

# ComEd Emerging Technologies

Updates on selected projects and the  
Income Eligible *Call for Ideas*

2/25/19 – Mark Milby, Noel Corral & pilot vendors

# Agenda

- ✓ Summary of 2018 Emerging Tech activity
- ✓ Updates on Emerging Tech projects
  - All-Electric Multifamily Ductless Heat Pumps
  - Affordable Multifamily Passive House
  - enVerid Adsorbent Air Cleaner
  - Baseline & Potential Study
- ✓ Update on 2018 *Call for Ideas* solicitation
- ✓ 2019 plans

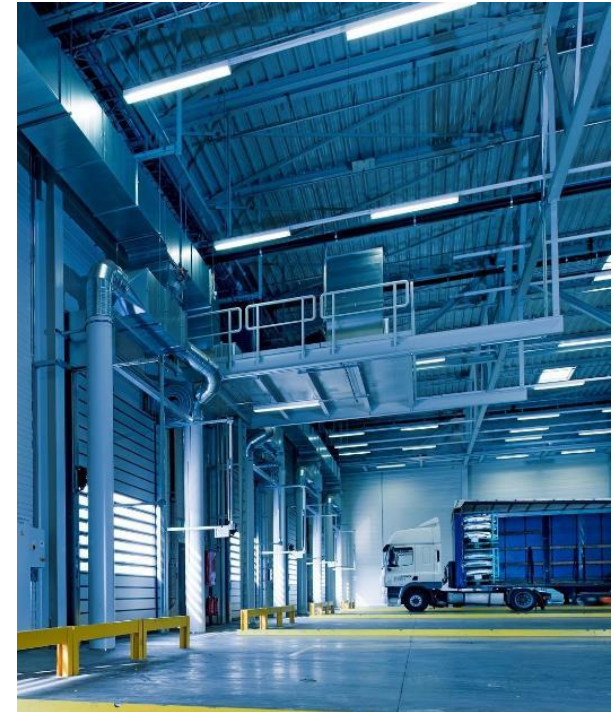
# ComEd Emerging Technologies Overview

- ✓ **Origin** – R&D budget has been allocated since 2008 (EE Program inception); FEJA legislation dramatically increased it in 2018
- ✓ **Purpose** – Identify, test, validate and integrate the next generation of energy efficiency *technologies* and *program delivery strategies* into the ComEd portfolio
- ✓ **Goal** – Drive the evolution of the ComEd EE Portfolio so that it continues to meet customer needs and energy savings targets cost-effectively



# The Need for R&D

- ✓ **Growing and Aggressive Goals** – Emphasis on persisting energy savings; ET is the pipeline for new measures and programs to meet kWh savings goals, ensuring health of the portfolio
- ✓ **Changing Baselines** – Will reduce the amount of energy savings we can claim in the future (e.g., new lighting baselines erode a once reliable source of energy savings)
- ✓ **New Customer Segments** – ComEd seeks innovative ways to cost-effectively engage income-eligible, public sector, and public housing customers

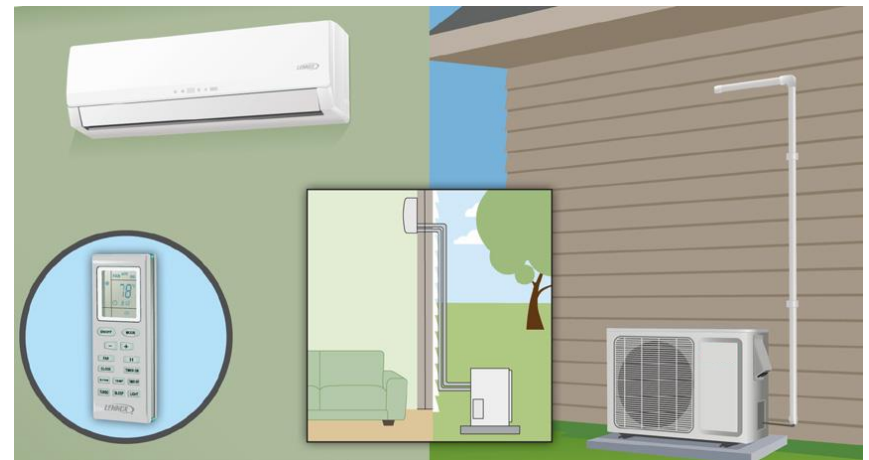
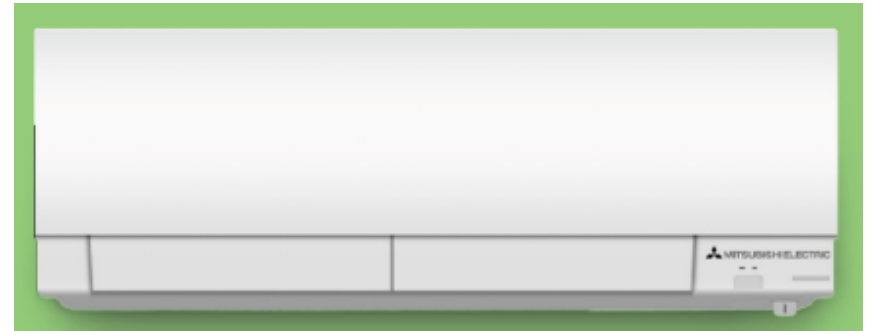


# 2018 Success

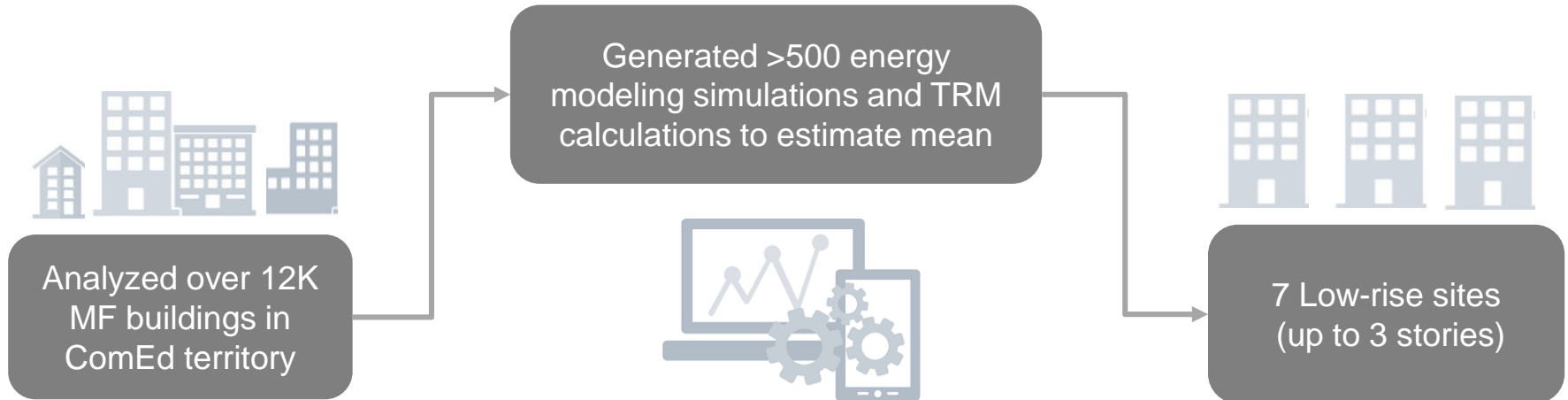
- ✓ Compared to last ten years of EE R&D, we have significantly scaled this effort in many ways
- ✓ Convened successful advisory group in 2017-18 to create vision, objectives, project selection criteria
- ✓ Onboarded new contractor support team
- ✓ Nearly 40 pilots or research projects in progress
- ✓ Launched Income Eligible *Call for Ideas* solicitation, launched over a dozen projects to date
- ✓ Refined pipeline, contracting and other critical processes
- ✓ Several TRM measures accepted

# Ductless Heat Pumps

- ✓ Partners: CMC Energy, Franklin Energy
- ✓ Pilot to evaluate performance, recruitment & costs of high performance cold climate ductless heat pumps
- ✓ 80 heat pumps have been installed in 7 low-rise, multi-family buildings with income eligible residents
- ✓ Help to understand customer experience with the technology
- ✓ Potential to better understand this technology in our climate zone



# Ductless Heat Pumps Pilot Design



	Plan I	Group 1	Group 2	1A	1B	1C	1D	2A	2B	2C
Precision	22%	14%	14%	26%	26%	26%	26%	25%	24%	25%

## Goals:

- ✓ 20% Plan and 25% Subset Precision Error at 90% Confidence
- ✓ Replicability, scalability, performance of systems
- ✓ Resistance heat impact (sub-metered)
- ✓ AC – energy savings versus potential penalty
- ✓ Education versus temperature lock-out of resistance heat

## Plan Limitations:

- ✓ Mid/High-rise not included due to logistics/time limitations
- ✓ Shell treatment not included as separate strata

# Ductless Heat Pumps Data Analysis

## Data Collected:

- Watts/watt hours
- Voltage/amperage
- Indoor/outdoor air temperature
- Indoor/outdoor relative humidity
- Customer surveys
- **Pre-post usage**

## Analysis

## Results:

- Energy reduction
- Run times/  
maintenance issues
- True COP/SEER
- Auxiliary heat impact
- **Total energy savings**

- ✓ Weather-normalizing – VDDR
- ✓ Quarterly results – 12 month final report
- ✓ Data from eGauge, smart thermostats
- ✓ Customer impact and perception
- ✓ **Data security and integrity**



# Ductless Heat Pumps



# Ductless Heat Pumps



# Passive House

- ✓ Partners: LUCHA, Slipstream
- ✓ Passive House demonstration project with local developer
- ✓ Affordable multifamily development with standard new construction comparison
- ✓ Analyzing energy performance, cost data and tenant experience
- ✓ Potential to rethink how ComEd supports affordable housing new construction
- ✓ Construction completed Q4 2018; resident move-in underway; monitoring and surveys in 2019



# Passive House – very early analysis

## *Annualized heating energy and cost (preliminary)*

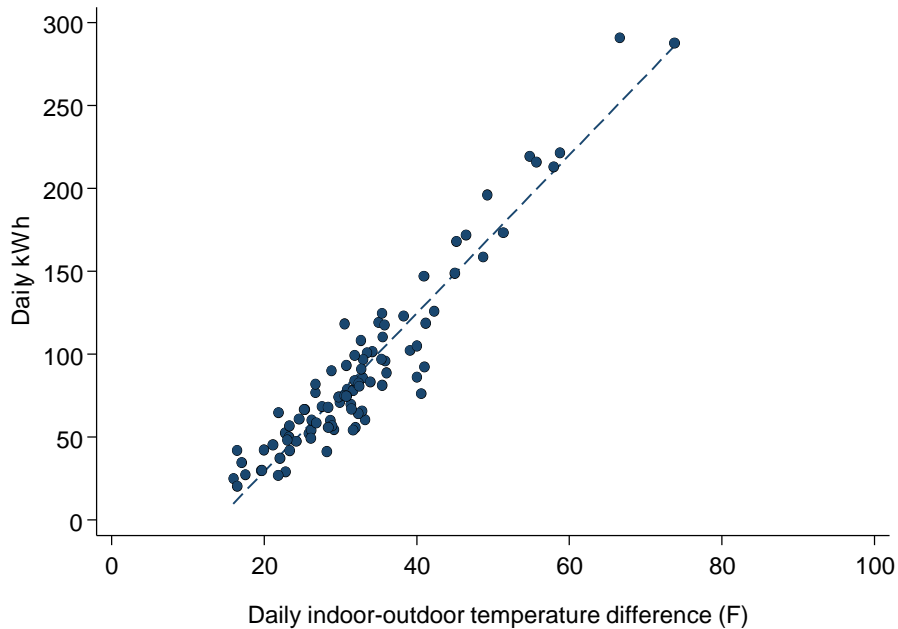
	Heating energy intensity (kBtu/sf)	Heating cost (\$/sf)
Passive House	3.38	\$0.13
ENERGY STAR	9.41	\$0.10

Normalized to average Chicago weather and 70°F indoor temperature.  
Heating cost based on October 2018 average IL electricity and natural gas prices.

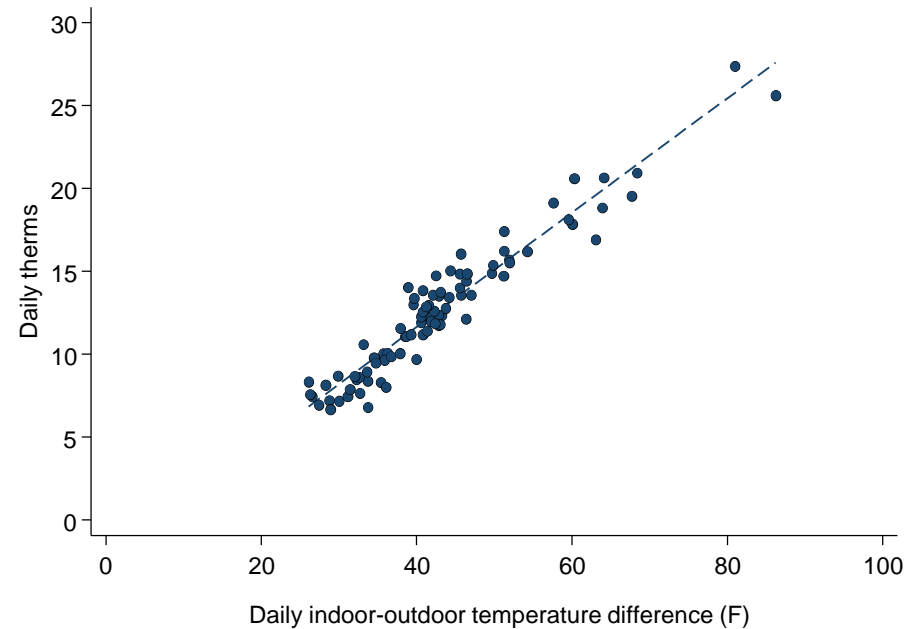
# Passive House – very early analysis

*Building-level daily heating energy vs. indoor-outdoor temp difference*

Passive House, Heat Pump Electricity

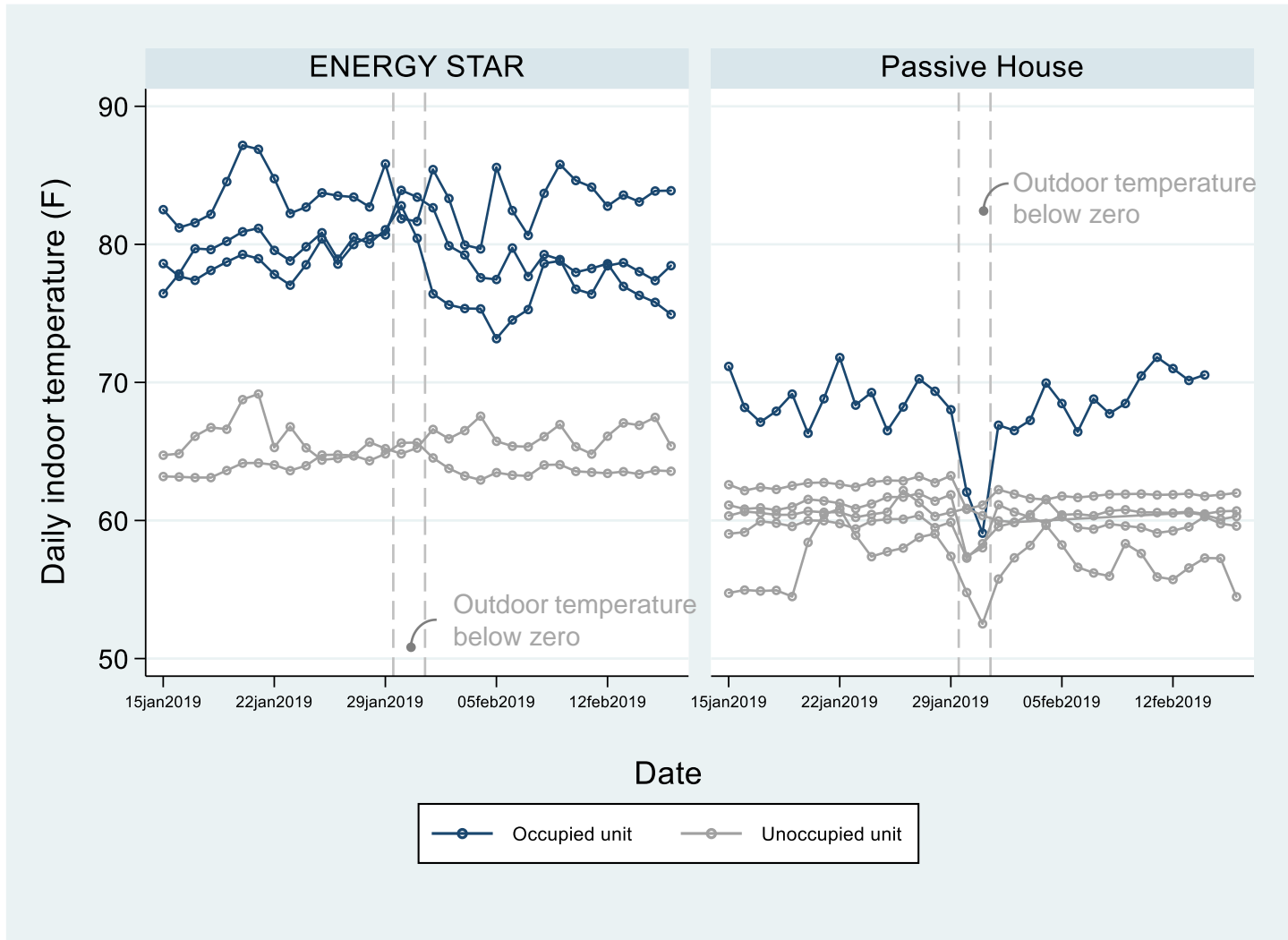


ENERGY STAR, Furnace Gas



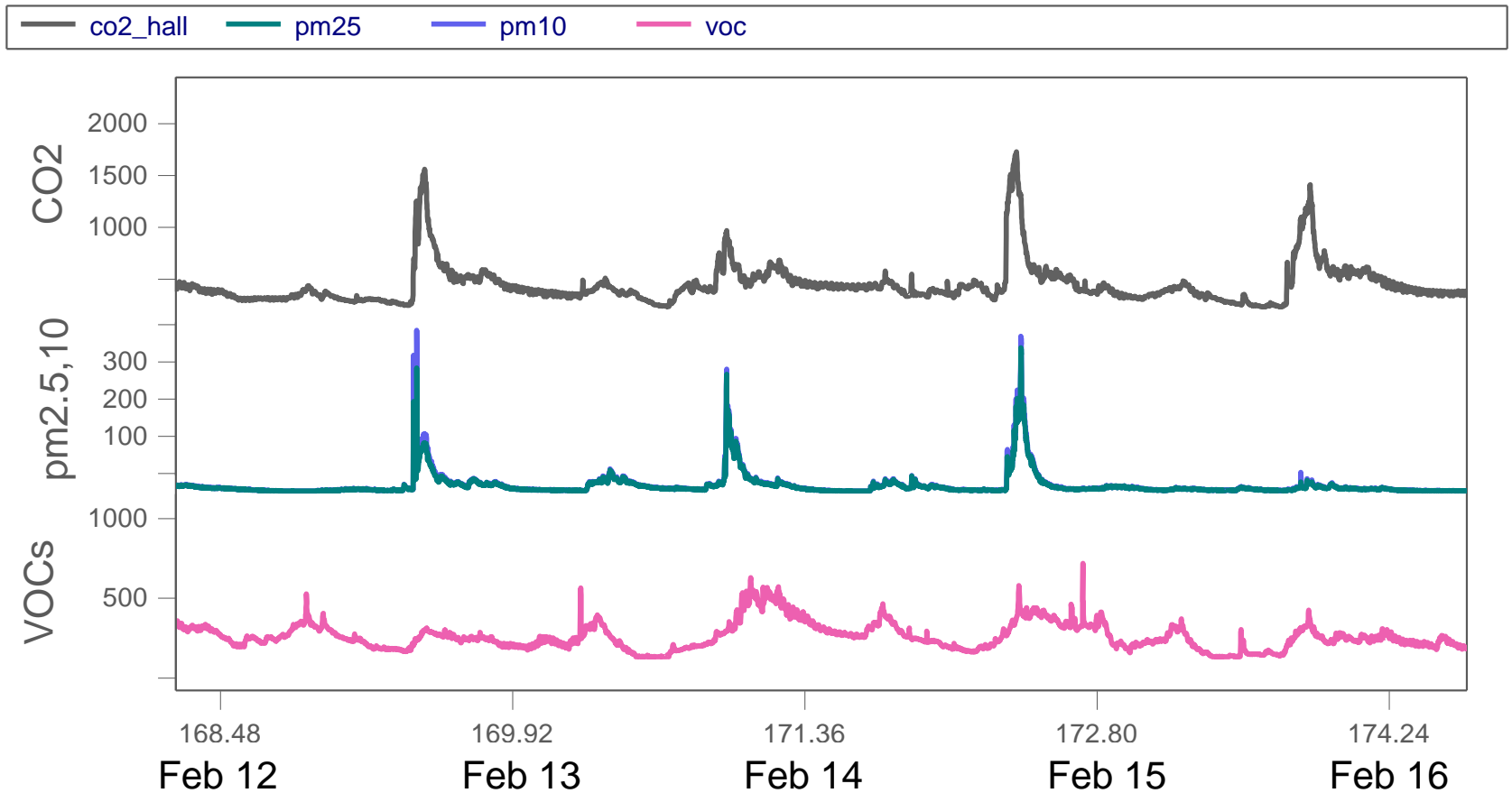
# Passive House – very early analysis

## Indoor temperature during polar vortex event



# Passive House – very early analysis

## Example of cooking impacts on IAQ



# enVerid Adsorbent Air Cleaner

- ✓ 21 units began installation at large, downtown Chicago commercial tower in December
- ✓ Commissioning currently underway
- ✓ Units to be operational in March
- ✓ This tech was awarded “2019 Product of the Year” at ASHRAE Innovation Awards in January





# Baseline & Potential Study

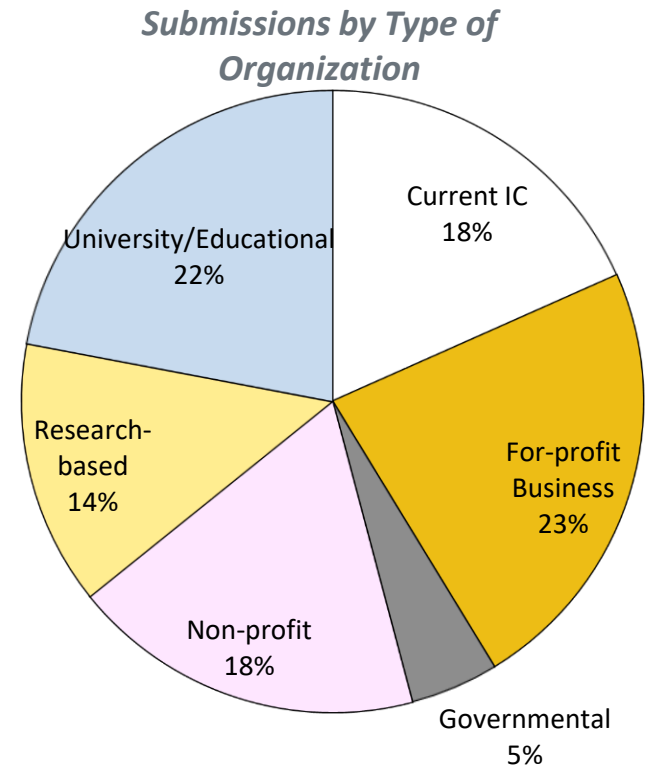
**Baseline Study:** Statistically representative survey of ComEd residential, commercial and industrial customers to determine energy-using equipment stock, efficiency, age, and utilization

**Potential Study:** Determine energy savings potential for more efficient equipment and behaviors and guide ComEd program design

**Vendor:** ITRON

# 2018 Income Eligible Call for Ideas

- ✓ Goals: Identify new ideas that can benefit IE customers and cast a wide net to reach new sources of ideas
- ✓ Received 109 ideas in Q2 2018
  - 51 unique organizations representing many new partners for ComEd
  - Over half of the ideas were not tech-focused
- ✓ Cross-dept team selection process
- ✓ Requested full proposals on 21 ideas
- ✓ Since Q3 2018, the ET team has been working on developing each project
- ✓ As of today, 14 projects launched or in final contracting phase



# Savings for Income Eligible Seniors

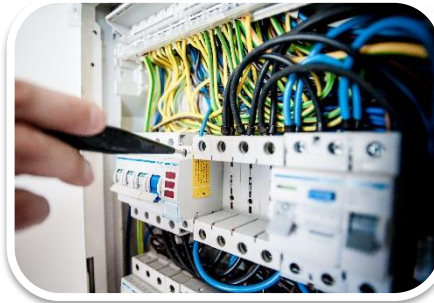
- ✓ *Call for Ideas* project
- ✓ Partners: Green Home Experts, AgeOptions, Illinois Dept on Aging
- ✓ AgeOptions is the state of Illinois Department on Aging's Area Service Agency for suburban Cook County
- ✓ Test a direct install program model for up to 500 income eligible residential customers aged 55+
- ✓ Measure package could include weather stripping, door sweeps, caulking, smart thermostats, LED bulbs, and LED nightlights
- ✓ Survey participant likelihood to engage with other EE offerings



# 2019 Strategic Focus Areas



Smart Home Energy  
Management  
Systems



Smart Commercial  
Building Control  
Systems



Energy/Water Nexus



Midstream/Upstream  
Program Design



Industrial Emerging  
Technologies

# Connect With Us

The screenshot shows the ComEd website's navigation menu. The 'Smart Energy' tab is selected and highlighted in red. A yellow arrow points to this tab. Below it, the 'Emerging Technologies' sub-menu item is highlighted in red, with another yellow arrow pointing to it. The website header includes the ComEd logo, the tagline 'powering lives', and navigation links for 'Outage', 'Pay Bill', 'Moving', 'Español', and 'Contact Us'. A search bar and a 'Sign In' button are also present. At the bottom of the page, there are icons for 'Outage', 'Pay Bill', and 'Moving', along with navigation arrows.

**ComEd** powering lives  
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Outage | Pay Bill | Moving