

MidAmerican Energy Company

Commercial New Construction Program Impact and Process Evaluation





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The Tetra Tech team was made up of the following individuals: Sue Hanson, Najoua Jouini, and Kendra Mueller of Tetra Tech.

1.0 EXECUTIVE SUMMARY

MidAmerican Energy Company (MidAmerican) offers energy efficiency programs to their customers throughout their Iowa and Illinois service territories. These programs cover electric and natural gas energy efficiency measures, as well as other services such as technical assistance provided through the Commercial New Construction (CNC) program. This report details the activities, results, and recommendations from the evaluation of program years (PY) 2019 for Iowa and Illinois and the first quarter (Q1) of PY2020 for Iowa¹.

1.1 BACKGROUND

MidAmerican's CNC program is a mature program designed to promote and increase adoption of energy-efficient strategies in new commercial building construction as well as major renovations of existing commercial buildings. Financial incentives and expert technical assistance are offered to encourage design teams and building owners to surpass standard practices and exceed current Iowa and Illinois Energy Conservation Code requirements. The program includes comprehensive energy modeling services which describe the relationships between building systems and energy-efficient technologies to help building owners and design teams with the decision-making process before design documents are complete. Once implemented, these strategies can offer long-term energy and cost savings for projects.

The CNC program is implemented by Willdan, who provides a variety of services for program participants. The program currently offers:

- Energy consulting services
- Design team participation incentives
- Construction incentives
- Measurement and verification.

1.2 EVALUATION METHODOLOGY

The evaluation included both impact and process components. To help guide these evaluation activities, the Tetra Tech team conducted interviews with MidAmerican program staff and implementation staff from Willdan. For the impact evaluation, the Tetra Tech team reviewed the CNC program manual, applicable energy efficiency codes², and the resulting energy savings for a sample of projects to make sure tracked savings were appropriately calculated. Additionally, the Tetra Tech team conducted primary net-to-gross (NTG) research with Illinois program participants and a literature review to help inform NTG findings.

¹ Due to legislative changes in Iowa in 2019, MidAmerican refiled their 2019-2023 program plan resulting in a delayed launch of programs in Iowa. Therefore, for Iowa only, the Tetra Tech team assessed program activities from April 1, 2019 through December 31, 2019 of PY2019 and additionally assessed the first quarter activities of PY2020 (January 1, 2020 through March 31, 2020).

² American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1: <https://www.ashrae.org/> and International Energy Conservation Code (IECC): <https://www.iccsafe.org/products-and-services/i-codes/2018-i-codes/iecc/>

For the process evaluation, the Tetra Tech team reviewed program materials and conducted interviews with PY2019 and PY2020 Q1 participating customers and market actors. Participant interviews investigated program delivery processes, interactions with the program staff, preferred communication channels, NTG effects (free-ridership and spillover for Illinois participants), satisfaction with different facets of the program, and demographic/firmographic information. Interviews with participating market actors explored perceptions of the program's design, interactions with the program staff, program operations, customer experiences, and market trends.

1.3 SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

Overall, it is the opinion of the Tetra Tech team that the CNC program is well established and has been operating with consistent processes and implementer for many years. This steady operation results in high levels of program satisfaction and awareness, and consistency in project-level energy savings estimates. Additionally, the Tetra Tech team found the implementer has successfully addressed most of the findings and recommendations from the previous evaluation.

Program participants and market actors interviewed reported high levels of satisfaction with the program and services provided by Willdan. They are happy with both their interaction with program staff and technical support provided through the program, indicating that they received enough support from Willdan and MidAmerican when they needed it.

The majority of participants and market actors interviewed became aware of the program through MidAmerican staff or previous projects. They indicated that the process of enrolling was easy and that the program requirements were clearly explained. The majority of market actors that receive a design team incentive appreciated the incentive level and thought that the program has been influencing their initial design choices and increasing interest for energy-efficient new construction building design.

Desire to reduce energy costs and return on investment were the main decision drivers for participants interviewed to get involved with the CNC program. Operating cost and initial purchase cost were the most important factors when considering new energy-using equipment. In particular, the majority of participants interviewed noted that upfront cost is the main obstacle when considering implementing energy efficiency features into a new building.

In regard to the COVID-19 pandemic, market actors reported little impact on their business and the supply chain but do anticipate some impacts to hit the new construction sector in the next year.

The Tetra Tech team found minimal errors in the energy simulation models and results within individual projects. These errors had minor impacts on the overall program year savings. The evaluation resulted in either 100 percent realization rate or very close to 100 percent realization rate for both Iowa and Illinois across all gross savings categories—energy (kWh), peak demand (kW), therms, and peak therms.

Table 1. Savings Impacts – Iowa and Illinois*

Impact	Tracked Gross Savings**	Evaluated Gross Realization Rate***	Evaluated Gross Savings	NTG Ratio****	Evaluated Net Savings*****
Iowa – PY2019 and PY2020 Q1					
kWh	21,247,887	100.0%	21,244,758	70.0%	14,871,331
Peak kW	7,350	100.0%	7,350	70.0%	5,145
Therms	380,591	100.0%	380,591	70.0%	266,414
Peak Therms	4,027	100.0%	4,027	70.0%	2,819
Illinois					
kWh	1,091,648	100.0%	1,091,648	70.0%	764,154
Peak kW	279	100.0%	279	70.0%	195
Therms	15,514	100.0%	15,514	70.0%	10,860
Peak Therms	202	100.0%	202	70.0%	141

* Numbers in the table are rounded—savings values are rounded to the nearest whole number and the realization rate is rounded to the nearest tenth of a percent. As a result, numbers may not calculate exactly in the table.

** Tracked savings shown are from PY2019 tracking data received from MidAmerican on June 2, 2020.

*** The evaluated gross realization rate calculation is the ratio of evaluated gross savings to tracked gross savings, and is described in more detail in Appendix B.

**** NTG ratio is based on primary data collection conducted with Illinois program participants. The NTG information in Iowa is for informational and program design only.

***** Evaluated net savings are derived by multiplying the evaluated gross savings by the NTG ratio.

Next, key findings from the evaluation and associated recommendations are presented.

Finding #1: Most of the key impact findings from the PY2015-PY2016 evaluation were sufficiently addressed. This resulted in improved adherence to modeling protocols, more consistency in energy modeling techniques, better overall documentation for projects, and fewer findings than the previous evaluation.

The Tetra Tech team assessed the degree to which the relevant recommendations from the last CNC program evaluation were addressed. The recommendations related to baseline model assumptions used an incorrect building energy code or minimum efficiency levels, and updates to the program manual were all sufficiently addressed. This resulted in verification and reports that were easy to reconcile with the modeled parameters in the simulation input files for most projects. The Tetra Tech team found that code minimum parameters from ASHRAE 90.1 were correctly applied in almost all cases, and all projects were modeled with the correct systems as outlined in the Performance Rating Method. Finally, tracked savings were reasonable for all projects and measures.

Recommendation #1: Willdan should continue its current practices of maintenance for energy modeling protocols and the current quality assurance/ quality control (QA/QC) of energy models to ensure sustained accuracy for project savings estimates.

Finding #2: Application of exceptions lacked documentation.

During the desk review process, the Tetra Tech team found a few projects with various types of spaces and configurations exceptions, but documentation of these exceptions was not included in the project files. Without documentation of the exceptions, the Tetra Tech team could not determine if these

projects reported savings beyond code. Follow-up conversations with Willdan did resolve these questions.

Recommendation #2: Willdan should consider incorporating these exceptions into the modeling protocols and consider adding additional QA/QC checks for these items to ensure sustained accuracy for project savings estimates.

Finding #3: The NTG research indicates moderate program influence on customer decision-making.

Overall, interviews with Illinois participants resulted in a calculated NTG ratio of 40 percent for gas and 38 percent for electric, and no spillover. Due to the small number of interviews completed with Illinois participants (n = 2), benchmarking of other programs with characteristics similar to MidAmerican's service territory in Illinois was completed and shows that most of the NTG ratios for these programs are between 58 and 77 percent. These ratios are in line with what the Tetra Tech team heard from market actors and other information gleaned from Iowa respondents.

Recommendation #3: A NTG ratio of 70 percent is recommended for the CNC program in Illinois.

Finding #4: Interviews with program participants and market actors show that satisfaction with the program and the services provided by Willdan remains high.

The participants and market actors interviewed expressed high satisfaction with the program and found Willdan's services and technical support to be valuable. Many commented that Willdan staff were very supportive, technically sound, and helped the process to go smoothly. Experience with MidAmerican staff and previous projects were identified as the primary sources of program awareness. Additionally, even though natural gas incentives are no longer offered for commercial new construction projects in Iowa as part of MidAmerican's current Energy Efficiency Plan, the Tetra Tech team confirmed with Willdan and MidAmerican that there have been no changes on the modeling or implementation side related to projects with natural gas mechanicals.

Recommendation #4: Continue to have program staff and key account managers build and leverage relationships to proactively engage customers in the program and early in project development. The Tetra Tech team recognizes that Willdan continues to increase outreach and that MidAmerican continues to meet with Key Account Managers to increase awareness of energy efficiency programs to help build relationships with customers.

Finding #5: Customers and market actors provided suggestions for program improvements in the areas of modeling information, incentives, and interactions with Willdan and MidAmerican staff.

While satisfaction is high, the participants and market actors interviewed did offer some program improvement suggestions. A few respondents noted that some new construction projects take several years, and during that time, they may not keep up with program and staff changes. Other respondents reported that it would be helpful to receive more information on the calculation of upfront costs and incentives (e.g., what sources and assumptions are considered in return on investment calculations or how incentive levels change based on the type of features installed).

Recommendation #5: Consider providing additional check-ins between major project milestones to keep participants and market actors aware of any changes to the program. Consider adjusting the presentation and report materials to include more information about the cost estimates (e.g., sources for upfront cost) and the incentive breakdown.

2.0 INTRODUCTION

This report presents the detailed Commercial New Construction program impact and process evaluation results for PY2019 in Iowa and Illinois and PY2020 Q1 for Iowa³.

2.1 PROGRAM DESCRIPTION

The Commercial New Construction (CNC) program is a mature program designed to promote and increase the adoption of energy-efficient strategies in new nonresidential building construction as well as major renovations of existing nonresidential buildings. The goal of the program is to provide seamless new construction consulting services to the customer. In Iowa, the program is implemented statewide but administrated separately by each utility. MidAmerican also offers the program to its Illinois customers. Historically, the program offered “tracks” and was marketed this way. In 2017 the program started moving away from marketing the program tracks to lessen confusion in the market about what was being offered and why. From an internal administrative standpoint, the program still records projects across five main categories—Standard Small Service, Standard Large Service, Custom Strategy Service, Multi-family Service, and Volume Build. The key differences among these internally tracked categories are described in more detail below.

Incentives are available to help offset higher initial costs associated with the design and installation of energy-efficient options. To qualify, commercial building projects must be early enough in the design process to implement energy analysis results, at least 5,000 square feet, be heated and/or cooled by a participating Iowa utility, have design decisions pending, able to achieve savings that are at least five percent better than energy code baseline, and pass a screening. Major renovations must include replacement of the mechanical system. To access MidAmerican’s incentives, projects must be within MidAmerican’s service territory, and the customer must purchase retail electricity or natural gas⁴ from MidAmerican on a nonresidential tariff. Transportation natural gas customers with daily metering are ineligible for natural gas incentives.

The CNC program is implemented by Willdan, who provides the current list of services to program participants:

- **Energy consulting services.** Willdan first screens a project to ensure it is a good candidate for the program. Once the project is accepted, Willdan works with the building owner’s design team to model the building and to help the team choose among “bundles” of energy efficiency improvements.
- **Design team participation incentives.** After the design team participates in the analysis of energy efficiency options, they are eligible to receive an incentive to help offset the cost of program participation, with differing incentive amounts depending on the program track.

³ Due to legislative changes in Iowa in 2019, MidAmerican refiled their 2019-2023 program plan resulting in a delayed launch of programs in Iowa. Therefore, for Iowa only, the Tetra Tech team assessed program activities from April 1, 2019 through December 31, 2019 of PY2019 and additionally assessed the first quarter activities of PY2020 (January 1, 2020 through March 31, 2020).

⁴ Beginning with PY2019, MidAmerican no longer offer gas incentives in their Iowa service territory. However, MidAmerican will work with gas customers on project design/modeling if they are enrolled in the CNC program and are dual fuel. MidAmerican offers both electric and natural gas incentives in their Illinois service territory.

- **Construction incentives.** The building owner receives incentives based on modeled and verified energy savings upon construction completion. The program requires energy performance beyond the Illinois or Iowa state energy code.
- **Measurement and verification.** Willdan reviews the operation of the energy-efficient strategies after completion of construction and provides feedback to the owners and design team on the verified results.

Targeting building owners, architecture and engineering (A/E) firms, and developers, Willdan brings the design team together to support an integrated building design approach. Through this collaborative process, efficiency strategies are identified for the owner to consider, and services and incentives are presented to those involved.

The program has been refreshed over the past few years. In particular, Willdan's Net Energy Optimization (NEO) tool has been enhanced to facilitate more modeling results and File Builder is used for conducting analyses that are beyond the NEO tool's capability, largely related to more complex HVAC systems. The differences among the internally tracked categories include:

- **Standard Small Service (formerly Track I)** is a one or two meeting process that offers a streamlined and express-style energy design assistance solution targeted to certain buildings types 5,000 square feet to 15,000 square feet in size. This category uses the NEO tool and includes evaluating up to three mechanical system types and 40 to 60 other energy efficiency strategies (e.g., insulation, windows, lighting, etc.) within a two- to three-week period. Participants must achieve savings of at least five percent better than the state energy code baseline in Illinois and 15 percent better than the state energy code baseline in Iowa.
- **Standard Large Service (formerly Track II)** includes two meetings and offers energy design assistance to buildings larger than 15,000 square feet in size or those not appropriate for the Standard Small Service. This category uses the NEO tool and includes evaluating up to three mechanical system types and more than 70 energy efficiency strategies. Projects reviewed are typically well-suited for both fast-track and longer time frames that are still in the design phase and have uncomplicated space configurations. Participants must achieve savings of at least five percent better than the state energy code baseline in Iowa and Illinois.
- **Custom Strategy Service (formerly Track III)** is a three meeting process for buildings larger than 15,000 square feet in size with more complicated space configurations and/or HVAC systems. DOE-2 is used for this category of projects, as teams tend to be interested in evaluating complex mechanical systems and determining efficiency levels for each. Up to 150 energy efficiency strategies can be evaluated for a given project. Participants must achieve savings of at least five percent better than the state energy code baseline in Iowa and Illinois.
- **Track IV – Advanced Custom Efficiency Strategies (no longer available)** provided four or more meetings for buildings larger than 15,000 square feet in size and was for customers who had a specific energy goal in mind and wanted to begin their analysis early in pre-design. Projects in this category used DOE-2 for energy analysis and supported teams interested in evaluating four complex HVAC systems and required participation in at least one of three modeling modules such as building massing, daylighting, and/or early HVAC analysis. Certification support of LEED Energy & Atmosphere Optimize Energy Performance or ENERGY STAR® was also provided. Participants must have achieved savings of at least 40 percent better than the state energy code baseline in either Illinois or Iowa.
- **Volume Build** is a term that means that a customer has one building design that will be built in multiple locations. Volume build examples may include convenience stores, identical college dorm buildings, quick service restaurants, retail stores, or any building design that is largely

duplicated and constructed in multiple places throughout the service territory. Volume build projects must be completed during the same program baseline cycle as the initial model.

The program tailors its services depending upon project timing, the size and complexity of the building, the number of design team meetings necessary, the percent of energy saved above code, and other needs of each market segment. Smaller projects (less than 15,000 square feet) that have shorter design periods tend to have fewer decision-makers and move faster, so design assistance, while complete, becomes more condensed and may only require one meeting. Larger projects that require more time to consider efficiency options (typically 15,000 square feet or more) receive a more extensive analysis of energy-efficient strategies potentially adaptable to the building and requires two or more meetings.

2.1.1 Summary of Researchable Questions and Evaluation Activities

This section describes the analytic methods and data collection activities implemented as part of the PY2019 and PY2020 Q1 impact and process evaluation of the MidAmerican CNC program. The Tetra Tech team designed a methodology to evaluate the program and address the researchable questions outlined in the program's Detailed Evaluation Plan⁵, as well as addressed other issues that became relevant during the evaluation process.

2.1.1.1 Key Researchable Questions

Based on discussions with the MidAmerican product manager, energy efficiency director, implementation contractor, key researchable questions were developed and prioritized for the evaluation of the Commercial New Construction program, and then addressed within the customer and trade ally research as well as the impact evaluation activities. The table below outlines the researchable questions that this evaluation examined.

Table 2. Commercial New Construction Program Researchable Questions

Researchable Questions	Activity to Support the Question
Program Design	
How effective do participants and A/E firms feel the program is? Is the energy analysis provide by Willdan helpful?	<ul style="list-style-type: none"> • Program staff interviews • Participant interviews • Market actor interviews
Has the design team incentive influenced A/E firms to bring customers to the CNC program? Is the program effectively achieving savings for participants? How can the program maximize its impact?	<ul style="list-style-type: none"> • Participant interviews • Market actor interviews
What are the primary barriers preventing customers from installing program-qualifying equipment?	<ul style="list-style-type: none"> • Participant interviews • Market actor interviews • Nonparticipant survey

⁵ A select group of Iowa and Illinois stakeholders were provided an opportunity to review and comment on the draft Detailed Evaluation Plan in June of 2020.

Researchable Questions	Activity to Support the Question
Customer Education, Outreach, and Marketing	
How do customers and market actors learn about the program and its options?	<ul style="list-style-type: none"> • Participant interviews • Market actor interviews
How successful are the various marketing strategies, and can they be improved to better reach the target population? What other marketing strategies could help attract new participants?	<ul style="list-style-type: none"> • Participant interviews • Market actor interviews • Nonparticipant survey
Can A/E firms help identify business segments or approaches that might expand the reach of the program into markets that may be underserved by the program?	<ul style="list-style-type: none"> • Market actor interviews
Program Administration, Processes, and Resources	
How well are program processes working from the perspectives of participants, A/E firms, and implementers? Are there challenges with completing projects?	<ul style="list-style-type: none"> • Program staff interviews • Participant interviews • Market actor interviews
Market Response	
How is the program influencing A/E firms in their design decisions for non-program buildings?	<ul style="list-style-type: none"> • Market actor interviews
Are focused facilities, such as high intensity (e.g., data centers) or commercial shell/multi-use buildings being served effectively by the program?	<ul style="list-style-type: none"> • Program staff interviews • Participant interviews • Market actor interviews
Program Satisfaction	
What is the level of satisfaction with the program and with MidAmerican? How can satisfaction be improved, if at all?	<ul style="list-style-type: none"> • Participant survey • Market actor interviews • Nonparticipant survey
How satisfied are customers with MidAmerican?	<ul style="list-style-type: none"> • Participant survey
Program Impacts	
What assumptions were used to develop savings estimates? Are the savings reasonable, following good industry practice and in compliance with stated baseline policies? Are there any updates that should be made?	<ul style="list-style-type: none"> • Program tracking data review • Engineering desk reviews • Project verification
What are the program's verified gross savings for Iowa and Illinois for the evaluation period?	<ul style="list-style-type: none"> • Program database review • Engineering desk reviews • Project verification
What is an appropriate NTG ratio for the program in Illinois?	<ul style="list-style-type: none"> • Participant interviews • Market actor interviews • Secondary research

2.1.2 Detailed Evaluation Activities

The table below documents the activities that were completed as part of this evaluation. The evaluation focused on estimating and verifying program impacts and providing key feedback on the functionality of program processes.

Table 3. Summary of Commercial New Construction Program Evaluation Activities

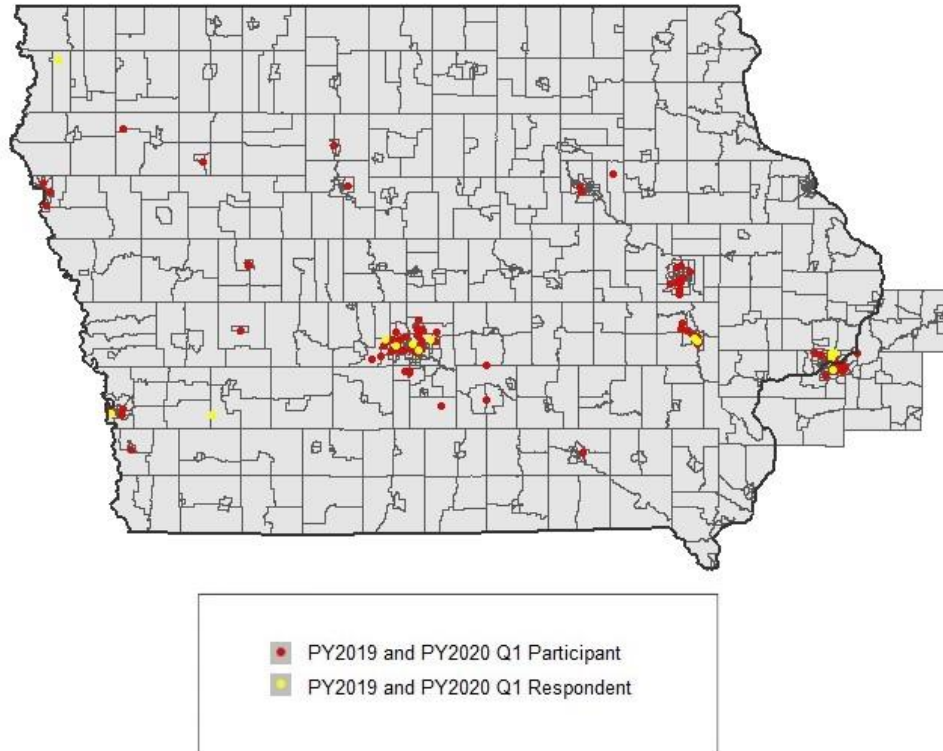
	Activities
Overarching Evaluation Activities	<p>Program staff interviews: Conducted in-depth interviews with the product manager and energy efficiency director, and one program implementation contractor.</p> <p>Tracking system review. Analyzed the tracking database, reported savings, and documentation for consistency.</p> <p>Program documentation review. Assessed completeness of program documentation.</p> <p>Net-to-gross: Estimated free-ridership and spillover effects from Illinois participant customer self-reports, triangulated with trade ally views (qualitative only), and a secondary literature review.</p> <p>Secondary research: Conducted secondary research to gather information on peer utility program goals, participation numbers, equipment offerings, maturity, and NTG estimate for other similar programs to provide additional context to evaluation results.</p>
Impact Evaluation Activities	<p>Engineering/desk reviews. Conducted engineering desk reviews on a sample of 20 custom projects. These consisted of a project-level data and documentation review to verify the savings methodology used and to confirm key assumptions for the primary measures that contributed to project level savings and incentives through the program.</p>
Process Evaluation Activities	<p>Participant interviews: Completed 11 interviews with Iowa participants and two interviews with Illinois participants. The interviews were conducted with a sample of the population of PY2019 and PY2020 Q1 program participants⁶.</p> <p>Nonparticipant survey: Completed 165 customer surveys with a random sample of nonresidential customers in MidAmerican's Iowa service territory who had not participated in a MidAmerican energy efficiency program in the past two years.</p> <p>Market actor interviews: Conducted interviews with 10 participating market actors in Iowa and Illinois³.</p>

The figure below shows the location of MidAmerican's customers who participated in the CNC program in red and the interviewed participants in yellow⁷. The Tetra Tech team notes that the map reflects two yellow dots assembled on the far-right side of the map; these are interviews that were completed in MidAmerican's Illinois service territory.

⁶ Due to the small number of participants and market actors in the Illinois service territory, Iowa and Illinois interview results were combined in most cases to help ensure confidentiality. Additionally, the program is implemented the same way in both Iowa and Illinois.

⁷ This information is also tracked in MidAmerican's database by zip code. Information can be provided at this level, if desired.

Figure 1. CNC Participants and Interviewed Respondents by County



Below is more detail related to the methodologies used for the different evaluation activities associated with MidAmerican's CNC program evaluation.

- **Program and implementation staff interviews.** Tetra Tech team members interviewed the MidAmerican product manager on April 3, 2020, and Willdan staff on April 21, 2020. The Tetra Tech team completed these interviews to better understand the program design and delivery, discuss program successes and challenges, and identify and prioritize researchable questions for the evaluation. The Tetra Tech team requested and received a few follow-up items from program and implementation staff in April through October 2020 to further clarify program design and discuss findings.
- **Participant data tracking and materials review.** The Tetra Tech team reviewed the program's tracking data, tracked savings, and related documentation. The Tetra Tech team compared all documentation and verified consistency.
- **Participant customer interviews.** The CNC program evaluation included 11 interviews with PY2019 and PY2020 Q1 program participants in Iowa and two PY2019 Illinois program participants. The participant customer interviews informed both process and impact evaluation objectives. The survey investigated program delivery processes, interactions with the program staff, preferred communication channels, NTG effects (free-ridership and spillover for Illinois participants), satisfaction with different facets of the program, and firmographic information. We leveraged past interview guides to identify questions that warranted tracking over time. The participant customer interviews were conducted by Tetra Tech team senior staff between July 24, 2020, and September 8, 2020. A copy of the participant survey can be found in Appendix D.

- **Market actor interviews.** The Tetra Tech team conducted 10 interviews with participating market actors in Iowa and Illinois. In July 2020, MidAmerican provided the Tetra Tech team with participating market actor data. Interviews explored perceptions of the program's design, interactions with the program staff, program operations, customer experiences, and market trends. The market actor interviews were conducted by Tetra Tech team staff in August 2020. A copy of the market actor interview guide can be found in Appendix E.
- **Nonparticipant survey.** The CNC program evaluation included a series of questions in support of the program evaluation as part of a general population telephone survey that the Tetra Tech team conducted for the MidAmerican nonresidential programs. Among other items, the questions assessed consumer awareness of different program offerings, interest in program participation and rebates, energy efficiency attitudes, and any recent energy efficiency activity. A copy of the nonparticipant survey can be found in Appendix F.
- **NTG assessment.** Primary NTG information was collected from the two Illinois program participant interviews from which the Tetra Tech team estimated free-ridership and participant spillover effects. The market actor interviews also investigated qualitative indicators of the program's influence on customer decision-making and market actor practices. Due to the very small sample size, the Tetra Tech team also reviewed studies addressing NTG for states or service territories with characteristics similar to MidAmerican's service territory and the CNC program.
- **Engineering/ desk reviews.** The Tetra Tech team reviewed a sample of 18 custom projects in Iowa and two custom projects in Illinois. These reviews verified demand savings for the program by comparing the modeling methodologies used among projects and to industry best practices. The Tetra Tech team reviewed and compared project-level energy savings methods and assumptions to assess and provide recommendations related to the use of project-level documentation, M&V, and the use of code- and market-based baseline assumptions. Project-specific results where adjustments were made can be found in Appendix A.
- **Secondary research.** In addition to primary research activities, we also conducted secondary research to gather information on NTG estimate for programs similar to MidAmerican's CNC program to provide additional context to evaluation results.

3.0 PROGRAM SAVINGS AND IMPACT EVALUATION FINDINGS

This section presents the results for the CNC program impacts for PY2019 in Iowa and Illinois and PY2020 Q1 for Iowa. The impact evaluation was designed around the key researchable questions identified in the methodology section 2.1.1. First, we present the program savings and then discuss the tracking, engineering, and data reviews.

3.1 PROGRAM SAVINGS

In this subsection, we present the electric and natural gas energy and demand savings results separately for Iowa and Illinois. For each service territory, the Tetra Tech team selected a statistically valid sample of measures for review. We provide detailed results for the project level reviews in Appendix A for those projects where adjustments were made based on the evaluation.

3.1.1 Iowa

In MidAmerican's Iowa service territory, 107 projects were completed across PY2019 and PY2020 Q1, with over 21 million kWh and 380,000 therms of gross savings. The Tetra Tech team reviewed the tracking data and found that the majority of projects went through the Standard Large program track, followed by Custom Strategy and Standard Small program tracks—95 of the 107 projects went through these three program tracks.

Based on the distribution of projects across the program tracks, the Tetra Tech team selected a sample of projects for desk reviews. The individual sampled projects were stratified by program track, with the quantities determined for each strata from their overall contribution to program savings. Projects were then selected at random from within each program track. As a result of consultation with MidAmerican, no projects were selected from the Advanced Custom Efficiency, Renovation, or Pilot tracks, due to these offerings being discontinued from the program.

In total, 18 customer projects were reviewed from the Iowa service territory; 16 projects included electric savings and 12 projects included natural gas savings. The Tetra Tech team made a minor savings adjustment to a single project for electric savings and no savings adjustments to natural gas savings projects. We provide detailed results for the project level reviews in Appendix A of this report for those projects where the evaluation made an adjustment to savings.

Table 4. Engineering Desk Reviews Sample by Category* - Iowa

Program Track	Number of Projects	Number of Unique Participants	Tracked Gross Savings (kWh)	Number of Sampled Electric Projects	Tracked Gross Savings (Therms)	Number of Sampled Gas Projects
Standard Small	15	15	955,704	2	72,603	1
Standard Large	64	64	11,901,609	7	245,685	5
Custom Strategy	16	16	7,057,956	7	24,217	5
Advanced Custom Efficiency	2	2	83,182	0	31,075	0
Other (Volume Build, Renovation, Pilot)	10	10	1,249,436	0	7,011	1
Total	107	107	21,247,887	16	380,591	12

* Numbers reflected in this table are from tracking data received from MidAmerican on June 2, 2020.

The Tetra Tech team's impact evaluation of Iowa projects resulted in an overall gross realization rate for electric measures of 100.0 percent with 0.038 relative precision at the 90 percent confidence interval for kWh and 100.0 percent with 0.0 percent relative precision for kW. There was a slight decrease in kWh and kW savings resulting from a single savings adjustment for occupancy sensor control savings being reported when it was required in the baseline on one project.

The overall realization rate for therms and peak therm savings were 100.0 percent with 0.0 relative precision. There were no quantifiable adjustments made to natural gas savings. Evaluated impacts are provided for the program tracks where the Tetra Tech team completed desk reviews (thus, Volume Build does not include renovation or pilot activities and no evaluated impacts are presented for Advanced Custom Efficiency).

Table 5. PY2019 and PY2020 Q1 Program Tracked and Evaluated Impacts* - Iowa

Program Track	Tracked (kWh)**	Evaluated (kWh)	kWh Realization Rate
Standard Small	955,704	955,483	100.0%
Standard Large	11,901,609	11,898,863	100.0%
Custom Strategy	7,057,956	7,056,327	100.0%
Volume Build	98,841	98,818	100.0%
All Projects	20,014,110	20,009,492	100.0%
Program Track	Tracked (Peak kW)**	Evaluated (Peak kW)	Peak kW Realization Rate
Standard Small	259	259	100.0%
Standard Large	4,672	4,672	100.0%
Custom Strategy	1,836	1,836	100.0%
Volume Build	60	60	100.0%
All Projects	6,827	6,827	100.0%

Program Track	Tracked (Therms)**	Evaluated (Therms)	Therms Realization Rate
Standard Small	72,603	72,603	100.0%
Standard Large	245,685	245,685	100.0%
Custom Strategy	24,217	24,217	100.0%
Volume Build	3,735	3,735	100.0%
All Projects	346,240	346,240	100.0%
Program Track	Tracked (Peak Therms)**	Evaluated (Peak Therms)	Peak Therms Realization Rate
Standard Small	30	30	100.0%
Standard Large	3,196	3,196	100.0%
Custom Strategy	305	305	100.0%
Volume Build	49	49	100.0%
All Projects	3,580	3,580	100.0%

* Numbers in the table are rounded—savings values are rounded to the nearest whole number and the realization rate is rounded to the nearest tenth of a percent. As a result, numbers may not calculate exactly in the table.

** Reported savings shown are from tracking data received from MidAmerican on June 2, 2020.

3.1.1 Illinois

In MidAmerican's Illinois service territory, eight projects were completed in PY2019, with over 1 million kWh and 15,000 therms of gross savings. The Tetra Tech team reviewed the tracking data and found that the majority of projects went through the Standard Large program track, followed by Custom Strategy and Standard Small. All eight projects went through these three program tracks.

Given the small number of completed projects, the Tetra Tech team selected a random sample of projects for desk reviews. As a result of the sampling, two customer projects⁸ were reviewed for the Illinois service territory; both projects reported electric and natural gas savings. The Tetra Tech team made no savings adjustments to either of the Illinois projects.

Table 6. Engineering Desk Reviews Sample by Category* - Illinois

Program Track	Number of Projects	Number of Unique Participants	Tracked Gross Savings (kWh)	Number of Sampled Electric Projects	Tracked Gross Savings (Therms)	Number of Sampled Gas Projects
Standard Small	2	2	84,007	2	837	2
Standard Large	5	5	534,515	0	13,078	0
Custom Strategy	1	1	473,126	0	1,599	0
Total	8	8	1,091,648	2	15,514	2

* Numbers reflected in this table are from tracking data received from MidAmerican on June 2, 2020.

⁸ By random chance, both projects were from the Standard Small program track. Other than the version of the energy code in use, there is no difference in program design or implementation. The two projects reviewed correctly used ASHRAE 90.1-2013 baselines.

Evaluated impacts are provided for the program tracks where the Tetra Tech team completed desk reviews. The Tetra Tech team's impact evaluation of Illinois projects resulted in overall realization rates of 100.0 percent with 0.0 relative precision at the 90 percent confidence interval for both energy and demand. The overall realization rates for therms and peak therm savings were also 100.0 percent with 0.0 relative precision. There were no quantifiable adjustments made to any Illinois projects.

Table 7. PY2019 Program Tracked and Evaluated Impacts - Illinois

Program Track	Tracked (kWh)**	Evaluated (kWh)	kWh Realization Rate
Standard Small	84,007	84,007	100.0%
Program Track	Tracked (Peak kW)**	Evaluated (Peak kW)	Peak kW Realization Rate
Standard Small	40	40	100.0%
Program Track	Tracked (Therms)**	Evaluated (Therms)	Therms Realization Rate
Standard Small	837	837	100.0%
Program Track	Tracked (Peak Therms)**	Evaluated (Peak Therms)	Peak Therms Realization Rate
Standard Small	11	11	100.0%

* Numbers in the table are rounded—savings values are rounded to the nearest whole number and the realization rate is rounded to the nearest tenth of a percent. As a result, numbers may not calculate exactly in the table.

** Reported savings shown are from tracking data received from MidAmerican on June 2, 2020.

3.2 PROJECT LEVEL TRACKING DATA AND DOCUMENTATION

The engineering analysis included an assessment of the appropriateness of the information collected to support program QA/QC, as well as the impact evaluation activities. The Tetra Tech team received and reviewed the CNC program population data queried from Vision and Traksmart for projects completed in PY2019 and PY2020 Q1. The CNC program tracking data was provided at the project level. The type of data that was captured and reviewed by the evaluation for each database is further described below.

Vision and Traksmart data that was key to the evaluation effort included:

- Customer information (e.g., company name, address, site contact information)
- Market actor information (e.g., company name, address, key contact information, market actor type)
- Project level energy and demand savings by fuel type
- Design team incentive awarded
- Construction incentive awarded
- Track type (e.g., I, II, III)
- Project square footage
- Utility provider for electric and gas
- Project number (MidAmerican and Willdan project numbers)

- Dates (e.g., preliminary and final results meeting, construction document review, fee proposal, construction letter, postconstruction verification, bundle requirements, and check sent).

Key documentation captured and reviewed for each sampled project included:

- Building baseline simulation model input and output files
- Building bundle simulation model input and output files
- Customer participation forms and applications
- Meeting minutes from project initiation, design, and bundle selection meetings
- Bundle selection/requirement documents
- Construction letters, fee proposals, and check request memos
- Strategy/results reports
- Final verification reports

3.3 ENGINEERING DESK REVIEWS

As noted earlier, for a sample of projects, reported savings were verified through engineering desk reviews completed by the Tetra Tech team. The engineering analysis included reviews of project-level data and documentation to verify the savings methodology used and to confirm key assumptions for the primary measures that contributed to project level savings and incentives through the program. The impact analysis primarily used existing building energy models to quantify and adjust savings based on the appropriate baseline, and as-built and verified conditions as documented in each project's strategy and verification reports. Savings adjustments also utilized the development of prototype models to determine energy savings impacts and modifications for some measures. Details of these adjustments and results are provided in the subsequent sections.

The whole building energy models developed by Willdan represent the energy consumption for baseline and projected new building design scenarios. The projected savings is the difference in annual electric and gas consumption between the two models⁹. All projects have savings calculated during the design stage, when several energy savings options analyzed, and a "Final Results Report" and "Bundle Requirements Document" are created. Once construction of the building is complete, the parameters of the as-constructed building are compared to the "Bundle Requirements Document" and where the as-built conditions deviate from the bundling requirements, modifications to the savings estimates are made. The primary method for modifying the savings is to adjust the parameters in the design model to create a verified model that reflects the as-built building. This procedure is used for Tracks I and II. For Track III, a bundling factor is determined from the results of the baseline and design models and applied to the savings estimates for individual measures. Based on verified conditions, these initial savings are then adjusted at the measure level using linear scalability of the verified conditions.

The impact analysis used by the Tetra Tech team differed slightly among projects that had final savings based on custom measure level savings adjustments and projects that utilized a final verified model and is further described next. For all sampled projects, the Tetra Tech team assessed:

⁹ The difference between the two approaches is not that different, so the way Willdan handles this is reasonable, particularly given that it can be costly to run verified models.

- The completeness of information in the project level files and documentation
- The alignment of tracking data with the project documentation
- The appropriateness of the baseline energy code selections
- Measure level baseline conditions compared to energy code specified levels
- Measure level new design conditions exceeded energy code specified levels
- The accounting for interactive effects and associated use of the bundling factor
- Key attributes of the whole building energy simulation models including lighting power densities, HVAC equipment efficiencies, window performance and envelope insulation.

3.3.1 Baseline Conditions

The energy performance baseline is the Energy Conservation Code for Commercial Buildings, which references and incorporates the applicable International Energy Conservation Code (IECC). This reference specifically allows for use of ASHRAE standard 90.1 as an alternate compliance method. The date of construction (i.e., typically the date of the construction permit) is typically used to determine which version of the IECC is the most appropriate for compliance purposes. Based on discussions with MidAmerican and Willdan, the CNC program determines the appropriate energy code baseline based on the date of the initial customer meeting. The following table presents the commercial building energy codes and their effective dates for Iowa and Illinois.

Table 8. Commercial Modeling Protocol Baseline Effective Dates

State	IECC 2012 /ASHRAE 90.1-2010	IECC 2015 /ASHRAE 90.1-2013	IECC 2018 /ASHRAE 90.1-2016
Iowa	July 1, 2015	n/a	n/a
Illinois	July 1, 2015	January 1, 2017	January 1, 2020

As stated above, the building codes used in the reported baseline savings models were based on the codes in effect at the time of the project initiation meeting. Although the applicable energy codes may change by the time the building permit is obtained, the Tetra Tech team believes that this would likely be rare and the program's approach of using the project initiation meeting to determine the applicable building energy code is reasonable. This is also in-line with industry-standard practices for determining code levels, such as what Leadership in Energy and Environmental Design (LEED) uses, which is the project's registration date. Due to the timeframe of this evaluation, every project in Iowa should have used ASHRAE 90.1-2010, while every project in Illinois should have used ASHRAE 90.1-2013. The Tetra Tech team found compliance to these standards across all 20 sampled projects.

3.3.2 Energy Model Conditions

The simulation model input files were identified as a key document to be provided for each project for the evaluation, and these files were made available for each sampled project through a request to Willdan. With the simulation input and output files, the Tetra Tech team was able to fully review both the modeled strategies and assumptions (e.g., lighting/HVAC occupancy schedules, HVAC equipment efficiencies, HVAC operating parameters) used as well as the examine the resulting simulation output file reports for evidence of their savings. Based on the data and documentation that was provided, the Tetra Tech team had some initial questions on five projects for how the modeled approaches to savings

were handled. After further discussions and information provided by Willdan, these questions were sufficiently addressed.

3.3.3 Unmet Load Hours

In the last evaluation cycle, the Tetra Tech team raised questions related to unmet load hours¹⁰. Substantial improvement to unmet load hour protocols have been made since the last evaluation. In particular, the Tetra Tech team identified only three projects during this evaluation that required a review of the unmet load hours, compared to 13 in the last evaluation.

Two models are created for each project—one that represents the energy consumption for the baseline facility and one that represents the facility with the new design improvements integrated. Since the last evaluation, the program clearly has defined and adopted a reasonable threshold for unmet load hours for the baseline and bundle energy models. Additionally, using a reasonable threshold for both models should alleviate any concerns over the difference between models when sufficiently applied. The Tetra Tech team recognizes that addressing these thresholds is not a small effort for the program, particularly related to modeling. In the previous evaluation, we recommended that a threshold¹¹ be adopted for the program, and this is clearly incorporated into the latest Program Manual. The threshold for resolving unmet load hours was set at five percent of the total simulation hours (438 hours), which is reasonable.

A review of the simulation output reports found three projects that exceeded these thresholds for unmet load hours across the baseline and bundle simulation models. Additionally, when the Tetra Tech team compared the differences in unmet load hours between the baseline and design models, we found that one of these projects also exceeded a five percent difference in unmet load hours between the baseline and bundle simulations. Upon review with Willdan, the Tetra Tech team learned that one project with high unmet load hours did not have any effect on savings, and the remaining two projects, if fully resolved to the criteria set out above, might have a small effect on savings. The Tetra Tech team agreed that the savings adjustments would be relatively small and difficult to quantify precisely, so no adjustments were made to savings.

3.3.4 Space-by-Space and Building Area Method Lighting

During the evaluation, the Tetra Tech team noted five projects that were using a combination of space-by-space and building area method baseline lighting values in the energy modeling input files. This initially appeared contradictory, as ASHRAE 90.1 specifies either path should be followed explicitly. However, after discussions with MidAmerican and Willdan, the Tetra Tech team learned of how the use of space asset areas differs from strict adherence to either the space-by-space or building area methods.

Space asset areas are portions of the building that are combined within the energy model because they share similar parameters, such as HVAC systems, and are then broken down into sub zones based on

¹⁰ An unmet load hour is any hour during the simulation run in which at least one HVAC zone falls outside of its specified space conditioning temperature range. These can occur for several reasons and are a key factor in assessing simulation model robustness and accuracy. Keeping such load hours to a specified minimum threshold is a standard modeling practice.

¹¹ As described in the last evaluation, whole building energy simulation modeling is an iterative process that relies on entering known inputs into the simulation program, running the program, interpreting the results, and then making adjustments to the model inputs to limit values outside of defined ranges on subsequent simulation runs. Because the simulations require refinement through this iterative process, it is good industry practice to develop thresholds for what is considered to be a “good” model for whole building simulation results.

orientation and exterior exposures, as required by Appendix G. This could not be done for a LEED submission, as other parameters, such as occupancy patterns, and lighting/equipment load schedules, would also necessitate more granular zoning. Additionally, LEED is highly focused on accuracy and does not have to be concerned with cost-effectiveness of projects. Further, Willdan explained that when space asset areas are used, the building area method is applied for the baseline lighting, except for zones where significant deviation from the primary building use type is encountered. Some examples where space-by-space lighting power densities were used rather than the building area method included library and kitchen spaces within school buildings, and warehouse spaces within a retail building.

The Tetra Tech team examined the use of space asset areas on these five projects and found them to be a reasonable compromise between the efficiency of providing analysis and the precision of the energy savings that would result from a strict ASHRAE 90.1 and LEED compliance. In the opinion of the Tetra Tech team, the protocol implemented by Willdan does not introduce bias at the program level and including more detail would not be a good use of implementer dollars. Willdan is doing what is needed to maintain the expected level of accuracy.

3.3.5 Application of Exceptions

During the desk review process, the Tetra Tech team found one project where there were space and configuration exceptions, but documentation of these exceptions was not found in the project files:

- This project claimed occupancy sensor control of lighting savings when controls were required in the baseline by ASHRAE 90.1. In this case, the Tetra Tech team found a storage space under 1,000 ft² that had occupancy sensor control savings when it was required to have controls, according to section 9.4.1.2a, exception b4. An adjustment was made to this project.

The following exceptions are similar in nature to the one listed above. These are listed for informational purposes only, as the Tetra Tech team did not find any clear incorrect applications of these exceptions. In discussions with Willdan, they stated that they do review these exceptions for each energy model and that savings are only claimed for measures that exceed the required baseline control methods:

- Classrooms are required under exception b1 to section 9.4.1.2a, and some projects reported “vacancy” controls for lighting savings.
- Conference rooms are required under exception b2 to section 9.4.1.2a, and some projects reported “vacancy” controls for lighting savings.
- Employee break rooms are required under exception b3 to section 9.4.1.2a, and some projects reported “vacancy” controls for lighting savings.
- Office space up to 250 ft² are required under exception b6 to section 9.4.1.2a, and it was unclear whether some smaller offices may have reported occupancy sensor savings when they were required by code because small office spaces are often combined for modeling purposes.
- Most projects in the sample reported daylighting savings, with a mixture of baselines either containing daylighting controls or totally omitting daylighting controls. It was not possible to determine whether these were complying with sections 9.4.1.4 and 9.4.1.5 of ASHRAE 90.1 in all cases due to combined zoning.

Based upon the results of the evaluation, the Tetra Tech team feels that any cases which may not have applied the exceptions correctly are rare and would have a minor effect on the overall program savings.

4.0 NET IMPACT EVALUATION

In addition to estimating evaluated gross savings, the Illinois Commerce Commission (ICC) requires that MidAmerican provide evaluated savings estimates with NTG adjustments and the Iowa Utility Board (IUB) has encouraged using NTG estimates for informational and program design purposes. To meet these requirements, the Tetra Tech team conducted primary and secondary research to recommend NTG ratios that would be appropriate to apply to MidAmerican's CNC program evaluated program savings.

4.1 ESTIMATION PROCESS

From an impact perspective, NTG represents a measurement of savings attributable to program interventions. It first accounts for free-ridership, which measures the savings reported by participants who would have installed the same high-efficiency measure type on their own at that same time if the program had not been offered. We also accounted for participant spillover, which measures untracked and non-rebated savings resulting from program information and intervention. When free-ridership and spillover are captured, the NTG ratio is calculated.

Because NTG is required in Illinois, the Tetra Tech team conducted primary NTG research with participating Illinois customers, as well as a secondary review of NTG values used by similar programs in nearby territories. Because MidAmerican's CNC program operates similarly in both Iowa and Illinois, NTG results from Illinois were applied to Iowa data. However, in Iowa, NTG is applied for informational purposes only.

During the time period reviewed by the evaluation, there were eight projects completed in Illinois. The Tetra Tech team conducted interviews with two of these program participants. Due to the small number of participants, and therefore, completed interviews, the Tetra Tech team utilized a simplified self-report approach to estimate free-ridership and participant spillover effects by averaging the gathered free-ridership and spillover values.

Free-ridership refers to actions taken by participants through a program that would have occurred in the absence of the program. In other words, a *free rider* is a program participant who would have made some of the energy efficiency choices if the program had not been offered.

Spillover refers to additional energy efficient equipment installed, or actions taken due to program influences but without any financial or technical assistance from the program. The Tetra Tech team relied on the two participant interviews to determine the spillover rate.

The final NTG ratio is calculated using the following formula:

$$NTG\ Ratio = 1 - (Free-Ridership\ Rate) + (Spillover)$$

As a simplistic example, if a program has a free-ridership rate of 20 percent and a spillover rate of eight percent, the NTG ratio would be:

$$NTG\ Ratio = 1.00 - ((0.20) + (0.08))$$

$$NTG\ Ratio = 0.88, \text{ or } 88\%$$

A higher NTG indicates program influence on decisions and high attribution toward behaviors. A lower NTG factor indicates a low level of influence, which may be further indicative of market transformation, a need for incentive restructuring, etc. There are occasions where outliers exist in the data. Outliers are cases that provide responses that extensively deviate from the norm. While important to account for

these cases, depending on the project size and the number and composition of survey completes, these data can significantly swing the results.

Within NTG research, the spillover calculation has the potential of capturing large outliers, which could then influence the overall NTG ratio considerably. While it is important to recognize these cases' spillover results, the Tetra Tech team needs to be careful to manage the results such that NTG is not overstated due to potential self-reporting bias.

Three main questions were utilized to capture NTG information from the participant interviews:

- V1** Using a 0 to 10 scale where 0 is "not at all important" and 10 is "very important," how important was the program, including incentives, program services, and information provided in influencing your decision to include energy-efficient equipment and building practices in your new building?
- V2** And using a 0 to 10 likelihood scale, where 0 is "not at all likely" and 10 is "very likely," what is the likelihood that you would have reduced the efficiency of some equipment or practices if the program had not been available?
- FR6a** If you were given a TOTAL of 100 points and you had to divide those 100 points between 1) the program; and 2) any other factors. How many points would you give to the importance of the program? And how many points would you give to other factors?

Participant net-to-gross was calculated as an average of the response to these above questions normalized on a scale of 0 to 100 percent.

$$NTG = \frac{1}{3} \times [(V1 \times 0.1) + (V2 \times 0.1) + (FR6a \times 0.01)]$$

Individual participant net-to-gross ratios were weighted by the project's energy savings to account for each project's contribution to the overall program result.

In addition to the participant interviews, the market actor interviews investigated qualitative indicators of the program's influence on customer decision-making and trade ally practices. Another source of information is the secondary review, which focused on relevant studies addressing NTG for states or service territories with characteristics similar to MidAmerican's service territory and the CNC program (Appendix C).

The self-reports from the two Illinois participant interviews resulted in a calculated NTG ratio of 40 percent for gas and 38 percent for electric. Information gleaned from the Iowa participant interviews suggest higher program influence, as does findings from the secondary review where the NTG ratios for states and service territories with characteristics similar to MidAmerican's service territory and the CNC program ranged between 58 and 77 percent. The self-reports from the Illinois interviews did not attempt to address participant spillover since newly constructed buildings are unlikely to have equipment replaced in such a short time frame. Given the low number of self-report responses and the findings from the secondary review, we recommend a 70 percent NTG ratio be applied to Illinois projects.

Feedback from participating market actors interviewed also suggests that the program influences customers' initial design choices. Market actors are a primary source of program awareness, and participants commonly mentioned the influence of the information provided by Willdan on energy efficient options. Market actors also indicated that the program is increasing interest and demand for energy efficiency (see section 5.2.3 for more details).

In addition, Willdan reported that they use the following approaches to keep the NTG as high as possible:

- They always provide their own energy analysis for each project and educates design teams and building owners on the energy analysis process.
- Willdan does not just look at the anticipated building design; rather, they always develop three bundles of energy efficiency strategies, which allows the end use client an opportunity to evaluate and consider design alternatives.
- They help prevent energy efficiency strategies from being removed through value engineering by developing multiple bundles and then providing a bundle requirements document for the selected bundle.
- Before screening projects, they must be at a point in the design when energy analysis can influence the design choices.
- Minimum thresholds beyond code that projects must achieve to receive an incentive are required.

5.0 PROCESS EVALUATION FINDINGS

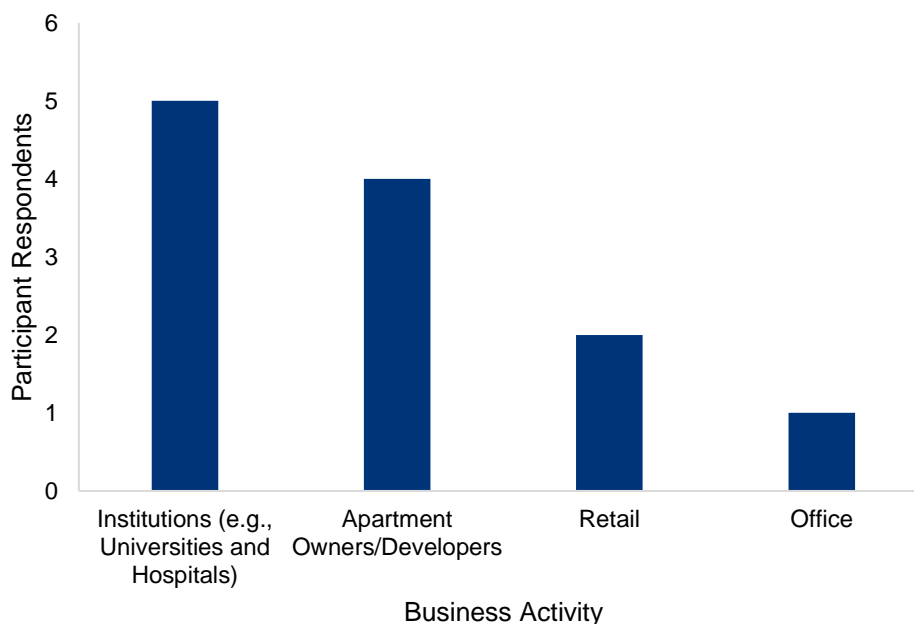
This section presents the findings from the process evaluation activities and are detailed separately for Iowa and Illinois. The process evaluation was designed around the key researchable questions identified in the methodology section 2.1.1. Process evaluation activities involved interviews with program and implementation staff, participating customers and participating market actors, and program nonparticipants. The key process-related findings are detailed in the subsections below.

The participating customer survey was used to understand the perspectives of program participants; questions explored consumers' awareness, reasons for participation, program experiences, and satisfaction with the CNC program. The participating market actor interviews investigated awareness, experiences, and satisfaction with the program. In addition, training, education, and outreach¹² were further explored with market actors, as well as the program's impact on increasing the interest and demand for energy-efficient equipment. Illinois program participants interviewed were asked NTG questions, as were all market actors interviewed. For purposes of this evaluation, participant and market actor interviews have been used to broadly represent end-users, rather than specific projects.

5.1 INTERVIEWED PARTICIPANT AND TRADE ALLY CHARACTERISTICS

The Tetra Tech team interviewed a total of 11 participating customers in Iowa and two participating customers in Illinois (one of the interviewed customers participated in both territories), representing a total of 17 projects. The participants interviewed represent five institutions, such as universities and hospital facilities, four apartment owners/developers, two retail, and one office (Figure 2). About two-thirds of the interviewed participants own and occupy their facility and occupy one building. Roughly one-third of the participants indicated that they have about 100 employees in their firm.

Figure 2. Firm Characteristics of Participants Interviewed



¹² Training, education, and outreach findings will be summarized as part of the Education program report.

The tables below summarize the firm, energy use, and facility characteristics for the nonparticipants surveyed. The most common business activity among surveyed nonparticipants is an office. Similar to the participants, it is most common for nonparticipants to be owners of the facility where they operate.

Table 9. Firm Characteristics of Nonparticipants Interviewed

Firm Characteristics	Percent
Business activity	
Office	26.9%
Retail	8.8%
Agricultural	8.8%
Warehouse or distribution center	8.1%
Restaurant	6.9%
Other healthcare	6.3%
Auto repair	6.3%
Other	6.3%
Industrial/Manufacturing	5.6%
Lodging	4.4%
Institution/government	2.5%
Religious worship	2.5%
School K-12	1.9%
Public assembly	1.9%
College/university	1.3%
Grocery	0.6%
Hospital	0.6%
Vacant	0.6%
Respondents (n)	160
Ownership	
Your company owns and occupies this facility	66.5%
Your company owns this facility but it is rented to someone else	9.3%
Your company rents this facility from someone else	24.2%
Respondents (n)	161

Source: Question FIRM1, FIRM2 (Nonparticipant Survey)

Don't know and refused responses are excluded.

About two-thirds of surveyed nonparticipants indicated that they use a furnace for heating. The majority use natural gas as the main fuel for heating and about half have a “residential-style” air conditioner in their facility.

Table 10. Energy Use Characteristics of Nonparticipants Interviewed

Energy Use Characteristics	Percent
Equipment used for heating	
Furnace	66.0%
Rooftop unit	14.7%
Steam Boiler	9.6%
Infrared heaters/tube heaters	6.4%
Heat pump	5.8%
Conventional hot water boiler	5.1%
Electric resistance	4.5%
Other	4.5%
Space heater	3.8%
High efficiency/condensing boiler	0.6%
None	0.6%
Respondents (n)	156
Main fuel used for heating	
Natural gas	85.3%
Electricity	11.2%
Other: (specify)	2.1%
Fuel oil	1.4%
Solar	0.0%
No heating fuel used	0.0%
Respondents (n)	143
Equipment used for cooling	
“Residential-style” air conditioner	47.8%
Rooftop unit	27.0%
None	6.9%
Other	5.0%
Commercial AC	5.0%
Heat pump	4.4%
Fans	3.8%
Water-cooled chiller	3.1%
Air-cooled chiller	1.3%
Respondents (n)	159

Source: Question FIRM13, FIRM14, FIRM15 (Nonparticipant Survey)

Don't know and refused responses are excluded.

The majority of nonparticipants surveyed indicated that their firm occupies one building (two-thirds, similar to participants) and a surface area under 10,000 square feet. About half reported that the age of their newest building is 30 years or more, they only have one location, and they have been occupying it for over 20 years. About two-thirds have less than 10 employees (lower compared to participants) and operate all year around.

Table 11. Facility Characteristics for Nonparticipants

Facility Characteristics	Percent
Buildings occupied by firm	
1 building	64.6%
2 to 5 buildings	26.1%
6 to 10 buildings	6.2%
11 to 20 buildings	2.5%
21 to 50 buildings	0.6%
Over 50 buildings	0.0%
Respondents (n)	161
Size of facility	
Under 5,000 sq. ft.	43.5%
5,000 to just under 10,000 sq. ft.	25.2%
10,000 to just under 25,000 sq. ft.	16.3%
25,000 to just under 50,000 sq. ft.	5.4%
50,000 sq. ft. or more	9.5%
Respondents (n)	147
Age of (newest) building	
Less than 2 years	4.7%
2 to 4 years	5.4%
5 to 9 years	6.1%
10 to 19 years	17.6%
20 to 29 years	15.5%
30 years or more	50.7%
Respondents (n)	148
Facility description	
Your company's only location	52.5%
The headquarter location of your company with several locations	17.1%
One of several locations owned by your company	30.4%
Respondents (n)	158

Facility Characteristics	Percent
Time business has occupied location	
Less than a year	5.8%
1 through 5 years	17.4%
6 through 10 years	12.9%
11 through 20 years	16.1%
More than 20 years	47.7%
Respondents (n)	155
Number of employees	
Less than 10	60.8%
10 to 49	26.6%
50 to 99	6.3%
100 to 249	3.8%
250 to 499	2.5%
500 or more	0.0%
Respondents (n)	158
Operate facility depending on season or production cycle	
Yes	30.0%
No	70.0%
Respondents (n)	160

Source: Question FIRM4, FIRM5, FIRM6, FIRM7, FIRM8, FIRM9, FIRM10, FIRM12 (Nonparticipant Survey)

Don't know and refused responses are excluded.

5.2 PROGRAM PROCESSES

5.2.1 Program Design

The CNC program is a mature program designed to promote and increase the adoption of energy-efficient strategies in new nonresidential building construction as well as major renovations of existing nonresidential buildings. Education and outreach are also provided by the program through utility staff and market actors.

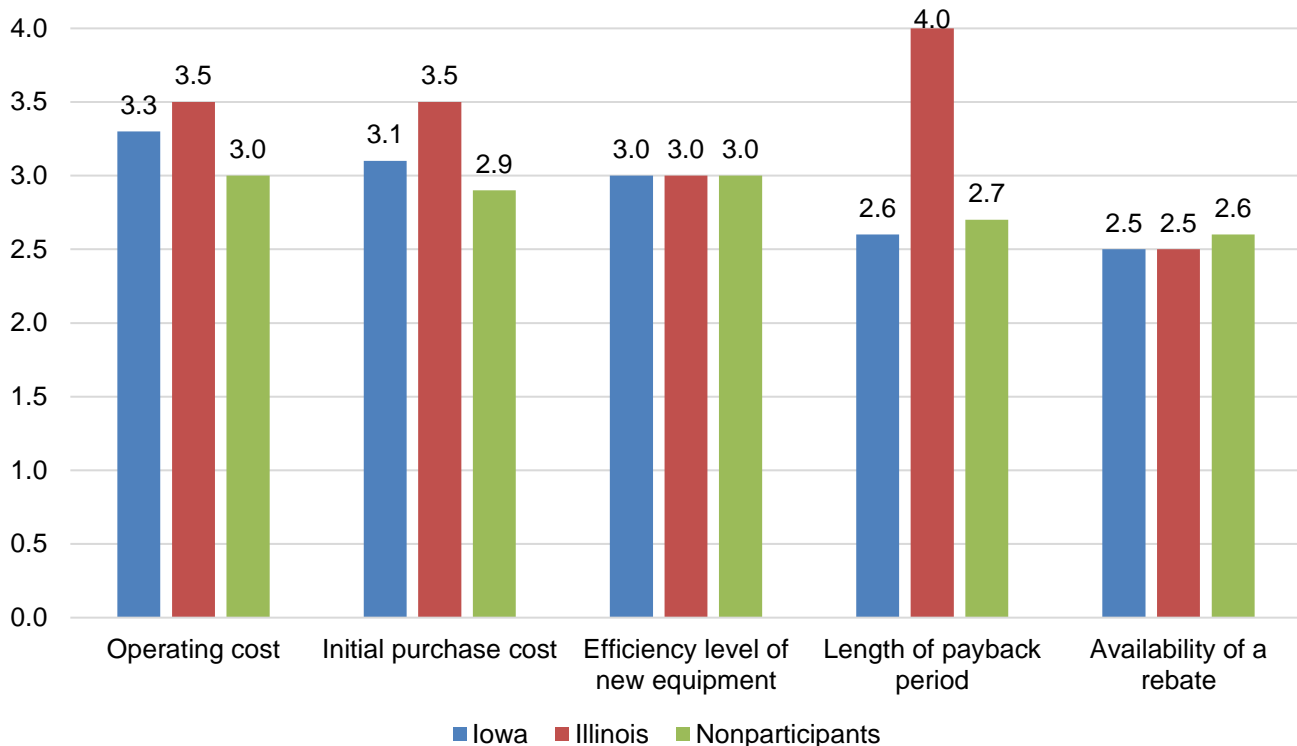
5.2.1.1 Motivations for Participation

Participants interviewed were asked to provide the considerations that led to the final decision to participate in the CNC program. Most of those who were involved in the decision process reported that a desire to reduce energy cost (4 of 5) and improving the return on investment (3 of 5) as the main decision drivers.

When asked to specifically rate the importance of various decision-making factors as they considered new energy using equipment (on a scale of 1 to 4, where 1 was "not at all important" and 4 was "very

important"), Iowa participants interviewed rated operating cost, initial purchase cost, and efficiency level of new equipment the highest (Figure 3 and Table 12). Illinois participants rated the same decision-making factors high, but length of payback scored the highest. Consistent with the participant interviews, the majority of nonparticipants rated operating cost, efficiency level of new equipment, and initial purchase cost as important. Both participant groups and nonparticipants rated the availability of a rebate the lowest among these factors.

Figure 3. Importance of Different Factors When Considering an Equipment Purchase (Means)



Valid number of responses for Iowa participants = 10; Illinois participants = 2; Nonparticipants varied from 162 – 165

Source: Questions A4 (Participant Interview Guide) and Questions I1A-A1K (Nonparticipant Survey)

Don't know and refused responses are excluded.

Rated on a scale of 1 to 4, where 1 was "not at all important" and 4 was "very important."

In addition to the decision-making factors in the table below, nonparticipants were asked to rate a few other factors. Other important factors for nonparticipants were equipment performance concerns (83 percent rated a 3 or 4), energy savings or reducing your energy bills (79 percent rated a 3 or 4), and compatibility with existing equipment (75 percent rated a 3 or 4).

Table 12. Importance of Different Factors When Considering an Equipment Purchase (Ratings)

Decision-making Factor	Iowa		Illinois		Nonparticipants	
	Respondents (n)	Number Rating 3 or 4	Respondents (n)	Number Rating 3 or 4	Respondents (n)	Percent Rating 3 or 4
Operating cost	10	9	2	2	164	83.5%
Initial purchase cost	10	9	2	2	164	70.7%
Efficiency level of new equipment	10	7	2	2	164	81.1%
Length of payback period	10	6	2	2	162	53.1%
Availability of a rebate	10	4	2	1	165	51.5%

The majority of participants interviewed (11 of 12) indicated that they do not have any corporate policies related to energy efficiency standards or sustainability plans that they need to consider when purchasing new equipment or making improvements to their buildings. However, about half of them mentioned that they have some guidelines or follow some best practices to reduce energy costs and improve efficiency. One Iowa participant noted that they usually use state income tax credits for affordable housing and that there is almost always energy efficiency requirements to receive those tax credits. Similar to participants, the majority of nonparticipants interviewed (91 percent) reported that they have no energy efficiency or sustainability policies.

Program-Specific Marketing and Outreach

The top sources of program awareness were similar for both participants and market actors. The majority of Iowa participants and market actors who recalled their first involvement with the program reported MidAmerican staff or previous project experience as the main source of awareness (7 of 10 Iowa participants and 5 of 8 market actors). One of the Illinois participants interviewed became aware of the program through his previous job and the other participant from an energy rater. Nonparticipating respondents, on the other hand, were more likely to mention that they heard about the program from an equipment vendor, a contractor, other businesses, or MidAmerican utility bill insert (Table 13).

Table 13. Source of Program Awareness for Nonparticipants

Source	Percent
Equipment vendor, contractor, grant writer, or other professional	11.4%
Other business/ family member	10.8%
MidAmerican utility bill insert	8.2%
Other	5.1%
Email	5.1%
Previous program participation	4.4%
MidAmerican website	3.8%
MidAmerican call center representative	3.8%
Television	3.8%
MidAmerican brochure	2.5%
Key Account Manager	1.9%
Newspaper	1.3%
Retail store	0.0%
Conference/trade show	0.0%
Radio	0.0%
Billboard	0.0%
Respondents (n)	158

Source: P4 (Nonparticipant Survey)

Don't know and refused responses are excluded.

5.2.2 Program Administration, Processes, and Resources

5.2.2.1 Customer Support

Willdan works with MidAmerican to deliver the CNC program, and provided a variety of services to customers in PY2019 and PY2020 such as:

- Energy consulting services
- Design team participation incentives
- Construction incentives
- Measurement and verification.

Participants were asked to rate the technical advice and assistance provided by Willdan, using a scale of 1 to 4 where 1 was “not at all helpful,” and 4 was “extremely helpful.” The majority of the participants interviewed who worked closely with Willdan (3 of 5) rated the technical assistance provided to be “extremely helpful.” Some of the participant comments included:

“I just didn't have to do a lot. They did the leg work for me.”

“Being able to see the different bundles and simulated payback, being able to see those strategies to make a decision is very helpful.”

The market actors interviewed found the technical assistance provided by Willdan equally valuable and useful. When asked about the importance of the technical assistance and if it has changed since they first became involved, most of the market actors interviewed (7 of 10) used the following to describe Willdan’s technical assistance (especially their modeling/consulting services):

“very valuable and provided access to modeling”

“tremendously helpful”

essential”

“pretty valuable and consistent over time,

“upfront cost information is helpful to present to the building owner.”

One market actor specifically stressed the importance of Willdan’s technical assistance to small firms and projects:

“On a smaller project recently, it [Willdan’s technical assistance] was very valuable. We didn’t have the fees to do a lot of the analysis to weigh our options relative to our goals. If we have that capability in-house, our engineers end up doing that as a matter of practice. It helps everyone be on a common page and walk through different options.”

One participant and two market actors (two large firms and one specialized design firm) rated the technical assistance provided by Willdan as “somewhat helpful” because they already had clear plans and internal support to work through energy efficiency options. All market actors interviewed, however, appreciated the third party validation and some of the information provided:

“We know the school business better, so we are usually more qualified to assess things. The review process has some useful input, especially in payback periods.”

One market actor found the technical assistance “not that useful” because he wanted more information on cutting-edge technologies “beyond conventional stuff,” including geothermal heating and cooling systems, and ended up going with feedback from another designer firm.

Participants and market actors were also asked if they receive enough support from Willdan and MidAmerican. The majority expressed that they received enough support. One market actor commented that:

“Willdan provides the most support of implementers from any state.”

Two participants and two market actors suggested that more support is needed. One participant asked for additional check-ins between major milestones to keep them aware of any changes to the program. In addition, both participants suggested including more information in the presentation and report material to support decision making, e.g., sources of upfront cost estimations and the incentive breakdown based on measures installed. One market actor recommended “*more out-of-the-box thinking*” when it comes to energy modeling and that Willdan should get more connected with contractors who “*do green buildings*.” The other market actor commented that the energy modeling reports should be more “*official*,” and that “*it is insufficient to qualify as energy review required by regulatory bodies*.” The Tetra Tech team notes that Willdan is aware that some authorities accept CNC documentation for code compliance. However, there are differences between the objectives of the

program and code compliance, and Willdan's objective is to meet the requirements of the utility program.

5.2.2.2 Program Administrative Requirements

Program participants were asked to rate the ease of program enrollment, using a scale of 1 to 4 where 1 was "very difficult," and 4 was "very easy." All participants who were involved in the enrollment process (7 of 12) reported that enrolling their project into the program was "easy" or "very easy." These participants also thought that the program requirements were clearly explained. Some participant respondents did not comment because the design team submitted the application on their behalf. One participant added that although most of the process was easy, adding a more clear timeline and getting the building owner more involved would make the process easier and more transparent. All market actors interviewed also thought that the process of enrolling projects into the program was easy. Those who recalled receiving a design team incentive (8 of 10) were satisfied with the incentive level.

5.2.3 Market Response

We asked the market actor respondents how much they saw the program influencing their initial design choices, and categorized their responses in the table below. Six out of 10 market actors reported that the program often had "quite a bit" of influence in their design choices, particularly if they engaged the program early in the design process. These market actors indicated that the modeling and payback information is very valuable:

"different feedback is helpful"

"learned about design and modeling from Willdan"

"modeling helps sell it"

"third party evaluation is valuable"

"very valuable feedback even for our experienced engineers."

A few of these respondents also commented that program influence varied by project and budget. One of the 10 market actors interviewed reported that the program had "somewhat or little" of an influence on their design choices. Three respondents reported that the program had "minimal or no" influence in their design choices—some mentioned that this was because they already designed efficiency in their buildings or that they have a lot of experience in the market. These were either large design firms that had internal design experts or firms that specialized in one sector.

Table 14. Degree to Which the Program Influenced Initial Energy Efficiency Design Choices for Market Actors

CNC Program Influence	Number of Responses*
Quite a Bit	6
Somewhat or Little	1
Minimal or No	3
Total	10

* Multiple responses allowed.

Market actors were asked if they built any new construction buildings that did not participate in the program. Four of the 10 market actors reported that all their projects participated in the program, two market actors were not sure, and four market actors indicated that they had built new buildings that did not go through the program. The latter group of market actors mentioned a number of reasons why that was the case (Table 15). In follow-up questions, market actors were asked if they helped the customer to design energy-efficient features in these buildings. Of the four market actors who responded, all said yes, that they designed energy-efficient features. When asked to compare the buildings that did not participate in the CNC program to those buildings that did participate, one market actor reported that the nonparticipating buildings included ENERGY STAR® appliances, and one market actor noted that they tried to include energy-efficient features as much as possible, but the buildings were less efficient overall than if they had gone through the CNC program. Two market actors were not sure about the response and were not able to compare participating with nonparticipating buildings.

Table 15. Reasons Why Not All Projects Go Through the CNC Program (n=4)

Reason	Number of Responses*
Schedule and timing related issues	2
Not interested in changing the design	1
Not willing to deal with the paperwork	1
Already decided what they want to do (knowing it's not the most efficient)	1

* Multiple responses allowed.

When asked to what degree they see the program increasing the interest and demand for energy-efficient new construction building design, seven of the 10 market actors interviewed thought that the program is slightly increasing interest, but one market actor commented on the fact that the code is catching up and that *“a lot of what's standard is already efficient.”*

5.2.3.1 Barriers to Installing Energy Efficient Equipment

We asked participants about some of the major obstacles that their firms face when considering implementing energy-efficient features into their new buildings. The most frequently mentioned obstacle by Iowa respondents was upfront cost, followed by uncertainty about return on investment and constraints of contractors (Table 16). For Illinois respondents, upfront cost, constraints of contractors, and the need to incorporate the implementation into long term budget were the top three obstacles. Participant respondents who mentioned contractor constraints as another obstacle noted that finding commercial-grade contractors, or contractors trained on complex features such as geothermal systems is challenging:

“Some of the contractors were kind of residential grade single-family house kind of contract; they weren't really commercial grade contractors.”

“There's not a lot of people around here that do complex features. We had somebody coming from Westchester, he would come in, and they would actually help out... we have these fancy systems [geothermal and solar], but we also have to have somebody who's knowledgeable enough to maintain them. And somebody gets trained, and then that person leaves to go somewhere else. So there's nobody that has that knowledge and knows how to properly run that system.”

Table 16. Barriers to Installing Energy Efficient Equipment for Participants

Barrier	Iowa		Illinois	
	Respondents (n)	Number of Responses*	Respondents (n)	Number of Responses*
Cost of energy efficient equipment	11	8	2	2
Uncertainty about ROI	11	4	2	1
Constraints of contractors	11	3	2	2
Need to incorporate into long term budget	11	2	2	2
Lack of capital budget	11	2	2	1
Decision-makers and system constraints	11	2	2	1
Maintenance and operating costs	11	2	2	1
Space or time constraints	11	1	2	1
Lack of resources	11	0	2	1
Low prioritization of energy efficiency	11	0	2	1

Source: Question A5 (Participant Interview Guide)

* Multiple responses allowed.

Nonparticipants were asked what some of the major challenges might be that their business faces when considering implementing energy efficiency improvements at their facility. Forty-four percent of respondents reported that lack of capital budget as one of their main challenges (the most frequently mentioned challenge). The difference from the participants responses is not surprising since commercial new construction projects typically have gone through the process of assigning budgets to the projects. Also of note was that more than one in 10 nonparticipant survey respondents (15 percent) noted that they do not face any major challenges when considering implementing energy efficiency improvements (Table 17).

Table 17. Challenges to Installing Energy Efficient Equipment For Nonparticipants

Decision-making Factor	Respondents (n)	Percent
Lack of capital budget	64	44.4%
None	21	14.6%
Time constraints of internal staff to implement	13	9.0%
Lack of awareness/knowledge about equipment characteristics or performance	13	9.0%
Uncertainty regarding return on investment	10	6.9%
Need to incorporate purchases or plans into longer term budget	8	5.6%
Compatibility with existing systems	8	5.6%
Age of the building	6	4.2%
Lack of resources to implement	5	3.5%
Approval by decision-makers	5	3.5%
Lack of awareness of or knowledge about energy and money saving opportunities	4	2.8%
Not owning the building	4	2.8%
Building structure	2	1.4%
Contractors aren't familiar with measures	1	0.7%
Low prioritization of energy efficiency or conservation in firm	1	0.7%
Lack of knowledge about how to obtain assistance from MidAmerican	0	0.0%
Other	14	9.7%
Respondents (n)		144

Source: Questions DM2 (Nonparticipant Survey)

Don't know and refused responses are excluded.

5.2.4 Program Satisfaction

5.2.4.1 Customer Satisfaction

Participating customers interviewed expressed high satisfaction with the program overall. The majority provided ratings of 3 or 4 on a 4-point scale where 1 was “not at all satisfied,” and 4 was “extremely satisfied” (Table 18). For example, one participant commented:

“It's a simple program to go through, easy to implement; and the incentive seems fair.”

One participant rated program satisfaction as two (somewhat satisfied). When asked about reasons for the lower rating, this respondent expressed that, as a company manager, he was not as much involved and that a lot of the work happens “*behind the scenes*” and that there was “*not a lot of communication*.” He also added that:

“I didn't have the time to really get the understanding as it is complicated. Also, with new construction, it is hard to work with a baseline, so the data wasn't there to see improvement.”

Satisfaction with Willdan's services was similarly high. Most of the participants interviewed were highly satisfied overall with Willdan's services (ranked 3 and 4 on a 4-point scale).

Table 18. Participant Satisfaction

Program Aspect	Iowa		Illinois	
	Respondents (n)	Mean Rating	Respondents (n)	Mean Rating
The program overall	11	3.2	2	3.0
The services provided by Willdan	8	3.3	2	3.0

The majority of participants interviewed reported that they would highly recommend the program—nine of 12 participants reported that they are “extremely likely” to recommend the program to a peer.

The nonparticipant survey also included a satisfaction question about their experience with MidAmerican in general as your energy provider. Eighty-eight percent of the nonparticipants surveyed reported being “very satisfied” or “extremely satisfied” with the service provided by MidAmerican (mean rating of 3.1).

5.2.4.2 Market Actor Satisfaction

Market actors interviewed expressed high satisfaction with the program overall. The majority provided ratings of 3 or 4 on a 4-point scale where 1 was “not at all satisfied,” and 4 was “extremely satisfied” (Table 19). Comments from the Market actors included:

“Important program, run well overall, it's something we appreciate.”

One market actor rated program satisfaction as two (somewhat satisfied). When asked about reasons for the lower rating, the market actor mentioned that there is a need for more innovative green designs.

Satisfaction with Willdan's services was similarly high. Most of the market actors interviewed were highly satisfied overall with Willdan's services (ranked 3 and 4 on a 4-point scale). In particular, there were a number of positive comments about Willdan and their administration of the program. The market actors and participants generally noted that Willdan was very supportive, technically sound, and helped the process to go smoothly. Other comments from the market actors about Willdan included:

“The support received by Willdan is above and beyond. They do valuable assessments.”

“Everybody is very knowledgeable, and they are very thorough. Some of the stuff is way over my head, and they let me ask stupid questions, and they do what they say they will.”

“Everything went smoothly. They were very respectful of my time, and they did a great job, especially for the amount of money we got.”

Table 19. Market Actor Satisfaction

	Respondents (n)	Mean Rating
The program overall	10	3.1
The services provided by Willdan	10	3.6

The majority of market actors interviewed reported that they would highly recommend the program—eight of 10 market actors reported that they are “extremely likely” to recommend the program to a peer. All market actor respondents thought that the program is effectively achieving savings for its participants.

5.2.1 Future Plans and COVID-19 Affects

With all the restrictions put in place in response to COVID-19, market actors were asked how this has affected their business and if they expect it to impact their projects over the next six months. Several market actors reported that they experienced delays due to COVID-19 (4 of 10), one market actor had to scale down by half, and the rest indicated that they had not seen major impacts. When asked about supply chain disruption, the responses varied from some experiencing delays (4 of 10) and others not noticing major supply chain issues (3 of 10). In terms of the effect COVID-19 will have on them over the next six months, a few market actors anticipate the impact to hit the sector in the next year.

APPENDIX A: PROJECT REVIEW RESULTS

As noted earlier, the PY2019 and PY2020 Q1 CNC program impact evaluation efforts included an engineering analysis for a sample of completed projects for 20 customer sites with 16 sites claiming electric savings and 12 claiming natural gas savings. Based on findings at the site visits, adjustments were made to one project.

Table A-1. Project Level Tracked and Evaluated Gross Energy Savings - Iowa

Project ID	Electric Savings (kWh)		Demand Savings (Peak kW)		Gas Savings (Therms)		Gas Savings (Peak Therms)		Realization Rate			
	Tracked	Evaluated	Tracked	Evaluated	Tracked	Evaluated	Tracked	Evaluated	kWh	kW	Therms	Peak Therms
4	60,056	58,881	13	13	0	0	0	0	98%	100%	N/A	N/A

Electric Project Adjustments

- Project ID 4: This project included occupancy sensor controls for both office and storages zones within the project. Occupancy sensors are mandatory for office spaces less than 250 ft² and for storage and supply rooms between 50 and 1,000 ft² according to section 9.4.1.2 of ASHRAE 90.1-2010. Willdan confirmed that the baseline should have been modeled with occupancy sensors for the storage zones within the project. The Tetra Tech adjusted the occupancy sensors savings for those zones, resulting in a 98.0 percent realization rate for electric savings.

APPENDIX B: GROSS REALIZATION RATE CALCULATIONS

Per the Strategic Evaluation Plan¹³ (SEP), the sampling design for each of MidAmerican's program-level impact evaluations will attempt to report verified program savings at a minimum 90% confidence (+/- 10% error). This confidence and precision level is an industry standard. However, error bands will vary somewhat by program due to sampling, program needs, and budgets. Additionally, the SEP noted that verified ex-post (evaluated) results will be presented numerically and by program track. The sampling process for the CNC program desk reviews was designed to achieve this level of precision for evaluated savings estimates at the program level.

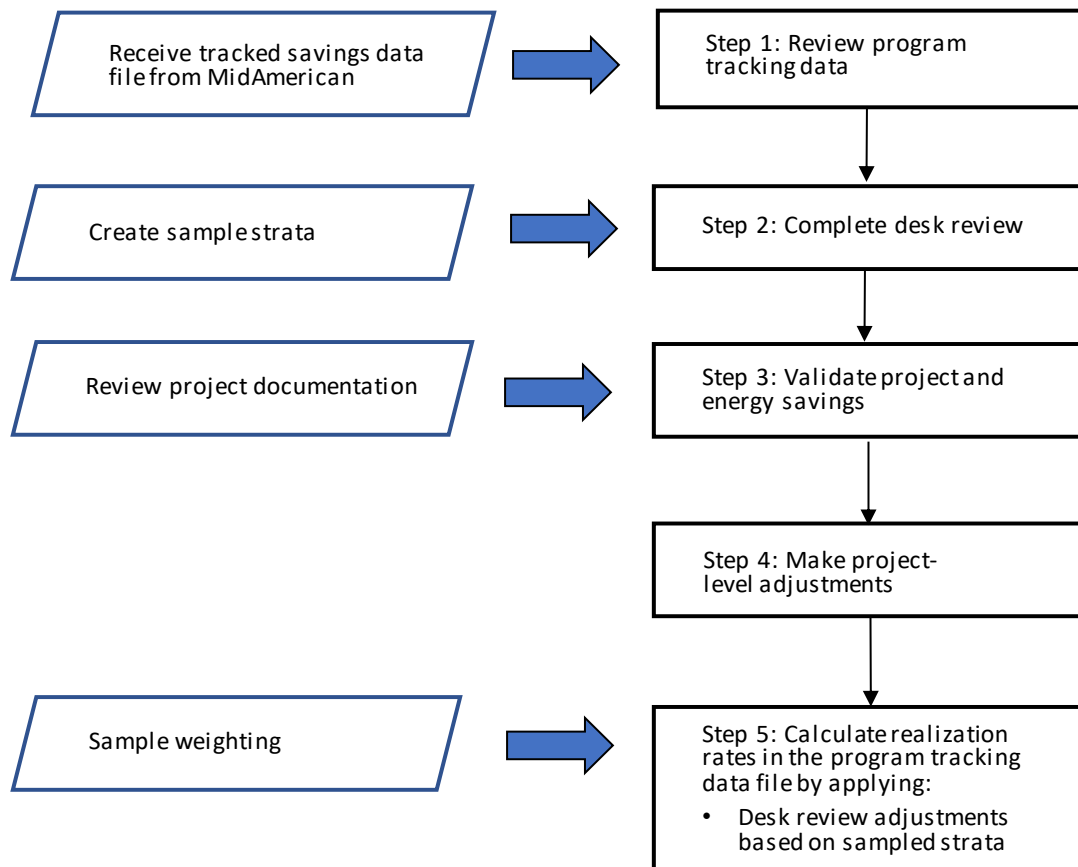
The program tracking data provides high level details for projects installed through the CNC program. The Tetra Tech team examined the tracking data across the service territories and program tracks to develop a sampling strategy for the custom telephone surveys and engineering desk reviews¹⁴.

The evaluated savings results are based on the sampled project-level adjustments. The Tetra Tech team calculated a realization rates based on the difference between the tracked savings and evaluated savings at the service territory level. The flow chart below outlines how the realization rate calculations were completed for sampled projects with desk reviews.

¹³ MidAmerican Energy Company 2019-2023 Energy Efficiency Monitoring and Evaluation Strategic Evaluation Plan, dated May 1, 2020.

¹⁴ These details were transmitted in the CNC Sampling Memo provided to MidAmerican on June 30, 2020.

Figure B-1: Realization Rate Calculation—Projects with Desk Reviews



APPENDIX C: NET-TO-GROSS LITERATURE REVIEW

The table below documents the literature review findings of recent studies in other jurisdictions to stipulate NTG ratios that would be appropriate to apply to MidAmerican's Illinois CNC program savings data. For each of the studies included in the review, the table below lists the time period addressed and the NTG ratios estimated.

Table C-1. Commercial New Construction Program Comparison Studies—NTG Ratios

State	Administrator	Program Period	Research Method	NTG
MI ¹⁵	DTE Energy	CY2016–CY2019	Deemed	92%
MN ¹⁷	Xcel Energy – Business New Construction	PY2017-PY2019	Deemed	100%
IL ¹⁸	ComEd – Business New Construction	CY2020	Deemed	59%
IL	Nicor Gas – Non-Residential New Construction	CY2020	Deemed	58%
IL	People's Gas and North Shore Gas –Non-Residential New Construction	CY2020	Deemed	58%
IL	ComEd – Business New Construction	CY2019	Deemed	68%
IL	Nicor Gas – Non-Residential New Construction	CY2019	Deemed	70%
IL	People's Gas and North Shore Gas –Business and Public Sector Dedicated New Construction	CY2019	Deemed	70%
IL	ComEd – Business New Construction	GPY 7 / CY2018	Deemed	60%
IL	Nicor Gas – Non-Residential New Construction	GPY 7 / CY2018	Deemed	60%
IL	People's Gas and North Shore Gas –Non-Residential New Construction	GPY 7 / CY2018	Deemed	77%
IL	ComEd – Business New Construction	EPY9 and GPY6 (6/1/2016–5/31/2017)	Deemed	77%
IL	Nicor Gas – Non-Residential New Construction	EPY9 and GPY6 (6/1/2016–5/31/2017)	Deemed	67%
IL	People's Gas and North Shore Gas – Non-Residential New Construction	EPY9 and GPY6 (6/1/2016–5/31/2017)	Deemed	67%
WI ¹⁹	Focus on Energy – Design Assistance	CY2019	Deemed	72%
WI ²⁰	Focus on Energy – Design Assistance	CY2018	Deemed	72%

¹⁵ <https://www.newlook.dteenergy.com/wps/wcm/connect/e20de3d0-11df-41e5-bfbc-b41927e5a77c/2015-EO-Annual-Report.pdf?MOD=AJPERES>

¹⁶ <https://www.newlook.dteenergy.com/wps/wcm/connect/dac12d4d-f194-4632-83b0-7206c4fe149c/EWR-Annual-Report.pdf?MOD=AJPERES>

¹⁷ <https://www.xcelenergy.com/staticfiles/xcelresponsive/Company/Rates%20&%20Regulations/Regulatory%20Filings/2020%20CIP%20Extension%20Plan.pdf>

¹⁸ Illinois sources: https://www.ilsag.info/ntg_2020/

¹⁹ https://focusonenergy.com/sites/default/files/Annual_Report-CY_2019_Volume_II_0.pdf

²⁰ https://focusonenergy.com/sites/default/files/Annual_Report-CY_2019_Volume_II_0.pdf

APPENDIX D: PARTICIPANT INTERVIEW GUIDE

MIDAMERICAN ENERGY COMMERCIAL NEW CONSTRUCTION PARTICIPANT INTERVIEW GUIDE

ID Number:

Interviewee(s):

Company Name:

Interviewer(s):

Date:

Background

This guide will be used to understand the perspectives of program participants in the MidAmerican Energy Commercial New Construction program for Illinois (PY2019) and Iowa (April 1, 2019 to March 31, 2020). For purposes of these interviews, participants are considered end users, not specific projects.

In-depth interviews will be conducted by senior Tetra Tech staff via telephone. The interviews will generally be semi-structured. Therefore, the following interview protocol is only a guide to ensure certain topics are covered, but evaluators will follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance and flow of conversation. However, some questions have been designed to be specifically followed to ensure consistency of information (in particular those in the Market Effects section) or to align with information being captured across other nonresidential programs.

We expect the interviews to take 30 - 45 minutes. We will attempt to schedule interviews with respondents in advance to accommodate each participant's schedule.

Introduction

Hello, my name is _____. I work for Tetra Tech, and I'm calling on behalf of MidAmerican Energy regarding your participation in their Commercial New Construction program.

We would like to ask you some questions about your participation in the program to help provide insight back to MidAmerican about program experiences, what has been working well, and/or where there might be areas for improvement. Additionally, we have questions about the program's effect on the market for energy-efficient commercial new construction going forward. All of your responses will be kept confidential and the interview should take about 30 - 45 minutes.

Is this a convenient time for you to talk, or would you prefer to schedule another time?
[Proceed or schedule appointment as appropriate.]

With your permission, I would like to record the interview. Do I have your permission to do so? [IF NEEDED: We will use the recording to help us compile the results, in order to make sure we accurately represent your responses. No one but Tetra Tech staff will listen to the recording.]

Awareness and Decision Making

A1 Please tell me about your involvement in MidAmerican's Commercial New Construction program. Specifically:

- How long [have you been working/did you work with] the program in relation to this project?
- What has been your role on the project and what have you been responsible for?
- Could you give me a brief overview of the project?

P1 How did you FIRST learn about the program?

For P1C01 to P1C88

- 0 Not mentioned
- 1 Mentioned

P1C01 MidAmerican Key Account Manager
P1C02 MidAmerican utility bill insert
P1C03 MidAmerican website
P1C04 MidAmerican brochure
P1C05 MidAmerican call center representative
P1C06 Retail store
P1C07 Equipment vendor, contractor, grant writer, or other professional
P1C08 Newspaper
P1C09 Radio
P1C10 Television
P1C11 Billboard
P1C12 Friend/family member/other business
P1C13 Energy advisor, energy engineer
P1C14 Other (specify)
P1C15 Previous experience with a MidAmerican program
P1C88 Don't know/don't remember

A2 When did your company initially become involved with the program for this project?

A3 Were you involved in the decision-making process to have your facility(s) participate in the program?

- 1 Yes -> What were the considerations that led to the final decision to participate in the program? [PROBE: payback or return on investment, a need to expand capacity, a desire to reduce energy costs, or other].
- 2 No

D2 Does your company have any corporate policies related to energy efficiency standards or sustainability plans that you need to consider when purchasing new equipment or making improvements to this facility?

- 1 Yes
- 2 No [SKIP TO D3]
- 8 Don't know [SKIP TO D3]
- 9 Refused [SKIP TO D3]

D3 [IF D2 = 1] Which of the following best describes your company's energy efficiency policy?
[READ LIST, SELECT ONE]

- 1 We purchase energy efficient equipment regardless of cost
- 2 We purchase energy efficient equipment if it meets payback or return on investment criteria
- 3 We purchase standard efficiency equipment that meets code
- 4 Something else (specify)
- 8 Don't know
- 9 Refused

A4 How important are each of the following to your company when considering new energy-using equipment? Please rate each one using a four-point scale where 1 means "not at all important" and 4 means "very important." [INTERVIEWER, READ EACH ITEM AND RECORD 1 – 4]

- _____ A Availability of a rebate
- _____ B Initial purchase cost
- _____ C Operating cost
- _____ D Length of payback period
- _____ E Efficiency level of new equipment

A5 What are some of the major obstacles that your company faced when considering implementing energy efficiency features into your new building? [PROBE: need to incorporate into long term budget, lack of capital budget, time constraints, lack of resources, approval by decision-makers, uncertainty about ROI, constraints of contractors, lack of awareness about energy efficiency or equipment, lack of knowledge about the program, low prioritization of energy efficiency, cost of equipment, or other].

Interactions with the Commercial New Construction Program

I1 The program implementer, Willdan, works with MidAmerican to deliver the Commercial New Construction program. Which of the following services or benefits did you receive through the program? [INTERVIEWER, READ EACH ITEM AND RECORD YES OR NO FOR EACH]

- 1 Yes
- 2 No
- 8 Don't know

- _____ A Energy consulting services
- _____ B Construction incentives
- _____ C Feedback on the operation of the energy-efficient strategies after completion of construction

SAT3 How satisfied are you with these services or benefits? Please respond with not at all satisfied, somewhat satisfied, very satisfied, or extremely satisfied. [INTERVIEWER, READ EACH SERVICE WITH A “YES” ANSWER IN THE QUESTION ABOVE; PROBE: Why do you say that?].

- _____ A Energy consulting services
- _____ B Construction incentives
- _____ C Feedback on the operation of the energy-efficient strategies after completion of construction

I2 Did you get enough support from Willdan and/or MidAmerican when you needed it?

- 1 Yes
- 2 No → What support would you like to see added or expanded (and from which entity)?

Program Procedures and Design

P2 Using a scale of 1 to 4 where 1 means “not at all helpful” and 4 means “extremely helpful,” how helpful was the technical advice and assistance provided by Willdan? [PROBE: Why do you say that?]

_____ Rating [1 – 4]

P3 How difficult or easy was it to enroll your project(s) in the program?

- A Were the program requirements clearly explained?
- B Did you submit your own application or did the design team submit the application?
- C Using a scale of 1 to 4 where 1 means “very difficult” and 4 means “very easy,” overall, how difficult or easy was it to enroll a project into the program? [PROBE: Why do you say that?]

_____ Rating [1 – 4]

P4 Considering future projects, how could the program engage you or your peers in the new construction industry earlier during a project’s pre-design phase?

Market Effects

V1 Next I’m going to ask you to rate the importance of the Commercial New Construction program in influencing your decision to build an energy-efficient new building.

Using a 0 to 10 scale where 0 is “not at all important” and 10 is “very important,” how important was the program, including incentives, program services, and information provided, in influencing your decision to include energy-efficient equipment and building practices in your new building?

_____ [Record 0-10]

- D Don’t know
- R Refused

V2 And using a 0 to 10 likelihood scale, where 0 is “not at all likely” and 10 is “very likely,” what is the likelihood that you would have reduced the efficiency of some equipment or practices if the program had not been available?

_____ [Record 0-10]

D Don't know

R Refused

FR2 Now could you give me an overview of the influence, if any, of the program on the energy-efficiency components of the building design?

A What were the main ways the program helped you improve the energy-efficiency of the project, if any?

B [If nothing specific described, then ask] Can you provide me with specific examples of the ways the program helped improve the energy-efficiency of the project?

C How would the energy-efficiency of the project be different if it had not participated in the program?

D Are there any other factors we haven't discussed that were influential in the decision to include energy-efficiency equipment or practices in your new building?

FR6 If you were given a TOTAL of 100 points and you had to divide those 100 points between: 1) the program; and 2) any other factors, how many points would you give to the importance of:

FR6A The program? _____ Points given to the program

FR6B And how many points would you give to other factors? _____ Points to other factors

M1 To what degree do you see the program increasing the interest and demand for energy-efficient new construction building design? [PROBE: comparable degrees of increased interest and demand (e.g., no increase, some increase, significant increase)] Why is that?

Conclusion

SAT1 Thinking about the assistance you had, and rebates you received, how satisfied are you with the program overall? Are you not at all satisfied, somewhat satisfied, very satisfied, or extremely satisfied?

1 Not at all satisfied

2 Somewhat satisfied

3 Very satisfied

4 Extremely satisfied

8 Don't know

9 Refused

SAT2 Why did you rate your satisfaction with the program in that way?

SAT4 How likely are you to recommend the program to a peer? Please answer on a scale of 0 to 10, where 0 is extremely unlikely and 10 is extremely likely.

_____ [Record 0-10]

- C1** If you were to recommend anything to MidAmerican regarding the program design or operations, what would it be?

Firmographics

My final questions are about your organization and facility and will help us to compare your responses about your program experiences with those of other participants.

- FIRM1** What business activity accounts for most of the floor space covered by your MidAmerican bill at <ADDRESS> in <CITY>?

- 01 Office
- 02 Retail
- 03 Industrial/Manufacturing
- 04 Agricultural
- 05 Warehouse or distribution center
- 06 Grocery
- 07 Hospital
- 08 Other healthcare
- 09 College/university
- 10 Institution/government
- 11 Lodging
- 12 Restaurant
- 13 School K-12
- 14 Religious worship
- 15 Public assembly
- 16 Vacant
- 17 Other (specify)
- 88 Don't know
- 99 Refused

- FIRM2** Which of the following best describes the ownership of this facility? [READ LIST]

- 1 Your company owns and occupies this facility
- 2 Your company owns this facility but it is rented to someone else
- 3 Your company rents this facility from someone else
- 8 Don't know
- 9 Refused

FIRM4 How many buildings are occupied by your firm at this location?
[READ LIST; SELECT ONE]

- 1 1 building
- 2 2 to 5 buildings
- 3 6 to 10 buildings
- 4 11 to 20 buildings
- 5 21 to 50 buildings
- 6 Over 50 buildings
- 8 Don't know
- 9 Refused

FIRM9 Approximately how many full-time and part-time employees work at this location most of the year?

_____ [RECORD NUMBER OF EMPLOYEES AS 0 TO 2000]
888 Don't know
999 Refused

That is all the questions I have today. If you think of anything you would like to add, please feel free to contact us. And if we uncover any clarifications, would it be alright if someone followed up with you on those?

Thank you very much for your time.

APPENDIX E: MARKET ACTOR INTERVIEW GUIDE

MIDAMERICAN ENERGY COMMERCIAL NEW CONSTRUCTION MARKET ACTOR INTERVIEW GUIDE

ID Number:

Interviewee(s):

Company Name:

Interviewer(s)

Date:

Background

This guide will be used to understand the perspectives of participating market actors involved with the MidAmerican Energy Commercial New Construction program Illinois (PY2019) and Iowa (April 1, 2019, to March 31, 2020). Most interviews will be conducted with A/E firms who interact with the program implementer, Willdan. In limited cases the interviews may be conducted with companies who act as their own A/E firm, typically in cases with multiple buildings of similar design.

In-depth interviews will be conducted by senior Tetra Tech staff via telephone. The interviews will be semi-structured. Therefore, the following interview protocol is only a guide to ensure certain topics are covered, but evaluators will follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance and flow of conversation.

We expect the interviews to take approximately 30 - 45 minutes. We will attempt to schedule interviews with respondents in advance to accommodate each market actor's schedule.

Introduction

Hello, my name is _____. I work for Tetra Tech, and I'm calling on behalf of MidAmerican Energy regarding your firm's participation in their Commercial New Construction program.

We would like to ask you some questions about your participation in the program to help provide insight back to MidAmerican Energy about your experience with the program, what worked well, or improvements you might recommend. Additionally we have questions about the program's effect on the market for energy efficient commercial new construction going forward. All of your responses will be kept confidential and the survey should take about 30 - 45 minutes.

Is this a convenient time for you to talk, or would you prefer to schedule another time?
[Proceed or schedule appointment as appropriate.]

With your permission, I would like to record the interview. Do I have your permission to do so? *[IF NEEDED: We will use the recording to help us compile the results, in order to make sure we accurately represent your responses. No one but Tetra Tech staff will listen to the recording.]*

Company, Role, and General Experience Information

- 1) To get us started, could you briefly tell me a little bit about your business?
 - What is your role?
 - What type(s) of services do you provide?
 - Do you provide services in Iowa?
 - Do you provide services in Illinois?
- 2) What types of new construction projects does [FIRM] typically do? [PROBE: market segments (e.g., commercial, educational, healthcare, lodging, manufacturing, offices, public safety, religious)]
- 3) How many new construction projects did your company work on in 2019?

Awareness and Interactions with the Commercial New Construction program

- 4) When did your company become involved with MidAmerican's Commercial New Construction program? [PROBE: approximate year]
- 5) How did [FIRM] first become aware of the program?
- 6) When providing services through this program, who do you usually work with on the client side (e.g., the property manager, building owner)? And who do you usually work with on the utility side (e.g., Willdan, MidAmerican Energy)?
- 7) Willdan works with MidAmerican to deliver the program. How much interaction do you have with Willdan on Commercial New Construction program projects?
 - What is their typical role for projects that [FIRM] is involved with? [PROBE: technical assistance, project review, rebate assistance, working with clients on decision making]
 - How important has the technical assistance that Willdan provides been? Why do you say that? Has this changed since you first became involved?
 - Have you received enough support from Willdan and/or MidAmerican when you needed it? IF NO, what support would you like to see added or expanded (and from which entity)?
- 8) Using a four-point scale where 1 means "not at all satisfied," and 4 means "extremely satisfied," how satisfied are you with the services provided by Willdan? Why do you say that? Is there anything you would recommend changing?
- 9) Does your firm work with any other MidAmerican energy efficiency programs?
IF YES, which ones?

Education and Outreach

- 10) What type of program-specific training has been made available to you and your staff? Would you like to see more trainings or outreach activities offered by MidAmerican or Willdan to support the program?
- IF YES, what sort of trainings or outreach would you like to see added or expanded?
- 11) Do you feel adequately informed of program changes?
- 1 Yes
 - 2 No -> How would you like to be better informed of program changes?
- 12) How, if at all, does the program affect your sales and recommendation practices?
- 13) Are there markets that you feel MidAmerican's program is reaching well? Are there markets that you feel the program is not reaching well?
- Are focused facilities such as high intensity (e.g., data centers) being served effectively by the program? [NOTE TO INTERVIEWER: For data centers, we are focused on those that are part of a building, not utility-scale data centers]
 - Can you identify approaches that might expand the reach of the program into markets such as multifamily buildings? What about other markets that may be underserved by the program? (e.g., commercial shell/multi-use buildings)

Program Procedures and Design

- 14) How difficult or easy is it to enroll a project into the program? What about taking it through construction and final project close-out? [PROBE: Have you noticed a change in the amount of time required for participation in the program?]
- 15) Do you think the program is effectively achieving savings for its participants? How can MidAmerican Energy maximize its impact?
- 16) Let's talk about the Design Team incentive for a few minutes.
- What role do you have in making sure the rebate gets paid? How has that process worked for you or your customers?
 - How are A/E firms influenced by the Design Team incentive? Are A/E firms satisfied with the incentive levels? Are they needed at all?
- 17) How are customers influenced by the program incentives? Are customers satisfied with the incentive levels?

Market Response

- 18) For your projects, how much do you see MidAmerican's Commercial New Construction program influencing your initial design choices? What about for your clients?

- 19) Do you find that your clients typically approach you in seeking energy efficient features or involvement in the program? Why?
- 20) Do any of your clients choose *not* participate in the program?
 - IF YES, why is that?
- 21) For your clients *not* participating in the MidAmerican Commercial New Construction program, do you work with them to design-in energy efficient features?
 - IF YES, how different are these facilities in their overall energy efficiency than those that go through the program? [PROBE: comparable efficiency level (e.g., more efficient, less efficient, about the same efficiency)]
- 22) To what degree do you see the program increasing the interest and demand for energy efficient new construction building design? [PROBE: comparable degrees of increased interest and demand (e.g., no increase, some increase, significant increase)] Why is that?
- 23) How has the market responded to the following program changes:
 - Inclusion of multi-family new construction
 - Exclusion of prescriptive lighting rebates from the program
- 24) What issue(s) may affect future program participation or performance? [PROBE: example issues (e.g., COVID-19, changes to building codes and standards promoted in the Midwest, program incentive levels)].
- 25) What level of code are new construction facilities currently being built? [PROBE: comparable to state code (e.g., at code, below code, above code)] What is the state or local level of enforcement?

COVID-19

- 26) How has Covid-19 affected your business? (*Probe on the following areas*)
 - Have customer projects been cancelled?
 - Have customer projects been delayed? By how long?
 - Is equipment or other materials and supplies taking longer to receive? How much longer?
 - Have you had to reduce the services your business offers?
 - Anything else?
- 27) How do you expect Covid-19 to impact projects six months from now?

Conclusion

- 28) Overall, how satisfied are you with the program? Are you...
 - 1 Not at all satisfied
 - 2 Somewhat satisfied
 - 3 Very satisfied
 - 4 Extremely satisfied

- 29) Why did you rate your satisfaction this way?
- 30) If you were to recommend anything to MidAmerican regarding the program design or operations, what would it be?

That is all the questions I have today. If you think of anything you would like to add, please feel free to contact us. Thank you very much for your time.

APPENDIX F: NONPARTICIPANT SURVEY

MidAmerican Energy Nonresidential Nonparticipant Survey (Commercial and Industrial)

Survey Sections:

- Sample Variables
- Introduction
- Program Awareness
- Decision-making
- Satisfaction
- Firmographics
- Conclusion

SAMPLE VARIABLES

CASEID	Unique case identifier
PHONE_NUM	Contact's telephone number
CONTACT_NAME	Contact name listed in participant database
COMPANY	Company name listed in participant database
ADDRESS CITY STATE ZIP	Address where equipment was installed
ACCOUNT_NUM	Account number
TRF_TYPE_CD	
METER_TYPE	(Gas, Electric, Electric Lighting)
REP	Assigned replicate

INTRODUCTION

INTRO [INTERVIEWER INSTRUCTION: Please dial the phone number [PHONE_NUM] and enter the call result.]

01	Connected	[PROCEED]
02	Did not connect	[DISPO CASE OUT]

INT01 Hello, my name is _____ calling from Tetra Tech on behalf of MidAmerican Energy. We are conducting a study about MidAmerican's energy efficiency offerings. This is not a sales call, and your responses will provide MidAmerican Energy with the opportunity to collect direct customer feedback that will inform and improve MidAmerican Energy's energy efficiency programs.

May I speak with the person who is responsible for purchasing and maintaining energy-using equipment for <COMPANY> at <ADDRESS>?

[IF CONTACT_NAME IS NOT BLANK SHOW "The name we have on record is <CONTACT_NAME>."]

- | | | |
|----|----------------------------------|---------------------|
| 01 | Yes | |
| 02 | No, R not knowledgeable | [SKIP TO OTHER_R] |
| 03 | No, R is not currently available | [SCHEDULE CALLBACK] |
| 04 | Did not connect | [DISPO CASE OUT] |

PREAMBLE

[IF NEEDED: I'm with Tetra Tech, an independent research firm. We are conducting a study about MidAmerican's energy efficiency offerings.

I'm not selling anything; I'd just like to ask your opinions. Let me assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone unless you grant permission.]

Before we start, I would like to inform you that for quality control purposes, this call will be recorded and monitored.

- 01 Continue

C1 Before getting started, are you the person who is knowledgeable about the decision making process for purchasing new energy-using equipment for your company?

- | | | |
|----|---|----------------|
| 01 | Yes | [SKIP TO S1] |
| 02 | Yes, but address is incorrect [Specify: What is the correct address?] | [SKIP TO S1] |
| 03 | The business no longer exists or functions at this address | |
| 06 | No | |
| -8 | Don't know | |
| -9 | Refused | [TERMINATE 91] |

C10 [ASK IF C1=2] What is the correct address?

OTHER_R

Is there someone else at your business that would be more knowledgeable about your organization's decision making processes related to maintaining existing equipment or purchasing new energy using equipment at this location?

- 01 Yes
- 02 No [TERMINATE 81]
- 8 Don't know [TERMINATE 81]
- 9 Refused [TERMINATE 91]

AVAILABLE_R May I please speak with that person?

- 01 Yes [SPECIFY NAME AND BEGIN THE SURVEY AGAIN WITH NEW RESPONDENT—SKIP TO INT01]
- 02 There is someone else, but not currently available [SCHEDULE CALLBACK]
- 03 No [TERMINATE 91]
- 8 Don't know [TERMINATE 81]
- 9 Refused [TERMINATE 91]

FAQ [THE FOLLOWING IS AVAILABLE ONLY IF NEEDED:

Who is doing this study: MidAmerican Energy has hired our firm to gather this information.

Why are you conducting this study: Studies like this help MidAmerican Energy better understand customers' need for energy efficiency programs and services.

Timing: This survey should take less than 15 minutes of your time. Is this a good time for us to speak with you? IF NOT, SET UP CALLBACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-454-5070.

Sales concern: I am not selling anything; we would simply like to hear about your experiences with MidAmerican and their programs. Your responses will be kept confidential and not revealed to anyone unless you grant permission. If you would like to talk with someone from MidAmerican Energy about this study, feel free to call the MidAmerican Energy customer experience team at 1-888-427-5632.

SCREENING QUESTIONS

- S1** According to our records, your business has not received an energy audit or received a rebate from MidAmerican Energy for the installation of energy efficient equipment during the past two years, or 24 months.

Is that correct?

- 01 Yes
- 02 No [THANK AND TERMINATE 82]
- 8 Don't know [SKIP TO OTHER_R]
- 9 Refused [SKIP TO OTHER_R]

PROGRAM AWARENESS

P2 MidAmerican Energy provides incentives through their energy efficiency programs to assist customers in making energy savings improvements in their facilities.

Before today, were you aware of any incentives available from MidAmerican Energy for the installation of certain energy-efficient upgrades or equipment? [SELECT ONE]

- 01 Yes
- 02 No [SKIP TO P8]
- 8 Don't Know [SKIP TO P8]

P3 What services, upgrades, or equipment are you aware of that qualify for an incentive? [DO NOT READ; SELECT ALL EQUIPMENT/SERVICES MENTIONED].

For P3C01 through P3C99:

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip

- P3C01** Engineering services (detailed study through Industrial Partners)
- P3C02** Insulation / Shell
- P3C03** Motors and Drives
- P3C04** Lighting (NOT including occupancy sensors)
- P3C05** HVAC (equipment and maintenance, thermostat)
- P3C06** Water Heating (Water Heaters and water saving devices – aerators and showerheads)
- P3C07** Appliances (kitchen appliances)
- P3C08** Retrocommissioning
- P3C09** Compressed air
- P3C10** Process
- P3C11** Controls (occupancy sensors, Energy Management System (EMS), etc.)
- P3C12** Other: (specify)
- P3C88** Don't know
- P3C99** Refused

P3C120 [ASK IF P3C12=1] What other items qualify for an incentive?

P4 How did you learn about the incentives available through MidAmerican Energy's energy efficiency programs? [DO NOT READ; SELECT ALL MENTIONED; PROBE: Any other way?]

For P4C01 through P4C99:

00 Not mentioned
01 Mentioned

P4C01 MidAmerican utility bill insert
P4C02 MidAmerican website
P4C03 MidAmerican brochure
P4C04 MidAmerican call center representative
P4C05 Previous program participation [PROBE: When, what program(s)?]
P4C06 Retail store
P4C07 Equipment vendor, contractor, grant writer, or other professional
P4C08 Conference/trade show
P4C09 Newspaper
P4C10 Radio
P4C11 Television
P4C12 Billboard
P4C13 Other business/ family member
P4C14 Key Account Manager
P4C15 Other, specify
P4C88 Don't know/don't remember [SKIP TO P6]
P4C99 Refused [SKIP TO P6]

P4C150 [ASK IF P4C15=1] How did you learn about the incentives?

P5 You said you received information from [IF SINGLE RESPONSE IS GIVEN IN P4, FILL WITH RESPONSE; ELSE FILL WITH 'multiple sources']. Did this provide you with enough information to know how to participate in a MidAmerican energy efficiency program if you wanted to? [SELECT ONE]

01 Yes
02 No
-4 Interviewer mistake
-6 Programmed skip
-8 Don't Know
-9 Refused

P6 [SKIP IF P4 = 02, MidAmerican website] Have you ever visited MidAmerican Energy's website for information on energy efficiency and incentives that they offer for efficient equipment? [SELECT ONE]

01 Yes
02 No
-6 Programmed skip
-8 Don't Know
-9 Refused

P7a [IF P4 = 02, MidAmerican website OR IF P6 = 01, Yes] How easy was it to find the information you were looking for on MidAmerican Energy's website? Was it... [READ CATEGORIES; SELECT ONE].

- 01 Not at all easy
- 02 Somewhat easy
- 03 Very easy
- 04 Extremely easy
- 6 Programmed skip
- 8 Don't Know
- 9 Refused

P7b [IF P4 = 02, MidAmerican website OR IF P6 = 01, Yes] How helpful was the information you found on the website? Was it not at all helpful, somewhat helpful, very helpful, or extremely helpful? [SELECT ONE]

- 01 Not at all helpful
- 02 Somewhat helpful
- 03 Very helpful
- 04 Extremely helpful
- 6 Programmed skip
- 8 Don't know

P8 Has your business replaced or upgraded equipment or made any other energy saving improvements over the past two years? [SELECT ONE]

- 01 Yes
- 02 No [SKIP TO C_P10_SKIP]
- 8 Don't Know [SKIP TO C_P10_SKIP]
- 9 Refused [SKIP TO C_P10_SKIP]

P9 What types of equipment did your business replace or upgrade in the past two years at this location? [DO NOT READ LIST; SELECT ALL THAT APPLY]

For P9C01 through P9C99:

00 Not mentioned
01 Mentioned
-6 Programmed skip

P9C01 Insulation / Shell
P9C02 Motors and Drives
P9C03 Lighting (NOT including occupancy sensors)
P9C04 HVAC (equipment and maintenance, thermostat)
P9C05 Water Heating (Water Heaters and water saving devices – aerators and showerheads)
P9C06 Appliances (kitchen appliances)
P9C07 Retrocommissioning
P9C08 Compressed air
P9C09 Process
P9C10 Controls (occupancy sensors, Energy Management System (EMS), etc.)
P9C11 Other: (specify)
P9C88 Don't know
P9C99 Refused

P9C11O[ASK IF P9C11=1] What other types of equipment did you replace or upgrade?

P9b [ASK FOR EACH MENTIONED IN P9] Was the [SHOW EQUIPMENT SELECTED IN P9] you installed high efficiency equipment or the standard equipment available in the market?

For P9b_01 to P9b_11

01 High efficiency
02 Standard efficiency
-6 Programmed skip
-8 Don't Know
-9 Refused

P9B_01 Insulation / Shell
P9B_02 Motors and Drives
P9B_03 Lighting (NOT including occupancy sensors)
P9B_04 HVAC (equipment and maintenance, thermostat)
P9B_05 Water Heating (Water Heaters and water saving devices – aerators and showerheads)
P9B_06 Appliances (kitchen appliances)
P9B_07 Retrocommissioning
P9B_08 Compressed air
P9B_09 Process
P9B_10 Controls (occupancy sensors, Energy Management System (EMS), etc.)
P9B_11 Other: (specify)

C_P10_SKIP [IF (P2 = 02 OR -8) SKIP TO P20]

P10 [IF P8 = 01] Did you consider participating in MidAmerican's energy efficiency programs before completing the replacements or upgrades? [CHECK ONE]

- 01 Yes
- 02 No
- 6 Programmed skip
- 8 Don't Know
- 9 Refused

P14 Have you ever considered participating in a MidAmerican energy-efficiency program? [SELECT ONE]

- 01 Yes
- 02 No
- 6 Programmed skip
- 8 Don't Know
- 9 Refused

P15 What has kept you from considering participating in one of MidAmerican's energy-efficiency programs? [DO NOT READ; SELECT ALL MENTIONED]

For P15C01 through P15C99:

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip

- P15C01** Time required to participate
- P15C02** The cost – high initial cost / incentives not enough
- P15C03** Possible interruptions to our business
- P15C04** The internal approval process / needs higher approval
- P15C05** Not sure the savings would be worth the cost
- P15C06** The facility is leased
- P15C07** The required paperwork
- P15C08** Confusing
- P15C09** Other: (specify)
- P15C88** Don't know
- P15C99** Refused

P15C08O [ASK IF P15C08=1] What did you find confusing?

P15C09O [ASK IF P15C09=1] What keeps you from considering participating?

P16 [IF P14 = 01, ELSE SKIP TO P20] Was there anything that raised questions or concerns about participating in a MidAmerican program? [SELECT ONE]

- 01 Yes
- 02 No
- 6 Programmed skip
- 8 Don't Know
- 9 Refused

P17 [IF P16 = 01] What raised concerns? [DO NOT READ; SELECT ALL MENTIONED]

For P17C01 through P17C99:

- 0 Not mentioned
- 1 Mentioned

- P17C01** Time required to participate
- P17C02** Possible interruptions to our business
- P17C03** Incentives not enough
- P17C04** Difficulty of participating
- P17C05** Hard time getting approvals or getting everyone on board
- P17C06** Not sure the savings would be worth the cost
- P17C07** Confusing
- P17C08** Hard to do things a new way
- P17C09** Other: (specify)
- P17C88** Don't know
- P17C99** Refused

P17C090 What other items raised concerns?

P20 Have you ever contacted MidAmerican Energy or its representatives about ways to reduce your energy bill or about the energy efficiency services MidAmerican Energy offers? [SELECT ONE]

- 01 Yes
- 02 No
- 8 Don't Know
- 9 Refused

P21 [IF P20 = 01] Would you say you are not at all satisfied, somewhat satisfied, very satisfied, or extremely satisfied with the ease of finding the right person to speak with at MidAmerican Energy? [SELECT ONE]

- 01 Not at all satisfied
- 02 Somewhat satisfied
- 03 Very satisfied
- 04 Extremely satisfied
- 6 Programmed skip
- 8 Don't know
- 9 Refused

P22 [IF P21 = 01 OR 02] What was the difficulty you encountered?

[RECORD VERBATIM]

P23 [IF P20 = 01] Would you say you are not at all satisfied, somewhat satisfied, very satisfied, or extremely satisfied with the usefulness of the information provided by the person you contacted? [SELECT ONE]

- 01 Not at all satisfied
- 02 Somewhat satisfied
- 03 Very satisfied
- 04 Extremely satisfied
- 6 Programmed skip
- 8 Don't Know
- 9 Refused

P24 Are there any other services MidAmerican Energy could provide that would help your firm to become more energy efficient? [SELECT ONE]

- 01 Yes
- 02 No
- 8 Don't Know
- 9 Refused

P25 [IF P24 = 01] What services?

[RECORD VERBATIM]

P26 Would you say you are extremely likely, very likely, somewhat likely, or not at all likely to use MidAmerican's energy-efficiency programs in the future, should the opportunity arise? [SELECT ONE]

- 01 Not at all likely
- 02 Somewhat likely

- 03 Very likely
- 04 Extremely likely
- 8 Don't Know
- 9 Refused

DECISION-MAKING PROCESS

- I1** Next I'd like to ask some questions about decision making at your business. How important would each of the following be to your business when considering new energy-using equipment? Please respond with not at all important, somewhat important, very important, or extremely important to you. How important is... [READ; ROTATE LIST]

For I1A through I1K:

- 01 Not at all important
- 02 Somewhat important
- 03 Very important
- 04 Extremely important
- 8 Don't know
- 9 Refused

- I1A** Availability of a rebate
- I1B** Recommendation of contractor or supplier
- I1C** Compatibility with existing equipment
- I1D** Initial purchase cost
- I1E** Operating cost
- I1F** Length of payback period
- I1G** Efficiency level of new equipment
- I1H** Environmental concerns
- I1I** Performance concerns
- I1J** Capital investment or budget availability
- I1K** Energy savings or reducing your energy bills

- I1L** [READ LAST] Are there any other considerations not already mentioned? [SPECIFY]

- 01 Yes, [RECORD RESPONSE VERBATIM]
- 02 No
- 8 Don't know
- 9 Refused

- I1LO** [ASK IF I1L=1] What considerations?

I2 [IF I1F = 01 or 02] You rated the length of the payback period a "<I1F>". What payback period do you strive for?

- year(s)
- 77 Other (specify)
- 6 Programmed skip
- 8 Don't know
- 9 Refused

I20 [ASK IF I2=77] What other payback period do you strive for?

I3 Does your company have any corporate policies related to energy efficiency standards or sustainability plans that you need to consider when purchasing new equipment or making improvements to this facility? [SELECT ONE]

- 01 Yes
- 02 No
- 8 Don't Know
- 9 Refused

DM1 [IF I3 = 1] Which of the following best describes your firm's energy efficiency policy? [READ LIST, SELECT ONE]

- 01 We purchase energy efficient equipment regardless of cost
- 02 We purchase energy efficient equipment if it meets payback or return on investment criteria
- 03 We purchase standard efficiency equipment that meets code
- 04 Something else [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

DM10 [ASK IF DM1=4] How would you describe your firm's energy efficiency policy?

DM2 What are some of the major challenges that your business faces when considering implementing energy efficiency improvements at your facility? [DO NOT READ; SELECT ALLTHAT APPLY]

For DM2C01 through DM2C99:

00 Not mentioned

01 Mentioned

DM2C01 Need to incorporate purchases or plans into longer term budget

DM2C02 Lack of capital budget

DM2C03 Time constraints of internal staff to implement

DM2C04 Lack of resources to implement

DM2C05 Approval by decision-makers

DM2C06 Uncertainty regarding return on investment

DM2C07 Contractors aren't familiar with measures

DM2C08 Lack of awareness of or knowledge about energy and money saving opportunities

DM2C09 Lack of awareness/knowledge about equipment characteristics or performance

DM2C10 Lack of knowledge about how to obtain assistance from MidAmerican

DM2C11 Low prioritization of energy efficiency or conservation in firm

DM2C12 Other [SPECIFY]

DM2C88 Don't know

DM2C99 Refused

DM2C120 [ASK IF DM2C12=1] What other challenges does your business face?

C10 Thinking about your business over the next six months, are you not at all likely, somewhat likely, very likely, or extremely likely to do the following?
[PROGRAMMER NOTE: ROTATE A – E]

For C10A through C10C:

01 Not at all likely

02 Somewhat likely

03 Very likely

04 Extremely likely

-8 Don't know

-9 Refused

C10A To purchase new energy efficient equipment for my business?

C10B To allow a contractor into my business to service existing equipment?

C10C To look for additional ways to save energy at my business that are low cost or no cost?

C11 Thinking about the last three statements that I read to you, did the COVID-19 pandemic influence any of your responses? [SELECT ONE]

01 Yes

02 No

-8 Don't know

C12 [IF C11 = 01] How did it influence your responses?
[RECORD VERBATIM]

SATISFACTION

SAT1 The next questions ask about your experience with MidAmerican Energy in general as your energy provider. How would you rate the service provided by MidAmerican Energy? Would you say not at all satisfied, somewhat satisfied, very satisfied, or extremely satisfied? [SELECT ONE]

- 01 Not at all satisfied
- 02 Somewhat satisfied
- 03 Very satisfied
- 04 Extremely satisfied
- 8 Don't know [SKIP TO FIRM1]
- 9 Refused [SKIP TO FIRM1]

SAT2 Why did you rate your satisfaction with MidAmerican Energy as "<SAT1>"?
[RECORD VERBATIM]

FIRMOGRAPHICS

FIRM1 Finally, I have some general questions about your facility.
What business activity accounts for most of the floor space covered by your MidAmerican Energy bill? [DO NOT READ; SELECT ONE ANSWER]

- 01 Office
- 02 Retail
- 03 Industrial/Manufacturing
- 04 Agricultural
- 05 Warehouse or distribution center
- 06 Grocery
- 07 Hospital
- 08 Other healthcare
- 09 College/university
- 10 Institution/government
- 11 Lodging
- 12 Restaurant
- 13 School K-12
- 14 Religious worship
- 15 Public assembly
- 16 Vacant
- 17 Other [SPECIFY]
- 1 Partially completed case
- 8 Don't know
- 9 Refused

FIRM10 [ASK IF FIRM1=17] What business activity?

FIRM2 Which of the following best describes <COMPANY>'s ownership of this facility? [READ LIST; SELECT ONE]

- 01 Your company owns and occupies this facility [SKIP TO FIRM4]
- 02 Your company owns this facility but it is rented to someone else
- 03 Your company rents this facility from someone else
- 1 Partially completed case
- 8 Don't know
- 9 Refused

FIRM3 Does <COMPANY> pay the electric bill at <ADDRESS>? [SELECT ONE]

- 01 Yes
- 02 No
- 1 Partially completed case
- 8 Don't Know
- 9 Refused

FIRM4 How many buildings are occupied by your firm at this location? [READ LIST; SELECT ONE]

- 01 1 building
- 02 2 to 5 buildings
- 03 6 to 10 buildings
- 04 11 to 20 buildings
- 05 21 to 50 buildings
- 06 Over 50 buildings
- 1 Partially completed case
- 8 Don't Know
- 9 Refused

FIRM5 What's your best guess as to the size of this facility—the approximate square footage of the space that is cooled or heated. [DISPLAY IF FIRM4 >1] Please tell us the total for all of the buildings. Is it...[READ LIST; SELECT ONE]

- 01 Under 5,000 sq. ft.
- 02 5,000 to just under 10,000 sq. ft.
- 03 10,000 to just under 25,000 sq. ft.
- 04 25,000 to just under 50,000 sq. ft.
- 05 50,000 sq. ft. or more
- 1 Partially completed case
- 8 Don't Know
- 9 Refused

FIRM6 How long has the business occupied this location? [READ LIST; SELECT ONE]

- 01 Less than a year
- 02 1 through 5 years
- 03 6 through 10 years
- 04 11 through 20 years
- 05 More than 20 years
- 1 Partially completed case
- 8 Don't Know
- 9 Refused

FIRM7 [IF FIRM4 = 01 SHOW "In what year was the building at this location constructed?"]
[IF FIRM4 > 01 OR -8, Don't know OR -9, Refused SHOW "Please tell us the year when the newest building at this location was constructed."]

- _____ Record year [1800 - 2020]
- 1 Partially completed case
- 8 Don't Know
- 9 Refused

FIRM8 [IF FIRM7 = -8 OR -9] Do you know the approximate age? Is it . . . ? [READ LIST; SELECT ONE]

- 01 Less than 2 years
- 02 2 to 4 years
- 03 5 to 9 years
- 04 10 to 19 years
- 05 20 to 29 years
- 06 30 years or more
- 6 Programmed skip
- 8 Don't Know
- 9 Refused

FIRM9 Approximately how many full-time and part-time employees work at this location most of the year? [NUMERIC OPEN END, 0 TO 2000]

- _____ [Number of employees]
- 1 Partially completed case
- 8 Don't know
- 9 Refused

FIRM9_B [IF FIRM9 = -8] Do you know the approximate number of employees? Is it...? [READ LIST; SELECT ONE]

- 01 Less than 10
- 02 10 to 49
- 03 50 to 99

- 04 100 to 249
- 05 250 to 499
- 06 500 or more
- 6 Programmed skip
- 8 Don't know

FIRM10 Which of the following best describes the facility? This facility is... [READ LIST; SELECT ONE]

- 01 Your company's only location
- 02 The headquarter location of your company with several locations
- 03 One of several locations owned by your company
- 1 Partially completed case
- 8 Don't Know
- 9 Refused

FIRM12 Do you operate your facility differently depending on the season or production cycle? [SELECT ONE]

[PROBE: A business cycle refers to time periods when your business' activities might be significantly different. For example, a school might have to wait until summer to implement projects, while a manufacturing facility might wait until production is lower.]

- 01 Yes
- 02 No
- 1 Partially completed case
- 8 Don't Know
- 9 Refused

FIRM13 What type of equipment is used to heat the space? [SELECT ALL EQUIPMENT USED] [READ CHOICES IF NEED]

For FIRM13C01 through FIRM13C99:

- 0 Not mentioned
- 1 Mentioned
- 1 Partially completed case

- FIRM13C01** Furnace
- FIRM13C02** Rooftop unit
- FIRM13C03** Infrared heaters/tube heaters
- FIRM13C04** Steam Boiler
- FIRM13C05** Conventional hot water boiler
- FIRM13C06** High efficiency/condensing boiler
- FIRM13C07** Heat pump
- FIRM13C08** Electric Resistance
- FIRM13C09** Other: (specify)
- FIRM13C77** None [SKIP TO FIRM15]
- FIRM13C88** Don't know [SKIP TO FIRM15]
- FIRM13C99** Refused [SKIP TO FIRM15]

FIRM13C090 [ASK IF FIRM13C09=1] What type of equipment?

FIRM14 [SKIP IF FIRM13 = 08 and is only one selected] What is the main fuel used for heating? [DO NOT READ; SELECT ONE]

- 01 No heating fuel used
- 02 Electricity
- 03 Natural gas
- 04 Fuel oil
- 05 Solar
- 06 Other: (specify)
- 1 Partially completed case
- 6 Programmed skip
- 8 Don't Know
- 9 Refused

FIRM140 [ASK IF FIRM14=6] What main fuel is used?

FIRM15 What type of equipment is used to cool the space? [SELECT ALL EQUIPMENT USED] [READ CHOICES IF NEEDED]

For FIRM15C01 through FIRM15C99:

- 0 Not mentioned
- 1 Mentioned
- 1 Partially completed case

- FIRM15C01** "Residential-style" air conditioner
- FIRM15C02** Rooftop unit
- FIRM15C03** Air-cooled Chiller
- FIRM15C04** Water-cooled Chiller
- FIRM15C05** Heat Pump
- FIRM15C06** Other: (specify)
- FIRM15C77** None
- FIRM15C88** Don't know
- FIRM15C99** Refused

FIRM15C06O [ASK IF FIRM15=6] What other type of equipment?

THANK YOU AND CLOSING

COM Do you have any comments you would like to share with MidAmerican Energy?

- 1 Yes
- 2 No
- 1 Partially completed case

COMO [ASK IF COM=1] Specify comments

INT99 That's all the questions I have! Thank you for your input into this important research. Have a great day.

- CP Complete
- 1 Partially completed case