Montana-Dakota Utilities Co.
2024 Integrated Resource Plan
Addendum

Montana-Dakota filed its 2024 Integrated Resource Plan (2024 IRP) with the South Dakota Public Utilities Commission on July 12, 2024. The Company now provides a supplemental analysis that includes a Badger Wind ownership (122.5 MW) and Badger Wind Power Purchase Agreement (PPA) (27.5 MW) option for a total of 150 MW into the resource supply options for the 2024 IRP. Badger Wind was the same project that was included as a sensitivity in the 2024 IRP as the “New Wind Opportunity” sensitivity and part of the five-year action plan to continue evaluation of the opportunity. The ownership portion would be a forty-nine percent ownership interest in the 250 MW Badger Wind project which is connecting to Montana-Dakota’s 230kV transmission system near Wishek, ND. Badger Wind is under construction, has all its permits and a signed generator interconnection agreement, and is scheduled to be on-line the end of 2025. The additional Badger Wind options were modeled into the four 2024 IRP base cases and all sensitivities runs for the DLOL cases.

In all four base cases, the Badger Wind options were selected in the 2024 IRP supplemental modeling which provided a lower net present value (NPV) over the fifty-year study period than the original base cases. The 2024 IRP Winter DLOL Base Case shown in Table 2, had the earliest need for a resource additional of all the base cases in the 2024 IRP selecting a simple cycle combustion turbine selected in 2027. Badger Wind ownership and PPA options were selected in the updated Winter DLOL modeling and

displaced the need for the simple cycle combustion turbine in 2027. Additional new capacity resources are pushed out to 2033.

Table 1: Comparison of Summer 2024 IRP base models

Summer DLOL models		
	Original Base Case	With Badger Wind Ownership/PPA
2024		
2025		
2026		Badger Own (122.5 MW), Badger PPA (27.5 MW)
2027		
2028	PP (10 MW)	
2029	PP (10 MW)	
2030	PP (10 MW)	
2031	PP (20 MW)	
2032	PP (20 MW)	PP (10 MW)
2033	Storage (50 MW)	PP (10 MW)
2034		PP (10 MW)
2035		PP (20 MW)
2036		CT (77.9 MW)
2037		
2038		
2039	PP (10 MW)	
2040	PP (10 MW)	
2041	Storage (50 MW)	
2042		PP (10 MW)
2043		PP (10 MW)
NPV ($M)	$2,684.72	$2,561.11
Difference	0.00%	-4.60%

Summer Current RA models		
	Original Base Case	With Badger Wind Ownership/PPA
2024		
2025		
2026		Badger Own (122.5 MW), Badger PPA (27.5 MW)
2027		
2028	PP (10 MW)	
2029	PP (10 MW)	
2030	PP(10 MW)	
2031	PP (20 MW)	
2032	PP (20 MW)	
2033	Storage (50 MW)	
2034		
2035		
2036		
2037		PP (10 MW)
2038		PP (10 MW)
2039	PP (10 MW)	PP (10 MW)
2040	PP (10 MW)	PP (20 MW)
2041	Storage (50 MW)	Storage (50 MW)
2042		PP (20 MW)
2043		PP (20 MW)
NPV ($M)	$2,644.41	$2,479.84
Difference	0.00%	-6.22%

Table 2: Comparison of Winter 2024 IRP base models

Winter DLOL models		
	Original Base Case	With Badger Wind Ownership/PPA
2024		
2025		
2026		Badger Own (122.5 MW), Badger PPA (27.5 MW)
2027	CT (94.8 MW)	PP (10 MW)
2028		PP (10 MW)
2029		PP (10 MW)
2030		PP (10 MW)
2031		PP (20 MW)
2032		PP (20 MW)
2033		Storage (50 MW)
2034		
2035		
2036	PP (10 MW)	PP (10 MW)
2037	PP (20 MW)	PP (10 MW)
2038	PP (20 MW)	PP (20 MW)
2039	PP (10 MW), Wind (100 MW)	PP(20 MW)
2040	PP (20 MW)	CT (94.8 MW)
2041	Storage (50 MW)	
2042	PP (20 MW)	PP (10 MW)
2043	PP (20 MW)	PP (20 MW)
NPV ($M)	$2,934.87	$2,701.82
Difference	0.00%	-7.94%

Winter Current RA models		
	Original Base Case	With Badger Wind Ownership/PPA
2024		
2025		
2026		Badger Own (122.5 MW), Badger PPA (27.5 MW)
2027		
2028		
2029		
2030		
2031		
2032		
2033		
2034		
2035	PP (10 MW)	
2036	Wind (100 MW)	
2037		
2038		
2039		
2040		
2041	PP (20 MW), Wind (100 MW)	CT (94.8 MW)
2042	PP (10 MW), Storage (50 MW)	PP (10 MW)
2043	PP (20 MW)	PP (20 MW)
NPV ($M)	$2,713.27	$2,554.02
Difference	0.00%	-12.98%

Additionally, all the 2024 IRP sensitivities were rerun for the summer DLOL (Tables 3 and 4) and winter DLOL (Tables 5 and 6) base cases with the inclusion of the ownership and PPA options for Badger Wind in the model. In the Summer DLOL sensitivities with the Badger Wind options, the ownership option was selected in all the sensitivities and the PPA option was selected in all except for the low market and low market/low natural gas price. The Winter DLOL sensitivities with the Badger Wind options selected the ownership option in all the sensitivities and the PPA option in all but one of the sensitivities, the increase of renewables by fifty percent and increase of demand response by ten percent.

Table 3: Least-Cost Resource Expansion Plan for Summer DLOL with Badger Wind Options

	Summer DLOL Base Case and Sensitivities with Badger Wind Ownership/PPA option											
	Base Case - Summer DLOL	High Gas +$2	High Gas +$5	High Gas +$7	Low Gas -$1	High Market +25%	High Market +50%	Low Market -25%	Low Market -25% & Low Gas -$1	High Market +25% & High Gas +$5	High Market +50% & High Gas +$7	High CT
2024												
2025												
2026	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW)	BW Own(122.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)
2027												
2028												
2029												
2030												
2031												
2032	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)
2033	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	Storage(50 MW)	Storage(50 MW)	PP(10 MW)	PP(10 MW)	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)
2034	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)			PP(20 MW)	PP(20 MW)			
2035	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)			PP(20 MW)	PP(20 MW)			
2036	CT(77.9 MW)	CT(77.9 MW)	CT(77.9 MW)	CT(77.9 MW)	CT(77.9 MW)			CT(77.9 MW)	CT(77.9 MW)			
2037												
2038												
2039												
2040												
2041						PP(20 MW)	PP(20 MW)			PP(20 MW)	PP(20 MW)	PP(20 MW)
2042	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	Wind(100 MW), PP(20 MW)	Wind(100 MW), PP(20 MW)	PP(10 MW)	PP(10 MW)	Wind(100 MW), PP(20 MW)	Wind(100 MW), PP(20 MW)	Solar(50 MW), PP(20 MW)
2043	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(20 MW)	PP(20 MW)	PP(10 MW)	PP(10 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)
NPV ($M)	$2,561.11	$2,561.71	$2,562.28	$2,562.62	$2,541.35	$2,733.65	$2,846.93	$2,321.99	$2,307.58	$2,732.44	$2,859.70	$2,569.56
Difference	0.00%	0.02%	0.05%	0.06%	-0.77%	6.74%	11.16%	-9.34%	-9.90%	6.69%	11.66%	0.33%

Alternative Resources:

PP(XX MW) - Purchase Capacity

BW Own (122.5 MW) - Badger Wind ownership option

BW PPA (27.5 MW) - Badger Wind PPA option

CT (77.9 MW) - Simple Cycle Combustion Turbine Frame Unit(GE 7E.03 LLI)

CT (107.3 MW) - Simple Cycle Combustion Turbine Frame Unit(2xGE 7F.05 - MDU 25% of 429 MW Total)

Solar(5 MW) - Self built 5 MW solar

Wind(100 MW) - Self built 100 MW wind

Wind(50 MW) - Self built 50 MW wind

Storage(50 MW) - Self built 50 MW Battery Storage

CC(200 MW) - Combined Cycle Combustion Turbine(1x1 GE 75.05)

CC(329.7 MW) - Heskett 3 & 4 Expansion to Combined Cycle

Table 4: Additional Least-Cost Resource Expansion Plan for Summer DLOL with Badger Wind Options

	Summer DLOL Base Case and Sensitivities with Badger Wind Ownership/PPA option Continued										
	Base Case - Summer DLOL	Limit Energy 5 years	Limit Energy 10 years	High Growth	Low Growth	Carbon Tax	Coyote Retire 2032	Greenhouse Gas Rule	Lower RA -10%	Renewable +25% Demand Response +5%	Renewable +50% Demand Response +10%
2024									PP(20 MW)		
2025				PP(20 MW)					PP(20 MW)		
2026	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW), PP(20 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW), PP(10 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)
2027				CC(329.7 MW)					CT (77.9 MW)		
2028		CC(200 MW)	CC(200 MW)							Wind(50 MW)	Wind(100 MW)
2029											
2030				Wind(100 MW), PP(20 MW)							
2031				CC(200 MW)							
2032	PP(10 MW)					PP(10 MW)	CT(107.3 MW)	CC(200 MW), PP(20 MW)			
2033	PP(10 MW)					Storage(50 MW)		Storage(50 MW)			
2034	PP(10 MW)						PP(10 MW)		PP(10 MW)	PP(10 MW)	
2035	PP(20 MW)			PP(20 MW)			PP(10 MW)		PP(10 MW)	PP(10 MW)	
2036	CT(77.9 MW)			CC(200 MW)	PP(10 MW)		PP(20 MW)		PP(20 MW)	PP(20 MW)	PP(10 MW)
2037					PP(10 MW)		PP(20 MW)		PP(20 MW)	PP(20 MW)	PP(10 MW)
2038					PP(10 MW)		PP(20 MW)		CT (77.9 MW)	Solar(5 MW), PP(20 MW)	PP(20 MW)
2039				PP(20 MW)	PP(20 MW)		Storage(50 MW)	PP(10 MW)		Storage(50 MW)	PP(20 MW)
2040				CC(200 MW)	PP(20 MW)			PP(10 MW)			Storage(50 MW)
2041		Storage(50 MW)	Storage(50 MW)		Storage(50 MW)	Wind(100 MW), PP(10 MW)	PP(10 MW)	Storage(50 MW)		PP(10 MW)	
2042	PP(10 MW)			PP(10 MW)		Wind(100 MW), PP(10 MW)	PP(20 MW)			PP(20 MW)	PP(10 MW)
2043	PP(10 MW)	PP(10 MW)	PP(10 MW)	Storage(50 MW), PP(20 MW)		PP(10 MW)	PP(20 MW)		PP(10 MW)	PP(20 MW)	PP(20 MW)
NPV ($M)	$2,561.11	$3,312.70	$3,202.57	$6,091.35	$2,410.81	$4,506.91	$2,580.37	$2,962.09	$2,826.28	$2,629.13	$2,666.84
Difference	0.00%	29.35%	25.05%	137.84%	-5.87%	75.98%	0.75%	15.66%	10.35%	2.66%	4.13%

Alternative Resources:

PP(XX MW) - Purchase Capacity

BW Own (122.5 MW) - Badger Wind ownership option

BW PPA (27.5 MW) - Badger Wind PPA option

CT (77.9 MW) - Simple Cycle Combustion Turbine Frame Unit(GE 7E.03 LLI)

CT (107.3 MW) - Simple Cycle Combustion Turbine Frame Unit(2xGE 7F.05 - MDU 25% of 429 MW Total)

Solar(5 MW) - Self built 5 MW solar

Wind(100 MW) - Self built 100 MW wind

Wind(50 MW) - Self built 50 MW wind

Storage(50 MW) - Self built 50 MW Battery Storage

CC(200 MW) - Combined Cycle Combustion Turbine(1x1 GE 75.05)

CC(329.7 MW) - Heskett 3 & 4 Expansion to Combined Cycle

Table 5: Least-Cost Resource Expansion Plan for Winter DLOL with Badger Wind Options

	Winter DLOL Base Case and Sensitivities with Badger Wind Ownership/PPA option											
	Base Case - Winter DLOL	High Gas +$2	High Gas +$5	High Gas +$7	Low Gas -$1	High Market +25%	High Market +50%	Low Market -25%	Low Market -25% & Low Gas -$1	High Market +25% & High Gas +$5	High Market +50% & High Gas +$7	High CT
2024												
2025												
2026	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)
2027	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)
2028	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)
2029	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)
2030	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)
2031	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)
2032	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)
2033	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)	CC(200 MW)	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)	Storage(50 MW)
2034												
2035												
2036	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)		PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)
2037	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)		PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)
2038	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)		PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)
2039	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)		PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)
2040	CT(94.8 MW)	CT(94.8 MW)	CT(94.8 MW)	CT(94.8 MW)		Wind(50 MW), PP(20 MW)	Wind(50 MW), PP(20 MW)	CT(94.8 MW)	CT(94.8 MW)	Wind(50 MW), PP(20 MW)	Storage(50 MW)	Storage(50 MW)
2041						Storage(50 MW)	Storage(50 MW)			Storage(50 MW)	PP(10 MW)	PP(10 MW)
2042	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)		PP(20 MW)	PP(20 MW)	PP(10 MW)	PP(10 MW)	PP(20 MW)	Wind(100 MW), PP(10 MW)	Wind(50 MW), PP(20 MW)
2043	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)		PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)
NPV ($M)	$2,701.82	$2,702.15	$2,702.57	$2,702.77	$2,640.46	$2,885.18	$2,990.00	$2,457.06	$2,442.39	$2,881.24	$3,011.87	$2,707.56
Difference	0.00%	0.01%	0.03%	0.04%	-2.27%	6.79%	10.67%	-9.06%	-9.60%	6.64%	11.48%	0.21%

Alternative Resources:

PP(XX MW) - Purchase Capacity

BW Own (122.5 MW) - Badger Wind ownership option

BW PPA (27.5 MW) - Badger Wind PPA option

CT (53.1 MW) - Simple Cycle Combustion Aeroderivative Unit(GE LM 6000 PF+)

CT (94.8 MW) - Simple Cycle Combustion Turbine Frame Unit(GE 7E.03 LLI)

CT (109.9 MW) - Simple Cycle Combustion Aeroderivative Unit(GE LMS 100 PB+)

CT (116.6 MW) - Simple Cycle Combustion Turbine Frame Unit(2xGE 7F.05 - MDU 25% of 429 MW Total)

RICE(44.4 MW) - Reciprocating Engine (4 x 11 MW Wartsila 31DF)

Wind(100 MW) - Self built 100 MW wind

Wind(50 MW) - Self built 50 MW wind

Storage(50 MW) - Self built 50 MW Battery Storage

CC(200 MW) - Combined Cycle Combustion Turbine(1x1 GE 75.05)

CC(365.4 MW) - Heskett 3 & 4 Expansion to Combined Cycle

Table 6: Additional Least-Cost Resource Expansion Plan for Winter DLOL with Badger Wind Options

	Winter DLOL Base Case and Sensitivities with Badger Wind Ownership/PPA option Continued										
	Base Case - Winter DLOL	Limit Energy 5 years	Limit Energy 10 years	High Growth	Low Growth	Carbon Tax	Coyote Retire 2032	Greenhouse Gas Rule	Lower RA -10%	Renewable +25% Demand Response +5%	Renewable +50% Demand Response +10%
2024				PP(30 MW)					PP(50 MW)		
2025				PP(60 MW)					PP(50 MW)		
2026	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW), PP(70 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BWOwn(122.5 MW), BW PPA(27.5 MW), PP(30 MW)	BW Own(122.5 MW), BW PPA(27.5 MW)	BW Own(122.5 MW)
2027	PP(10 MW)	PP(10 MW)	PP(10 MW)	CT(109.9 MW), CT(94.8 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	CT(94.8 MW), PP(10 MW)	PP(10 MW)	PP(10 MW)
2028	PP(10 MW)	CC(200 MW)	PP(10 MW)	CC(200 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	Wind(50 MW)	Wind(100 MW)
2029	PP(10 MW)		PP(10 MW)		PP(20 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)		
2030	PP(10 MW)		PP(10 MW)		PP(20 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)	PP(10 MW)		
2031	PP(20 MW)		PP(20 MW)		PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(10 MW)	
2032	PP(20 MW)		CC(200 MW)	CC(200 MW)	PP(20 MW)	PP(20 MW)	CT(116.6 MW)	CC(200 MW), Storage(50 MW)	PP(20 MW)	PP(10 MW)	PP(10 MW)
2033	Storage(50 MW)				Storage(50 MW)	CC(200 MW)			Storage(50 MW)	Storage(50 MW)	Storage(50 MW)
2034											
2035				CC(200 MW)		PP(10 MW)					
2036	PP(10 MW)							PP(20 MW)	PP(10 MW)		
2037	PP(10 MW)			PP(20 MW)	PP(10 MW)			PP(20 MW)	PP(20 MW)		
2038	PP(20 MW)	PP(10 MW)	PP(10 MW)	CC(200 MW)	PP(10 MW)	PP(10 MW)		Storage(50 MW)	PP(20 MW)	PP(10 MW)	
2039	PP(20 MW)				PP(10 MW)				PP(20 MW)	PP(10 MW)	
2040	CT(94.8 MW)	PP(10 MW)	PP(10 MW)	CC(200 MW)	PP(10 MW)		PP(10 MW)		CT(94.8 MW)	PP(10 MW)	PP(10 MW)
2041		Storage(50 MW)	Storage(50 MW)		Storage(50 MW)	Wind(100 MW)	Storage(50 MW)	PP(20 MW)		Storage(50 MW)	Storage(50 MW)
2042	PP(10 MW)	PP(10 MW)	PP(10 MW)	CC(200 MW)	PP(10 MW)		PP(10 MW)	Wind(100 MW), PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(10 MW)
2043	PP(20 MW)	PP(20 MW)	PP(20 MW)		PP(10 MW)		PP(10 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)	PP(20 MW)
NPV ($M)	$2,701.82	$3,383.90	$3,274.66	$7,186.52	$2,573.05	$4,641.64	$2,735.71	$3,118.05	$2,994.67	$2,771.19	$2,824.74
Difference	0.00%	25.25%	21.20%	165.99%	-4.77%	71.80%	1.25%	15.41%	10.84%	2.57%	4.55%

Alternative Resources:

PP(XX MW) - Purchase Capacity

BW Own (122.5 MW) - Badger Wind ownership option

BW PPA (27.5 MW) - Badger Wind PPA option

CT (53.1 MW) - Simple Cycle Combustion Aeroderivative Unit(GE LM 6000 PF+)

CT (94.8 MW) - Simple Cycle Combustion Turbine Frame Unit(GE 7E.03 LLI)

CT (109.9 MW) - Simple Cycle Combustion Aeroderivative Unit(GE LMS 100 PB+)

CT (116.6 MW) - Simple Cycle Combustion Turbine Frame Unit(2xGE 7F.05 - MDU 25% of 429 MW Total)

RICE(44.4 MW) - Reciprocating Engine (4 x 11 MW Wartsila 31DF)

Wind(100 MW) - Self built 100 MW wind

Wind(50 MW) - Self built 50 MW wind

Storage(50 MW) - Self built 50 MW Battery Storage

CC(200 MW) - Combined Cycle Combustion Turbine(1x1 GE 75.05)

CC(365.4 MW) - Heskett 3 & 4 Expansion to Combined Cycle

The extreme weather modeling, as part of the 2024 IRP, was also updated with the addition of the Badger Wind options included into the Winter DLOL base case. Comparing the extreme weather modeling from the 2024 IRP Winter DLOL base case and the Badger Wind options, the amount of unserved energy decreases for both normal and extreme weather. The two scenarios can be seen in Table 7.

Table 7: Comparing extreme weather results from 2024 IRP and Badger Wind Options

Badger Wind Ownership/PPA modeling Extreme Weather (Winter DLOL)				
	Normal Weather annual costs($M)	Extreme Weather annual costs($M)	Normal Weather unserved energy (GWh)	Extreme Weather unserved energy (GWh)
5th year	115.23	115.29	0	0
10th year	138.74	138.79	0	0
20th year	252.38	255.96	0	0.53
2024 IRP modeling Extreme Weather (Winter DLOL)				
	Normal Weather annual costs($M)	Extreme Weather annual costs($M)	Normal Weather unserved energy (GWh)	Extreme Weather unserved energy (GWh)
5th year	137.37	137.88	0	0.09
10th year	159.13	160.61	0	0.64
20th year	267.43	271.46	0.06	0.61

In comparing the natural gas shortage modeling from the 2024 IRP Winter DLOL base case to the Badger Wind options in the updated Winter DLOL case, the amount of unserved energy decreased with the Badger wind options as compared to the original 2024 IRP modeling. The results can be seen in Table 8.

Table 8: Comparing extreme weather results from 2024 IRP and Badger Wind Options

Badger Wind Ownership/PPA modeling Natural Gas Shortage (Winter DLOL)		
	Base Case unserved energy (GWh)	NG Shortage unserved energy (GWh)
5th year	0	0.01
10th year	0	0
20th year	0	2.65
IRP 2024 modeling Natural Gas Shortage (Winter DLOL)		
	Base Case unserved energy (GWh)	NG Shortage unserved energy (GWh)
5th year	0	0.58
10th year	0	3.43
20th year	0.06	3.09

As an update to the 2024 IRP five-year action plan, Montana-Dakota has signed a power purchase agreement and ownership purchase agreement with the Badger Wind project. Montana-Dakota signed a twenty-year 150 MW power purchase agreement with Badger Wind LLC on November 4, 2024, which contained a 49 percent undivided interest purchase option. Montana-Dakota signed a purchase agreement with Badger Wind for the 49 percent undivided interest purchase option on February 13, 2025. Terms of the purchase agreement included a condition precedent that Montana-Dakota receive an approval of an advanced determination of prudence from the North Dakota Public Service Commission (ND PSC ADP) for the ownership purchase transaction, which was approved on September 24, 2025. Approval of the ND PSC ADP for the purchase transaction will reduce the amount of MWs under the Badger Wind PPA to 27.5 MWs over its twenty-year term.