

**COMMONWEALTH OF KENTUCKY**

**BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of Duke Energy Kentucky, )  
Inc.'s Integrated Resource Plan ) Case No. 2021-00245  
)

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**PETITION OF DUKE ENERGY KENTUCKY, INC.  
FOR CONFIDENTIAL TREATMENT OF INFORMATION  
CONTAINED IN ITS RESPONSES TO COMMISSION STAFF'S  
POST-HEARING DATA REQUESTS**

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Duke Energy Kentucky, Inc. (Duke Energy Kentucky or Company), pursuant to 807 KAR 5:001, Section 13, respectfully requests the Commission to classify and protect certain information provided by Duke Energy Kentucky in its Responses to Commission Staff (Staff)'s Post-Hearing Request for Information issued on May 20, 2022. The information that Duke Energy Kentucky seeks confidential treatment on includes third party owned and licensed modeling tools. The information which the Company is requesting to remain confidential includes the attachment to item 5.

The public disclosure of the information described would place Duke Energy Kentucky at a commercial disadvantage as it discloses information regarding how the Company manages its business, plans for future investment strategies, evaluates participation in the wholesale power markets, negotiates contracts with various suppliers and vendors, and could potentially harm Duke Energy Kentucky's competitive position in the marketplace, to the detriment of Duke Energy Kentucky and its customers. Moreover, to the extent the requested information is subject to licensing agreements, disclosure of the information would be in violation of such agreements and could put the Company in an adverse legal position to the detriment of its customers.

In support of this Petition, Duke Energy Kentucky states:

1. The Kentucky Open Records Act exempts from disclosure certain commercial information. KRS 61.878 (1)(c). To qualify for this exemption and, therefore, maintain the confidentiality of the information, a party must establish that disclosure of the commercial information would permit an unfair advantage to competitors of that party. Public disclosure of the information identified herein would, in fact, prompt such a result for the reasons set forth below.

2. Duke Energy Kentucky requests confidential protections for certain third-party data contained in its responses. Duke Energy Kentucky used certain confidential and proprietary data consisting of confidential information belonging to third parties who take reasonable steps to protect their confidential information, such as only releasing such information subject to confidentiality agreements. Duke Energy Kentucky used forecasts of various commodities developed by an independent third party, Guidehouse, subject to confidentiality restrictions. Additionally, Burns and McDonnell provided operating specifications and costs for potential future generating units. Duke Energy Kentucky is contractually bound to maintain such information confidential. Moreover, this information is deserving of protection to protect Duke Energy Kentucky's customers. If allowance brokers or equipment vendors knew Duke Energy Kentucky's cost projections and operating assumptions, including fuel and emission projections, for potential generating resources, by station or otherwise, such brokers or vendors would have an unfair advantage in negotiating contracts for generation procurement, as well as for future emission allowance or emission control equipment sales, to the detriment of Duke Energy Kentucky and its customers.

Furthermore, if competitors of Duke Energy Kentucky knew such forecasts, they could have an advantage in competing for new business against Duke Energy Kentucky.

3. The information contained in its response to item 5 includes various forecasts depicting the Company's view of power prices, facility operations, costs, and fuel consumption respectfully. This information is considered proprietary to Duke Energy Kentucky and depicts its views of operations in the future. The Company would be placed at a competitive disadvantage if such information is released publicly as it would provide the competitors and potential counterparties and vendors for Duke Energy Kentucky with a competitive advantage that would prevent the Company from having the ability to manage its costs. It would also allow such counterparties and/or competitors to make decisions regarding pricing they otherwise would not have done, thereby making Duke Energy Kentucky and, in turn, its customers pay more than they otherwise would absent such information.

4. The confidential information is distributed within Duke Energy Kentucky only to those who must have access for business reasons and is generally recognized as confidential and proprietary in the energy industry.

5. Duke Energy Kentucky does not object to limited disclosure of the confidential information described herein, pursuant to an acceptable protective agreement, with the Attorney General or other intervenors with a legitimate interest in reviewing the same for the purpose of participating in this case.

6. This information was, and remains, integral to Duke Energy Kentucky's effective execution of business decisions. And such information is generally regarded as confidential or proprietary. Indeed, as the Kentucky Supreme Court has found, "information concerning the inner workings of a corporation is 'generally accepted as confidential or

proprietary.” *Hoy v. Kentucky Industrial Revitalization Authority*, Ky., 904 S.W.2d 766, 768 (Ky. 1995).

7. In accordance with the provisions of 807 KAR 5:001, Section 13(3), the Company is filing one copy of the Confidential Information separately under seal, and eleven copies without the confidential information included.

8. Duke Energy Kentucky respectfully requests that the Confidential Information be withheld from public disclosure for a period of ten years. This will assure that the Confidential Information – if disclosed after that time – will no longer be commercially sensitive so as to likely impair the interests of the Company or its customers if publicly disclosed.

9. To the extent the Confidential information becomes generally available to the public, whether through filings required by other agencies or otherwise, Duke Energy Kentucky will notify the Commission and have its confidential status removed pursuant to 807 KAR 5:001 Section 13(10)(a).

WHEREFORE, Duke Energy Kentucky, Inc. respectfully requests the Commission classify and protect as confidential the specific information described herein.

Respectfully submitted,

DUKE ENERGY KENTUCKY, INC.

/s/Rocco D’Ascenzo  
Rocco O. D’Ascenzo (92796)  
Deputy General Counsel  
Duke Energy Business Services LLC  
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E-mail: [rocco.d’ascenzo@duke-energy.com](mailto:rocco.d’ascenzo@duke-energy.com)  
*Counsel for Duke Energy Kentucky, Inc.*

**CERTIFICATE OF SERVICE**

This is to certify that the foregoing electronic filing is a true and accurate copy of the document being filed in paper medium; that the electronic filing was transmitted to the Commission on June 3, 2022; and, that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding.

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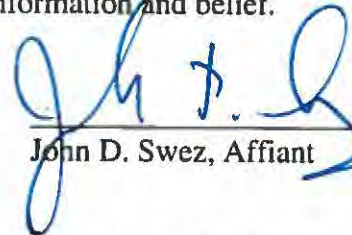
*/s/Rocco D'Ascenzo*  
\_\_\_\_\_  
Rocco D'Ascenzo



VERIFICATION

STATE OF NORTH CAROLINA     )  
                                                          )     SS:  
COUNTY OF MECKLENBURG     )

The undersigned, John D. Swez, Managing Director, Trading and Dispatch, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing post hearing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
John D. Swez, Affiant

Subscribed and sworn to before me by John D. Swez on this 24 day of May, 2022.

  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:

**SHAMALE M WILSON**  
Notary Public, North Carolina  
Mecklenburg County  
My Commission Expires  
July 08, 2026

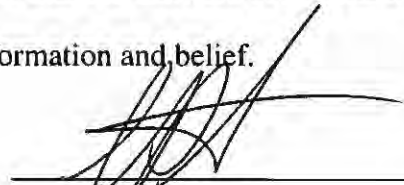




**VERIFICATION**

**STATE OF NORTH CAROLINA**        )  
                                                  )  
**COUNTY OF MECKLENBURG**        )        **SS:**

The undersigned, Scott Park, Director IRP & Analytics-Midwest, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing posting hearing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
Scott Park, Affiant

Subscribed and sworn to before me by Scott Park on this 23 day of May,  
2022.

  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires: 09/21/2022

**MARY B VICKNAIR  
NOTARY PUBLIC  
Davie County  
North Carolina  
My Commission Expires Sept. 21, 2022**

**VERIFICATION**

STATE OF INDIANA            )  
                                          )  
COUNTY OF                    )        SS:

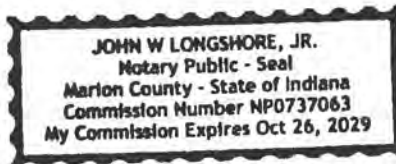
The undersigned, Timothy Hohenstatt, Director Transmission Planning, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing post hearing data requests and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
Timothy Hohenstatt, Affiant

Subscribed and sworn to before me by Timothy Hohenstatt, on this 26 day of May, 2022.

  
\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires: 10/26/29



**KyPSC Case No. 2021-00245**  
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**Duke Energy Kentucky**  
**Case No. 2021-00245**  
**STAFF First Set Post Hearing Data Requests**  
**Date Received: May 20, 2022**

**STAFF-PHDR-01-001**

**REQUEST:**

Provide PJM's most recent Effective Load Carrying Capability (ELCC) Report showing projected future ELCC class ratings for onshore wind, offshore wind, solar fixed panel, and solar tracking panel.

**RESPONSE:**

Please refer to figure 2 and 3 (pages 6-7) in the report (<https://www.pjm.com/-/media/planning/res-adeq/elcc/elcc-report-december-2021.ashx>) showing the projected future ELCC class ratings for onshore wind, offshore wind, solar fixed panel, and solar tracking panel.

**PERSON RESPONSIBLE:** John Swez

**REQUEST:**

Refer to Table H2 on pages 167-168 of Duke Kentucky's Integrated Resource Plan (IRP).

- a. Provide the per \$/MWh cost of carbon taxed for operating each generating resource listed in Table H2 in each month of the IRP planning period using the same assumptions used to produce the information in Table H2.
- b. Provide the marginal per \$/MWh cost of operating each generating resource listed in Table H2 in each month of the IRP planning period using the same assumptions used in the IRP model for the following IRP scenarios:
  - 1) Base gas costs with CO2 regulation;
  - 2) Base gas cost without CO2 regulation;
  - 3) High gas cost with CO2 regulation; and
  - 4) High gas cost without CO2 regulation.
- c. Provide the average per \$/MWh price of energy in the market in each month of the IRP planning period using the same assumptions used in the IRP model for the following IRP scenarios:
  - 1) Base gas costs with CO2 regulation;
  - 2) Base gas cost without CO2 regulation;
  - 3) High gas cost with CO2 regulation; and
  - 4) High gas cost without CO2 regulation.



Provide the per \$/MWh cost of carbon taxes for operating each generating resource listed in Table H.2 in each month of the IRP planning period using the same assumptions used to prod

<b>\$/MWh CO2 Tax</b>	<b>Jan-25</b>	<b>Feb-25</b>	<b>Mar-25</b>	<b>Apr-25</b>	<b>May-25</b>	<b>Jun-25</b>	<b>Jul-25</b>	<b>Aug-25</b>	<b>Sep-25</b>	<b>Oct-25</b>	<b>Nov-25</b>	<b>Dec-25</b>	<b>Jan-26</b>	<b>Feb-26</b>
East Bend 2	5.41	5.40	5.45	5.43	5.49	5.53	5.49	5.50	5.48	-	5.42	5.41	10.86	10.81
New CC DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New CC DEK DF	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woodsdale 1	-	-	-	-	-	-	4.49	-	-	-	-	-	-	-
Woodsdale 2	-	-	-	-	-	-	4.47	-	4.43	-	-	-	-	-
Woodsdale 3	-	-	-	-	-	-	4.47	-	4.43	-	-	-	-	-
Woodsdale 4	-	-	-	-	-	-	4.49	-	4.45	-	-	-	-	-
Woodsdale 5	-	-	-	-	-	-	4.47	-	4.43	-	-	-	-	-
Woodsdale 6	-	-	-	-	-	-	-	-	4.43	-	-	-	-	-

*Supporting data*

<b>Generation (GWh)</b>	<b>Jan-25</b>	<b>Feb-25</b>	<b>Mar-25</b>	<b>Apr-25</b>	<b>May-25</b>	<b>Jun-25</b>	<b>Jul-25</b>	<b>Aug-25</b>	<b>Sep-25</b>	<b>Oct-25</b>	<b>Nov-25</b>	<b>Dec-25</b>	<b>Jan-26</b>	<b>Feb-26</b>
East Bend 2	446	403	225	291	320	295	344	290	149		300	345	296	374
New CC DEK														
New CC DEK DF														
Woodsdale 1							5							
Woodsdale 2							5		3					
Woodsdale 3							5		3					
Woodsdale 4							5		3					
Woodsdale 5							5		3					
Woodsdale 6									3					
<b>CO2 ('000 tons)</b>	<b>Jan-25</b>	<b>Feb-25</b>	<b>Mar-25</b>	<b>Apr-25</b>	<b>May-25</b>	<b>Jun-25</b>	<b>Jul-25</b>	<b>Aug-25</b>	<b>Sep-25</b>	<b>Oct-25</b>	<b>Nov-25</b>	<b>Dec-25</b>	<b>Jan-26</b>	<b>Feb-26</b>
East Bend 2	482	436	245	316	351	326	378	319	163		325	373	321	405
New CC DEK														
New CC DEK DF														
Woodsdale 1							4							
Woodsdale 2							4		3					
Woodsdale 3							4		3					
Woodsdale 4							4		3					
Woodsdale 5							4		3					
Woodsdale 6									3					
<b>CO2 Tax (\$)</b>	<b>Jan-25</b>	<b>Feb-25</b>	<b>Mar-25</b>	<b>Apr-25</b>	<b>May-25</b>	<b>Jun-25</b>	<b>Jul-25</b>	<b>Aug-25</b>	<b>Sep-25</b>	<b>Oct-25</b>	<b>Nov-25</b>	<b>Dec-25</b>	<b>Jan-26</b>	<b>Feb-26</b>
CO2 cost/ton	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 10.00	\$ 10.00





Sep-27	Oct-27	Nov-27	Dec-27	Jan-28	Feb-28	Mar-28	Apr-28	May-28	Jun-28	Jul-28	Aug-28	Sep-28	Oct-28	Nov-28	Dec-28	Jan-29	Feb-29
-	16.51	16.36	16.34	21.79	21.86	-	-	-	-	21.98	22.25	-	22.43	21.86	21.81	27.32	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Sep-27	Oct-27	Nov-27	Dec-27	Jan-28	Feb-28	Mar-28	Apr-28	May-28	Jun-28	Jul-28	Aug-28	Sep-28	Oct-28	Nov-28	Dec-28	Jan-29	Feb-29
	338	232	200	202	51					111	56		23	128	76	140	

Sep-27	Oct-27	Nov-27	Dec-27	Jan-28	Feb-28	Mar-28	Apr-28	May-28	Jun-28	Jul-28	Aug-28	Sep-28	Oct-28	Nov-28	Dec-28	Jan-29	Feb-29
	371	253	218	220	56					122	62		26	140	83	152	

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Sep-27	Oct-27	Nov-27	Dec-27	Jan-28	Feb-28	Mar-28	Apr-28	May-28	Jun-28	Jul-28	Aug-28	Sep-28	Oct-28	Nov-28	Dec-28	Jan-29	Feb-29
\$ 15.00	\$ 15.00	\$ 15.00	\$ 15.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 25.00	\$ 25.00



Sep-30	Oct-30	Nov-30	Dec-30	Jan-31	Feb-31	Mar-31	Apr-31	May-31	Jun-31	Jul-31	Aug-31	Sep-31	Oct-31	Nov-31	Dec-31	Jan-32	Feb-32
-	-	-	-	38.30	-	-	-	-	-	38.35	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Sep-30	Oct-30	Nov-30	Dec-30	Jan-31	Feb-31	Mar-31	Apr-31	May-31	Jun-31	Jul-31	Aug-31	Sep-31	Oct-31	Nov-31	Dec-31	Jan-32	Feb-32
				66						65							

Sep-30	Oct-30	Nov-30	Dec-30	Jan-31	Feb-31	Mar-31	Apr-31	May-31	Jun-31	Jul-31	Aug-31	Sep-31	Oct-31	Nov-31	Dec-31	Jan-32	Feb-32
				72						71							

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Sep-30	Oct-30	Nov-30	Dec-30	Jan-31	Feb-31	Mar-31	Apr-31	May-31	Jun-31	Jul-31	Aug-31	Sep-31	Oct-31	Nov-31	Dec-31	Jan-32	Feb-32
\$ 30.00	\$ 30.00	\$ 30.00	\$ 30.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 40.00	\$ 40.00



Sep-33	Oct-33	Nov-33	Dec-33	Jan-34	Feb-34	Mar-34	Apr-34	May-34	Jun-34	Jul-34	Aug-34	Sep-34	Oct-34	Nov-34	Dec-34	Jan-35	Feb-35
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.79	20.79
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28.31	28.31
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Sep-33	Oct-33	Nov-33	Dec-33	Jan-34	Feb-34	Mar-34	Apr-34	May-34	Jun-34	Jul-34	Aug-34	Sep-34	Oct-34	Nov-34	Dec-34	Jan-35	Feb-35
																238	296
																3	1

Sep-33	Oct-33	Nov-33	Dec-33	Jan-34	Feb-34	Mar-34	Apr-34	May-34	Jun-34	Jul-34	Aug-34	Sep-34	Oct-34	Nov-34	Dec-34	Jan-35	Feb-35
																90	112
																1	1

Sep-33	Oct-33	Nov-33	Dec-33	Jan-34	Feb-34	Mar-34	Apr-34	May-34	Jun-34	Jul-34	Aug-34	Sep-34	Oct-34	Nov-34	Dec-34	Jan-35	Feb-35
\$ 45.00	\$ 45.00	\$ 45.00	\$ 45.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 55.00	\$ 55.00



Provide the marginal per \$/MWh cost of operating each generating resource listed in Table H.2 in each month of the IRP planning period using the same assumptions used in the IRP model for the following IRP scenarios:(1) Base gas costs

<b>\$/MWh marginal cost</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Bend 2	23.7	24.2	24.5	24.1	26.6	25.8	25.5	26.3	28.0	-	-	24.0	23.5	24.3	23.9	24.6
New Battery DEK	-	-	-	-	-	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.2	9.2	9.2	9.2
New CC DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New CC DEK DF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Solar DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solar Exist DEKY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woodsdale 1	44.0	27.3	-	-	-	59.4	51.7	53.8	58.0	-	-	-	51.3	47.6	56.2	-
Woodsdale 2	44.0	27.3	-	-	-	58.7	51.2	52.0	52.1	-	-	-	51.3	47.6	-	-
Woodsdale 3	44.0	27.3	55.6	-	-	58.7	51.2	52.0	52.1	-	-	-	52.0	47.6	56.2	-
Woodsdale 4	44.0	27.3	-	-	-	59.4	51.7	-	-	-	-	-	51.3	47.6	56.2	-
Woodsdale 5	44.0	27.6	55.6	-	-	58.7	51.2	52.0	-	-	-	-	51.3	47.6	56.2	-
Woodsdale 6	45.1	27.2	55.6	-	-	58.7	51.2	52.0	-	-	-	-	51.3	47.6	56.2	-

*Supporting Data*

<b>Total Energy Cost (\$000)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	10,444	8,376	7,711	8,837	6,503	8,607	9,797	4,910	2,692			10,211	10,499	7,336	8,112	7,400
New Battery DEK						2	2	2	2	2	1	2	1	2	1	1
New CC DEK																
New CC DEK DF																
New Solar DEK																
Solar Exist DEKY																
Woodsdale 1	151	559				19	121	50	36				291	94	26	
Woodsdale 2	151	559				19	123	83	46				291	94		
Woodsdale 3	151	559	26			19	123	83	46				167	94	26	
Woodsdale 4	151	559				19	121						291	94	26	
Woodsdale 5	151	345	26			19	123	83					291	94	26	
Woodsdale 6	87	422	26			19	123	83					291	94	26	

<b>Generation (GWh)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	440	346	315	367	244	334	384	187	96			425	446	302	339	301
New Battery DEK						0	0	0	0	0	0	0	0	0	0	0
New CC DEK																
New CC DEK DF																
New Solar DEK						3	3	2	2	1	1	1	1	1	2	2
Solar Exist DEKY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Woodsdale 1	3	21				0	2	1	1				6	2	0	
Woodsdale 2	3	21				0	2	2	1				6	2		
Woodsdale 3	3	21	0			0	2	2	1				3	2	0	
Woodsdale 4	3	21				0	2						6	2	0	
Woodsdale 5	3	13	0			0	2	2					6	2	0	
Woodsdale 6	2	16	0			0	2	2					6	2	0	

with CO2 regulation;

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.0	27.0	26.4	25.7	26.5	26.1	23.9	23.8	25.2	24.5	27.4	-	-	-	27.1	27.4	-	28.5
9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	54.1	48.9	48.3	48.5	-	-	-	46.6	49.2	-	-	-	51.3	45.6	44.4	42.5	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	50.7	44.8	44.7	42.1	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	-	44.8	44.7	42.1	-
-	-	48.9	48.3	48.5	-	-	-	46.6	49.2	-	-	-	51.3	44.6	44.4	42.5	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	50.7	44.8	44.7	42.1	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	50.7	44.8	44.7	42.1	-

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
4,695	4,057	7,022	9,076	5,967	2,341	8,798	9,488	8,700	9,813	3,357				6,616	6,306		633
1	3	4	4	4	4	3	4	2	3	2	2	2	6	6	7	5	5
	21	153	90	45				356	60				20	153	62	53	
	21	155	92	46				356	60				20	161	89	54	
	21	155	92	46				356	60					161	89	54	
		153	90	45				356	60				20	101	62	53	
	21	155	92	46				356	60				20	161	89	27	
	21	155	92	46				233	60				20	161	89	54	

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
180	150	266	353	225	90	368	399	346	400	122				244	230		22
0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
2	5	5	5	4	3	2	2	2	2	3	4	5	8	8	7	6	4
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	3	2	1				8	1				0	3	1	1	
	0	3	2	1				8	1				0	4	2	1	
	0	3	2	1				8	1				0	4	2	1	
	0	3	2	1				8	1				0	4	2	1	
	0	3	2	1				5	1				0	4	2	1	



Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1	25.5	23.5	24.2	24.2	24.6	-	26.3	25.6	26.5	27.0	-	24.3	23.7	25.8	25.8	27.9	26.7	28.5
9.4	9.4	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.9	9.9	9.9	9.9	9.9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	45.4	-	-	-	-	-	44.4	44.4	40.5	30.6	-	-	-	-	-	-	-
-	-	45.4	-	-	-	-	54.3	44.0	44.0	40.1	30.6	-	-	-	-	-	-	-
-	-	45.3	-	-	-	-	54.3	44.0	44.0	40.1	30.6	-	-	-	-	-	-	-
-	-	46.2	-	-	-	-	-	44.4	44.2	40.5	-	-	-	-	-	-	-	-
-	-	45.4	-	46.3	-	-	54.3	44.0	44.0	40.1	30.6	-	-	-	-	-	-	-
-	-	45.4	-	46.3	-	-	54.3	44.0	44.0	40.1	30.6	-	-	-	-	-	-	-

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
8,535	7,450	10,470	7,652	8,141	3,734		3,751	9,238	6,889	3,117		7,686	9,579	11,495	10,389	6,273	7,758	9,103
4	5	4	5	3	2	3	6	9	9	6	7	7	5	3	1	2	3	4

		360						156	87	57	188							
		360					17	158	88	58	188							
		239					17	158	88	58	188							
		270						156	59	57								
		360		58			17	158	88	58	188							
		360		58			17	158	88	58	188							

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
340	292	446	317	337	152		143	361	260	116		317	405	446	403	225	291	320
0	1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0
3	2	3	4	5	6	7	14	14	13	11	8	6	4	5	7	9	11	13
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		8						4	2	1	6							
		8					0	4	2	1	6							
		5					0	4	2	1	6							
		6						4	1	1								
		8		1			0	4	2	1	6							
		8		1			0	4	2	1	6							

















Provide the marginal per \$/MWh cost of operating each generating resource listed in Table H.2 in each month of the IRP planning period using the same assumptions used in the IRP model for the following IRP scenarios:(2) Base gas costs

<b>\$/MWh marginal cost</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Bend 2	23.7	24.2	24.5	24.1	26.6	25.8	25.5	26.3	28.0	-	-	24.0	23.5	24.3	23.9	24.6
New Battery DEK	-	-	-	-	-	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.2	9.2	9.2	9.2
New CC DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New CC DEK DF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Solar DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solar Exist DEKY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woodsdale 1	44.0	27.3	-	-	-	59.4	51.7	53.8	58.0	-	-	-	51.3	47.6	56.2	-
Woodsdale 2	44.0	27.3	-	-	-	58.7	51.2	52.0	52.1	-	-	-	51.3	47.6	-	-
Woodsdale 3	44.0	27.3	55.6	-	-	58.7	51.2	52.0	52.1	-	-	-	52.0	47.6	56.2	-
Woodsdale 4	44.0	27.3	-	-	-	59.4	51.7	-	-	-	-	-	51.3	47.6	56.2	-
Woodsdale 5	44.0	27.6	55.6	-	-	58.7	51.2	52.0	-	-	-	-	51.3	47.6	56.2	-
Woodsdale 6	45.1	27.2	55.6	-	-	58.7	51.2	52.0	-	-	-	-	51.3	47.6	56.2	-

*Supporting Data*

<b>Total Energy Cost (\$000)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	10,444	8,376	7,711	8,837	6,503	8,607	9,797	4,910	2,692			10,211	10,499	7,336	8,112	7,400
New Battery DEK						2	2	2	2	2	1	2	1	2	1	1
New CC DEK																
New CC DEK DF																
New Solar DEK																
Solar Exist DEKY																
Woodsdale 1	151	559				19	121	50	36				291	94	26	
Woodsdale 2	151	559				19	123	83	46				291	94		
Woodsdale 3	151	559	26			19	123	83	46				167	94	26	
Woodsdale 4	151	559				19	121						291	94	26	
Woodsdale 5	151	345	26			19	123	83					291	94	26	
Woodsdale 6	87	422	26			19	123	83					291	94	26	

<b>Generation (GWh)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	440	346	315	367	244	334	384	187	96			425	446	302	339	301
New Battery DEK						0	0	0	0	0	0	0	0	0	0	0
New CC DEK																
New CC DEK DF																
New Solar DEK						3	3	2	2	1	1	1	1	1	2	2
Solar Exist DEKY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Woodsdale 1	3	21				0	2	1	1				6	2	0	
Woodsdale 2	3	21				0	2	2	1				6	2		
Woodsdale 3	3	21	0			0	2	2	1				3	2	0	
Woodsdale 4	3	21				0	2						6	2	0	
Woodsdale 5	3	13	0			0	2	2					6	2	0	
Woodsdale 6	2	16	0			0	2	2					6	2	0	

without CO2 regulation;

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.0	27.0	26.4	25.7	26.5	26.1	23.9	23.8	25.2	24.5	27.4	-	-	-	27.1	27.4	-	28.5
9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	54.1	48.9	48.3	48.5	-	-	-	46.6	49.2	-	-	-	51.3	45.6	44.4	42.5	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	50.7	44.8	44.7	42.1	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	-	44.8	44.7	42.1	-
-	-	48.9	48.3	48.5	-	-	-	46.6	49.2	-	-	-	51.3	44.6	44.4	42.5	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	50.7	44.8	44.7	42.1	-
-	53.5	48.4	47.8	48.0	-	-	-	46.6	49.2	-	-	-	50.7	44.8	44.7	42.1	-

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
4,695	4,057	7,022	9,076	5,967	2,341	8,798	9,488	8,700	9,813	3,357				6,616	6,306		633
1	3	4	4	4	4	3	4	2	3	2	2	2	6	6	7	5	5
	21	153	90	45				356	60				20	153	62	53	
	21	155	92	46				356	60				20	161	89	54	
	21	155	92	46				356	60					161	89	54	
		153	90	45				356	60				20	101	62	53	
	21	155	92	46				356	60				20	161	89	27	
	21	155	92	46				233	60				20	161	89	54	

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
180	150	266	353	225	90	368	399	346	400	122				244	230		22
0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
2	5	5	5	4	3	2	2	2	2	3	4	5	8	8	7	6	4
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	3	2	1				8	1				0	3	1	1	
	0	3	2	1				8	1				0	4	2	1	
	0	3	2	1				8	1				0	4	2	1	
	0	3	2	1				8	1				0	4	2	1	
	0	3	2	1				5	1				0	4	2	1	

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.1	25.5	23.5	24.2	24.2	24.6	-	26.3	25.6	26.5	27.0	-	24.3	23.7	20.4	20.4	22.2	21.1	22.3
9.4	9.4	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.9	9.9	9.9	9.9	9.9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	45.4	-	-	-	-	-	44.4	44.4	40.5	30.6	-	-	46.7	48.9	47.3	-	-
-	-	45.4	-	-	-	-	54.3	44.0	44.0	40.1	30.6	-	-	46.7	48.9	47.3	-	-
-	-	45.3	-	-	-	-	54.3	44.0	44.0	40.1	30.6	-	-	46.7	-	47.3	-	-
-	-	46.2	-	-	-	-	-	44.4	44.2	40.5	-	-	-	46.7	48.9	-	-	-
-	-	45.4	-	46.3	-	-	54.3	44.0	44.0	40.1	30.6	-	-	46.7	48.9	47.3	-	-
-	-	45.4	-	46.3	-	-	54.3	44.0	44.0	40.1	30.6	-	-	46.7	48.9	47.3	-	-

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
8,535	7,450	10,470	7,652	8,141	3,734		3,751	9,238	6,889	3,117		7,686	9,579	9,089	8,209	5,446	6,326	8,725
4	5	4	5	3	2	3	6	9	9	6	7	7	5	4	4	4	2	5

		360						156	87	57	188			361	69	59		
		360					17	158	88	58	188			361	69	59		
		239					17	158	88	58	188			361		59		
		270						156	59	57				361	69			
		360		58			17	158	88	58	188			361	69	59		
		360		58			17	158	88	58	188			361	69	59		

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
340	292	446	317	337	152		143	361	260	116		317	405	446	403	245	299	392
0	1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0
3	2	3	4	5	6	7	14	14	13	11	8	6	4	5	7	9	11	13
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		8						4	2	1	6			8	1	1		
		8					0	4	2	1	6			8	1	1		
		5					0	4	2	1	6			8		1		
		6						4	1	1				8	1			
		8		1			0	4	2	1	6			8	1	1		
		8		1			0	4	2	1	6			8	1	1		

Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	22.4	23.1	23.2	-	20.9	21.0	22.5	21.5	21.4	21.9	23.0	22.9	23.5	22.9	24.2	26.1	21.4	21.2
9.9	9.9	9.9	9.9	9.9	9.9	9.9	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52.2	46.8	45.3	41.6	-	-	-	-	-	-	-	-	-	39.1	-	33.7	31.1	-	-
51.6	45.8	44.2	41.2	-	-	-	-	-	-	-	-	-	38.9	-	33.5	31.1	-	-
51.6	45.8	46.4	41.2	-	-	-	-	-	-	-	-	-	38.9	-	33.5	31.6	-	-
52.2	-	45.3	41.6	-	-	-	-	-	-	-	-	-	-	-	33.7	31.1	-	-
-	45.8	44.2	41.2	-	-	-	-	-	-	-	-	-	38.9	-	33.5	31.1	-	-
51.6	45.8	44.2	41.2	-	-	-	-	-	-	-	-	-	38.9	-	33.5	31.1	-	-

Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
7,402	8,410	6,801	3,444		5,824	7,051	7,136	8,064	8,005	6,394	9,495	9,321	7,934	9,779	4,299	736	8,919	9,448
8	11	12	7	9	8	7	5	2	2	3	3	4	8	7	6	3	4	4
20	120	57	55										307		166	515		
21	128	60	56										313		169	515		
21	128	26	56										313		169	256		
20		57	55												166	515		
	128	60	56										313		169	515		
21	128	60	56										313		169	515		

Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
326	376	294	148		279	336	317	374	374	292	413	407	338	427	178	28	418	446
1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0
21	20	19	16	12	9	6	7	9	13	17	18	28	27	26	21	15	11	8
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0	3	1	1										8		5	17		
0	3	1	1										8		5	17		
0	3	1	1										8		5	17		
0		1	1												5	17		
	3	1	1										8		5	17		
0	3	1	1										8		5	17		















Provide the marginal per \$/MWh cost of operating each generating resource listed in Table H.2 in each month of the IRP planning period using the same assumptions used in the IRP model for the following IRP scenarios:(3) High gas costs

<b>\$/MWh marginal cost</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Bend 2	24.0	24.5	24.8	24.3	26.5	26.4	25.8	26.6	28.3	-	-	24.3	23.4	24.1	23.8	24.5
New Battery DEK	-	-	-	-	-	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.2	9.2	9.2	9.2
New CC DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New CC DEK DF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Solar DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solar Exist DEKY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woodsdale 1	46.3	28.8	-	-	-	61.2	54.3	55.7	59.8	-	-	-	63.3	58.4	-	-
Woodsdale 2	46.3	28.8	-	-	-	60.5	53.8	55.2	59.1	-	-	-	63.3	58.4	-	-
Woodsdale 3	46.3	28.8	-	-	-	60.5	53.8	55.2	59.1	-	-	-	66.8	58.4	-	-
Woodsdale 4	46.3	28.8	-	-	-	61.2	54.3	-	-	-	-	-	63.3	58.4	-	-
Woodsdale 5	46.3	29.1	-	-	-	60.5	53.8	55.2	-	-	-	-	63.3	58.4	-	-
Woodsdale 6	49.0	28.8	-	-	-	60.5	53.8	55.2	-	-	-	-	63.3	58.4	-	-

*Supporting Data*

<b>Total Energy Cost (\$000)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	10,476	8,387	7,683	8,899	6,241	8,620	9,785	4,921	2,708			10,260	10,438	7,295	8,099	7,390
New Battery DEK						2	2	2	2	2	1	2	1	2	1	1
New CC DEK																
New CC DEK DF																
New Solar DEK																
Solar Exist DEKY																
Woodsdale 1	118	477				19	119	52	37				216	88		
Woodsdale 2	118	477				19	121	53	38				216	88		
Woodsdale 3	118	477				19	121	53	38				127	88		
Woodsdale 4	118	477				19	119						216	88		
Woodsdale 5	118	306				19	121	53					216	88		
Woodsdale 6	52	363				19	121	53					216	88		

<b>Generation (GWh)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	437	343	310	366	235	327	380	185	96			423	446	302	341	302
New Battery DEK						0	0	0	0	0	0	0	0	0	0	0
New CC DEK																
New CC DEK DF																
New Solar DEK						3	3	2	2	1	1	1	1	1	2	2
Solar Exist DEKY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Woodsdale 1	3	17				0	2	1	1				3	2		
Woodsdale 2	3	17				0	2	1	1				3	2		
Woodsdale 3	3	17				0	2	1	1				2	2		
Woodsdale 4	3	17				0	2						3	2		
Woodsdale 5	3	11				0	2	1					3	2		
Woodsdale 6	1	13				0	2	1					3	2		

with CO2 regulation;

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.9	26.9	26.3	25.6	26.4	26.0	23.7	23.6	25.6	25.0	28.6	-	-	-	27.5	27.9	-	28.9
9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	57.4	-	60.8	-	-	-	58.8	77.3	-	-	-	-	59.0	-	61.2	-
-	-	56.8	-	60.1	-	-	-	58.8	77.3	-	-	-	-	57.9	-	60.4	-
-	-	56.8	-	60.1	-	-	-	58.8	77.3	-	-	-	-	57.9	-	60.4	-
-	-	57.4	-	60.8	-	-	-	58.8	77.3	-	-	-	-	59.0	-	61.2	-
-	-	56.8	-	60.1	-	-	-	58.8	77.3	-	-	-	-	57.9	-	60.4	-
-	-	56.8	-	60.1	-	-	-	-	77.3	-	-	-	-	57.9	-	60.4	-

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
4,697	4,064	7,019	9,068	5,963	2,329	8,791	9,484	8,840	9,948	2,737				6,688	6,321		642
1	3	4	4	4	4	3	4	2	3	2	2	2	6	6	7	5	5
		116		38				88	22					110		19	
		118		38				88	22					116		39	
		118		38				88	22					116		39	
		116		38				88	22					83		19	
		118		38				88	22					116		19	
		118		38					22					116		39	

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
182	151	267	355	226	90	370	401	346	399	96				243	227		22
0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
		2		1				2	2	3	4	5	8	8	7	6	4
		1		1		1	1	1	1	1	1	1	1	1	1	1	1
				2				2	0					2		0	
				2				2	0					2		1	
				2				2	0					2		0	
				2				2	0					2		0	
				2					0					2		1	



















Provide the marginal per \$/MWh cost of operating each generating resource listed in Table H.2 in each month of the IRP planning period using the same assumptions used in the IRP model for the following IRP scenarios:(4) High gas costs

<b>\$/MWh marginal cost</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Bend 2	24.0	24.5	24.8	24.3	26.5	26.4	25.8	26.6	28.3	-	-	24.3	23.4	24.1	23.8	24.5
New Battery DEK	-	-	-	-	-	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.2	9.2	9.2	9.2
New CC DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New CC DEK DF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Solar DEK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solar Exist DEKY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woodsdale 1	46.3	28.8	-	-	-	61.2	54.3	55.7	59.8	-	-	-	63.3	58.4	-	-
Woodsdale 2	46.3	28.8	-	-	-	60.5	53.8	55.2	59.1	-	-	-	63.3	58.4	-	-
Woodsdale 3	46.3	28.8	-	-	-	60.5	53.8	55.2	59.1	-	-	-	66.8	58.4	-	-
Woodsdale 4	46.3	28.8	-	-	-	61.2	54.3	-	-	-	-	-	63.3	58.4	-	-
Woodsdale 5	46.3	29.1	-	-	-	60.5	53.8	55.2	-	-	-	-	63.3	58.4	-	-
Woodsdale 6	49.0	28.8	-	-	-	60.5	53.8	55.2	-	-	-	-	63.3	58.4	-	-

*Supporting Data*

<b>Total Energy Cost (\$000)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	10,476	8,387	7,683	8,899	6,241	8,620	9,785	4,921	2,708			10,260	10,438	7,295	8,099	7,390
New Battery DEK						2	2	2	2	2	1	2	1	2	1	1
New CC DEK																
New CC DEK DF																
New Solar DEK																
Solar Exist DEKY																
Woodsdale 1	118	477				19	119	52	37				216	88		
Woodsdale 2	118	477				19	121	53	38				216	88		
Woodsdale 3	118	477				19	121	53	38				127	88		
Woodsdale 4	118	477				19	119						216	88		
Woodsdale 5	118	306				19	121	53					216	88		
Woodsdale 6	52	363				19	121	53					216	88		

<b>Generation (GWh)</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>	<b>Apr-21</b>	<b>May-21</b>	<b>Jun-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>	<b>Oct-21</b>	<b>Nov-21</b>	<b>Dec-21</b>	<b>Jan-22</b>	<b>Feb-22</b>	<b>Mar-22</b>	<b>Apr-22</b>
DSM PS DEK UCAP																
East Bend 2	437	343	310	366	235	327	380	185	96			423	446	302	341	302
New Battery DEK						0	0	0	0	0	0	0	0	0	0	0
New CC DEK																
New CC DEK DF																
New Solar DEK						3	3	2	2	1	1	1	1	1	2	2
Solar Exist DEKY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Woodsdale 1	3	17				0	2	1	1				3	2		
Woodsdale 2	3	17				0	2	1	1				3	2		
Woodsdale 3	3	17				0	2	1	1				2	2		
Woodsdale 4	3	17				0	2						3	2		
Woodsdale 5	3	11				0	2	1					3	2		
Woodsdale 6	1	13				0	2	1					3	2		

without CO2 regulation;

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.9	26.9	26.3	25.6	26.4	26.0	23.7	23.6	25.6	25.0	28.6	-	-	-	27.5	27.9	-	28.9
9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	57.4	-	60.8	-	-	-	58.8	77.3	-	-	-	-	59.0	-	61.2	-
-	-	56.8	-	60.1	-	-	-	58.8	77.3	-	-	-	-	57.9	-	60.4	-
-	-	56.8	-	60.1	-	-	-	58.8	77.3	-	-	-	-	57.9	-	60.4	-
-	-	57.4	-	60.8	-	-	-	58.8	77.3	-	-	-	-	59.0	-	61.2	-
-	-	56.8	-	60.1	-	-	-	58.8	77.3	-	-	-	-	57.9	-	60.4	-
-	-	56.8	-	60.1	-	-	-	-	77.3	-	-	-	-	57.9	-	60.4	-

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
4,697	4,064	7,019	9,068	5,963	2,329	8,791	9,484	8,840	9,948	2,737				6,688	6,321		642
1	3	4	4	4	4	3	4	2	3	2	2	2	6	6	7	5	5

		116		38				88	22					110		19	
		118		38				88	22					116		39	
		118		38				88	22					116		39	
		116		38				88	22					83		19	
		118		38				88	22					116		19	
		118		38					22					116		39	

May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
182	151	267	355	226	90	370	401	346	399	96				243	227		22
0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
2	5	5	5	4	3	2	2	2	2	3	4	5	8	8	7	6	4
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		2		1				2	0					2		0	
		2		1				2	0					2		1	
		2		1				2	0					2		0	
		2		1				2	0					2		0	
		2		1					0					2		1	

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.2	26.2	23.7	24.5	24.5	24.9	-	26.6	25.9	26.9	27.3	-	24.6	24.0	20.6	20.6	22.5	21.4	22.6
9.4	9.4	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.9	9.9	9.9	9.9	9.9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	61.1	-	-	-	-	-	61.0	-	-	-	-	-	68.5	-	-	-	-
-	-	61.1	-	-	-	-	-	60.4	-	-	-	-	-	68.5	-	-	-	-
-	-	61.1	-	-	-	-	-	60.4	-	-	-	-	-	68.5	-	-	-	-
-	-	61.1	-	-	-	-	-	61.0	-	-	-	-	-	68.5	-	-	-	-
-	-	61.1	-	-	-	-	-	60.4	-	-	-	-	-	68.5	-	-	-	-
-	-	61.1	-	-	-	-	-	60.4	-	-	-	-	-	68.5	-	-	-	-

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
5,340	6,843	10,592	7,732	8,169	3,744		3,735	9,255	6,905	3,122		7,703	9,620	9,215	8,323	5,515	6,411	8,765
4	5	4	5	3	2	3	6	9	9	6	7	7	5	4	4	4	2	5

92								86						91				
92								116						91				
92								116						91				
92								86						91				
92								116						91				
92								116						91				

Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
204	261	446	316	334	150		140	358	257	114		314	401	446	403	245	299	388
0	1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0
3	2	3	4	5	6	7	14	14	13	11	8	6	4	5	7	9	11	13
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		2						1						1				
		2						2						1				
		2						2						1				
		2						1						1				
		2						2						1				
		2						2						1				

Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.1	22.7	23.4	23.6	-	21.2	21.3	22.9	21.9	21.8	22.2	23.2	23.2	23.8	23.2	24.2	26.4	21.8	21.6
9.9	9.9	9.9	9.9	9.9	9.9	9.9	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	66.8	-	-	-	-	-	-	-	-	-	-	-	62.2	-	51.8	-	-	-
-	66.1	-	-	-	-	-	-	-	-	-	-	-	61.8	-	51.3	-	-	-
-	66.1	-	-	-	-	-	-	-	-	-	-	-	61.8	-	51.3	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51.8	-	-	-
-	66.1	-	-	-	-	-	-	-	-	-	-	-	61.8	-	51.3	-	-	-
-	66.1	-	-	-	-	-	-	-	-	-	-	-	61.8	-	51.3	-	-	-

Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
7,387	8,450	6,818	3,463		5,864	7,106	7,261	8,212	8,153	6,718	10,350	10,016	8,232	10,350	5,574	760	9,084	9,625
8	11	12	7	9	8	7	8	4	4	5	7	7	12	9	9	10	6	7

89  
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Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
320	373	291	147		277	334	317	374	374	302	446	432	346	446	230	29	418	446
1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1
21	20	19	16	12	9	6	7	9	13	17	18	28	27	26	21	15	11	8
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1												2		3			
	1												2		3			
	1												2		3			
	1												2		3			















Year	Month	Base gas costs with CO2 regulation -		Base gas cost without CO2 regulation -		High gas cost with CO2 regulation -		High gas cost without CO2 regulation -	
		Average Power	Price (\$/MWh)	Average Power	Price (\$/MWh)	Average Power	Price (\$/MWh)	Average Power	Price (\$/MWh)
2021	1	\$	27.08	\$	27.08	\$	27.08	\$	27.08
2021	2	\$	26.66	\$	26.66	\$	26.66	\$	26.66
2021	3	\$	25.00	\$	25.00	\$	25.00	\$	25.00
2021	4	\$	25.10	\$	25.10	\$	25.10	\$	25.10
2021	5	\$	24.58	\$	24.58	\$	24.58	\$	24.58
2021	6	\$	25.09	\$	25.09	\$	25.09	\$	25.09
2021	7	\$	29.72	\$	29.72	\$	29.72	\$	29.72
2021	8	\$	27.64	\$	27.64	\$	27.64	\$	27.64
2021	9	\$	26.14	\$	26.14	\$	26.14	\$	26.14
2021	10	\$	25.00	\$	25.00	\$	25.00	\$	25.00
2021	11	\$	26.26	\$	26.26	\$	26.26	\$	26.26
2021	12	\$	28.44	\$	28.44	\$	28.44	\$	28.44
2022	1	\$	35.92	\$	35.92	\$	35.92	\$	35.92
2022	2	\$	33.95	\$	33.95	\$	33.95	\$	33.95
2022	3	\$	27.87	\$	27.87	\$	27.87	\$	27.87
2022	4	\$	24.58	\$	24.58	\$	24.58	\$	24.58
2022	5	\$	24.54	\$	24.54	\$	24.54	\$	24.54
2022	6	\$	24.40	\$	24.40	\$	24.40	\$	24.40
2022	7	\$	27.87	\$	27.87	\$	27.87	\$	27.87
2022	8	\$	27.16	\$	27.16	\$	27.16	\$	27.16
2022	9	\$	25.00	\$	25.00	\$	25.00	\$	25.00
2022	10	\$	24.09	\$	24.09	\$	24.09	\$	24.09
2022	11	\$	25.07	\$	25.07	\$	25.07	\$	25.07
2022	12	\$	26.79	\$	26.79	\$	26.79	\$	26.79
2023	1	\$	33.59	\$	33.59	\$	33.59	\$	33.59
2023	2	\$	30.98	\$	30.98	\$	30.98	\$	30.98
2023	3	\$	26.32	\$	26.32	\$	26.32	\$	26.32
2023	4	\$	23.96	\$	23.96	\$	23.96	\$	23.96
2023	5	\$	23.73	\$	23.73	\$	23.73	\$	23.73
2023	6	\$	23.40	\$	23.40	\$	23.40	\$	23.40
2023	7	\$	27.57	\$	27.57	\$	27.57	\$	27.57
2023	8	\$	26.29	\$	26.29	\$	26.29	\$	26.29
2023	9	\$	23.89	\$	23.89	\$	23.89	\$	23.89
2023	10	\$	24.14	\$	24.14	\$	24.14	\$	24.14
2023	11	\$	24.57	\$	24.57	\$	24.57	\$	24.57
2023	12	\$	25.84	\$	25.84	\$	25.84	\$	25.84
2024	1	\$	33.70	\$	33.70	\$	33.70	\$	33.70
2024	2	\$	31.19	\$	31.19	\$	31.19	\$	31.19
2024	3	\$	26.99	\$	26.99	\$	26.99	\$	26.99
2024	4	\$	24.81	\$	24.81	\$	24.81	\$	24.81
2024	5	\$	23.69	\$	23.69	\$	23.69	\$	23.69
2024	6	\$	23.38	\$	23.38	\$	23.38	\$	23.38
2024	7	\$	28.05	\$	28.05	\$	28.05	\$	28.05
2024	8	\$	26.00	\$	26.00	\$	26.00	\$	26.00
2024	9	\$	24.06	\$	24.06	\$	24.06	\$	24.06
2024	10	\$	24.53	\$	24.53	\$	24.53	\$	24.53
2024	11	\$	24.36	\$	24.36	\$	24.36	\$	24.36
2024	12	\$	26.09	\$	26.09	\$	26.09	\$	26.09
2025	1	\$	35.31	\$	34.35	\$	44.85	\$	34.35
2025	2	\$	35.54	\$	31.63	\$	43.02	\$	31.63
2025	3	\$	30.17	\$	27.71	\$	37.09	\$	27.71
2025	4	\$	31.82	\$	25.46	\$	38.22	\$	25.46
2025	5	\$	28.48	\$	24.22	\$	34.73	\$	24.22
2025	6	\$	28.37	\$	24.21	\$	34.75	\$	24.21
2025	7	\$	32.37	\$	28.59	\$	39.47	\$	28.59
2025	8	\$	29.51	\$	26.24	\$	36.49	\$	26.24
2025	9	\$	28.40	\$	24.85	\$	35.09	\$	24.85
2025	10	\$	28.68	\$	24.86	\$	35.02	\$	24.86
2025	11	\$	31.90	\$	24.53	\$	38.01	\$	24.53
2025	12	\$	32.09	\$	26.61	\$	38.89	\$	26.61
2026	1	\$	40.46	\$	33.59	\$	47.31	\$	45.16
2026	2	\$	38.45	\$	32.42	\$	45.22	\$	41.49
2026	3	\$	32.50	\$	27.74	\$	39.91	\$	36.01
2026	4	\$	33.70	\$	28.40	\$	39.36	\$	36.11
2026	5	\$	31.67	\$	27.12	\$	38.60	\$	35.28
2026	6	\$	32.08	\$	26.44	\$	38.42	\$	34.60
2026	7	\$	36.63	\$	30.81	\$	44.32	\$	40.46
2026	8	\$	34.15	\$	28.10	\$	41.63	\$	36.71
2026	9	\$	32.46	\$	26.78	\$	39.85	\$	35.56
2026	10	\$	33.73	\$	27.81	\$	40.07	\$	36.71
2026	11	\$	35.48	\$	30.13	\$	42.61	\$	39.28
2026	12	\$	36.64	\$	30.83	\$	43.45	\$	40.32
2027	1	\$	43.48	\$	35.05	\$	55.16	\$	47.44
2027	2	\$	42.78	\$	34.03	\$	51.89	\$	46.33
2027	3	\$	35.76	\$	28.94	\$	45.24	\$	39.93
2027	4	\$	38.53	\$	31.85	\$	47.61	\$	40.92
2027	5	\$	34.82	\$	28.77	\$	43.74	\$	38.18
2027	6	\$	35.20	\$	28.35	\$	46.42	\$	38.08
2027	7	\$	41.14	\$	32.07	\$	51.73	\$	43.76

2027	8	\$	38.01	\$	30.37	\$	49.45	\$	40.98
2027	9	\$	35.31	\$	27.62	\$	45.69	\$	38.94
2027	10	\$	38.42	\$	29.90	\$	49.06	\$	40.73
2027	11	\$	38.95	\$	31.52	\$	48.21	\$	42.79
2027	12	\$	39.74	\$	32.42	\$	51.09	\$	45.11
2028	1	\$	44.61	\$	35.67	\$	55.75	\$	49.28
2028	2	\$	43.53	\$	34.39	\$	53.62	\$	46.48
2028	3	\$	39.44	\$	31.24	\$	49.94	\$	42.67
2028	4	\$	41.18	\$	32.31	\$	50.02	\$	41.91
2028	5	\$	38.82	\$	30.62	\$	48.60	\$	41.39
2028	6	\$	37.82	\$	29.10	\$	47.89	\$	39.70
2028	7	\$	44.35	\$	34.01	\$	56.26	\$	47.59
2028	8	\$	41.88	\$	31.85	\$	52.86	\$	43.69
2028	9	\$	38.28	\$	29.19	\$	49.67	\$	41.06
2028	10	\$	41.14	\$	31.60	\$	51.17	\$	43.16
2028	11	\$	43.16	\$	34.42	\$	53.82	\$	46.35
2028	12	\$	42.96	\$	33.93	\$	53.86	\$	47.71
2029	1	\$	49.18	\$	37.45	\$	61.05	\$	50.60
2029	2	\$	48.92	\$	37.39	\$	59.56	\$	50.71
2029	3	\$	42.23	\$	32.36	\$	54.00	\$	44.18
2029	4	\$	47.17	\$	36.40	\$	57.46	\$	46.20
2029	5	\$	43.18	\$	32.77	\$	53.68	\$	43.68
2029	6	\$	43.06	\$	31.99	\$	53.88	\$	44.05
2029	7	\$	50.41	\$	37.83	\$	62.94	\$	51.60
2029	8	\$	47.71	\$	36.05	\$	60.09	\$	49.67
2029	9	\$	44.35	\$	32.83	\$	56.34	\$	46.00
2029	10	\$	47.41	\$	35.54	\$	58.75	\$	48.78
2029	11	\$	47.96	\$	36.60	\$	59.59	\$	49.74
2029	12	\$	47.30	\$	35.56	\$	59.91	\$	50.38
2030	1	\$	53.33	\$	40.53	\$	66.45	\$	55.54
2030	2	\$	53.17	\$	41.38	\$	66.36	\$	56.06
2030	3	\$	47.28	\$	35.79	\$	60.56	\$	49.97
2030	4	\$	52.46	\$	40.20	\$	63.52	\$	52.84
2030	5	\$	47.36	\$	35.85	\$	60.05	\$	48.87
2030	6	\$	47.62	\$	35.38	\$	60.70	\$	49.35
2030	7	\$	57.17	\$	42.41	\$	71.33	\$	59.14
2030	8	\$	53.84	\$	40.22	\$	68.81	\$	56.85
2030	9	\$	49.05	\$	36.16	\$	64.10	\$	51.98
2030	10	\$	50.13	\$	36.84	\$	63.16	\$	51.81
2030	11	\$	53.97	\$	41.66	\$	67.02	\$	56.95
2030	12	\$	53.24	\$	40.90	\$	67.46	\$	57.39
2031	1	\$	59.36	\$	43.89	\$	76.68	\$	61.91
2031	2	\$	58.20	\$	44.54	\$	74.89	\$	61.12
2031	3	\$	51.66	\$	38.28	\$	68.46	\$	54.62
2031	4	\$	57.93	\$	42.96	\$	70.56	\$	57.18
2031	5	\$	51.23	\$	37.32	\$	66.19	\$	52.26
2031	6	\$	51.92	\$	37.56	\$	67.51	\$	53.81
2031	7	\$	61.30	\$	44.79	\$	79.05	\$	64.07
2031	8	\$	58.34	\$	41.71	\$	75.53	\$	60.35
2031	9	\$	53.12	\$	38.56	\$	69.79	\$	55.95
2031	10	\$	53.94	\$	38.65	\$	69.41	\$	55.25
2031	11	\$	54.79	\$	41.12	\$	70.99	\$	57.19
2031	12	\$	55.13	\$	40.85	\$	71.68	\$	58.26
2032	1	\$	59.93	\$	43.73	\$	79.12	\$	62.75
2032	2	\$	56.88	\$	41.74	\$	74.39	\$	58.89
2032	3	\$	52.14	\$	37.99	\$	70.51	\$	54.17
2032	4	\$	58.19	\$	41.99	\$	72.49	\$	57.74
2032	5	\$	51.49	\$	36.73	\$	68.47	\$	52.42
2032	6	\$	54.00	\$	37.67	\$	70.98	\$	54.46
2032	7	\$	62.56	\$	44.44	\$	82.33	\$	65.06
2032	8	\$	59.92	\$	42.36	\$	79.22	\$	61.60
2032	9	\$	54.78	\$	38.00	\$	73.41	\$	56.93
2032	10	\$	56.18	\$	39.70	\$	73.12	\$	55.83
2032	11	\$	57.57	\$	41.75	\$	75.96	\$	58.88
2032	12	\$	57.44	\$	42.44	\$	77.02	\$	61.23
2033	1	\$	63.92	\$	45.04	\$	83.83	\$	63.37
2033	2	\$	61.80	\$	45.23	\$	80.87	\$	62.54
2033	3	\$	55.78	\$	39.20	\$	74.45	\$	56.46
2033	4	\$	61.96	\$	44.21	\$	75.59	\$	58.93
2033	5	\$	55.25	\$	39.00	\$	72.27	\$	53.92
2033	6	\$	56.01	\$	38.15	\$	73.86	\$	54.51
2033	7	\$	65.30	\$	45.27	\$	84.97	\$	64.58
2033	8	\$	63.39	\$	43.67	\$	82.52	\$	62.47
2033	9	\$	56.49	\$	38.50	\$	76.17	\$	56.29
2033	10	\$	60.30	\$	41.78	\$	78.25	\$	58.07
2033	11	\$	60.69	\$	43.58	\$	79.37	\$	60.84
2033	12	\$	59.56	\$	42.77	\$	80.27	\$	60.87
2034	1	\$	65.92	\$	46.21	\$	86.54	\$	65.69
2034	2	\$	63.96	\$	46.62	\$	84.20	\$	65.23
2034	3	\$	58.46	\$	40.66	\$	77.86	\$	58.49
2034	4	\$	60.21	\$	42.21	\$	75.47	\$	57.72



2034	5	\$	58.03	\$	39.96	\$	75.59	\$	55.85
2034	6	\$	58.10	\$	38.94	\$	76.29	\$	56.00
2034	7	\$	67.37	\$	46.03	\$	87.40	\$	66.08
2034	8	\$	64.71	\$	43.98	\$	84.37	\$	64.24
2034	9	\$	57.68	\$	38.23	\$	77.53	\$	57.90
2034	10	\$	62.12	\$	42.00	\$	80.82	\$	60.53
2034	11	\$	60.68	\$	42.76	\$	80.27	\$	60.28
2034	12	\$	60.65	\$	42.40	\$	82.19	\$	61.52
2035	1	\$	68.63	\$	45.40	\$	90.38	\$	66.45
2035	2	\$	65.14	\$	45.03	\$	85.60	\$	63.44
2035	3	\$	59.16	\$	39.51	\$	78.78	\$	56.45
2035	4	\$	66.46	\$	45.93	\$	81.85	\$	61.33
2035	5	\$	61.14	\$	40.61	\$	79.79	\$	58.12
2035	6	\$	61.54	\$	39.89	\$	81.29	\$	58.19
2035	7	\$	72.37	\$	47.55	\$	93.56	\$	68.72
2035	8	\$	68.97	\$	45.37	\$	90.52	\$	65.69
2035	9	\$	61.50	\$	39.74	\$	82.59	\$	59.50
2035	10	\$	66.37	\$	44.93	\$	84.95	\$	62.96
2035	11	\$	64.33	\$	44.16	\$	85.97	\$	62.82
2035	12	\$	64.78	\$	43.54	\$	87.75	\$	64.18
2036	1	\$	73.03	\$	47.49	\$	96.35	\$	69.44
2036	2	\$	67.33	\$	45.50	\$	89.36	\$	65.26
2036	3	\$	64.08	\$	41.54	\$	85.19	\$	61.51
2036	4	\$	68.56	\$	45.24	\$	85.45	\$	62.64
2036	5	\$	62.86	\$	40.23	\$	82.16	\$	58.49
2036	6	\$	63.91	\$	39.82	\$	83.88	\$	58.69
2036	7	\$	74.79	\$	47.89	\$	97.43	\$	70.49
2036	8	\$	71.62	\$	45.59	\$	93.72	\$	67.79
2036	9	\$	65.61	\$	41.67	\$	87.77	\$	62.48
2036	10	\$	67.60	\$	43.92	\$	88.26	\$	64.37
2036	11	\$	68.74	\$	45.82	\$	91.30	\$	67.16
2036	12	\$	68.38	\$	44.70	\$	92.98	\$	67.80
2037	1	\$	75.20	\$	47.75	\$	100.03	\$	70.47
2037	2	\$	73.29	\$	47.98	\$	96.31	\$	69.72
2037	3	\$	66.36	\$	41.97	\$	88.16	\$	62.85
2037	4	\$	71.19	\$	46.93	\$	87.83	\$	64.52
2037	5	\$	64.28	\$	39.79	\$	83.59	\$	59.23
2037	6	\$	66.79	\$	40.42	\$	87.30	\$	60.84
2037	7	\$	77.47	\$	48.63	\$	100.03	\$	72.14
2037	8	\$	74.17	\$	46.04	\$	97.34	\$	68.73
2037	9	\$	67.58	\$	41.91	\$	89.91	\$	63.22
2037	10	\$	68.53	\$	42.66	\$	88.91	\$	63.50
2037	11	\$	71.71	\$	46.60	\$	94.77	\$	67.80
2037	12	\$	71.75	\$	46.03	\$	96.23	\$	69.14
2038	1	\$	78.21	\$	49.92	\$	103.98	\$	72.75
2038	2	\$	75.48	\$	49.22	\$	99.64	\$	71.75
2038	3	\$	70.21	\$	44.43	\$	92.90	\$	65.70
2038	4	\$	73.49	\$	47.49	\$	91.50	\$	66.08
2038	5	\$	66.36	\$	39.67	\$	85.52	\$	60.58
2038	6	\$	69.77	\$	41.68	\$	91.40	\$	63.56
2038	7	\$	80.54	\$	49.63	\$	104.98	\$	73.86
2038	8	\$	77.61	\$	47.42	\$	102.17	\$	71.78
2038	9	\$	70.97	\$	42.74	\$	94.55	\$	66.14
2038	10	\$	73.55	\$	46.21	\$	95.08	\$	68.56
2038	11	\$	75.04	\$	48.67	\$	99.73	\$	71.31
2038	12	\$	76.39	\$	48.91	\$	103.64	\$	74.01
2039	1	\$	82.84	\$	51.14	\$	110.79	\$	78.50
2039	2	\$	79.61	\$	51.00	\$	106.35	\$	76.55
2039	3	\$	74.57	\$	45.71	\$	99.98	\$	71.19
2039	4	\$	75.65	\$	48.57	\$	95.49	\$	69.72
2039	5	\$	72.36	\$	43.45	\$	93.43	\$	66.47
2039	6	\$	72.96	\$	42.26	\$	96.18	\$	66.13
2039	7	\$	83.70	\$	50.58	\$	109.58	\$	77.73
2039	8	\$	81.16	\$	48.60	\$	108.03	\$	76.18
2039	9	\$	73.97	\$	43.63	\$	100.18	\$	70.02
2039	10	\$	79.19	\$	49.29	\$	101.64	\$	74.26
2039	11	\$	79.54	\$	50.15	\$	106.31	\$	76.60
2039	12	\$	79.61	\$	49.27	\$	107.97	\$	76.77
2040	1	\$	86.79	\$	51.88	\$	115.29	\$	80.29
2040	2	\$	81.68	\$	50.12	\$	108.64	\$	77.43
2040	3	\$	77.24	\$	46.19	\$	102.36	\$	72.67
2040	4	\$	78.79	\$	49.68	\$	94.79	\$	72.69
2040	5	\$	75.69	\$	44.00	\$	97.77	\$	70.00
2040	6	\$	76.64	\$	44.18	\$	100.84	\$	69.39
2040	7	\$	89.41	\$	53.02	\$	116.92	\$	82.68
2040	8	\$	86.19	\$	50.13	\$	113.64	\$	79.66
2040	9	\$	78.95	\$	45.30	\$	105.88	\$	74.12
2040	10	\$	83.43	\$	49.77	\$	106.04	\$	77.36
2040	11	\$	83.13	\$	51.04	\$	111.05	\$	79.77
2040	12	\$	83.77	\$	50.40	\$	113.49	\$	81.04
2041	1	\$	91.48	\$	54.85	\$	120.55	\$	83.87

2041	2	\$	88.08	\$	54.26	\$	115.67	\$	82.52
2041	3	\$	81.78	\$	48.81	\$	106.91	\$	76.58
2041	4	\$	85.23	\$	55.00	\$	99.61	\$	77.19
2041	5	\$	79.32	\$	46.39	\$	101.95	\$	71.90
2041	6	\$	81.01	\$	46.51	\$	105.77	\$	72.46
2041	7	\$	94.00	\$	55.70	\$	121.89	\$	85.89
2041	8	\$	90.05	\$	52.60	\$	118.17	\$	82.16
2041	9	\$	83.06	\$	48.02	\$	110.52	\$	76.91
2041	10	\$	85.69	\$	51.65	\$	106.95	\$	78.60
2041	11	\$	86.89	\$	52.63	\$	113.68	\$	80.37
2041	12	\$	88.16	\$	52.66	\$	117.56	\$	82.89
2042	1	\$	96.52	\$	56.52	\$	124.95	\$	87.16
2042	2	\$	91.70	\$	55.38	\$	119.04	\$	85.83
2042	3	\$	85.57	\$	49.57	\$	109.30	\$	79.45
2042	4	\$	89.16	\$	57.18	\$	101.25	\$	82.26
2042	5	\$	82.55	\$	47.57	\$	103.50	\$	75.12
2042	6	\$	85.31	\$	48.50	\$	112.30	\$	76.82
2042	7	\$	98.58	\$	57.74	\$	127.03	\$	89.70
2042	8	\$	94.62	\$	54.56	\$	124.58	\$	86.97
2042	9	\$	88.48	\$	50.16	\$	117.12	\$	81.61
2042	10	\$	89.46	\$	53.15	\$	112.10	\$	83.87
2042	11	\$	94.37	\$	57.50	\$	123.06	\$	89.71
2042	12	\$	94.70	\$	56.15	\$	126.19	\$	89.78
2043	1	\$	102.52	\$	59.61	\$	131.84	\$	94.41
2043	2	\$	97.34	\$	58.87	\$	127.69	\$	92.85
2043	3	\$	90.30	\$	52.48	\$	108.96	\$	84.96
2043	4	\$	92.27	\$	60.16	\$	100.70	\$	86.32
2043	5	\$	86.66	\$	49.59	\$	104.85	\$	80.07
2043	6	\$	90.45	\$	51.54	\$	117.42	\$	82.93
2043	7	\$	103.33	\$	60.55	\$	133.41	\$	95.62
2043	8	\$	99.95	\$	58.04	\$	131.20	\$	93.09
2043	9	\$	93.49	\$	53.44	\$	122.29	\$	88.18
2043	10	\$	91.92	\$	53.83	\$	110.32	\$	84.16
2043	11	\$	95.89	\$	57.42	\$	123.02	\$	89.86
2043	12	\$	98.81	\$	58.22	\$	129.81	\$	93.61
2044	1	\$	106.43	\$	59.64	\$	135.78	\$	97.72
2044	2	\$	99.41	\$	59.00	\$	127.31	\$	95.80
2044	3	\$	94.88	\$	54.11	\$	112.61	\$	90.21
2044	4	\$	96.15	\$	61.00	\$	100.58	\$	92.31
2044	5	\$	89.27	\$	52.02	\$	110.16	\$	85.32
2044	6	\$	95.81	\$	53.90	\$	123.62	\$	90.07
2044	7	\$	109.87	\$	63.64	\$	142.27	\$	103.48
2044	8	\$	106.58	\$	61.66	\$	141.02	\$	102.10
2044	9	\$	99.28	\$	56.47	\$	129.15	\$	96.00
2044	10	\$	101.05	\$	61.51	\$	114.52	\$	97.17
2044	11	\$	101.32	\$	59.09	\$	130.27	\$	97.75
2044	12	\$	103.89	\$	60.38	\$	138.45	\$	101.64
2045	1	\$	111.68	\$	63.26	\$	143.25	\$	104.58
2045	2	\$	106.44	\$	62.73	\$	134.27	\$	103.36
2045	3	\$	99.35	\$	56.02	\$	112.40	\$	94.71
2045	4	\$	97.31	\$	62.09	\$	94.54	\$	93.85
2045	5	\$	93.57	\$	53.83	\$	109.28	\$	88.26
2045	6	\$	98.29	\$	54.20	\$	124.18	\$	90.98
2045	7	\$	112.55	\$	63.10	\$	143.28	\$	103.66
2045	8	\$	109.33	\$	61.46	\$	142.25	\$	102.64
2045	9	\$	101.07	\$	55.73	\$	129.30	\$	96.21
2045	10	\$	109.45	\$	67.53	\$	119.47	\$	103.96
2045	11	\$	103.32	\$	58.45	\$	129.47	\$	98.49
2045	12	\$	108.11	\$	62.20	\$	142.21	\$	104.39
2046	1	\$	117.21	\$	64.83	\$	144.91	\$	107.62
2046	2	\$	110.27	\$	63.81	\$	131.43	\$	106.69
2046	3	\$	102.88	\$	57.60	\$	108.64	\$	98.22
2046	4	\$	99.15	\$	65.05	\$	88.82	\$	97.58
2046	5	\$	98.54	\$	54.91	\$	105.47	\$	92.20
2046	6	\$	101.70	\$	55.32	\$	128.28	\$	93.69
2046	7	\$	116.17	\$	64.95	\$	148.09	\$	107.70
2046	8	\$	112.43	\$	62.55	\$	146.70	\$	105.82
2046	9	\$	104.83	\$	57.21	\$	134.90	\$	99.18
2046	10	\$	106.54	\$	61.25	\$	115.77	\$	99.03
2046	11	\$	108.66	\$	60.77	\$	130.73	\$	102.82
2046	12	\$	112.00	\$	62.38	\$	145.45	\$	107.87
2047	1	\$	120.50	\$	66.87	\$	148.32	\$	110.59
2047	2	\$	113.61	\$	65.36	\$	133.65	\$	109.41
2047	3	\$	105.81	\$	58.79	\$	102.67	\$	100.67
2047	4	\$	100.07	\$	64.59	\$	80.49	\$	99.15
2047	5	\$	100.91	\$	56.34	\$	99.74	\$	94.70
2047	6	\$	103.63	\$	56.43	\$	128.22	\$	95.90
2047	7	\$	120.06	\$	66.39	\$	151.77	\$	110.41
2047	8	\$	115.72	\$	63.92	\$	148.95	\$	107.93
2047	9	\$	108.74	\$	59.26	\$	136.61	\$	102.46
2047	10	\$	108.91	\$	63.28	\$	115.99	\$	102.89

2047	11	\$	111.96	\$	61.75	\$	128.52	\$	104.14
2047	12	\$	115.29	\$	63.96	\$	149.17	\$	109.26
2048	1	\$	122.44	\$	66.69	\$	149.37	\$	111.48
2048	2	\$	112.45	\$	63.68	\$	122.71	\$	108.28
2048	3	\$	105.53	\$	59.28	\$	97.47	\$	101.73
2048	4	\$	101.21	\$	66.45	\$	74.08	\$	101.92
2048	5	\$	100.57	\$	54.71	\$	94.80	\$	94.50
2048	6	\$	107.32	\$	57.54	\$	131.32	\$	98.27
2048	7	\$	121.92	\$	67.08	\$	155.42	\$	112.44
2048	8	\$	119.03	\$	64.73	\$	153.74	\$	110.68
2048	9	\$	112.86	\$	61.03	\$	140.65	\$	106.62
2048	10	\$	112.97	\$	63.78	\$	112.49	\$	103.80
2048	11	\$	113.68	\$	62.58	\$	132.07	\$	106.30
2048	12	\$	117.64	\$	64.26	\$	152.96	\$	110.86
2049	1	\$	124.76	\$	67.19	\$	149.80	\$	112.68
2049	2	\$	118.28	\$	66.84	\$	131.83	\$	111.59
2049	3	\$	105.38	\$	58.25	\$	86.74	\$	98.77
2049	4	\$	101.48	\$	67.71	\$	55.96	\$	103.29
2049	5	\$	101.42	\$	56.23	\$	85.35	\$	95.59
2049	6	\$	110.34	\$	58.95	\$	130.03	\$	100.09
2049	7	\$	125.09	\$	68.62	\$	159.11	\$	114.10
2049	8	\$	123.28	\$	67.65	\$	156.76	\$	114.06
2049	9	\$	117.16	\$	64.50	\$	144.30	\$	110.85
2049	10	\$	114.34	\$	66.31	\$	110.38	\$	107.71
2049	11	\$	119.62	\$	65.13	\$	133.78	\$	110.42
2049	12	\$	121.06	\$	66.15	\$	155.47	\$	112.92
2050	1	\$	127.21	\$	68.43	\$	160.27	\$	115.68
2050	2	\$	120.66	\$	69.29	\$	124.55	\$	116.84
2050	3	\$	110.20	\$	63.45	\$	93.86	\$	108.69
2050	4	\$	98.27	\$	68.32	\$	35.78	\$	106.33
2050	5	\$	102.30	\$	58.45	\$	80.90	\$	98.76
2050	6	\$	112.38	\$	60.93	\$	130.63	\$	104.16
2050	7	\$	127.11	\$	69.98	\$	165.21	\$	117.15
2050	8	\$	124.52	\$	68.73	\$	162.04	\$	116.44
2050	9	\$	117.58	\$	64.49	\$	141.51	\$	112.70
2050	10	\$	113.07	\$	67.82	\$	101.37	\$	110.48
2050	11	\$	121.90	\$	68.32	\$	126.45	\$	116.44
2050	12	\$	124.28	\$	68.64	\$	159.69	\$	118.28

**Average PJM Day-Ahead and Real-Time LMP for Selected DEK Points by Month; January 2020 - April 2022**

	Day Ahead		Day Ahead LMP, Real Time LMP,		Day Ahead LMP, Real Time LMP,		Day Ahead LMP, Real Time LMP,		Day Ahead LMP, Real Time LMP,	
	LMP, DEK Load	Real Time LMP, DEK Load	East Bend Unit 2 Generation	East Bend Unit 2 Generation	Woodsdale Units 1-6 Generation	Woodsdale Units 1-6 Generation	AEP-DAYTON HUB	AEP-DAYTON HUB	AEP-DAYTON HUB	AEP-DAYTON HUB
Zone	Zone	Zone	Node	Node	Nodes	Nodes	HUB	HUB	HUB	HUB
1/31/2020	\$ 22.24	\$ 21.95	\$ 21.84	\$ 21.56	\$ 22.15	\$ 21.89	\$ 22.10	\$ 21.87		
2/29/2020	\$ 20.26	\$ 19.46	\$ 19.95	\$ 19.17	\$ 20.15	\$ 19.39	\$ 20.07	\$ 19.37		
3/31/2020	\$ 18.45	\$ 18.32	\$ 18.18	\$ 18.04	\$ 18.39	\$ 18.26	\$ 18.24	\$ 18.04		
4/30/2020	\$ 17.16	\$ 17.48	\$ 16.85	\$ 17.16	\$ 17.16	\$ 17.42	\$ 17.23	\$ 17.59		
5/31/2020	\$ 18.11	\$ 18.60	\$ 17.82	\$ 18.38	\$ 18.01	\$ 18.56	\$ 17.99	\$ 18.64		
6/30/2020	\$ 19.49	\$ 19.62	\$ 19.10	\$ 19.15	\$ 19.39	\$ 19.47	\$ 19.05	\$ 19.57		
7/31/2020	\$ 25.53	\$ 24.77	\$ 22.79	\$ 23.33	\$ 25.35	\$ 24.85	\$ 25.54	\$ 26.43		
8/31/2020	\$ 22.92	\$ 23.33	\$ 22.42	\$ 22.86	\$ 22.74	\$ 23.23	\$ 23.47	\$ 24.22		
9/30/2020	\$ 20.08	\$ 19.42	\$ 18.64	\$ 18.90	\$ 20.07	\$ 19.39	\$ 20.00	\$ 19.36		
10/31/2020	\$ 23.76	\$ 24.11	\$ 23.79	\$ 24.10	\$ 23.82	\$ 24.45	\$ 22.23	\$ 23.24		
11/30/2020	\$ 21.32	\$ 21.50	\$ 21.57	\$ 21.55	\$ 21.42	\$ 21.77	\$ 20.71	\$ 21.01		
12/31/2020	\$ 25.06	\$ 24.76	\$ 24.85	\$ 24.34	\$ 25.18	\$ 24.92	\$ 24.56	\$ 24.38		
1/31/2021	\$ 25.66	\$ 25.18	\$ 25.37	\$ 24.63	\$ 25.67	\$ 25.21	\$ 24.81	\$ 24.46		
2/28/2021	\$ 43.54	\$ 41.35	\$ 41.48	\$ 39.24	\$ 43.50	\$ 41.11	\$ 43.16	\$ 41.10		
3/31/2021	\$ 25.04	\$ 25.50	\$ 20.98	\$ 2.12	\$ 25.52	\$ 25.86	\$ 24.26	\$ 25.02		
4/30/2021	\$ 29.03	\$ 26.95	\$ 25.67	\$ 25.91	\$ 29.13	\$ 27.10	\$ 28.45	\$ 27.01		
5/31/2021	\$ 31.38	\$ 32.05	\$ 29.50	\$ 30.66	\$ 31.16	\$ 31.83	\$ 28.41	\$ 28.06		
6/30/2021	\$ 32.32	\$ 31.54	\$ 31.37	\$ 30.55	\$ 31.85	\$ 31.50	\$ 32.30	\$ 34.09		
7/31/2021	\$ 37.23	\$ 35.70	\$ 35.95	\$ 34.64	\$ 36.86	\$ 35.61	\$ 36.97	\$ 35.57		
8/31/2021	\$ 42.78	\$ 43.28	\$ 41.37	\$ 42.39	\$ 41.68	\$ 42.88	\$ 42.28	\$ 43.30		
9/30/2021	\$ 45.03	\$ 47.03	\$ 44.23	\$ 46.24	\$ 44.59	\$ 46.79	\$ 44.52	\$ 47.04		
10/31/2021	\$ 58.85	\$ 59.30	\$ 58.02	\$ 58.28	\$ 58.58	\$ 58.88	\$ 58.14	\$ 58.30		
11/30/2021	\$ 65.84	\$ 66.45	\$ 64.63	\$ 64.89	\$ 64.78	\$ 65.42	\$ 60.94	\$ 62.57		
12/31/2021	\$ 39.03	\$ 39.41	\$ 38.51	\$ 38.73	\$ 38.17	\$ 38.91	\$ 36.86	\$ 37.78		
1/31/2022	\$ 55.03	\$ 50.78	\$ 54.13	\$ 49.27	\$ 54.35	\$ 50.25	\$ 53.57	\$ 50.58		
2/28/2022	\$ 47.42	\$ 45.08	\$ 46.48	\$ 44.10	\$ 46.83	\$ 44.72	\$ 46.57	\$ 43.96		
3/31/2022	\$ 46.30	\$ 45.13	\$ 45.34	\$ 44.17	\$ 45.76	\$ 44.61	\$ 45.06	\$ 43.56		
4/30/2022	\$ 66.94	\$ 65.85	\$ 65.58	\$ 64.62	\$ 66.21	\$ 65.37	\$ 65.65	\$ 64.99		

**Duke Energy Kentucky**  
**Case No. 2021-00245**  
**STAFF First Set Post Hearing Data Requests**  
**Date Received: May 20, 2022**

**STAFF-PHDR-01-003**

**REQUEST:**

Refer to Figure 6.8 on pages 61-62 of Duke Kentucky's IRP. Provide an Excel spreadsheet with all formulas, rows, and columns unprotected and fully accessible showing the total load in each year used to calculate the percentages in Figure 6.8 and the load served by market purchases in each year for each of the scenarios and portfolios reflected in Figure 6.8.

**RESPONSE:**

Please see STAFF-PHDR-01-003 Attachment 1 for details on the load forecast.

The energy from generating resources and market purchases do not serve particular loads but are a result of PJM dispatch of Duke Energy Kentucky's generating units and customers' energy needs. When energy from generating units exceeds customer load, this excess generation is sold into the PJM market. During times when energy from generating units is less than customer load, this shortfall in generation is made up by purchases from the PJM market. Please see STAFF-PHDR-01-003 Attachment 2 for market purchase data.

**PERSON RESPONSIBLE:**

Ben Passty  
Scott Park

FIGURE B-1  
 DUKE ENERGY KENTUCKY SYSTEM  
 SERVICE AREA ENERGY FORECAST (MEGAWATT HOURS/YEAR)  
 BEFORE EE

-2

Year	(1) Rural and Residential	(2) Commercial	(3) Industrial	(4) Street-Hwy Lighting	(5) Sales for Resale <sup>a</sup>	(6) Other	(7) (1+2+3+4+5+6) Total Consumption	(8) Losses and Unaccounted For <sup>b</sup>	(9) (7+8) Net Energy for Load
-5 2015	1,445,887	1,477,900	812,522	15,120	0	292,528	4,043,958	320,627	4,364,585
-4 2016	1,451,682	1,498,287	818,455	15,264	0	296,767	4,080,455	323,525	4,403,980
-3 2017	1,395,234	1,457,929	812,294	15,077	0	283,263	3,963,797	314,275	4,278,071
-2 2018	1,568,884	1,489,143	831,846	14,317	0	292,331	4,196,521	332,723	4,529,244
-1 2019	1,529,903	1,475,224	843,415	13,759	0	286,577	4,148,879	328,953	4,477,832
0 2020	1,494,087	1,469,752	838,398	13,827	0	281,570	4,097,635	324,893	4,422,528
1 2021	1,483,075	1,441,951	816,816	13,664	0	227,673	3,983,179	315,812	4,298,991
2 2022	1,482,005	1,413,155	877,839	13,617	0	269,903	4,056,520	321,628	4,378,148
3 2023	1,491,383	1,417,868	950,091	13,581	0	272,921	4,145,843	328,711	4,474,555
4 2024	1,501,878	1,427,897	954,607	13,563	0	274,448	4,172,392	330,817	4,503,209
5 2025	1,529,707	1,444,041	990,324	13,549	0	276,369	4,253,989	337,287	4,591,277
6 2026	1,541,613	1,441,815	990,447	13,534	0	278,528	4,265,938	338,235	4,604,172
7 2027	1,560,889	1,444,497	992,250	13,524	0	281,285	4,292,447	340,337	4,632,784
8 2028	1,579,031	1,448,602	997,047	13,516	0	284,256	4,322,451	342,716	4,665,168
9 2029	1,598,222	1,451,934	1,001,253	13,510	0	287,140	4,352,058	345,064	4,697,122
10 2030	1,624,475	1,456,322	1,041,040	13,438	0	290,044	4,425,318	350,874	4,776,192
11 2031	1,643,231	1,456,057	1,046,067	13,386	0	292,615	4,451,356	352,939	4,804,295
12 2032	1,667,456	1,462,003	1,050,634	13,356	0	294,918	4,488,367	355,874	4,844,240
13 2033	1,694,521	1,467,913	1,053,042	13,346	0	297,051	4,525,873	358,848	4,884,720
14 2034	1,716,795	1,470,885	1,055,090	13,339	0	298,966	4,555,075	361,164	4,916,238
15 2035	1,747,065	1,479,484	1,056,914	13,338	0	300,623	4,597,424	364,522	4,961,946
16 2036	1,786,508	1,497,012	1,059,210	13,339	0	301,970	4,658,039	369,329	5,027,368
17 2037	1,810,899	1,502,024	1,059,895	13,340	0	302,919	4,689,078	371,790	5,060,868
18 2038	1,843,421	1,514,744	1,061,660	13,342	0	303,811	4,736,979	375,588	5,112,567
19 2039	1,875,408	1,528,266	1,063,687	13,343	0	304,609	4,785,312	379,421	5,164,734
20 2040	1,907,362	1,533,025	1,066,520	13,329	0	305,458	4,825,694	382,624	5,208,317

NOTES  
 History is billed sales; Other = sum(OPA,ID,CU)

check

For losses 2013-2017 Losses = (Total Consumption -CU)\*(historical annual loss factor)

For losses 2018 beyond: Losses = (Total Consumption -CU)\*0.0793

(a) Sales for resale to municipals.  
 (b) Transmission, transformer and other losses and energy unaccounted for.

20 year gr	0.81%	0.09%	1.22%	-0.35%		0.19%	0.61%	0.61%	0.61%
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History is billed; forecast is calendar.

20-year GR 1.19% 0.31% 1.33% 2.12% -0.18% 0.96% 1.22% 0.21% 1.20% 0.40% -0.09%

**\*\*Spring 2021 Forecast, including UEE achievements**

	Res	Com	Ind	OPA	SL	ID	TOTAL	CU	Total w CU
2013	1,465,361	1,454,627	808,831	289,425	15,362	873	4,034,478	720	4,035,198
2014	1,479,746	1,459,944	827,408	289,831	15,274	954	4,073,158	551	4,073,709
2015	1,445,887	1,477,900	812,522	290,988	15,120	804	4,043,222	736	4,043,958
2016	1,451,682	1,494,014	810,977	292,467	15,264	757	4,065,161	694	4,065,855
2017	1,395,234	1,450,924	800,034	276,772	15,077	1,136	3,939,177	684	3,939,861
2018	1,563,656	1,479,511	814,989	284,443	14,317	689	4,157,605	776	4,158,382
2019	1,512,664	1,460,450	817,559	275,132	13,759	928	4,080,492	667	4,081,160
2020	1,477,914	1,416,427	746,182	187,140	13,827	591	3,842,080	626	3,842,705
2021	1,481,262	1,440,776	812,705	225,382	13,664	829	3,974,617	680	3,975,297
2022	1,477,026	1,409,837	866,225	266,183	13,617	829	4,033,716	680	4,034,396
2023	1,483,566	1,412,460	931,161	267,808	13,581	829	4,109,404	680	4,110,083
2024	1,491,406	1,420,430	928,475	267,962	13,563	829	4,122,665	680	4,123,345
2025	1,516,641	1,434,560	957,141	268,540	13,549	829	4,191,260	680	4,191,939
2026	1,525,979	1,430,349	950,316	269,375	13,534	829	4,190,382	680	4,191,062
2027	1,542,689	1,431,046	945,169	270,809	13,524	829	4,204,066	680	4,204,745
2028	1,558,264	1,433,163	943,013	272,456	13,516	829	4,221,242	680	4,221,921
2029	1,575,040	1,434,509	940,266	274,015	13,510	829	4,238,168	680	4,238,847
2030	1,599,006	1,436,910	973,099	275,594	13,438	829	4,298,877	680	4,299,556
2031	1,615,818	1,434,916	972,076	277,013	13,386	829	4,314,038	680	4,314,718
2032	1,638,609	1,439,347	971,338	278,306	13,356	829	4,341,785	680	4,342,465
2033	1,664,855	1,443,726	968,388	279,418	13,346	829	4,370,562	680	4,371,241
2034	1,686,490	1,445,171	965,092	280,315	13,339	829	4,391,236	680	4,391,916
2035	1,716,110	1,452,757	963,369	281,297	13,338	829	4,427,700	680	4,428,379
2036	1,755,426	1,470,077	964,939	282,505	13,339	829	4,487,115	680	4,487,794
2037	1,779,930	1,475,189	965,972	283,521	13,340	829	4,518,781	680	4,519,461
2038	1,812,453	1,487,979	967,982	284,459	13,342	829	4,567,044	680	4,567,724
2039	1,844,418	1,501,546	970,167	285,288	13,343	829	4,615,591	680	4,616,270
2040	1,876,353	1,506,320	973,054	286,146	13,329	829	4,656,031	680	4,656,711

**\*\*Spring 2021 Forecast, before deducting UEE achievements**

	Res	Com	Ind	OPA	SL+ID	TOTAL
2015	1,445,887	1,477,900	812,522	290,988	15,924	4,043,222
2016	1,451,682	1,498,287	818,455	295,315	16,021	4,079,761
2017	1,395,234	1,457,929	812,294	281,443	16,213	3,963,113
2018	1,568,884	1,489,143	831,846	290,865	15,007	4,195,745
2019	1,529,903	1,475,224	843,415	284,982	14,687	4,148,212
2020	1,494,087	1,469,752	838,398	280,353	14,418	4,097,009
2021	1,483,075	1,441,951	816,816	226,165	14,492	3,982,499
2022	1,482,005	1,413,155	877,839	268,395	14,445	4,055,840
2023	1,491,383	1,417,868	950,091	271,413	14,409	4,145,164
2024	1,501,878	1,427,897	954,607	272,939	14,392	4,171,713
2025	1,529,707	1,444,041	990,324	274,860	14,377	4,253,309
2026	1,541,613	1,441,815	990,447	277,019	14,363	4,265,258
2027	1,560,889	1,444,497	992,250	279,777	14,353	4,291,767
2028	1,579,031	1,448,602	997,047	282,748	14,344	4,321,772
2029	1,598,222	1,451,934	1,001,253	285,632	14,338	4,351,378
2030	1,624,475	1,456,322	1,041,040	288,536	14,266	4,424,639
2031	1,643,231	1,456,057	1,046,067	291,106	14,215	4,450,677
2032	1,667,456	1,462,003	1,050,634	293,410	14,185	4,487,687
2033	1,694,521	1,467,913	1,053,042	295,543	14,174	4,525,193
2034	1,716,795	1,470,885	1,055,090	297,457	14,168	4,554,395
2035	1,747,065	1,479,484	1,056,914	299,115	14,167	4,596,744
2036	1,786,508	1,497,012	1,059,210	300,461	14,168	4,657,360
2037	1,810,899	1,502,024	1,059,895	301,411	14,169	4,688,398
2038	1,843,421	1,514,744	1,061,660	302,303	14,170	4,736,299
2039	1,875,408	1,528,266	1,063,687	303,101	14,172	4,784,633
2040	1,907,362	1,533,025	1,066,520	303,949	14,157	4,825,014

FIGURE B-2  
 DUKE ENERGY KENTUCKY SYSTEM  
 SERVICE AREA ENERGY FORECAST (MEGAWATT HOURS/YEAR)<sup>a</sup>  
 AFTER EE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
	Rural and Residential	Commercial	Industrial	Steet-Hwy Lighting	Sales for Resale <sup>b</sup>	Other	(1+2+3+4+5+6) Total Consumption	Losses and Unaccounted For <sup>c</sup>	Net Energy for Load		
-5	2015	1,445,887	1,477,900	812,522	15,120	0	292,528	4,043,958	320,627	4,364,585	
-4	2016	1,451,682	1,494,014	810,977	15,264	0	293,918	4,065,855	322,367	4,388,222	
-3	2017	1,395,234	1,450,924	800,034	15,077	0	278,593	3,939,861	312,377	4,252,238	
-2	2018	1,563,656	1,479,511	814,989	14,317	0	285,909	4,158,382	329,698	4,488,080	
-1	2019	1,512,664	1,460,450	817,559	13,759	0	276,728	4,081,160	323,583	4,404,743	
0	2020	1,477,914	1,416,427	746,182	13,827	0	188,356	3,842,705	304,677	4,147,382	
1	2021	1,481,262	1,440,776	812,705	13,664	0	226,890	3,975,297	315,187	4,290,484	7.3%
2	2022	1,477,026	1,409,837	866,225	13,617	0	267,691	4,034,396	319,874	4,354,269	7.3%
3	2023	1,483,566	1,412,460	931,161	13,581	0	269,316	4,110,083	325,876	4,435,959	7.3%
4	2024	1,491,406	1,420,430	928,475	13,563	0	269,470	4,123,345	326,927	4,450,273	7.3%
5	2025	1,516,641	1,434,560	957,141	13,549	0	270,048	4,191,939	332,367	4,524,306	7.3%
6	2026	1,525,979	1,430,349	950,316	13,534	0	270,884	4,191,062	332,297	4,523,359	7.3%
7	2027	1,542,689	1,431,046	945,169	13,524	0	272,318	4,204,745	333,382	4,538,128	7.3%
8	2028	1,558,264	1,433,163	943,013	13,516	0	273,964	4,221,921	334,744	4,556,666	7.3%
9	2029	1,575,040	1,434,509	940,266	13,510	0	275,523	4,238,847	336,087	4,574,934	7.3%
10	2030	1,599,006	1,436,910	973,099	13,438	0	277,103	4,299,556	340,901	4,640,457	7.3%
11	2031	1,615,818	1,434,916	972,076	13,386	0	278,521	4,314,718	342,103	4,656,821	7.3%
12	2032	1,638,609	1,439,347	971,338	13,356	0	279,814	4,342,465	344,304	4,686,768	7.3%
13	2033	1,664,855	1,443,726	968,388	13,346	0	280,927	4,371,241	346,586	4,717,827	7.3%
14	2034	1,686,490	1,445,171	965,092	13,339	0	281,823	4,391,916	348,225	4,740,141	7.3%
15	2035	1,716,110	1,452,757	963,369	13,338	0	282,805	4,428,379	351,117	4,779,496	7.3%
16	2036	1,755,426	1,470,077	964,939	13,339	0	284,013	4,487,794	355,828	4,843,623	7.3%
17	2037	1,779,930	1,475,189	965,972	13,340	0	285,029	4,519,461	358,339	4,877,800	7.3%
18	2038	1,812,453	1,487,979	967,982	13,342	0	285,968	4,567,724	362,167	4,929,891	7.3%
19	2039	1,844,418	1,501,546	970,167	13,343	0	286,796	4,616,270	366,016	4,982,287	7.3%
20	2040	1,876,353	1,506,320	973,054	13,329	0	287,655	4,656,711	369,223	5,025,934	7.3%

- (a) Includes EE Impacts
- (b) Sales for resale to municipals.
- (c) Transmission, transformer and other losses and energy unaccounted for.

20 year gr 1.19%





	Portfolio	Scenario	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	Preferred Portfolio	EB2 Gas Conversion	1,627	1,242	2,468	1,818	1,290	1,046	904	1,275	1,284	4,628	4,644	4,572	4,535	4,452	4,406
	Ref w/ CO2 (High Gas)	EB2 Gas Conversion	1,625	1,232	2,330	1,374	2,262	3,334	3,904	4,456	4,562	4,628	4,644	4,570	4,535	4,452	4,406
	Ref w/ CO2 (Base Gas)	EB2 Gas Conversion	1,610	1,239	2,320	1,592	1,410	1,013	887	900	912	4,575	4,644	4,560	4,535	4,452	4,406
	Ref w/ CO2 (Low Gas)	EB2 Gas Conversion	1,627	1,242	2,468	1,818	1,440	970	816	844	885	4,579	4,644	4,560	4,535	4,452	4,406
	Ref No CO2 (High Gas)	EB2 Gas Conversion	1,625	1,232	2,330	1,374	923	1,224	1,649	1,673	1,372	4,556	4,644	4,557	4,486	4,452	4,406
	Ref No CO2 (Base Gas)	EB2 Gas Conversion	1,610	1,239	2,320	1,592	1,532	1,842	2,711	4,046	4,164	4,628	4,644	4,609	4,535	4,452	4,406
	Ref No CO2 (Low Gas)	EB2 Retire / CC replacement	1,597	1,393	2,766	1,752	1,423	978	853	833	878	1,174	1,223	1,182	1,441	1,374	1,212
	EB2 Gas Conversion	EB2 Retire / CC replacement	1,597	1,393	2,766	1,752	1,270	1,054	1,003	1,270	1,318	1,153	1,109	1,012	1,115	1,149	957
	EB2 Retire / CC replacement	EB2 Retire / CC replacement	1,587	1,390	2,339	1,276	2,239	3,280	3,869	4,417	4,562	973	1,102	1,015	1,325	1,326	1,169
	EB2 Retire / CT replacement	EB2 Retire / CC replacement	1,547	1,390	2,361	1,551	1,381	993	944	883	906	1,106	1,194	1,109	1,226	1,188	1,118
	EB2 Retire / Ren replacement	EB2 Retire / CC replacement	1,587	1,390	2,339	1,276	880	1,572	1,530	1,810	1,303	1,051	1,060	911	1,030	1,103	1,072
		EB2 Retire / CC replacement	1,547	1,390	2,361	1,551	1,482	1,984	2,692	4,106	4,168	1,042	1,144	1,197	1,289	1,352	1,187
		EB2 Retire / CT replacement	1,628	1,330	2,269	1,763	1,271	1,035	1,008	1,214	1,254	4,357	4,395	4,431	4,354	4,315	4,283
		EB2 Retire / CT replacement	1,627	1,329	2,114	1,266	2,135	3,446	3,851	4,383	4,562	3,752	4,030	4,135	4,211	4,199	4,190
	Ref w/ CO2 (High Gas)	EB2 Retire / CT replacement	1,543	1,328	2,222	1,501	1,383	944	956	855	878	3,512	3,677	3,838	3,655	3,718	3,765
	Ref w/ CO2 (Base Gas)	EB2 Retire / CT replacement	1,628	1,330	2,269	1,763	1,407	986	845	814	872	3,876	4,069	4,130	4,136	4,049	4,118
	Ref w/ CO2 (Low Gas)	EB2 Retire / CT replacement	1,627	1,329	2,114	1,266	937	1,291	1,624	1,722	1,213	3,682	3,637	3,628	3,604	3,768	3,746
	Ref No CO2 (High Gas)	EB2 Retire / CT replacement	1,543	1,328	2,222	1,502	1,560	1,809	2,895	3,845	4,215	4,078	4,209	4,368	4,248	4,266	4,238
	Ref No CO2 (Base Gas)	EB2 Retire / Ren replacement	1,608	1,287	2,545	1,632	1,167	726	567	503	496	2,646	2,601	2,603	2,594	2,560	2,592
	Ref No CO2 (Low Gas)	EB2 Retire / Ren replacement	1,524	1,324	2,380	1,501	1,317	1,254	2,107	2,611	2,838	2,695	2,629	2,648	2,618	2,606	2,619
	EB2 Gas Conversion	EB2 Retire / Ren replacement	1,608	1,287	2,545	1,632	1,046	789	655	707	735	2,780	2,678	2,659	2,636	2,607	2,616
	EB2 Retire / CC replacement	EB2 Retire / Ren replacement	1,617	1,324	2,409	1,324	2,016	2,698	2,881	3,030	2,949	2,598	2,578	2,591	2,605	2,595	2,611
	EB2 Retire / CT replacement	EB2 Retire / Ren replacement	1,524	1,324	2,380	1,501	1,154	709	617	524	497	2,520	2,473	2,506	2,466	2,468	2,499
	EB2 Retire / Ren replacement	EB2 Retire / Ren replacement	1,617	1,324	2,409	1,324	767	952	1,194	999	707	2,558	2,454	2,432	2,429	2,464	2,477
	Preferred Portfolio	No CO2 (Base Gas)	1,510	1,297	2,537	1,774	1,308	908	831	751	746	746	742	731	744	749	1,000
	Preferred Portfolio	No CO2 (High Gas)	1,536	1,301	2,722	1,822	1,335	905	741	718	723	744	722	726	741	748	1,083
	Preferred Portfolio	CO2 (High Gas)	1,536	1,301	2,722	1,822	1,205	932	908	1,052	968	1,110	962	1,605	2,312	3,411	834
	Preferred Portfolio	CO2 (Low Gas)	1,534	1,294	2,573	1,410	2,116	3,217	3,593	4,083	4,204	4,177	4,129	4,158	4,137	4,107	1,045
	Preferred Portfolio	No CO2 (Low Gas)	1,534	1,294	2,573	1,410	840	1,125	1,228	1,457	930	943	836	856	1,024	1,600	955
	Preferred Portfolio	CO2 (Base Gas)	1,510	1,297	2,537	1,774	1,433	1,604	2,606	3,665	3,893	4,035	4,062	4,105	4,137	4,107	1,059
	Ref No CO2 (Base Gas)	CO2 (High Gas)	1,587	1,294	2,852	1,786	1,306	1,060	1,005	1,183	1,181	1,246	1,238	1,676	2,904	3,894	4,169
	Ref No CO2 (Base Gas)	CO2 (Base Gas)	1,538	1,376	2,600	1,658	1,513	1,727	2,949	3,922	4,348	4,435	4,526	4,616	4,705	4,727	4,767
	Ref No CO2 (Base Gas)	CO2 (Low Gas)	1,578	1,375	2,572	1,332	2,137	3,246	3,861	4,383	4,562	4,583	4,588	4,674	4,705	4,727	4,767
	Ref No CO2 (Base Gas)	No CO2 (High Gas)	1,587	1,294	2,852	1,786	1,425	1,000	867	829	845	887	871	905	935	939	915
	Ref No CO2 (Base Gas)	No CO2 (Low Gas)	1,578	1,375	2,572	1,332	952	1,341	1,457	1,675	1,162	1,174	1,003	1,112	1,356	1,716	1,879
	CO2 (High Gas)	Ref No CO2 (Base Gas)	1,538	1,376	2,600	1,658	1,391	996	917	871	851	887	871	912	938	953	916
	CO2 (Base Gas)	Ref No CO2 (High Gas)	1,525	1,248	2,618	1,769	1,273	1,030	1,034	1,246	1,176	1,200	1,368	1,770	2,479	3,656	3,851
	CO2 (Low Gas)	Ref No CO2 (High Gas)	1,572	1,187	2,689	1,849	1,396	1,133	946	933	868	923	865	866	834	810	809
	No CO2 (High Gas)	Ref No CO2 (High Gas)	1,572	1,187	2,689	1,849	1,630	2,078	3,041	4,159	4,284	4,518	4,422	4,469	4,452	4,369	4,388
	No CO2 (Base Gas)	Ref No CO2 (High Gas)	1,567	1,190	2,518	1,418	2,128	3,274	4,027	4,383	4,562	4,583	4,546	4,526	4,452	4,369	4,388
	No CO2 (Low Gas)	Ref No CO2 (High Gas)	1,567	1,190	2,518	1,418	874	1,348	1,540	1,715	1,228	1,074	1,049	987	1,148	1,668	1,699
		Ref No CO2 (High Gas)	1,572	1,187	2,689	1,849	1,396	981	845	870	845	889	865	845	820	792	808
		Ref No CO2 (Low Gas)	1,606	1,221	2,565	1,917	3,159	3,383	3,487	3,898	4,120	4,360	4,396	4,497	4,532	4,586	4,600
		Ref No CO2 (Low Gas)	1,600	1,290	2,326	1,478	1,855	2,132	2,336	2,727	3,451	3,756	4,029	4,198	4,390	4,465	4,502
		Ref No CO2 (Low Gas)	1,600	1,290	2,326	1,478	932	1,001	1,522	2,031	2,378	2,997	3,245	3,589	3,702	3,963	3,996
		Ref No CO2 (Low Gas)	1,606	1,221	2,565	1,917	4,199	2,945	3,187	3,358	3,694	3,882	4,065	4,195	4,312	4,312	4,428

Ref No CO2 (Low Gas)	No CO2 (Base Gas)	1,600	1,290	2,326	1,478	1,134	524	874	1,065	1,451	1,747	2,000	2,140	2,054	2,046	2,052
Ref No CO2 (Low Gas)	No CO2 (Low Gas)	1,600	1,290	2,326	1,478	1,135	1,801	2,180	2,590	3,000	3,679	3,638	3,687	3,771	4,015	4,028
Ref w/ CO2 (Base Gas)	CO2 (High Gas)	1,572	1,316	2,332	1,745	1,268	1,023	1,412	1,647	1,726	1,634	1,547	1,517	1,595	1,643	943
Ref w/ CO2 (Base Gas)	CO2 (Low Gas)	1,570	1,388	2,491	1,434	2,184	3,428	1,202	1,320	1,569	1,473	1,538	1,515	1,756	1,778	1,160
Ref w/ CO2 (Base Gas)	No CO2 (Base Gas)	1,514	1,239	2,574	1,668	1,359	965	1,274	1,459	1,654	1,579	1,617	1,578	1,679	1,670	1,093
Ref w/ CO2 (Base Gas)	No CO2 (High Gas)	1,596	1,394	2,632	1,839	1,396	977	1,557	1,762	1,814	1,651	1,640	1,642	1,871	1,825	1,173
Ref w/ CO2 (Base Gas)	No CO2 (Low Gas)	1,548	1,436	2,292	1,376	810	1,424	1,206	1,399	1,433	1,545	1,481	1,407	1,498	1,597	1,050
Ref w/ CO2 (Base Gas)	CO2 (Base Gas)	1,547	1,328	2,635	1,690	1,529	1,717	1,278	1,565	1,610	1,541	1,582	1,659	1,747	1,802	1,157
Ref w/ CO2 (High Gas)	CO2 (Base Gas)	1,684	1,355	2,533	1,728	1,607	2,112	2,882	3,973	4,289	4,378	4,193	4,214	4,063	3,859	2,828
Ref w/ CO2 (High Gas)	CO2 (Low Gas)	1,621	1,325	2,193	1,421	2,243	3,092	4,142	4,383	4,551	4,467	4,313	4,214	4,063	3,312	2,192
Ref w/ CO2 (High Gas)	No CO2 (Base Gas)	1,644	1,238	2,547	1,763	1,374	1,139	938	927	873	843	800	784	709	703	2,877
Ref w/ CO2 (High Gas)	No CO2 (High Gas)	1,639	1,268	2,368	1,903	1,433	962	821	852	858	825	775	747	732	562	2,185
Ref w/ CO2 (High Gas)	No CO2 (Low Gas)	1,803	1,219	2,594	1,301	957	1,495	1,535	1,713	1,166	1,030	885	860	1,142	1,168	2,019
Ref w/ CO2 (High Gas)	CO2 (Base Gas)	1,750	1,231	2,811	1,663	1,274	1,046	1,010	1,245	1,122	1,055	920	1,506	2,387	2,694	2,200
Ref w/ CO2 (Low Gas)	CO2 (Base Gas)	1,616	1,257	2,400	1,341	942	1,001	1,518	2,025	2,367	2,996	3,241	3,597	3,687	3,932	3,887
Ref w/ CO2 (Low Gas)	No CO2 (Base Gas)	1,616	1,257	2,400	1,341	1,140	548	873	1,060	1,449	1,741	2,005	2,137	2,072	2,015	1,966
Ref w/ CO2 (Low Gas)	No CO2 (High Gas)	1,623	1,263	2,609	1,773	4,199	2,939	3,179	3,358	3,686	3,888	4,061	4,200	4,298	4,273	4,320
Ref w/ CO2 (Low Gas)	No CO2 (Low Gas)	1,616	1,257	2,400	1,341	1,140	1,800	2,176	2,585	2,994	3,681	3,632	3,697	3,761	3,988	3,927
Ref w/ CO2 (Low Gas)	CO2 (Low Gas)	1,616	1,257	2,400	1,341	1,862	2,130	2,329	2,727	3,443	3,758	4,025	4,204	4,378	4,428	4,395
Ref w/ CO2 (Low Gas)	CO2 (High Gas)	1,623	1,263	2,609	1,773	3,156	3,374	3,472	3,897	4,114	4,362	4,393	4,499	4,521	4,547	4,493



**Duke Energy Kentucky**  
**Case No. 2021-00245**  
**STAFF First Set Post Hearing Data Requests**  
**Date Received: May 20, 2022**

**STAFF-PHDR-01-004**

**REQUEST:**

- a. Identify and briefly describe each modeling constraint that Duke Kentucky placed on the model when it selected each of the scenario-optimized portfolios.
- b. Identify and briefly describe each constraint and qualitative requirement that Duke Kentucky determined must be met when developing each of the alternative portfolios (e.g. whether East Bend had to be closed by a specific date in an alternative, whether Duke Kentucky required a certain amount or restricted the amount of solar or wind to be added when considering an alternative, etc.).

**RESPONSE:**

- a. Please see STAFF-PHDR-01-004 Attachment.
- b. The development of the alternative portfolios did not include an explicit qualitative constraint other than controlling for the retirement of East Bend 2 in the portfolios we used to investigate different replacement strategies. This was done to isolate the type of replacement decision from the timing of that decision.

**PERSON RESPONSIBLE:**            Robert McMurry – a.  
                                                 Scott Park – b.



<b>Project Name</b>	<b>Max Annual Project Additions</b>	<b>Max Active Projects</b>	<b>Maximum Units to Retire</b>	<b>Nameplate MW PER 'Unit' (Based on Winter Rating)</b>
Proj New Battery DEK	10 Beginning 2021			10
Proj New CC DEK	Beginning 2025	10		107.4
Proj New CC DF DEK	Beginning 2025	10		13.6
Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	30		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035	1		111.7
Proj New Nuclear SMR DEK	Beginning 2035	1		114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK	0 DEK Solar Limit			50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

<b>Name</b>	<b>Effective Date</b>	<b>Ending Date</b>	<b>Value</b>	<b>Cumulative Installed/Nameplate (MW)</b>
DEK Solar Limit	1/1/2021		9	45
DEK Solar Limit	1/1/2022		14	70
DEK Solar Limit	1/1/2023		18	90
DEK Solar Limit	1/1/2024		20	100
DEK Solar Limit	1/1/2025		23	115
DEK Solar Limit	1/1/2026		24	120
DEK Solar Limit	1/1/2027		26	130
DEK Solar Limit	1/1/2028		27	135
DEK Solar Limit	1/1/2029		29	145
DEK Solar Limit	1/1/2030		31	155
DEK Solar Limit	1/1/2031		31	155
DEK Solar Limit	1/1/2032		32	160
DEK Solar Limit	1/1/2033		33	165
DEK Solar Limit	1/1/2034		35	175

DEK Solar Limit	1/1/2035	37	185
DEK Solar Limit	1/1/2036	41	205
DEK Solar Limit	1/1/2037	44	220
DEK Solar Limit	1/1/2038	48	240
DEK Solar Limit	1/1/2039	53	265
DEK Solar Limit	1/1/2040	60	300
DEK Solar Limit	1/1/2041	67	335
DEK Solar Limit	1/1/2042	75	375
DEK Solar Limit	1/1/2043	83	415
DEK Solar Limit	1/1/2044	90	450
DEK Solar Limit	1/1/2045	96	480
DEK Solar Limit	1/1/2046	101	505
DEK Solar Limit	1/1/2047	106	530
DEK Solar Limit	1/1/2048	109	545
DEK Solar Limit	1/1/2049	112	560
DEK Solar Limit	1/1/2050	115	575
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

<b>Project Name</b>	<b>Max Annual Project Additions</b>	<b>Max Active Projects</b>	<b>Maximum Units to Retire</b>	<b>Nameplate MW PER 'Unit' (Based on Winter Rating)</b>
Proj New Battery DEK	10 Beginning 2021			10
Proj New CC DEK	Beginning 2025	10		107.4
Proj New CC DF DEK	Beginning 2025	10		13.6
Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	30		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035	1		111.7
Proj New Nuclear SMR DEK	Beginning 2035	1		114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK	0 DEK Solar Limit			50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

<b>Name</b>	<b>Effective Date</b>	<b>Ending Date</b>	<b>Value</b>	<b>Cumulative Installed/Nameplate (MW)</b>
DEK Solar Limit	1/1/2021		9	45
DEK Solar Limit	1/1/2022		14	70
DEK Solar Limit	1/1/2023		18	90
DEK Solar Limit	1/1/2024		20	100
DEK Solar Limit	1/1/2025		23	115
DEK Solar Limit	1/1/2026		25	125
DEK Solar Limit	1/1/2027		27	135
DEK Solar Limit	1/1/2028		28	140
DEK Solar Limit	1/1/2029		29	145
DEK Solar Limit	1/1/2030		32	160
DEK Solar Limit	1/1/2031		35	175
DEK Solar Limit	1/1/2032		37	185
DEK Solar Limit	1/1/2033		41	205
DEK Solar Limit	1/1/2034		45	225



DEK Solar Limit	1/1/2035	50	250
DEK Solar Limit	1/1/2036	56	280
DEK Solar Limit	1/1/2037	61	305
DEK Solar Limit	1/1/2038	66	330
DEK Solar Limit	1/1/2039	73	365
DEK Solar Limit	1/1/2040	79	395
DEK Solar Limit	1/1/2041	83	415
DEK Solar Limit	1/1/2042	85	425
DEK Solar Limit	1/1/2043	87	435
DEK Solar Limit	1/1/2044	90	450
DEK Solar Limit	1/1/2045	92	460
DEK Solar Limit	1/1/2046	92	460
DEK Solar Limit	1/1/2047	93	465
DEK Solar Limit	1/1/2048	94	470
DEK Solar Limit	1/1/2049	96	480
DEK Solar Limit	1/1/2050	99	495
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

Project Name	Max Annual Project Additions	Max Active Projects	Maximum Units to Retire	Nameplate MW PER 'Unit' (Based on Winter Rating)
Proj New Battery DEK	10 Beginning 2021			10
Proj New CC DEK	Beginning 2025	10		107.4
Proj New CC DF DEK	Beginning 2025	10		13.6
Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	30		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035	1		111.7
Proj New Nuclear SMR DEK	Beginning 2035	1		114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK	0 DEK Solar Limit			50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

Name	Effective Date	Ending Date	Value	Cumulative Installed/Nameplate (MW)
DEK Solar Limit	1/1/2021		9	45
DEK Solar Limit	1/1/2022		14	70
DEK Solar Limit	1/1/2023		18	90
DEK Solar Limit	1/1/2024		20	100
DEK Solar Limit	1/1/2025		23	115
DEK Solar Limit	1/1/2026		25	125
DEK Solar Limit	1/1/2027		27	135
DEK Solar Limit	1/1/2028		28	140
DEK Solar Limit	1/1/2029		29	145
DEK Solar Limit	1/1/2030		32	160
DEK Solar Limit	1/1/2031		35	175
DEK Solar Limit	1/1/2032		37	185
DEK Solar Limit	1/1/2033		41	205
DEK Solar Limit	1/1/2034		45	225

DEK Solar Limit	1/1/2035	50	250
DEK Solar Limit	1/1/2036	56	280
DEK Solar Limit	1/1/2037	61	305
DEK Solar Limit	1/1/2038	66	330
DEK Solar Limit	1/1/2039	73	365
DEK Solar Limit	1/1/2040	79	395
DEK Solar Limit	1/1/2041	83	415
DEK Solar Limit	1/1/2042	85	425
DEK Solar Limit	1/1/2043	87	435
DEK Solar Limit	1/1/2044	90	450
DEK Solar Limit	1/1/2045	92	460
DEK Solar Limit	1/1/2046	92	460
DEK Solar Limit	1/1/2047	93	465
DEK Solar Limit	1/1/2048	94	470
DEK Solar Limit	1/1/2049	96	480
DEK Solar Limit	1/1/2050	99	495
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

Project Name	Max Annual Project	Max Active	Maximum Units to Nameplate MW PER 'Unit' (Based on Winter	
	Additions	Projects	Retire	Rating)
Proj New Battery DEK	10 Beginning 2021			10
Proj New CC DEK	Beginning 2025	10		107.4
Proj New CC DF DEK	Beginning 2025	10		13.6
Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	30		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035			111.7
Proj New Nuclear SMR DEK	Beginning 2035			114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK		0 DEK Solar Limit		50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

Name	Effective Date	Ending Date	Value	Cumulative Installed/Nameplate (MW)
DEK Solar Limit	1/1/2021		9	45
DEK Solar Limit	1/1/2022		14	70
DEK Solar Limit	1/1/2023		19	95
DEK Solar Limit	1/1/2024		22	110
DEK Solar Limit	1/1/2025		24	120
DEK Solar Limit	1/1/2026		26	130
DEK Solar Limit	1/1/2027		28	140
DEK Solar Limit	1/1/2028		29	145
DEK Solar Limit	1/1/2029		31	155
DEK Solar Limit	1/1/2030		34	170
DEK Solar Limit	1/1/2031		36	180
DEK Solar Limit	1/1/2032		39	195
DEK Solar Limit	1/1/2033		43	215
DEK Solar Limit	1/1/2034		47	235

DEK Solar Limit	1/1/2035	51	255
DEK Solar Limit	1/1/2036	56	280
DEK Solar Limit	1/1/2037	61	305
DEK Solar Limit	1/1/2038	66	330
DEK Solar Limit	1/1/2039	72	360
DEK Solar Limit	1/1/2040	79	395
DEK Solar Limit	1/1/2041	86	430
DEK Solar Limit	1/1/2042	92	460
DEK Solar Limit	1/1/2043	97	485
DEK Solar Limit	1/1/2044	104	520
DEK Solar Limit	1/1/2045	109	545
DEK Solar Limit	1/1/2046	114	570
DEK Solar Limit	1/1/2047	118	590
DEK Solar Limit	1/1/2048	122	610
DEK Solar Limit	1/1/2049	126	630
DEK Solar Limit	1/1/2050	130	650
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

Project Name	Max Annual Project	Max Active	Maximum Units to Nameplate MW PER 'Unit' (Based on Winter	
	Additions	Projects	Retire	Rating)
Proj New Battery DEK	10 Beginning 2021			10
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Proj New CC DF DEK	Beginning 2025	10		13.6
Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	30		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035			111.7
Proj New Nuclear SMR DEK	Beginning 2035			114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK		0 DEK Solar Limit		50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

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DEK Solar Limit	1/1/2021		9	45
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DEK Solar Limit	1/1/2024		21	105
DEK Solar Limit	1/1/2025		23	115
DEK Solar Limit	1/1/2026		25	125
DEK Solar Limit	1/1/2027		26	130
DEK Solar Limit	1/1/2028		28	140
DEK Solar Limit	1/1/2029		29	145
DEK Solar Limit	1/1/2030		31	155
DEK Solar Limit	1/1/2031		32	160
DEK Solar Limit	1/1/2032		32	160
DEK Solar Limit	1/1/2033		33	165
DEK Solar Limit	1/1/2034		33	165

DEK Solar Limit	1/1/2035	34	170
DEK Solar Limit	1/1/2036	37	185
DEK Solar Limit	1/1/2037	39	195
DEK Solar Limit	1/1/2038	42	210
DEK Solar Limit	1/1/2039	44	220
DEK Solar Limit	1/1/2040	47	235
DEK Solar Limit	1/1/2041	50	250
DEK Solar Limit	1/1/2042	53	265
DEK Solar Limit	1/1/2043	56	280
DEK Solar Limit	1/1/2044	59	295
DEK Solar Limit	1/1/2045	62	310
DEK Solar Limit	1/1/2046	63	315
DEK Solar Limit	1/1/2047	64	320
DEK Solar Limit	1/1/2048	65	325
DEK Solar Limit	1/1/2049	66	330
DEK Solar Limit	1/1/2050	67	335
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

<b>Project Name</b>	<b>Max Annual Project Additions</b>	<b>Max Active Projects</b>	<b>Maximum Units to Retire</b>	<b>Nameplate MW PER 'Unit' (Based on Winter Rating)</b>
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Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	0		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035			111.7
Proj New Nuclear SMR DEK	Beginning 2035			114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK	0 DEK Solar Limit			50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

<b>Name</b>	<b>Effective Date</b>	<b>Ending Date</b>	<b>Value</b>	<b>Cumulative Installed/Nameplate (MW)</b>
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DEK Solar Limit	1/1/2024		21	105
DEK Solar Limit	1/1/2025		23	115
DEK Solar Limit	1/1/2026		25	125
DEK Solar Limit	1/1/2027		27	135
DEK Solar Limit	1/1/2028		28	140
DEK Solar Limit	1/1/2029		30	150
DEK Solar Limit	1/1/2030		32	160
DEK Solar Limit	1/1/2031		32	160
DEK Solar Limit	1/1/2032		32	160
DEK Solar Limit	1/1/2033		32	160
DEK Solar Limit	1/1/2034		34	170



DEK Solar Limit	1/1/2035	36	180
DEK Solar Limit	1/1/2036	40	200
DEK Solar Limit	1/1/2037	44	220
DEK Solar Limit	1/1/2038	48	240
DEK Solar Limit	1/1/2039	52	260
DEK Solar Limit	1/1/2040	56	280
DEK Solar Limit	1/1/2041	61	305
DEK Solar Limit	1/1/2042	67	335
DEK Solar Limit	1/1/2043	73	365
DEK Solar Limit	1/1/2044	80	400
DEK Solar Limit	1/1/2045	86	430
DEK Solar Limit	1/1/2046	93	465
DEK Solar Limit	1/1/2047	100	500
DEK Solar Limit	1/1/2048	106	530
DEK Solar Limit	1/1/2049	112	560
DEK Solar Limit	1/1/2050	118	590
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

Project Name	Max Annual Project Additions	Max Active Projects	Maximum Units to Retire	Nameplate MW PER 'Unit' (Based on Winter Rating)
Proj New Battery DEK	10 Beginning 2021			10
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Proj New CC DF DEK	Beginning 2025	10		13.6
Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	30		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035			111.7
Proj New Nuclear SMR DEK	Beginning 2035			114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK		0 DEK Solar Limit		50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

Name	Effective Date	Ending Date	Value	Cumulative Installed/Nameplate (MW)
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DEK Solar Limit	1/1/2023		19	95
DEK Solar Limit	1/1/2024		21	105
DEK Solar Limit	1/1/2025		23	115
DEK Solar Limit	1/1/2026		25	125
DEK Solar Limit	1/1/2027		26	130
DEK Solar Limit	1/1/2028		27	135
DEK Solar Limit	1/1/2029		29	145
DEK Solar Limit	1/1/2030		30	150
DEK Solar Limit	1/1/2031		31	155
DEK Solar Limit	1/1/2032		32	160
DEK Solar Limit	1/1/2033		33	165
DEK Solar Limit	1/1/2034		33	165

DEK Solar Limit	1/1/2035	34	170
DEK Solar Limit	1/1/2036	36	180
DEK Solar Limit	1/1/2037	39	195
DEK Solar Limit	1/1/2038	42	210
DEK Solar Limit	1/1/2039	44	220
DEK Solar Limit	1/1/2040	47	235
DEK Solar Limit	1/1/2041	49	245
DEK Solar Limit	1/1/2042	53	265
DEK Solar Limit	1/1/2043	56	280
DEK Solar Limit	1/1/2044	59	295
DEK Solar Limit	1/1/2045	62	310
DEK Solar Limit	1/1/2046	63	315
DEK Solar Limit	1/1/2047	64	320
DEK Solar Limit	1/1/2048	65	325
DEK Solar Limit	1/1/2049	67	335
DEK Solar Limit	1/1/2050	67	335
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

<b>Project Name</b>	<b>Max Annual Project Additions</b>	<b>Max Active Projects</b>	<b>Maximum Units to Retire</b>	<b>Nameplate MW PER 'Unit' (Based on Winter Rating)</b>
Proj New Battery DEK	10 Beginning 2021			10
Proj New CC DEK	Beginning 2025	10		107.4
Proj New CC DF DEK	Beginning 2025	10		13.6
Proj New CHP DEK	Beginning 2024			21
Proj New Coal DEK	10 Beginning 2027	30		106.25
Proj New CT DEKY	Beginning 2024			116
Proj New Nuclear DEK	Beginning 2035			111.7
Proj New Nuclear SMR DEK	Beginning 2035			114
Proj New Recip DEK	Beginning 2024			100.5
Proj New Solar (50MW) DEK		0 DEK Solar Limit		50
Proj New Solar DEK	10 Beginning 2021	DEK Solar Limit		5
Proj New Wind DEK	10 Beginning 2022			5
East Bend 2			1 Beginning 2025	600

**Time Series**

<b>Name</b>	<b>Effective Date</b>	<b>Ending Date</b>	<b>Value</b>	<b>Cumulative Installed/Nameplate (MW)</b>
DEK Solar Limit	1/1/2021		9	45
DEK Solar Limit	1/1/2022		14	70
DEK Solar Limit	1/1/2023		19	95
DEK Solar Limit	1/1/2024		21	105
DEK Solar Limit	1/1/2025		24	120
DEK Solar Limit	1/1/2026		26	130
DEK Solar Limit	1/1/2027		28	140
DEK Solar Limit	1/1/2028		29	145
DEK Solar Limit	1/1/2029		31	155
DEK Solar Limit	1/1/2030		32	160
DEK Solar Limit	1/1/2031		32	160
DEK Solar Limit	1/1/2032		32	160
DEK Solar Limit	1/1/2033		33	165
DEK Solar Limit	1/1/2034		33	165

DEK Solar Limit	1/1/2035	34	170
DEK Solar Limit	1/1/2036	36	180
DEK Solar Limit	1/1/2037	40	200
DEK Solar Limit	1/1/2038	42	210
DEK Solar Limit	1/1/2039	46	230
DEK Solar Limit	1/1/2040	50	250
DEK Solar Limit	1/1/2041	53	265
DEK Solar Limit	1/1/2042	58	290
DEK Solar Limit	1/1/2043	62	310
DEK Solar Limit	1/1/2044	67	335
DEK Solar Limit	1/1/2045	71	355
DEK Solar Limit	1/1/2046	74	370
DEK Solar Limit	1/1/2047	77	385
DEK Solar Limit	1/1/2048	80	400
DEK Solar Limit	1/1/2049	83	415
DEK Solar Limit	1/1/2050	86	430
10 Beginning 2021		0	
10 Beginning 2021	1/1/2021	10	
Beginning 2025		0	
Beginning 2025	1/1/2025	1000	
Beginning 2024		0	
Beginning 2024	1/1/2024	1000	
10 Beginning 2027		0	
10 Beginning 2027	1/1/2027	10	
Beginning 2035		0	
Beginning 2035	1/1/2035	1000	
10 Beginning 2022		0	
10 Beginning 2022	1/1/2022	10	
1 Beginning 2025		0	
1 Beginning 2025	1/1/2025	1	

**Duke Energy Kentucky**  
**Case No. 2021-00245**  
**STAFF First Set Post Hearing Data Requests**  
**Date Received: May 20, 2022**

**PUBLIC STAFF-PHDR-01-005**  
**(As to Attachment only)**

**REQUEST:**

Refer to Figure 4.1 on page 35 of Duke Kentucky's IRP.

- a. Identify and briefly describe the source of each of the overnight capital costs listed in that figure and provide a copy of the source material if available.
- b. Provide a detailed description of the types of generation resources from which each of the overnight capital costs listed on that figure were estimated.

**RESPONSE:**

**CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)**

- a. Cost estimates for solar, wind and storage were provided by Guidehouse. The remaining resources in Figure 4.1 were provided by Burns & McDonnell. Please see STAFF-PHDR-01-005 Confidential Attachment.
- b. Please see STAFF-PHDR-01-005 Confidential Attachment.

**PERSON RESPONSIBLE:**            Scott Park

**CONFIDENTIAL PROPRIETARY TRADE  
SECRET**

**STAFF-DR-01-005 CONFIDENTIAL  
ATTACHMENT**

**FILED UNDER SEAL**

**Duke Energy Kentucky  
Case No. 2021-00245  
STAFF First Set Post Hearing Data Requests  
Date Received: May 20, 2022**

**STAFF-PHDR-01-006**

**REQUEST:**

Provide the inputs Duke Kentucky used to calculate the carrying charge used to calculate the Present Value Revenue Requirements for the IRP model.

**RESPONSE:**

Please see STAFF-PHDR-01-006 Attachment.

**PERSON RESPONSIBLE:** Scott Park



		Source/Notes:
Real Discount Rate		Input on the Asset Specific Inputs sheet
After-Tax WACC	5.96%	disc_rate
AFUDC Debt	1.99%	weighted
AFUDC Equity	4.46%	weighted
Rate for Cap Interest	3.85%	cap_int
State/Federal Income Tax Rate	24.86%	Financial Assumptions 2021
Property Tax		Input on the Asset Specific Inputs sheet
Insurance		Input on the Asset Specific Inputs sheet
Infl Rate	2.50%	Financial Assumptions 2021
State Income Tax Rate	4.89%	Financial Assumptions 2021
Federal Income Tax Rate	21.0%	Financial Assumptions 2021
Base Year for Construction Cost Estimates	2021	

WACC Components: Financial Assumptions 2021

	Rate	Portion %	Nominal WACC	After-Tax WACC
Debt	3.85%	51.80%	1.99%	1.50%
Common Equity	9.25%	48.20%	4.46%	4.46%
		100.00%	6.45%	5.96%

response

Tax Depreciation Rates -- Full year convention

Tax Life	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5	20.0%	32.0%	19.2%	11.5%	11.5%	5.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7	26.5%	21.0%	15.0%	10.7%	8.9%	8.9%	6.7%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15	9.75%	9.05%	8.15%	7.30%	6.55%	6.05%	5.90%	5.90%	5.90%	5.90%	5.9%	5.9%	5.9%	5.9%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20	7.4%	7.0%	6.5%	6.0%	5.5%	5.1%	4.7%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.0%
60% 7yr SL; 40% 20yr MACRS	7_20	11.5%	11.4%	11.2%	11.0%	10.8%	10.6%	10.5%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.6%
60% 5yr SL; 40% 20yr MACRS	5_20	15.0%	14.8%	14.6%	14.4%	14.2%	2.0%	1.9%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.6%





69

0.0%  
0.0%  
0.0%  
0.0%  
0.0%  
0.0%

**PROJECT SPECIFIC METRICS**

Project Description/Activity	Start	End	Actual	Planned	Remaining	Cost	Revenue	Profit	Loss	...
Project A - Phase 1	2023-01-01	2023-03-31	100%	100%	0%	1000000	1000000	0	0	...
Project B - Phase 2	2023-04-01	2023-06-30	80%	80%	20%	800000	800000	0	0	...
Project C - Phase 3	2023-07-01	2023-09-30	60%	60%	40%	600000	600000	0	0	...

**Summary Metrics**

Category	Value	Unit
Total Revenue	3400000	USD
Total Cost	3400000	USD
Total Profit	0	USD
Total Loss	0	USD

**QUARTERLY SUMMARY METRICS**

Quarter	Revenue	Cost	Profit	Loss	...
Q1 2023	1000000	1000000	0	0	...
Q2 2023	800000	800000	0	0	...
Q3 2023	600000	600000	0	0	...

**DETAILED METRICS**

Item	Value	Unit
Item 1	1000000	USD
Item 2	800000	USD
Item 3	600000	USD
Item 4	400000	USD
Item 5	200000	USD













**.Duke Energy Kentucky**  
**Case No. 2021-00245**  
**STAFF First Set Post Hearing Data Requests**  
**Date Received: May 20, 2022**

**STAFF-PHDR-01-007**

**REQUEST:**

- a. Explain the physical constraints for the interconnection of each of the new generation resources in the preferred portfolio, including a description of network upgrades necessary to interconnect each generation resource and situation in which a physical constraint could prevent a resource from being interconnected,
- b. Provide an itemized estimate of the cost of interconnection and network upgrades necessary to interconnect each generation resource in the preferred portfolio, and explain how Duke Kentucky made those estimates and major uncertainties.
- c. Explain how interconnection constraints and network upgrades were considered when developing the scenario-optimized portfolios and the alternative portfolios, including whether and, if so, how costs associated with interconnection of each resource were included in the scenario-optimized models.

**RESPONSE:**

- a. Unknown. Necessary network upgrades and physical constraints associated with potential generation sites are location specific. The new generation resources identified in the preferred portfolio have not yet been sited. Necessary network upgrades associated with any new generation resource are identified as part of the PJM queue process.
- b. Unknown. Cost estimates for necessary network upgrades are identified and provided as part of the PJM queue process. Necessary network upgrades and

physical constraints associated with potential generation sites are location specific. The new generation resources identified in the preferred portfolio have not yet been sited.

- c. Since the new generation resources identified in the scenario-optimized portfolios and the alternative portfolios were not sited, interconnection constraints and network upgrades were not included in that process. Once particular projects have been identified and put forward in a CPCN, network upgrades and physical constraints will be included in that analysis.

**PERSON RESPONSIBLE:** Timothy Hohenstatt – a. thru b.  
Scott Park – c.