Evaluation of Energy Efficient Affordable Housing Construction Program

June 2014 through May 2015

Prepared for:
Illinois Department of Commerce Economic Opportunity

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Table of Contents

List of Tables

Executive Summary

This report presents results of impact and process evaluations performed by ADM Associates, Inc. of the Energy Efficient Affordable Housing Construction Program (AHC Program) offered by the Illinois Department of Commerce & Economic Opportunity (hereinafter referred to as the "Department of Commerce"). The report presents results for electric program year seven and natural gas program year four (EPY7/GPY4), the period June 2014 through May 2015.

The main features of the evaluation approach include:

- Data collection through review of program materials, interviews with Department of Commerce staff members, and interviews with program participants.
- Engineering review verifying gross savings using the Illinois Statewide Technical Reference Manual (TRM), and other sources as appropriate.

The gross and net ex post kWh savings of the AHC Program during EPY7/GPY4 are summarized below in Table ES-1. Because the program targets energy efficiency improvements in low income resident housing, the net ex post savings are assumed to equal the gross ex post savings. For EPY7/GPY4, net ex post electricity savings total 2,624,640 kWh. The gross realization rate is 55%.

Table ES-1 Summary of kWh Savings for Affordable Housing Construction Program

Utility	*Ex Ante kWh Savings*	*TRM-Calculated*		*TRM-Calculated (Errata Corrected)*		*ADM-Calculated*			
		Gross Ex Post kWh Savings	*Net Ex Post kWh Savings*	*Gross Ex Post kWh Savings*	*Net Ex Post kWh Savings*	*Gross Ex Post kWh Savings*	*Gross Realization Rate*	*Net Ex Post kWh Savings*	*Net-to-Gross Ratio*
Ameren	1,811,900	513,363	513,363	513,363	513,363	950,161	52%	950,161	100%
ComEd	2,984,443	1,260,806	1,260,806	1,260,806	1,260,806	1,674,479	56%	1,674,479	100%
Total	4,796,343	1,774,169	1,774,169	1,774,169	1,774,169	2,624,640	55%	2,624,640	100%

Gross and net ex post natural gas savings are shown in Table ES-2. Net ex posts natural gas savings total 99,105 therms. The gross realization rate is 94% for natural gas savings.

Table ES-2 Summary of Therm Savings for Affordable Housing Construction Program

Utility	*Ex Ante Therm Savings*	*TRM-Calculated*		*TRM-Calculated (Errata Corrected)*		*ADM-Calculated*			
		Gross Ex Post Therm Savings	*Net Ex Post Therm Savings*	*Gross Ex Post Therm Savings*	*Net Ex Post Therm Savings*	*Gross Ex Post Therm Savings*	*Gross Realization Rate*	*Net Ex Post Therm Savings*	*Net-to-Gross Ratio*
Ameren	7,176	3,293	3,293	3,293	3,293	3,982	55%	3,982	100%
Nicor	33,762	50,534	50,534	50,534	50,534	55,960	166%	55,960	100%
Peoples	65,010	34,580	34,580	34,580	34,580	39,163	60%	39,163	100%
Total	105,948	88,407	88,407	88,407	88,407	99,105	94%	99,105	100%

The gross and net ex post peak kW reductions of the Affordable Housing Construction Program during the period June 2014 through May 2015 are summarized in Table ES-3.

Table ES-3 Summary of Peak kW Savings for Affordable Housing Construction Program

Utility	*TRM-Calculated*		*TRM-Calculated (Errata-Corrected)*		*ADM-Calculated*		
	Ex Post Gross kW Savings	*Ex Post Net kW Savings*	*Ex Post Gross kW Savings*	*Ex Post Net kW Savings*	*Realized Gross kW Savings*	*Realized Net kW Savings*	*Net-to-Gross Ratio*
Ameren	94.38	94.38	94.38	94.38	381.31	381.31	100%
ComEd	298.21	298.21	298.21	298.21	341.01	341.01	100%
Total	392.59	392.59	392.59	392.59	722.31	722.31	100%

The following presents a selection of key conclusions from the analysis of EPY7/GPY4:

- **Additional Details are Necessary to Track Project Details and Calculate Energy Savings:** Currently the technical consultant develops project specification sheets that provide general descriptions of the measure and quantity. However, the descriptions are unclear and do not always match the measure categories and inputs in the Illinois Technical Reference Manual (TRM) Version 3.0. As an example, lighting measures should have the number fixtures, lamps, and wattages of individual bulbs recorded. These data should be developed in conjunction with the establishment of a standardized list of measures to ensure that the appropriate data for each measure are being collected. Several lighting projects were unable to be verified due to lack of documentation. For non-TRM measures, additional documentation is also necessary. For example, a window schedule and architectural drawings are needed for calculating energy efficient window savings. Architectural drawings are also necessary for attic and wall insulation energy savings for new construction projects.
- **Some Qualifying Measures Do Not Yield Energy Savings:** Some measures implemented through the AHC program do not yield energy savings due to the measures either being at or below building code energy efficiency requirements. This was the case for several window and attic insulation projects.

- **Modify lighting standards in program guidelines.** Currently the guidelines for building three stories state that interior hard-wired fixtures must be ENERGY STAR listed fluorescent and that common and exterior lighting must be fluorescent or an approved equivalent. ADM recommends referencing minimum efficiency requirements per the Illinois TRM for each lamp type instead of more general statements. For example, a 32 Watt 4 foot T8 fluorescent lamp installed in a multi-family building that is under four stories does not result in claimable energy saving impacts when using the baseline provided by the current version of the TRM, but would appear to qualify under program guidelines. Additionally, note that for buildings 4 stories and above, draft TRM version 5 indicates that the lighting power density standard under IECC 2015 for multi-family buildings is 0.51 watts / ft^2.

The following recommendations based on the review of the program are offered for the Department of Commerce's consideration:

- **Continue to Improve Project Documentation and Measure-level Information:** Each measure should include descriptors precise enough to account for differences in expected useful life (EUL), but general enough to be aggregated at a higher level. There may be a few custom measures that may not be easily categorized. Such measures should be assigned to an "Other" category and/or subcategory. Ideally tracking data should contain:
    - **Measure Category:** Lighting, HVAC, building insulation, etc.
    - **Measure Subcategory:** Linear Fluorescent, Lighting Occupancy Sensor, HVAC Packaged Unit, etc.
    - **Measure Name:** 14W CFL, R-19 fiberglass insulation, 2 Ton SEER 14 central air conditioner, etc.
    - **Measure Quantity:** Number of fixtures or lamps, appliances, etc.
    - **Measure Unit:** Number of units, square feet, liner feet, etc.
    - **Notes:** For custom measures this field would provide the description for those measures that do not correspond to any established category in the fields described above. These measures would be given a value of "Other" for the preceding fields.
- **Develop Measure-Level Ex Ante Savings Estimates:** Ex ante savings estimates were calculated using a savings per housing unit multiplier based on ADM's EPY5/GPY2 evaluation of the AHC Program. Changes in building codes, updates to the Illinois TRM's savings algorithms, and differences in the measures implemented at each project lead to this approach overestimating savings. To achieve a more accurate ex ante savings estimate and measure-level realization rates, ADM recommends developing measure-level TRM-based ex ante savings estimations.
- **Utilize the Illinois Energy Now Information Management System (IEN IMS) to estimate program savings, store project documentation, and record key project data:** ADM understands that efforts to use IEN IMS as a program management tool were undercut by the current lack of funding and cessation of program activity resulting from the ongoing state

budget stalemate. However, going forward, ADM recommends integrating use of IEN IMS into program operations. Doing so will allow the program to estimate ex ante savings that align with ex post saving calculations and store project documentation and facilitate its transmittal to ADM

- **Institute an Expiration Date for Grant Offers:** Approved grantees receive a letter notifying them that they have been awarded a grant through the program. By instituting an expiration date for these funds, projects that are stalled will be removed from the program, decreasing backlog. The program may consider a grant renewal process for expired grants.
- **Develop a Standard Communication Procedure for Notifying the Technical Consultant when Projects Begin:** Early involvement with a program representative would reduce the potential for initial missteps that could result in non-compliance or delays in construction or payment down the road.

1. Introduction

This report presents the results of the impact and process evaluations of the Illinois Department of Commerce & Economic Opportunity (hereinafter referred to as the "Department of Commerce") Affordable Housing Construction (AHC) Program. The report presents evaluation results pertaining to program activity during electric program year seven and natural gas program year four (EPY7/GPY4), the period from June 2014 through May 2015.

1.1 Description of Program

The Affordable Housing Construction Program provides grants to non-profit and for-profit affordable housing developers to help offset the cost of incorporating energy efficient building practices in residential construction. The goal of the program is to promote the benefits of lower utility bills for low income households within energy efficient buildings. Eligible projects must be targeted at households that are at or below 80% of the Average Median Income (AMI) level.

Grant amounts for projects are calculated per living unit, building, or living space square footage. To receive grant funding, the new construction or rehab project must meet program guidelines and implement all specified measures. There are three sets of program guidelines applicable to different types of projects:

- New single-family and low-rise residential construction minimum energy standards;
- New multi-family building construction minimum energy standards; and
- Single and multi-family building rehab minimum energy standards.

These guidelines specify requirements for insulation, windows, air sealing, mechanical systems, ventilation, appliances, and lighting.

1.2 Overview of Evaluation Objectives and Approach

The primary objective of the impact evaluation of the Affordable Housing Construction Program was to determine the net electricity and natural gas energy savings and peak demand (kW) reductions resulting from program projects completed during EPY7/GPY4.

The impact evaluation included:

- Review of project documentation (e.g., invoices, savings calculation work papers, etc.), with particular attention given to calculation methods and documentation of savings estimates.
- Verification of gross savings via analytical desk review.

The process evaluation included:

- Review of program documentation and prior evaluation reports and;

- Interviews conducted with program staff members to discuss program operations, successes, challenges, and future plans.

1.3 Organization of Report

The evaluation report for the Affordable Housing Construction Program is organized as follows:

- Chapter 2 presents and discusses the analytical methods and results of estimating program energy savings.
- Chapter 3 presents and discusses the analytical methods and results of the process evaluation of the program.
- Appendix A provides a list of summaries for completed projects.

2. Estimation of Gross Savings

This chapter presents the results of the impact evaluation of the Affordable Housing Construction Program offered by the Department of Commerce. The main objective of the impact evaluation was to determine the electricity and natural gas energy savings, and peak demand (kW) reductions resulting from projects completed under the program during the period June 2014 through May 2015. Section 2.1 describes the methodology used for estimating savings. Section 2.2 presents the results of the effort to estimate program savings.

2.1 Methodology for Estimating Gross Savings

The methodology used for calculating program savings is described in this section.

The overall objective of the impact evaluation of the Affordable Housing Construction Program was to determine the net electric energy and natural gas energy savings, as well as peak demand (kW) reductions resulting from projects completed during the program year.

2.1.1 Review of Documentation

Available documentation (e.g., invoices, savings calculation work books, ECRM forms, etc.) was reviewed for projects, with particular attention given to the calculation procedures and documentation for savings estimates. In cases where project documentation was incomplete or unclear, evaluation staff contacted the technical consultant to seek further information. This ensured the development of accurate realized energy savings estimates.

2.1.2 Analytical Desk Review

Available documentation was reviewed to determine the number, and type of measures installed through the program. Through this process, ADM assessed the appropriate savings calculations for each measure, and if there was adequate documentation.

Energy savings for most measures were developed by applying the Illinois Statewide Technical Reference Manual Version 3.0. Depending on the measure type, savings were calculated using up to three different approaches. The approaches used are as follows:

- TRM-Calculated: Savings calculated per the Illinois's Statewide Technical Reference Manual Version 3.0.
- TRM-Calculated (Errata Corrected): Savings calculated per an erratum correction in Version 4.0 of the TRM.
- ADM-Calculated: Savings calculated using a non-TRM methodology. ADM-Calculated savings were performed when the measure was not in the TRM or when the methodology in the TRM was not applicable because the assumptions provided were not appropriate for a new construction application.

Table 2-1 displays which approach was used for each of the program measure types, the TRM section referenced, and other resources utilized to estimate gross ex post savings.

Table 2-1 Illinois TRM Sections by Measure Type

Measure	*Section in Illinois TRM Version 3*	*Other Resources*	*TRM*	*Errata Corrected*	*ADM*
Air Sealing	5.6.1	Applicable Building Code			•
Attic and Wall Insulation	5.6.4	Applicable Building Code			•
Bathroom Exhaust Fan	5.3.9	-	•		
Ceiling Fan	-	Illinois TRM Version 4			•
Clothes Washer	5.1.2	-	•		
Dishwasher	5.1.4	-	•		
Efficient AC	5.3.3	-	•		
Efficient Boiler	5.3.6, 4.4.10	-	•		
Efficient Heat Pump	5.3.1, 5.3.8, 4.4.9	-	•		
Efficient Lighting	5.5.1, 5.5.6, 4.5.12, 4.5.3, 4.5.7	-	•	•	•
Efficient Refrigerator	5.1.6	-	•		
Efficient Window	-	Engineering Calculation			•
Furnace w/ Advanced Blower	5.3.5, 5.3.7	-	•		
Room Air Conditioner	5.1.7		•		
Water Heater	4.3.1, 5.4.2		•	•	

2.2 Results of Gross Savings Estimation

This section presents the results of the impact evaluation for the Affordable Housing Construction Program during EPY7/GPY4.

2.2.1 Measure-Level Savings Results

This section presents gross and net ex post savings by measure type. Ex ante savings were calculated using a savings per housing unit multiplier making realization rates unavailable at the measure-level. A net-to-gross factor of 100% was used because the Affordable Housing

Construction Program targets low income residents. Gross and net ex post energy savings are present Table 2-2 and Table 2-3

Table 2-2 Summary of kWh Savings by Measure

Measure	*TRM-Calculated*		*TRM-Calculated (Errata Corrected)*		*ADM-Calculated*		
	Gross Ex Post kWh Savings	*Net Ex Post kWh Savings*	*Gross Ex Post kWh Savings*	*Net Ex Post kWh Savings*	*Gross Ex Post kWh Savings*	*Net Ex Post kWh Savings*	*Net-to-Gross Ratio*
Air Sealing	-	-	-	-	506,182	506,182	100%
Attic and Wall Insulation	-	-	-	-	89,259	89,259	100%
Bathroom Exhaust Fan	82,699	82,699	82,699	82,699	82,699	82,699	100%
Ceiling Fan	-	-	-	-	85,899	85,899	100%
Clothes Washer	33,911	33,911	33,911	33,911	33,911	33,911	100%
Dishwasher	3,800	3,800	3,800	3,800	3,800	3,800	100%
Efficient AC	38,219	38,219	38,219	38,219	38,219	38,219	100%
Efficient Heat Pump	268,804	268,804	268,804	268,804	268,804	268,804	100%
Efficient Lighting	867,808	867,808	867,808	867,808	867,808	867,808	100%
Efficient Refrigerator	124,004	124,004	124,004	124,004	124,004	124,004	100%
Efficient Windows	-	-	-	-	169,132	169,132	100%
Furnace w/ Advanced Blower	328,124	328,124	328,124	328,124	328,124	328,124	100%
Individual Electric Water Heater	26,799	26,799	26,799	26,799	26,799	26,799	100%
Total	1,774,169	1,774,169	1,774,169	1,774,169	2,624,640	2,624,640	100%

Table 2-3 Summary of Therm Savings by Measure

Measure	*TRM-Calculated*		*TRM-Calculated (Errata Corrected)*		*ADM-Calculated*		
	Gross Ex Post Therm Savings	*Net Ex Post Therm Savings*	*Gross Ex Post Therm Savings*	*Net Ex Post Therm Savings*	*Gross Ex Post Therm Savings*	*Net Ex Post Therm Savings*	*Net-to-Gross Ratio*
Air Sealing	-	-	-	-	5,242	5,242	100%
Attic and Wall Insulation	-	-	-	-	3,760	3,760	100%
Central Gas Water Heater	24,548	24,548	24,548	24,548	24,548	24,548	100%
Clothes Washer	2,221	2,221	2,221	2,221	2,221	2,221	100%
Dishwasher	106	106	106	106	106	106	100%
Efficient Boiler	14,960	14,960	14,960	14,960	14,960	14,960	100%
Efficient Windows	-	-	-	-	1,695	1,695	100%
Furnace w/ Advanced Blower	45,165	45,165	45,165	45,165	45,165	45,165	100%
Individual Gas Water Heater	1,407	1,407	1,407	1,407	1,407	1,407	100%
Total	88,407	88,407	88,407	88,407	99,105	99,105	100%

2.2.2 Program-Level Savings Results and Realization Rates

The gross and net kWh savings of the Affordable Housing Construction Program for the period June 2014 through May 2015 are summarized by utility in Table 2-4. During this period, net ex post kWh savings total 2,624,640 kWh. The gross realization rate for the program is 55%. A net-to-gross factor of 100% was used because the Affordable Housing Construction Program targets low income residents.

Gross and net ex post natural gas savings are shown by program component in Table 2-5. Net ex post natural gas savings are 99,105 therms and the gross realization rate is 94%.

Table 2-4 Summary of kWh Savings by Utility

Utility	*Ex Ante kWh Savings*	*TRM-Calculated*		*TRM-Calculated (Errata Corrected)*		*ADM-Calculated*			
		Gross Ex Post kWh Savings	*Net Ex Post kWh Savings*	*Gross Ex Post kWh Savings*	*Net Ex Post kWh Savings*	*Gross Ex Post kWh Savings*	*Gross Realization Rate*	*Net Ex Post kWh Savings*	*Net-to-Gross Ratio*
Ameren	1,811,900	513,363	513,363	513,363	513,363	950,161	52%	950,161	100%
ComEd	2,984,443	1,260,806	1,260,806	1,260,806	1,260,806	1,674,479	56%	1,674,479	100%
Total	4,796,343	1,774,169	1,774,169	1,774,169	1,774,169	2,624,640	55%	2,624,640	100%

Table 2-5 Summary of Therm Savings by Utility

Utility	Ex Ante Therm Savings	TRM-Calculated		TRM-Calculated (Errata Corrected)		ADM-Calculated			
		Gross Ex Post Therm Savings	Net Ex Post Therm Savings	Gross Ex Post Therm Savings	Net Ex Post Therm Savings	Gross Ex Post Therm Savings	Gross Realization Rate	Net Ex Post Therm Savings	Net-to-Gross Ratio
Ameren	7,176	3,293	3,293	3,293	3,293	3,982	55%	3,982	100%
Nicor	33,762	50,534	50,534	50,534	50,534	55,960	166%	55,960	100%
Peoples	65,010	34,580	34,580	34,580	34,580	39,163	60%	39,163	100%
Total	105,948	88,407	88,407	88,407	88,407	99,105	94%	99,105	100%

The gross and net ex post peak kW reductions of the Affordable Housing Construction Program during the period June 2014 through May 2015 are summarized in Table 2-6. The net ex post peak demand savings for the program total 722.31 kW.

Table 2-6 Summary of Peak kW Savings by Utility

Utility	TRM-Calculated		TRM-Calculated (Errata-Corrected)		ADM-Calculated		
	Ex Post Gross kW Savings	Ex Post Net kW Savings	Ex Post Gross kW Savings	Ex Post Net kW Savings	Realized Gross kW Savings	Realized Net kW Savings	Net-to-Gross Ratio
Ameren	94.38	94.38	94.38	94.38	381.31	381.31	100%
ComEd	298.21	298.21	298.21	298.21	341.01	341.01	100%
Total	392.59	392.59	392.59	392.59	722.31	722.31	100%

2.2.3 Discussion of Gross Savings Analysis

Below are several key findings from the Affordable Housing New Construction Program:

- **Additional Details are Necessary to Track Project Details and Calculate Energy Savings:** Currently the technical consultant develops project specification sheets that provide general descriptions of the measure and quantity. However, the descriptions are unclear and do not always match the measure categories and inputs in the Illinois TRM. As an example, lighting measures should have the number fixtures, lamps, and wattages of individual bulbs recorded. These data should be developed in conjunction with the establishment of a standardized list of measures to ensure that the appropriate data for each measure are being collected. Several lighting projects were unable to be verified due to lack of documentation. For non-TRM measures, additional documentation is also necessary. For example, a window schedule and architectural drawings are needed for calculating energy efficient window savings. Architectural drawings are also necessary for attic and wall insulation energy savings for new construction projects.
- **Some Qualifying Measures Do Not Yield Energy Savings:** Some measures implemented through the AHC program do not yield energy savings due to the measures either being at or

below building code energy efficiency requirements. This was the case for several window and attic insulation projects.

- **Modify lighting standards in program guidelines:** Currently the guidelines for building three stories state that interior hard-wired fixtures must be ENERGY STAR listed fluorescent and that common and exterior lighting must be fluorescent or an approved equivalent. ADM recommends referencing minimum efficiency requirements per the Illinois TRM for each lamp type instead of more general statements. For example, a 32 Watt 4 foot T8 fluorescent lamp installed in a multi-family building that is under four stories does not result in claimable energy saving impacts when using the baseline provided by the current version of the TRM, but would appear to qualify under program guidelines. Additionally, note that for buildings 4 stories and above, draft TRM version 5 indicates that the lighting power density standard under IECC 2015 for multi-family buildings is 0.51 watts / ft^2.

The following recommendations based on the review of the program are offered for the Department of Commerce's consideration:

- **Continue to Improve Project Documentation and Measure-level Information:** Each measure should include descriptors precise enough to account for differences in expected useful life (EUL), but general enough to be aggregated at a higher level. There may be a few custom measures that may not be easily categorized. Such measures should be assigned to an "Other" category and/or subcategory. Ideally tracking data should contain:
    - **Measure Category:** Lighting, HVAC, building insulation, etc.
    - **Measure Subcategory:** Linear Fluorescent, Lighting Occupancy Sensor, HVAC Packaged Unit, etc.
    - **Measure Name:** 14W CFL, R-19 fiberglass insulation, 2 Ton SEER 14 central air conditioner, etc.
    - **Measure Quantity:** Number of fixtures or lamps, appliances, etc.
    - **Measure Unit:** Number of units, square feet, liner feet, etc.
    - **Notes:** For custom measures this field would provide the description for those measures that do not correspond to any established category in the fields described above. These measures would be given a value of "Other" for the preceding fields.
- **Develop Measure-Level Ex Ante Savings Estimates:** Ex ante savings estimates were calculated using a savings per housing unit multiplier based on ADM's EPY5/GPY2 evaluation of the AHC Program. Changes in building codes, updates to the Illinois TRM's savings algorithms, and differences in the measures implemented at each project lead to this approach overestimating savings. To achieve a more accurate ex ante savings estimate and measure-level realization rates, ADM recommends developing measure-level TRM-based ex ante savings estimations.
- **Utilize the Illinois Energy Now Information Management System (IEN IMS) to estimate program savings, store project documentation, and record key project data:** ADM

understands that efforts to use IEN IMS as a program management tool were undercut by the current lack of funding and cessation of program activity resulting from the ongoing state budget stalemate. However, going forward, ADM recommends integrating use of IEN IMS into program operations. Doing so will allow the program to estimate ex ante savings that align with ex post saving calculations and store project documentation and facilitate its transmittal to ADM

3. Process Evaluation

This chapter presents the results of the process evaluation of the Department of Commerce AHC Program. Because the program did not change in its design or operations during the program year, a limited process evaluation was performed.

The process analysis is meant to provide a qualitative understanding of how the program is progressing, what is working well, and what needs to be improved upon. In addition, it can identify issues that are critical to the future success of the program. Conclusions, recommendations, and other findings from the process evaluation may be useful in conducting planning efforts for future program years.

3.1 Methodology for Process Evaluation

The purpose of the process evaluation is to examine program operations and results throughout the program operating year, and to identify potential program improvements that may prospectively increase program efficiency or effectiveness in terms of participation and satisfaction levels.

Key research questions to be addressed by this evaluation of EPY7/GPY4:

- What were the primary changes that occurred during EPY7/GPY4?
- Are there any planned changes for EPY8/GPY5?
- What were the program's greatest successes and challenges?

The research activities to be undertaken to answer the research questions are described below.

3.1.1 Review of Program Documentation

ADM staff reviewed available program documentation including program guidelines and project documentation.

3.1.2 Interviews with Program Staff

Interviews with Department of Commerce and program partner staff provided an opportunity to clarify our understanding of the key activities used to deliver the program and its intended objectives. Additionally, these interviews provided an opportunity for staff to provide input into what key questions should be investigated. This input was used to refine the evaluation research questions.

3.1.3 Review of Program Tracking Data and System

Due to the cessation of program operations resulting from the lack of a state budget, project information and documentation was not uploaded to the Illinois Energy Now Information

Management System. Summary project information was provided in a spreadsheet to program staff.

3.2 Summary of Findings and Recommendations

The following recommendations based on the review of the program are offered for the Department of Commerce's consideration:

- **Develop a Standard Communication Procedure for Notifying the Technical Consultant when Projects Begin:** Early involvement with a program representative would reduce the potential for initial missteps that could result in non-compliance or delays in construction or payment down the road.
- **Institute an Expiration Date for Grant Offers:** Approved grantees receive a letter notifying them that they have been awarded a grant through the program. By instituting an expiration date for these funds, projects that are stalled will be removed from the program, decreasing backlog. The program may consider a grant renewal process for expired grants.

3.3 Detailed Findings

The following sections present the detailed findings from the evaluation of the Affordable Housing Construction Program.

3.3.1 Program Description

The AHC Program was designed to help improve the energy efficiency of low-income housing in Illinois. Grant funds are available for energy efficiency measures at sites serviced by Ameren Illinois or ComEd. Grant funds are available for natural gas conservation measures for sites serviced by Ameren Illinois, Nicor, Peoples, or North Shore.

The AHC Program provides grants to non-profit and for-profit affordable housing developers to offset the cost of incorporating energy efficient building practices in residential construction. The goal of the program is to promote the benefits of lower utility bills for low-income households as a result of living in energy efficient buildings. Eligible projects must be targeted at households that are at or below 80% of the Average Median Income (AMI) level.

To receive the grant funds, the new construction or rehabilitation project must meet the program guideline requirements and implement all required measures. There are different measures for each type of project:

- New single-family and low-rise residential construction minimum energy standards;
- New multi-family building construction minimum energy standard; and.
- Single and multi-family building rehab minimum energy standards;

Prescriptive grant amounts for projects are based on per living unit, building, or living space square footage. Projects receiving prescriptive incentives must adhere to the program requirements for insulation, windows, air sealing, mechanical systems, ventilation, appliances, and lighting.

Rehab prescriptive incentive amounts are described below and reflect combined natural and electric incentives:

- Up to $4,650 per living unit for single-family homes;
- Up to $4.60/ft2 of gross living space or $4,650, whichever is less, for multi-family buildings with fewer than 80 units; and
- Up to $4.35/ft2 of gross living space or $4,650, whichever is less, for multi-family buildings with 80 or more units.

New construction prescriptive incentive amounts are described below and reflect combined natural and electric incentives:

- Up to $4,150 per living unit for new single-family homes;
- Up to $6,700 per building for new duplex construction;
- Up to $7,800 per building for new “3-flat” construction;
- Up to $8,900 per building for new “4-flat” construction;
- Up to $11,500 per building for new “6-flat” construction;
- Up to $4.35/ft2 of gross living space in new multi-family buildings with fewer than 80 units; and
- Up to $4.10/ft2 of gross living space in new multi-family buildings with 80 or more units.

The program also offered performance based incentives for multifamily projects that sought ENERGY STAR® or LEED certification and achieved energy savings of 15% over ASHRAE 90.-2010 or IECC 2012. Energy saving estimates cannot include reductions achieved through solar or wind power. No projects completed during the year received performance based incentives.

Table 3-1 presents a summary of the total number of residential units constructed or rehabilitated by project type. In total, 1,170 units were constructed or rehabilitated through 23 program projects. The majority of units were new multi-family construction, followed by multi-family building rehab.

Table 3-1 Number of Residential Units Receiving Efficiency Improvements

Type of Project	*Number of Residential Units*
Single Family Rehab	10
New Single Family Construction	181
Multi-Family Building Rehab	25
New Multi-Family Building Construction	954
Total	1,170

3.3.2 Program Operations Perspective

This section summarizes the core findings of the assessment of the AHC Program operations. This assessment is primarily informed by an interviews completed with DomusPlus, the program technical consultant, and the Department of Commerce program manager.

3.3.2.1. Program Status

The current freeze on use of EEPS funds has resulted in a halt to AHC program operations. All EPY7/GPY4 grants that were awarded prior to the funding interruption will be honored; however no new applications are being accepted at this time. The technical consultant indicated that developers continue to inquire about program funds and are sending building schematics in anticipation of the budget approval in the coming months.

During EPY8/GPY5, program staff intends to review program guidelines in the coming year and may modify them. No other program changes are currently planned.

3.3.2.2. Performance Incentive Component

Most program activity occurred from projects implemented under the guidelines that provide an incentive based on building type and size for incorporating a set of measures and design specifications into the project. However, during EPY7/GPY4 one participant chose to take the performance incentive approach that bases energy savings on whole building modeling (this project was not completed during the program year). Staff estimated that the project will achieve a 24% increase in efficiency over the IECC Code. Most of the savings will come from lighting measures. The technical consultant indicated that the performance incentive participation path requires energy modeling by a third party but could result in more flexibility with the project scope, which he sees as a positive outcome and even more necessary in the future as deeper energy savings are sought.

3.3.2.3. Marketing and Outreach

The program does not take part in education or outreach activities. Interview feedback indicates that program awareness is strong and therefore the program continues to thrive without outreach efforts. Awareness has increased over the years through word of mouth, among previous participants and architect design firms. The program has always utilized its budget. The technical

consultant also indicated that most projects have a person or entity responsible for structuring the financial aspects of a project, as well an architecture firm responsible for the design specifications. In turn, the financial entity or architect will often put the developer in touch with the program if they are unaware of the grant opportunities.

3.3.2.4. Program Administration and Communication

The technical consultant indicated that there tends to be a lag between the dates when the grant is awarded and when the project is underway. This lag is due to the length of time necessary to align funding sources and finalize the construction plans. This challenge was characterized in the EPY6/GPY3 evaluation report and was discussed again this year during staff interviews. A recommendation was made to impose an expiration date on the grant award. No action was taken in response to the recommendation.

Communication between Department of Commerce program staff and the technical consultant occurs on an ad hoc basis. The technical consultant indicated the communication is mostly adequate but could be improved. The technical consultant is responsible for verifying installation of program eligible measures. It is necessary that he visits the site early in the construction process as well as at the end. Currently, there is no communication protocol that requires Department of Commerce to notify the technical consultant that the project has started; he is only notified when the initial construction documents are under review and when grant funds are requested. The technical consultant indicated that he could address non-compliance issues earlier if he was consistently notified by Department of Commerce every time a project is to begin construction.

During EPY8/GPY5 a check list was developed to be utilized by the project architect. The purpose of the check list is for the design team to identify where in the project documentation energy efficiency measure specifications can be found. In the past, it required the technical consultant to review, in detail, all schematic and construction drawings in an effort to identify all the program eligible measures. Now the design team must create a check list with references to identify where in the documentation the pertinent information can be found. He said this has significantly improved the project review process.

Appendix A: Project Summaries

Table A-1 presents a summary of Affordable Housing Construction Program projects completed in EPY7/GPY4.

Table A-1 Project Summaries

Grantee	*Project Name*	*Type*	*Number of Units*	*Gas Utility*	*Electric Utility*
CSL Properties	CSL Markham Energy Rehab	Rehab SF	10	Nicor	ComEd
DuPage County Habitat for Humanity	Prairie Green	New SF	12	Nicor	ComEd
Heartland Housing, Inc.	3600 N. Halsted Senior Apartments	New MF<80	79	Peoples	ComEd
DKI-LITH Villas GP, LLC	Villas in Lake of the Hills	New MF<80	60	Nicor	ComEd
Burton Foundation	Waters Edge of South Elgin	New MF<80	48	Nicor	ComEd
Senior Suites Chicago Norwood Park LLC	Senior Suites of Norwood Park	New MF<80	52	Nicor	ComEd
New Pisgah Missionary Baptist Church	Veterans New Beginnings	New MF<80	54	Peoples	ComEd
Hispanic Housing Development Corp.	North & Pulaski	New MF<80	73	Peoples	ComEd
Interfaith Housing Development Corp.	Lake Street Studios	New MF<80	61	Peoples	ComEd
Trinity Services, Inc.	The Landings at Villa	New MF<80	16	Nicor	ComEd
TCB Development Services	Shops & Lofts at 47th	New MF<80	56	Peoples	ComEd
Volunteers of America of Illinois	Hope Manor II	New MF<80	73	Peoples	ComEd
Blue Island SLF, LLC	Blue Island Supportive Living Facility	New MF<80	96	Electric	ComEd
Montclare Senior Residences of Avalon Park, Phase II	Montclare Senior Residences	New MF<80	109	Peoples	ComEd
Porta Coeli Senior Housing, NFP	Porta Coeli	New MF<80	86	Peoples	ComEd
Alden Foundation	Mt. Prospect Horizon	New MF<80	91	Nicor	ComEd
Heartland Properties IV, LLC	Harrison & Sonny	Rehab MF<80	20	None	Ameren
S. Crider Construction II	Neighborhood Stabilization	Rehab MF<80	5	None	Ameren
Central Illinois Services	Parkside Homes	New SF	33	None	Ameren
Technical Assistance Corporation	Defense Area Redevlopment	New SF	46	None	Ameren
Mt. Sinai Development Corporation	Sinai Village II	New SF	30	None	Ameren
Apple Prairie Residential Services	Walnut Estates	New SF	34	None	Ameren
Christian County Integrated Community Services	Hathaway Homes	New SF	26	Ameren Gas	Ameren