

CARES Program

DSM Program Changes

Explanation CARES Program

Background

EKPC Community Assistance Resources for Energy Savings (“CARES”) program provides an incentive to enhance the weatherization and energy efficiency services provided to the retail members of the Owner-Members of EKPC by the Kentucky Community Action Agency (“CAA”) network of not-for-profit community action agencies. EKPC provides an incentive through the Owner-Member to the CAA on behalf of the retail member. EKPC’s incentive enables the CAA to accomplish additional energy efficiency improvements in each home. The additional incentive from EKPC assists the CAA in weatherizing more homes.

Cost-effectiveness

The CARES program remains cost-effective based on the most recent avoided electricity and natural gas costs that were used for EKPC’s 2022 IRP filing.

The benefit-cost ratio for the CARES program using the TRC test is 1.15.

Please refer to the program assumptions sheet and cost-effectiveness summary sheet (attached) for more details.

Tariff Changes

The CARES program was originally designed to partner only with the CAA Network. However, EKPC has recently become aware of other 501(c)(3) nonprofit entities in the Owner-Members’ service territories that are performing rehabilitation work on existing homes. These Affordable Housing organizations (*i.e.* Habitat for Humanity) are improving insulation, air sealing, and mechanicals at many of their job sites. The efforts they are putting forward align with the improvements EKPC requires in the CARES program. As a result, EKPC plans to alter the tariff so that any 501(c)(3) affordable housing organization in the Owner-Members’ service territories can participate in this program.

The incentive structure and payments to the Owner-Member will remain the same. The total transfer payment amount can be up to \$2,700 per residence.

DSM for 2022 IRP

CARES Program (Low income)

EKPC provides an incentive to enhance the weatherization and energy efficiency services provided to its low income residential members by the Kentucky Community Action network of community action agencies (CAAs). Heat pump eligible homes receive a new SEER 14 heat pump as well as weatherization measures. Other homes receive only weatherization measures.

15 years of participation Year 1 is 2022

<u>Assumption</u>	<u>Source</u>
Load Impacts Before Participant 11,286 kWh, 8.81 kW (coincident with winter system peak), 3.45 kW (summer), 750 therms Savings: 4,495 kWh, 59 therms After Participant 6,791 kWh, 7.47 kW (coincident with winter system peak), 2.79 kW (summer), 691 therms	HVAC loads for a typical heat pump in typical residence. Note: the program savings are based on a mix of homes with different primary heating systems: electric furnace, wood, heat pump, and other non-electric heat. Plus gas furnace. HVAC loads for a typical heat pump home reduced by 4,495 kWh. Savings estimate is a weighted average based on measure packages and baseline HVAC consumption of the different participation categories. Weighted gas savings of 59 therms.
Lifetime of savings Discount rate for TRC and RIM Generation Capacity Cost -PJM Market, 100% summer \$36.50 per kW-year in 2022 Avoided Electricity Energy Costs - PJM Market, AEP-Dayton hub, \$30.31 /MWh in 2022 Transmission Capacity Cost - OATT tariff \$ 24.31 per kW-year in 2022 Avoided Gas Commodity Costs - \$2.87 per Mcf in 2022 Participant Costs \$ 867	15 years 5 percent per EKPC data, 3/14/21; 3.5 % societal test from Mercatus Center report PJM capacity performance market March 2021, start year is 2022. Updated escalators to match. 100% allocation to summer based on March 3, 2021 ACES Forward prices for AEP_Dayton hub. \$30.31 /MWh in 2021. DSMore Scenario 2, 1.193 esc in 2022 Network rate, 2020-21. 2.3 % escalation rate. Applied to winter coincident peak. DSMore scenario 2. Based on Aces Henry Hub 3/2021 forecast . This is the Kentucky Housing share of measure costs, modeled to calculate a true TRC
Administrative Cost EK \$21,250 fixed annual (2022-2036) 2% esc. Co-op \$2,106 per new participant	0.1 FTE for implementation admin, plus M&V. escalated at 2% to 2022 This includes the rebate to the CAA (avg will be \$2,000) but since it does not go to the consumer it is treated as a program cost. Plus coop admin cost (\$106 per participant).
Rate Schedule - Retail Median Residential Rate for Co-ops Cust chrg \$15.00, Energy Rate \$.08532 Rate Schedule - Wholesale East Kentucky E-2 rate. Natural gas delivery rate is \$ 5.578 per Mcf in 2018 (\$0.578 per ccf for DSMore units)	Current rates in effect as of February, 2020 Current rates in effect as of February, 2020 Current rates as of August 2021. From Columbia Gas of KY GSR rate. Sum of base rate charge and gas cost demand. DSMore adds in the commodity portion using the market forecast.
Participation - 2022-2036: 375. 0% Free Riders	Based on budget allocation for \$ 3 million base case
Rebates Co-op to Participant \$0 EK to Co-op \$2,670	Direct installation program - no participant out of pocket costs 100% reimbursement of program costs plus 5 years net lost revenue

CARES program (Low income) for 2022 IRP: 15 years participation

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 17,011,193	Revenue Declines	(\$22,997,088)
Rebates From EK	\$12,356,928	Administrative Costs	(\$9,746,701)
		Rebates Paid To Consumers	\$0
Total Benefits	\$29,368,121	Total Costs	(\$32,743,788)
Benefit / Cost Ratio: 0.90			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$9,802,796	Up Front Investment	(\$2,621,197)
Rebates From Distribution System	\$ -		
Reductions in Gas bill	\$1,160,089		
Total Benefits	\$10,962,885	Total Costs	(\$2,621,197)
Benefit / Cost Ratio: 4.18			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$9,737,687	Up Front Customer Investment	(\$4,012,531)
Avoided Gen Capacity Costs	\$3,065,896	Distribution System Admin. Costs	(\$9,746,701)
Avoided Transmission Expense	\$2,061,614	EK Administrative Costs	(\$262,257)
Reduced Nat Gas Costs	\$1,194,361		
Total Benefits	\$16,059,558	Total Costs	(\$14,021,488)
Benefit / Cost Ratio: 1.15			

EK Benefits		EK Costs	
Avoided Energy Costs	\$9,737,687	Decrease In Revenue	(\$17,011,193)
Avoided Gen Capacity Costs	\$3,065,896	Rebates Paid	(\$12,356,928)
Avoided Transmission Expense	\$2,061,614	Administrative Costs	(\$262,257)
Total Benefits	\$14,865,197	Total Costs	(\$29,630,378)
Benefit / Cost Ratio: 0.50			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$12,012,363	Up Front Customer Investment	(\$4,411,882)
Avoided Gen Capacity Costs	\$3,738,493	Utility Admin Costs	(\$11,005,110)
Avoided Transmission Expense	\$2,495,959		
Environmental Externalities	\$0		
Reduced Gas Costs	\$ 1,466,075		
Total Benefits	\$19,712,890	Total Costs	(\$15,416,993)
Benefit / Cost Ratio: 1.28			

Combined RIM:			
Benefits:	\$14,865,197	Costs:	(\$33,006,045)
Benefit / Cost Ratio: 0.45			

Button-Up Weatherization

DSM Program Changes Explanation

Button-up Weatherization Program

Background

The Button-up Weatherization (“Button-up”) Program is designed to incentivize members with poor energy-performing homes to improve the energy efficiency of the home’s shell. The program’s primary focus is on air sealing the shell of the home and improving ceiling insulation. Air-sealing actions reduce air infiltration by sealing air leaks in the shell walls, floors or ceiling. Electrical and plumbing protrusions as well as window and door seals are typical places where air leaks cause the home to lose heat in the winter. The incentive is paid based on heat loss reduction measured in British Thermal Units per hour (“BTUH”). Heat losses are reduced by lowering air leakage via improved air-sealing. The Button-up program is an important program to assist members with high bills caused by excessive heat loss. Air-sealing and improved ceiling insulation are the most cost-effective measures to improve home energy performance.

In 2021, EKPC resumed its working relationship with the Collaborative group. The Collaborative public-interest representatives requested that EKPC and its Owner-Members consider adding a measure for duct sealing to the existing button up tariff. Duct sealing targets the air sealing of ducts in existing homes that are located in un-heated spaces like attics or crawlspaces. The measure is cost-effective. Reducing the amount of duct leakage has a beneficial impact on the end user’s energy costs.

Cost-effectiveness

The most recent energy efficiency potential study (GDS Associates, October 2021) identified duct sealing as a cost-effective measure. Across all housing types and heating technologies, the weighted average benefit-cost ratio for the duct sealing measure using the TRC test is 2.33.

Including the duct sealing measure in the program results in a TRC of 1.68 for the Button-up program.

These results are based on the avoided costs used in EKPC’s 2022 IRP filing. Measure costs, savings, and savings lives are based on the October 2021 GDS study, which is included as an Exhibit in EKPC’s 2022 IRP filing.

Please refer to the program assumptions sheet and cost-effectiveness summary sheet (included) for more details.

Tariff Changes

The Button-up tariff is being changed to provide an incentive for duct sealing. Duct sealing is a standalone measure that is calculated differently than the performance-based Button-up incentive. End-use members who improve their duct leakage are eligible for a \$400 incentive per duct system.

The HVAC duct sealing portion of the Button-up program will pay a \$400 incentive to residential members (or their contractor) that meets the eligibility requirements for duct sealing listed above. EKPC will also pay the Owner-Member an administrative fee of \$100 and lost margins of \$150. EKPC will pay a total transfer payment of \$650.

DSM for 2022 IRP

Button-Up Weatherization Program

15 years of participation Year 1 is 2022

The Button-Up Weatherization Program offers an incentive for reducing the heat loss of a home. Measures are **ceiling insulation, air sealing, and duct sealing.**

<u>Assumption</u>	<u>Source</u>
Load Impacts Before Participant 10,500 kWh, 8.12 kW (coinc. with winter system peak), 2.47 kW (summer) Savings: 2,253 kWh 1.74 kW (winter) 0.53 kW (summer) After Participant 8,247 kWh, 6.38 kW (winter peak), 1.94 (summer peak)	Mix of Furnace/Central AC and air source heat pump weighted according to saturation in existing single family homes. 70% heat pump, 30% furnace/CAC. GDS kWh savings for ceiling insulation, air sealing, & duct sealing, weighted by home type and electric heat technology
Lifetime of savings Discount rate for TRC and RIM Generation Capacity Cost -PJM Market, 100% summer \$36.50 per kW-year in 2022 Avoided Electricity Energy Costs - PJM Market, AEP-Dayton hub, \$30.31 /MWh in 2022 Transmission Capacity Cost - OATT tariff \$ 24.31 per kW-year in 2022 Participant Costs \$1,401	20 Years weighted by measure kWh 5 percent per EKPC Data, 3/14/21; 3.5 % societal test from Mercatus Center report PJM capacity performance market March 2021, start year is 2022. Updated escalators to match. 100% allocation to summer based on March 3, 2021 ACES Forward prices for AEP_Dayton hub. \$30.31 /MWh in 2021. DSMore Scenario 2, 1.193 esc in 2022 Network rate, 2020-21. 2.3 % escalation rate. Applied to winter coincident peak. GDS measure costs, weighted
Administrative Cost EK \$5,400 per year (2012-2036), 2% escalation Co-op \$316 per new participant	Program admin estimate of \$4,300 provided by EKPC Marketing/Communications, October 2010 updated to 2021 (using PPI). Also includes \$0 advertising budget. Labor costs are \$116. (2 hours times \$58 per hour). Plus \$200 for pre and post blower door test.
Rate Schedule - Retail Median Residential Rate for Co-ops Cust chrg \$15.00 , Energy Rate \$.08532 Rate Schedule - Wholesale East Kentucky E-2 rate.	Current rates in effect as of February, 2020 Current rates in effect as of February, 2020
Participation - 2022-2036: 280 10% free riders	Based on budget allocation for the \$ 3 million base case. Free riders based on Frontier Assoc study for LG&E/KU
Rebates Co-op to Participant \$ 510 EK to Co-op \$ 1,000	Based on tariff - \$40 per 1,000 BTUH design day heating loss reduction Reimburse for rebate, 50% of admin costs, plus compensation for net lost revenues.

Button Up Weatherization program for 2022 IRP: 15 years of participation

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 8,037,095	Revenue Declines	(\$9,645,229)
Rebates From EK	\$3,455,620	Administrative Costs	(\$1,091,976)
		Rebates Paid To Consumers	(\$1,762,366)
Total Benefits	\$11,492,715	Total Costs	(\$12,499,571)
Benefit / Cost Ratio: 0.92			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$4,069,672	Up Front Investment	(\$3,162,608)
Rebates From Distribution System	\$ 1,151,271		
Reductions in O&M costs	\$0		
Total Benefits	\$5,220,943	Total Costs	(\$3,162,608)
Benefit / Cost Ratio: 1.65			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$4,849,388	Up Front Customer Investment	(\$4,357,192)
Avoided Gen Capacity Costs	\$2,118,078	Distribution System Admin. Costs	(\$1,091,976)
Avoided Transmission Expense	\$2,284,231	EK Administrative Costs	(\$66,644)
Reduced Customer O&M costs	\$0		
Total Benefits	\$9,251,697	Total Costs	(\$5,515,812)
Benefit / Cost Ratio: 1.68			

EK Benefits		EK Costs	
Avoided Energy Costs	\$4,849,388	Decrease In Revenue	(\$8,037,095)
Avoided Gen Capacity Costs	\$2,118,078	Rebates Paid	(\$3,455,620)
Avoided Transmission Expense	\$2,284,231	Administrative Costs	(\$66,644)
Total Benefits	\$9,251,697	Total Costs	(\$11,559,360)
Benefit / Cost Ratio: 0.80			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$6,217,477	Up Front Customer Investment	(\$4,790,846)
Avoided Gen Capacity Costs	\$2,668,252	Utility Admin Costs	(\$1,273,933)
Avoided Transmission Expense	\$2,854,563		
Environmental Externalities	\$0		
Total Benefits	\$11,740,292	Total Costs	(\$6,064,779)
Benefit / Cost Ratio: 1.94			

Combined RIM:

Benefits: \$9,251,697 Costs: (\$12,566,215)

Benefit / Cost Ratio: 0.74