Lauckhart's testimony is clearly too high.

1 **Q. What is the basis of your conclusion?**

2 **A.** I have taken a number of factors into consideration. First, the forecast is from Fall 2010, so it is
3 over a year old. The Black & Veatch forecast for just the first year, 2011, was also significantly
4 higher than actual market data. The forecast then continues to exceed current forward market
5 prices through 2015. And finally, the price increases included for carbon emissions starting in
6 2016 appear to be quite high.

7 **Q. Please explain the differences observed for 2011?**

8 **A.** Since the Black & Veatch forecast was prepared in 2010, we have one year of data for which we
9 can compare the forecast to actual spot market values. The Black & Veatch On-Peak and Off-
10 Peak price forecasts average 14% and 30% higher respectively than the actual monthly On-Peak
11 and Off-Peak prices reported by MISO for the Minnesota Hub for the calendar year. In fact, only
12 one month, July 2011, had actual prices higher than the Black & Veatch forecast. A detailed
13 table and chart are included as Exhibit SEL-08.

14 **Q. Please also explain the differences observed through 2015?**

15 **A.** For the first four years (2012–2015), their forecast is 23% to 40% higher than the forward
16 market values we computed using the MISO forward markets. A detailed comparison is
17 available in Exhibit SEL-09. In addition, as referenced in the Prefiled Direct and Rebuttal
18 Testimony of Bleau LaFave and documented in Exhibit BJL-4, the pricing for February 2011
19 would have been even lower than the prices we produced in October 2011.

20 **Q. And what differences were observed after 2015?**

21 **A.** In 2016, their forecast takes a dramatic jump upwards, particularly during Off-Peak hours. The
22 increase causes a much more pronounced price increase between 2016 and 2031 than we had
23 in our forecast.

24 **Q. What is the basis for their large escalation in 2016?**

25 **A.** In reviewing some of the other documents provided by Mr. Lauckhart, specifically the
26 PowerPoint presentation titled “Energy Market Perspective: Midwest Baseline,” it is apparent
27 that the Black & Veatch forecast incorporated significant price increases in 2016 based on an
28 assumption that carbon penalties would commence and add operating costs to generating units
29 emitting greenhouse gases. You can see how they explain the difference between their no
30 carbon-cost projections and with carbon-cost projections in slide 27 of their presentation
31 material. This slide is included as SEL-10 for easy reference.

1 **Q. Does your forecast include carbon emission costs?**

2 A. The forecast referenced in my testimony so far has not included any carbon emission cost
3 numbers. We did, however, provide NorthWestern with a forecast including a projected carbon
4 emission cost; but the impact on our electricity price forecast is much smaller, indicating that
5 our carbon emission cost projection must also be lower than Black & Veatch's. Our carbon
6 projection was \$5/ton starting in 2015 and shifting to \$10/ton starting in 2020 and rising to
7 \$15/ton in 2025. Our forecast with the carbon cost adders and how it compares to the Black &
8 Veatch forecast is included in Exhibit SEL-09. During this part of the forecast window, the Black
9 & Veatch forecast is 49% to 109% higher than ours.

10 **Q. Do you believe your carbon cost adder to be reasonable?**

11 A. The commencement of any sort of emission cost adder has been speculative and difficult to
12 forecast for some time now due to the political nature of the proposed regulations. Four years
13 ago, we and others were projecting a much sooner start to these regulations and costs as the
14 Waxman-Markey bill² had passed the house in June 2009 and the Kerry-Boxer bill³ was being
15 discussed in Senate committee in November of that year. Since then, no climate change
16 legislation has been pursued with any fervor at the national level, indicating a definite slowing in
17 the political process with regard to implementing these new regulations. At this time, a
18 cautious approach seems reasonable, particularly when considering long-term purchases, which
19 is what our projection reflects.

20 **Q. Have you reviewed the prices at which Oak Tree Energy proposes to sell their output?**

21 A. Yes, the price is \$54.40/MWh in 2012 escalating at 2.5% annually thereafter, which is equivalent
22 to \$65.10/MWh on a levelized basis.

23 **Q. How does this compare to their price forecast?**

24 A. It is \$5.30/MWh higher than their market price forecast on a levelized basis over 20 years and it
25 is particularly higher than their forecast in the initial four years prior to the onset of their
26 forecasted carbon emission prices. During this period, their offer price is \$18.20/MWh higher
27 than the Black & Veatch forecast price. Obviously, comparisons to our price forecast would
28 produce even greater differences.

² H.R. 2454: The American Clean Energy and Security Act of 2009.

³ S. 1733: The Clean Energy Jobs and American Power Act.

1 **South Dakota Resource Solicitations**

2 **Q. Has Lands Energy conducted resource solicitations on behalf of NorthWestern Energy?**

3 A. Yes. We have facilitated two solicitations for South Dakota resources. We facilitated the
4 2007/2008 solicitation for wind resources that resulted in the Power Purchase Agreement (PPA)
5 for output from the Titan I Wind Project and also facilitated a renewable resource Request For
6 Information (RFI) in 2009/2010 that was concluded without the selection of a power supply
7 resource.

8 **Q. How many responses were received in response to the renewable resource RFI?**

9 A. Lands Energy received 26 proposals from 19 distinct entities. Some respondents submitted
10 multiple proposals, which accounts for the difference in number of proposals and the number of
11 entities.

12 **Q. Did Oak Tree Energy submit a proposal in response to the RFI?**

13 A. No. We did not receive a proposal from Oak Tree Energy.

14 **Q. Did Lands Energy receive proposals for wind PPAs as part of the RFI?**

15 A. Yes. Most of the proposals were for wind projects.

16 **Q. Were prices submitted that were competitive with the prices Oak Tree has indicated they
17 would like to sell to NorthWestern Energy?**

18 A. Yes. Included in the responses were seven proposals with levelized PPA pricing below
19 \$60/MWh. The lowest levelized price offer was for \$54.90/MWh.

20 **Q. Did you consider these offers to be viable?**

21 A. Yes. Among these seven proposals were wind developers with proven track records.

22 **Q. Did NorthWestern Energy pursue any of these proposals?**

23 A. No. Northwestern determined after redoing its load and resource outlook that additional wind
24 was not needed in its portfolio, and NorthWestern terminated the RFI without pursuing any of
25 the proposals.

26 **Q. Does that conclude your testimony?**

27 A. Yes, it does.

Affidavit of Steven E. Lewis

STATE OF WASHINGTON)

: ss

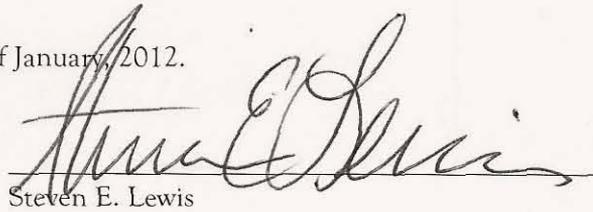
COUNTY OF KING)

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

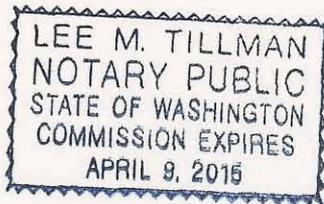
- 1) I am a principal and employee of Lands Energy Consulting.
- 2) I have read this document and am familiar with its contents, and the same are true to the best of my knowledge and belief.

Further affiant sayeth naught.

Dated at Seattle, Washington, this 12 day of January, 2012.


Steven E. Lewis

SIGNED AND SWORN to before me this 12 day of January, 2012, by Steven E. Lewis.




Notary Public, Washington
My appointment expires: 4/9/2015