A Prescriptive Solution for Affordable Housing Performance Ills

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Program Overview

- Started in 2017 (Previously operated since 1999 through State)
- ComEd service territory with joint support from People's Gas and Nicor Gas
- Serving 50+ active projects with total units 4,120 units served since 2017
- $2.2M annual budget
- 2,800,000 kWh and 230,000 therms saved in 2019

Source: IL <80% AMI, energy.gov/eere/slsc/maps/lead-tool
Program Requirements

1. Must be in ComEd service territory
2. Housing for occupants at or below 80% AMI
3. Must meet the requirements of the ComEd Multi-family Standard

Types of Buildings
How does the program work

1. HIGH-PERFORMANCE WINDOWS: Improved windows with above-code specifications for U-factor and Solar Heat Gain Coefficient (SHGC).
2. REDUCED INFILTRATION: Reduced envelope infiltration verified by testing.
3. REDUCED THERMAL BRIDGING: Improved detailing of the thermal envelope and better accounting for thermal bridges. The measure includes a straightforward list of prescriptive requirements.

13 Measures

HVAC Performance Measures

4. HIGH-PERFORMANCE HVAC EQUIPMENT: Above-code levels of performance for HVAC equipment that generally correspond to the Consortium for Energy Efficiency (CEE) Tier 2.
5. HIGH-PERFORMANCE FANS: High efficiency fans, including requirements for both system and exhaust/ventilator fans.
6. EFFICIENT VENTILATION: Improved ventilation through the adoption of strategies based on ASHRAE 62.2.
7. ADVANCED HVAC CONTROLS: Smart thermostats
13 Measures

Lighting Performance Measures

8. HIGH-PERFORMANCE INTERIOR LIGHTING: Reduced lighting power density in common areas and improved lamp efficacy in dwelling units.

9. INTERIOR LIGHTING CONTROLS: Occupancy and vacancy controls for common areas paired with implementation of bi-level lighting in some areas.

10. HIGH-PERFORMANCE EXTERIOR LIGHTING: Improved lamp efficacy for exterior site, landscape and architectural lighting.

Hot Water and Appliance Measures

11. HIGH-PERFORMANCE WATER HEATING EQUIPMENT: Higher-efficiency water heaters and boilers used for water heating.

12. HOT WATER CONSERVATION: Low-flow fixtures in kitchens and bathrooms meeting WaterSense® criteria

13. EFFICIENT APPLIANCES: ENERGY STAR® appliances and other equipment.

Why does this approach work

- Up-front requirements
- Predictable savings
- Both developer and utility share risks
- Incentive at the end
Partners

- IHDA
  - Alignment with QAP
  - Supplemental funding
  - 10 of 12 projects in ComEd Territory
- City of Chicago
  - Due diligence
  - Alignment with SDP
- Local Housing Authorities
  - Largest developer in Chicago (3rd largest housing authority)
  - RAD, and HCV for capital and operational support
- Community Development Financial Institutions
  - Supplemental funding
  - Due diligence
- Habitat for Humanity
  - Replicable scattered sites
- IHC
  - Combined marketing efforts

“These are excellent programs and we want everyone to take advantage of them.”
-City of Chicago

Tie – Lighting

- Switched to relaxed requirement of EnergyStar®
- Many projects able to meet original lighting requirements especially in common areas
- Lighting procurement can be varied
- Exceptions for some fixtures
Tie – Envelope Performance

- Importance of recognizing difference between residential and commercial grade windows
- Blower door testing was already required by the State, healthy workforce behind it and developers used to it
- Continuous insulation varies among design and development teams

Win – HVAC Efficiency

- CEE Tier 2 – based on high performance but readily available equipment
- Typical equipment rated performance above Standard is 7-12%
- Large number of projects using high performance VRF or condensing furnaces
- Only one developer using radiant boilers and wall ACs
Win – Hot Water

- Systems mostly storage
- All meeting high performance requirements
- Some projects using heat pump water heaters
- Watersense® fixtures, State of IL now counts energy savings from water reductions

Concession – Ducted Corridors

- City of Chicago allows undercuts
- 2 of 26 projects with common corridors ducting to residences
- Require continuous exhaust with boosted operation in bathrooms
Concession – Smart Thermostats

- Senior and supportive housing populations
- Savings in question

![Ecobee4 on the wall from an angle showing home screen](https://commons.wikimedia.org/wiki/File:Ecobee4_on_the_wall_from_an_angle_showing_home_screen.jpg)

Energystar®
- Designed for national code cycles
- Doesn’t require airPLUS

PHIUS+
- Deemed vs actual savings
- Doubling up on verification

Comparing against other criteria

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<th>PHIUS+</th>
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Energy and Cost Comparison:

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*Note: space-cooling costs are omitted in these preliminary results – these will be analyzed at the conclusion of the 2016 cooling season.

Looking ahead

Air quality comparison using PM2.5

- Base: 40 CFM
  Continuous with boost
- PHIUS+: 100 cfm continuous ERV
- Also looked at CO2 and TVOC
Next steps

Partial Renovations
- Already cover deep retro-fits
- Existing equipment replacement program

PHIUS+ pass through program
- Deemed vs modeled savings
- Reduce implementation costs

Photo courtesy of Paul Knight

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