

Opportunity Assessment for the Northwest Grocer Market

The Cadmus Group
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Overview

- Why did BPA conduct the research and what does it cover
- Assessment of Savings Opportunities
- Interview findings
- Conclusions and recommendations

Why did we do this research?

- To understand where we have successfully penetrated the market in grocery refrigeration
- To identify remaining areas of opportunity
- To gain various stakeholder insight into market opportunities and barriers

Project Scope



NO=CONVENIENCE STORES



YES=GROCERY
REFRIGERATION



NO=LIGHTING, HVAC

Opportunity Assessment

Here's the Punch Line

Account Category	Program Achieved Savings (aMW)	Remaining Comprehensive Savings Opportunities		Programmatic Saving Opportunities	
		aMW	Pct. of Total	aMW	Pct. of Total
Current Program Measures	10.7	75.8	72%	20.1	50%
EBCx	0	6.5	6%	5.6	14%
New Construction	0	1.3	1%	1.1	3%
New Measures	0	21.8	20%	13.4	33%
TOTAL	10.7	105.4	100%	40.1	100%

We'll get into the details in a moment...

Opportunity Assessment Methodology

- Opportunities in existing program measures
 - Utilized PEI audit and rebate data
- Other Opportunities: New Construction, EBCx, New Measures
 - Secondary literature, including 6th Plan, Cadmus ETO NC evaluation, PEI analysis



Methodology: Program Measures



Audit recommendations

Rebate data

Per unit energy-saving estimates & quantity

Story Type

Over 30 rules developed to control for...

- Competing measures
- Rebated measures

Avg kWh by store type * non-audited stores

The result is comprehensive energy-savings by utility and store type

Unique Grocer Accounts

Account Category	Number and Type of Accounts		
	National	Independent	Overall
Accounts with audit and rebate data used in analysis	263	383	646
Rebate-only accounts	43	15	58
Stores with neither audit nor rebates	NA	NA	112
TOTAL	306	398	816

- Complete data on nearly 80% of grocery stores in BPA territory
- Analysis focused on 646 accounts with available audit data
- Average energy-savings was extrapolated to remaining 170 accounts without program audits

Methodology: Other Opportunities

- **EBCx:** assumed savings from commissioning is 5% of grocery store refrigeration energy consumption.
 - Used a mix of secondary literature
- **New Construction:** relied on ETO new construction evaluation data covering past three years.

Methodology: Other Opportunities

- **New Measures:** reviewed PECl analysis for reasonableness. New measures included:
 - Enhanced floating head pressure (FHP) and floating suction pressure (FSP) controls
 - Adaptive controls – refrigeration
 - Variable capacity modulation for refrigeration compressors
 - Inefficient compressors replaced with efficient compressors - low temp
 - ECMs on condenser fans
 - Efficient display case evaporator coils

Measure Categories	Total Comprehensive Opportunities (aMW)	Total Rebated Savings (aMW)	Program Achieved Savings as Pct. of Comp. Op.	Remaining Comp. Op. (aMW)	Remaining Comp. Op. as Pct. of Total Comp. Op.
Case Lighting	0.01	0.01	NA	0.0	0.0%
Other	0.11	0.11	NA	0.0	0.0%
Vending Machine Controls	0.19	0.02	11%	0.17	89%
Auto Closers	0.27	0.01	5%	0.26	9%
LEDs for Open Cases	0.49	0.01	2%	0.48	4%
Gaskets	0.82	0.18	21%	0.65	79%
Night Covers	1.67	1.67	NA	0.0	0%
Controls	1.38	1.38	75%	0.46	25%
Strip Curtains	1.88	0.27	14%	1.61	86%
Motors	4.06	3.19	79%	0.87	21%
LEDs for Reach-In Cases	5.06	0.85	17%	4.21	83%
Condensers, FHPCs, and Compressors	25.67	1.83	7%	23.84	3%
Cases	27.43	0.79	3%	26.64	7%
TOTAL	69.49	10.31	15%	59.18	85%

Low uptake and saturation

High uptake and saturation

Low uptake and saturation

* Table details specific to the analysis sample (n=646)

Measure Cost Bundles

- Cadmus developed measure cost bundles
 - Cost bundle 1: Approximate one-year payback
 - Cost bundle 2: Approximate two-to three year payback
 - Cost bundle 3: Longer than three years

- Cost bundles were used to define what percent of savings are attainable by the program

Defining Programmatic Opportunity

- Cadmus considered various measures with similar cost characteristics and barriers (cost bundles).
- Current measure data, solicited feedback from BPA staff, and consulted other regional sources to estimate what the ESG Program could realize.
- Cadmus estimates the remaining, programmatic, energy-savings opportunities at approximately 27% of the remaining, comprehensive saving opportunities for the program as a whole.

Remaining Programmatic Opportunities

Measure Categories	Cost Bundle	Remaining Comprehensive Saving Opportunities (aMW)	Remaining Programmatic Saving Opportunities (aMW)	Remaining Comprehensive Op. by Cost Bundle (aMW)	Remaining Programmatic Saving Op. by Cost Bundle (aMW)
Auto Closers	1	0.26	0.22		
Gaskets	1	0.65	0.55		
Strip Curtains	1	1.61	1.37	2.68	2.28
Vending Machine Controls	1	0.17	0.14		
Controls	2	0.46	0.39		
LEDs for Open Cases	2	0.48	0.41	6.01	5.11
LEDs for Reach-In Cases	2	4.21	3.58		
Motors	2	0.87	0.74		
Cases	3	26.64	4.38		
Condensers, FHPCs, and Compressors	3	23.84	3.92	50.48	8.30
TOTAL		59.18	15.69	59.18	15.69

Remaining Savings Opportunities—Other Opportunity Resources

Resource Type	Number of Accounts	Remaining Comprehensive Saving Opportunities (aMW)	Remaining Programmatic Saving Opportunities (aMW)
EBCx	All Stores	6.5	5.6
New Construction	56*	1.3	1.1
New Measures	% of Stores	21.8	13.4
TOTAL		29.6	20.0

* Store count extrapolated based on forecasted square feet, assuming an average of 75,011 square feet per store.

National and Independent Accounts

- Comprehensive energy savings opportunities nearly split evenly between account types
 - National accounts slightly higher (0.12 aMW per store)
 - Independent accounts (0.07 aMW per store)

- Independent accounts had slightly higher rebated savings compared to national accounts

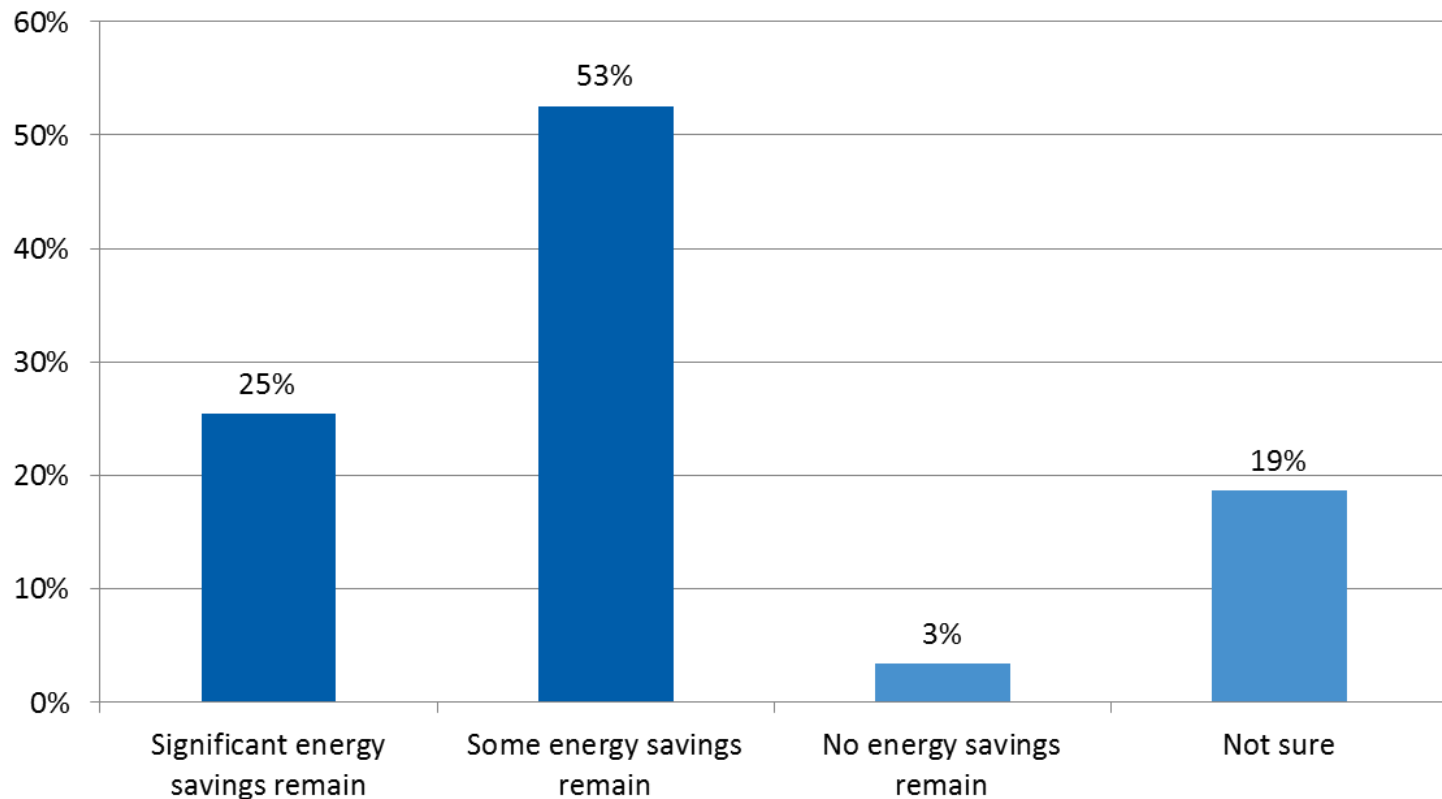
Market Actor and Stakeholder Interviews

Interviews Conducted

Stakeholder Group	Research Method	Sample Size (n)
EnergySmart Grocer Trade Allies	Phone Interviews	12
Participating Grocery Stores	Phone Interviews	39 Independent Stores 6 National Account Stores
Nonparticipating Grocery Stores	Phone Interviews	5
BPA Utility Customers	Online Survey	43 Currently offering ESG 16 Offered ESG in the past
BPA Staff	In-person, In-depth Interview	3
PECI Program Staff	In-person, In-depth Interview	4

Utility Perception of Opportunities

Nearly 80% of utilities said either *significant* or *some* energy savings remain in their territory



Differences in Region

- Western WA and OR reported “significant” energy savings remain in their territory; more than twice as much as others

How much Energy Savings from Refrigeration Remain in your Territory?

Region	Significant energy savings remain	Some energy savings remain	No energy savings remain	Not Sure
Eastern WA and OR	15%	77%	-	8%
Montana, Idaho, & Wyoming	7%	43%	7%	43%
Western WA and OR	38%	47%	3%	13%

- This group sometimes reported savings were “very achievable” while others did not

How Achievable are those Savings?

Region	Very achievable	Moderately Achievable	Not very Achievable	Not sure
Eastern WA and OR	0%	50%	25%	25%
Montana, Idaho, & Wyoming	0%	43%	29%	29%
Western WA and OR	19%	56%	15%	11%

Program Satisfaction and Value Among Utilities

- Most utilities currently offering the program were *satisfied* (81%)
- Six utilities reported they were *not very satisfied*

Utility Region	Very Satisfied	Somewhat Satisfied	Not Very Satisfied	Not Sure	Total Responses
Eastern OR, WA, MT and ID	7	8	3	2	20
Western WA and OR	17	3	3	-	23

- 70% reported the program was *very valuable* to their customers
- Program satisfaction corresponded somewhat to how many stores the utility thought the program reached within their territory
 - Those reporting the program had reached a high number of stores were more likely to be *very satisfied*

Reasons for No Longer Offering the ESG Program

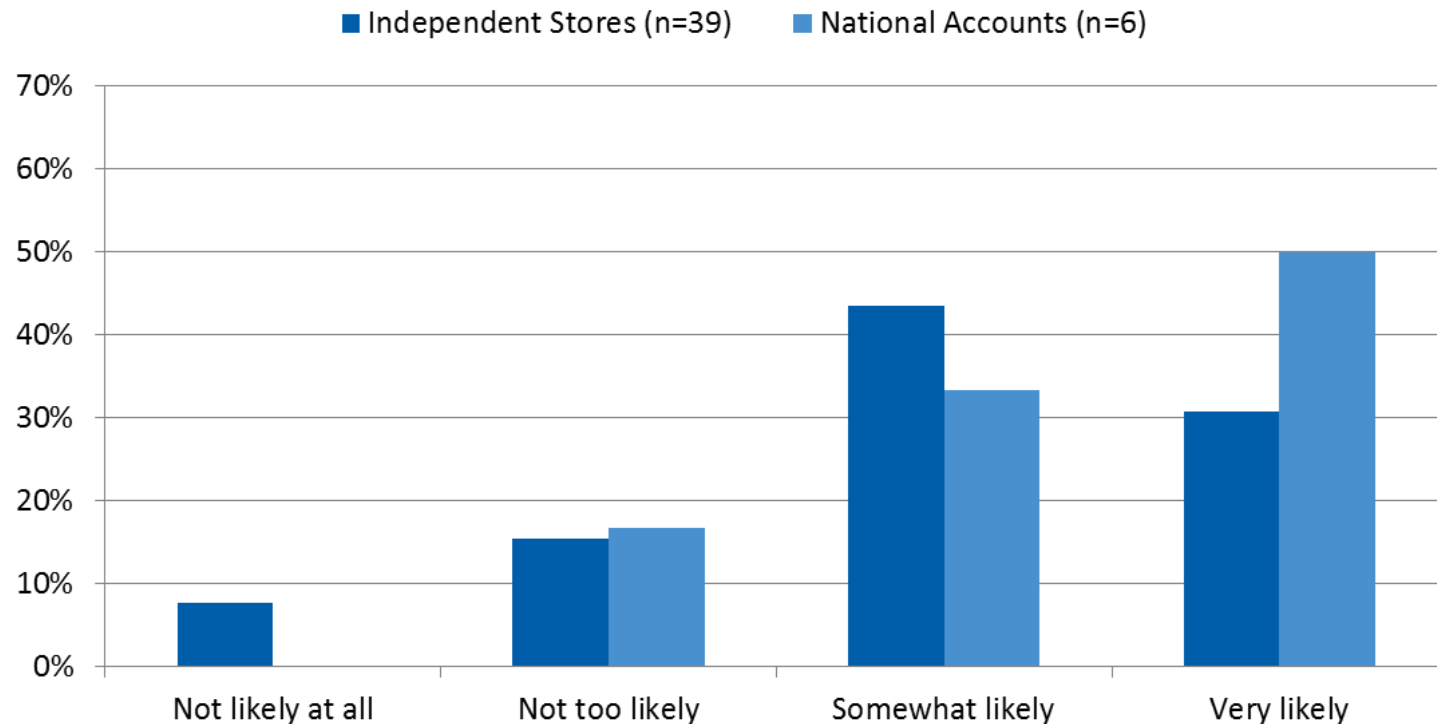
16 utilities that offered ESG in the past participated in the online survey – here is what they said:

Reasons Utilities Are Not Currently Offering ESG Program	Frequency	Percent
We needed to allocate EEI funds to another program.	6	29%
All the grocery stores in my service territory already participated so there was limited potential for more energy savings.	4	19%
Dissatisfaction with the program delivery.	3	14%
Limited demand for energy-efficiency measures offered through this program among grocery store owners.	3	14%
Budget cutbacks from BPA.	2	10%
The EEI funds commitment to offer the program was too high.	2	10%
Have not seen a representative in more than a year and decided to shift funds.	1	5%

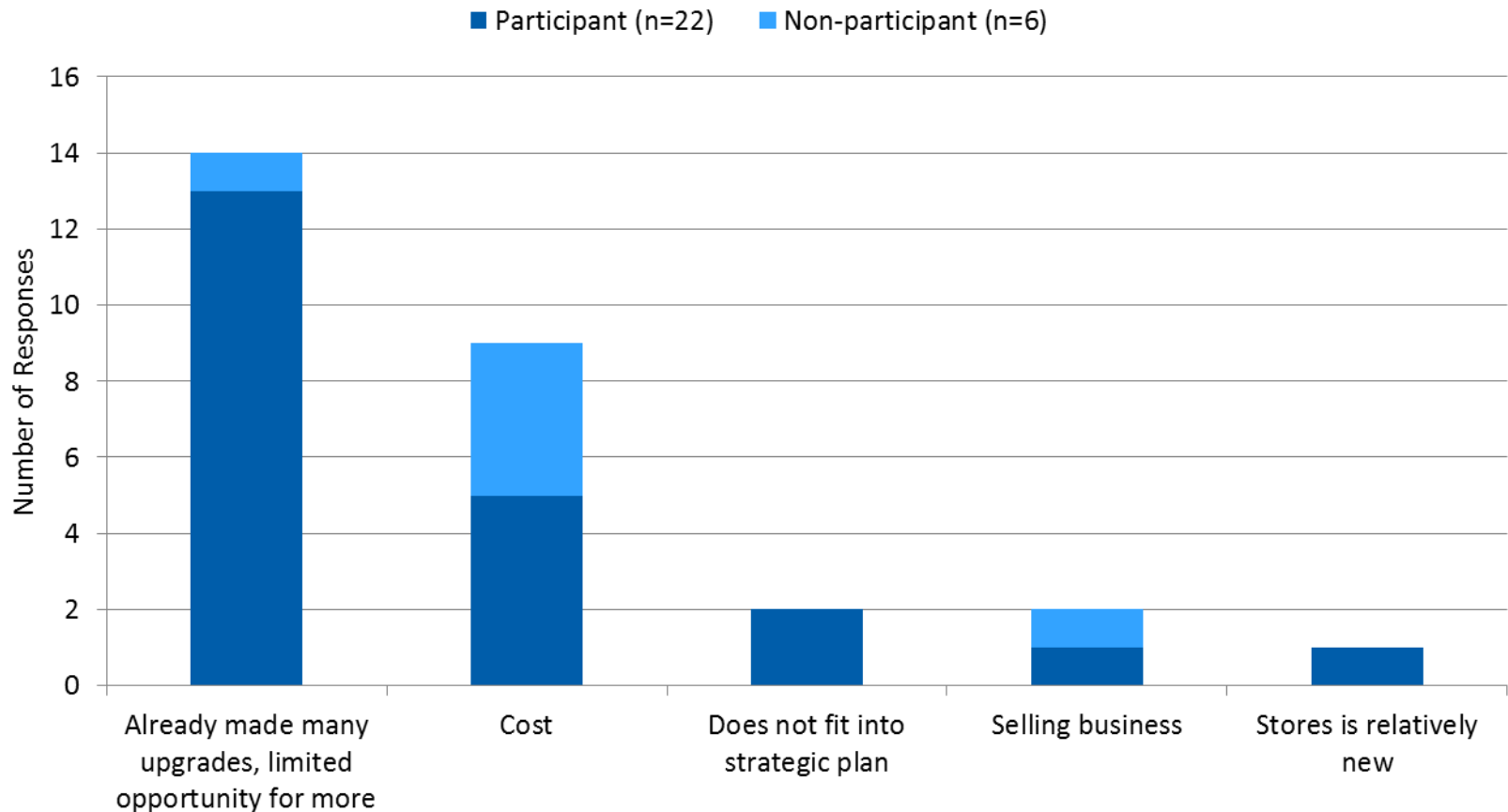
Source: Utility online survey question: “What were the main reasons why you stopped offering the program? Please select all the reasons that impacted your decision.” (n=16)

Future Upgrades in Grocery Stores

- The majority of stores (76%) are *somewhat likely* or *very likely* to make energy-efficient upgrades in the next year
 - All national accounts reported likely refrigeration upgrades



Reason for Not Making Upgrades

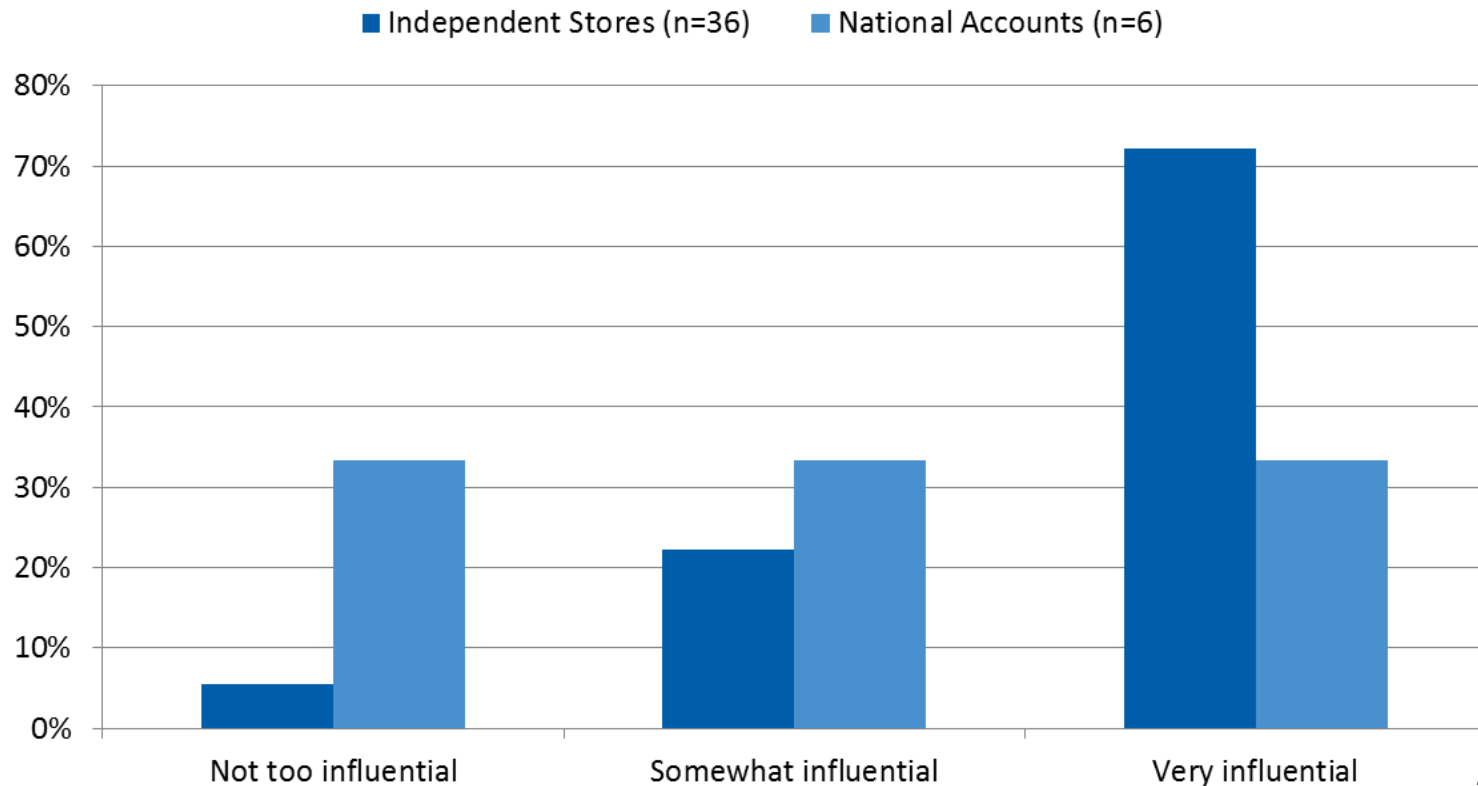


Perception v. Remaining Opportunity

- Cadmus matched store information from the survey to the ESG database to assess each store's implementation of energy-savings measures
- Contrary to respondents' perceptions, considerable saving opportunities remained at stores that perceived limited opportunity for more upgrades
- Stores that were "likely" to make upgrades had about the same remaining opportunities as those "unlikely" to make upgrades

Influence of the Program

- 90% of respondents were likely to apply for rebates from the program
- Independent stores, more so than national accounts, reported ESG was *very influential* in their decision to make upgrades



Market Barriers



Summary and Recommendations

Significant savings opportunities remain for grocery store refrigeration equipment

Consider modifying incentives to increase measures with lower uptake and possibly decrease measures that are approaching market saturation.

Evaluate the procedures for approving new construction and EBCx projects to help streamline the process and increase uptake.

Consider offering additional incentives for undertaking more comprehensive projects with deeper savings (for example, projects with four or more measures).

Summary and Recommendations

Demand for energy-efficiency among grocery stores remains high

Continue raising awareness and education among store owners about their specific options.

The barriers to making upgrades reported by grocery stores appear to be unrelated to the program's delivery challenges

Consider a financial or a tiered structure with bonuses to influence small stores and national chains to do more projects.

Summary and Recommendations

Most utilities are realistic about the remaining opportunities ... but utilities would benefit from a better understanding of what is attainable

BPA should consider a strategy for communicating with utilities regarding remaining savings in their territories, based on this study's findings. Work with stakeholders to generate solutions specific to their territories.