

# ComEd EE R&D Programs

*Update for SAG 7/31/2018*

Noel Corral, Jim Fay & Mark Milby

# Agenda

1. Emerging Technologies Program Framework & Update – Noel Corral
2. Income Eligible Call for Ideas Update – Jim Fay
3. Baseline/Potential Study Update – Jim Fay
4. Review of Current Emerging Technology Projects – Mark Milby

# Emerging Technologies (ET) Program

*Framework and Update*

Noel Corral

# Agenda

1. Background and Introduction
2. ET Program Framework Development
3. Framework Walk-Through
4. Status

# Background and Introduction

- ✓ FEJA permits ComEd to spend up to 6% of its EE budget for “research, development, or pilot deployment of new equipment or measures”
- ✓ Filed and approved (ICC) budget is \$13.3M per year
  - Previous filed budget was \$3.6M per year
- ✓ Immediate Need

*Clear sense of objectives, a comprehensive emerging technology portfolio strategy, and a structured and disciplined organizational practice*

# ET Program Framework

- ✓ Developed with thought leaders in the industry
  - Four meetings – starting July '17 and ending on February '18
  
- ✓ Sharing with you today:
  1. **Vision** for the ET Program
  2. **Purpose** of the ET Program
  3. **Objectives** of the ET Program
  4. **Criteria** for project selection

# Participants (alphabetical order)

AECOM

Center for Neighborhood Technology

Chicago Council on Global Affairs

Citizens Utility Board

Clean Energy Trust

Elevate Energy

Energy Foundry

Energy Futures Group / Natural Resources  
Defense Council

Environmental Law & Policy Center

Faith in Place

Illinois Commerce Commission

Institute for Market Transformation / City of  
Chicago

Rocky Mountain Institute

Sieben Energy

The Accelerate Group

# Vision

✓ To be the best in class ET Program in the nation that accomplishes the following:

- To be a leader in innovation
- Strongest market and program impacts
- Highest customer satisfaction
- A steady stream of new products transitioned into customer offerings
- Industry leadership (e.g. technical papers, conferences)



# Purpose

The purpose of the ET Program is to identify, test, validate, and integrate into program offerings:

- ✓ New energy efficiency technologies
- ✓ New energy efficiency program delivery strategies

This will drive the evolution of the ComEd Energy Efficiency Program so that it continues to meet customers' needs and its cumulative persisting energy savings goals cost-effectively.

# Objectives

1. **Expand the ways in which ComEd can help its customers save energy** (with new measures or by increasing customer participation in the program), with emphasis on longer-lived savings
2. **Lower ComEd's future costs per unit of program energy savings** (thereby indirectly enabling greater total savings within statutory spending caps)
3. **Increase the diversity of the sources of energy savings** from ComEd's future program offerings (thereby decreasing the risk of failing to meet future savings goals)
4. **Identify, develop, and validate scalable approaches** to delivering cost-effective energy savings for **income eligible and public housing customers**
5. **Collaborate with local communities** on shared areas of interest to advance mutually beneficial objectives
6. Contribute to a powerful narrative that will catalyze, enhance and support the area's efforts to **attract innovation to Illinois and cultivate clean energy-focused business growth**
7. **Utilize the area's energy efficiency technology and delivery research community**; support the Chicago region's emergence as a **national center for such R&D**
8. Accelerate the rate of energy efficiency deployment in ways that advance **non-energy benefits like climate, jobs, and economic development (with a special emphasis on under-served areas)**

# Criteria

## 1. Alignment with the Objectives

**2. Potential Benefit per ET dollar:** the potential future benefit (once at scale) compared to the ET dollars being requested for the project. For example, ET dollar per:

- New savings potential
- Cost reduction potential
- Low income benefit potential
- Local job growth potential
- Etc.

**3. Probability of Success:** the likelihood that the project will produce the stated benefits. Determined by evaluating the following:

- The concept
- Research or pilot approach
- Bidder Experience and Capabilities

**4. Timing of the Pay-Off:** the duration of when the benefits are expected to be realized.

- Short-term: 4 years or less
- Medium-term: 5 to 8 years
- Long-term: 9 years or more

# Key Initiatives - 2018

1. Develop Program Framework
2. Hire an Implementation Contractor
3. Conduct a Baseline and Potential Study
4. Conduct a Call for Ideas – Income Eligible

# Questions



# ComEd's Income Eligible Call-for-Ideas (CFI)

*Update*

Jim Fay

## CFI Concept - Background

- ✓ R&D on Income Eligible concepts is a component of overall IE spend goal:
  - Average over 4 years
  - IE ET budget: \$6m/yr on average in ET or 3<sup>rd</sup> Party
- ✓ Through meetings with thought leaders and ET Stakeholders, a framework and criteria were developed to solicit and vet promising research ideas

## Call for Ideas (CFI) Goals

1. Identify 25 – 30 innovative ideas that improve the IE EE Program
2. “Cast a wide net” and reach new sources of ideas beyond current ICs and vendors; provide excellent experience for respondents
3. Use a broader definition of innovation: move beyond just widgets and gather different types of ideas including delivery methods, market research, program design and business models
4. Develop and test a new CFI process and procedures



## CFI Concept

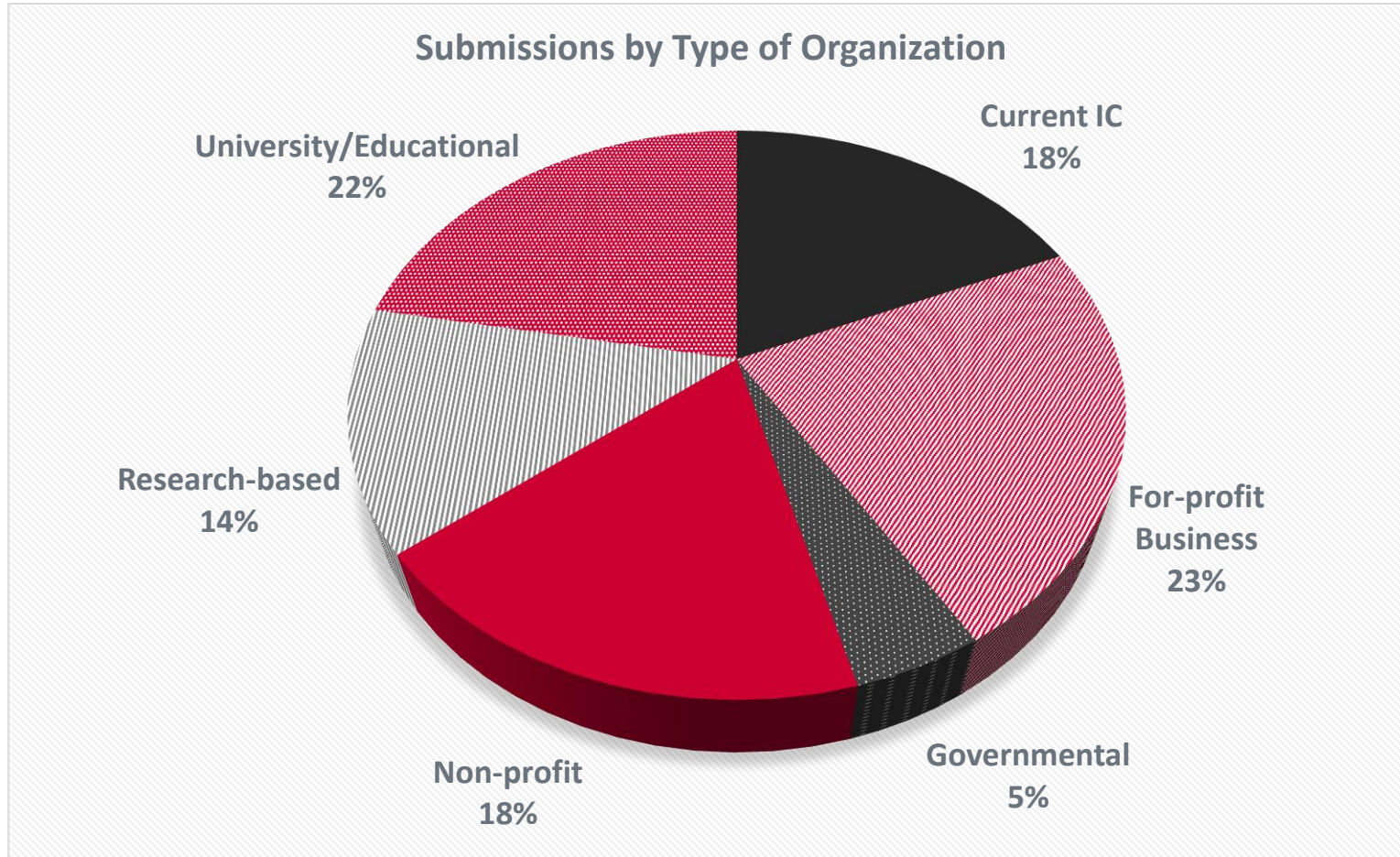
- ✓ Solicitation benchmarking discussions with BPA, ConEd, DOE (ARPA-e)
- ✓ How is the CFI different?
  - Simplified the proposal process: 5 page CFI; 3 page response limit
  - Based on 9 research & impact questions
  - Worked across ComEd and with stakeholders to broaden the bidder's list: Over 500 people from nearly 250 organizations received the CFI

## CFI Results

- ✓ The Call for Ideas was sent out on March 8
- ✓ On April 5, we received **109 idea submissions**

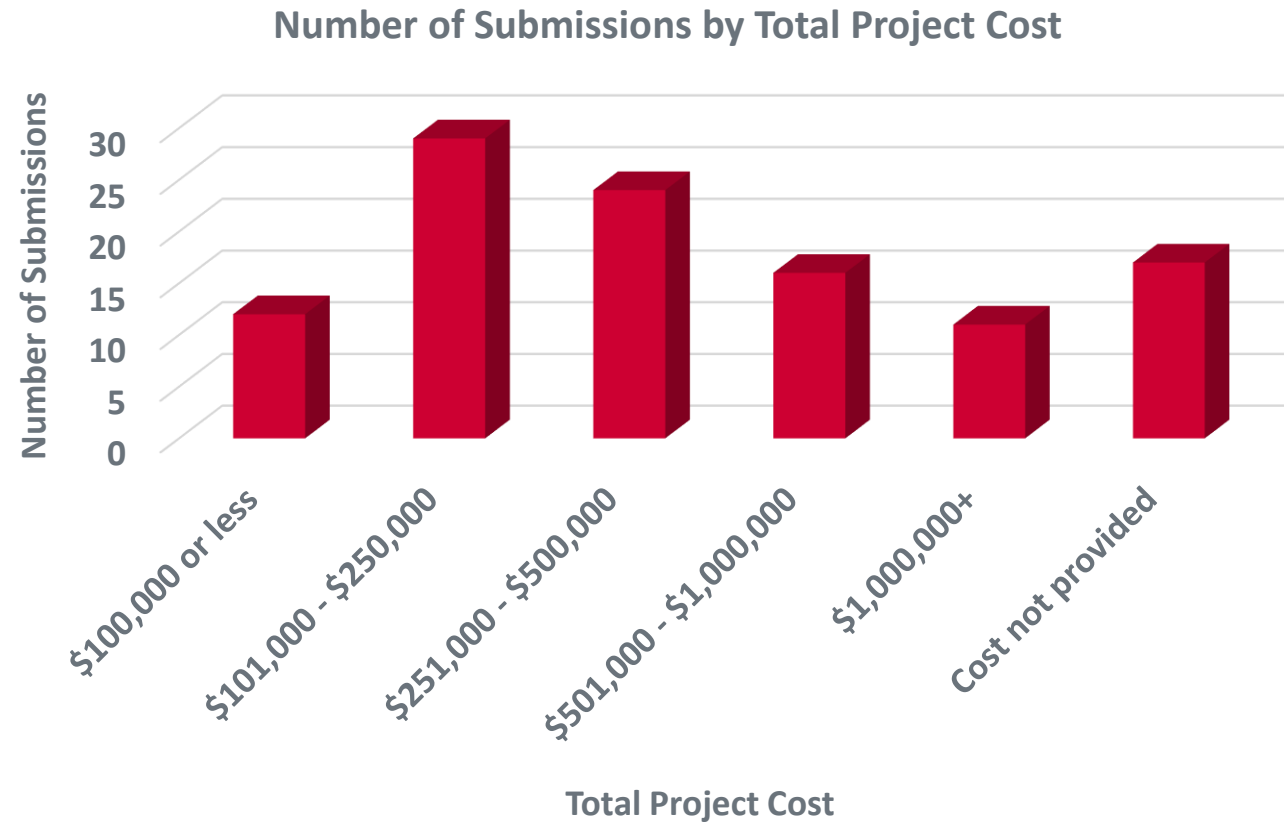
# Who submitted ideas?

We received ideas from a diverse group of 51 different organizations including many non-traditional sources.



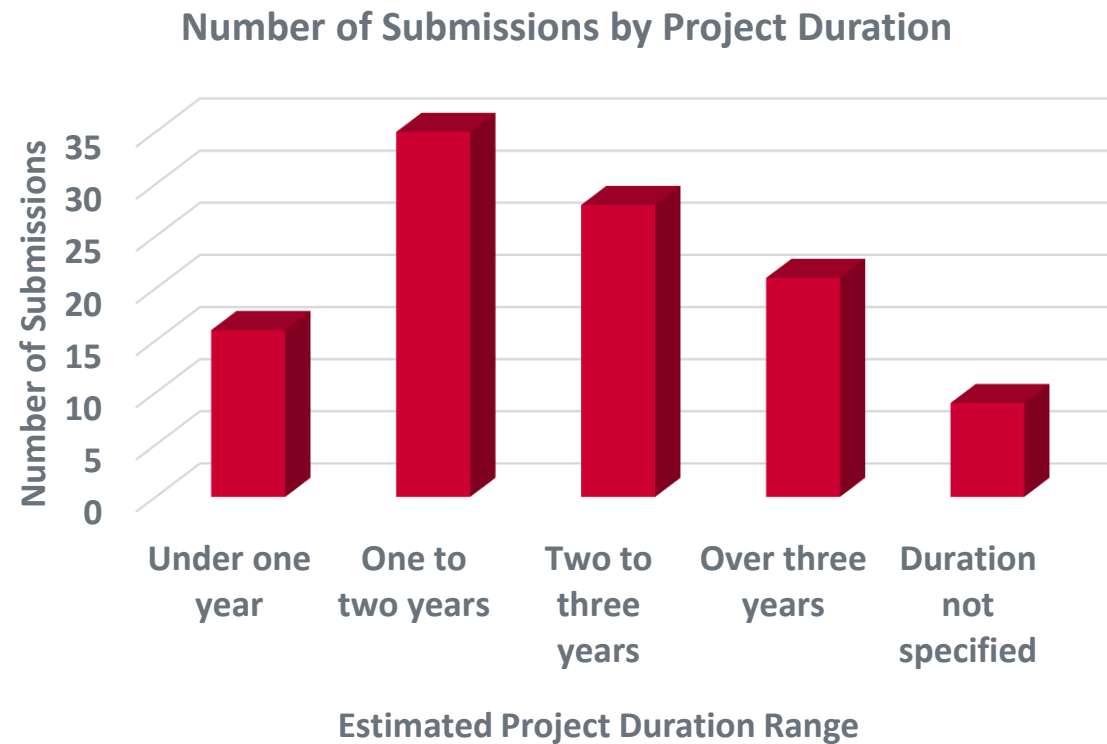
# What are the costs involved?

Total estimated budgets for CFI ideas where budget was provided: over \$75 million



# What are the project durations?

Most projects are expected to take between one and two years.



## Call for Ideas (CFI) Goals

1. Identify 25 – 30 innovative ideas that improve the IE EE Program – **109 Idea submissions**
2. “Cast a wide net” and reach new sources of ideas beyond current ICs and vendors; provide excellent experience for respondents – **51 different organizations**

## Call for Ideas (CFI) Goals

3. Use a broader definition of innovation: move beyond just widgets and gather different types of ideas including delivery methods, market research, program design and business models

**- more than half the ideas were not technology**

4. Develop and test a new CFI process and procedures

**- Anecdotal feedback from submitters has been overwhelmingly positive; each submitter received personalized thank you email**

## What Are the Primary IE Strategic Research Areas?

- ✓ Develop a basic understanding of IE customers energy usage and energy saving potential
- ✓ Understand health issues, health benefits and leverage opportunities for IE energy efficiency programs
- ✓ Understand the performance and economics of new technologies for IE customers
- ✓ Identify and test new outreach and recruiting strategies
- ✓ Identify and test new program delivery design options



## Next Steps

- ✓ We are moving forward:
  - With 15 invited to submit to Open Source (3<sup>rd</sup> Party) with 6 non-IE being considered as R&D
  - With 20 full proposals requested/under review
- ✓ Many CFI deferred until 2019
- ✓ Several deferred until 2019 pending state-of-the-art technology assessments
- ✓ Three remain under discussion with submitters

# ComEd's 2018 Baseline & Potential Study

*Overview & Update*

Jim Fay

## Baseline Study

- ✓ A Baseline Study is a statistically representative survey of ComEd residential, commercial and industrial customers to determine energy-using equipment stock, efficiency, age, and utilization.
- ✓ A Potential Study determines energy savings potential for more efficient equipment and behaviors
- ✓ ComEd completed Baseline Surveys in 2009 and 2012
- ✓ 2018 Baseline RFP – February, 2018

# Baseline Timeline

- February - RFP
- April - 5 Solid Bids
- June - Contractor Selection: Itron
- August - Contract
- 12-Month Project Timeline
- Final Report Summer, 2019

# Baseline Study: What's New & Innovative in 2018

1. Utilizing AMI data
2. Stock turnover model
3. Aggregation bias & second order potential
4. The Baseline survey results: data analysis capability

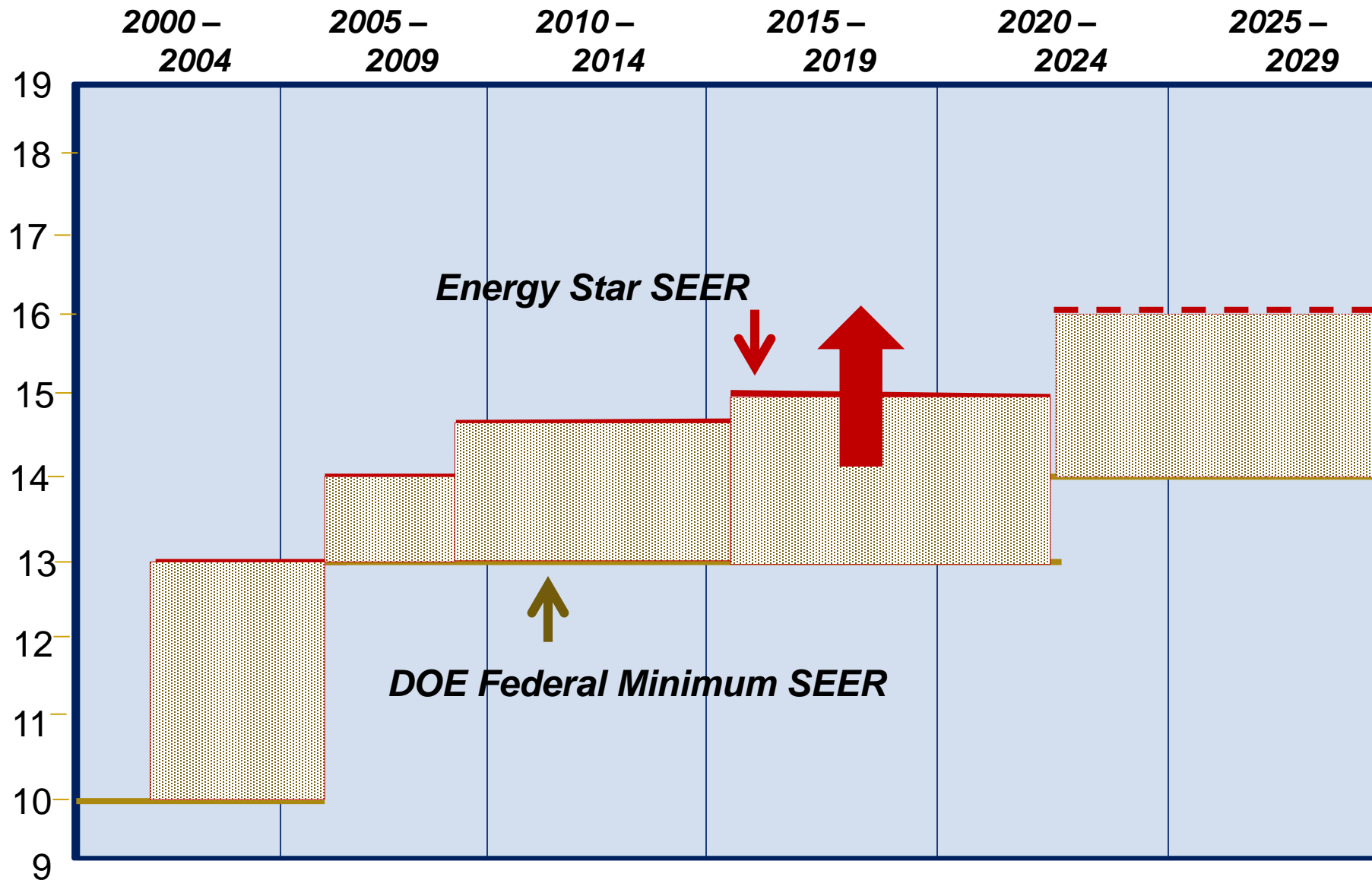
# May, 2016 Potential Study Results

Figure 20. Programs Contributing 1 Percent or More Additional Achievable MWh Savings in the Maximum Achievable Scenario

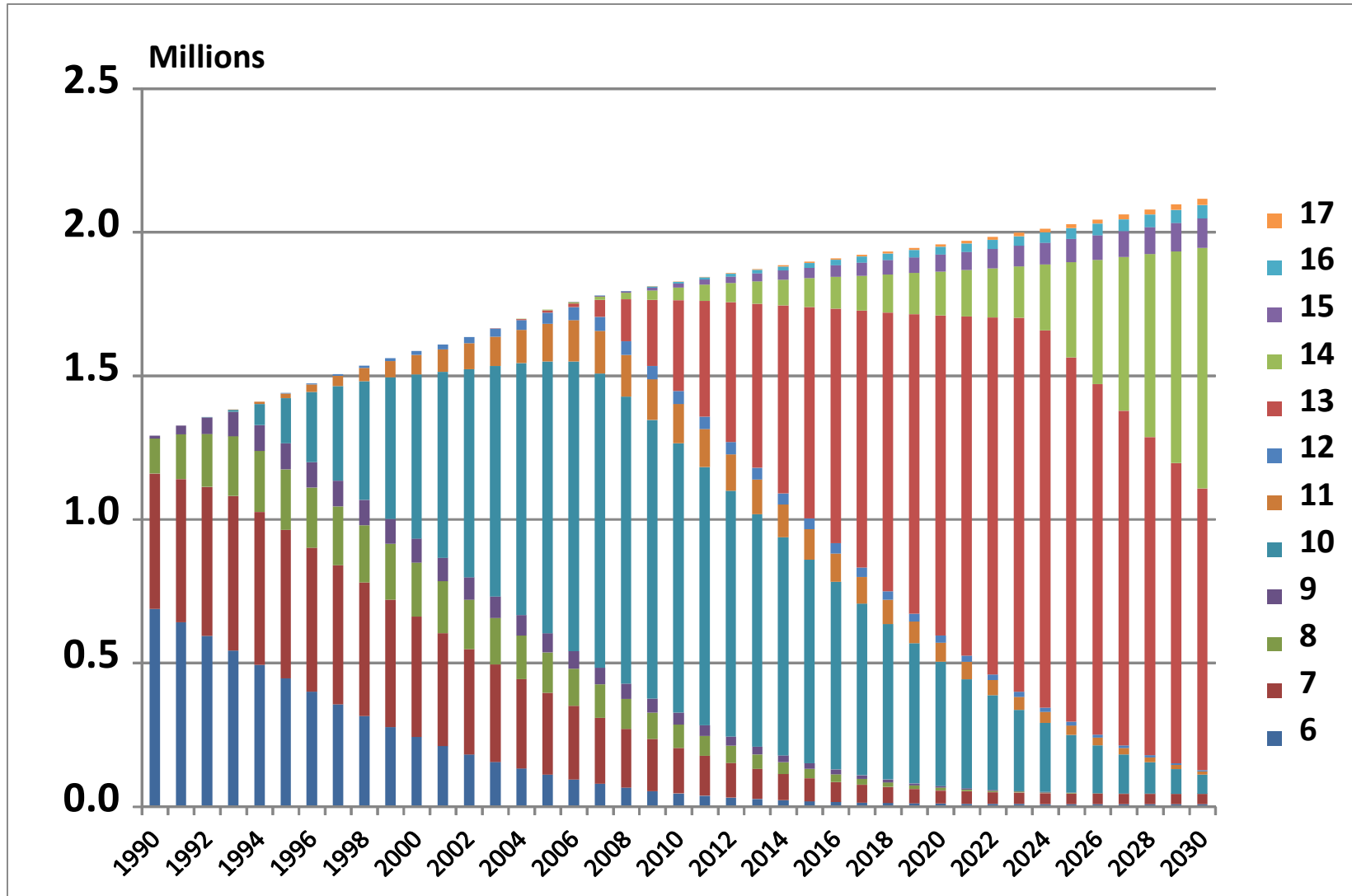
Sector	Program	Additional Cumulative MWh in 2030 in Max Achievable Scenario	% Total Additional MWh in Max Achievable Scenario
Commercial	Small Business	1,073,222	34%
Commercial	Commercial Prescriptive & Custom	967,341	31%
Commercial	Midstream Incentives	384,897	12%
Commercial	Retrocommissioning	142,908	5%
Residential	Connected Home	110,500	4%
Residential	Lighting	92,829	3%
Commercial	C&I New Construction	81,768	3%
Residential	Retail Products Platform	72,332	2%
Residential	HVAC and Weatherization	47,811	2%
Residential	Home Energy Assessment	36,874	1%
Total			96%



# Residential Central Air Conditioner

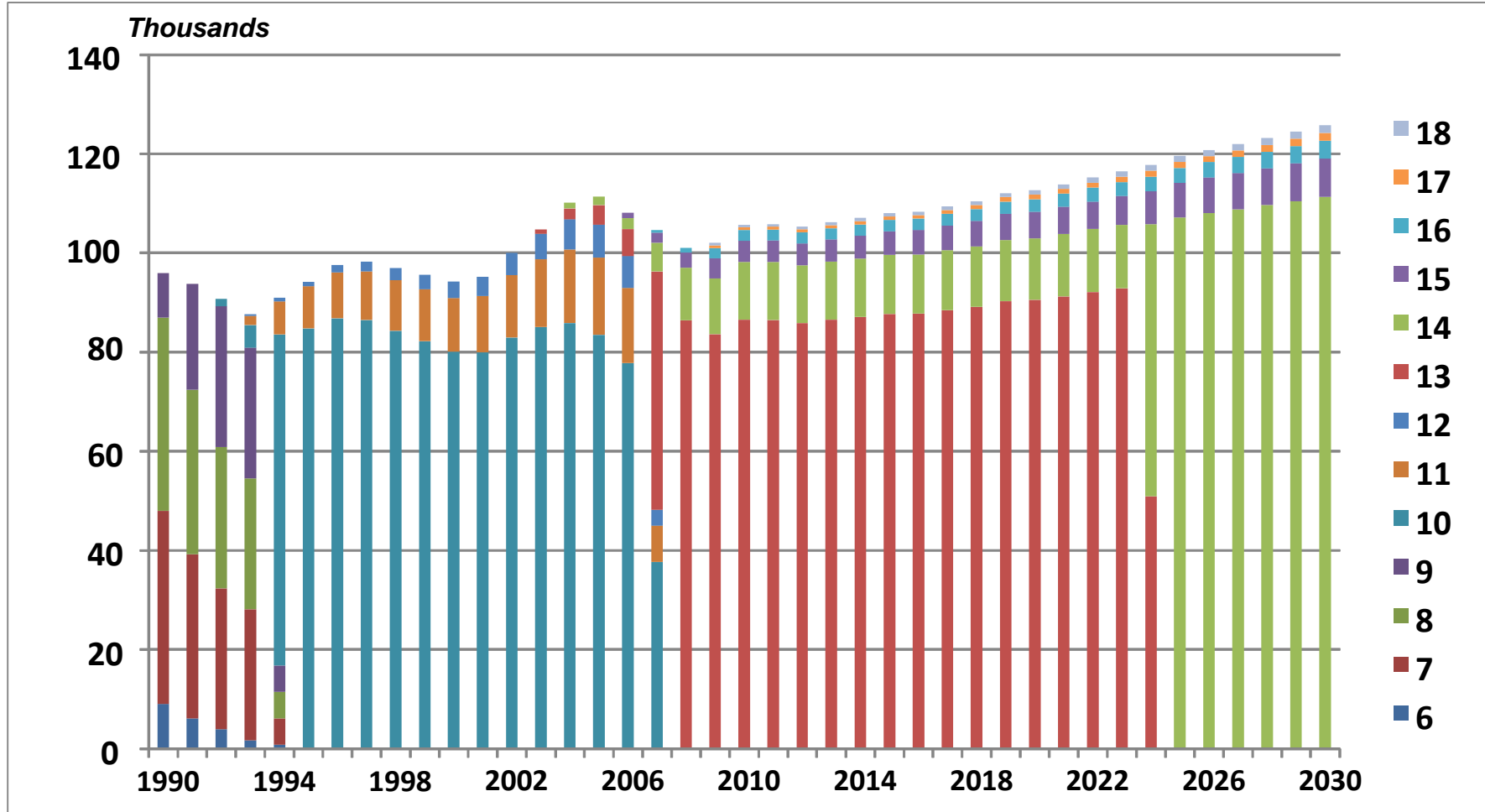


# ComEd Single-Family Central Air Conditioning Stock



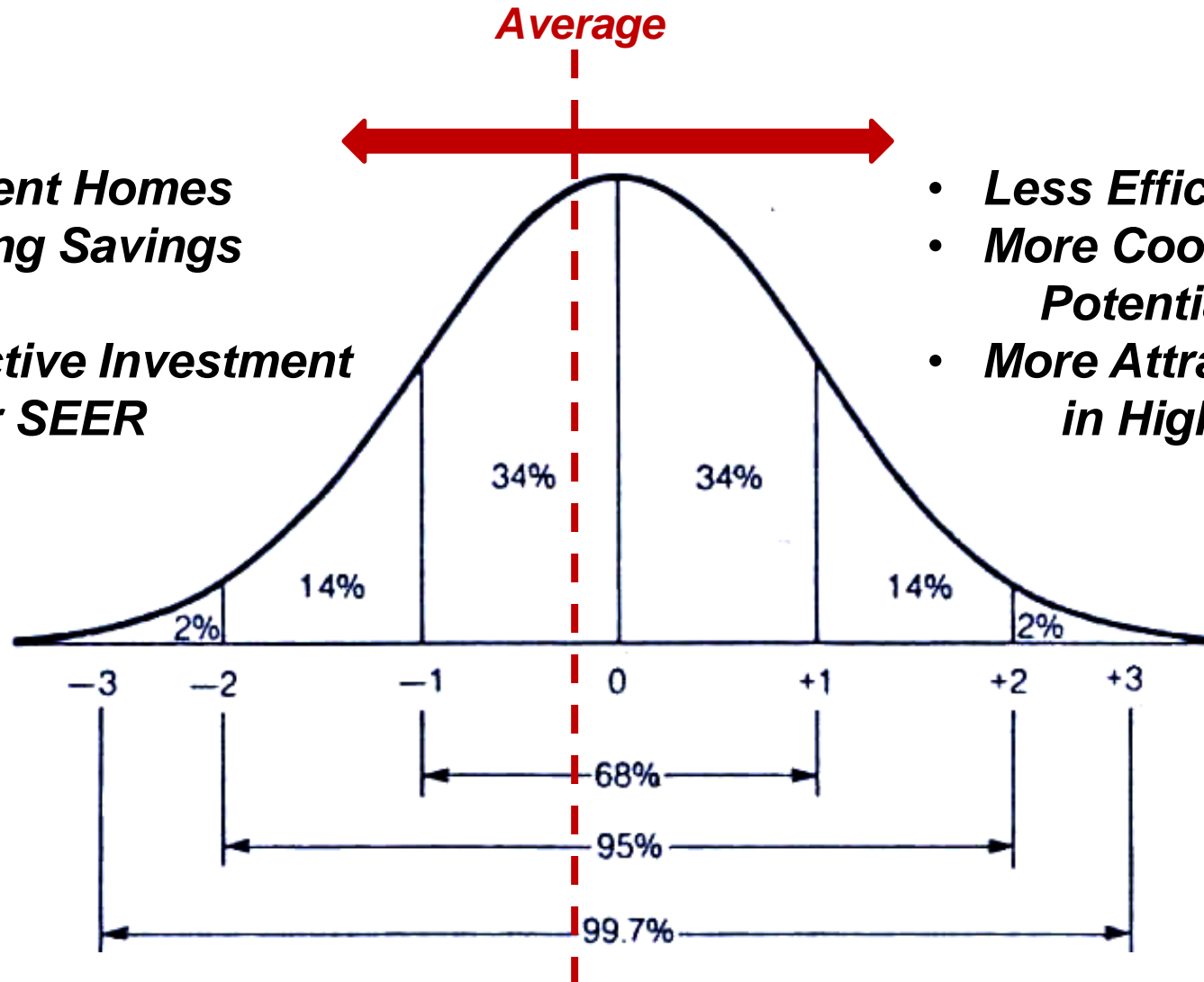


# SF CAC Shipments/Installs in ComEd Territory by SEER



# Cooling Load Normal Distribution

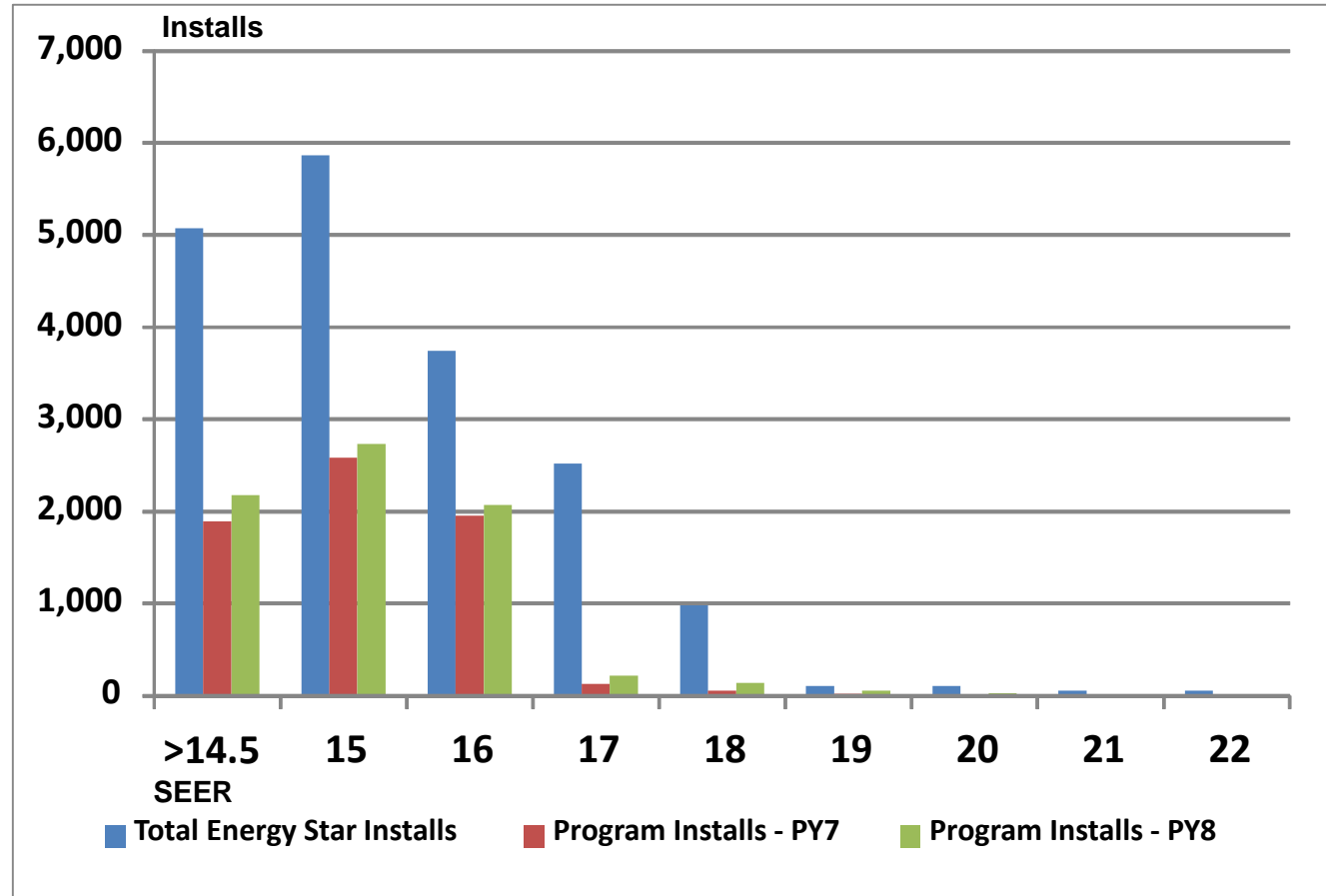
- **More Efficient Homes**
- **Less Cooling Savings Potential**
- **Less Attractive Investment in Higher SEER**



- **Less Efficient Homes**
- **More Cooling Savings Potential**
- **More Attractive Investment in Higher SEER**

# SIFYH CAC PY7-8 Program Impact

- **100,000**  
SF CAC Installs per Year  
↓
- **20,000**  
Energy Star Installs  
↓
- **6-8,000**  
ComEd Program Installs  
↓
- **80,000**  
Non-Energy Star SF CAC  
Installs per Year  
↓
- **40,000 – 60,000**  
Cost-Effective Upgrades



# Baseline Study Summary

- ✓ Summer 2018 Project Start
- ✓ Summer 2019 Results
- ✓ Market-Based Economic Potential to Inform Portfolio Mix

# Emerging Technologies Program

*Selected Projects Update 7/31/18*

Mark Milby

# Demo Project – LUCHA Passive House

- ✓ Partner: Seventhwave, LUCHA
- ✓ Passive House demonstration project with local developer
- ✓ Affordable multifamily development (*Tierra Linda* project) with standard new construction comparison
- ✓ Analyzing energy performance, construction cost data and tenant experience



<https://lucha.org/tag/passive-house/>

# Pilot – HVAC SAVE Quality Installation

- ✓ Partners: CLEARResult and MEEA
- ✓ Quality Installation training and rating program popular in Iowa
- ✓ Focused on ensuring the performance of HVAC systems to match rated efficiency
- ✓ 400 QI projects across summer 2018
- ✓ TRM measure under development



<https://www.achrnews.com/articles/136030-projects-highlight-air-quality-energy-efficiency-and-comfort-goals>



# Research Project – Energy/Water Nexus

- ✓ Partner: Elevate Energy
- ✓ Understand the energy embedded in a gallon of water that is sourced, distributed and treated
- ✓ Creating recommendations for improved energy intensity estimates
- ✓ TRM measure under development
- ✓ Could lead to exciting new measures and customer opportunities

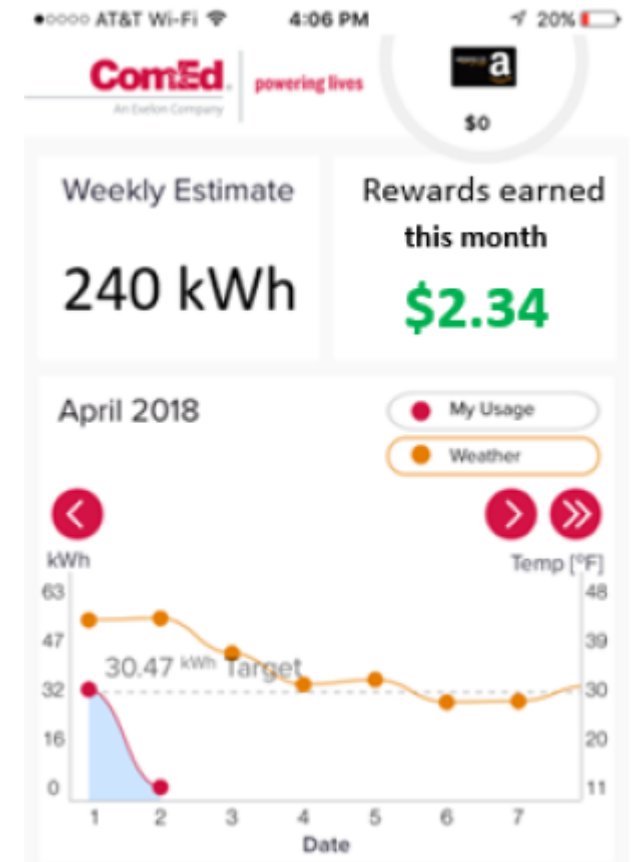


<https://www.chicagoarchitecture.org/2015/04/17/spend-saturday-with-your-mind-in-the-sewer/screen-shot-2015-04-16-at-5-53-05-pmpacific-daylight-time/>



# Pilot – Save and Share Mobile App

- ✓ Partners: EnergySavvy, MeterGenius, Faith in Place
- ✓ Mobile app for Bronzeville residents
- ✓ Engage customers with meter data and provide personalized program recommendations
- ✓ Generate matched savings in a special account that can be donated to community organizations
- ✓ App available to Bronzeville residents on Aug 18



# Demo Project – enVerid Adsorbent Air Cleaner

- ✓ Partners: Seventhwave, enVerid
- ✓ Scrubs contaminants from indoor air to reduce the amount of outside air ventilation required for proper IAQ
- ✓ Working with manufacturer to recruit commercial building participants and Seventhwave to study energy impacts
- ✓ Recruited one participant to date, a major Chicago Loop high rise



- A** Return air from AHU
- B** Clean air from HLR ducted back to AHU
- C** Outside air for regeneration
- D** Regeneration exhaust from HLR

<https://www.achrnews.com/articles/136030-projects-highlight-air-quality-energy-efficiency-and-comfort-goals>

# Demo Project – Q-Sync Synchronous Motors

- ✓ Partners: Seventhwave, QM Power
- ✓ Highly energy efficient motor for for refrigeration applications such as walk-in and case coolers/freezers
- ✓ Recognized as a “High Impact Technology” by US DOE
- ✓ Working with manufacturer to recruit commercial building participants and Seventhwave to study energy impacts



<https://www.energy.gov/eere/success-stories/articles/eere-success-story-revolutionary-refrigeration-motor-slashes>

# RFP – Ductless Heat Pumps

- ✓ Purpose: Study the performance of high performance, cold climate, ductless heat pumps
  - ✓ Target: Residential, income eligible, all-electric multi-family buildings
  - ✓ Collaboration: Worked with non-financially interested stakeholders to develop RFP
  - ✓ Status: RFP August, study will take place in 2019
- ✓ Key Objectives:
    - Determine the energy savings potential for this technology in ComEd's area
    - Evaluate performance and cost effectiveness in a variety of applications
    - Understand product costs and potential benefit of bulk purchasing
    - Understand customer experience
    - Develop program design & implementation recommendations for a potential full-scale program

# Get Involved

- ✓ Submit ideas at [EmergingTech@ComEd.com](mailto:EmergingTech@ComEd.com)
- ✓ Contact Mark Milby at [Mark.Milby@ComEd.com](mailto:Mark.Milby@ComEd.com)
- ✓ Emerging Tech web portal coming soon