

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE COMPLAINT  
BY JUHL ENERGY, INC. AGAINST  
NORTHWESTERN CORPORATION  
DBA NORTHWESTERN ENERGY FOR  
ESTABLISHING A PURCHASE POWER  
AGREEMENT

UTILITY DIVISION  
DOCKET NO. EL16-021

**PREFILED REBUTTAL TESTIMONY OF ROGER SCHIFFMAN ON BEHALF OF  
JUHL ENERGY**

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS**

**A.** My name is Roger Schiffman. My business address is 1701 Arena Drive, Davis, CA 95618.

**Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS DOCKET?**

**A.** Yes. I filed Direct Testimony in support of Juhl Energy's avoided cost estimate in this case.

**Q. WHAT IS THE PURPOSE OF THIS REBUTTAL TESTIMONY**

**A.** In this rebuttal testimony, I respond to a number of points raised by NorthWestern witnesses Mr. Bleau LaFave and Mr. Luke Hansen, and also respond to a number of points raised by Commission Staff witnesses Mr. John Thurber, and Ms. Kavita Maini. The testimony addresses some apparent misunderstandings about the Differential Revenue Requirement analysis I completed on behalf of Juhl, and also discusses deficiencies in the discriminatory avoided cost approach proposed by NorthWestern, and supported by Staff witnesses.

**Q. WHAT CONCERNS DO YOU HAVE RELATED TO NORTHWESTERN'S PROPOSED AVOIDED COST APPROACH DESCRIBED IN MR. LAFAVE'S AND MR. HANSEN'S TESTIMONY?**

1  
2 **A.** NorthWestern’s proposed avoided cost methodology rests on a foundation that does not  
3 reflect underlying supply and demand fundamentals in the energy markets, and includes a  
4 number of proposed “adjustments” to avoided cost that are discriminatory against QF resources,  
5 and which are designed to advantage NorthWestern at the expense of QF resources (all of the  
6 proposed “adjustments”, are in a downward direction and reduce NorthWestern’s estimated  
7 avoided cost). I do not believe NorthWestern’s proposed approach results in an unbiased  
8 estimate of full avoided cost, and I believe it violates PURPA, and FERC rules implementing  
9 PURPA, because of the discriminatory treatment.

10 **Q. WHY DO YOU BELIEVE THE NORTHWESTERN AVOIDED COST**  
11 **APPROACH DOES NOT REFLECT UNDERLYING SUPPLY AND DEMAND**  
12 **FUNDAMENTALS IN THE ENERGY MARKETS?**

13  
14 **A.** In developing its avoided cost estimate, NorthWestern witness Hansen testified as  
15 follows:

16 “NorthWestern projected natural gas prices by starting with Intercontinental Exchange  
17 (“ICE”) forward market quotes through October 2017 and escalated them forward at the  
18 annual escalation rate from the 2016 Energy Information Administration (“EIA”) Annual  
19 Energy Outlook (“AEO”) for natural gas. NorthWestern projected market prices for  
20 electricity by using ICE quoted prices December 2018 and then escalated those values at  
21 the 2016 EIA AEO escalation rate for natural gas. NorthWestern uses the natural gas  
22 escalation rates to forecast its electric price to maintain consistency in escalation factors  
23 and because natural gas generation is often the marginal unit in the market. NorthWestern  
24 used natural gas and electricity price quotes from the October 4, 2016 ICE forward  
25 market prices in this docket.”

1 In short, under NorthWestern's approach, it takes near-term forward prices for natural gas and  
2 electricity, and escalates those price strips using the annual escalation rate for Henry Hub natural  
3 gas prices, as published in the 2016 EIA Annual Energy Outlook.

4 As discussed in my direct testimony, the NorthWestern approach does not include  
5 fundamental modeling of changing supply and demand conditions in the electricity markets, and  
6 is incapable of measuring structural changes occurring in the industry due to retiring coal  
7 generation, a shift to natural gas generation, and substantial development of renewable energy.  
8 Those aspects all will result in changing market heat rates and marginal resources in the SPP  
9 market, in altered energy and transmission flows across the Midwest, and in substantially higher  
10 natural gas demand than has occurred historically. The expected electricity price under  
11 NorthWestern's approach is wholly dependent upon the credibility and validity of the ICE  
12 futures prices in both the short-term and the long-term, because prices from those futures  
13 contracts are used initially, and are then subsequently carried forward through the end of the  
14 study period after incorporating EIA projected escalation of Henry Hub natural gas prices.

15 I have considerable concern with the reliance upon ICE published futures prices for  
16 electricity, because there is zero reported trading volume for the underlying futures contracts that  
17 NorthWestern uses as the foundation of its electricity price estimates. As an example, Exhibit  
18 RJS-1 lists daily reports published by ICE for its SPP North Hub Day-Ahead Peak Fixed Price  
19 Future contract, for the first week of February, 2017. As shown, there is zero trading volume for  
20 all delivery dates published throughout that week. That has been the case every time I have  
21 reviewed trading volume data for ICE futures electricity prices. The same observation is true for  
22 the daily futures contract. There is zero reported trading volume for that contract as well.  
23 Market participants are not transacting or trading these instruments, so there is a lack of

1 credibility about the underlying published prices. While NorthWestern argues that these data are  
2 representative of market, and are simple and transparent, the data have no demonstrated  
3 reliability, and the process that ICE uses to publish “prices” for products that have zero trading  
4 volume is neither transparent nor subject to audit. This is a critical flaw in the NorthWestern  
5 avoided cost approach.

6 **Q. MR. LAFAVE STATES THAT THE NUMBERS PROVIDED BY**  
7 **NORTHWESTERN ARE SPECIFIC TO THE COSTS THAT ARE PAID BY**  
8 **NORTHWESTERN’S SOUTH DAKOTA CUSTOMERS CONSIDERING THE**  
9 **MARKET FORECAST, THE ECONOMIC DISPATCH OF NORTHWESTERN’S**  
10 **RESOURCES, AND THE NORTHWESTERN CUSTOMER LOAD. DO YOU AGREE**  
11 **WITH MR. LAFAVE’S CHARACTERIZATION?**  
12

13 **A.** No. As I just discussed, the foundation of NorthWestern’s energy price market forecast  
14 is the ICE futures prices, for which there is no trading volume. There is no evidence that those  
15 prices are either valid, or representative of the wholesale market prices at which NorthWestern  
16 completes transactions. While NorthWestern does complete an economic dispatch analysis,  
17 reflecting its customer load, using the PowerSimm model, results from those simulations are  
18 only used to determine if the company is in a net long or short sales position, and then  
19 subsequently used to apply its Situation 2 and Situation 3 adjustments to avoided cost.  
20 NorthWestern’s PowerSimm modeling is not used to determine its cost of energy production, its  
21 total system variable cost, or its fuel prices. It is not used in any way to determine its forecast of  
22 market energy prices. In fact, NorthWestern’s PowerSimm modeling approach is not used in any  
23 way that is consistent with normal or industry accepted approaches for determining avoided cost.  
24 For those reasons, I can’t agree with Mr. LaFave’s characterization.

25 **Q. MR. LAFAVE STATES THAT THE ANALYSIS DESCRIBED IN YOUR DIRECT**  
26 **TESTIMONY IS A REGIONAL EVALUATION OF THE CHANGE IN PRICING**  
27 **RESULTING FROM ADDING 60 MW OF WIND GENERATION TO THE REGION. IS**  
28 **THAT AN ACCURATE DESCRIPTION OF YOUR AVOIDED COST APPROACH?**

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A. No. I believe Mr. LaFave is misunderstanding the avoided cost analysis I completed on behalf of Juhl. The avoided cost approach that I presented in direct testimony is a true differential revenue requirement analysis. As such, it represents an economic dispatch of the NorthWestern South Dakota power system, with and without inclusion of the Juhl wind projects. In modeling the NorthWestern system, I included only NorthWestern loads and resources, plus the Juhl resources for the QF-In simulation. Avoided cost is measured as the change in total system production cost (fuel, variable O&M, net wholesale market purchases and sales).

The only regional modeling that I completed, was to replicate the ABB/Ventyx Reference Case energy price forecast. That was necessary because I licensed the PROMOD model and data from Ventyx, so that I could complete the DRR analysis, rather than just purchasing the Ventyx forecast already derived. The data I licensed was the Ventyx Advisor Case, so completing the PROMOD regional simulation with those data, produces the Reference Case forecast. The Reference Case energy price forecast was then used to represent wholesale energy prices in the SPP market. Effectively, the wholesale market was represented as an additional source of demand and resources for NorthWestern, to utilize in economically dispatching its power system. This is standard practice in the industry in completing a DRR avoided cost analysis.

**Q. MR. LAFAVE ALSO STATES THAT YOU BASED YOUR AVOIDED COST ESTIMATE ON AN OUTDATED FORECAST AND THAT NORTHWESTERN HAS NO KNOWLEDGE OF WHAT ASSUMPTIONS ABOUT INPUTS WERE USED OR HOW THEY WERE USED. DO YOU AGREE WITH MR. LAFAVE ON THOSE POINTS?**

1 A. No. As detailed in my testimony, I used the Fall 2015 ABB/Ventyx Reference Case as  
2 the basis for the data assumptions and PROMOD simulation to be used in completing a DRR  
3 analysis. At the time my analysis was completed, that was the most recent reference case  
4 forecast available from Ventyx. As such, it was an appropriate forecast and set of assumptions to  
5 use at the time in developing long-term avoided cost estimates. It is an independent source of  
6 market assumptions, not developed by me, or by NorthWestern. Moreover, Ventyx has over 100  
7 clients for its Reference Case forecast, and is the industry leader in providing that type of  
8 forecast to U.S. electricity market participants.

9 **Q. MR. LAFAVE ALSO DISAGREES WITH YOUR CAPACITY VALUE**  
10 **CALCULATION FOR THE JUHL PROJECTS. DO YOU AGREE WITH MR.**  
11 **LAFAVE?**

12 A. No. Mr. LaFave's analysis assumes that NorthWestern will address its need for capacity,  
13 which is demonstrated to begin in 2019 according to NorthWestern's 2016 Resource Plan, solely  
14 by making short-term capacity purchases in the SPP market, over the next 20 years. As detailed  
15 in its 2016 Resource Plan, assuming that long-term capacity will be available for that long of a  
16 period, and at the current prices seen for short-term capacity purchases in SPP, represents  
17 reliability risk for NorthWestern. The company goes to great lengths in its Resource Plan to  
18 evaluate the addition of physical peaking resources onto its power system, to meet the  
19 demonstrated capacity need, and to balance risk and cost. NorthWestern states that it will  
20 carefully evaluate its capacity need in 2019. In its Resource Plan, NorthWestern admits that  
21 despite perceived excess capacity in SPP, in its last Request for Proposals seeking capacity  
22 resources, NorthWestern received only one bid. NorthWestern also acknowledges there may be

1 delivery risk in getting any available market capacity in SPP to reliably serve its South Dakota  
2 power system.

3 I do not believe that NorthWestern will rely upon long-term market capacity purchases to  
4 meet its capacity need, but instead will opt for a physical peaking resource. Similarly, I don't  
5 believe NorthWestern would accept capacity revenue of \$3.50/kW/Month for 20 years for rate  
6 recovery purposes, because it knows the actual cost it incurs will be higher. Moreover, if  
7 NorthWestern went into the market to price a 20-year capacity purchase, the bid prices it  
8 received would approach the fixed operating and capital recovery cost of a peaking resource, and  
9 would be much higher than the \$3.50/kW/Month cited in Mr. LaFave's testimony. I do not  
10 believe that NorthWestern can achieve a long-term capacity transaction, priced at current short-  
11 term prices in the SPP market. Instead, the capacity value of the Juhl projects should be priced  
12 based on a physical peaking resource. As NorthWestern has extolled the benefits of flexible  
13 peaking technology in its 2016 Resource Plan, the estimate I developed in my direct testimony  
14 reflects the cost of a flexible LMS 100 unit, and is an appropriate measure to use for determining  
15 the avoided cost of capacity.

16 **Q. IN MR. HANSEN'S TESTIMONY, HE DESCRIBES NORTHWESTERN'S**  
17 **POWERSIMM MODELING, AND ADJUSTMENTS MADE TO ADDRESS WHETHER**  
18 **THE COMPANY IS IN A NET LONG OR NET SHORT POSITION IN THE**  
19 **WHOLESALE MARKET. DO YOU AGREE WITH THE APPROACH USED BY MR.**  
20 **HANSEN?**

21 **A.** No. Mr. Hansen describes NorthWestern's assignment of avoided cost value to  
22 the Juhl resource generation, under what he terms as Situation 1, Situation 2, and Situation 3.

1 For Situation 1 periods, when Juhl Energy produces and delivers energy when NorthWestern's  
2 supply portfolio is short (i.e., when generation is less than load), Juhl Energy generation is  
3 assigned the market purchase price for electricity that NorthWestern would otherwise have  
4 purchased.

5 For Situation 2 periods when the project produces and delivers energy when  
6 NorthWestern's supply portfolio is long (i.e., when generation is greater than load), if  
7 NorthWestern's generating resources can reduce dispatch levels, then Juhl Energy generation is  
8 assigned a value equal to the variable cost of the unit being backed down. Under Situation 3,  
9 market prices are below what NorthWestern terms the marginal resource, then energy produced  
10 by Juhl resources is valued at zero.

11 Mr. Hansen did not use the PowerSimm model to actually measure changes in production  
12 cost with and without the Juhl projects. In contrast, NorthWestern, completed PowerSimm  
13 simulations with and without the Juhl resources, and used that information to tabulate whether it  
14 is in a net purchase or a net sales position. Then NorthWestern took the additional step, external  
15 to the simulation, of applying a combination of forecast monthly energy prices, production cost  
16 estimates for “avoidable resources, or a value of zero, to the monthly forecast production of the  
17 Juhl resources. NorthWestern limited its use of the PowerSimm model only to estimate whether  
18 its system would be in a net purchase or net sale position, on a monthly basis, segmented by  
19 High Load (On-Peak) and Low Load (Off-Peak) periods.

20 NorthWestern’s approach in not examining changes in production costs on its system,  
21 and in assigning the operating cost of an “avoidable resource”, or assigning a zero value to Juhl’s  
22 energy production when the utility is in long energy position, violates industry best practice in  
23 estimating avoided cost. This approach is inconsistent with how NorthWestern actually operates



1 its system, and is designed to subsidize NorthWestern shareholders and ratepayers at the expense  
2 of QF resource owners and developers. NorthWestern is effectively taking Juhl energy for free  
3 under Situation 3 conditions, but in its actual operations, would re-sell that energy at market  
4 prices. Under Situation 2 conditions, economic dispatch principles require that NorthWestern  
5 would not back down its resources, but instead would also sell the excess energy into the market.  
6 The avoided cost approach being used by NorthWestern is discriminatory against the Juhl  
7 projects, and in violation of FERC and PURPA avoided cost principles.

8 NorthWestern has attempted to apply this same approach in estimating avoided cost in  
9 Montana, and it has been rejected by the Montana PUC. The Montana PUC has explicitly  
10 recognized that the Situation 3 adjustment is discriminatory and in violation of PURPA.

11 **Q. IS NORTHWESTERN'S AVOIDED COST APPROACH CONSISTENT WITH**  
12 **ECONOMIC DISPATCH PRINCIPLES?**

13  
14 **A.** No. In assigning the production cost of an avoidable resource to QF output under  
15 Situation 2 conditions, NorthWestern is essentially assuming it will back down generation from  
16 its other resources, even when those resources are in merit. In cases where NorthWestern is in a  
17 net sales position and the market price of energy is higher than the variable operating cost of the  
18 avoidable resource, in actual operation, NorthWestern will sell excess energy into the wholesale  
19 market. The QF resource should properly be credited with the market price as avoided cost  
20 value, in that situation.

21 The approach taken here by NWE violates economic dispatch principles, and artificially  
22 suppresses estimated avoided cost. If the avoidable resource is in the money, meaning its  
23 production costs are lower than the market price of energy, then there is no need to reduce its  
24 output during times when the Juhl resources are generating. The Juhl resource's dispatch cost  
25 will be zero, as the energy is taken whenever produced. Both resources will be in the money

1 under this type of circumstance, so the prudent decision by NWE would be to sell additional  
2 energy into the market.

3 NorthWestern's approach of assigning a zero value to energy produced when in a  
4 Situation 3 position, is even more punitive. As NorthWestern is able to re-sell excess energy at  
5 the market price, that is the appropriate value to assign to QF energy production under the  
6 Situation 3 condition.

7 **Q. IN HIS TESTIMONY, MR. HANSEN DESCRIBES THE STOCHASTIC**  
8 **APPROACH USED BY THE POWERSIMM MODEL, AND STATES THAT IT IS THE**  
9 **BEST TOOL TO USE IN ESTIMATING AVOIDED COST? DO YOU AGREE?**

10

11 **A.** No. While the risk analysis features of PowerSimm may present some advantages in  
12 resource planning, the model is not a price forecasting tool. More importantly, the way in which  
13 NorthWestern has used it in this proceeding, its stochastic features have been used only to  
14 estimate the Situation 1, 2 and 3 conditions. There is no stochastic treatment of price, or cross-  
15 correlation with fuel price volatility in NorthWestern's actual avoided cost estimate. Instead,  
16 NorthWestern applies a simplistically derived, deterministic estimate of electricity prices as the  
17 avoided cost value in Situation 1 conditions, and then applies a deterministically derived estimate  
18 of the operating cost of the marginal resources, or zero, as an avoided cost value under Situation  
19 2 and Situation 3 conditions. NorthWestern doesn't use the production costs from its  
20 PowerSimm modeling, so the claimed benefits of stochastic modeling are not even applied to the  
21 avoided cost determination. As such, the application of stochastic modeling techniques in  
22 NorthWestern's dispatch analysis adds no substantive value to its analytic approach, and is really  
23 just window-dressing to make the approach seem more sophisticated and analytically rigorous  
24 than it really is.

1 In addition, NorthWestern has declined to offer any information about the actual  
2 stochastic techniques and algorithms used by PowerSimm, and has not provided any information  
3 about the stochastic parameters used in the modeling. As such, it is impossible to assess the  
4 validity of the stochastic approach being used, based on the current record evidence.

5 **Q. IF STOCHASTIC MODELING WERE ACTUALLY APPLIED TO THE**  
6 **ELECTRICITY PRICES USED IN DETERMINING AVOIDED COST, WHAT WOULD**  
7 **BE THE IMPACT?**

8 **A.** It is well-known that energy and natural gas prices are statistically distributed with a  
9 right/upward skew, similar to a lognormal or mean-reverting probability distribution. That  
10 means the probability of high prices and upside price volatility, is greater than the probability of  
11 low prices and downside price volatility. This means that the expected value of power prices  
12 from the stochastic modeling would be higher than the input average price. NorthWestern's  
13 claimed stochastic modeling does not reflect that aspect. If true stochastic modeling were  
14 applied to the electricity prices used in determining avoided cost, then that would tend to  
15 increase the avoided cost relative to a deterministic approach.

16 **Q. MS. MAINI STATES THAT MODELING UNCERTAINTY IS A KEY**  
17 **ADVANTAGE OF USING POWERSIMM? DO YOU AGREE?**

18 **A.** No. As I just described, the stochastic modeling of uncertainty under NorthWestern's  
19 approach provides little value, because it is used only to determine the net short and net long  
20 positions. There is no application of uncertainty in NorthWestern's actual assignment of avoided  
21 cost value, either in the market prices assigned, or in the production costs of the marginal unit  
22 that are assigned. So, while Ms. Maini bases her conclusions and preference for NorthWestern's  
23 avoided cost approach, largely upon the uncertainty modeling features of PowerSimm, in reality

1 those features are not used in a meaningful way in estimating avoided cost for the Juhl projects.  
2 Thus, Ms. Maini's opinion is based on a flawed assumption and has relatively little value.

3 **Q. MS. MAINI STATES THAT NORTHWESTERN'S AVOIDED COST**  
4 **APPROACH IS NOT DISCRIMINATING AGAINST QFS. DO YOU AGREE?**

5 **A.** No. Ms. Maini reaches this conclusion because NorthWestern uses PowerSimm in its  
6 resource planning. That is an insufficient reason to conclude the approach is not discriminatory.  
7 As I have discussed, despite its claimed sophistication, PowerSimm is being used only for a  
8 limited purpose. The assignment of avoided cost value under Situation 2 and Situation 3  
9 conditions, proposed by NorthWestern, is clearly discriminatory against QFs. For this approach  
10 to not be discriminatory, NorthWestern would have to forego rate recovery for its generation  
11 resources under Situation 3 conditions, and would have to limit rate recovery during Situation 2  
12 to only the variable cost of its marginal resource.

13 **Q. MS. MAINI STATES THAT YOUR APPROACH ASSIGNS MARKET VALUE**  
14 **TO ALL JUHL ENERGY PRODUCTION, AND IGNORES MINIMUM DISPATCH**  
15 **LIMITATIONS ON NORTHWESTERN'S EXISTING GENERATION? IS THAT**  
16 **CRITICISM ACCURATE?**

17 **A.** No. Ms. Maini apparently misunderstands the DRR approach that I implemented. In  
18 completing a real DRR analysis, and measuring the change in system production cost from the  
19 QF resources, as the avoided cost value, the approach explicitly incorporates the minimum  
20 dispatch and other operating constraints on the NorthWestern units. It also explicitly  
21 incorporates the net short and net long conditions that both NorthWestern and Ms. Maini claim  
22 to be concerned about. It incorporates those aspects by completing an hourly economic dispatch  
23 of the NorthWestern system, respecting operating constraints on the generators. If there are

1 conditions where minimum generation levels are in excess of NorthWestern load, and market  
2 prices are lower than the operating cost of the marginal resource, then the DRR approach will  
3 recognize the economic loss from such a situation, and avoided cost in that circumstance will be  
4 appropriately lower, by the increment between generation cost and market price. But the  
5 approach will not artificially assign a zero value to energy in that instance. The DRR approach  
6 has been widely accepted as an avoided cost method in the industry, precisely because it  
7 explicitly measures those features.

8 Counter to the claims made by Ms. Maini, and by NorthWestern, my approach does not  
9 assign market price to Juhl energy production in all periods. It assigns the change in  
10 NorthWestern system costs, which is the appropriate measure of avoided cost. The approach I  
11 have taken is considerably more straightforward than the approach proposed by NorthWestern,  
12 and promoted by Ms. Maini.

13 **Q. MS. MAINI SUGGESTS ALTERNATIVE APPROACHES TO SETTING**  
14 **AVOIDED COST, INCLUDING COMPETITIVE BIDDING AND JUST ASSIGNING**  
15 **THE ACTUAL LOCATIONAL MARGINAL PRICES? ARE THOSE SUGGESTIONS**  
16 **APPROPRIATE?**

17 **A.** No. While competitive bidding is an approach that can be used to establish long-term  
18 avoided cost, implementing that approach requires upfront determinations by the Commission,  
19 and requires safeguards to ensure the process is administered fairly, without bias or  
20 discrimination. None of those steps have been put in place. Juhl has been attempting to  
21 negotiate an avoided cost with NorthWestern for over a year and a half, and has responded to the  
22 processes currently in place in South Dakota. During that time, NorthWestern's avoided cost  
23 estimates have changed numerous times, and have been well below market, as detailed in my

1 direct testimony. For Ms. Maini to now suggest a new process, is inappropriate and in violation  
2 of Juhl's rights under PURPA.

3 In addition, the prices that Ms. Maini cites for wind resources procured through  
4 competitive bidding proceedings are not on the NorthWestern System, and are for large wind  
5 projects, in excess of 75 MW. The Juhl projects are smaller, and would not even have been  
6 eligible to bid into those RFP processes. Smaller projects have less economies of scale  
7 advantages compared to larger projects, and for NorthWestern to adopt a bidding approach, that  
8 would have to be taken into account. It is also the case that using current bidding prices for  
9 resource specific acquisitions has little or nothing to do with NorthWestern's system wide  
10 avoided cost.

11 Ms. Maini's proposal to price Juhl output at current LMP prices would violate PURPA  
12 and would violate Juhl's right to a forecast, long-term avoided cost rate as required under  
13 PURPA and its implementing regulations. Juhl would be unable to obtain financing under that  
14 approach, and as such, what Ms. Maini is proposing is in violation of PURPA, and would  
15 effectively kill the QF industry in South Dakota.

16 **Q. MS. MAINI ALSO STATES THAT IT IS APPROPRIATE TO REDUCE**  
17 **AVOIDED COST TO REFLECT THE COST OF TRANSMISSION NETWORK**  
18 **UPGRADES. DO YOU AGREE?**

19 **A.** No. Juhl will address issues of jurisdiction at the briefing stage of this case. But, as  
20 stated in my direct testimony, this proposed treatment by NorthWestern, and again blessed by  
21 Ms. Maini, is discriminatory against QFs, and is in violation of FERC transmission  
22 interconnection policy.

1 **Q. MR. THURBER STATES THAT THE AVOIDED COST APPROACH**  
2 **PROPOSED BY NORTHWESTERN IS MORE CONSISTENT WITH THE HYBRID**  
3 **APPROACH ADOPTED BY THE COMMISSION IN THE OAK TREE CASE. DO YOU**  
4 **AGREE?**

5 **A.** No. In reaching his conclusion, Mr. Thurber states that is important to use a combination  
6 of market prices and the cost of internal generation, and based on that, he concludes that  
7 NorthWestern's approach is more consistent with Oak Tree. Here again, Mr. Thurber appears to  
8 misunderstand the DRR approach used by Juhl in this case.

9 Juhl's approach is being mischaracterized by witnesses claiming it always assigns market  
10 value to QF output. A differential revenue requirement approach, by definition, measures the  
11 change in variable operating and net production costs on the NorthWestern system, with and  
12 without the QF generation. It reflects the net sales and net purchase activity on the  
13 NorthWestern system, and explicitly reflects operating constraints on the existing generators,  
14 fuel costs, and the utility's overall resource portfolio and how it is economically dispatched to  
15 meet load, both with and without the Juhl projects. The approach explicitly measures the  
16 avoided cost value of the Juhl projects, by measuring the change in system energy cost, not by  
17 assigning market prices. It simulates the system as NorthWestern actually will operate it The  
18 NorthWestern approach does not do that, and instead is designed to artificially reduce the value  
19 of the QF energy below full avoided cost. The DRR approach does exactly what Mr. Thurber  
20 cites as important. In contrast, the Situation 3 adjustment proposed by NorthWestern is wholly  
21 inconsistent with the Commission's decision and approach in Oak Tree, in assigning zero value  
22 to QF energy production.

23 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

1 A. Yes.

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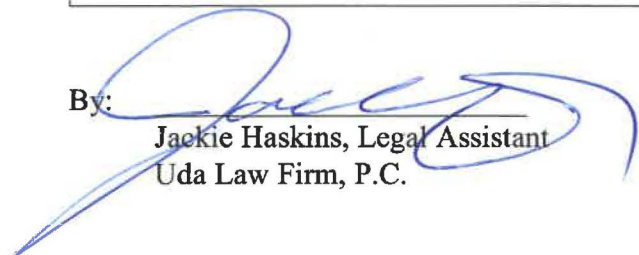
CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing PREFILED REBUTTAL TESTIMONY OF ROGER SCHIFFMAN ON BEHALF OF JUHL ENERGY was served, electronically and postage prepaid via first class U.S. mail on this 10<sup>th</sup> day of February, 2017, upon the following:

The foregoing was e-filed and the original was hand-delivered to the following:

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By:



Jackie Haskins, Legal Assistant  
Uda Law Firm, P.C.

**Futures Daily Market Report for Financial Power**  
**01-Feb-2017**

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
<b>FNP-SPP North Hub Day-Ahead Peak Fixed Price Future</b>														
FNP	Jan17					24.35	0.00	0	50	0	0	0	0	0
FNP	Feb17					23.09	-0.48	0	50	0	0	0	0	0
FNP	Mar17					26.50	-0.30	0	25	0	0	0	0	0
FNP	Apr17					28.50	0.25	0	25	0	0	0	0	0
FNP	May17					26.85	0.15	0	25	0	0	0	0	0
FNP	Jun17					29.55	-0.65	0	25	0	0	0	0	0
FNP	Jul17					34.60	0.25	0	25	0	0	0	0	0
FNP	Aug17					31.65	0.20	0	25	0	0	0	0	0
FNP	Sep17					27.35	0.35	0	25	0	0	0	0	0
FNP	Oct17					26.70	0.45	0	25	0	0	0	0	0
FNP	Nov17					26.55	0.10	0	25	0	0	0	0	0
FNP	Dec17					29.15	0.20	0	25	0	0	0	0	0
FNP	Jan18					37.60	0.20	0	25	0	0	0	0	0
FNP	Feb18					35.35	0.20	0	25	0	0	0	0	0
FNP	Mar18					28.95	0.25	0	25	0	0	0	0	0
FNP	Apr18					27.55	0.05	0	25	0	0	0	0	0
FNP	May18					26.85	0.05	0	25	0	0	0	0	0
FNP	Jun18					27.30	0.05	0	25	0	0	0	0	0
FNP	Jul18					33.70	0.20	0	25	0	0	0	0	0
FNP	Aug18					30.75	0.20	0	25	0	0	0	0	0
FNP	Sep18					24.95	0.05	0	25	0	0	0	0	0
FNP	Oct18					24.65	0.05	0	25	0	0	0	0	0
FNP	Nov18					24.15	0.05	0	25	0	0	0	0	0
FNP	Dec18					25.85	0.15	0	25	0	0	0	0	0
FNP	Jan19					38.30	0.00	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Feb19					37.50	0.00	0	0	0	0	0	0	0
FNP	Mar19					29.40	0.10	0	0	0	0	0	0	0
FNP	Apr19					27.20	0.10	0	0	0	0	0	0	0
FNP	May19					26.10	0.10	0	0	0	0	0	0	0
FNP	Jun19					26.50	0.10	0	0	0	0	0	0	0
FNP	Jul19					33.00	0.10	0	0	0	0	0	0	0
FNP	Aug19					30.05	0.10	0	0	0	0	0	0	0
FNP	Sep19					25.05	0.10	0	0	0	0	0	0	0
FNP	Oct19					24.05	0.05	0	0	0	0	0	0	0
FNP	Nov19					24.25	0.10	0	0	0	0	0	0	0
FNP	Dec19					24.45	0.10	0	0	0	0	0	0	0
FNP	Jan20					35.95	0.10	0	0	0	0	0	0	0
FNP	Feb20					34.15	0.10	0	0	0	0	0	0	0
FNP	Mar20					28.45	0.10	0	0	0	0	0	0	0
FNP	Apr20					26.50	0.05	0	0	0	0	0	0	0
FNP	May20					25.80	0.05	0	0	0	0	0	0	0
FNP	Jun20					27.25	0.05	0	0	0	0	0	0	0
FNP	Jul20					33.70	0.10	0	0	0	0	0	0	0
FNP	Aug20					30.35	0.10	0	0	0	0	0	0	0
FNP	Sep20					25.10	0.05	0	0	0	0	0	0	0
FNP	Oct20					24.25	0.05	0	0	0	0	0	0	0
FNP	Nov20					24.45	0.05	0	0	0	0	0	0	0
FNP	Dec20					26.30	0.05	0	0	0	0	0	0	0
FNP	Jan21					35.25	0.10	0	0	0	0	0	0	0
FNP	Feb21					33.70	0.10	0	0	0	0	0	0	0
FNP	Mar21					26.50	0.10	0	0	0	0	0	0	0
FNP	Apr21					25.45	0.05	0	0	0	0	0	0	0
FNP	May21					25.05	0.05	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Jun21					26.40	0.05	0	0	0	0	0	0	0
FNP	Jul21					33.60	0.10	0	0	0	0	0	0	0
FNP	Aug21					30.55	0.10	0	0	0	0	0	0	0
FNP	Sep21					24.00	0.05	0	0	0	0	0	0	0
FNP	Oct21					22.65	0.05	0	0	0	0	0	0	0
FNP	Nov21					22.75	0.05	0	0	0	0	0	0	0
FNP	Dec21					24.55	0.05	0	0	0	0	0	0	0
<b>Totals for FNP:</b>								<b>0</b>	<b>650</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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NOTE: OI information is not available until the next business day.

NOTE: Volume is aggregated and representative of each Futures market strip including applicable TAS trading activity.

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**Futures Daily Market Report for Financial Power**  
**02-Feb-2017**

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
<b>FNP-SPP North Hub Day-Ahead Peak Fixed Price Future</b>														
FNP	Jan17					24.35	0.00	0	50	0	0	0	0	0
FNP	Feb17					23.07	-0.02	0	50	0	0	0	0	0
FNP	Mar17					26.00	-0.50	0	25	0	0	0	0	0
FNP	Apr17					28.10	-0.40	0	25	0	0	0	0	0
FNP	May17					26.75	-0.10	0	25	0	0	0	0	0
FNP	Jun17					29.45	-0.10	0	25	0	0	0	0	0
FNP	Jul17					34.65	0.05	0	25	0	0	0	0	0
FNP	Aug17					31.65	0.00	0	25	0	0	0	0	0
FNP	Sep17					27.50	0.15	0	25	0	0	0	0	0
FNP	Oct17					26.85	0.15	0	25	0	0	0	0	0
FNP	Nov17					26.70	0.15	0	25	0	0	0	0	0
FNP	Dec17					29.30	0.15	0	25	0	0	0	0	0
FNP	Jan18					37.80	0.20	0	25	0	0	0	0	0
FNP	Feb18					35.55	0.20	0	25	0	0	0	0	0
FNP	Mar18					28.85	-0.10	0	25	0	0	0	0	0
FNP	Apr18					27.45	-0.10	0	25	0	0	0	0	0
FNP	May18					26.75	-0.10	0	25	0	0	0	0	0
FNP	Jun18					27.20	-0.10	0	25	0	0	0	0	0
FNP	Jul18					33.80	0.10	0	25	0	0	0	0	0
FNP	Aug18					30.85	0.10	0	25	0	0	0	0	0
FNP	Sep18					25.00	0.05	0	25	0	0	0	0	0
FNP	Oct18					24.75	0.10	0	25	0	0	0	0	0
FNP	Nov18					24.25	0.10	0	25	0	0	0	0	0
FNP	Dec18					25.95	0.10	0	25	0	0	0	0	0
FNP	Jan19					38.35	0.05	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Feb19					37.55	0.05	0	0	0	0	0	0	0
FNP	Mar19					29.45	0.05	0	0	0	0	0	0	0
FNP	Apr19					27.25	0.05	0	0	0	0	0	0	0
FNP	May19					26.15	0.05	0	0	0	0	0	0	0
FNP	Jun19					26.55	0.05	0	0	0	0	0	0	0
FNP	Jul19					33.05	0.05	0	0	0	0	0	0	0
FNP	Aug19					30.10	0.05	0	0	0	0	0	0	0
FNP	Sep19					25.10	0.05	0	0	0	0	0	0	0
FNP	Oct19					24.10	0.05	0	0	0	0	0	0	0
FNP	Nov19					24.30	0.05	0	0	0	0	0	0	0
FNP	Dec19					24.50	0.05	0	0	0	0	0	0	0
FNP	Jan20					36.00	0.05	0	0	0	0	0	0	0
FNP	Feb20					34.20	0.05	0	0	0	0	0	0	0
FNP	Mar20					28.50	0.05	0	0	0	0	0	0	0
FNP	Apr20					26.55	0.05	0	0	0	0	0	0	0
FNP	May20					25.85	0.05	0	0	0	0	0	0	0
FNP	Jun20					27.30	0.05	0	0	0	0	0	0	0
FNP	Jul20					33.75	0.05	0	0	0	0	0	0	0
FNP	Aug20					30.40	0.05	0	0	0	0	0	0	0
FNP	Sep20					25.15	0.05	0	0	0	0	0	0	0
FNP	Oct20					24.30	0.05	0	0	0	0	0	0	0
FNP	Nov20					24.50	0.05	0	0	0	0	0	0	0
FNP	Dec20					26.35	0.05	0	0	0	0	0	0	0
FNP	Jan21					35.30	0.05	0	0	0	0	0	0	0
FNP	Feb21					33.75	0.05	0	0	0	0	0	0	0
FNP	Mar21					26.55	0.05	0	0	0	0	0	0	0
FNP	Apr21					25.50	0.05	0	0	0	0	0	0	0
FNP	May21					25.10	0.05	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Jun21					26.45	0.05	0	0	0	0	0	0	0
FNP	Jul21					33.65	0.05	0	0	0	0	0	0	0
FNP	Aug21					30.60	0.05	0	0	0	0	0	0	0
FNP	Sep21					24.05	0.05	0	0	0	0	0	0	0
FNP	Oct21					22.70	0.05	0	0	0	0	0	0	0
FNP	Nov21					22.80	0.05	0	0	0	0	0	0	0
FNP	Dec21					24.60	0.05	0	0	0	0	0	0	0
<b>Totals for FNP:</b>								<b>0</b>	<b>650</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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**Futures Daily Market Report for Financial Power**  
**03-Feb-2017**

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
<b>FNP-SPP North Hub Day-Ahead Peak Fixed Price Future</b>														
FNP	Jan17					24.35	0.00	0	50	0	0	0	0	0
FNP	Feb17					22.39	-0.68	0	50	0	0	0	0	0
FNP	Mar17					25.35	-0.65	0	25	0	0	0	0	0
FNP	Apr17					27.05	-1.05	0	25	0	0	0	0	0
FNP	May17					25.85	-0.90	0	25	0	0	0	0	0
FNP	Jun17					28.65	-0.80	0	25	0	0	0	0	0
FNP	Jul17					33.90	-0.75	0	25	0	0	0	0	0
FNP	Aug17					30.95	-0.70	0	25	0	0	0	0	0
FNP	Sep17					27.00	-0.50	0	25	0	0	0	0	0
FNP	Oct17					26.65	-0.20	0	25	0	0	0	0	0
FNP	Nov17					26.80	0.10	0	25	0	0	0	0	0
FNP	Dec17					29.20	-0.10	0	25	0	0	0	0	0
FNP	Jan18					37.30	-0.50	0	25	0	0	0	0	0
FNP	Feb18					35.05	-0.50	0	25	0	0	0	0	0
FNP	Mar18					28.85	0.00	0	25	0	0	0	0	0
FNP	Apr18					27.25	-0.20	0	25	0	0	0	0	0
FNP	May18					26.60	-0.15	0	25	0	0	0	0	0
FNP	Jun18					27.00	-0.20	0	25	0	0	0	0	0
FNP	Jul18					33.70	-0.10	0	25	0	0	0	0	0
FNP	Aug18					30.75	-0.10	0	25	0	0	0	0	0
FNP	Sep18					24.90	-0.10	0	25	0	0	0	0	0
FNP	Oct18					24.65	-0.10	0	25	0	0	0	0	0
FNP	Nov18					24.15	-0.10	0	25	0	0	0	0	0
FNP	Dec18					25.80	-0.15	0	25	0	0	0	0	0
FNP	Jan19					38.25	-0.10	0	0	0	0	0	0	0



COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Feb19					37.45	-0.10	0	0	0	0	0	0	0
FNP	Mar19					29.40	-0.05	0	0	0	0	0	0	0
FNP	Apr19					27.20	-0.05	0	0	0	0	0	0	0
FNP	May19					26.10	-0.05	0	0	0	0	0	0	0
FNP	Jun19					26.50	-0.05	0	0	0	0	0	0	0
FNP	Jul19					33.00	-0.05	0	0	0	0	0	0	0
FNP	Aug19					30.05	-0.05	0	0	0	0	0	0	0
FNP	Sep19					25.05	-0.05	0	0	0	0	0	0	0
FNP	Oct19					24.05	-0.05	0	0	0	0	0	0	0
FNP	Nov19					24.25	-0.05	0	0	0	0	0	0	0
FNP	Dec19					24.45	-0.05	0	0	0	0	0	0	0
FNP	Jan20					35.80	-0.20	0	0	0	0	0	0	0
FNP	Feb20					34.00	-0.20	0	0	0	0	0	0	0
FNP	Mar20					28.35	-0.15	0	0	0	0	0	0	0
FNP	Apr20					26.40	-0.15	0	0	0	0	0	0	0
FNP	May20					25.70	-0.15	0	0	0	0	0	0	0
FNP	Jun20					27.15	-0.15	0	0	0	0	0	0	0
FNP	Jul20					33.55	-0.20	0	0	0	0	0	0	0
FNP	Aug20					30.25	-0.15	0	0	0	0	0	0	0
FNP	Sep20					25.00	-0.15	0	0	0	0	0	0	0
FNP	Oct20					24.20	-0.10	0	0	0	0	0	0	0
FNP	Nov20					24.40	-0.10	0	0	0	0	0	0	0
FNP	Dec20					26.20	-0.15	0	0	0	0	0	0	0
FNP	Jan21					35.10	-0.20	0	0	0	0	0	0	0
FNP	Feb21					33.55	-0.20	0	0	0	0	0	0	0
FNP	Mar21					26.40	-0.15	0	0	0	0	0	0	0
FNP	Apr21					25.35	-0.15	0	0	0	0	0	0	0
FNP	May21					24.95	-0.15	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Jun21					26.30	-0.15	0	0	0	0	0	0	0
FNP	Jul21					33.45	-0.20	0	0	0	0	0	0	0
FNP	Aug21					30.45	-0.15	0	0	0	0	0	0	0
FNP	Sep21					23.90	-0.15	0	0	0	0	0	0	0
FNP	Oct21					22.60	-0.10	0	0	0	0	0	0	0
FNP	Nov21					22.70	-0.10	0	0	0	0	0	0	0
FNP	Dec21					24.45	-0.15	0	0	0	0	0	0	0
<b>Totals for FNP:</b>								<b>0</b>	<b>650</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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Futures Daily Market Report for Financial Power  
06-Feb-2017

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
<b>FNP-SPP North Hub Day-Ahead Peak Fixed Price Future</b>														
FNP	Jan17					24.35	0.00	0	50	0	0	0	0	0
FNP	Feb17					21.59	-0.80	0	50	0	0	0	0	0
FNP	Mar17					25.20	-0.15	0	25	0	0	0	0	0
FNP	Apr17					27.15	0.10	0	25	0	0	0	0	0
FNP	May17					25.85	0.00	0	25	0	0	0	0	0
FNP	Jun17					28.60	-0.05	0	25	0	0	0	0	0
FNP	Jul17					34.05	0.15	0	25	0	0	0	0	0
FNP	Aug17					31.10	0.15	0	25	0	0	0	0	0
FNP	Sep17					27.10	0.10	0	25	0	0	0	0	0
FNP	Oct17					26.60	-0.05	0	25	0	0	0	0	0
FNP	Nov17					26.65	-0.15	0	25	0	0	0	0	0
FNP	Dec17					29.15	-0.05	0	25	0	0	0	0	0
FNP	Jan18					37.45	0.15	0	25	0	0	0	0	0
FNP	Feb18					35.20	0.15	0	25	0	0	0	0	0
FNP	Mar18					29.00	0.15	0	25	0	0	0	0	0
FNP	Apr18					27.40	0.15	0	25	0	0	0	0	0
FNP	May18					26.75	0.15	0	25	0	0	0	0	0
FNP	Jun18					27.15	0.15	0	25	0	0	0	0	0
FNP	Jul18					33.70	0.00	0	25	0	0	0	0	0
FNP	Aug18					30.75	0.00	0	25	0	0	0	0	0
FNP	Sep18					25.05	0.15	0	25	0	0	0	0	0
FNP	Oct18					24.80	0.15	0	25	0	0	0	0	0
FNP	Nov18					24.30	0.15	0	25	0	0	0	0	0
FNP	Dec18					25.95	0.15	0	25	0	0	0	0	0
FNP	Jan19					38.45	0.20	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Feb19					37.60	0.15	0	0	0	0	0	0	0
FNP	Mar19					29.50	0.10	0	0	0	0	0	0	0
FNP	Apr19					27.30	0.10	0	0	0	0	0	0	0
FNP	May19					26.20	0.10	0	0	0	0	0	0	0
FNP	Jun19					26.60	0.10	0	0	0	0	0	0	0
FNP	Jul19					33.15	0.15	0	0	0	0	0	0	0
FNP	Aug19					30.15	0.10	0	0	0	0	0	0	0
FNP	Sep19					25.15	0.10	0	0	0	0	0	0	0
FNP	Oct19					24.15	0.10	0	0	0	0	0	0	0
FNP	Nov19					24.35	0.10	0	0	0	0	0	0	0
FNP	Dec19					24.55	0.10	0	0	0	0	0	0	0
FNP	Jan20					35.95	0.15	0	0	0	0	0	0	0
FNP	Feb20					34.15	0.15	0	0	0	0	0	0	0
FNP	Mar20					28.50	0.15	0	0	0	0	0	0	0
FNP	Apr20					26.50	0.10	0	0	0	0	0	0	0
FNP	May20					25.80	0.10	0	0	0	0	0	0	0
FNP	Jun20					27.25	0.10	0	0	0	0	0	0	0
FNP	Jul20					33.70	0.15	0	0	0	0	0	0	0
FNP	Aug20					30.40	0.15	0	0	0	0	0	0	0
FNP	Sep20					25.10	0.10	0	0	0	0	0	0	0
FNP	Oct20					24.30	0.10	0	0	0	0	0	0	0
FNP	Nov20					24.50	0.10	0	0	0	0	0	0	0
FNP	Dec20					26.30	0.10	0	0	0	0	0	0	0
FNP	Jan21					35.30	0.20	0	0	0	0	0	0	0
FNP	Feb21					33.70	0.15	0	0	0	0	0	0	0
FNP	Mar21					26.55	0.15	0	0	0	0	0	0	0
FNP	Apr21					25.45	0.10	0	0	0	0	0	0	0
FNP	May21					25.05	0.10	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Jun21					26.40	0.10	0	0	0	0	0	0	0
FNP	Jul21					33.60	0.15	0	0	0	0	0	0	0
FNP	Aug21					30.60	0.15	0	0	0	0	0	0	0
FNP	Sep21					24.00	0.10	0	0	0	0	0	0	0
FNP	Oct21					22.70	0.10	0	0	0	0	0	0	0
FNP	Nov21					22.80	0.10	0	0	0	0	0	0	0
FNP	Dec21					24.55	0.10	0	0	0	0	0	0	0
<b>Totals for FNP:</b>								<b>0</b>	<b>650</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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NOTE: Volume is aggregated and representative of each Futures market strip including applicable TAS trading activity.

# Open and Close prices reflect the first and last trade in the market and do not correlate to any opening or closing periods.

**Futures Daily Market Report for Financial Power**  
**07-Feb-2017**

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
<b>FNP-SPP North Hub Day-Ahead Peak Fixed Price Future</b>														
FNP	Jan17					24.35	0.00	0	50	0	0	0	0	0
FNP	Feb17					22.35	0.76	0	50	0	0	0	0	0
FNP	Mar17					26.10	0.90	0	25	0	0	0	0	0
FNP	Apr17					27.80	0.65	0	25	0	0	0	0	0
FNP	May17					26.35	0.50	0	25	0	0	0	0	0
FNP	Jun17					29.05	0.45	0	25	0	0	0	0	0
FNP	Jul17					34.80	0.75	0	25	0	0	0	0	0
FNP	Aug17					31.80	0.70	0	25	0	0	0	0	0
FNP	Sep17					27.20	0.10	0	25	0	0	0	0	0
FNP	Oct17					27.00	0.40	0	25	0	0	0	0	0
FNP	Nov17					26.75	0.10	0	25	0	0	0	0	0
FNP	Dec17					29.55	0.40	0	25	0	0	0	0	0
FNP	Jan18					38.25	0.80	0	25	0	0	0	0	0
FNP	Feb18					35.95	0.75	0	25	0	0	0	0	0
FNP	Mar18					29.10	0.10	0	25	0	0	0	0	0
FNP	Apr18					27.50	0.10	0	25	0	0	0	0	0
FNP	May18					26.85	0.10	0	25	0	0	0	0	0
FNP	Jun18					27.25	0.10	0	25	0	0	0	0	0
FNP	Jul18					34.20	0.50	0	25	0	0	0	0	0
FNP	Aug18					31.20	0.45	0	25	0	0	0	0	0
FNP	Sep18					25.15	0.10	0	25	0	0	0	0	0
FNP	Oct18					24.90	0.10	0	25	0	0	0	0	0
FNP	Nov18					24.75	0.45	0	25	0	0	0	0	0
FNP	Dec18					26.05	0.10	0	25	0	0	0	0	0
FNP	Jan19					38.70	0.25	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Feb19					37.80	0.20	0	0	0	0	0	0	0
FNP	Mar19					29.50	0.00	0	0	0	0	0	0	0
FNP	Apr19					27.30	0.00	0	0	0	0	0	0	0
FNP	May19					26.20	0.00	0	0	0	0	0	0	0
FNP	Jun19					26.60	0.00	0	0	0	0	0	0	0
FNP	Jul19					33.15	0.00	0	0	0	0	0	0	0
FNP	Aug19					30.15	0.00	0	0	0	0	0	0	0
FNP	Sep19					25.15	0.00	0	0	0	0	0	0	0
FNP	Oct19					24.15	0.00	0	0	0	0	0	0	0
FNP	Nov19					24.35	0.00	0	0	0	0	0	0	0
FNP	Dec19					24.55	0.00	0	0	0	0	0	0	0
FNP	Jan20					36.90	0.95	0	0	0	0	0	0	0
FNP	Feb20					35.10	0.95	0	0	0	0	0	0	0
FNP	Mar20					29.35	0.85	0	0	0	0	0	0	0
FNP	Apr20					27.30	0.80	0	0	0	0	0	0	0
FNP	May20					26.60	0.80	0	0	0	0	0	0	0
FNP	Jun20					28.05	0.80	0	0	0	0	0	0	0
FNP	Jul20					34.70	1.00	0	0	0	0	0	0	0
FNP	Aug20					31.30	0.90	0	0	0	0	0	0	0
FNP	Sep20					25.85	0.75	0	0	0	0	0	0	0
FNP	Oct20					25.00	0.70	0	0	0	0	0	0	0
FNP	Nov20					25.25	0.75	0	0	0	0	0	0	0
FNP	Dec20					27.05	0.75	0	0	0	0	0	0	0
FNP	Jan21					35.40	0.10	0	0	0	0	0	0	0
FNP	Feb21					33.80	0.10	0	0	0	0	0	0	0
FNP	Mar21					26.65	0.10	0	0	0	0	0	0	0
FNP	Apr21					25.50	0.05	0	0	0	0	0	0	0
FNP	May21					25.10	0.05	0	0	0	0	0	0	0

COMMODITY NAME	CONTRACT MONTH	DAILY PRICE RANGE				SETTLE		VOLUME AND OI TOTALS						
		OPEN#	HIGH	LOW	CLOSE#	PRICE	CHANGE	TOTAL VOLUME	OI	CHANGE	EFP	EFS	BLOCK VOLUME	SPREAD VOLUME
FNP	Jun21					26.45	0.05	0	0	0	0	0	0	0
FNP	Jul21					33.70	0.10	0	0	0	0	0	0	0
FNP	Aug21					30.70	0.10	0	0	0	0	0	0	0
FNP	Sep21					24.05	0.05	0	0	0	0	0	0	0
FNP	Oct21					22.75	0.05	0	0	0	0	0	0	0
FNP	Nov21					22.85	0.05	0	0	0	0	0	0	0
FNP	Dec21					24.60	0.05	0	0	0	0	0	0	0
<b>Totals for FNP:</b>								<b>0</b>	<b>650</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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