Black Hills Power, Inc. d/b/a Black Hills Energy
Informational Compliance Filing
With the South Dakota Public Utilities Commission as required by
18 CFR 292.302

§ 292.302 (b) (1) The estimated avoided cost on the electric utility's system, solely with respect to the energy component, for various levels of purchases from qualifying facilities. Such levels of purchases shall be stated in blocks of not more than 100 megawatts for systems with peak demand of 1000 megawatts or more, and in blocks equivalent to not more than 10 percent of the system peak demand for systems of less than 1000 megawatts. The avoided costs shall be stated on a cents per kilowatt-hour basis, during daily and seasonal peak and off-peak periods, by year, for the current calendar year and each of the next 5 years;

Based on an all-time peak demand of 452 MW (July, 2011) Black Hills Energy South Dakota ("Black Hills") is submitting avoided cost estimates for four sizes of qualifying facilities ("QF"). This filing includes the estimated avoided cost on the Company's electric system of a 10 MW, 20 MW, 30 MW and 40 MW solar facility. Table A-1 includes the Company's estimated avoided costs, on a cents per kilowatt-hour basis, during daily and seasonal peak and off-peak periods, by year, for 2017 through 2022.

The basic method used by Black Hills for calculating avoided costs includes comparing two scenarios to estimate the resource composition and the costs and benefits of the utility's future electric system with and without the QF over a planning period. These benefits may include avoided costs such as fossil fuel expense, purchased power expense, variable O&M production expense and a reduction in or delay of future generation capacity additions.

The first scenario is a "QF plan" that reflects the utility's resource plan including the QF. The second scenario is a "No-QF plan" which reflects the utility's resource plan that replaces the qualifying facility with new resources reasonably available. Avoided cost is the calculated difference between the cost of the QF plan and the No-QF plan over the predetermined planning period.

The avoided cost of energy is calculated using a production cost model[1] to determine the hourly dispatch and costs of the two scenario portfolios. Black Hills then compares the production costs of the two models to determine the avoided cost of energy. The difference between the total system costs of the two scenarios is the avoided cost of energy.

Black Hills uses resource planning analysis tools, such as capacity expansion modeling, to determine the future resource portfolio for each of the scenarios. If the analysis shows that the addition of the QF reduces or delays future generation additions the Company calculates an avoided capacity cost. Black Hills would use the economic carrying charges of a new small combustion turbine to calculate the avoidable capacity cost.

The avoided cost rates included in this compliance filing are based on modeling that included a solar QF. Black Hills used the performance characteristics of a solar project located in the southwestern corner of the Company's service territory in the modeling. In addition, the modeling assumptions included fuel and electric price forecasts from ABB's Fall 2016 Reference Case. The information provided in Table A-1 is included for illustrative purposes only. The Company would recalculate the avoided costs for specific QF projects using the appropriate assumptions based on the QF technology type and the most current fuel and electric price forecasts.

---

[1] Black Hills uses ABB's Planning and Risk software to complete production cost modeling.

§ 292.302 (b) (2) The electric utility's plan for the addition of capacity by amount and type, for purchases of firm energy and capacity, and for capacity retirements for each year during the succeeding 10 years; and

Black Hills completes system-level peak demand and energy forecasts and a load and resource balance annually to determine the resources necessary to serve its customers. The load and resource balance showed that Black Hills will have sufficient capacity resources to serve customer electricity demand, including a 15 percent reserve margin, over the ten-year planning period (2017 through 2026). The Company does estimate that seasonal firm energy will be required in years 2017 through 2021. The need for seasonal firm energy is primarily driven by contractual and regulatory commitments that the Company has through 2023. These regulatory and contractual obligations have varying expiration dates and by the end of 2023 the Company's obligations, based on current contracts and agreements, are eliminated. For purposes of the avoided cost calculation the Company assumed that the current obligations would not be extended or renewed but that they would expire based on the terms of the current contracts. Table A-2, includes the Company's peak demand and energy forecast for the ten-year planning period. Table 1 shows the estimated firm energy purchases over the ten-year planning period without the addition of any QFs.

Table 1
Seasonal Firm Energy Purchases[2] (MW)

Year	June	July	August
2017	50	50	50
2018	0	50	50
2019	0	25	50
2020	0	50	50
2021	0	50	50
2022	0	0	0
2023	0	0	0
2024	0	0	0
2025	0	0	0
2026	0	0	0

The Company has entered into an agreement for the capacity and energy from a 20 MW solar QF that is expected to begin commercial operation in September 2018. Black Hills calculated avoided costs for the 20 MW solar QF using the same methodology that was used to calculate the avoided costs in this filing. Black Hills does not have plans to retire any of its existing capacity resources during the ten-year planning period.

§ 292.302 (b) (3) The estimated capacity costs at completion of the planned capacity additions and planned capacity firm purchases, on the basis of dollars per kilowatt, and the associated energy costs of each unit, expressed in cents per kilowatt hour. These costs shall be expressed in terms of individual generating units and of individual planned firm purchases.

As noted in (2) above Black Hills does not expect to add any capacity resources over the ten-year planning period. In the case where no future capacity resources are included in the resource portfolio other than seasonal firm energy purchases, Black Hills would not include an avoided capacity cost in its calculation of avoided costs. Black Hills' analysis that determines the future resource portfolio (for this filing a system-level peak demand and energy forecast and load and resource balance) also identifies the reduction or elimination of seasonal firm energy purchases due to the addition of the QF. The avoided costs associated with the reduction of seasonal firm energy purchases are captured in the production cost modeling used to calculate the avoided costs of energy and reflected in the total avoided energy costs included in Table A-1.

---

[2] Seasonal firm market purchases were assumed to be 25 MW blocks, for 16 hours per day six days a week for the summer months of June, July and August.

Table A-1						
Avoided Energy Costs for Various Levels of Purchase from Qualifying Facilities ($/kWh)						
10 MW Solar QF	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Summer						
Off-Peak	$ 0.0215	$ 0.0227	$ 0.0266	$ 0.0304	$ 0.0316	$ 0.0320
On-Peak	$ 0.0284	$ 0.0294	$ 0.0428	$ 0.0524	$ 0.0385	$ 0.0396
Season	$ 0.0270	$ 0.0281	$ 0.0392	$ 0.0479	$ 0.0370	$ 0.0381
Winter						
Off-Peak	$ 0.0208	$ 0.0220	$ 0.0249	$ 0.0275	$ 0.0284	$ 0.0287
On-Peak	$ 0.0267	$ 0.0278	$ 0.0303	$ 0.0335	$ 0.0350	$ 0.0349
Season	$ 0.0256	$ 0.0269	$ 0.0295	$ 0.0325	$ 0.0338	$ 0.0339
20 MW Solar QF	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Summer						
Off-Peak	$ 0.0216	$ 0.0227	$ 0.0265	$ 0.0305	$ 0.0317	$ 0.0319
On-Peak	$ 0.0284	$ 0.0345	$ 0.0423	$ 0.0447	$ 0.0470	$ 0.0395
Season	$ 0.0270	$ 0.0322	$ 0.0388	$ 0.0419	$ 0.0438	$ 0.0380
Winter						
Off-Peak	$ 0.0208	$ 0.0219	$ 0.0249	$ 0.0274	$ 0.0284	$ 0.0280
On-Peak	$ 0.0267	$ 0.0278	$ 0.0302	$ 0.0336	$ 0.0350	$ 0.0347
Season	$ 0.0256	$ 0.0269	$ 0.0294	$ 0.0325	$ 0.0338	$ 0.0336

Table A-1 Avoided Energy Costs for Various Levels of Purchase from Qualifying Facilities ($/kWh)						
30 MW Solar QF	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Summer						
Off-Peak	$ 0.0215	$ 0.0227	$ 0.0264	$ 0.0304	$ 0.0316	$ 0.0319
On-Peak	$ 0.0284	$ 0.0329	$ 0.0435	$ 0.0522	$ 0.0491	$ 0.0395
Season	$ 0.0270	$ 0.0308	$ 0.0398	$ 0.0478	$ 0.0454	$ 0.0380
Winter						
Off-Peak	$ 0.0208	$ 0.0219	$ 0.0249	$ 0.0273	$ 0.0285	$ 0.0282
On-Peak	$ 0.0267	$ 0.0278	$ 0.0303	$ 0.0335	$ 0.0350	$ 0.0348
Season	$ 0.0256	$ 0.0268	$ 0.0294	$ 0.0325	$ 0.0339	$ 0.0337
40 MW Solar QF	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Summer						
Off-Peak	$ 0.0215	$ 0.0227	$ 0.0266	$ 0.0304	$ 0.0316	$ 0.0318
On-Peak	$ 0.0284	$ 0.0344	$ 0.0409	$ 0.0485	$ 0.0464	$ 0.0394
Season	$ 0.0270	$ 0.0321	$ 0.0378	$ 0.0449	$ 0.0433	$ 0.0379
Winter						
Off-Peak	$ 0.0207	$ 0.0219	$ 0.0249	$ 0.0273	$ 0.0285	$ 0.0283
On-Peak	$ 0.0267	$ 0.0278	$ 0.0302	$ 0.0335	$ 0.0350	$ 0.0348
Season	$ 0.0256	$ 0.0268	$ 0.0294	$ 0.0325	$ 0.0339	$ 0.0337

Table A-2 Black Hills Energy-South Dakota 2017 - 2026 Load Forecast*		
Date	**Peak (MW)**	**Energy (GWh)**
2017	391	2,299
2018	400	2,318
2019	401	2,341
2020	403	2,354
2021	405	2,369
2022	408	2,388
2023	412	2,405
2024	415	2,421
2025	418	2,438
2026	422	2,454
* Includes MDU and City of Gillette ownership of Wygen 3		