

**COMMONWEALTH OF KENTUCKY**  
**BEFORE THE PUBLIC SERVICE COMMISSION**

**In the Matter of:**

<b>ELECTRONIC APPLICATION OF EAST</b>	)	
<b>KENTUCKY POWER COOPERATIVE, INC.</b>	)	
<b>FOR A GENERAL ADJUSTMENT OF RATES,</b>	)	<b>CASE NO.</b>
<b>APPROVAL OF DEPRECIATION STUDY,</b>	)	<b>2021-00103</b>
<b>AMORTIZATION OF CERTAIN REGULATORY</b>	)	
<b>ASSETS, AND OTHER GENERAL RELIEF</b>	)	

**APPHARVEST MOREHEAD FARM LLC'S FIRST REQUEST FOR  
INFORMATION TO EAST KENTUCKY POWER COOPERATIVE, INC.  
DATED MAY 14, 2021**



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<b>ASSETS, AND OTHER GENERAL RELIEF</b>	)	

**CERTIFICATE**

**STATE OF MINNESOTA**     )  
  )  
**COUNTY OF WASHINGTON**    )

Richard J. Macke, being duly sworn, states that he has supervised the preparation of the responses of East Kentucky Power Cooperative, Inc. to AppHarvest Morehead Farm LLC's First Request for Information in the above-referenced case dated May 14, 2021, and that the matters and things set forth therein are true and accurate to the best of his knowledge, information and belief, formed after reasonable inquiry.

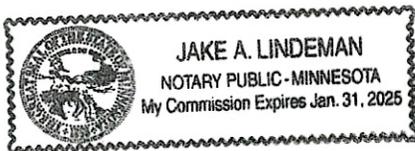


Subscribed and sworn before me on this 26 day of May 26 2021.



Notary Public - # 1140508100034

Commission expires - 01/31/2025











**EAST KENTUCKY POWER COOPERATIVE, INC.**

**PSC CASE NO. 2021-00103**

**FIRST REQUEST FOR INFORMATION**

**APPHARVEST'S FIRST REQUEST FOR INFORMATION DATED 5/14/21**

**REQUEST 1**

**RESPONSIBLE PERSON: Julia J. Tucker**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 1.** Did the Company use and prepare a load forecast in conjunction with this Rate Case?

Consistent with the Commission's discussion in its May 24, 2021 Order on rehearing, this request is not relevant to issues raised in the rate case. EKPC prepared its rate application utilizing a historic test year with adjustments reflecting known and measurable changes or events. A load forecast was not utilized in conjunction with the application. Consequently, all questions concerning EKPC's load forecast are not germane to this rate case. Without waiving said objection, EKPC states as follows:

**Request 1a.** If no, please state why not?

**Response 1a.** EKPC did not use and prepare a load forecast in conjunction with the Rate Case.

**Request 1b.** If yes, please provide a copy of same.

**Response 1b.** Not applicable.

**Request 1c.** When was the last time the Company prepared a load forecast?

**Response 1c.** EKPC's most recent load forecast was developed in 2020, approved by the EKPC Board of Directors in December 2020 and by the Rural Utilities Services ("RUS") in January 2021.

**Request 1d.** Was the load forecast used for the 2019-00096 Integrated Resource plan prepared in 2018? On what day was the load forecast for the 2019-00096 IRP completed?

**Response 1d.** EKPC's Integrated Resource Plan 2019-00096 load forecast was based on the forecast approved by the EKPC Board of Directors in December 2018 and by RUS in February 2019.

**Request 1e.** Has the Company completed the load forecast yet for the 2022 IRP?

**Response 1e.** Yes. See response to 1c.

**Request 1e(1).** If yes, please attach a copy.

**Response 1e(1).** EKPC's latest load forecast document is provided on pages 4 through 51 of this response which are subject to a motion for confidential treatment.

**Request 1e(2).** If not, when is the load forecast expected to be completed?

**Response 1e(2).** Not applicable.



A Touchstone Energy Cooperative 

# 2021 - 2035 Load Forecast

Prepared by:  
Load Forecasting Department

December 2020

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## **Section 1.0**

### **Executive Summary and Key Results**

East Kentucky Power Cooperative Inc. (EKPC) is a generation and transmission electric cooperative located in Winchester, Kentucky and is a member of the PJM Interconnection LLC (PJM). EKPC is owned by 16 owner-member distribution cooperatives (owner-members) serving a population of approximately 1,100,000.

EKPC's load forecast is prepared every two years in accordance with EKPC's Rural Utilities Service (RUS)-approved Load Forecast Work Plan (Work Plan). EKPC's "2021 - 2035 Load Forecast" was prepared pursuant to its Work Plan, which was approved by both EKPC's Board of Directors and by RUS in December 2019. The Work Plan details the methodology used to develop the forecasts. The EKPC Load Forecasting Department works with the staff of each owner-member to prepare 16 owner-member forecasts and then aggregates the resulting forecasts, adds projections of use of EKPC facilities and transmission losses, incorporates energy efficiency and demand response impacts resulting in EKPC's total system forecast. Owner-members use their load forecasts as input in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the load forecast for demand-side management analyses, marketing analyses, transmission planning, power supply planning, and financial forecasting.

Factors considered in preparing the forecast include national, regional, and local economic performance, population and housing trends, service area industrial development, electric price, household income, appliance saturations and efficiencies, demand-side management programs, and weather.

#### **Key Results**

Due to the pandemic in 2020, this load forecast was produced later in the year than typical. Coronavirus Disease 2019 (COVID-19) began impacting Kentucky's economy in March of 2020. In an effort to better understand the near and longer-term impacts, EKPC opted to wait until updated economic forecasts became available. IHS Global Insight, Inc. (IHS) released an updated outlook in June 2020. EKPC's load experienced its greatest reduction in April at an estimated 14%,

weather normalized. Business and school closings and other government-imposed restrictions continue to impact the load. Having actual energy for most of 2020, energy for 2020 was estimated outside of the construct of the model using insights from the owner-members and analysis of recent impacts due to COVID-19. To prevent skewing the growth rates, 2020 has been excluded from the calculations.

The forecast indicates that, in the period of 2021 through 2035, total customers served by owner-members will increase from 554,011 to 612,888, an average of 0.7 percent per year which is consistent with historical growth. COVID-19 has not significantly impacted customer growth. Some owner-members reported an increase in the housing starts in the second and third quarter of 2020. The Residential Class will continue to be the largest class with respect to customers and energy use.

### **Customer Growth by Class**

Time Period	Residential	Seasonal	Small Commercial	Public Buildings	Large Commercial	Public Street / Highway Lighting	Total Customers
2014 - 2019	0.7%	5.5%	0.5%	0.9%	2.9%	0.0%	0.7%
2021 - 2026	0.7%	5.8%	0.8%	0.5%	1.8%	0.5%	0.7%
2009 - 2019	0.6%	-28.7%	0.6%	1.6%	1.3%	-0.4%	0.5%
2021 - 2031	0.7%	5.2%	0.8%	0.5%	1.5%	0.4%	0.7%
2005 - 2019	0.8%	-21.3%	0.9%	1.8%	0.9%	0.4%	0.7%
2021 - 2035	0.7%	4.8%	0.8%	0.5%	1.5%	0.3%	0.7%

*Note: The Seasonal Sales Class is reported by 2 owner-members. Historical fluctuations are a result of owner-members reclassifying into the Residential Class.*

EKPC's load forecast projects net total energy requirements to increase from 13.5 to 16.7 million MWh, an average of 1.5 percent per year over the 2021 through 2035 period. Sales to the Residential Class will increase by 0.7 percent per year, small commercial sales (customers with  $\leq 1000$  KVA) will increase by 0.9 percent per year, and large commercial and industrial sales (customers with  $> 1000$  KVA) will increase by 3.3 percent per year. The higher growth rate for the large commercial and industrial sales is primarily due to the expansion of a steel mill.

### Energy Sales Growth by Class

Time Period	Residential	Seasonal	Small Commercial	Public Buildings	Large Commercial	Public Street / Highway Lighting	Total Sales
2014 - 2019	-0.3%	12.3%	0.1%	0.0%	0.4%	-2.4%	-0.1%
2021 - 2026	0.5%	5.4%	1.3%	0.5%	8.0%	0.3%	2.9%
2009 - 2019	0.4%	-25.8%	0.8%	1.2%	1.6%	-0.3%	0.7%
2021 - 2031	0.6%	5.1%	1.0%	0.2%	4.3%	0.3%	1.8%
2005 - 2019	0.3%	-19.8%	0.8%	4.2%	0.7%	0.9%	0.5%
2021 - 2035	0.7%	4.8%	0.9%	0.2%	3.3%	0.3%	1.6%

Net winter and summer peak demands will increase by approximately 355 MW or 0.8 percent per year and 370 MW or 1.0 percent per year, respectively. Annual load factor projections are increasing from 48 percent to approximately 53 percent due to a large industrial customer expanding its operation resulting in additional energy but minimal peak demand because they have an interruptible contract.

Historical and projected class sales, total energy requirements, seasonal peak demands, and annual load factor for the EKPC system are presented on the following pages. Peak demands are based on coincident hourly-integrated demand intervals. Load factor is calculated using annual net peak demand and energy requirements.

**Coincident Peak Demands and Total Requirements**  
**Historical and Projected**

Season	Net Winter	Net Summer		Net Total	
	Peak Demand (MW)	Year	Peak Demand (MW)	Year	Requirements (MWh) Load Factor (%)
2009 - 10	2868.0	2010	2443.0	2010	13,376,292 53.2%
2010 - 11	2891.0	2011	2388.0	2011	12,666,998 50.0%
2011 - 12	2481.0	2012	2354.0	2012	12,190,070 55.9%
2012 - 13	2597.0	2013	2199.0	2013	12,644,590 55.6%
2013 - 14	3425.0	2014	2192.0	2014	13,163,516 43.9%
2014 - 15	3507.0	2015	2179.0	2015	12,604,942 41.0%
2015 - 16	2890.0	2016	2293.0	2016	13,039,953 51.4%
2016 - 17	2871.0	2017	2311.0	2017	12,680,111 50.4%
2017 - 18	3437.0	2018	2375.0	2018	13,576,581 45.1%
2018 - 19	3073.0	2019	2366.0	2019	13,140,304 48.8%
2019 - 20	2723.0	2020	2312.0	2020	12,790,896 53.5%
2020 - 21	3218.5	2021	2402.1	2021	13,521,597 48.0%
2021 - 22	3337.0	2022	2571.5	2022	15,025,345 51.4%
2022 - 23	3359.2	2023	2569.3	2023	15,205,782 51.7%
2023 - 24	3379.7	2024	2607.5	2024	15,318,864 51.6%
2024 - 25	3386.8	2025	2618.2	2025	15,411,475 51.9%
2025 - 26	3404.2	2026	2629.8	2026	15,514,567 52.0%
2026 - 27	3423.7	2027	2646.2	2027	15,618,780 52.1%
2027 - 28	3452.4	2028	2664.3	2028	15,761,578 52.0%
2028 - 29	3465.6	2029	2679.1	2029	15,863,406 52.3%
2029 - 30	3476.5	2030	2690.4	2030	15,959,404 52.4%
2030 - 31	3489.8	2031	2702.8	2031	16,072,284 52.6%
2031 - 32	3515.6	2032	2721.1	2032	16,241,768 52.6%
2032 - 33	3528.4	2033	2737.9	2033	16,353,444 52.9%
2033 - 34	3551.4	2034	2756.3	2034	16,505,292 53.1%
2034 - 35	3573.8	2035	2775.0	2035	16,661,197 53.2%

Impacts from demand response and energy efficiency programs have been subtracted from the projections.

**Energy Sales by Class**

Year	Residential Sales (MWh)	Seasonal Sales (MWh)	Small Comm. Sales (MWh)	Public Buildings (MWh)	Large Comm. Sales (MWh)	Public Street and Highway Lighting (MWh)	Total Retail Sales (MWh)
2010	7,388,901	13,959	1,935,479	39,809	2,845,857	9,503	12,233,507
2011	6,967,413	12,774	1,892,090	38,468	2,889,142	9,845	11,809,733
2012	6,577,784	227	1,883,241	35,194	2,901,688	9,600	11,407,734
2013	6,909,853	300	1,917,730	37,215	3,017,925	9,845	11,892,868
2014	7,142,350	370	1,919,198	39,753	3,246,287	9,916	12,357,874
2015	6,781,622	354	1,958,109	38,996	2,979,716	9,890	11,768,687
2016	6,847,090	416	1,951,787	37,627	3,296,495	9,940	12,143,355
2017	6,502,113	534	1,896,475	36,578	3,395,430	9,325	11,840,456
2018	7,324,079	621	1,962,505	41,142	3,425,613	8,796	12,762,756
2019	7,036,916	663	1,925,821	39,829	3,314,391	8,770	12,326,390
2020	7,005,512	673	1,798,762	35,885	3,219,793	8,703	12,069,329
2021	7,205,739	744	1,967,078	39,064	3,546,763	8,707	12,768,095
2022	7,253,125	787	2,015,313	39,744	4,950,393	8,714	14,268,076
2023	7,283,102	830	2,043,245	39,984	5,068,151	8,724	14,444,036
2024	7,322,856	875	2,062,484	40,066	5,121,298	8,751	14,556,331
2025	7,346,496	921	2,079,718	40,009	5,173,293	8,788	14,649,225
2026	7,392,185	970	2,097,729	40,027	5,211,114	8,817	14,750,841
2027	7,447,191	1,024	2,108,594	40,062	5,248,287	8,845	14,854,002
2028	7,528,324	1,079	2,125,152	40,080	5,290,142	8,872	14,993,649
2029	7,573,245	1,126	2,142,182	40,010	5,327,401	8,898	15,092,862
2030	7,614,810	1,172	2,153,353	39,979	5,369,151	8,923	15,187,389
2031	7,659,372	1,222	2,170,018	39,974	5,418,073	8,949	15,297,607
2032	7,745,879	1,274	2,188,051	40,009	5,476,916	8,974	15,461,102
2033	7,794,976	1,325	2,204,658	39,993	5,519,501	8,999	15,569,452
2034	7,876,424	1,374	2,215,933	40,003	5,573,828	9,024	15,716,587
2035	7,960,650	1,427	2,236,079	40,019	5,619,644	9,049	15,866,867

**Purchased Power and Total Requirements**

Year	Total Retail Sales (MWh)	Owner-Member Office Use (MWh)	Average Distribution Losses (%)	Purchased Power (MWh)	EKPC Facilities Use (MWh)	Transmission Losses (%)	Total Requirements (MWh)	Energy Efficiency and Demand Response Impacts (MWh)	Net Total Requirements (MWh)
2010	12,233,507	10,401	4.4%	12,811,906	8,654	4.3%	13,376,292		
2011	11,809,733	9,742	3.8%	12,289,071	10,146	3.0%	12,666,998		
2012	11,407,734	9,120	4.4%	11,943,406	8,811	2.0%	12,190,070		
2013	11,892,868	9,977	4.0%	12,400,903	8,270	1.9%	12,644,590		
2014	12,357,874	10,497	4.1%	12,898,402	8,246	2.0%	13,163,516		
2015	11,768,687	10,008	4.3%	12,303,441	8,190	2.3%	12,604,942		
2016	12,143,355	10,270	4.1%	12,674,244	8,203	2.7%	13,039,953		
2017	11,840,456	9,992	4.0%	12,340,793	8,374	2.5%	12,680,111		
2018	12,762,756	10,647	3.5%	13,238,766	8,451	2.4%	13,576,581		
2019	12,326,390	10,232	3.6%	12,798,772	7,891	2.5%	13,140,304		
2020	12,069,329	10,408	4.0%	12,518,672	7,524	2.4%	12,799,104	(8,208)	12,790,896
2021	12,768,095	10,408	4.0%	13,245,253	8,250	2.4%	13,540,813	(19,216)	13,521,597
2022	14,268,076	10,408	4.0%	14,757,434	8,250	2.4%	15,060,976	(35,631)	15,025,345
2023	14,444,036	10,408	4.0%	14,939,564	8,250	2.4%	15,247,429	(41,647)	15,205,782
2024	14,556,331	10,408	4.0%	15,056,005	8,273	2.4%	15,366,526	(47,662)	15,318,864
2025	14,649,225	10,408	4.0%	15,152,394	8,250	2.4%	15,465,153	(53,678)	15,411,475
2026	14,750,841	10,408	4.0%	15,258,528	8,250	2.4%	15,573,999	(59,432)	15,514,567
2027	14,854,002	10,408	4.0%	15,365,931	8,250	2.4%	15,683,966	(65,186)	15,618,780
2028	14,993,649	10,408	4.0%	15,511,082	8,273	2.4%	15,832,518	(70,940)	15,761,578
2029	15,092,862	10,408	4.0%	15,614,917	8,250	2.4%	15,938,985	(75,579)	15,863,406
2030	15,187,389	10,408	4.0%	15,713,246	8,250	2.4%	16,039,622	(80,218)	15,959,404
2031	15,297,607	10,408	4.0%	15,828,009	8,250	2.4%	16,157,141	(84,857)	16,072,284
2032	15,461,102	10,408	4.0%	15,998,097	8,273	2.4%	16,331,264	(89,496)	16,241,768
2033	15,569,452	10,408	4.0%	16,111,536	8,250	2.4%	16,447,579	(94,135)	16,353,444
2034	15,716,587	10,408	4.0%	16,264,512	8,250	2.4%	16,604,066	(98,774)	16,505,292
2035	15,866,867	10,408	4.0%	16,421,239	8,250	2.4%	16,764,610	(103,413)	16,661,197

**Note: Losses do not apply to direct serve loads.**

## Section 2.0 Description of the Cooperative

EKPC is a generation and transmission electric cooperative headquartered in Winchester, Kentucky, and owned by its 16 owner-members:

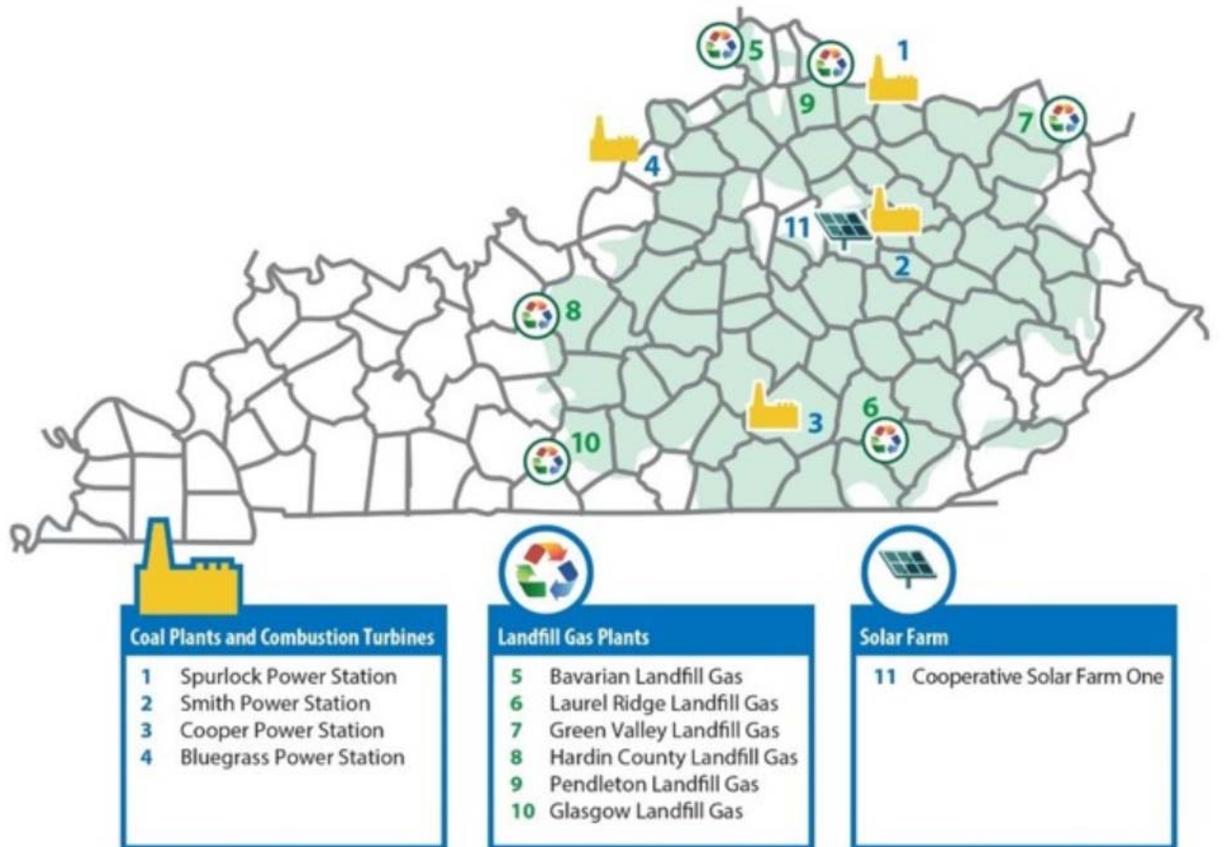
- Big Sandy RECC
- Blue Grass Energy Cooperative
- Clark Energy Cooperative
- Cumberland Valley Electric
- Farmers RECC
- Fleming-Mason Energy
- Grayson RECC
- Inter-County Energy Cooperative
- Jackson Energy Cooperative
- Licking Valley RECC
- Nolin RECC
- Owen Electric Cooperative
- Salt River Electric
- Shelby Energy Cooperative
- South Kentucky RECC
- Taylor County RECC

EKPC owns a generation fleet of 3,267 MW, including coal, natural gas, oil, solar and landfill gas units, and an additional 170 MW of hydropower purchases from the Southeastern Power Administration (SEPA). EKPC operates within PJM, which has over 180,000 MW of generation. EKPC's all-time peak demand of 3,507 MW occurred on February 20, 2015.

Generation includes (net winter rating):

- Spurlock – 1,346 MW
- Cooper – 341 MW
- Smith Combustion Turbine Units  
– 989 MW
- Bluegrass Combustion Turbine Units  
– 567 MW
- Cooperative Solar 1 – 8.5 MW
- SEPA, hydropower – 170 MW
- Landfill Gas Plants
  - Boone County – 4.6 MW
  - Laurel County – 3.0 MW
  - Greenup County – 2.3 MW
  - Glasgow – 0.9 MW
  - Pendleton County – 3.0 MW
  - Hardin County – 2.3 MW

EKPC owns and operates a 2,955-circuit mile network of high voltage transmission lines consisting of 69 kV, 138 kV, 161 kV, and 345 kV lines, and all the related substations. EKPC is a member of the SERC Reliability Corporation (SERC). EKPC maintains 74 normally closed free-flowing interconnections with its neighboring utilities.



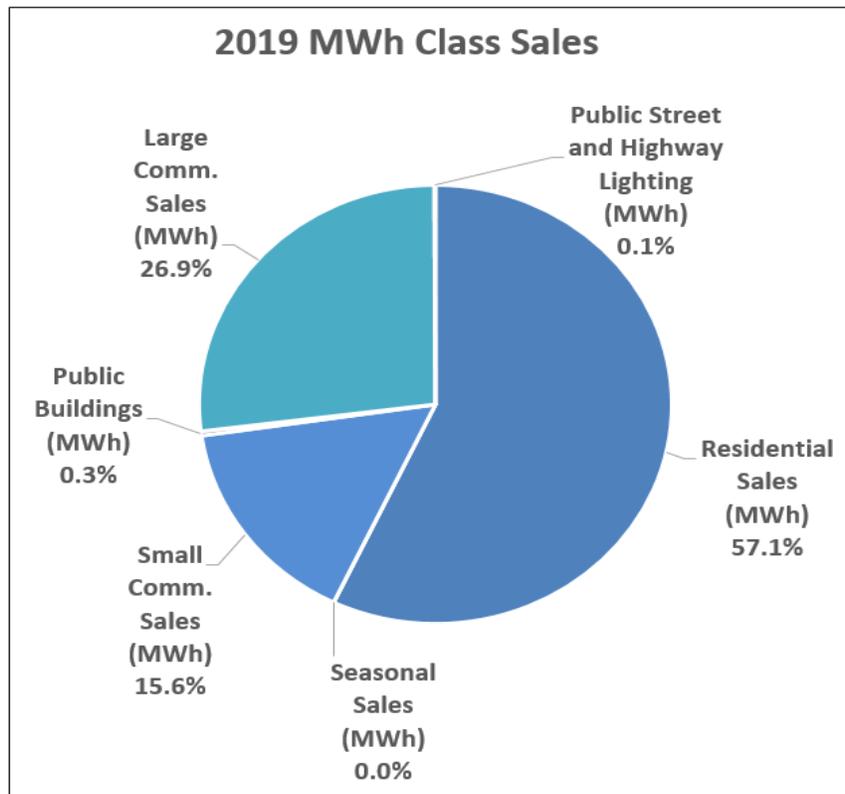
## 2.1 Owner-Members' Service Territory

EKPC owner-members serve approximately 545,000 retail meters (approximately 1,100,000 customers) in 87 counties in Kentucky and 3 counties in Tennessee, including portions of the Louisville, Cincinnati, Elizabethtown, Lexington, Huntington, and Bowling Green Metropolitan Statistical Areas (MSA). EKPC owner-members serve most of the rural areas, while investor-owned and municipal utilities serve most of the cities and towns. Interstates 64, 65, 71, and 75 and several limited-access parkways pass through the area. EKPC owner-members' fixed service territory boundaries are on file with the Kentucky Public Service Commission.

The service territory is diverse. Areas around Lexington and Louisville have a significant amount of manufacturing. The region around Cincinnati contains a growing number of retail trade, transportation and service jobs. Mining has seen strong decreases due to regulatory changes as well as decreased gas prices, the most notable impacts being in eastern and southeastern regions. Tourism is an important aspect of the southern and southwestern service area, with Lake Cumberland and Mammoth Cave National Park contributing to jobs in the service and retail trade industries. Kentucky as a whole expects to see growth in the health care sector due to the aging population.

## 2.2 Customer Overview

The owner-members' collective customer base is comprised predominantly of residential customers, 93 percent. In 2019, 57 percent of EKPC's owner-member retail sales were to the residential class. The 2020 End-Use Survey results indicate electricity is the primary method for water heating, 86 percent, and home heating, 63 percent. The availability of natural gas is limited in most of the service territory.



Appliance efficiency improvements, the economy, and the increasing electricity prices in recent years have had a dampening effect on electric use per customer and this is expected to continue. In 2019, residential customer use averaged 1,153 kWh per month. Over the last 10 years, the use per customer averaged 1,170 kWh per month. The forecast is projecting 1,150 kWh per month.

## **Section 3.0**

### **Description of the Forecasting Method**

#### **3.1 Coordination with Owner-Members**

EKPC's load forecast was prepared pursuant to the Work Plan, which was approved by EKPC's Board of Directors and RUS in December 2019. Factors considered when preparing the forecast include regional economic growth, electric appliance saturation and efficiency trends, electricity rates, and weather. The EKPC Load Forecasting Department works with the staff of each owner-member to prepare its forecast and then aggregates the 16 owner-member forecasts, adds forecasts of use of EKPC facilities and transmission losses, and subtracts planned demand response and energy efficiency to create EKPC's forecast.

EKPC and its owner-members will use the load forecast for long-term planning, including construction work plans and financial forecasts for the owner-members and transmission, generation, demand response and energy efficiency, and financial planning for EKPC.

The general steps followed in developing the load forecast include:

1. Develop regional economic projections: EKPC subscribes to IHS, in order to analyze regional economic performance. IHS provides county-level projections for population, employment, income as well as other variables. EKPC further analyzes the data to appropriately reflect the owner-members' individual service territories.
  
2. Perform analysis and construct models: EKPC prepares a preliminary forecast for each of its owner-members for each classification as reported on the RUS Form 7, which contains retail sales data for owner-members. These classes include: residential, seasonal, small commercial, public buildings, large commercial, and public street and highway lighting. EKPC's sales to owner-members are then determined by adding distribution losses to total retail sales. EKPC's total requirements are estimated by adding transmission losses to total owner-member sales. Seasonal peak demands are developed using historical normalized peaks and seasonal load factors.

3. Collect insights from the owner-members: EKPC meets with each owner-member to discuss their preliminary forecast. Owner-member staff at these meetings includes the President/CEO and other key individuals.
4. Revise the forecasts: The preliminary forecast is revised based on mutual agreement of EKPC staff and owner-member's President/CEO and staff. This final forecast is approved by the Board of Directors of each owner-member.
5. Develop the system load forecast: The EKPC forecast is the summation of the forecasts of its 16 owner-members with demand response, energy efficiency, transmission losses and EKPC facilities' use incorporated.

There is close collaboration and coordination between EKPC and its owner-members in this process. This working relationship is essential because EKPC has no retail customers. Input from owner-members relating to industrial development, subdivision growth, and other specific service area information is crucial to the development of accurate forecasts. Review meetings provide opportunities to critique the assumptions and the overall results of the preliminary forecast. The resulting load forecast reflects a combination of EKPC's structured forecast methodology combined with the judgment and experience of the owner-member staff.

### **3.2 Forecast Model Structure and Inputs**

Customer and energy models for each class are used to develop load forecasts for each owner-member. The regional economy, customer and sales trends, appliance saturations, energy efficiency and demand response impacts, weather impacts and electricity rates are modeled and analyzed during the forecast study.

**Regional Economic Model:** EKPC has divided its owner-members' service area into seven economic regions with economic activity projected for each. Some natural regions exist within the EKPC territory. For example, the Central Economic Region defined by EKPC fits closely within the Lexington Standard Metropolitan Statistical Area ("SMSA"). The Bureau Economic

Analysis (BEA) defines SMSA's as areas of interrelated economic activity that go beyond a single county's boundaries. The Northern Region includes Kentucky counties that border Cincinnati. Regional forecasts for population, income and employment are developed and used as variables in customer or energy models as appropriate. EKPC combines county-level forecasts from IHS into regional economic forecasts based roughly on owner-member service territory boundaries. Owner-members and counties are assigned to regions as follows:

- Central Region:  
*Owner-members:* Blue Grass Energy Cooperative  
*Counties:* Anderson, Bourbon, Clark, Fayette, Franklin, Harrison, Jessamine, Madison, Mercer, Scott, and Woodford
- East Region:  
*Owner-members:* Big Sandy RECC, Cumberland Valley Electric, Jackson Energy Cooperative and Licking Valley RECC  
*Counties:* Bell, Breathitt, Clay, Estill, Floyd, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lee, Leslie, Letcher, Magoffin, Martin, Morgan, Owsley, Perry, Pike, Rockcastle, Whitley, and Wolfe
- North Region:  
*Owner-members:* Owen Electric Cooperative  
*Counties:* Boone, Bracken, Campbell, Carroll, Gallatin, Grant, Kenton, Owen, and Pendleton
- North Central Region:  
*Owner-members:* Nolin RECC, Salt River Electric, and Shelby Energy Cooperative  
*Counties:* Bullitt, Hardin, Henry, Jefferson, Larue, Meade, Nelson, Oldham, Shelby, Spencer, Trimble, and Washington
- North East Region:  
*Owner-members:* Clark Energy Cooperative, Fleming-Mason Energy, and Grayson RECC  
*Counties:* Bath, Boyd, Carter, Elliott, Fleming, Greenup, Lawrence, Lewis, Mason, Menifee, Montgomery, Nicholas, Powell, Robertson, and Rowan
- South Region:  
*Owner-members:* Inter-County Energy Cooperative, South Kentucky RECC, and Taylor County RECC  
*Counties:* Adair, Boyle, Casey, Garrard, Green, Lincoln, Marion, McCreary, Pulaski, Russell, Taylor, and Wayne
- South Central Region:  
*Owner-member:* Farmers RECC  
*Counties:* Allen, Barren, Butler, Cumberland, Edmonson, Grayson, Hart, Metcalfe, Monroe, Simpson, and Warren

EKPC utilized a geographic information system from Environmental Systems Research Institute (ESRI) to define owner-members' territories. The county-level economic data provided by IHS is segmented into owner-members' service territories using the mapping of county and service territory boundaries. Using economic data that closely represents individual owner-members' territories produces more accurate forecasts.

The load forecast is based on IHS's county-level economic forecasts released in June 2020. County-level historical and projected data provided to EKPC include:

- North American Industry Classification System (NAICS) Employment
  - Total Non-farm, Non-Manufacturing, Service Providing Private, Construction, Manufacturing, Transportation, Trade & Utilities, Information, Financial Activities, Professional & Business Services, Educational & Health Services, Leisure & Hospitality, Other Services, Government, Federal Government, State & Local Government, Military
- Personal Income
- Real Personal Income
- Population
- Households

These county-level projections combine into regional economic activity. EKPC converts IHS's county-level projections to monthly values to use in the load forecasting models. Projections of regional economic activity enhance the sales forecasting and strategic planning of EKPC because changes in regional employment and income are important determinants of customer and sales growth.

**Customer and Sales Models:** Residential, seasonal energy sales and the public building class are forecasted using regression analysis. At the owner-member level, energy use per customer is projected using a statistically adjusted end-use (SAE) model. This method of modeling incorporates end-use forecasts and is used to separate the monthly and annual forecasts into end-use components. SAE models offer the structure of end-use models while also using the strength of time-series analysis. This method, like end-use modeling, requires detailed information about appliance saturation, appliance use, appliance efficiencies, household characteristics, weather

characteristics, and demographic and economic data. The SAE approach segments the average household use into end-use components as follows:

$$\text{Use}_{y,m} = \text{Heat}_{y,m} + \text{Cool}_{y,m} + \text{Water Heat}_{y,m} + \text{Other}_{y,m}$$

Where,  
y=year  
m=month

Each component is defined in terms of its end-use structure. For example, the cool index may be defined as a function of appliance saturation, efficiency of the appliance, and usage of the appliance. Annual end-use indices and a usage variable are constructed and used to develop a variable to be used in least squares regression in the model. These variables are constructed for heating, cooling, water heating, and an 'Other' variable, which includes lighting and other miscellaneous usages.

$$\text{CoolIndex}_y = \sum_{\text{Type}} \text{Wgt}^{\text{Type}} * \left( \frac{\text{CoolShare}_y^{\text{Type}} / \text{Eff}_y^{\text{Type}}}{\text{CoolShare}_{98}^{\text{Type}} / \text{Eff}_{98}^{\text{Type}}} \right)$$

$$\text{CoolUse}_{y,m} = \left( \frac{\text{CDD}_{y,m}}{\text{NormCDD}} \right) * \left( \frac{\text{HHSize}_y}{\text{HHSize}_{by}} \right) * \left( \frac{\text{Income}_y}{\text{Income}_{by}} \right) * \left( \frac{\text{Price}_{y,m}^{-.30}}{\text{Price}_{by}} \right)$$

Where,  
by=base year

$$\text{Cool}_{y,m} = \text{CoolIndex}_y * \text{CoolUse}_{y,m}$$

The Cool, Heat, Water Heat, and Other variables are then used in a least squares regression, which results in estimates for annual and monthly use per household.

The number of residential customers is also projected with regression analysis using economic variables such as population and households. The owner-member results are summed to determine total customers and total class sales. System residential energy use per customer is calculated by dividing the forecasted number of customers into the energy sales forecast. Seasonal sales are only reported by one owner-member. Accounts include seasonal residences, such as vacation homes

and weekend retreats. Public building sales are reported by two owner-members and are government buildings, libraries and sometimes schools.

Owner-members classify commercial and industrial accounts into two groups. Customers whose annual peak demand is less than 1 MW are classified as small commercial customers and customers whose annual peak demand is greater than or equal to 1 MW are classified as large commercial/industrial customers. Small commercial energy sales forecast results from regression analysis. The number of small commercial customers is forecasted by means of regression analysis on various regional economic data. Exogenous variables include electric price, employment by sector and economic activity. Energy use per customer is calculated by dividing the forecasted number of customers into the energy sales forecast.

Large commercial sales projections rely on the input of the owner-members. Owner-members, having knowledge of their key accounts, project usage for existing large loads, and advise of new customers or customers that are leaving. The longer-term energy projections use economic variables as model drivers. EKPC projects new large loads based on history, the presence of industrial parks, and the economy of the service territory. The Large Commercial Class is forecasted using input from owner-members as well as a modeling approach. New industrial customers that owner-members expect in the next few years are explicitly input into the forecasts. To estimate total new large loads at the system level, a regression approach is used. A probabilistic model is then used to distribute these customers among the 16 owner-members. A load of 1.5 MW and 60% load factor is assumed for these new loads. This methodology for forecasting new large commercial customers and energy provides a robust and defensible projection at the owner-member level as well as the system level.

Public street and highway lighting sales is a relatively small class reported by eleven owner-members. Customers are correlated with residential customers. Energy has been impacted by upgrading light bulbs to high-efficient light-emitting diode light bulbs (LEDs).

**Demand Response, Energy Efficiency Appliance Saturations:** EKPC and its 16 owner-members promote the cost-effective use of energy by offering conservation, energy efficiency and

other programs to the retail customer. These programs were designed to meet the needs of the customer and to delay the need for additional generating capacity. EKPC considers the programs' impacts as part of its overall supply portfolio. Projections of appliance efficiencies are sourced from the Energy Information Administration (EIA). EKPC is a member of Itron's Energy Forecasting Group and receives the EIA projections for the East South Central U.S. Census Division. States included in this division are: Alabama, Kentucky, Mississippi, and Tennessee. These projections combined with EKPC's End-Use Survey saturations are used in the models. Every 2-3 years since 1981, EKPC has surveyed its owner-members' residential customers to gather information on electric appliance saturation, household characteristics, resident demographics, and other factors affecting electricity demand. EKPC projects these saturations for each owner-member as a function of time. The most recent survey was conducted first quarter of 2020. Naturally-occurring appliance efficiency and lighting improvements will have a dampening effect on residential retail sales.

**Electricity Rates:** The wholesale power cost projections are based on EKPC's 2019 Integrated Resource Plan filing with the Kentucky Public Service Commission. Each owner-member provides a projection of the distribution adder for the retail rate assumption used in the individual owner-member models.

**Weather:** The forecasts rely on National Oceanic and Atmospheric Administration (NOAA) weather stations located at seven airports in or near the EKPC system. Normal weather is based on historic 20-year values (1999-2019). Owner-members are assigned to airports as follows:

- Blue Grass Airport (LEX) in Lexington, KY:  
*Owner-members:* Blue Grass Energy Cooperative, Clark Energy Cooperative, and Inter-County Energy Cooperative
- Bowling Green/Warren County Regional Airport (BWG) in Bowling Green, KY:  
*Owner-members:* Farmers RECC and Taylor County RECC
- Cincinnati/Northern Kentucky International Airport (CVG) in Covington, KY:  
*Owner-members:* Fleming-Mason Energy and Owen Electric Cooperative
- Huntington Tri-State Airport (HTS) in Huntington, WV:  
*Owner-member:* Grayson RECC

- Julian Carroll Airport (JKL) in Jackson, KY:  
*Owner-members:* Big Sandy RECC, Cumberland Valley Electric, Jackson Energy Cooperative, and Licking Valley RECC
- Louisville International Airport (SDF) in Louisville, KY:  
*Owner-members:* Nolin RECC, Salt River Electric, and Shelby Energy Cooperative
- Pulaski County Airport (SME) in Somerset, KY:  
*Owner-member:* South Kentucky RECC.

**Development of Alternative Economic and Weather Scenarios:** Seasonal peak demands are projected using normalized historical peaks, the summation of monthly energy usages and load factors. High and low scenarios have been constructed around the base case forecast by developing weather and economic variations resulting in optimistic and pessimistic projections.

EKPC presents three economic growth scenarios:

- **Baseline:** This is the most likely forecast scenario, representing base economic assumptions and normal weather.
- **Lower:** To simulate pessimistic economic conditions, the annual increase in energy sales falls short of the baseline by the same amount by which the average annual increase in energy sales in the slowest-growing 10-year period in the past 20 years falls short of the 20-year average annual increase.
- **Higher:** The annual increase in energy sales exceeds the baseline by the same amount by which the average annual increase in energy sales in the fastest-growing 10-year period in the past 20 years exceeds the 20-year average annual increase.

Scenarios are also presented assuming mild and extreme winter and summer weather. The LEX weather station, which is central to Kentucky, was used. EKPC uses the distribution of weather during 1999 - 2019 to identify mild and extreme temperatures, as well as seasonal degree days to develop:

- 1-in-30 mild,
- 1-in-2 normal,
- 1-in-10 extreme, and
- 1-in-30 extreme.

Total energy requirements, winter peak demand, and summer peak demand are modeled as functions of the appropriate weather concepts.

REDACTED

## Section 4.0 Key Assumptions

### 4.1 Regional Economy Summary

As previously mentioned, Kentucky was greatly affected by the COVID-19 pandemic. IHS provided the following summary:



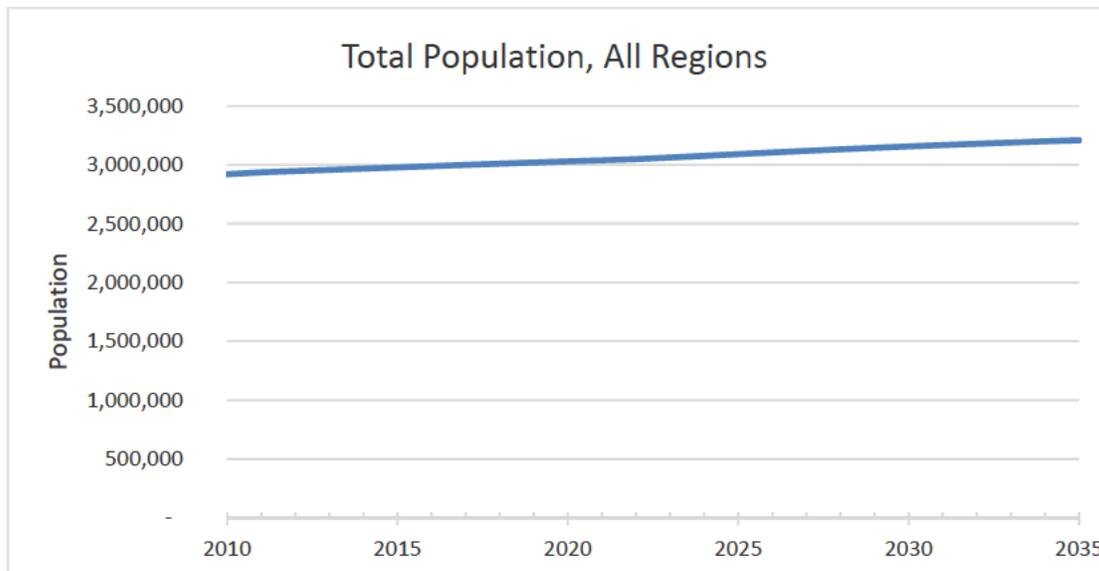
For the forecast period, the economic projections over the medium term show Kentucky's labor market expanding at a compound annual rate of 2.1% across the 2020-2025 period following an

employment contraction over the next three years. Slumping demand and business closures related to COVID-19 mitigation measures will depress the state economy over the first half of the forecast period, but Kentucky will match the national average over the medium term. Leisure and hospitality services will experience the most severe hits in the near term but are expected to see modest gains by 2025. Real personal income will grow at a compound annual rate of around 1.4% while real gross state product is forecast to advance 2.8% over the medium term, both below the national rates.

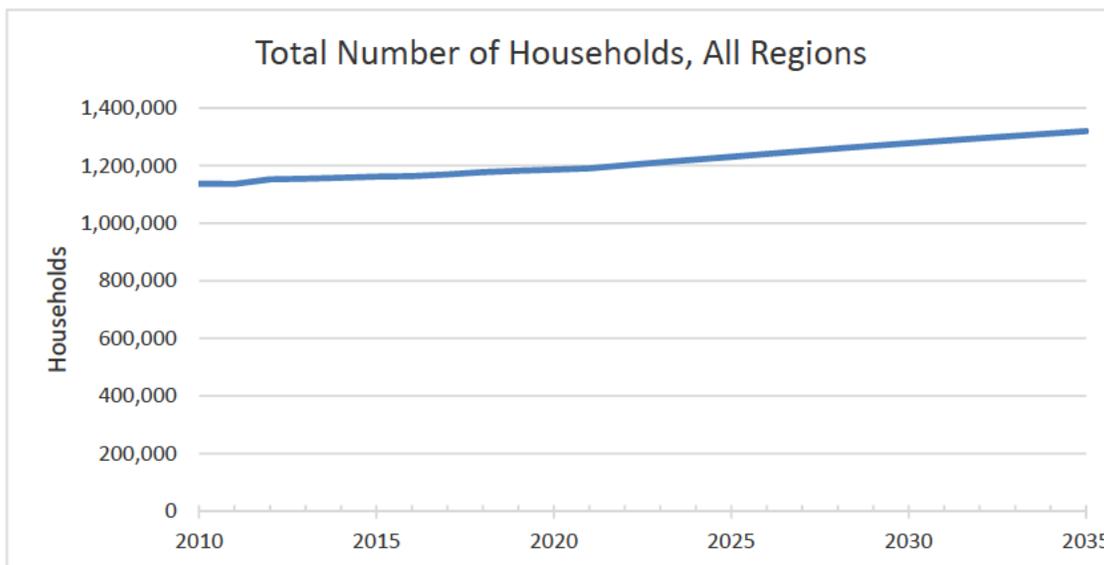
While many firms are laying off staff, either temporarily or permanently, as COVID-19 inflicts damage on the economy, growth in e-commerce and shipping is strong, which positively impacts the owner-members in the northern part of the state. Transportation and warehousing is expected to continue to grow as more shopping is done online.

*Overview of Key Economic Variables*

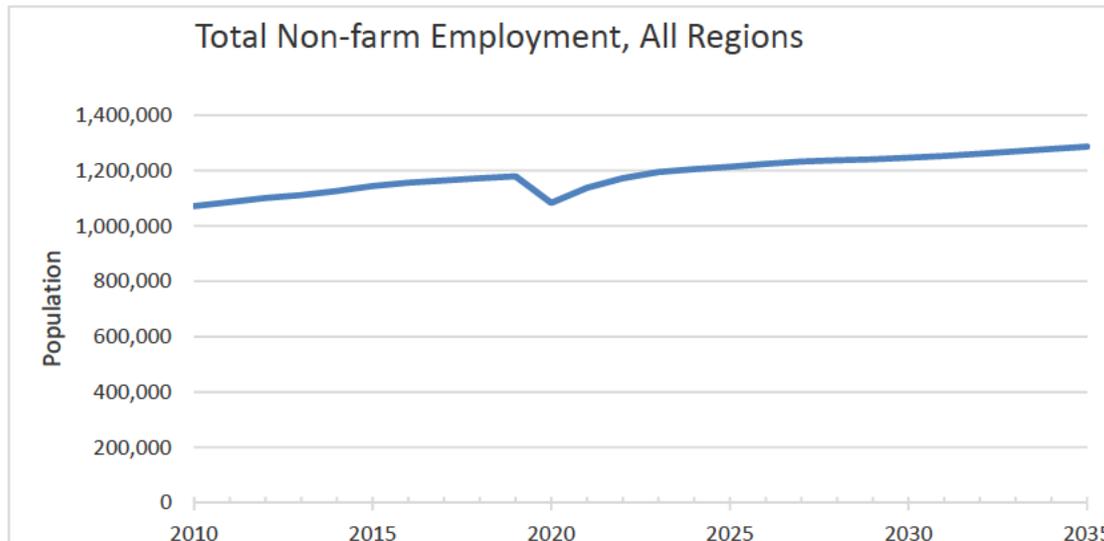
An important variable that impacts the load forecast is regional population. The spreadsheets with the county-level data from IHS are provided in Appendix. Overall, population continues to show some moderate growth, however, some regions in the eastern part of the state are projected to decline.



Household growth did slow during COVID-19 response, but it is expected to recover and grow moderately through the forecast period.



Total regional employment is tied closely to the national economy. During the response to COVID-19, total non-farm employment decreased significantly, however, is expected to recover in the coming years and then continue to grow throughout the forecast period.



#### 4.2 Results by Region

Northern Economic Region Forecast Summary						
	Population		Households		Total Employment	
		(%) Change		(%) Change		(%) Change
2020	475,548	0.57%	183,252	0.63%	209,520	-5.89%
2021	478,752	0.67%	184,311	0.58%	220,697	5.33%
2022	482,621	0.81%	186,326	1.09%	227,503	3.08%
2023	486,600	0.82%	188,309	1.06%	230,371	1.26%
2024	490,119	0.72%	189,937	0.86%	231,273	0.39%
2025	493,584	0.71%	191,517	0.83%	232,660	0.60%
2026	497,268	0.75%	193,352	0.96%	235,218	1.10%
2027	501,036	0.76%	195,228	0.97%	237,327	0.90%
2028	504,744	0.74%	197,028	0.92%	238,622	0.55%
2029	508,431	0.73%	198,774	0.89%	239,477	0.36%
2030	512,109	0.72%	200,580	0.91%	241,035	0.65%
2031	515,780	0.72%	202,508	0.96%	242,760	0.72%
2032	519,282	0.68%	204,394	0.93%	244,595	0.76%
2033	522,853	0.69%	206,313	0.94%	246,942	0.96%
2034	526,426	0.68%	208,271	0.95%	248,956	0.82%
2035	529,912	0.66%	210,163	0.91%	251,259	0.93%

Central Northern Economic Region Forecast Summary						
	Population		Households		Total Employment	
		(%) Change		(%) Change		(%) Change
2020	456,723	0.64%	171,345	0.82%	133,546	-7.75%
2021	460,326	0.79%	172,766	0.83%	138,989	4.08%
2022	464,267	0.86%	175,092	1.35%	143,563	3.29%
2023	468,360	0.88%	177,255	1.24%	146,489	2.04%
2024	472,528	0.89%	179,314	1.16%	148,282	1.22%
2025	476,557	0.85%	181,301	1.11%	149,659	0.93%
2026	480,443	0.82%	183,405	1.16%	151,003	0.90%
2027	484,270	0.80%	185,504	1.14%	151,984	0.65%
2028	488,044	0.78%	187,541	1.10%	152,564	0.38%
2029	491,607	0.73%	189,462	1.02%	152,955	0.26%
2030	494,944	0.68%	191,321	0.98%	153,767	0.53%
2031	498,059	0.63%	193,214	0.99%	154,235	0.30%
2032	501,215	0.63%	195,261	1.06%	155,099	0.56%
2033	504,350	0.63%	197,130	0.96%	156,011	0.59%
2034	507,246	0.57%	198,893	0.89%	156,792	0.50%
2035	510,079	0.56%	200,599	0.86%	157,558	0.49%

North Eastern Economic Region Forecast Summary						
	Population		Households		Total Employment	
		(%) Change		(%) Change		(%) Change
2020	268,814	-0.29%	105,985	-0.36%	78,532	-8.00%
2021	268,190	-0.23%	105,792	-0.18%	81,790	4.15%
2022	267,901	-0.11%	106,282	0.46%	83,592	2.20%
2023	268,032	0.05%	106,786	0.47%	85,212	1.94%
2024	268,399	0.14%	107,241	0.43%	86,013	0.94%
2025	268,880	0.18%	107,725	0.45%	86,538	0.61%
2026	269,384	0.19%	108,314	0.55%	87,163	0.72%
2027	269,875	0.18%	108,904	0.54%	87,645	0.55%
2028	270,344	0.17%	109,455	0.51%	87,958	0.36%
2029	270,819	0.18%	109,983	0.48%	88,172	0.24%
2030	271,242	0.16%	110,480	0.45%	88,560	0.44%
2031	271,467	0.08%	110,909	0.39%	88,960	0.45%
2032	271,662	0.07%	111,285	0.34%	89,482	0.59%
2033	271,787	0.05%	111,640	0.32%	89,998	0.58%
2034	271,843	0.02%	111,976	0.30%	90,519	0.58%
2035	271,879	0.01%	112,280	0.27%	91,013	0.55%

Central Economic Region Forecast Summary						
	Population		Households		Total Employment	
		(%) Change		(%) Change		(%) Change
2020	729,063	0.58%	288,890	0.69%	335,865	-7.48%
2021	733,997	0.68%	290,871	0.69%	354,875	5.66%
2022	739,121	0.70%	294,388	1.21%	365,595	3.02%
2023	745,166	0.82%	297,865	1.18%	372,757	1.96%
2024	751,251	0.82%	300,971	1.04%	375,305	0.68%
2025	757,287	0.80%	304,014	1.01%	377,887	0.69%
2026	762,778	0.73%	307,114	1.02%	381,466	0.95%
2027	767,822	0.66%	310,056	0.96%	384,310	0.75%
2028	772,584	0.62%	312,803	0.89%	385,900	0.41%
2029	777,123	0.59%	315,391	0.83%	387,020	0.29%
2030	781,432	0.55%	317,909	0.80%	389,065	0.53%
2031	785,522	0.52%	320,430	0.79%	391,186	0.55%
2032	789,520	0.51%	322,900	0.77%	393,913	0.70%
2033	793,557	0.51%	325,393	0.77%	396,832	0.74%
2034	797,506	0.50%	327,905	0.77%	399,580	0.69%
2035	801,345	0.48%	330,320	0.74%	402,365	0.70%

Central Southern Economic Region Forecast Summary						
	Population		Households		Total Employment	
		(%) Change		(%) Change		(%) Change
2020	317,920	0.88%	124,265	1.04%	110,660	-10.25%
2021	319,183	0.40%	125,117	0.69%	116,724	5.48%
2022	320,546	0.43%	126,671	1.24%	120,729	3.43%
2023	322,075	0.48%	128,125	1.15%	123,830	2.57%
2024	323,483	0.44%	129,374	0.98%	125,574	1.41%
2025	324,934	0.45%	130,631	0.97%	126,735	0.92%
2026	326,373	0.44%	132,012	1.06%	127,806	0.85%
2027	327,874	0.46%	133,437	1.08%	128,611	0.63%
2028	329,272	0.43%	134,798	1.02%	129,118	0.39%
2029	330,508	0.38%	136,075	0.95%	129,422	0.24%
2030	331,684	0.36%	137,238	0.86%	129,980	0.43%
2031	332,864	0.36%	137,918	0.50%	130,680	0.54%
2032	334,011	0.34%	138,932	0.73%	131,556	0.67%
2033	335,052	0.31%	139,939	0.73%	132,475	0.70%
2034	336,049	0.30%	140,973	0.74%	133,408	0.70%
2035	336,951	0.27%	141,957	0.70%	134,297	0.67%

Eastern Economic Region Forecast Summary						
	Population		Households		Total Employment	
		(%) Change		(%) Change		(%) Change
2020	496,605	-0.71%	198,902	-0.65%	130,189	-10.74%
2021	492,744	-0.78%	197,721	-0.59%	135,880	4.37%
2022	489,284	-0.70%	197,722	0.00%	139,472	2.64%
2023	486,718	-0.52%	197,793	0.04%	142,073	1.87%
2024	484,640	-0.43%	197,793	0.00%	143,245	0.82%
2025	482,794	-0.38%	197,853	0.03%	143,835	0.41%
2026	481,026	-0.37%	198,119	0.13%	144,389	0.39%
2027	479,219	-0.38%	198,375	0.13%	144,670	0.19%
2028	477,465	-0.37%	198,595	0.11%	144,702	0.02%
2029	475,966	-0.31%	198,870	0.14%	144,587	-0.08%
2030	474,472	-0.31%	199,114	0.12%	144,775	0.13%
2031	473,148	-0.28%	199,457	0.17%	145,079	0.21%
2032	471,789	-0.29%	199,697	0.12%	145,577	0.34%
2033	470,309	-0.31%	199,919	0.11%	146,094	0.36%
2034	468,625	-0.36%	200,095	0.09%	146,648	0.38%
2035	466,972	-0.35%	200,246	0.08%	147,151	0.34%

Southern Economic Region Forecast Summary						
	Population		Households		Total Employment	
		(%) Change		(%) Change		(%) Change
2020	284,443	0.13%	113,663	0.16%	84,661	-9.94%
2021	284,546	0.04%	113,871	0.18%	88,917	5.03%
2022	284,778	0.08%	114,725	0.75%	91,843	3.29%
2023	285,439	0.23%	115,591	0.76%	94,052	2.40%
2024	286,307	0.30%	116,390	0.69%	95,357	1.39%
2025	287,238	0.33%	117,200	0.70%	96,283	0.97%
2026	288,147	0.32%	118,109	0.78%	97,189	0.94%
2027	288,969	0.29%	118,992	0.75%	97,916	0.75%
2028	289,761	0.27%	119,833	0.71%	98,459	0.55%
2029	290,467	0.24%	120,615	0.65%	98,846	0.39%
2030	291,091	0.21%	121,346	0.61%	99,417	0.58%
2031	291,482	0.13%	121,998	0.54%	99,955	0.54%
2032	291,802	0.11%	122,572	0.47%	100,612	0.66%
2033	292,061	0.09%	123,145	0.47%	101,283	0.67%
2034	292,197	0.05%	123,696	0.45%	101,980	0.69%
2035	292,349	0.05%	124,233	0.43%	102,645	0.65%

**4.3 Energy and Peak Adjustments**

EKPC's owner-member residential sales account for nearly 60 percent of all retail sales. To understand the load characteristics of homes, every two to three years since 1981, EKPC has surveyed the owner-members' residential customers. The most recent survey was conducted in 2020. EKPC gathers appliance, heating and cooling, economic, and demographic data. Appliance holdings of survey respondents are analyzed in order to better understand electricity consumption and to project future appliance saturations. Results are also used to identify potential energy efficiency program offerings. EKPC evaluates new potential programs using the California tests and offers programs to customers that are deemed beneficial to EKPC and the customer. These programs generally result in a reduction in energy sales or peak demand. Commercial and industrial customers may choose to be on an interruptible rate contract that allows EKPC to request a customer reduce load during peak times or when price volatility is high. The cumulative impact of these offerings are projected to be:

**Additional Effect of Demand Response and  
Energy Efficiency Programs**

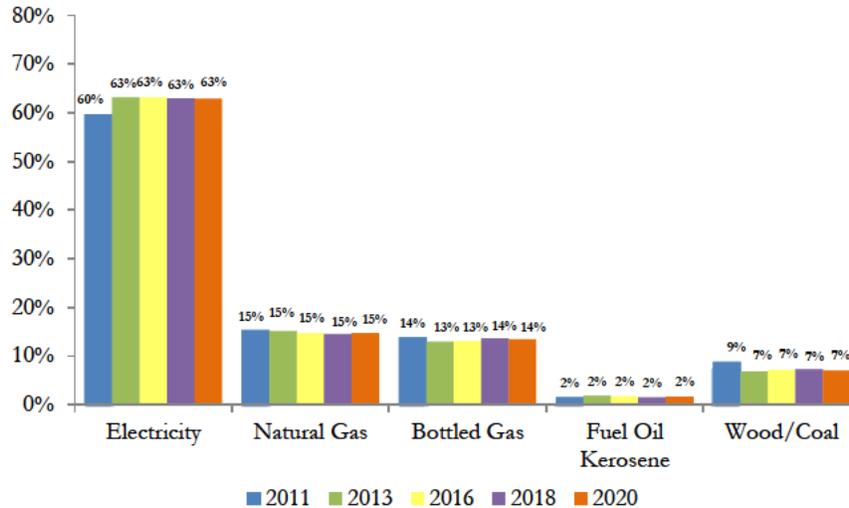
	Annual Energy (MWH)	Winter Peak (MW)	Summer Peak (MW)
2021	-19,216	-133	-133
2022	-35,631	-238	-237
2023	-41,647	-239	-238
2024	-47,662	-240	-238
2025	-53,678	-241	-239
2026	-59,432	-242	-240
2027	-65,186	-243	-240
2028	-70,940	-244	-241
2029	-75,579	-245	-241
2030	-80,218	-246	-241
2031	-84,857	-246	-242
2032	-89,496	-247	-242
2033	-94,135	-248	-243
2034	-98,774	-249	-243
2035	-103,413	-249	-243

*Note: To avoid double counting, additional effects do not include energy efficiency measures installed prior to 2021. These are assumed to be embedded in the historical data.*

#### 4.4 Residential Appliance Saturations

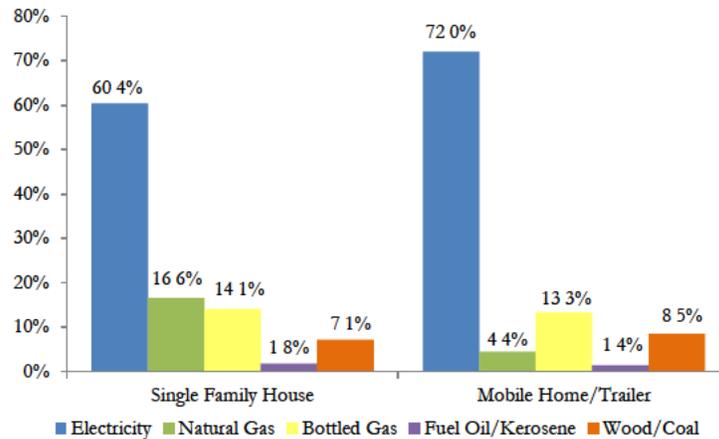
Survey Results – Heating: Electricity continues to be the main method of home heating. All fuel types have remained constant compared to the last few studies.

Historic Comparison of Main Heating Methods  
EKPC Weighted Average



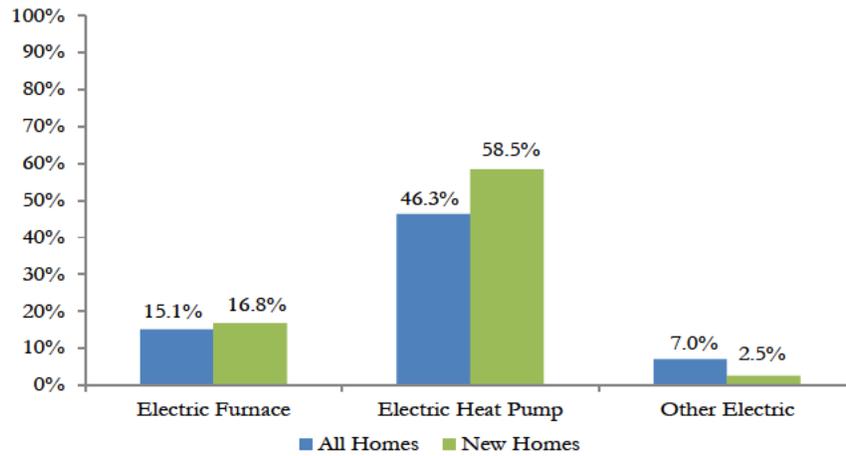
Electric heat continues to be more popular in mobile homes and trailers, while natural gas heat has a much higher percentage rate in single family homes. Among both types of homes, bottled gas and fuel oil/kerosene are relatively similar.

Main Heating Method  
EKPC Weighted Average



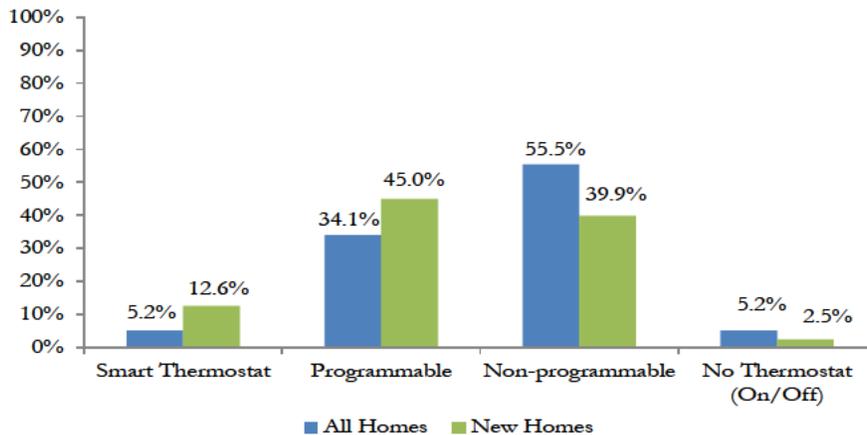
When compared to those who use an electric furnace (15.5 percent) and other types of electric heat (7.0 percent), central heating continues to be the predominant type of electric heat installed in all homes (46.3 percent), a finding which is consistent with results from previous surveys. This trend is particularly strong among newer homes, with few homes that are less than five years old having electric baseboard and ceiling cable heat installed.

Installation of Electric Heat  
EKPC Weighted Average

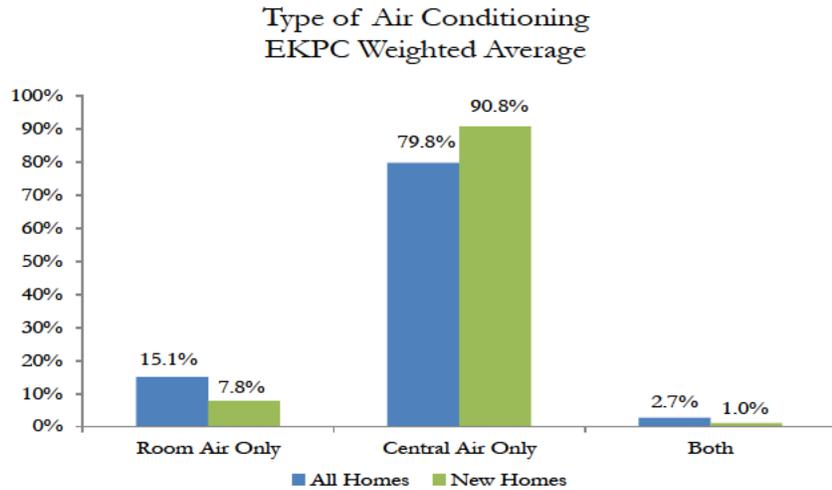


Over 55 percent of all homes use a non-programmable thermostat. Only five percent of all homes have a smart thermostat, whereas new homes are more than twice as likely to use a smart thermostat at over 12 percent.

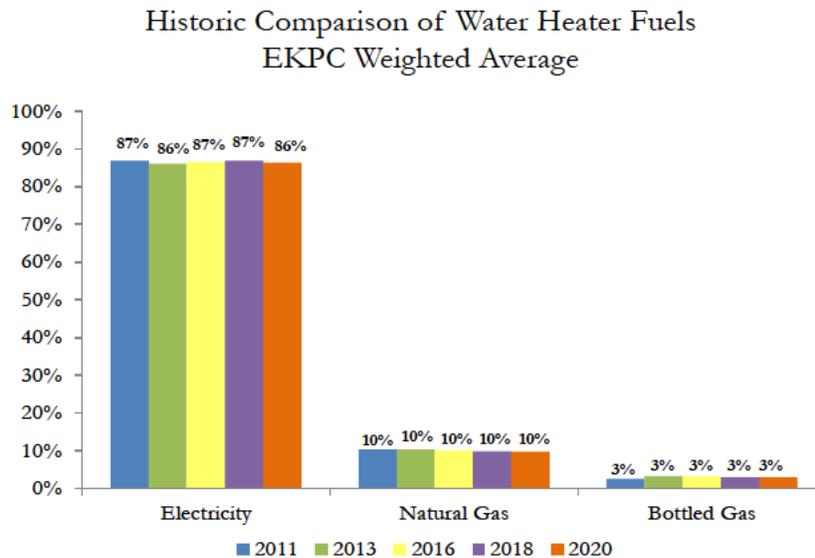
Type of Thermostat for Main Heating  
EKPC Weighted Average



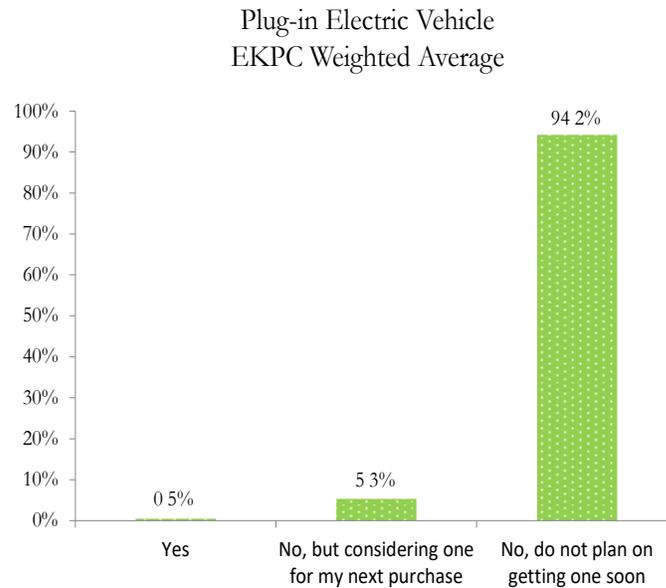
Survey Results – Cooling: Almost 80 percent of homes in have central air conditioning, including the majority of all homes that are less than five years old. A few homes have both central air conditioning and a room air conditioner.



Survey Results - Water Heating: Water heater ownership has changed very little over time with electricity being the dominant fuel.



Survey Results – Plug-in Vehicles: The question was asked if residential customers owned/leased or are interested in owning a plug-in electric vehicle. Less than 1 percent of residential customers currently own one, but almost 5 percent are considering one. Whereas, 94 percent are not interested in owning an electric vehicle.



Survey Results – Demographics: Over forty-nine percent of member households are headed by someone 65 years of age or older, which is a 4 percent increase from the 2018 survey. While less than 1 percent is headed by someone under 25 years of age. Studies show adults 65 year or older are more likely to complete a survey than younger adults. (Traugott, 1987; Shaiko et al., 1991; Merkle et al., 1993). While the owner-members serve predominantly rural and older segments of the population, survey design and delivery methods have been changed and continue to adapt in an effort to collect data from all customer segments.

#### 4.5 Energy Efficiency Programs

The programs currently offered target residential customers and energy efficiency and include:

- Button-Up Weatherization Program
- CARES Low-Income Weatherization
- Heat Pump Retrofit Program
- Touchstone Energy Program
- ENERGY STAR<sup>®</sup> Manufactured Home Program
- Energy Audit
- Residential Efficient Lighting

Button-Up Weatherization Program designed to incentivize members with poor energy-performing homes to improve the energy efficiency of the home's shell. The Button-Up Weatherization Program is an important program to assist members with high bills caused by excessive heat losses. Air-sealing and attic insulation are the most cost-effective measures to improve home energy performance. The Button-Up Weatherization Program offers an incentive for reducing the heat loss of a home and is based on based on heat loss reduction measured in British Thermal Units per hour ("BTUH"). The retail member may qualify for this incentive by reducing the air leakage of their home and/or adding insulation in the attic.

Community Assistance Resources for Energy Savings (CARES) Low-Income Program provides an incentive to enhance the weatherization and energy efficiency services provided to its residential retail members by the Kentucky Community Action Agency's (CAA) network of not for profit community action agencies. EKPC and its owner-members provide an incentive to the CAA implementing the project on behalf of the end-use member. EKPC's program has two primary objectives. First, EKPC's incentive will enable the CAA to install more measures in each home. Second, the additional incentive from EKPC will assist CAA in weatherizing more homes. Two types of homes are eligible for incentives: Heat Pump Eligible Homes are single family or multi-family residential dwellings that use electricity for their primary source of heat. The EKPC incentive can be used to upgrade the home to an air source heat pump as well as to install weatherization improvements including insulation, air sealing, duct sealing, and a water heater blanket. Heat Pump ineligible homes are single family or multi-family residential dwellings that do not use electricity for their primary source of heat, but do cool their home with central or window unit air conditioners. The EKPC incentive can be used to install weatherization improvements.

Heat Pump Retrofit Program provides incentives for residential members to replace their existing resistance heat source heat (electric furnace, ceiling cable heat, baseboard heat, or electric thermal storage) with a more efficient heat pump. Most high bill complaints are from members with homes that are heated with electric resistive heat instead of a heat pump. Installing an electric heat pump lowers electric bills significantly for those members. The Heat Pump Retrofit Program provides incentives for both centrally ducted systems and mini-split systems.

Touchstone Energy Program is designed to encourage new homes to be built to higher standards for thermal integrity and equipment efficiency, as well as to choose a geothermal or an air source heat pump rather than less efficient forms of heating and cooling. The Touchstone Energy Program provides guidance during the building process to guarantee a home that is  $\geq 25$ -30% more efficient than the Kentucky standard built home. The typical home built in rural Kentucky scores a 105 on the Home Energy Rating System (HERS) Index. The HERS testing and rating system is the industry accepted standard for evaluating the energy efficiency of a new home. Therefore, EKPC and the owner-members will provide the incentive for a home that either scores a HERS of 75 or better for the Performance Path or completes a Prescriptive Path check list of energy saving measures that assure the home performs equivalently to a 75 HERS tested home.

ENERGY STAR<sup>®</sup> Manufactured Home Program (ESMH) is designed to ensure that residential customers purchase an energy efficient manufactured home. EKPC will accomplish this by providing an incentive to purchase and install a new ENERGY STAR<sup>®</sup> certified manufactured home instead of a U.S. Department of Housing and Urban Development (HUD) minimum standard home. The incentive is paid to the member who purchases the ENERGY STAR<sup>®</sup> manufactured home. In February 2018, the U.S. Environmental Protection Agency (EPA) changed the ENERGY STAR<sup>®</sup> requirements for ENERGY STAR<sup>®</sup> manufactured homes. Effectively, EPA lessened the efficiency requirements for the home's shell. The changes allow the manufacturers to achieve ENERGY STAR<sup>®</sup> certification while spending less on improving the home's shell. Therefore, EKPC is lowering the incentive to a more appropriate level to offset these lower costs. Through the program, EKPC will pay incentives in the form of rebates for electrically heated manufactured homes that qualify for the ENERGY STAR<sup>®</sup> label. Such homes use a combination of structural envelope and equipment measures that, in combination, result energy consumption that is significantly lower than comparable factory-built homes produced in accordance with the HUD code.

Energy Audit program uses targeted information on home energy use to help customers manage their energy use and save energy. The Energy Audit is designed to offer two kinds of information delivery: an in-home audit and an online audit. EKPC uses the *BillingInsights* tool from Apogee

Interactive, Inc. to analyze energy usage and make recommendations to lower energy consumption.

The in-home audit is available for members who want a more thorough assessment of their electricity usage. An energy advisor from one of our owner-members will visit the home to conduct an energy audit by inspecting the appliances, building shell, heating and cooling systems, ductwork, appliances, and other sources of energy consumption and energy losses. The energy advisors have access to blower doors and infrared cameras if needed to identify air leakage and other heat losses. The audit report will include simple low cost improvements that the homeowners can do themselves. The homeowner will also be made aware of any recommendations that are eligible for a rebate under our other energy efficiency programs.

Residential Efficient Lighting program's purpose is to improve the efficiency of residential lighting by subsidizing the cost of higher efficiency lighting products. EKPC and its owner-members distribute compact fluorescent light bulbs (CFLs) and (LEDs) to members. The Residential Efficient Lighting provides CFLs at the annual meetings held by the owner-members. In addition, each member who completes an online energy audit receives an LED light bulb.

## Section 5.0 Results by Customer Class

### Residential Class Customers and Sales

Year	<i>Customers</i>			<i>Use Per Customer</i>			<i>Class Sales</i>		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	481,825	1,298	0.3	1,278	101	8.5	7,388,901	599,759	8.8
2011	482,351	526	0.1	1,204	-74	-5.8	6,967,413	-421,487	-5.7
2012	487,793	5,442	1.1	1,124	-80	-6.6	6,577,784	-389,629	-5.6
2013	489,738	1,945	0.4	1,176	52	4.6	6,909,853	332,069	5.0
2014	491,776	2,038	0.4	1,210	35	2.9	7,142,350	232,497	3.4
2015	494,297	2,521	0.5	1,143	-67	-5.5	6,781,622	-360,728	-5.1
2016	497,803	3,506	0.7	1,146	3	0.3	6,847,090	65,468	1.0
2017	500,260	2,457	0.5	1,083	-63	-5.5	6,502,113	-344,977	-5.0
2018	505,379	5,119	1.0	1,208	125	11.5	7,324,079	821,967	12.6
2019	508,475	3,096	0.6	1,153	-54	-4.5	7,036,916	-287,163	-3.9
2020	512,906	4,431	0.9	1,138	-15	-1.3	7,005,512	-31,404	-0.4
2021	517,009	4,103	0.8	1,161	23	2.0	7,205,739	200,227	2.9
2022	521,049	4,040	0.8	1,160	-1	-0.1	7,253,125	47,386	0.7
2023	524,917	3,868	0.7	1,156	-4	-0.3	7,283,102	29,977	0.4
2024	528,726	3,809	0.7	1,154	-2	-0.2	7,322,856	39,754	0.5
2025	532,583	3,857	0.7	1,150	-5	-0.4	7,346,496	23,640	0.3
2026	536,459	3,876	0.7	1,148	-1	-0.1	7,392,185	45,689	0.6
2027	540,328	3,869	0.7	1,149	0	0.0	7,447,191	55,006	0.7
2028	544,224	3,896	0.7	1,153	4	0.4	7,528,324	81,133	1.1
2029	548,114	3,890	0.7	1,151	-1	-0.1	7,573,245	44,921	0.6
2030	551,999	3,885	0.7	1,150	-2	-0.2	7,614,810	41,564	0.5
2031	555,873	3,874	0.7	1,148	-1	-0.1	7,659,372	44,562	0.6
2032	559,802	3,929	0.7	1,153	5	0.4	7,745,879	86,507	1.1
2033	563,721	3,919	0.7	1,152	-1	-0.1	7,794,976	49,097	0.6
2034	567,644	3,923	0.7	1,156	4	0.3	7,876,424	81,448	1.0
2035	571,512	3,868	0.7	1,161	4	0.4	7,960,650	84,225	1.1

**Notes: Totals may not equal sum of components due to rounding.**

**In 2012, there was a reclassification of 4,400 customers from the Seasonal Class to the Residential Class.**

**In 2018, there was a reclassification of about 500 customers from the Small Commercial Class to the Residential Class.**

Seasonal Class Customers and Sales

Year	Customers			Use Per Customer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	4,490	70	1.6	259	12	5.1	13,959	879	6.7
2011	4,518	28	0.6	236	-23	-9.1	12,774	-1,185	-8.5
2012	67	-4,451	-98.5	282	46	19.6	227	-12,547	-98.2
2013	94	27	40.3	266	-16	-5.6	300	73	32.4
2014	115	21	22.3	268	2	0.9	370	70	23.5
2015	120	5	4.3	246	-23	-8.4	354	-17	-4.5
2016	125	5	4.2	277	31	12.8	416	62	17.5
2017	141	16	12.8	316	38	13.8	534	118	28.4
2018	144	3	2.1	360	44	14.0	621	88	16.4
2019	150	6	4.2	368	8	2.3	663	41	6.6
2020	160	10	6.7	351	-18	-4.8	673	10	1.6
2021	170	10	6.3	365	14	4.1	744	71	10.6
2022	180	10	5.9	364	-1	-0.2	787	43	5.7
2023	191	11	6.1	362	-2	-0.6	830	43	5.5
2024	203	12	6.3	359	-3	-0.8	875	45	5.5
2025	214	11	5.4	359	-1	-0.2	921	46	5.2
2026	225	11	5.1	359	1	0.2	970	49	5.3
2027	238	13	5.8	358	-1	-0.3	1,024	53	5.5
2028	251	13	5.5	358	0	-0.1	1,079	55	5.4
2029	262	11	4.4	358	0	0.0	1,126	47	4.4
2030	273	11	4.2	358	0	-0.1	1,172	46	4.1
2031	284	11	4.0	358	1	0.2	1,222	50	4.2
2032	295	11	3.9	360	1	0.4	1,274	52	4.3
2033	307	12	4.1	360	0	-0.1	1,325	51	4.0
2034	317	10	3.3	361	2	0.4	1,374	49	3.7
2035	329	12	3.8	361	0	0.0	1,427	53	3.8

Notes: Totals may not equal sum of components due to rounding.

In 2012, there was a reclassification of 4,400 customers from the Seasonal Class to the Residential Class.

Public Buildings Class Customers and Sales

Year	Customers			Use Per Customer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	1,046	48	4.8	3,172	207	7.0	39,809	4,301	12.1
2011	1,084	38	3.6	2,957	-214	-6.8	38,468	-1,341	-3.4
2012	1,096	12	1.1	2,676	-281	-9.5	35,194	-3,274	-8.5
2013	1,109	13	1.2	2,796	121	4.5	37,215	2,021	5.7
2014	1,117	8	0.7	2,966	169	6.1	39,753	2,537	6.8
2015	1,132	15	1.3	2,871	-95	-3.2	38,996	-757	-1.9
2016	1,137	5	0.4	2,758	-113	-3.9	37,627	-1,369	-3.5
2017	1,156	19	1.7	2,637	-121	-4.4	36,578	-1,049	-2.8
2018	1,165	9	0.8	2,943	306	11.6	41,142	4,563	12.5
2019	1,166	1	0.1	2,847	-96	-3.3	39,829	-1,313	-3.2
2020	1,171	5	0.4	2,554	-293	-10.3	35,885	-3,943	-9.9
2021	1,178	7	0.6	2,763	210	8.2	39,064	3,178	8.9
2022	1,184	6	0.5	2,797	34	1.2	39,744	680	1.7
2023	1,190	6	0.5	2,800	3	0.1	39,984	240	0.6
2024	1,197	7	0.6	2,789	-11	-0.4	40,066	82	0.2
2025	1,203	6	0.5	2,771	-18	-0.6	40,009	-58	-0.1
2026	1,209	6	0.5	2,759	-12	-0.5	40,027	18	0.0
2027	1,216	7	0.6	2,745	-13	-0.5	40,062	35	0.1
2028	1,222	6	0.5	2,733	-12	-0.4	40,080	18	0.0
2029	1,228	6	0.5	2,715	-18	-0.7	40,010	-70	-0.2
2030	1,235	7	0.6	2,698	-17	-0.6	39,979	-30	-0.1
2031	1,241	6	0.5	2,684	-13	-0.5	39,974	-5	0.0
2032	1,247	6	0.5	2,674	-11	-0.4	40,009	34	0.1
2033	1,254	7	0.6	2,658	-16	-0.6	39,993	-16	0.0
2034	1,260	6	0.5	2,646	-12	-0.5	40,003	10	0.0
2035	1,266	6	0.5	2,634	-12	-0.4	40,019	15	0.0

Note: Totals may not equal sum of components due to rounding.

Small Commercial Class Customers and Sales

Year	Customers			Use Per Customer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	32,553	173	0.5	59	4	7.3	1,935,479	148,367	8.3
2011	32,653	100	0.3	58	-1	-1.7	1,892,090	-43,389	-2.2
2012	33,069	416	1.3	57	-1	-1.7	1,883,241	-8,850	-0.5
2013	33,287	218	0.7	58	1	1.8	1,917,730	34,489	1.8
2014	33,670	383	1.2	57	-1	-1.7	1,919,198	1,468	0.1
2015	34,117	447	1.3	57	0	0.0	1,958,109	38,912	2.0
2016	34,252	135	0.4	57	0	0.0	1,951,787	-6,322	-0.3
2017	34,494	242	0.7	55	-2	-3.5	1,896,475	-55,312	-2.8
2018	34,199	-295	-0.9	57	2	3.6	1,962,505	66,030	3.5
2019	34,517	318	0.9	56	-1	-1.8	1,925,821	-36,684	-1.9
2020	34,750	233	0.7	52	-4	-7.1	1,798,762	-127,059	-6.6
2021	35,054	304	0.9	56	4	7.7	1,967,078	168,316	9.4
2022	35,341	287	0.8	57	1	1.8	2,015,313	48,234	2.5
2023	35,644	303	0.9	57	0	0.0	2,043,245	27,932	1.4
2024	35,929	285	0.8	57	0	0.0	2,062,484	19,239	0.9
2025	36,211	282	0.8	57	0	0.0	2,079,718	17,234	0.8
2026	36,507	296	0.8	57	0	0.0	2,097,729	18,011	0.9
2027	36,805	298	0.8	57	0	0.0	2,108,594	10,866	0.5
2028	37,093	288	0.8	57	0	0.0	2,125,152	16,558	0.8
2029	37,374	281	0.8	57	0	0.0	2,142,182	17,030	0.8
2030	37,658	284	0.8	57	0	0.0	2,153,353	11,171	0.5
2031	37,945	287	0.8	57	0	0.0	2,170,018	16,665	0.8
2032	38,240	295	0.8	57	0	0.0	2,188,051	18,033	0.8
2033	38,535	295	0.8	57	0	0.0	2,204,658	16,607	0.8
2034	38,827	292	0.8	57	0	0.0	2,215,933	11,275	0.5
2035	39,122	295	0.8	57	0	0.0	2,236,079	20,146	0.9

**Note: Totals may not equal sum of components due to rounding.  
Beginning in 2018 there is a reclassification from Small Commercial to Residential.**

Large Commercial Class Customers and Sales

Year	<i>Customers</i>			<i>Use Per Customer</i>			<i>Class Sales</i>		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	125	-13	-9.4	22,767	2,246	10.9	2,845,857	13,922	0.5
2011	128	3	2.4	22,571	-195	-0.9	2,889,142	43,285	1.5
2012	130	2	1.6	22,321	-251	-1.1	2,901,688	12,546	0.4
2013	135	5	3.8	22,355	34	0.2	3,017,925	116,237	4.0
2014	136	1	0.7	23,870	1,515	6.8	3,246,287	228,362	7.6
2015	129	-7	-5.1	23,099	-771	-3.2	2,979,716	-266,571	-8.2
2016	138	9	7.0	23,888	789	3.4	3,296,495	316,779	10.6
2017	149	11	8.0	22,788	-1,100	-4.6	3,395,430	98,935	3.0
2018	153	4	2.7	22,390	-398	-1.7	3,425,613	30,183	0.9
2019	157	4	2.6	21,111	-1,279	-5.7	3,314,391	-111,222	-3.2
2020	161	4	2.5	19,999	-1,112	-5.3	3,219,793	-94,598	-2.9
2021	169	8	5.0	20,987	988	4.9	3,546,763	326,970	10.2
2022	173	4	2.4	28,615	7,628	36.3	4,950,393	1,403,630	39.6
2023	178	5	2.9	28,473	-142	-0.5	5,068,151	117,758	2.4
2024	180	2	1.1	28,452	-21	-0.1	5,121,298	53,147	1.0
2025	183	3	1.7	28,269	-182	-0.6	5,173,293	51,995	1.0
2026	185	2	1.1	28,168	-101	-0.4	5,211,114	37,821	0.7
2027	187	2	1.1	28,066	-102	-0.4	5,248,287	37,173	0.7
2028	189	2	1.1	27,990	-76	-0.3	5,290,142	41,855	0.8
2029	191	2	1.1	27,892	-98	-0.4	5,327,401	37,259	0.7
2030	193	2	1.0	27,819	-73	-0.3	5,369,151	41,750	0.8
2031	196	3	1.6	27,643	-176	-0.6	5,418,073	48,922	0.9
2032	199	3	1.5	27,522	-121	-0.4	5,476,916	58,843	1.1
2033	202	3	1.5	27,324	-198	-0.7	5,519,501	42,585	0.8
2034	204	2	1.0	27,323	-2	0.0	5,573,828	54,327	1.0
2035	207	3	1.5	27,148	-175	-0.6	5,619,644	45,816	0.8

Note: Totals may not equal sum of components due to rounding.

**Public Street and Highway Lighting Class Customers and Sales**

Year	<i>Customers</i>			<i>Use Per Customer</i>			<i>Class Sales</i>		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	423	-1	-0.2	22	1	5.1	9,503	438	4.8
2011	416	-7	-1.7	24	1	5.3	9,845	342	3.6
2012	414	-2	-0.5	23	0	-2.0	9,600	-245	-2.5
2013	412	-2	-0.5	24	1	3.0	9,845	244	2.5
2014	408	-4	-1.0	24	0	1.7	9,916	72	0.7
2015	412	4	1.0	24	0	-1.2	9,890	-26	-0.3
2016	402	-10	-2.4	25	1	3.0	9,940	50	0.5
2017	381	-21	-5.2	24	0	-1.0	9,325	-615	-6.2
2018	390	9	2.4	23	-2	-7.9	8,796	-530	-5.7
2019	409	19	4.9	21	-1	-4.9	8,770	-25	-0.3
2020	429	20	4.9	20	-1	-5.4	8,703	-68	-0.8
2021	431	2	0.5	20	0	-0.4	8,707	4	0.0
2022	433	2	0.5	20	0	-0.4	8,714	8	0.1
2023	436	3	0.7	20	0	-0.6	8,724	9	0.1
2024	438	2	0.5	20	0	-0.1	8,751	27	0.3
2025	440	2	0.5	20	0	0.0	8,788	37	0.4
2026	441	1	0.2	20	0	0.1	8,817	28	0.3
2027	442	1	0.2	20	0	0.1	8,845	28	0.3
2028	444	2	0.5	20	0	-0.1	8,872	27	0.3
2029	445	1	0.2	20	0	0.1	8,898	26	0.3
2030	446	1	0.2	20	0	0.1	8,923	26	0.3
2031	447	1	0.2	20	0	0.1	8,949	25	0.3
2032	449	2	0.4	20	0	-0.2	8,974	25	0.3
2033	450	1	0.2	20	0	0.1	8,999	25	0.3
2034	451	1	0.2	20	0	0.1	9,024	25	0.3
2035	452	1	0.2	20	0	0.1	9,049	25	0.3

**Note: Totals may not equal sum of components due to rounding.**

REDACTED

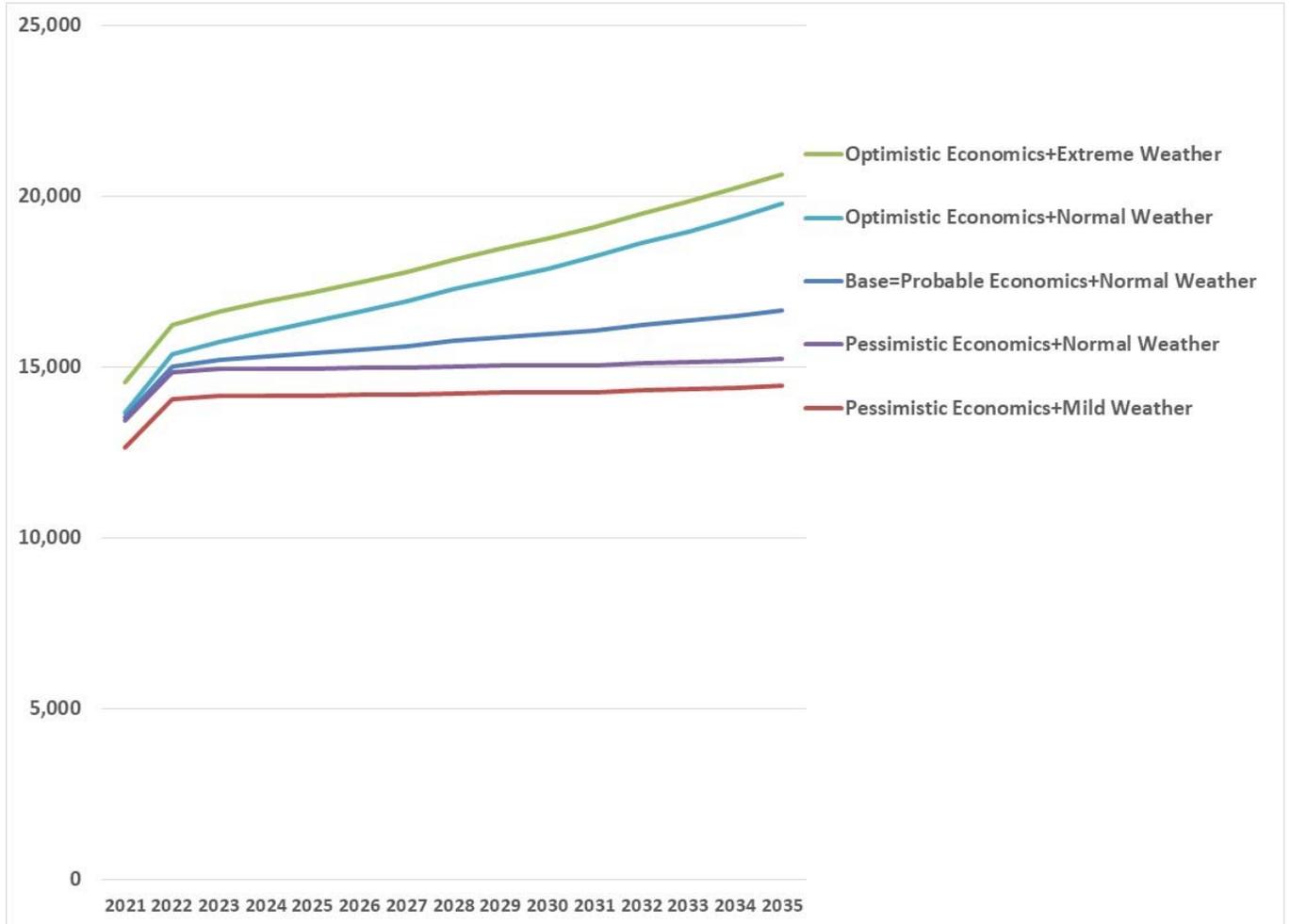
## Section 6.0 Results by Owner-Member

The forecast indicates that total energy sales growth is higher for owner-members located near large MSAs (Cincinnati, Lexington, and Louisville) or in the South Region. Owner-members located in the East Region are forecast to remain relatively flat.

Owner-Member	Economic Region	Customers		Total Energy Sales	
		Portion of System Total	Growth Rate 2021 - 2035	Portion of System Total	Growth Rate 2021 - 2035
Big Sandy RECC	East				
Blue Grass Energy	Central				
Clark Energy	North East				
Cumberland Valley Electric	East				
Farmers RECC	South Central				
Fleming Mason Energy	North East				
Grayson RECC	North East				
Inter County Energy	South				
Jackson Energy	East				
Licking Valley RECC	East				
Nolin RECC	North Central				
Owen Electric	North				
Salt River Electric	North Central				
Shelby Energy	North Central				
South Kentucky RECC	South				
Taylor County RECC	South				

## Section 7.0 Results by Weather and Economic Scenario

### Net Total Energy Requirements (MWh) by Economic and Weather Scenario



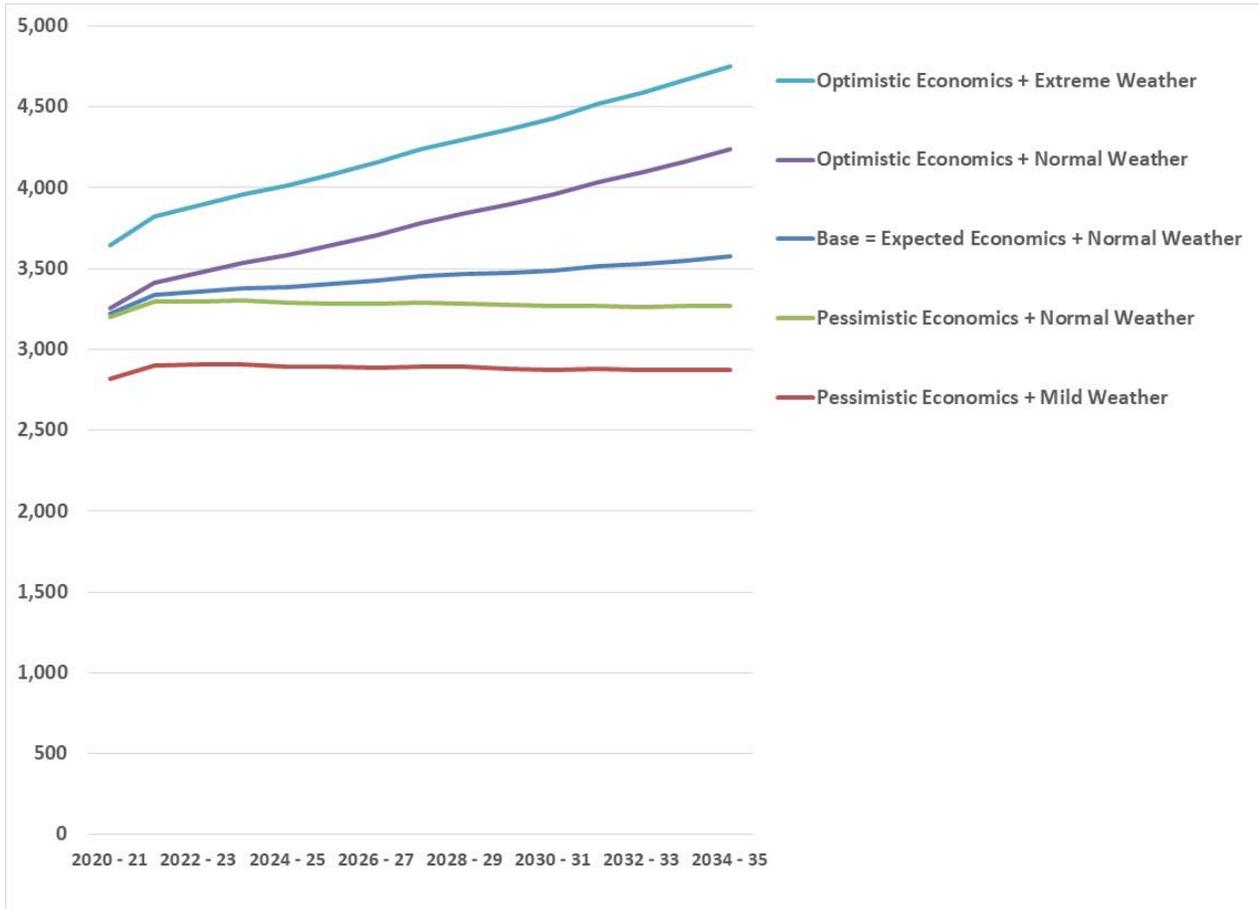
The higher economic growth scenario begins 1.1 percent and ends 18.7 percent greater than the baseline economic growth scenario. The lower economic growth scenario begins 0.6 and ends 8.6 percent less than the baseline economic growth scenario.

The higher economic growth scenario combined with extreme weather begins 7.6 percent and ends 23.9 percent greater than the baseline economic growth scenario. The lower economic growth scenario begins 6.4 and ends 13.3 percent less than the baseline economic growth scenario.

**Net Total Energy Requirements (MWh)  
By Economic and Weather Scenario**

Year	Pessimistic Economics Mild Weather	Pessimistic Economics Normal Weather	<b>BASE CASE</b>	Optimistic Economics Normal Weather	Optimistic Economics Extreme Weather
2021	12,653	13,441	<b>13,522</b>	13,677	14,551
2022	14,059	14,847	<b>15,025</b>	15,372	16,247
2023	14,147	14,936	<b>15,206</b>	15,736	16,610
2024	14,169	14,957	<b>15,319</b>	16,035	16,909
2025	14,170	14,958	<b>15,411</b>	16,317	17,191
2026	14,180	14,968	<b>15,515</b>	16,614	17,489
2027	14,191	14,979	<b>15,619</b>	16,918	17,792
2028	14,238	15,026	<b>15,762</b>	17,269	18,143
2029	14,245	15,033	<b>15,863</b>	17,580	18,454
2030	14,245	15,034	<b>15,959</b>	17,889	18,764
2031	14,262	15,050	<b>16,072</b>	18,223	19,097
2032	14,330	15,118	<b>16,242</b>	18,626	19,500
2033	14,343	15,131	<b>16,353</b>	18,969	19,844
2034	14,392	15,180	<b>16,505</b>	19,365	20,240
2035	14,444	15,233	<b>16,661</b>	19,773	20,647

### Net Winter Peak Demand (MW) by Economic and Weather Scenario



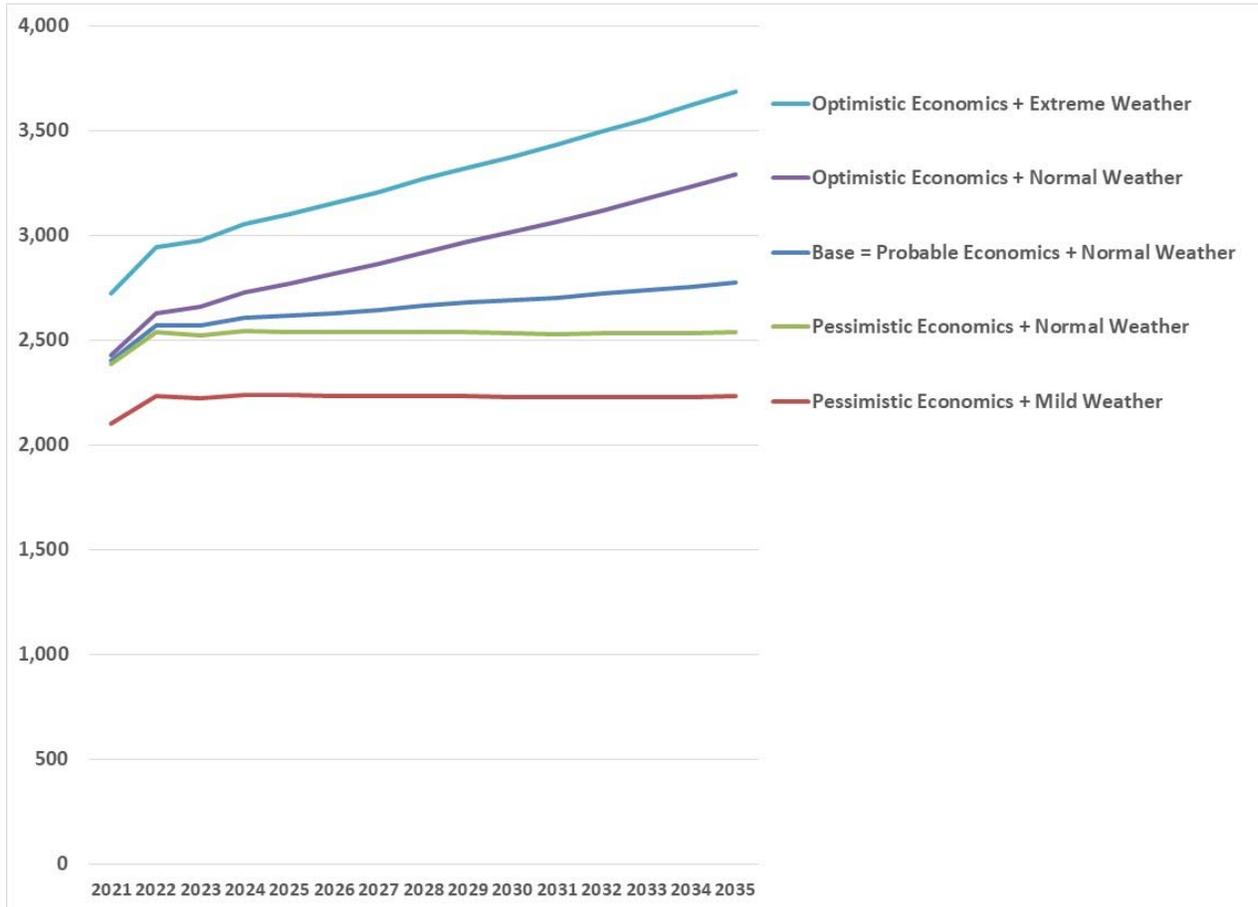
The higher economic growth scenario begins 1.1 percent and ends 18.7 percent greater than the baseline economic growth scenario. The lower economic growth scenario begins 0.6 and ends 8.6 percent less than the baseline economic growth scenario.

The higher economic growth scenario combined with extreme weather begins 13.3 percent and ends 32.9 percent greater than the baseline economic growth scenario. The lower economic growth scenario begins 12.5 and ends 19.5 percent less than the baseline economic growth scenario.

**Net Winter Peak Demand (MW) by Economic and Weather Scenario**

Year	Pessimistic Economics Mild Weather	Pessimistic Economics Normal Weather	<b>BASE CASE</b>	Optimistic Economics Normal Weather	Optimistic Economics Extreme Weather
2020 - 21	2,815	3,199	<b>3,219</b>	3,255	3,646
2021 - 22	2,902	3,297	<b>3,337</b>	3,414	3,824
2022 - 23	2,904	3,300	<b>3,359</b>	3,476	3,893
2023 - 24	2,904	3,300	<b>3,380</b>	3,538	3,962
2024 - 25	2,893	3,287	<b>3,387</b>	3,586	4,016
2025 - 26	2,890	3,284	<b>3,404</b>	3,646	4,083
2026 - 27	2,889	3,283	<b>3,424</b>	3,708	4,153
2027 - 28	2,896	3,291	<b>3,452</b>	3,783	4,236
2028 - 29	2,890	3,284	<b>3,466</b>	3,841	4,301
2029 - 30	2,882	3,275	<b>3,477</b>	3,897	4,364
2030 - 31	2,876	3,268	<b>3,490</b>	3,957	4,431
2031 - 32	2,880	3,272	<b>3,516</b>	4,032	4,515
2032 - 33	2,873	3,265	<b>3,528</b>	4,093	4,584
2033 - 34	2,874	3,266	<b>3,551</b>	4,167	4,667
2034 - 35	2,875	3,267	<b>3,574</b>	4,241	4,750

### Net Summer Peak Demand (MW) by Economic and Weather Scenario



The higher economic growth scenario begins 1.1 percent and ends 18.7 percent greater than the baseline economic growth scenario. The lower economic growth scenario begins 0.6 and ends 8.6 percent less than the baseline economic growth scenario.

The higher economic growth scenario combined with extreme weather begins 13.3 percent and ends 32.9 percent greater than the baseline economic growth scenario. The lower economic growth scenario begins 12.5 and ends 19.5 percent less than the baseline economic growth scenario.

**Net Summer Peak Demand (MW) by Economic and Weather Scenario**

Year	Pessimistic Economics Mild Weather	Pessimistic Economics Normal Weather	<b>BASE CASE</b>	Optimistic Economics Normal Weather	Optimistic Economics Extreme Weather
2021	2,101	2,388	<b>2,402</b>	2,430	2,721
2022	2,236	2,541	<b>2,572</b>	2,631	2,947
2023	2,221	2,524	<b>2,569</b>	2,659	2,978
2024	2,240	2,546	<b>2,607</b>	2,729	3,057
2025	2,236	2,541	<b>2,618</b>	2,772	3,105
2026	2,233	2,537	<b>2,630</b>	2,816	3,154
2027	2,233	2,538	<b>2,646</b>	2,866	3,210
2028	2,235	2,540	<b>2,664</b>	2,919	3,269
2029	2,234	2,539	<b>2,679</b>	2,969	3,325
2030	2,230	2,534	<b>2,690</b>	3,016	3,378
2031	2,227	2,531	<b>2,703</b>	3,064	3,432
2032	2,229	2,533	<b>2,721</b>	3,121	3,495
2033	2,229	2,533	<b>2,738</b>	3,176	3,557
2034	2,231	2,535	<b>2,756</b>	3,234	3,622
2035	2,233	2,537	<b>2,775</b>	3,293	3,688

**EAST KENTUCKY POWER COOPERATIVE, INC.  
FIRST REQUEST FOR INFORMATION**

**APPHARVEST'S FIRST REQUEST FOR INFORMATION DATED 5/14/21**

**REQUEST 2**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 2.** Why did the Company use a test year ending in 2019 and not a more recent year?

**Response 2.** EKPC selected the 12 months ending December 31, 2019 as the test year for this rate application because it believed it to be representative of reasonable, on-going conditions and operations. The majority of calendar year 2020 was impacted by the COVID-19 pandemic and EKPC believes the results from that period are not representative of normal, on-going business conditions and operations. As it takes time to prepare a rate case application and the utilization of a historic test year calls for adjustments being based on known and measurable conditions or events, no month in 2021 could be included in the test year.

**EAST KENTUCKY POWER COOPERATIVE, INC.**

**PSC CASE NO. 2021-00103**

**FIRST REQUEST FOR INFORMATION**

**APPHARVEST'S FIRST REQUEST FOR INFORMATION DATED 5/14/21**

**REQUEST 3**

**RESPONSIBLE PERSON: Isaac S. Scott**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 3.** Did the Company make any adjustments to the 2019 data because of the pandemic?

- a. If not, why not?
- b. If yes, what adjustments were made?

**Response 3.** EKPC did not make any adjustments to the historic test year because of the COVID-19 pandemic. EKPC does not believe the events during 2020 related to the COVID-19 pandemic reflect reasonable on-going business conditions and hopefully are temporary in nature.

**EAST KENTUCKY POWER COOPERATIVE, INC.**

**PSC CASE NO. 2021-00103**

**FIRST REQUEST FOR INFORMATION**

**APPHARVEST'S FIRST REQUEST FOR INFORMATION DATED 5/14/21**

**REQUEST 4**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 4.** When was the last meeting of the DSM collaborative?

a. If a report/minutes of the last meeting has been prepared, please attach of a copy of such.

b. Given AppHarvest Morehead Farm, LLC's ("AppHarvest") existing and anticipated high load and its expressed interest in DSM and Energy Efficiency, why hasn't AppHarvest been invited to join same?

**Response 4.** Consistent with the Commission's May 24, 2021 Order on rehearing, EKPC objects to this request on the grounds that the operation and participation in the DSM collaborative is not a subject of, or relevant to, the issues raised in this rate proceeding.

**EAST KENTUCKY POWER COOPERATIVE, INC.**

**PSC CASE NO. 2021-00103**

**FIRST REQUEST FOR INFORMATION**

**APPHARVEST'S FIRST REQUEST FOR INFORMATION DATED 5/14/21**

**REQUEST 5**

**RESPONSIBLE PERSON:** Scott Drake

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 5.** Please refer to the direct testimony of Scott Drake at page 3, and the answer to question appearing at line 1.

a. Why didn't you attach a copy of the 2020 Annual Demand Site Management Report?

b. Has the 2020 report been prepared?

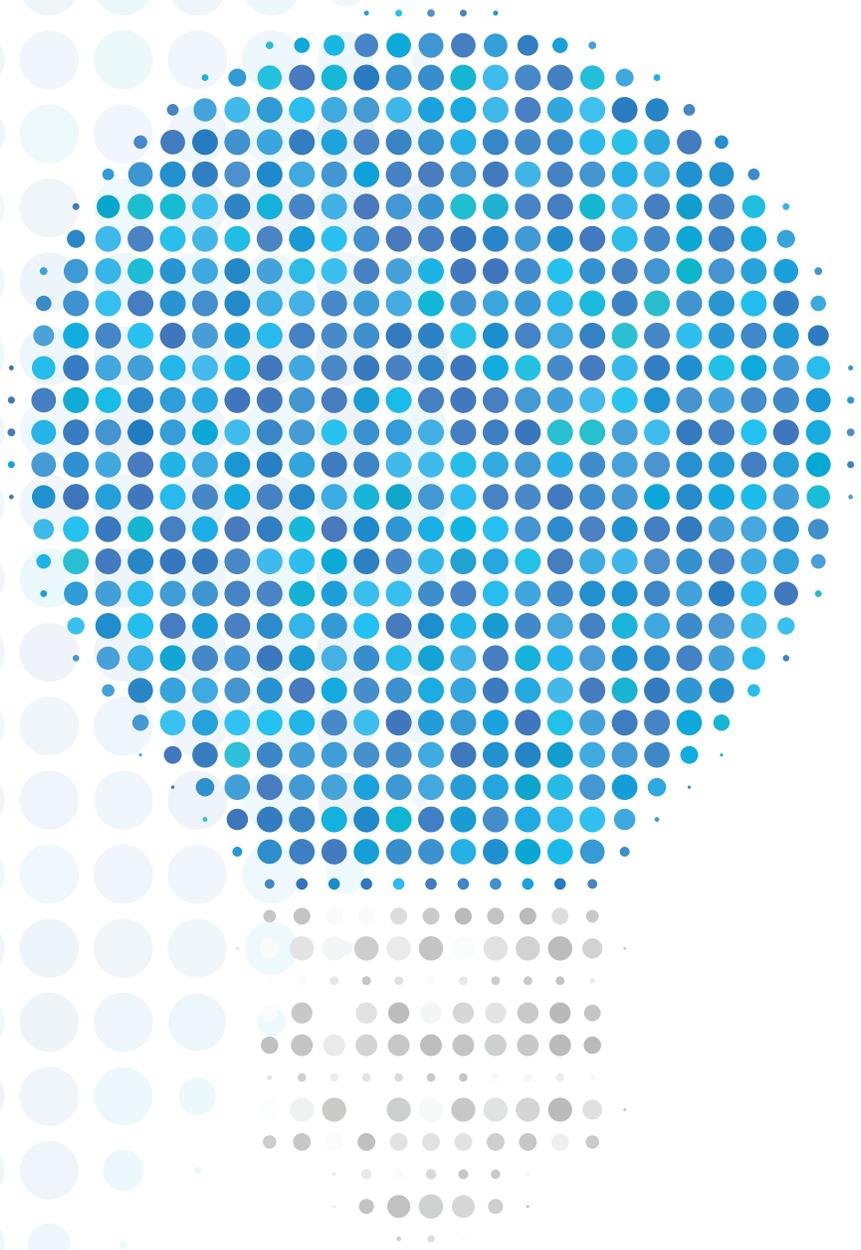
1. If yes, please attach a copy of that report.

2. If not, why not?

**Response 5.** At the time Mr. Drake was preparing his testimony, the 2020 Annual Demand Side Management Report was still being drafted. The report has been completed and is attached as pages 2 through 13 of this response.

# DSM

Demand Side Management  
2020 Annual Report



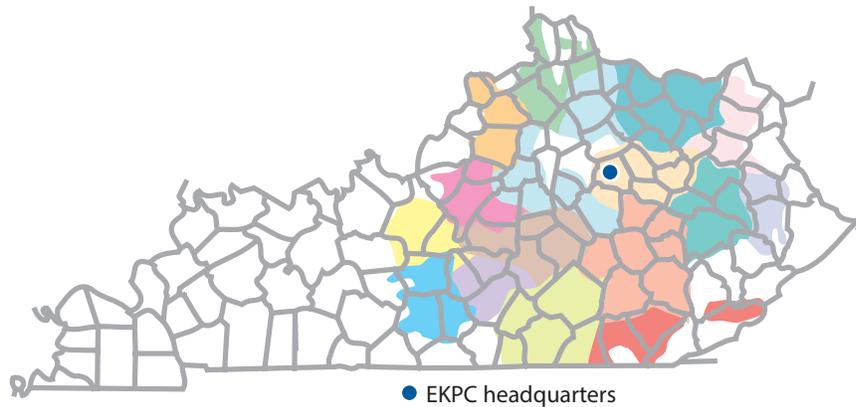
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## Who We Are

Located in the heart of the Bluegrass state, East Kentucky Power Cooperative is a not-for-profit generation and transmission (G&T) electric utility with headquarters in Winchester, Ky. Our cooperative has a vital mission: to safely generate and deliver affordable, reliable, sustainable electric power to 16 owner-member cooperatives serving more than one million Kentuckians.

Together, with our 16 owner-members, we're known as Kentucky's Touchstone Energy Cooperatives. The member co-ops distribute energy to over 554,000 Kentucky homes, farms, businesses and industries across 87 counties. We're leaders in energy efficiency and environmental stewardship. And we're committed to providing power to improve the lives of people in Kentucky.



### Sixteen distribution cooperatives, which are called the member systems, own EKPC. The 16 co-ops include:

- Big Sandy RECC
- Blue Grass Energy Cooperative
- Clark Energy Cooperative
- Cumberland Valley Electric
- Farmers RECC
- Fleming-Mason Energy Cooperative
- Grayson RECC
- Inter-County Energy
- Jackson Energy Cooperative
- Licking Valley RECC
- Nolin RECC
- Owen Electric Cooperative
- Salt River Electric Cooperative
- Shelby Energy Cooperative
- South Kentucky RECC
- Taylor County RECC

### East Kentucky Power Generation

<b>Coal</b>	<b>Generation</b>	<b>Natural Gas</b>	<b>Generation</b>	<b>Landfill</b>	<b>Generation</b>
Spurlock	1,346 net MW	Smith	Summer	Bavarian	4.6 net MW
Cooper	341 net MW	Combustion	753 net MW	Laurel Ridge	3.0 net MW
<b>Total</b>	<b>1,687 net MW</b>	Turbine	Winter	Green Valley	2.3 net MW
		Units	989 net MW	Pearl Hollow	2.3 net MW
		Bluegrass	Summer	Pendleton	3.0 net MW
<b>Hydro</b>	<b>Generation</b>	Combustion	501 net MW	Glasgow*	0.9 net MW
Southeastern	170 MW	Turbine	Winter	<b>Total Landfill</b>	<b>16.1 net MW</b>
Power Adm.		Units	567 net MW		
(SEPA)		<b>Total Natural Gas Summer</b>	<b>1,254 net MW</b>	<b>Solar Generation</b>	
		<b>Total Natural Gas Winter</b>	<b>1,556 net MW</b>	Cooperative Solar	8.5 net MW

\* Under an existing agreement, a third party receives the output of Glasgow in a 10-year power purchase agreement.

## Button-Up Weatherization:

Since the early 1990s, EKPC and its owner-member cooperatives have offered this program to improve a home's energy efficiency, comfort, and reduce energy use. This program offers incentives to members who air seal the shell of their home with the end goal of reducing heat loss in the home. Any member who resides in a site-built or manufactured home that is at least two years old and uses electricity as their primary source of heat is eligible.

### Button-Up Weatherization with Air Sealing:

*The Button-Up encourages members to air seal the envelope of their home. Air sealing is one of the most cost effective ways to improve the efficiency of a home. A blower door test is required before and after air sealing is completed to demonstrate the impact in kW demand reduction, and an incentive is paid based on that reduction. An additional incentive is paid for increased ceiling insulation.*

**In 2020, 27 Button-Up rebates were provided to members, resulting in a lifetime savings of 693 MWh and 1,385,568 pounds of carbon dioxide emissions.**



## ENERGY STAR™ Manufactured Home:

The ENERGY STAR™ Manufactured Home Program began in 2014. End use members who purchase and install an ENERGY STAR™ Manufactured Home are eligible for a rebate. ENERGY STAR™ Manufactured Homes are certified by a third-party administrator, Systems Building Research Alliance (SBRA) in order to ensure quality control.

An ENERGY STAR™ certified manufactured home is a home that has been designed, produced and installed by the home manufacturer to meet ENERGY STAR™ requirements for energy efficiency. These manufactured homes feature efficient heating and cooling equipment, water heaters, properly installed insulation, high-performance windows, tight construction and sealed ducts.

This program is available to all end-use members who qualify.

**In 2020, 6 rebates were provided to members, resulting in a lifetime savings of 365 MWh and 730,800 pounds of carbon dioxide emissions.**



## Touchstone Energy Home:

Since 2003, EKPC and its owner-member cooperatives have offered this program to increase energy efficiency in new-home construction. This program is designed to encourage new homes to be built to higher standards for thermal integrity and equipment efficiency, as well as to choose a geothermal or an air-source heat pump, rather than less efficient forms of heating and cooling. Homes built to Touchstone Energy Home standards typically use 30 percent less energy than the same home built to typical construction standards. Plans are submitted before the home is built, a pre-drywall inspection is made, and a blower door test is administered after the home is built to verify that the home meets the standard.

This program is targeted towards the residential new construction market and members who are constructing new site-built homes.

**In 2020, 264 Touchstone Energy Home rebates were provided to members, resulting in a lifetime savings of 16,685 MWh and 33,369,440 pounds of carbon dioxide emissions.**

EKPC's owner-members have also used this program to partner with Kentucky's affordable housing builders. Relationships with these organizations have led to improved efficiency in affordable housing and lower monthly energy costs for recipients of these homes.



## Heat Pump Retrofit:

For decades, EKPC and its owner-member cooperatives have offered this program to lower the cost of heating homes and increase comfort. This program provides incentives for members to replace their existing resistance heat source with a high-efficiency heat pump through two levels of rebates.

Level 1 offers a rebate for a 14 SEER/8.2 HSPF heat pump. Level 2 offers a rebate for a 15 SEER/8.5 HSPF heat pump or higher heat pump. Popularity of mini-split ductless heat pumps has risen in recent years. The retrofit program also offers a special incentive for mini-split systems. The existing heating system must be two years or older to qualify for incentives unless the heat pump is being installed in a new manufactured home. New manufactured homeowners who install a heat pump qualify based on the levels above.

The program is targeted to members who currently use a resistance heat source. Incentives are offered when the homeowner's primary source of heat is an electric resistance furnace, ceiling cable heat, or baseboard heat in both site-built and manufactured homes.

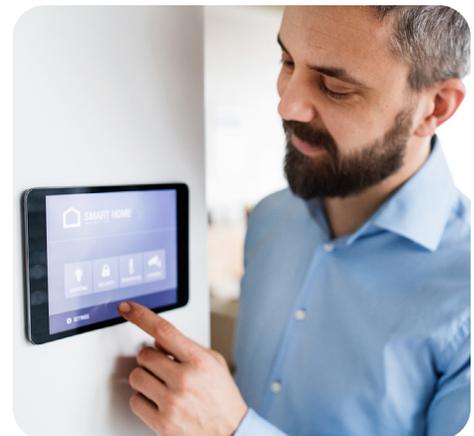
**In 2020, 363 Heat Pump Retrofit rebates were provided to members, resulting in a lifetime savings of 53,247 MWh and 106,493,120 pounds of carbon dioxide emissions.**



## Direct Load Control:

Since 2008, EKPC and its owner-member cooperatives have offered this program to manage peak usage. This program offers incentives to members who enroll central air-conditioners. Switches are installed and, during periods of high demand, the utility briefly cycles the appliance off in order to reduce system peaks and save on costs for peak power. Although EKPC's system typically peaks in winter, member's heating appliances are not interrupted to lower peak. Member comfort and safety are top priority.

This program is targeted to any member with central air-conditioning or heat pump. Beginning in 2019, EKPC also began offering a thermostat program that includes a qualifying Wi-Fi enabled thermostat so that end use members could enroll their smart thermostats in direct load control events. Enrollees in this program help lower energy demand during EKPC's system peaks.



## Residential Lighting:

Since 2003, EKPC and its owner-member cooperatives have provided more than one million compact fluorescent lights (CFL) and light-emitting diodes (LED) bulbs to members.

**In 2020, cooperatives provided 64,665 LEDs to its members. Each member who participated in a free, online energy audit called Virtual Energy Assessment received an LED, along with Annual Meeting attendees. These LEDs are expected to result in a lifetime savings of 12,416 MWh and 24,831,360 pounds of carbon dioxide emissions.**



## CARES:

The Community Assistance Resources for Energy Savings (CARES) program began in early 2015, and provides an incentive to enhance the weatherization and energy efficiency services provided to the end-use members by the Kentucky Community Action Agencies (CAA) network. EKPC and its owner-members provide an incentive to the CAA implementing the project on behalf of the end-use member.

This program is available to end-use members who qualify for weatherization and energy-efficiency services through their local CAA in all service territories of participating cooperatives. The maximum incentive possible per household is \$2,000.

**In 2020, 56 CARES incentives were provided, resulting in a lifetime savings of 3,974 MWh and 7,948,080 pounds of carbon dioxide emissions.**



# Impact Measures:

System summary of 2020 DSM program savings

DSM program totals (totals for installed energy-efficiency measures and total DLC participation for 2020)

All programs	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Lifetime energy savings (MWh)	Cost of demand saved (\$/kW)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
All DSM Programs	101,190	5,687	28.189	8.727	\$4,061,466*	\$87,635	\$66.72	0.025	175,270,908

## Button-Up Weatherization

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Measure life (years)	Lifetime energy savings (MWh)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
Button-Up	27	46	0.011	0.036	\$22,557	15	693	\$0.033	1,385,568

## CARES

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Measure life (years)	Lifetime energy savings (MWh)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
CARES	56	265	0.040	0.081	\$140,200	15	3,974	\$0.035	7,948,080

\* Includes \$835,972 program administration and promotional expenses.

## Energy Audits

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Measure life (years)	Lifetime energy savings (MWh)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
Online	100	51	0.000	0.000	\$133,000	5	256	\$0.519	512,540

## ENERGY STAR® Manufactured Home

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Measure life (years)	Lifetime energy savings (MWh)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
ES Manufactured Home	6	24	0.003	0.006	\$12,840	15	365	\$0.035	730,800

## Heat Pump Retrofit

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Measure life (years)	Lifetime energy savings (MWh)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
Heat Pump	363	2,662	0.124	0.000	\$629,632	20	53,247	\$0.012	106,493,120

## Residential Lighting

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Measure life (years)	Lifetime energy savings (MWh)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
LEDs	64,665	1,552	0.155	0.259	\$59,844	8	12,416	\$0.005	24,831,360

## Touchstone Energy Home

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Measure life (years)	Lifetime energy savings (MWh)	Cost of energy saved (\$/kWh)	Lifetime CO2 savings (lbs)
TSE Home Prescriptive	41	124	0.028	0.102	\$57,950	20	2,474	\$0.023	4,948,320
TSE Home Performance	223	711	0.159	0.585	\$323,400	20	14,211	\$0.023	28,421,120

## Direct Load Control Cumulative

Residential program	Participation	Annual Energy Savings (MWh)	Summer Demand Savings (MW)	Winter Demand Savings (MW)	2020 program costs	Cost of Demand saved (\$/KW)
DLC Air Conditioner	18,910	95	18.910	0.000	\$857,912	\$45.37
DLC Water Heater	14,731	147	5.450	7.660	\$668,319	\$122.62
Thermostats	2,068	10	3.309	0.000	\$319,840	\$96.66
Totals	35,709	252	27.669	7.660	\$1,846,072	\$66.72

## 2020 Basic Program Assumptions <sup>1</sup>

### Measure: Button-Up Weatherization with Air Sealing

Annual kWh Saved:	2,205
Winter Demand Savings:	1.71
Summer Demand Savings:	0.52
Lifetime of Savings:	15 years
Installation Rate:	100%
TRC: <sup>2</sup>	1.45

### Measure: Heat Pump SEER 14

From Electric Furnace to ENERGY STAR  
SEER 14, HSPF 8.2

Annual kWh Saved:	7,533
Winter Demand Savings:	0
Summer Demand Savings:	0.32
Lifetime of Savings:	20 years
Installation Rate:	100%
TRC: <sup>2</sup>	1.55

### Measure: Heat Pump SEER 15

From Electric Furnace to ENERGY STAR  
SEER 15, HSPF 8.5

Annual kWh Saved:	7,978
Winter Demand Savings:	0
Summer Demand Savings:	0.45
Lifetime of Savings:	20 years
Installation Rate:	100%
TRC: <sup>2</sup>	1.55

### Measure: Touchstone Energy Home

Prescriptive and Performance – Encourages new homes to be built to a standard of at least SEER 15, HSPF 8.5; HERS Rating of 75 and below

Annual kWh Saved:	3,172
Winter Demand Savings:	2.61
Summer Demand Savings:	0.71
Lifetime of Savings:	20 years
Installation Rate:	100%
TRC:	1.60

### Measure: LEDs

Annual kWh Saved:	24
Winter Demand Savings:	0.0040
Summer Demand Savings:	0.0024
Lifetime of Savings:	8 years
Installation Rate:	80%
TRC:	2.78

### Measure: Wi-fi Enabled Thermostat

Annual kWh Saved:	36
Winter Demand Savings:	0.00
Summer Demand Savings:	1.20
Lifetime of Savings:	15 years
Installation Rate:	100%
TRC:	3.96

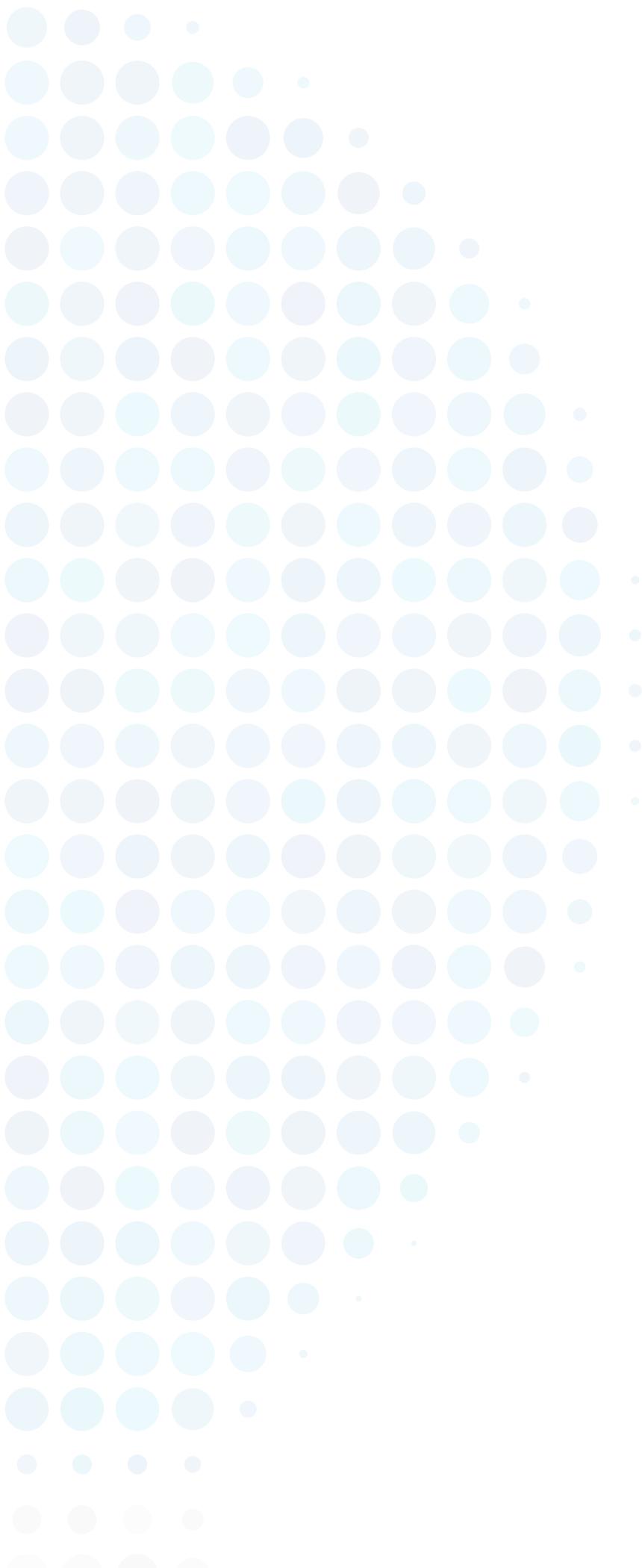
### Measure: CARES

Annual kWh Saved:	4,731
Winter Demand Savings:	1.44
Summer Demand Savings:	0.72
Lifetime of Savings:	15 years
Installation Rate:	100%
TRC:	0.96

### Measure: ENERGY STAR® Manufactured Home

Annual kWh Saved:	4,060
Winter Demand Savings:	0.93
Summer Demand Savings:	0.47
Lifetime of Savings:	15 years
Installation Rate:	100%
TRC:	1.71

<sup>1</sup> Savings numbers are "ex ante" or as planned gross savings except where noted.  
<sup>2</sup> Total Resource Cost (TRC) is an overall program benefits/costs analysts ratio.



A Touchstone Energy Cooperative 

4775 Lexington Road, 40391  
P.O. Box 707,  
Winchester, KY 40392-0707  
Telephone: 859-744-4812  
Fax: 859-744-6008  
[www.ekpc.coop](http://www.ekpc.coop)

**EAST KENTUCKY POWER COOPERATIVE, INC.**

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**REQUEST 6**

**RESPONSIBLE PERSON: Isaac S. Scott**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 6.** Please refer to the Exhibit 1 of Scott Drake's direct testimony at page 11, Commercial and Industrial Lighting.

a. Please describe in detail, the eligibility requirements and the benefits to the customer for participating.

b. Please attach copies of all materials related to this program, that describe the program and detail eligibility for the program.

c. Why must the lighting have been in service for two years?

d. After two years in service, will AppHarvest be eligible to participate?

e. Please indicate whether EKPC offers any other DSM/EE programs for Commercial and Industrial retail members.

**Response 6a-e.** Pursuant to the Commission's February 27, 2019 Order in Case No. 2019-00059,<sup>1</sup> the Commercial and Industrial Advanced Lighting Program was discontinued effective March 1, 2019. As for other programs available to commercial and industrial retail customers, as noted in the Commission's November 26, 2019 Order in Case No. 2019-00059, the only commercial program is for direct load control. The terms and conditions of that program are described in EKPC's tariffs, which are available on the Commission's website.

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<sup>1</sup> See *In the Matter of Demand-Side Management Filing of East Kentucky Power Cooperative, Inc.*, Case No. 2019-00059, Orders (Ky. P.S.C. Feb. 27, 2019 and Nov. 26, 2019).

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**REQUEST 7**

**RESPONSIBLE PERSON:** Scott Drake

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 7.** Please provide a detailed listing of all bidding that EKPC did of EE/DSM savings into any of the PJM auctions for the years 2016-2020. For each such bid, please state the date, whether such bid was accepted, amount of the bid, and the nature of the bid (i.e. direct load control, energy efficiency, etc.).

**Response 7.** EKPC's demand response assets fully transitioned to PJM's Capacity Performance market starting the 2018-2019 PJM delivery year. A requirement of the Capacity Performance market is that all participating assets must perform up to 12 hours during any one event. Managing an end-use participant's water heater and air conditioning for a 12-hour period places an unreasonable burden on the participant. Therefore, EKPC stopped direct load control asset participation in the PJM markets beginning the 2018-2019 PJM delivery year. The chart on page 2 of this response contains information for PJM market participation during the timeframe requested. EKPC's non-interruptible EE/DSM savings that participated in PJM auctions are all direct load control assets.

<b>PJM Delivery Year</b>	<b>Bid by EKPC (KW)</b>	<b>Minimum Bid Offering</b>	<b>Bid Accepted by PJM</b>	<b>PJM Clearing Price</b>	<b>Assets</b>
2015-2016	12776.31	\$0.00	Yes	\$136.00	Direct Load Control
2016-2017	18239.79	\$0.00	Yes	\$59.37	Direct Load Control
2017-2018	18239.79	\$0.00	Yes	\$120.00	Direct Load Control

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**REQUEST 8**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 8.** Please provide a short description of federal and state environmental rules and requirements that apply to EKPC by each generating facility.

a. For each facility please distinguish between: (1) rules and requirements with which EKPC is already in compliance, (2) expected changes to rules and requirements that would have a material effect on EKPC's operations and how its operations would be affected; and (3) rules and requirements with which EKPC is not yet in compliance.

b. What are EKPC's plans for retirement for each of EKPC's coal fired facilities?

c. What is EKPC's projected generation mix in the year 2030?

d. What is the capacity-utilization rate (factor) for each of EKPC's coal fired facilities by year from 2015 through 2020 as well as the first 4 months of this year?

**Response 8a-d.** EKPC objects to the overly broad request for information contained in the initial request and subparts a, c, and d. EKPC proposed no adjustments in its rate application related to the federal and state environmental rules and requirements

applicable to its generating facilities. EKPC utilized a historic test year in the preparation of its rate application and did not incorporate any forecasted information. Capacity utilization rates for EKPC's generation facilities were not incorporated in any proposed adjustments in the rate application. Consistent with the Commission's May 24, 2021 Order on rehearing, these issues are not relevant to issues raised in this rate proceeding. Concerning Request 8b, to the extent this information was considered in the development of EKPC's proposed depreciation study, the details requested would be incorporated in the depreciation study provided in Exhibit 15 of the application, the direct testimony of John J. Spanos and Exhibit JJS-1.

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**REQUEST 9**

**RESPONSIBLE PERSON:** Isaac S. Scott / Julia J. Tucker

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 9.** There are multiple utility scale merchant solar facilities that have obtained or are seeking approval to construct and interconnect with EKPC's transmission system.

EKPC objects to this series of requests as the potential development and deployment of numerous merchant solar facilities and the impacts on EKPC are not relevant to the issues raised in this rate proceeding. EKPC filed a rate application utilizing a historic test year and the possible addition of merchant solar facilities does not constitute know or measurable adjustments to EKPC's operations. In addition, none of the referenced merchant solar facilities have been completed or are operational. Consistent with the Commission's May 24, 2021 Order on rehearing, these issues are not relevant to issues raised in this rate proceeding. Without waiving said objections, EKPC responds as follows:

**Request 9a.** Please detail and quantify the costs and benefits of this expansion of EKPC's system. For example, (1) will this provide additional revenues; (2) will the new substations be part of EKPC's rate base; (3) will there be additional transmission costs? (4) Is it likely that on balance more revenues will be received than expenses? (5) Why or why not?

**Response 9a.** There are no costs or benefits to the EKPC system with regards to the new proposed solar facilities. PJM is responsible for the interconnection studies and facilities as needed. PJM is also responsible for seeking remuneration of expenses for performing those studies and/or adding facilities. To the extent that EKPC resources, including personnel, are involved in the interconnection process, all expenses are reimbursed to EKPC by PJM.

**Request 9b.** What will be the long term and short term effects on EKPC's system?

**Response 9b.** The effects to the EKPC system should be non-existent or minimal at best, however, there is no historical basis from which any specific conclusions about long-term or short-term effects may be drawn. The rules are designed to hold the transmission provider harmless. Any quantifiable expense created as a direct result of the proposed interconnection is to be borne by the solar project.

**Request 9c.** Is it anticipated that this will have an increase in demand for energy (and capacity, if applicable)?

**Response 9c.** There are no anticipated increases in demand for energy or capacity.

**Request 9d.** Is it anticipated that this will have any impact on EKPC's solar share/community cooperative solar program?

**Response 9d.** EKPC's community solar program was developed to supply alternative availability to solar generation for end-use members who would like to participate in solar generation but did not wish to have it installed at their location. The utility scale projects that are referenced in this request are seeking to sell large quantities of generation to a small number of buyers. Those buyers are not the same set of buyers that the community solar project was developed to serve. EKPC would not expect its program to be materially impacted by the large utility-scale projects.

**Request 9e.** Will the results of the many interconnection studies produced by PJM result in material changes to EKPC's system?

**Response 9e.** EKPC could increase the number of substations that are connected to its system, but there should be no material change in its transmission system. If a merchant solar project is found to create transmission issues on the system, the developer will be responsible for paying for the system to be modified to accommodate the generation output.

**Request 9f.** Will the sustainability goals of large customers have any impact on EKPC's transmission and generation planning?

**Response 9f.** Large customers who seek to have EKPC assist in the support of their sustainability goals by entering into a contract for services as defined in its Wholesale Renewable Energy Program tariff could impact EKPC's plans. As defined in the tariff, the customer would be responsible for any incremental costs associated with such support from EKPC. Without having specific information to consider, any impacts on EKPC's transmission and generation planning remain speculative.

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**REQUEST 10**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 10.** Are there any current, expiring or potential credits or incentives that may be available to EKPC or its retail end-users for constructing or using renewables?

**Response 10.** Consistent with the Commission's May 24, 2021 Order on rehearing, these issues are not relevant to issues raised in this rate proceeding and EKPC objects to this request as the availability of credits or incentives associated with the construction or utilization of renewables is not an issue that has been addressed in this rate proceeding.

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**REQUEST 11**

**RESPONSIBLE PERSON: Isaac S. Scott**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 11.** Please refer to EKPC's Cooperative Solar Project.

**Response 11.** EKPC notes this is not a request and as such, no response is required.

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**REQUEST 12**

**RESPONSIBLE PERSON:** Scott Drake and Julia J. Tucker

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 12.** How many panels in the Cooperative Solar Project have been leased at this point?

**Response 12.** One thousand and thirty-eight (1,038) panels.

**Request 12a.** What is the total KW's that have been leased?

**Response 12a.** EKPC would note that only the panels are leased in the Cooperative Solar Project, not the generation. With this clarification, the generation capacity associated with the leased panels is 342.5 kW.

**Request 12b.** From 2016 through March 2021 on an annual basis, please provide the total revenues the project has received from PJM.

**Response 12b.** The project does not receive revenue from PJM. The project supplies electric “behind the meter”, so less energy is purchased from PJM. Cooperative Solar participants are credited the costs that were avoided by the solar generation in accordance with the tariff.

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**REQUEST 13**

**RESPONSIBLE PERSON: Denver York**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 13.** Please refer to the direct testimony of Denver York.

**Request 13a.** Which of the Smart Grid technologies described in response to the question beginning on line 10, page 4 are considered distribution technologies and which are considered generation or transmission technologies?

**Response 13a.** For the Smart Grid technologies described in response to the question beginning on line 10, page 4, electronic, microprocessor-based relays, digital fault recorders, remotely controlled, motor-powered switch operators, travelling wave relays, online dissolved gas monitors, and online bushing monitors are considered generation or transmission technologies. Power Quality ("PQ") meters are considered distribution technologies.

**Request 13b.** If any of the technologies described are considered distribution technologies, please state the technology, estimate its cost and state whether the distribution company paid or reimbursed EKPC for its cost, and if not, why not.

**Response 13b.** PQ meters are considered distribution technologies. However, they are used to determine if there has been an anomaly in the service quality regardless of whether it was initiated on distribution or transmission equipment. The estimated cost of equipment and installation for the 72 PQ meters is \$338,400. EKPC uses these meters to help identify issues on transmission and does not charge the distribution cooperative for this equipment on an individual basis.

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**REQUEST 14**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 14.** Please state with specificity what regulatory changes have caused a need for the filing of this rate-case increase and approximately what percent of the rate increase relates to each regulatory change.

**Response 14.** No regulatory changes, as EKPC understands the term, contributed to the need for filing this rate application. The reasons for the proposed increase in EKPC's rates are described in detail in the rate application.

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**REQUEST 15**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 15.** Please state with specificity what its additional costs are to maintain G&T infrastructures and approximately what percent of the rate increase relates to increased maintenance costs.

**Response 15.** EKPC's determination of its proposed increase in revenues is detailed in Exhibit 13 of the Application, the direct testimony of Mr. Scott and Exhibit ISS-1, Schedules 1.00 through 1.30. Please see this information for adjustments associated with increased maintenance costs. Concerning the costs to maintain G&T infrastructures, please see EKPC's responses to the Commission Staff's First Request for Information, Requests 5 through 8.

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**REQUEST 16**

**RESPONSIBLE PERSON: Julia J. Tucker**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 16.** Please state the amount of load by year for each year from 2016-2021. Please state the projected load from 2021-2030.

**Response 16.** The table, provided on page 2 of this response, is the same table provide on page 4 of the Load Forecast Report referenced in Response 1e. Historical and forecasted energy requirements, and coincident winter and summer peak demands are shown.

**Coincident Peak Demands and Total Requirements**  
**Historical and Projected**

Season	Net Winter	Net Summer		Net Total	
	Peak Demand (MW)	Year	Peak Demand (MW)	Year	Requirements (MWh) Load Factor (%)
2009 - 10	2868.0	2010	2443.0	2010	13,376,292 53.2%
2010 - 11	2891.0	2011	2388.0	2011	12,666,998 50.0%
2011 - 12	2481.0	2012	2354.0	2012	12,190,070 55.9%
2012 - 13	2597.0	2013	2199.0	2013	12,644,590 55.6%
2013 - 14	3425.0	2014	2192.0	2014	13,163,516 43.9%
2014 - 15	3507.0	2015	2179.0	2015	12,604,942 41.0%
2015 - 16	2890.0	2016	2293.0	2016	13,039,953 51.4%
2016 - 17	2871.0	2017	2311.0	2017	12,680,111 50.4%
2017 - 18	3437.0	2018	2375.0	2018	13,576,581 45.1%
2018 - 19	3073.0	2019	2366.0	2019	13,140,304 48.8%
2019 - 20	2723.0	2020	2312.0	2020	12,790,896 53.5%
2020 - 21	3218.5	2021	2402.1	2021	13,521,597 48.0%
2021 - 22	3337.0	2022	2571.5	2022	15,025,345 51.4%
2022 - 23	3359.2	2023	2569.3	2023	15,205,782 51.7%
2023 - 24	3379.7	2024	2607.5	2024	15,318,864 51.6%
2024 - 25	3386.8	2025	2618.2	2025	15,411,475 51.9%
2025 - 26	3404.2	2026	2629.8	2026	15,514,567 52.0%
2026 - 27	3423.7	2027	2646.2	2027	15,618,780 52.1%
2027 - 28	3452.4	2028	2664.3	2028	15,761,578 52.0%
2028 - 29	3465.6	2029	2679.1	2029	15,863,406 52.3%
2029 - 30	3476.5	2030	2690.4	2030	15,959,404 52.4%
2030 - 31	3489.8	2031	2702.8	2031	16,072,284 52.6%
2031 - 32	3515.6	2032	2721.1	2032	16,241,768 52.6%
2032 - 33	3528.4	2033	2737.9	2033	16,353,444 52.9%
2033 - 34	3551.4	2034	2756.3	2034	16,505,292 53.1%
2034 - 35	3573.8	2035	2775.0	2035	16,661,197 53.2%

Impacts from demand response and energy efficiency programs have been subtracted from the projections.

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**REQUEST 17**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 17.** Please see Exhibit 23 sponsored by Isaac Scott. For each of the four rates listed (B, C, E Option 2, and G), please provide in which category each Fleming Mason tariff belongs.

**Response 17.** Please see EKPC's response to the Commission Staff's Second Request for Information, Request 41.

**Request 17a.** Why are contract and steam calculated separately?

**Response 17a.** The contract and steam categories reflect separate industrial concerns for which service is provided under special contracts approved by the Commission. The contract customer is provided electric service while the steam customer is provided electric service under Rate G and steam service under a separate contract.

**Request 17b.** Is Rate E, Option 2 the wholesale rate for the 16 member co-ops?

**Response 17b.** All 16 owner-members of EKPC take service under Rate E and all currently utilize Option 2.

**Request 17c.** Are the special contracts, contract category that list one (1) customer a customer in Fleming Mason's territory?

**Response 17c.** The customer identified as "contract" is not a customer of Fleming-Mason.

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**REQUEST 18**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 18.** Is the power that AppHarvest purchases from Fleming-Mason provided to Fleming-Mason, pursuant to Rate B, Rate C, Rate E, Option 2, Rate G or contract?

- a. If yes, which category?
- b. If not, please explain why not?

**Response 18.** Pursuant to the Industrial Power Agreement with Interruptible Service and Economic Development Rider between EKPC, Fleming-Mason, and AppHarvest, paragraph 2, page 3, EKPC provides wholesale electricity to Fleming-Mason under Rate B.

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**REQUEST 19**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 19.** Please refer to the direct testimony of John Wolfram filed in each of the distributed pass-through cases. Please see the answer to the question in lines 1-2 on page 3.

a. Please provide the summary provided and a copy of all work papers used to calculate the proposed increase by distribution cooperative wholesale rate class.

**Response 19.** Please see Fleming-Mason's response to AppHarvest's First Request for Information dated May 14, 2021, Request 2, which was filed on May 26, 2021.

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REQUEST 20

RESPONSIBLE PERSON: Richard J. Macke  
COMPANY: East Kentucky Power Cooperative, Inc.

**Request 20.** For whatever category AppHarvest belongs (B, C, E, G or contract), please provide a chart similar to Table 3 which shows the changes which would have resulted from the cost-of-service study without the adjustments Mr. Macke undertook described on page 19 of his testimony.

**Response 20.** AppHarvest is served under Rate B with interruptible service and the economic development rider. The table below shows the cost of service study results for Rate B versus the present rates is included below:

Summary of Cost of Service Results					
Line No.	Description	Present Rates	Cost of Service Results		As Percent
		Amount	Amount	Difference	
1		\$	\$	\$	
2	<b><u>Totals Revenues by Rate</u></b>				
3	Rate B	59,815,719	61,816,100	2,000,381	3.3%
4					

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**REQUEST 21**

**RESPONSIBLE PERSON: Richard J. Macke**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 21.** Were Mr. Macke's adjustments interclass, intraclass, or both?

**Response 21.** Assuming the question relates to rate design, the answer is that the adjustments were both interclass and intraclass.

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**REQUEST 22**

**RESPONSIBLE PERSON: Richard J. Macke**

**COMPANY: East Kentucky Power Cooperative, Inc.**

**Request 22.** Please show the adjustments made to each class that differed from the COS study.

**Response 22.** The table provided in response to Request 20 provides a partial answer to this question. In addition, please reference EKPC's response to the Commission Staff's Second Request for Information, Request 32.

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**REQUEST 23**

**RESPONSIBLE PERSON:** Isaac S. Scott

**COMPANY:** East Kentucky Power Cooperative, Inc.

**Request 23.** Does EKPC have any plans to consider revising its green tariff so as to financially incent more customers? If yes, please describe its plans. Does it expect to evaluate a green tariff specifically developed to attract customers in the AgTech sector? If yes, please provide details of the evaluation.

**Response 23.** Consistent with the Commission's May 24, 2021 Order on rehearing, these issues are not relevant to issues raised in this rate proceeding, EKPC objects to this request as it requests information about future plans of EKPC that are not addressed in this rate application. Any changes to any of EKPC's tariffs will be submitted to the Commission for its approval at the appropriate time.