Advanced Building Energy Efficiency Policy Task Force (ABEEP) Meeting

Building Energy Policies and Municipal Opportunities in Illinois

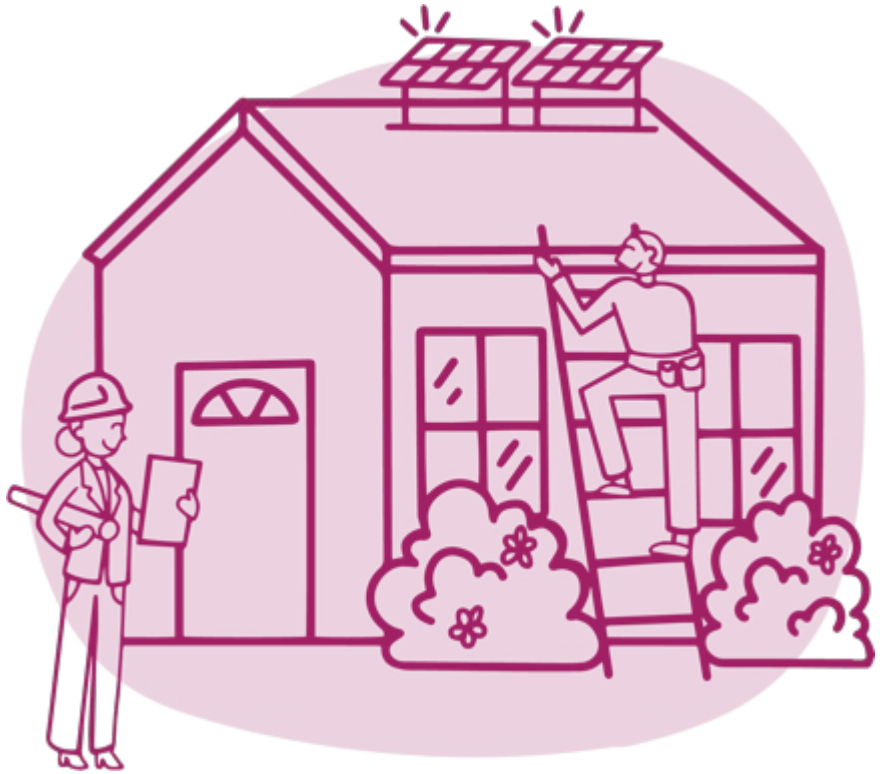
September 16, 2024

Agenda

- Introductions
- Background and community Updates
- Stretch Code Updates and FAQ
- High-efficiency affordable development

  Keri Asevedo, Habitat for Humanity Rockford

  Benjamin Van Horne, Greenline Homes
- Questions / next steps



Project background

Project Background

Our Approach

- Engage with municipalities to assist with the adoption and implementation of advanced building policies
- Develop utility-funded support programs that help municipalities successfully implement policies
- Develop savings and attribution methodologies that follow market transformation protocols

Our Team

Slipstream, MEEA, MMC with funding support from ComEd

Support for Advanced Municipal Building Energy Policies

- Help municipalities move forward with adoption of stretch codes and BPS
- Support efforts and offer tools needed to act on building energy policies
- Assist in creation of a roadmap without obligation of adoption
- Collect feedback and guidance on most effective ways utilities can support with compliance and implementation

Partnership with Metropolitan Mayors Caucus through Advanced Building Energy Efficiency Policy Task Force

https://mayorscaucus.org/abeep-task-force-meeting-materials/

Overview of Building Policies

Stretch codes

New construction policy that municipalities MAY adopt, and which require greater levels of efficiency.

Benchmarking & Building Performance Standards

Policy to use reporting and improvement targets to gradually reduce energy use in **Existing Commercial and Multifamily Buildings**.

Municipality Updates

1-on-1 Assistance

Goals

- Provide technical assistance directed at each city's circumstances
- Help drive forward adoption of stretch code and BPS

Requirements

- Recurring meetings at cadence that works for each city
- Consider the policies in earnest with no need to commit

Municipality Updates

Elgin

- Ongoing energy code engagement with residential developers
- Developing Climate and Resilience Plan (CARP)

Evanston

- Dep't. of Energy awarded funding to support BPS adoption and implementation.
- Evaluating equity considerations related to BPS implementation
- Increased benchmarking compliance in 2024

Highland Park

- Introductory meeting with sustainability staff.
- City has Sustainability Strategic Plan in place, with a goal of community-wide net zero emissions by 2035.
- Presented to Sustainability Advisory Committee on 9/12 re. advanced building EE policies

Oak Park

- Energy benchmarking "data jams" scheduled for early November
- Village considering 2024 IECC and IL stretch code to take effect in January.

Skokie

- Presented to staff on details of residential and commercial stretch codes (i.e., specific standards/provisions, alternative compliance pathways, *etc.*).
- One-on-one meetings to continue addressing questions or concerns.

Northbrook

- Introductory meeting with sustainability staff
- Energy Rating Index webinar outcome based on conversations

1:1 Municipal Engagement

Engaged Municipalities

- Broadview
- Chicago
- Downers Grove
- Elgin
- Evanston
- Highland Park
- Naperville
- Northbrook
- Oak Park
- Skokie

Examples of Technical Assistance

- Town Hall or public meeting presentations and material support
- Internal presentations on stretch code details
- Analysis of building data to estimate savings
- Comparison of stretch vs. base code in terms of cost and energy savings
- Benchmarking “data jam” facilitations

Resources for Communities

Stretch codes

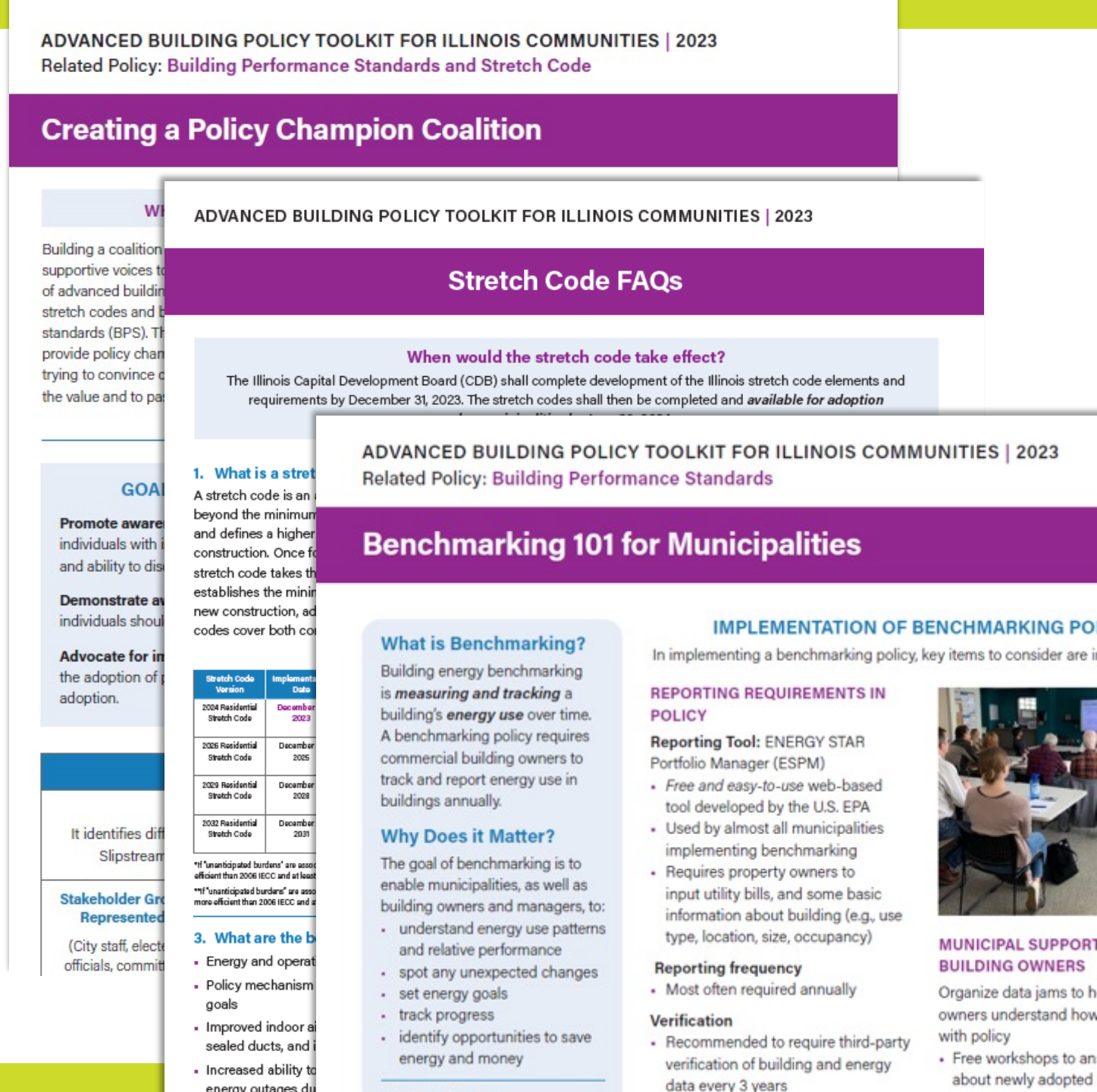
- Creating your own stretch code
- Stretch code FAQ
- Massachusetts case study
- Residential stretch vs base code comparison

Benchmarking/BPS

- Analyze existing building stock and define scope
- Choose building performance metric and determine targets
- Create compliance pathway and determine timeline
- Benchmarking implementation fact sheet
- Case studies – Chicago, Oak Park, Evanston

Applicable to both policies

- Stakeholder engagement
- Policy Champion Engagement



Illinois Stretch Code
Frequently Asked Questions

Illinois Energy Code Update

Residential Base Code

Status: Capital Development Board has **approved** 2021 IECC w/slight weakening amendments

Next Steps: Took effect statewide Jan 1, 2024

Commercial Base Code

Status: Capital Development Board has **approved** 2021 IECC w/slight weakening amendments

Next Steps: Took effect statewide Jan 1, 2024

Residential Stretch Code

Status: JCAR voted to approve on 9/10/24. Incorporates (with Illinois-specific modifications and amendments) the 2021 IECC and aspects of the 2024 IECC, with additional required decarbonization provisions (EV-readiness, solar-readiness, electric-readiness, demand-response-readiness, etc.)

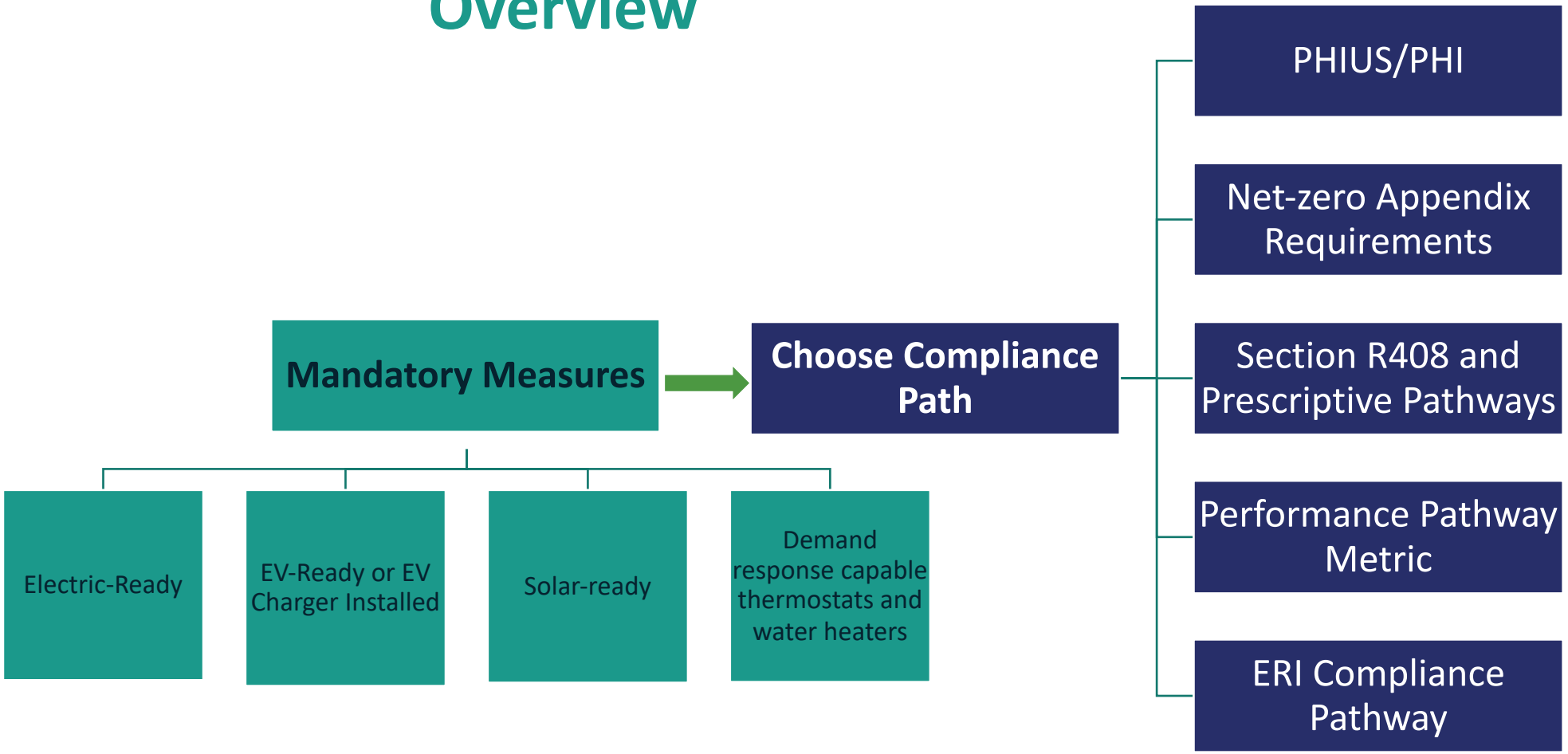
Next Steps: Will be available for adoption January 1, 2025

Commercial Stretch Code

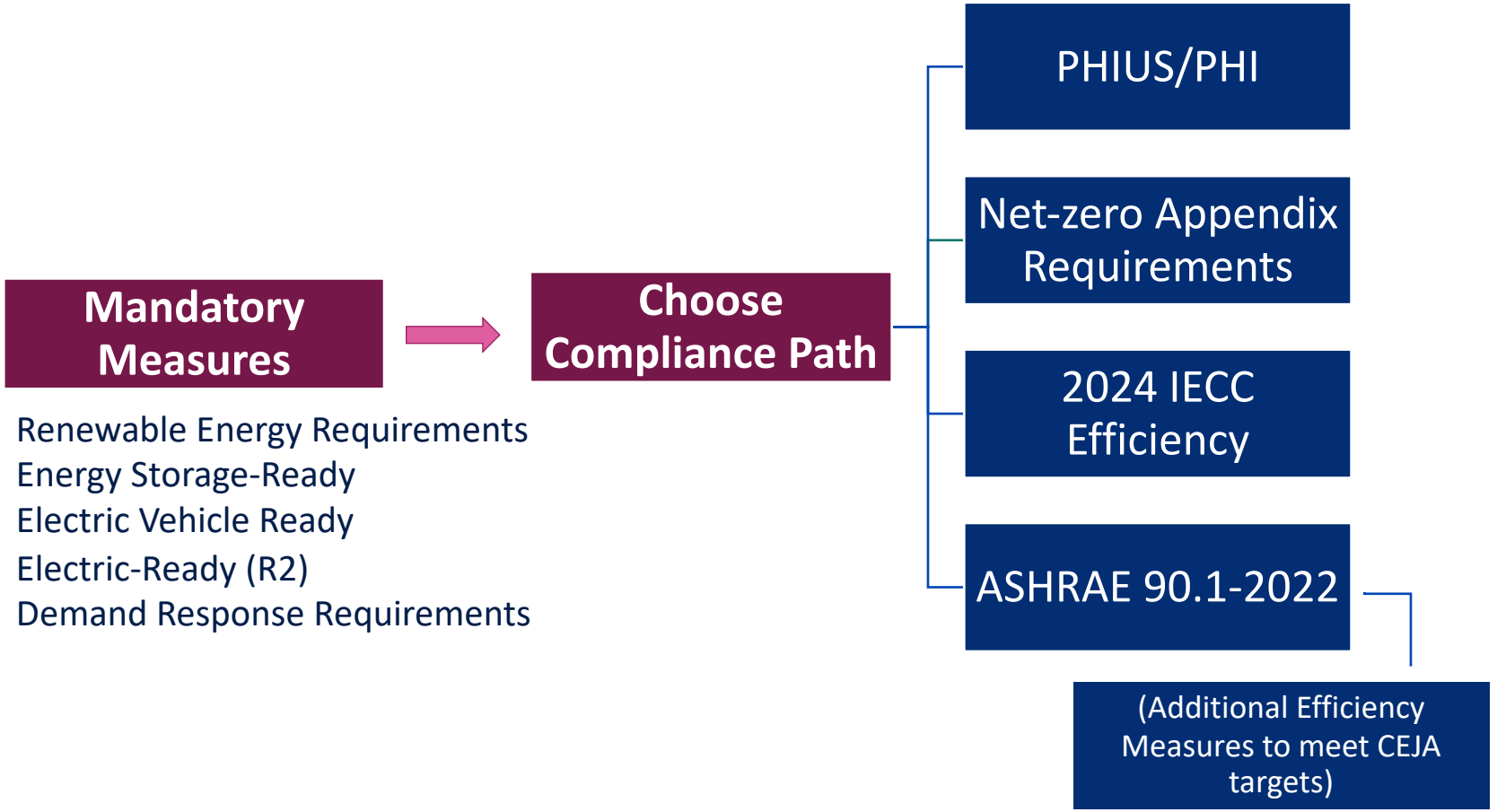
Status: JCAR voted to approve on 9/10/24. Incorporates (with Illinois-specific modifications and amendments) the 2024 Final Draft version of the IECC, with additional required decarbonization provisions (EV-readiness, solar-readiness, electric-readiness, demand-response-readiness, etc.)

Next Steps: Will be available for adoption January 1, 2025

Residential Stretch Code Overview



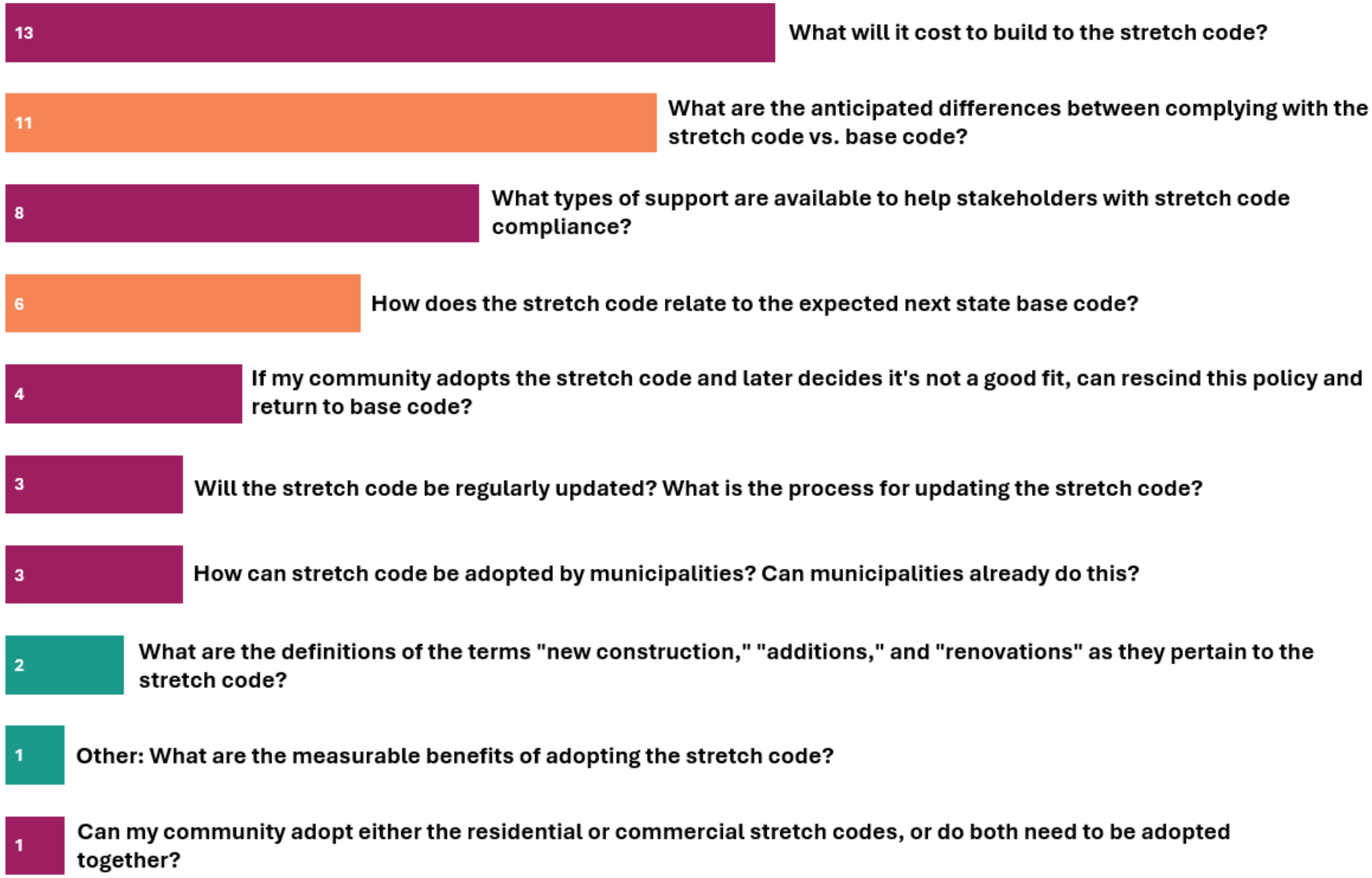
Commercial Stretch Code Overview



Pre-Meeting Topics Poll

Focus on these topics in pink during today's call

Require additional time to cover



How are codes adopted by Illinois municipalities?

Illinois Energy Efficient Building Act (Act)

The CDB shall adopt the Illinois Energy Conservation Code (IECC) as ***minimum requirements*** for ***all*** commercial buildings in the State and as ***minimum and maximum*** requirements for ***all*** residential buildings in the State

All Illinois municipalities are required to enforce the energy standards adopted by the State, regardless of if they have specific language in place directing as such

How are codes adopted by Illinois municipalities?

Exceptions: The following may adopt, enforce EE building standards for residential or commercial buildings that are ***more stringent*** than the State base code:

1) A municipality that had adopted standards equivalent to or more stringent than the 2006 International Energy Conservation Code prior to May 2009
2) A municipality that has adopted the Illinois Stretch Energy Code
3) A municipality with a population of 1,000,000 or more

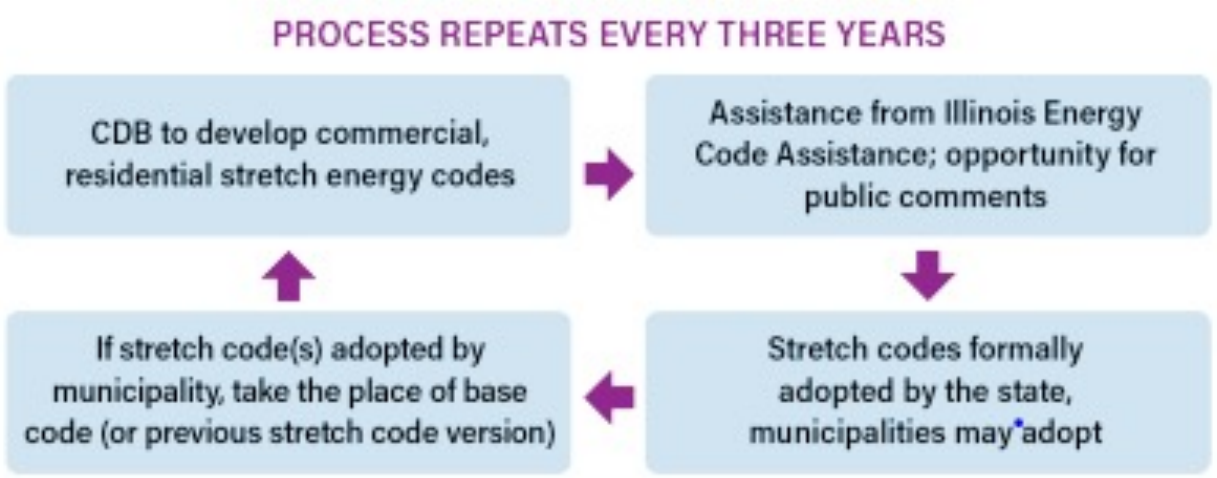
How are codes adopted by Illinois municipalities?

- For a municipality to enforce the Illinois Stretch Energy Code (once adopted by the State), it simply needs to draft language such as:

  "The City enforces the Illinois Commercial and Residential Stretch Energy Codes" or "The City enforces the latest adopted/published edition of the Illinois Commercial and Residential Stretch Energy Codes”

- A municipality will not need to take any further action to continue to enforce updated versions of the state stretch code

Will the stretch code be regularly updated? What is the process for updating it?



Residential

Residential Stretch Code Version	Code Developed By	Site Energy Index	Performance Targets (efficiency more than 2006 IECC)	Code Completed By
2023	December 31, 2023	0.50	At least 50% more	June 30, 2024
2026	December 31, 2025	0.40-0.42	At least 60% more	2026
2029	December 31, 2028	0.33-0.35	At least 67% more	2029
2032	December 31, 2031	0.25	At least 75% more	2032

Commercial

Commercial Stretch Code Version	Code Developed By	Site Energy Index	Performance Targets (efficiency more than 2006 IECC)	Code Completed By
2023	December 31, 2023	0.60	At least 40% more	June 30, 2024
2026	December 31, 2025	0.50	At least 50% more	2026
2029	December 31, 2028	0.44	At least 56% more	2029
2032	December 31, 2031	0.39	At least 61% more	2032

If my community adopts the stretch code and later decides it is not a good fit, can we rescind the policy?

If a municipality decides it wants to return to enforcing the state base energy code, it can simply ***rescind/repeal*** the previously mentioned language ***or amend*** it to something like, "The City enforces the Illinois Energy Conservation Code"

This process should follow the typical municipal procedure(s) for rescinding or amending code language

What will it cost to build to the stretch code?

Summary of PNNL Cost-Determination: Things to Consider

- Only analyzes primary prescriptive requirements
- Stretch code allows compliance flexibility by providing separate compliance pathways
- Readiness measures are the only definite *new added* cost
- Benefits of stretch code much more than one-time cost

What will it cost to build to the stretch code?

Summary of PNNL Cost-Determination

Table 7. Total Single-Family Construction Cost Increase for the Illinois Stretch Energy Code

Single-family Prototype House					
Climate Zone	**Measure Type**	**Crawlspace**	**Heated Basement**	**Unheated Basement**	**Slab**
4A	Efficiency	$4,841	$4,289	$4,841	$5,112
	Readiness	$3,350	$3,350	$3,350	$3,350
5A	Efficiency	$3,917	$3,366	$3,918	$4,188
	Readiness	$3,350	$3,350	$3,350	$3,350
Average	Combined	$7,375	$6,823	$7,375	$7,646

~$7,200

Table 8. Multifamily Construction Cost Increase for the Illinois Stretch Energy Code[17]

Multifamily Prototype Apartment/Condo		
Climate Zone	**Measure Type**	**All Foundation Types**
4A	Efficiency	$2,319
	Readiness	$3,350
5A	Efficiency	$2,008
	Readiness	$3,350
Average	Combined	$5,395

~$5,400

What will it cost to build to the stretch code?

Summary of PNNL Cost-Determination

- LCC = present value of costs over 30 years
- Initial equipment & construction costs, energy savings, maintenance and replacement costs, residual value of components at the end of the 30-year period
- When LCC of updated code is positive, considered cost effective
- Considers upfront costs and avoided retrofit costs of readiness measures

Table 11. Individual Consumer Life-cycle Impact of Illinois Stretch Energy Code

Metric	Illinois Stretch Energy Code
Life-cycle energy cost savings	$2,355
Life-cycle decarbonization cost savings	$6,474
Life-cycle total cost savings	$8,829

What will it cost to build to the stretch code?

Summary of PNNL Cost-Determination

Table 9. Decarbonization and Grid Flexibility Feature Installation and Avoided Costs

Measure	New Construction Cost	Retrofit Cost	Avoided Cost
EV Readiness[18]	$920	$3,710	$2,790
Electric Readiness**[19]	$1,200	$2,400	$1,200
Solar Readiness[20]	$1,059	$3,637	$2,578
Demand Response[21]	$200	$2,100	$1,900
Total Costs	**$3,379**	**$11,847**	**$8,468**
Life Cycle Costs (Present Value)	**$3,350**	**$9,824**	**$6,474**

** *Mixed fuel prototypes only*

What will it cost to build to the stretch code?

Stretch Code/Passive House Cost Studies

- PNNL Report (previous slides)
- See here for Massachusetts Dept of Energy Resources (DOER)
  - After applying incentives, net cost reduction to build to all-electric stretch code
  - $3K - $10K incremental initial cost to build to dual-fuel stretch code (dependent on home size), but annual cost savings due to reduced energy use.
- See here for NYSERDA Buildings of Excellence (multifamily)
  - For ~50% of projects, incremental construction costs were <1% of total project cost
  - Levels of incremental costs varied based on region and building size (larger building -> increased incremental cost
- MA and NY are different markets than IL and programs have different requirements. However, requirements for both programs significantly exceed 2021 IECC and the states include climate zones in Illinois

What types of support are available to help stakeholders with stretch code compliance?

Financial Support (Rebates and Incentives)

- Existing ComEd New Construction incentives offset design and constructions costs.

  Additional stretch code-aligned incentives anticipated for 2025

- Federal tax credits for efficient new construction (ex. Section 45L)

Technical Support

- Design assistance support in existing ComEd new construction programs
- Stretch code plan review program in consideration for 2025

Trainings

- Two in-person trainings (one on residential, one on commercial) in Oak Park sometime in November or December
- Two webinars sometime in October
- Hoping to have dates solidified ASAP

Additional support available to municipalities

Structure

- Provide support and technical assistance directed at each city's circumstances
- Enable consideration of policies with no need to commit

Pre-adoption

- Town Hall or public meeting presentations and material support
- Internal presentations on stretch code details
- Analysis of building data to estimate savings
- Support and guidance on developing a policy development

Post-adoption

- Training and resources (checklists, field guides, videos)
- Support with compliance tracking
- Financial incentives that align with policy

Stretch Code FAQs

When would the stretch code take effect?

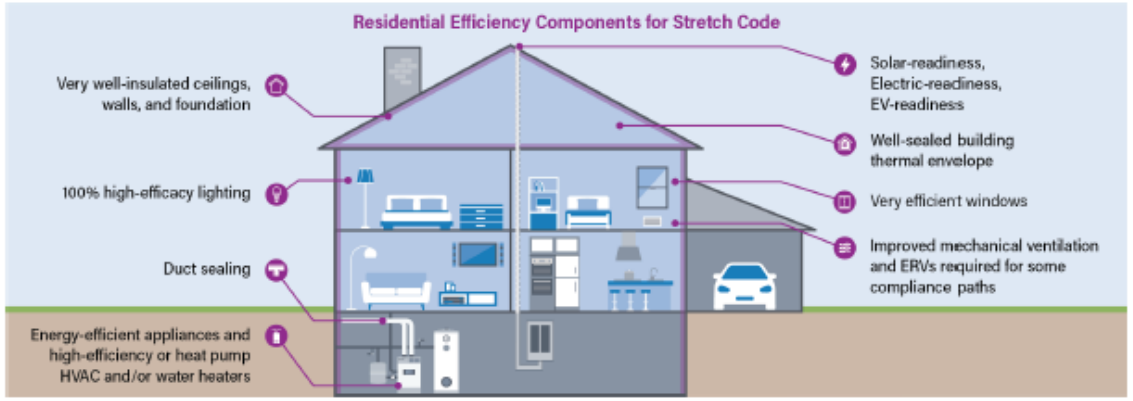
The Illinois Capital Development Board (CDB) shall complete development of the Illinois stretch code elements and requirements by December 31, 2023. The stretch codes shall then be completed and ***available for adoption by municipalities by June 30, 2024.***

1. What is a stretch code?

A stretch code is an alternative energy code that goes beyond the minimum base energy code requirements and defines a higher level of energy efficiency for new construction. Once formally adopted by a municipality, the stretch code takes the place of the state energy code and establishes the minimum energy efficiency requirements for new construction, additions, and major renovations. Stretch codes cover both commercial and residential buildings.

2. What led to the Illinois stretch code and how is it different than the Illinois base code?

In 2021, the Climate and Equitable Jobs Act (CEJA) was passed in Illinois, which contained a provision to create a statewide stretch energy code for the first time. CEJA requires that the Illinois stretch code improve energy efficiency in residential buildings by 34.2% and in commercial buildings by 9.1% compared to the current Illinois base energy code.



3. What are the benefits of adopting a stretch code?

- Energy and operating cost savings compared to base code
- Policy mechanism to address building energy performance and climate goals
- Improved indoor air quality from tighter envelopes, better sealed ducts, and increased ventilation
- Increased ability to maintain safe indoor conditions during energy outages due to buildings designed with tighter envelopes

4. How is a stretch code developed and adopted?

As described above, CEJA set "site energy index" performance targets to increase energy efficiency every three years. The following process describes the key steps in creation and adoption of stretch codes every three years.

High Efficiency Affordable Homes

Benjamin Van Horne

Founder
Greenline Homes, LLC

We are builders of: affordable, certified-green, all-electric, solar-powered homes


3211

ENERGY EFFICIENT AND DURABLE BUILDING ENVELOPE

1. COMMERCIAL GRADE WHITE ROOF
2. SUPER INSULATED ROOF AND EXTERIOR WALLS
3. ADVANCED AIR SEALING CONSTRUCTION
4. FIBER CEMENT SIDING
5. ENERGY STAR RATED EXTERIOR DOORS
6. TRIPLE GLAZED WINDOWS
7. INSULATED FOUNDATION
8. INSULATED BASEMENT FLOOR
9. DRAIN TILE AND SUMP PUMP

ENERGY EFFICIENT AND DURABLE SYSTEMS

10. 8KW SOLAR ARRAY
11. RIGHT-SIZED HEATING AND AIR CONDITIONING SYSTEMS
12. HEAT PUMP WATER HEATER
13. WHISPERGREEN BATH FANS
14. OVERHEAD SEWER SYSTEM
15. FROST FREE HOSE BIB
16. LED LIGHTING

ENERGY EFFICIENT APPLIANCES

17. ENERGY STAR RATED APPLIANCES
18. INDUCTION RANGE
19. VENTLESS CLOTHES DRYER

HEALTHY AND COMFORTABLE INTERIOR

20. ERV FRESH AIR SYSTEM
21. RADON VENTING
22. LOW EMISSION MATERIALS

WATER EFFICIENT PLUMBING AND LANDSCAPING

23. WATERSENSE BATH FIXTURES
24. NIAGARA TOILETS
25. DROUGHT RESISTANT SOD

EFFICIENT MATERIAL USE

26. ADVANCED FRAMING
27. RECYCLED CONSTRUCTION WASTE


Greenline
Homes LLC


1221
1219
SOLD


Greenline Homes LLC
LEED FOR HOMES
PROJECT UNDER CONSTRUCTION
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STOP


MITSUBISHI
ELECTRIC


Whirlpool
Whirlpool
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COSTS AND BENEFITS FOR A 2,400 SINGLE-FAMILY HOME

	EXTRA COSTS		
	$	375	Manual J & D
	$	6,500	Mitsubishi heat pump versus 95% efficient gas furnace ($24k v. $17.5k)
	$	-	Extra electrical costs (since 1/1/23 City of Chicago code change, previously $1,500-2,000 extra)
	$	950	HERS Rating, Energy Star Certification, and ZERH certification
	$	1,200	Electric resistance backup heaters
TOTAL	$	9,025	
	SAVINGS/INCENTIVES		
	$	1,500	Cost of installing gas lines
	$	5,000	ComEd all-electric homes incentive (more for two-flat)
	$	5,000	DOE ZERH (45L) certified home federal tax credit (more for two-flat)
TOTAL	$	11,500	
BENEFIT	$	2,475	

$1,600 Rheem heat pump water heater
$1,479 Frigidare induction slide-in range
$1,340 Whirlpool heat pump dryer

Home Energy Rating Certificate

Final Report

Rating Date: 2023-12-22
Registry ID: 287422744
Ekotrope ID: vg0YZBA2

HERS® Index Score:

-8

Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings

$2,276

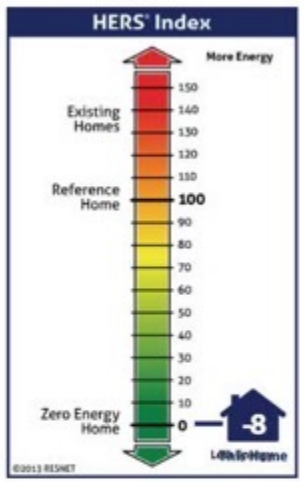
*Relative to an average U.S. home

Home:
6545 S LANGLEY AVE
CHICAGO, IL 60637

Builder:
GREENLINE HOMES, LLC

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	9.9	$231
Cooling	1.7	$41
Hot Water	1.9	$44
Lights/Appliances	16.0	$375
Service Charges		$60
Generation (e.g. Solar)	35.7	-$692
Total:	**29.5**	**$60**



Home Feature Summary:

Home Type:	Duplex, single unit
Model:	N/A
Community:	N/A
Conditioned Floor Area:	1,596 ft²
Number of Bedrooms:	3
Primary Heating System:	Air Source Heat Pump • Electric • 11 HSPF
Primary Cooling System:	Air Source Heat Pump • Electric • 18 SEER2
Primary Water Heating:	Residential Water Heater • Electric • 3.88 Energy Factor
House Tightness:	358 CFM50 (1.42 ACH50) (Adjusted Infiltration: 1.14 ACH50)
Ventilation:	85 CFM • 85 Watts (Default) • ERV
Duct Leakage to Outside:	Forced Air Ductless
Above Grade Walls:	R-28
Ceiling:	Vaulted Roof, R-63
Window Type:	U-Value: 0.25, SHGC: 0.23
Foundation Walls:	N/A
Framed Floor:	R-50

This home meets or exceeds the criteria of the following:

ENERGY STAR v3.2
ENERGY STAR v3.1
ENERGY STAR v3

Rating Completed by:

Energy Rater: Jamison Lenz
RESNET ID: 3892781

Rating Company: Lenz Consultants

616-308-7702

Rating Provider: Energy Efficient Homes Midwest

Jamison Lenz, Certified Energy Rater
Digitally signed: 12/31/23 at 4:46 PM

ekotrope

Ekotrope RATER - Version:4.2.0.3305

The Energy Rating Disclosure for this home is available from the Approved Rating Provider.
This report does not constitute any warranty or guarantee.

Better Homes:

Higher R-values = quieter, more comfortable

Air sealed & mechanically ventilated = no drafts & higher indoor air quality

VRF heat pumps = keep your indoor air temperature constant

No gas = safer and better indoor air quality

Resources:

rewiringamerica.org/IRAguide
greenbuildingadvisor.com
buildingscience.com
prettygoodhouse.org
Illinois Green Alliance / GreenBuilt Home Tour
Fine Homebuilding Magazine
Journal of Light Construction

Me:

bvanhorne@greenlinehomes.com

We are builders of: affordable, certified-green, all-electric, solar-powered homes

Keri Asevedo

Executive Director
Rockford Area Habitat for Humanity

Next steps

Municipal Building Policy Surveys

- We are looking for your input!
- 2024 Municipal Building Energy Policy Survey
  - Questions about both stretch codes and benchmarking / BPS
  - Repeat from last year, but important for us to understand trends and impact of our program
- Benchmarking and BPS specific survey
  - Specific questions to municipalities that want to dive deep into BPS

Next steps

- Stay tune for details on upcoming stretch code trainings
- 2024 Advanced Building Policy Community Survey
  - Please complete the survey by September 30!
- Next ABEEP meeting will be in November or December, date TBD, ideas for topics:
  - BPS FAQ
  - Program support next steps
  - Other?
- Always looking for more communities interested in 1:1 assistance

Interested in finding out more about energy codes or policies?

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