

**Input sensitivities and updated assumptions**

- Input Sensitivities
  - PTC: [0, 23] \$/MWh
  - Carbon dioxide price: [none, base, high]
    - None – no carbon costs in the future
    - Base – 15 \$/ton in 2020 to 60 \$/ton in 2040 and continued growth
    - High – 25 \$/ton in 2020 to 90 \$/ton in 2040 and continued growth
  - Natural gas price: [80, 100, 120]% of EIA AEO2014 projections, corrected for Mcf to mmBtu conversion
  - KS wind capacity factor: [50, 55, 60]%
  - MO wind capacity factor: [25, 30, 35]%
- Updated capital cost to reflect latest RTO studies – an increase by \$214 million to the upgrade costs in PJM

<b>Input Sensitivities</b>	Low	Med	High
PTC Value (\$/MWh)	0	<del>X</del>	23
Carbon Dioxide Price (Scenario)	None	Base	High
Natural Gas Price (% of EIA forecast)	80	100	120
KS Wind Capacity Factor (%)	50	55	60
MO Wind Capacity Factor (%)	25	30	35

*2\*3<sup>4</sup>=162 scenarios considered*

The tables on the following pages show the levelized cost of the different generation methods including capacity value for each scenario. The numbers on the 2<sup>nd</sup> through 6<sup>th</sup> columns represent the low (0), med (1), and high (2) case as described above (except for the PTC column where 1 represents the high case). Values are in \$/MWh.

Kansas wind and Grain Belt Project levelized costs are lowest in 80% of all cases. It is lower than Coal, Nuclear, and Solar in every scenario, and is cheaper than Missouri wind in 89% and Gas in 89% of all scenarios.

Grain Belt Express

Updated LCOE Results

Scenario	PTC Value	Carbon Dioxide	Natural Gas	KS Wind CF	MO Wind CF	Grain Belt Project	Missouri Wind	Pulverized Coal	Combined Cycle Gas	Nuclear	Utility-scale Solar
1	0	0	0	0	0	68.65	90.39	79.70	50.65	102.23	122.20
2	0	0	0	0	1	69.73	77.32	79.70	50.65	102.23	122.20
3	0	0	0	0	2	70.50	67.99	79.70	50.65	102.23	122.20
4	0	0	0	1	0	62.96	90.39	79.70	50.39	102.23	122.20
5	0	0	0	1	1	64.04	77.32	79.70	50.39	102.23	122.20
6	0	0	0	1	2	64.81	67.99	79.70	50.39	102.23	122.20
7	0	0	0	2	0	58.22	90.39	79.70	50.39	102.23	122.20
8	0	0	0	2	1	59.30	77.32	79.70	50.39	102.23	122.20
9	0	0	0	2	2	60.07	67.99	79.70	50.39	102.23	122.20
10	0	0	1	0	0	68.65	90.39	79.70	61.23	102.23	122.20
11	0	0	1	0	1	69.73	77.32	79.70	61.23	102.23	122.20
12	0	0	1	0	2	70.50	67.99	79.70	61.23	102.23	122.20
13	0	0	1	1	0	62.96	90.39	79.70	60.98	102.23	122.20
14	0	0	1	1	1	64.04	77.32	79.70	60.98	102.23	122.20
15	0	0	1	1	2	64.81	67.99	79.70	60.98	102.23	122.20
16	0	0	1	2	0	58.22	90.39	79.70	60.98	102.23	122.20
17	0	0	1	2	1	59.30	77.32	79.70	60.98	102.23	122.20
18	0	0	1	2	2	60.07	67.99	79.70	60.98	102.23	122.20
19	0	0	2	0	0	68.65	90.39	79.70	71.82	102.23	122.20
20	0	0	2	0	1	69.73	77.32	79.70	71.82	102.23	122.20
21	0	0	2	0	2	70.50	67.99	79.70	71.82	102.23	122.20
22	0	0	2	1	0	62.96	90.39	79.70	71.56	102.23	122.20
23	0	0	2	1	1	64.04	77.32	79.70	71.56	102.23	122.20
24	0	0	2	1	2	64.81	67.99	79.70	71.56	102.23	122.20
25	0	0	2	2	0	58.22	90.39	79.70	71.56	102.23	122.20
26	0	0	2	2	1	59.30	77.32	79.70	71.56	102.23	122.20
27	0	0	2	2	2	60.07	67.99	79.70	71.56	102.23	122.20
28	0	1	0	0	0	68.65	90.39	120.05	68.62	102.23	122.20
29	0	1	0	0	1	69.73	77.32	120.05	68.62	102.23	122.20
30	0	1	0	0	2	70.50	67.99	120.05	68.62	102.23	122.20
31	0	1	0	1	0	62.96	90.39	120.05	68.36	102.23	122.20
32	0	1	0	1	1	64.04	77.32	120.05	68.36	102.23	122.20
33	0	1	0	1	2	64.81	67.99	120.05	68.36	102.23	122.20
34	0	1	0	2	0	58.22	90.39	120.05	68.36	102.23	122.20
35	0	1	0	2	1	59.30	77.32	120.05	68.36	102.23	122.20
36	0	1	0	2	2	60.07	67.99	120.05	68.36	102.23	122.20
37	0	1	1	0	0	68.65	90.39	120.05	79.20	102.23	122.20
38	0	1	1	0	1	69.73	77.32	120.05	79.20	102.23	122.20
39	0	1	1	0	2	70.50	67.99	120.05	79.20	102.23	122.20
40	0	1	1	1	0	62.96	90.39	120.05	78.94	102.23	122.20
41	0	1	1	1	1	64.04	77.32	120.05	78.94	102.23	122.20
42	0	1	1	1	2	64.81	67.99	120.05	78.94	102.23	122.20
43	0	1	1	2	0	58.22	90.39	120.05	78.94	102.23	122.20
Scenario	PTC Value	Carbon Dioxide	Natural Gas	KS Wind CF	MO Wind CF	Grain Belt Project	Missouri Wind	Pulverized Coal	Combined Cycle Gas	Nuclear	Utility-scale Solar

Grain Belt Express

Updated LCOE Results

Scenario	PTC Value	Carbon Dioxide	Natural Gas	KS Wind CF	MO Wind CF	Grain Belt Project	Missouri Wind	Pulverized Coal	Combined Cycle Gas	Nuclear	Utility-scale Solar
44	0	1	1	2	1	59.30	77.32	120.05	78.94	102.23	122.20
45	0	1	1	2	2	60.07	67.99	120.05	78.94	102.23	122.20
46	0	1	2	0	0	68.65	90.39	120.05	89.78	102.23	122.20
47	0	1	2	0	1	69.73	77.32	120.05	89.78	102.23	122.20
48	0	1	2	0	2	70.50	67.99	120.05	89.78	102.23	122.20
49	0	1	2	1	0	62.96	90.39	120.05	89.53	102.23	122.20
50	0	1	2	1	1	64.04	77.32	120.05	89.53	102.23	122.20
51	0	1	2	1	2	64.81	67.99	120.05	89.53	102.23	122.20
52	0	1	2	2	0	58.22	90.39	120.05	89.53	102.23	122.20
53	0	1	2	2	1	59.30	77.32	120.05	89.53	102.23	122.20
54	0	1	2	2	2	60.07	67.99	120.05	89.53	102.23	122.20
55	0	2	0	0	0	68.65	90.39	141.50	78.14	102.23	122.20
56	0	2	0	0	1	69.73	77.32	141.50	78.14	102.23	122.20
57	0	2	0	0	2	70.50	67.99	141.50	78.14	102.23	122.20
58	0	2	0	1	0	62.96	90.39	141.50	77.88	102.23	122.20
59	0	2	0	1	1	64.04	77.32	141.50	77.88	102.23	122.20
60	0	2	0	1	2	64.81	67.99	141.50	77.88	102.23	122.20
61	0	2	0	2	0	58.22	90.39	141.50	77.88	102.23	122.20
62	0	2	0	2	1	59.30	77.32	141.50	77.88	102.23	122.20
63	0	2	0	2	2	60.07	67.99	141.50	77.88	102.23	122.20
64	0	2	1	0	0	68.65	90.39	141.50	88.73	102.23	122.20
65	0	2	1	0	1	69.73	77.32	141.50	88.73	102.23	122.20
66	0	2	1	0	2	70.50	67.99	141.50	88.73	102.23	122.20
67	0	2	1	1	0	62.96	90.39	141.50	88.47	102.23	122.20
68	0	2	1	1	1	64.04	77.32	141.50	88.47	102.23	122.20
69	0	2	1	1	2	64.81	67.99	141.50	88.47	102.23	122.20
70	0	2	1	2	0	58.22	90.39	141.50	88.47	102.23	122.20
71	0	2	1	2	1	59.30	77.32	141.50	88.47	102.23	122.20
72	0	2	1	2	2	60.07	67.99	141.50	88.47	102.23	122.20
73	0	2	2	0	0	68.65	90.39	141.50	99.31	102.23	122.20
74	0	2	2	0	1	69.73	77.32	141.50	99.31	102.23	122.20
75	0	2	2	0	2	70.50	67.99	141.50	99.31	102.23	122.20
76	0	2	2	1	0	62.96	90.39	141.50	99.05	102.23	122.20
77	0	2	2	1	1	64.04	77.32	141.50	99.05	102.23	122.20
78	0	2	2	1	2	64.81	67.99	141.50	99.05	102.23	122.20
79	0	2	2	2	0	58.22	90.39	141.50	99.05	102.23	122.20
80	0	2	2	2	1	59.30	77.32	141.50	99.05	102.23	122.20
81	0	2	2	2	2	60.07	67.99	141.50	99.05	102.23	122.20
82	1	0	0	0	0	39.71	62.61	79.70	50.65	102.23	122.20
83	1	0	0	0	1	40.79	49.55	79.70	50.65	102.23	122.20
84	1	0	0	0	2	41.57	40.22	79.70	50.65	102.23	122.20
85	1	0	0	1	0	34.02	62.61	79.70	50.39	102.23	122.20
86	1	0	0	1	1	35.10	49.55	79.70	50.39	102.23	122.20
Scenario	PTC Value	Carbon Dioxide	Natural Gas	KS Wind CF	MO Wind CF	Grain Belt Project	Missouri Wind	Pulverized Coal	Combined Cycle Gas	Nuclear	Utility-scale Solar

Grain Belt Express

Updated LCOE Results

Scenario	PTC Value	Carbon Dioxide	Natural Gas	KS Wind CF	MO Wind CF	Grain Belt Project	Missouri Wind	Pulverized Coal	Combined Cycle Gas	Nuclear	Utility-scale Solar
87	1	0	0	1	2	35.87	40.22	79.70	50.39	102.23	122.20
88	1	0	0	2	0	29.28	62.61	79.70	50.39	102.23	122.20
89	1	0	0	2	1	30.36	49.55	79.70	50.39	102.23	122.20
90	1	0	0	2	2	31.13	40.22	79.70	50.39	102.23	122.20
91	1	0	1	0	0	39.71	62.61	79.70	61.23	102.23	122.20
92	1	0	1	0	1	40.79	49.55	79.70	61.23	102.23	122.20
93	1	0	1	0	2	41.57	40.22	79.70	61.23	102.23	122.20
94	1	0	1	1	0	34.02	62.61	79.70	60.98	102.23	122.20
95	1	0	1	1	1	35.10	49.55	79.70	60.98	102.23	122.20
96	1	0	1	1	2	35.87	40.22	79.70	60.98	102.23	122.20
97	1	0	1	2	0	29.28	62.61	79.70	60.98	102.23	122.20
98	1	0	1	2	1	30.36	49.55	79.70	60.98	102.23	122.20
99	1	0	1	2	2	31.13	40.22	79.70	60.98	102.23	122.20
100	1	0	2	0	0	39.71	62.61	79.70	71.82	102.23	122.20
101	1	0	2	0	1	40.79	49.55	79.70	71.82	102.23	122.20
102	1	0	2	0	2	41.57	40.22	79.70	71.82	102.23	122.20
103	1	0	2	1	0	34.02	62.61	79.70	71.56	102.23	122.20
104	1	0	2	1	1	35.10	49.55	79.70	71.56	102.23	122.20
105	1	0	2	1	2	35.87	40.22	79.70	71.56	102.23	122.20
106	1	0	2	2	0	29.28	62.61	79.70	71.56	102.23	122.20
107	1	0	2	2	1	30.36	49.55	79.70	71.56	102.23	122.20
108	1	0	2	2	2	31.13	40.22	79.70	71.56	102.23	122.20
109	1	1	0	0	0	39.71	62.61	120.05	68.62	102.23	122.20
110	1	1	0	0	1	40.79	49.55	120.05	68.62	102.23	122.20
111	1	1	0	0	2	41.57	40.22	120.05	68.62	102.23	122.20
112	1	1	0	1	0	34.02	62.61	120.05	68.36	102.23	122.20
113	1	1	0	1	1	35.10	49.55	120.05	68.36	102.23	122.20
114	1	1	0	1	2	35.87	40.22	120.05	68.36	102.23	122.20
115	1	1	0	2	0	29.28	62.61	120.05	68.36	102.23	122.20
116	1	1	0	2	1	30.36	49.55	120.05	68.36	102.23	122.20
117	1	1	0	2	2	31.13	40.22	120.05	68.36	102.23	122.20
118	1	1	1	0	0	39.71	62.61	120.05	79.20	102.23	122.20
119	1	1	1	0	1	40.79	49.55	120.05	79.20	102.23	122.20
120	1	1	1	0	2	41.57	40.22	120.05	79.20	102.23	122.20
121	1	1	1	1	0	34.02	62.61	120.05	78.94	102.23	122.20
122	1	1	1	1	1	35.10	49.55	120.05	78.94	102.23	122.20
123	1	1	1	1	2	35.87	40.22	120.05	78.94	102.23	122.20
124	1	1	1	2	0	29.28	62.61	120.05	78.94	102.23	122.20
125	1	1	1	2	1	30.36	49.55	120.05	78.94	102.23	122.20
126	1	1	1	2	2	31.13	40.22	120.05	78.94	102.23	122.20
127	1	1	2	0	0	39.71	62.61	120.05	89.78	102.23	122.20
128	1	1	2	0	1	40.79	49.55	120.05	89.78	102.23	122.20
129	1	1	2	0	2	41.57	40.22	120.05	89.78	102.23	122.20

Grain Belt Express

Updated LCOE Results

Scenario	PTC Value	Carbon Dioxide	Natural Gas	KS Wind CF	MO Wind CF	Grain Belt Project	Missouri Wind	Pulverized Coal	Combined Cycle Gas	Nuclear	Utility-scale Solar
130	1	1	2	1	0	34.02	62.61	120.05	89.53	102.23	122.20
131	1	1	2	1	1	35.10	49.55	120.05	89.53	102.23	122.20
132	1	1	2	1	2	35.87	40.22	120.05	89.53	102.23	122.20
133	1	1	2	2	0	29.28	62.61	120.05	89.53	102.23	122.20
134	1	1	2	2	1	30.36	49.55	120.05	89.53	102.23	122.20
135	1	1	2	2	2	31.13	40.22	120.05	89.53	102.23	122.20
136	1	2	0	0	0	39.71	62.61	141.50	78.14	102.23	122.20
137	1	2	0	0	1	40.79	49.55	141.50	78.14	102.23	122.20
138	1	2	0	0	2	41.57	40.22	141.50	78.14	102.23	122.20
139	1	2	0	1	0	34.02	62.61	141.50	77.88	102.23	122.20
140	1	2	0	1	1	35.10	49.55	141.50	77.88	102.23	122.20
141	1	2	0	1	2	35.87	40.22	141.50	77.88	102.23	122.20
142	1	2	0	2	0	29.28	62.61	141.50	77.88	102.23	122.20
143	1	2	0	2	1	30.36	49.55	141.50	77.88	102.23	122.20
144	1	2	0	2	2	31.13	40.22	141.50	77.88	102.23	122.20
145	1	2	1	0	0	39.71	62.61	141.50	88.73	102.23	122.20
146	1	2	1	0	1	40.79	49.55	141.50	88.73	102.23	122.20
147	1	2	1	0	2	41.57	40.22	141.50	88.73	102.23	122.20
148	1	2	1	1	0	34.02	62.61	141.50	88.47	102.23	122.20
149	1	2	1	1	1	35.10	49.55	141.50	88.47	102.23	122.20
150	1	2	1	1	2	35.87	40.22	141.50	88.47	102.23	122.20
151	1	2	1	2	0	29.28	62.61	141.50	88.47	102.23	122.20
152	1	2	1	2	1	30.36	49.55	141.50	88.47	102.23	122.20
153	1	2	1	2	2	31.13	40.22	141.50	88.47	102.23	122.20
154	1	2	2	0	0	39.71	62.61	141.50	99.31	102.23	122.20
155	1	2	2	0	1	40.79	49.55	141.50	99.31	102.23	122.20
156	1	2	2	0	2	41.57	40.22	141.50	99.31	102.23	122.20
157	1	2	2	1	0	34.02	62.61	141.50	99.05	102.23	122.20
158	1	2	2	1	1	35.10	49.55	141.50	99.05	102.23	122.20
159	1	2	2	1	2	35.87	40.22	141.50	99.05	102.23	122.20
160	1	2	2	2	0	29.28	62.61	141.50	99.05	102.23	122.20
161	1	2	2	2	1	30.36	49.55	141.50	99.05	102.23	122.20
162	1	2	2	2	2	31.13	40.22	141.50	99.05	102.23	122.20
Scenario	PTC Value	Carbon Dioxide	Natural Gas	KS Wind CF	MO Wind CF	Grain Belt Project	Missouri Wind	Pulverized Coal	Combined Cycle Gas	Nuclear	Utility-scale Solar