Frankfort Plant Board

Energy Efficiency Program Plan Final Report

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VEIC | September 2018

Agenda

- Introductions
- Reminder of key project purpose and objectives
- Key findings
- Phase I program recommendations
- Recommendations on hiring implementer vs. in-house implementation
- Costs and benefits of energy efficiency programs
- Next steps for FPB
- Questions and discussion

Why Did Frankfort Plant Board Hire VEIC?

- To engage stakeholders, community members, and customers to understand their energy efficiency needs
- To develop an energy efficiency program plan that is overall aligned with the needs of these groups

What is Energy Efficiency?

- Energy efficiency allows for the same activities to be accomplished for less energy and lower utility bills
- Benefits of energy efficiency extend well beyond energy and utility bill savings

FPB's Objectives for Energy Efficiency Plan

- Focuses on Frankfort Plant Board customers and provides options for them to lower their bills
- Maximizes the amount of overall savings per dollar spent by FPB on energy efficiency programs
- Integrates individual programs into a unified strategy and plan that supports all billing classes
- Provides future flexibility to choose different program combinations based on what is or isn't working
- Includes education and outreach as a key component

Project Timeline

- Kick-off in **mid-April**
- Conduct first round of interviews and present project at the **May board meeting**
- Further community outreach and present progress update at the **July board meeting**
- Develop final report and present findings, proposed plan, and recommendations at the **September board meeting**

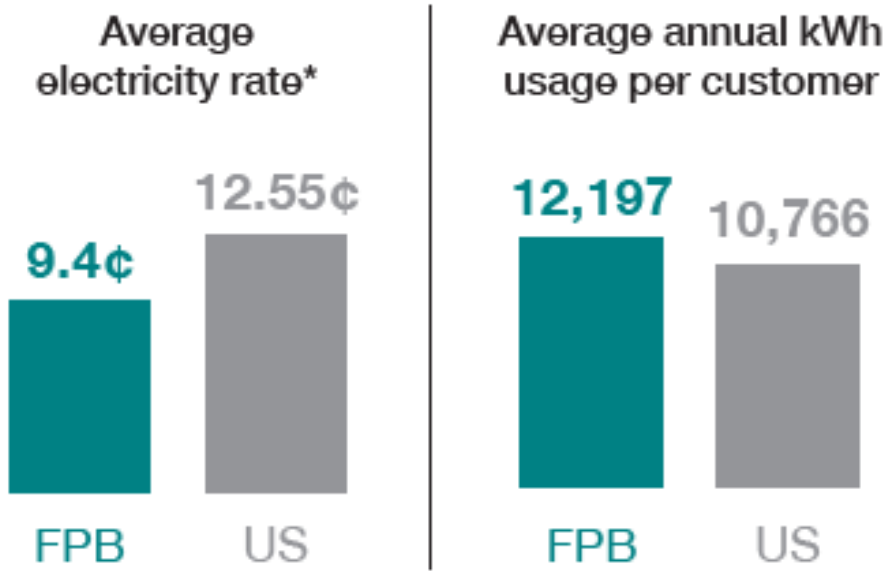
Project Tasks and Final Report

- Executive Summary (page 4)
- Energy Efficiency Programs from KY & Midwest Utilities (page 9)
- Stakeholder Engagement (page 20)
- Energy Efficiency Opportunities in FPB Service Territory (page 23)
- Energy Efficiency Implementation Options and Recommendations (page 24)
- Recommended Energy Efficiency Program for Phase I (page 32)
- Recommended Next Steps (page 37)
- Program Options Matrix (Appendix B – multiple tabs in separate Excel file)
- Phase I Program Briefs (Appendix C – page 43)

Key Findings: Frankfort Plant Board

- Low rates
- Relatively high residential energy bills

Frankfort Plant Board's electricity rates are lower than the national average, but residents' energy consumption is higher.



*Only includes kWh usage cost, and does not include any additional service charges.

Key Findings: Kentucky Utility Programs

Kentucky Utility	Electric Customers	Types of Electric Energy Efficiency Programs	Delivery Approach	Approximate Annual Budget
Kentucky Utility (KU) and Louisville Gas & Electric (LG&E)	964,000	• 1 Low-income • 1 Residential (discontinued 4 residential) • 3 Commercial, Industrial and Institutional	3rd Party Implementer	$14.3 million
East Kentucky Power Cooperative	530,000	• 1 Low-income • 10 Residential • 3 Commercial, Industrial and Institutional	Hybrid	$10 million

Key Findings: Midwest Municipal Utility Programs

Midwest Municipal Utility	Electric Customers	Types of Electric Energy Efficiency Programs	Delivery Approach	Approximate Annual Budget
Cedar Falls Utilities; IO	37,000	• 4 Residential • 2 Commercial, Industrial and Institutional	In-house	$910,000
City Utilities Springfield; MO	150,000	• 5 Residential • 2 Commercial, Industrial and Institutional	In-house	$1.5 million
City Water, Light & Power; IL	111,000	• 1 Low-income (discontinued) • 2 Residential • 1 Commercial, Industrial and Institutional	In-house	$3 million
Southern Minnesota Municipal Power Agency; MN	118,000 through 18 municipal utilities in MN	• 3 Residential • 3 Commercial, Industrial and Institutional	Hybrid model	2.5 million – SMMPA budget only- does not include individual muni utility costs
American Municipal Power, Inc.; OH, PE, MI, KY, WV, IN, MD, DE	650,000 through 135 members across 9 states	Delivered through Efficiency Smart to 25 members: • 1 Low-income • 4 Residential • 3 Commercial, Industrial and Institutional	3rd Party implementer	Range $3.3 million to $9 million

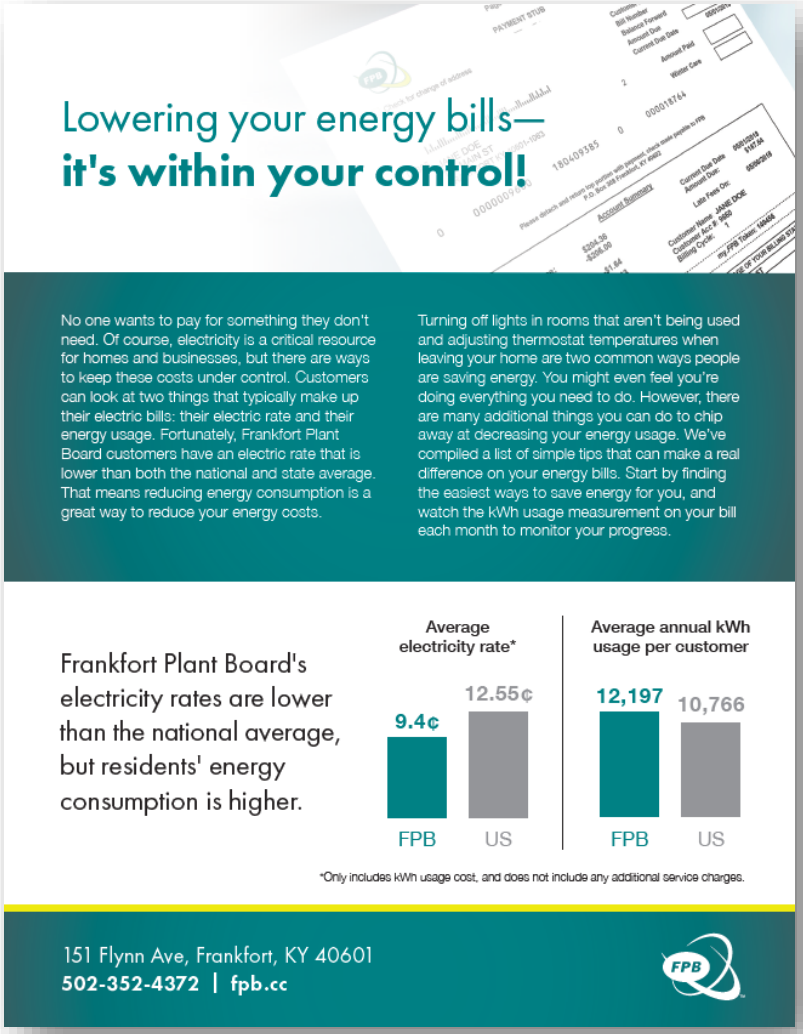
Stakeholder Interviews

- FPB Board and staff: 15
- Residential Representatives: 16
  1. Blue Grass Community Action Partnership, Kentucky Housing Corporation, Housing Authority of Frankfort, South Frankfort Neighborhood, Tanglewood Neighborhood Association, Envision Franklin County, and local churches and residents.
- Institutional and Government Representatives: 7
  1. City and County Government
  2. State Facilities Manager
  3. State Energy Office
  4. County Schools
  5. KSU
- Business Representatives: 2
  1. KY Home Builders Association
  2. Downtown Frankfort
- Industrial Representatives: 2
- **Total: 42**

Community Input

- Desire for energy efficiency options for all rate classes, including options for renters
- Education and outreach is important
- Workforce training is needed
- For commercial, industrial, and institutional customers, technical assistance to guide energy efficiency projects is necessary
- There are significant energy savings opportunities available for the largest energy users
- Some lighting upgrades have been done but many additional opportunities are present across all market segments
- Community interested in supporting its vulnerable populations

Educational Piece for FPB's Residential Customers



Lowering your energy bills— **it's within your control!**

No one wants to pay for something they don't need. Of course, electricity is a critical resource for homes and businesses, but there are ways to keep these costs under control. Customers can look at two things that typically make up their electric bills: their electric rate and their energy usage. Fortunately, Frankfort Plant Board customers have an electric rate that is lower than both the national and state average. That means reducing energy consumption is a great way to reduce your energy costs.

Turning off lights in rooms that aren't being used and adjusting thermostat temperatures when leaving your home are two common ways people are saving energy. You might even feel you're doing everything you need to do. However, there are many additional things you can do to chip away at decreasing your energy usage. We've compiled a list of simple tips that can make a real difference on your energy bills. Start by finding the easiest ways to save energy for you, and watch the kWh usage measurement on your bill each month to monitor your progress.

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Save energy and lower your bills with these simple tips.

1. You can save $15 annually by replacing your most frequently used lightbulb with an ENERGY STAR® certified LED, or by just turning off one 60-watt incandescent lightbulb that would otherwise burn for eight hours a day. Start by switching out your most frequently used lightbulbs to LEDs, and change the rest as they burn out.
2. Caulk around windows and door frames, use weather stripping on exterior doors, and have a professional seal gaps where air can travel between the attic and your living space. Air sealing is a critical component to home comfort and efficient HVAC use, even more so than adding insulation.
3. Install a smart thermostat, which can help reduce your energy use by automatically adjusting the temperature based on daily weather conditions, schedules, and heating and cooling needs. This can reduce your heating and cooling costs by $130 annually. Also, make sure to keep air vents open and uncovered throughout your home.
4. Take advantage of the sun by keeping drapes open during winter daylight hours and then closed at night during cold weather. Close window shades and drapes in the summer to keep the heat out.
5. Wash your laundry with cold water whenever possible. Water heating accounts for about 90 percent of the energy your machine uses to wash clothes. Newer detergents have been specifically designed for cold water use, and their performance is equal to or better than using hot water. For drying clothes, use the sensor drying mode instead of time drying if your clothes dryer has this feature. This will save energy by turning the unit off once the clothes are dry, and prevent over drying, which can damage clothes. Make sure to clean lint from the exhaust hose and filter from your dyer as well.
6. If your water heater's thermostat lists temperatures, set the temperature on your water heater between 120 and 125 degrees for safety and efficiency.
7. Reduce or eliminate the use of space heaters and electric resistance heating. As an alternative, consider ENERGY STAR certified ductless mini-split heat pumps for rooms not served by central heat. These heat pumps offer superior comfort and performance, and can save you money on your electric bills.
8. Use a ceiling fan in both summer and winter to save on HVAC costs. Raise your AC setpoint by four degrees in the summer while using a ceiling fan with no change in comfort. In the winter, set the fan to turn clockwise, and let it run on a low speed. This will force warmer air back down to occupied spaces. Fans only cool people and not rooms, so turn the fan off when leaving the room. Also, make sure to dust fan blades to improve your fan's performance.
9. Install a new 2.0 gallon-per-minute (low-flow) showerhead. A new showerhead can save you up to $50 annually on utility bills. Be sure to also fix leaks, as one drip per second can waste up to $35 annually.
10. Appliances such as old refrigerators can be some of the biggest energy hogs in your home. When replacing older appliances, look for the ENERGY STAR logo. This logo means that the item has been independently certified and has undergone extensive testing to ensure that it will save energy and perform as expected. For existing appliances, improve performance by cleaning fridge coils, vents, and improve performance by cleaning fridge coils and vents.
11. Use a smart power strip. Many electronics continue to use power, even when they are turned off. Plug electronics such as your tv, video game systems, and desktop computers into a smart power strip. Smart power strips turn off devices that are plugged into them when they are not in use, and help save you energy.
12. Insulate the attic, which saves energy and improves comfort in your home. Your attic should have at least 12 inches of fiberglass or blown cellulose insulation (the most commonly used materials).

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Phase I Program Recommendations

- **Community outreach and education** to educate residents on energy conservation and energy efficiency
- **In-store LED light bulb discounts** in partnership with hardware and grocery stores to offer discounted ENERGY STAR® rated LED bulbs
- **Energy efficiency kits** that make free energy-saving products available to low income residents through food pantries, community action agencies, and other local organizations
- **Appliance recycling** to promote the early retirement of operable but inefficient appliances, such as refrigerators and freezers, by removing and recycling these inefficient appliances

Phase I Program Recommendations (Continued)

- **Online product store** offering discounts on energy-efficient products through an online portal
- **Prescriptive rebates** to incentivize the purchase of energy-efficient products and equipment for both residential products and commercial equipment
- **Energy advising and technical assistance** to advise large commercial and industrial energy users on cost savings through energy efficiency, including long-term capital plans
- **Custom incentives** to help large commercial and industrial customers install qualified energy projects that are less common or more complex than those typically included in prescriptive rebate programs

Phase I Program Portfolio Expectations

	Program Type	Expected Relative Participation	Expected Relative Savings	Expected Relative Cost Effectiveness
Homeowners, Renters, and Small to Midsize Businesses	Community Outreach/Education	High	N/A	N/A
	LED Lightbulb Discounts	Very High	Moderate	Very High
	Energy Efficiency Kits for Low Income Customers	Low	Low	High
	Appliance Recycling	Low	Low	Moderate
	Product Rebates	Low	Low	Low
	Online Store for Efficient Products	Variable	Variable	High
Commercial, Industrial, & Institutional	Energy Advising / Technical Assistance	Low*	N/A	N/A
	Prescriptive Rebate	Variable	Variable	Moderate
	Custom Incentive	Low*	High	Variable

*Although participation is listed as Low, this means that the total number of possible participants are small because most service territories have far less commercial, industrial, and institutional customers than they do residential customers. However, within this small group of participants this program generates moderate participation.

Programs to Revisit in the Future

Homeowners, Renters, and Small to Midsize Businesses	
Smart Thermostats for Energy Conservation and Demand Response	Smart Thermostats for Energy Conservation and Demand Response for Low-Income Residents
Energy Efficiency Education for Students	Home Energy Reports
Audit and Weatherization	Residential Online Audit
Walkthrough/Direct Install (DI) for Low Income	Conservation/Behavior
Commercial, Industrial, and Institutional	
Facility Assessments - ASHRAE Level 1Facility Audit	
Support	
Crowdlending for Non-profits or Donations to Support Low Income Energy Efficiency	Residential and Small Business Low interest Financing (Either On-bill or Separate)
Energy Project Assessment District Financing (EPAD)	

Implementation Options and Recommendations

Options to deliver energy efficiency programs:

1. Implement in-house
2. **Hire an outside implementer**
   - Join an existing program
   - Hire an implementer to implement programs designed solely for FPB
3. A hybrid approach

VEIC Recommends Hiring an Outside Implementer Through an RFP

BENEFITS:

- Economies of scale and lower costs of implementation, resulting in more energy savings for each dollar spent
- Limited strain on current FPB workforce
- Low risk—tested and proven approaches and processes
- Implementer may offer additional services offered beyond implementation

DRAWBACKS:

- Less control over implementation details
- Less internal knowledge-building within FPB

Estimated Costs and Benefits

Energy efficiency is expected to cost FPB significantly less than procuring electricity at wholesale…

Projected range of annual costs and energy savings that FPB could expect with the recommended Phase I energy efficiency programs:

Estimated Annual Program Costs	Estimated Annual Program Energy Savings	Estimated Program Administrator Cost per kWh
$300,000 – $1,000,000	1,700 – 5,000 MWh	$0.06 – $0.15 per kWh

Over the life of the efficiency measures, energy efficiency is expected to save 2 to 2 ½ times more than it costs FPB and its customers.

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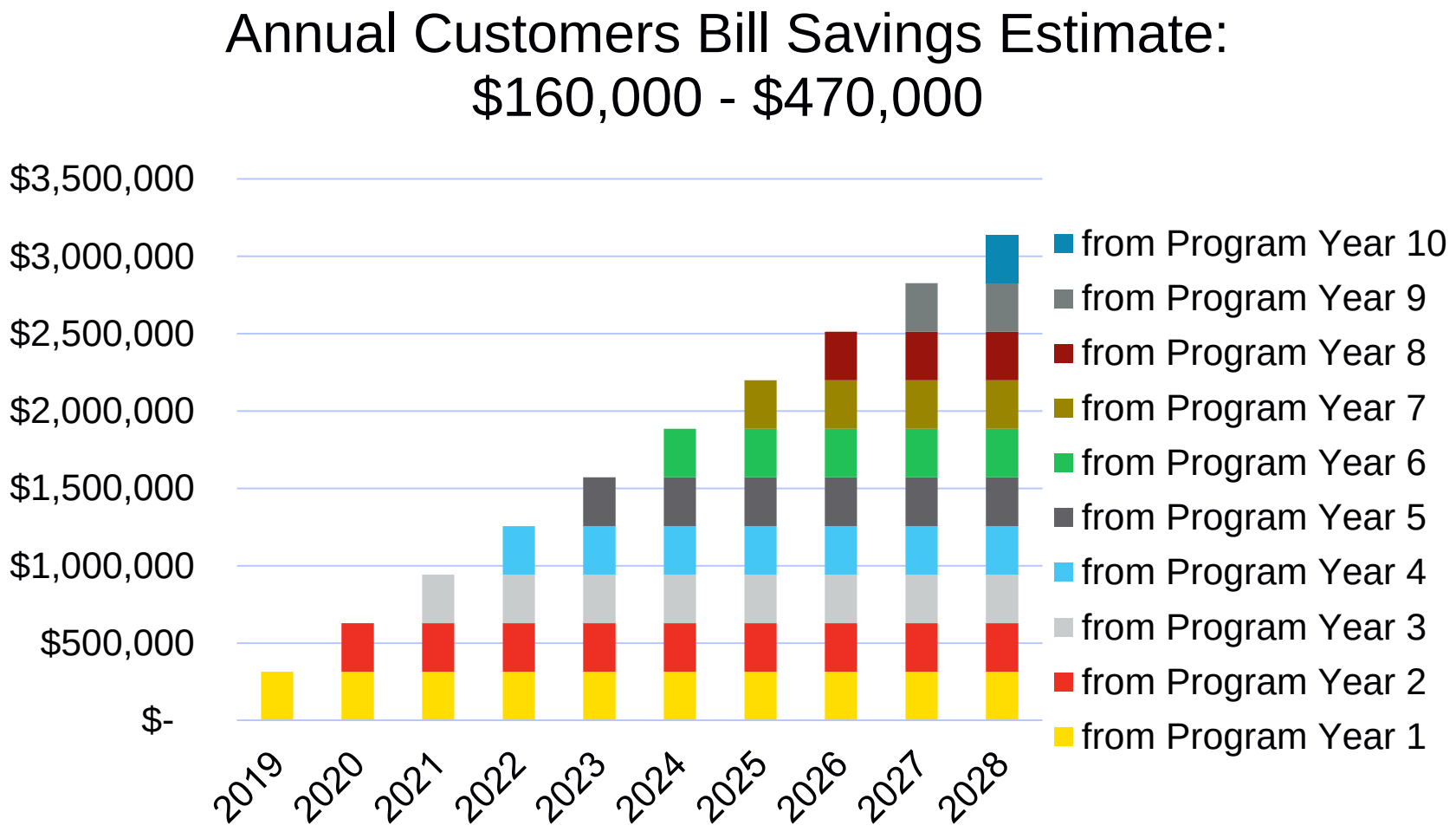
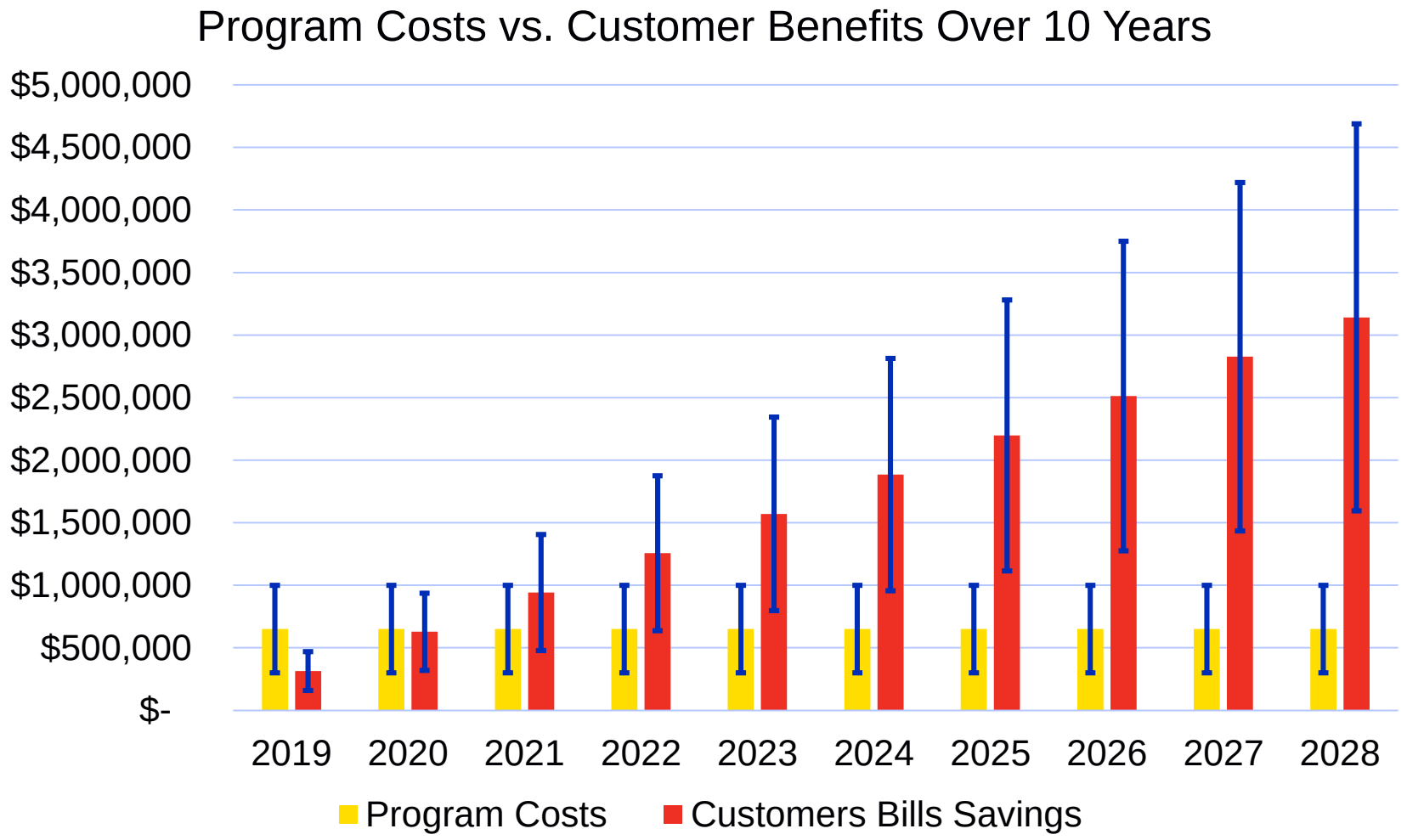
Estimated Customers Bill Savings



Estimated Customers Bill Savings



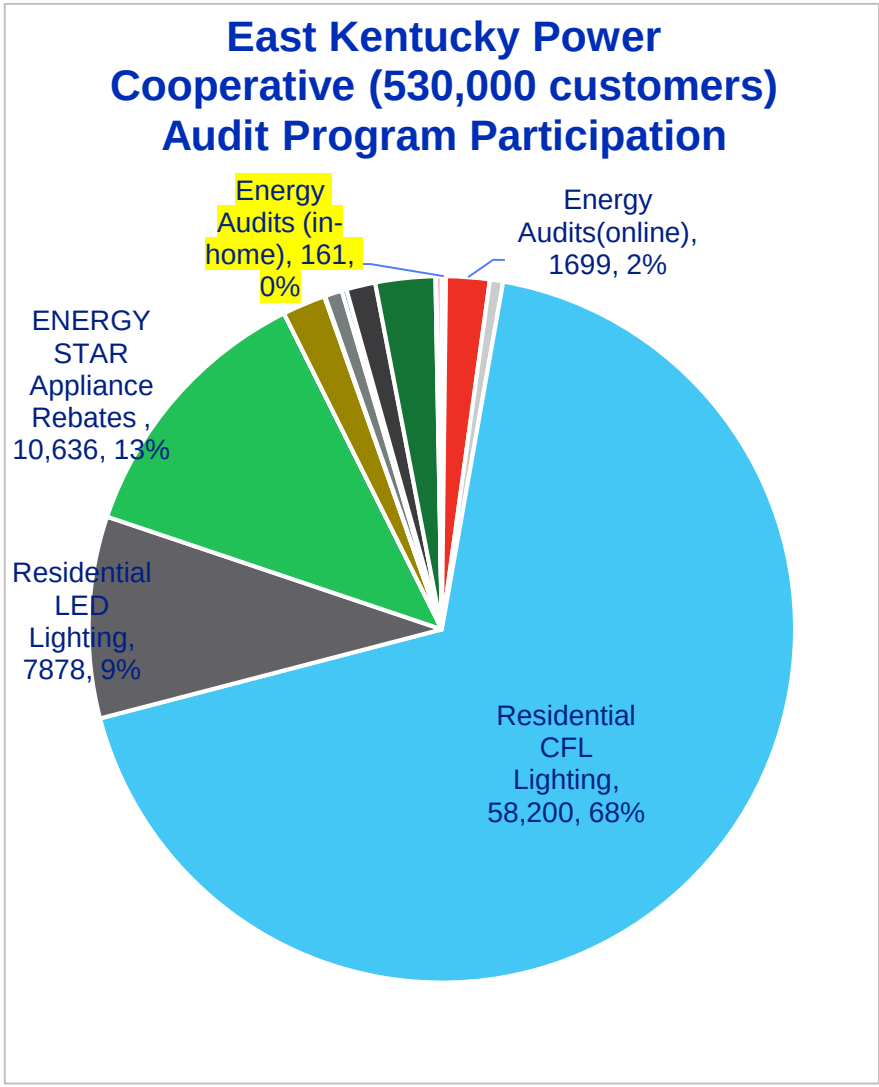
Recommended Next Steps

- **September 2018 Board Meeting:** Accept the final report from VEIC entitled “Energy Efficiency Program Plan for Frankfort Plant Board.” Pursue the recommended Phase I energy efficiency programs.
- **October/November 2018:** Develop and issue an RFP for implementation, requesting Phase I programs at a minimum, and allowing for respondents to propose additional programs to add to the portfolio.
- **January 2019:** Review responses to RFP and decide if FPB will hire an implementer or implement in-house.
- **February 2019:** Allocate budget based on responses to RFP.

Questions and Feedback

Why no Residential Audits for Phase I

- Interest from community
- No guaranteed savings: only 30-40% of people make upgrades when incentives for upgrades are available- not just an audit, audits on their own lead to very little efficiency upgrades.
- Typically low participation (FPB has offered audits before, only a dozen participants)
- Not useful to renters (half of Frankfort's population)
- Not useful to low-income residents: can't afford upgrades
- Costly with little energy savings, compared to other program options



In Absence of a Residential Audit Program

- Homeowners can use online tool (link currently on FPB's website), or hire contractor on their own to know where to get started for home weatherization.
- List of local contractors offering audits can be compiled in an education piece and provided on FPB's website.
- Add residential audits in future programs, if the conditions are right:
  - Incentive or loan program (e.g. on-bill) offer financial assistance to help homeowners make upgrades and ensure upgrades are made.
  - Interest in energy efficiency grows community-wide and there is support for greater budgets for energy efficiency.
  - Programs can be coordinated with other programs to increase participation and reduce costs: such as gas utility programs, low-income weatherization programs, etc.