Energy Codes & Building Performance Standards

IL SAG – Market Transformation Working Group
Code Advancement Small Group

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05/07/2021

Guidehouse

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

slipstream

Goals of this Discussion

Purpose of this Discussion

- Review options for Illinois utility involvement, evaluation, and attribution for stretch codes and building performance standards.
- Determine clear next steps in order to create potential market transformation savings attribution and evaluation models for workgroup review

Considerations for Discussion

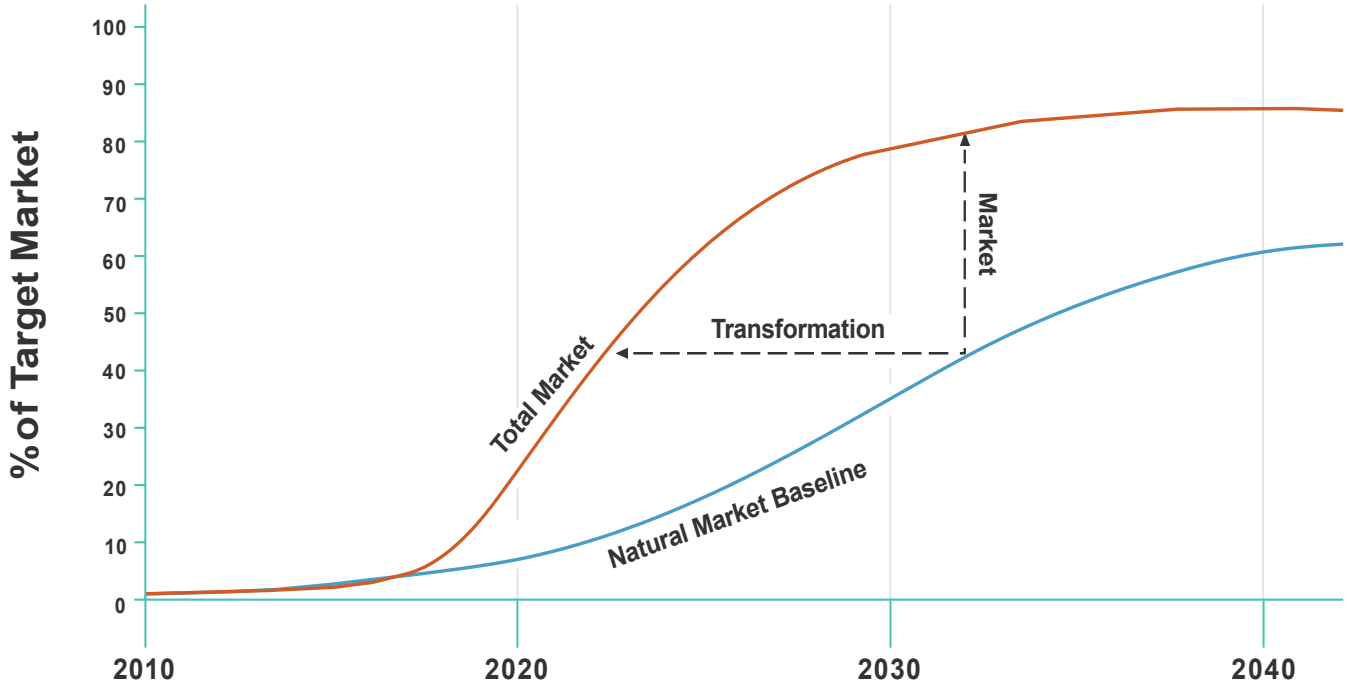
- **Stretch codes and BPS both have two aspects**. Both are important for program success, and are attributed and evaluated separately:

  1. Policy Advancement

  2. Support (i.e. “compliance”)

- **Timeline for this discussion**. As we are already working on policy advancement, it is important that we understand issues and opportunities quickly.

“Compliance” in this discussion means complying with an above-code policy that has been passed by the local jurisdiction. It does not mean compliance with the state baseline energy code. The opportunity for compliance/support does not occur until a policy is passed by a local jurisdiction.



MT Savings Framework

Source: 2020 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 9.0, Attachment C

Market Transformation per the IL TRM

- Successful incorporation of MT initiatives into a program portfolio require **stakeholders accept methodological differences** between MT and RA programs
- Attribution can typically only be established **qualitatively**
- Quantitative estimates of net savings should be made but may be **less certain**
- Defensible methods are listed in **Attachment C**

Source: 2020 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 9.0, Attachment C

Key questions for Working Group

- How to quantify Advancement influence? What is acceptable proof?
- How to quantify Support influence?
- What is preferred calculation framework for estimating and determining savings?
- How much of the savings can utilities claim?
- Timeframe of savings:
  - How long to wait until utilities savings?
  - How long can they claim savings for?

Utility Involvement in Policy Advancement and Support

In what ways can utilities be involved?

Policy Influence / Advancement

- Policy development
- Support adoption
- At the statewide and/or municipal level

Program Support or Compliance

- Training program targeted code officials, contractors or city staff
- Technical assistance
- Development of EE hub

For example purposes only

Potential options for demonstrating influence

Advancement

Technical Assistance

State Creates Appendix Chapter During Baseline Adoption Process (Could include both R & C)

Participate in stretch code development; design program based on those elements

Encourage local municipality adoption

Administer program

Program elements to fit potential policy

Letter from Capital Development Board or JCAR detailing utility involvement

Letter from Sustainability Manager/stakeholders verifying utilities helped

Existing program elements that meet program

Number of compliance checklists turned in

Key policy maker survey that determines if the utility involvement advanced the policy

Delphi panel

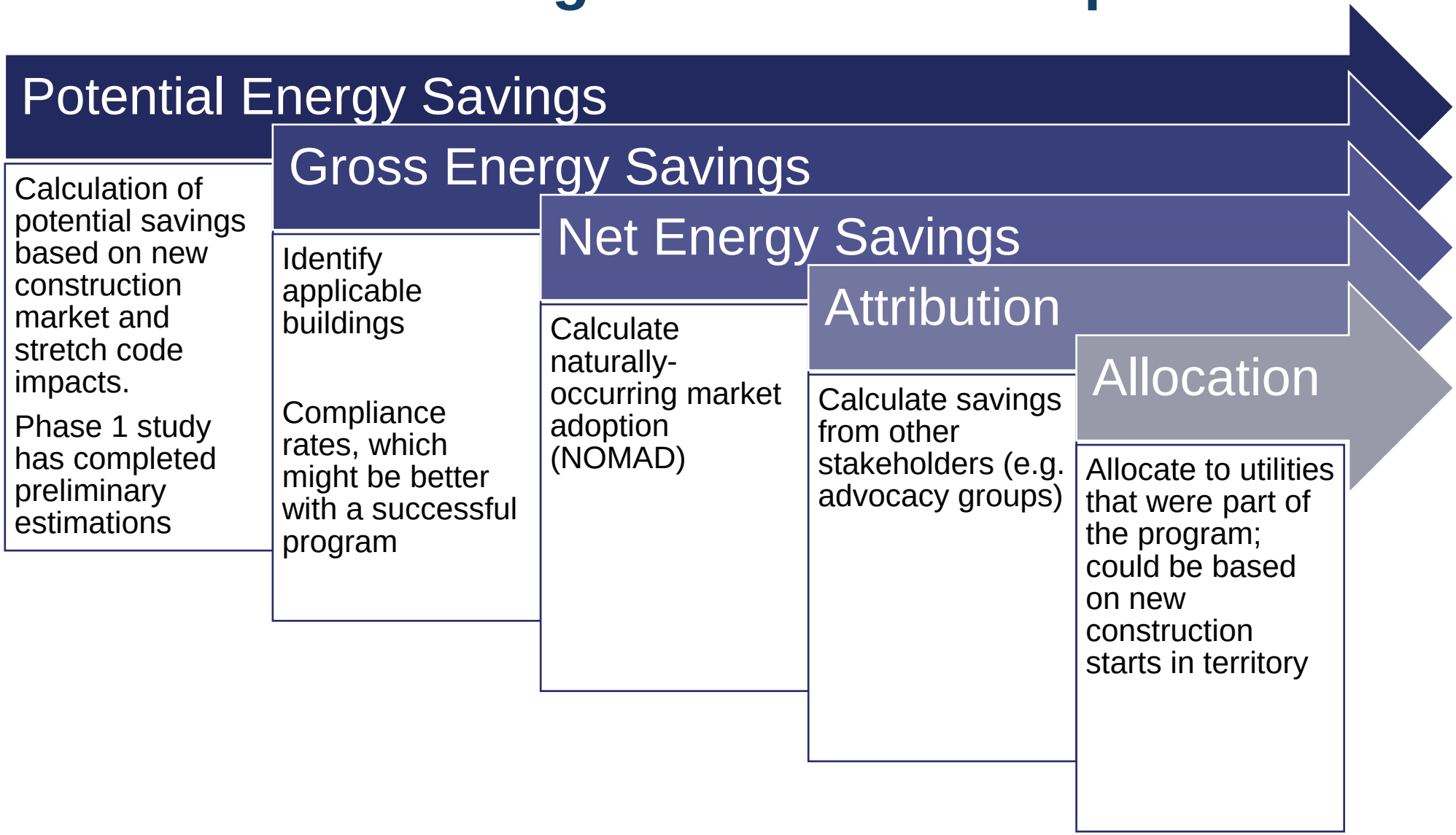
Trainee survey that determines if the trainings make meeting stretch code easier or increase compliance

Number of code officials trained or hours of training

Baseline and incremental compliance field studies

Stretch Code Attribution and Evaluation

Evaluating Stretch Code Impacts



Attribution Beyond Resource Acquisition Programs

There are currently two main pathways for utilities to claim savings as a result of advanced code market transformation efforts:

Claim savings for assisting code advancement

- Efforts include completion of savings potential studies and research into possible areas of code expansion
- California, Arizona

Claim savings for enhancing code compliance

- Efforts include training local inspectors and educating builders on recent code updates
- Massachusetts, Rhode Island

- Utilities and other Program Administrators are uniquely positioned to assist with the implementation of building codes and similar programs such as building performance standards

Development of Attribution Score

Assess influence of adoption	Determine stretch code compliance	Assess measure categories relative importance	Identify training focus and reported improvements	Identify efforts of other organizations	Approximate NOMAD
Interviews with policy officials to verify utility's influence on policy adoption; formal letters by policymakers	Baseline study every 3-6 years, Delphi panel of experts	REM/RATE models, PNNL checklist, Delphi panel of experts	Hours of training, surveys of participants, interviews with code officials	Existing resources by ICC, SEDAC, ASHRAE, and IL EPA	Calculated through comparing baseline studies over multiple years, Delphi panel of experts

Attribution Score

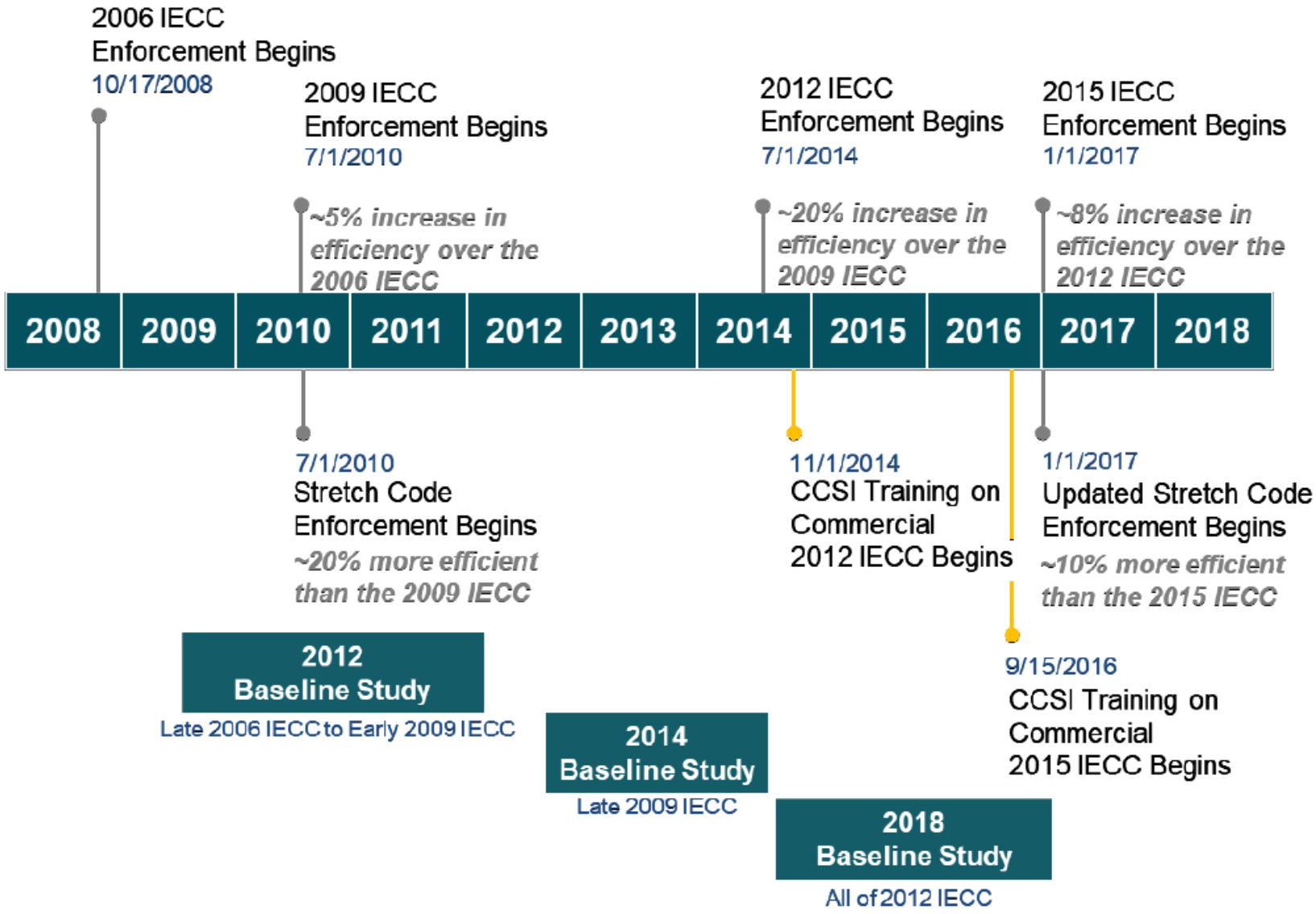
Other State Examples

State	Utility	Program	Savings Structure	Evaluation	Notes
RI	National Grid	Program assists with base state code compliance	No policy advancement savings; Program includes savings from support/compliance program	Code Compliance Studies Delphi Panels	Evaluators utilize **analytical approach** to determine total savings realized. They attribute a portion of those savings to CCEI program activities and initiatives. Utilized **PNNL code compliance checklist** point system to determine "weights" of various building components. Examined 2 RI residential and 2 RI commercial studies to determine the baseline, with 2 additional MA studies helping with the residential **NOMAD estimation**
MA	National Grid	Program assists with stretch code and base state code compliance	Savings do come from stretch codes and base codes through support/compliance program	Code Compliance Studies Delphi Panels	MA does not do advocacy for stretch codes, but does **provide support** for both stretch code and base code jurisdictions. MA PAs and the Energy Efficiency Advisory Council (EEAC) assemble an **evaluation team** to estimate the savings attributable to the commercial portion of the CCSI. Utilize statewide 2012, 2014, and 2018 **code compliance baseline studies** in conjunction with CCSI survey data, Dodge new construction data, and building energy modeling to determine program impact on compliance rates and the resulting energy savings attributable to these efforts. Utilize **Delphi panel** for attribution.

Other State Examples

State	Utility	Program	Savings Structure	Evaluation	Notes
CA	All IOUs in State	Program covers: Building Codes & Appliance Standards Advocacy, Compliance Improvement, Reach Codes	Policy advancement savings; Program includes support/compliance but not savings from support/compliance	Code Compliance Studies Delphi Panels	Final statewide energy savings are estimated by discounting for how much the utilities' efforts contribute to codes and standards adoption compared to other relevant entities. Attribution includes: **Data Collection, Review of public and Codes & Standards program documents, Stakeholder interviews**. Estimation of Factor Scores, Factor Weights, and Attribution Scores determined by "**panel of independent codes and standards experts"**. Default baseline measure is the previously applicable set of codes. Code compliance is capped at 100%
AZ	Salt River Project	Utility helps advance national energy code. Code adoption happens per individual jurisdiction; utilities provide compliance support	Policy advancement savings; Program includes support/compliance but not savings from support/compliance	Code Compliance Studies Delphi Panels	Commercial: SRP uses EUI in conjunction with building size to **calculate savings over IECC 2006** values Residential: Guidehouse uses billing data from past years to **calculate energy savings. Utilities may count up to** 1/3 of the energy savings resulting from energy efficiency building codes that are quantified and reported through a **measurement and evaluation study** undertaken by the affected utility
ID, MT, OR, WA	Multiple Utilities	NEEA assists in state energy code adoption process and provides compliance support	Policy advancment savings; Program includes support/compliance but not savings from support/compliance	Code Compliance Studies Delphi Panels	Savings are estimated using a combination of **billing analysis and site tests compared to baseline**. Codes-related market transformation efforts contributed 24% of total 2019 electric portfolio savings

Massachusetts Stretch Code Timeline



Key questions for Working Group

- How to quantify Advancement influence? What is acceptable proof?
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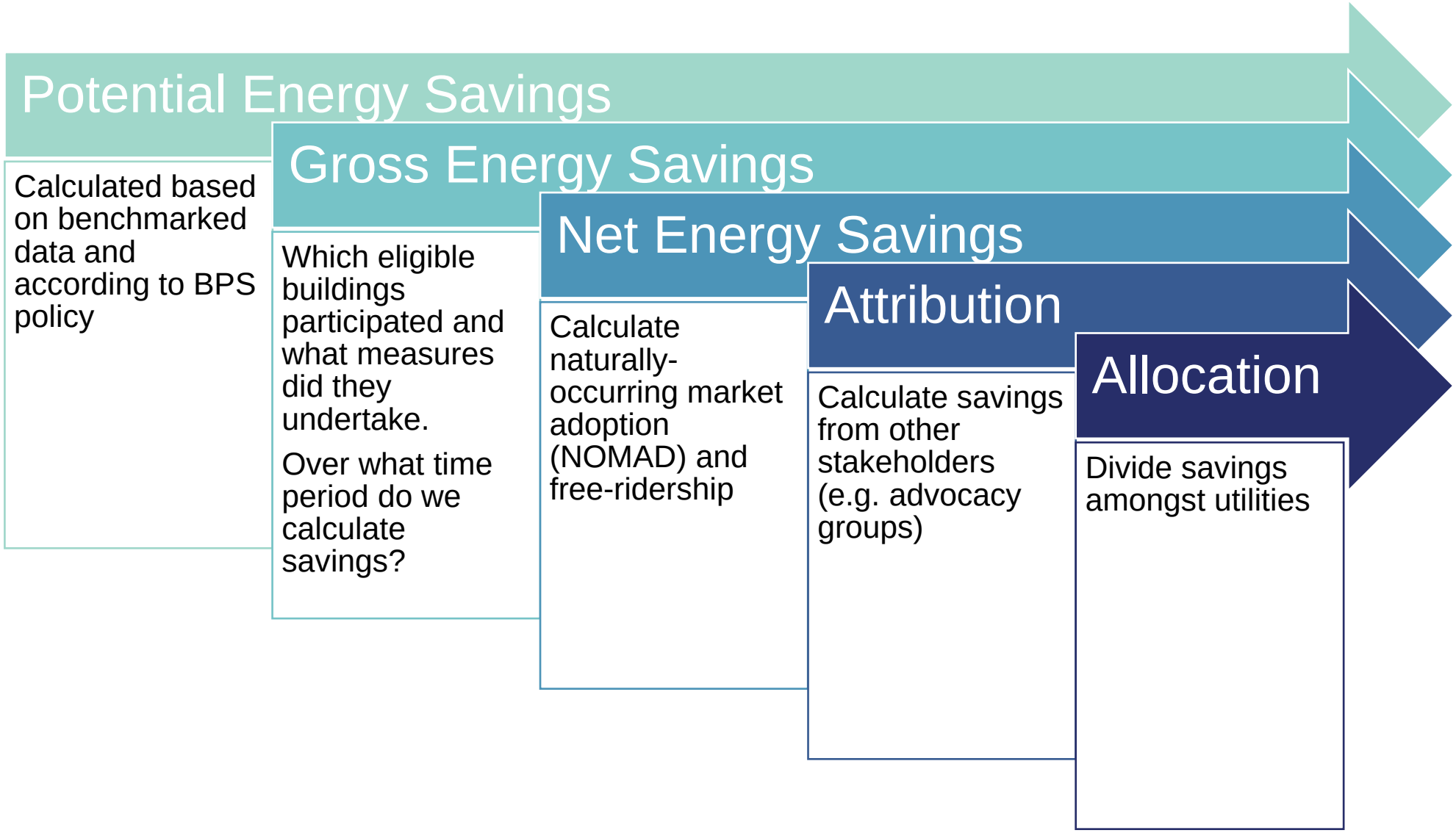
Considerations for BPS

Building Performance Standards (BPS)

Location	Enacted	Compliance Cycle	Performance Metric
Washington D.C.	2018	Every 5 years	ENERGYSTAR score
New York	2019	Compliance beginning in 2024	Greenhouse Gas reduction
Washington State	2019	Standard to be updated in 2029 and then every 5 years	Weather-normalized Energy Use Intensity
St. Louis, MO	2020	Every 4 years, beginning May, 2021	Site Energy Use Intensity

Evaluating Building Performance Standards

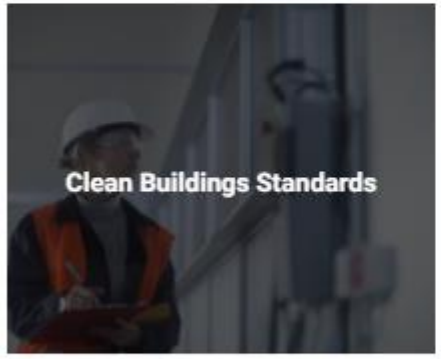


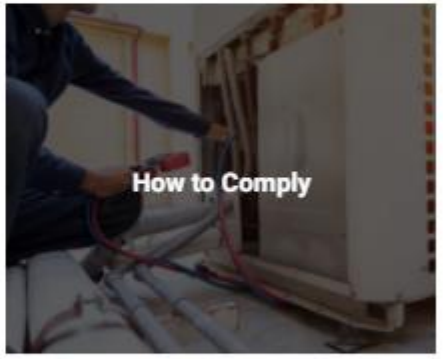
Technical assistance in Washington State

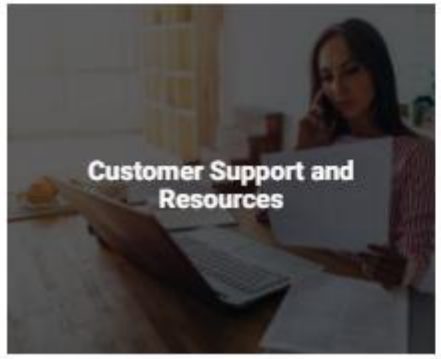
- Clear communications about which buildings are applicable to policy
- Creation of a Clean Buildings Portal (coming July 2021)

Clean Buildings

On May 7, 2019, the Clean Buildings bill (HB 1257, 2019) was signed into law. The objective is to lower costs and pollution from fossil fuel consumption in the state's existing buildings, especially large commercial buildings. The law requires the Washington State Department of Commerce to develop and implement an energy performance standard for these buildings and provide incentives to encourage efficiency improvements.







Questions and next steps

Key questions for Working Group

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Presentation Appendix

Appendix: Project Timeline and Pathways

CEJA Language on Stretch Codes

(e) Consistent with the requirements under paragraph (2.5) of subsection (g) of Section 8-103B of the Public Utilities Act and under paragraph (2) of subsection (j) of Section 8-104.1 of the Public Utilities Act, municipalities that adopt the Illinois Stretch Energy Code may **use utility programs to support compliance** with the Illinois Stretch Energy Code. The amount of savings from such utility efforts **that may be counted toward achievement of their cumulative persisting annual savings goals** shall be based on reasonable estimates of the increase in savings resulting from the utility efforts, relative to **reasonable approximations** of what would have **occurred absent the utility involvement**.

Illinois
Existing Resources

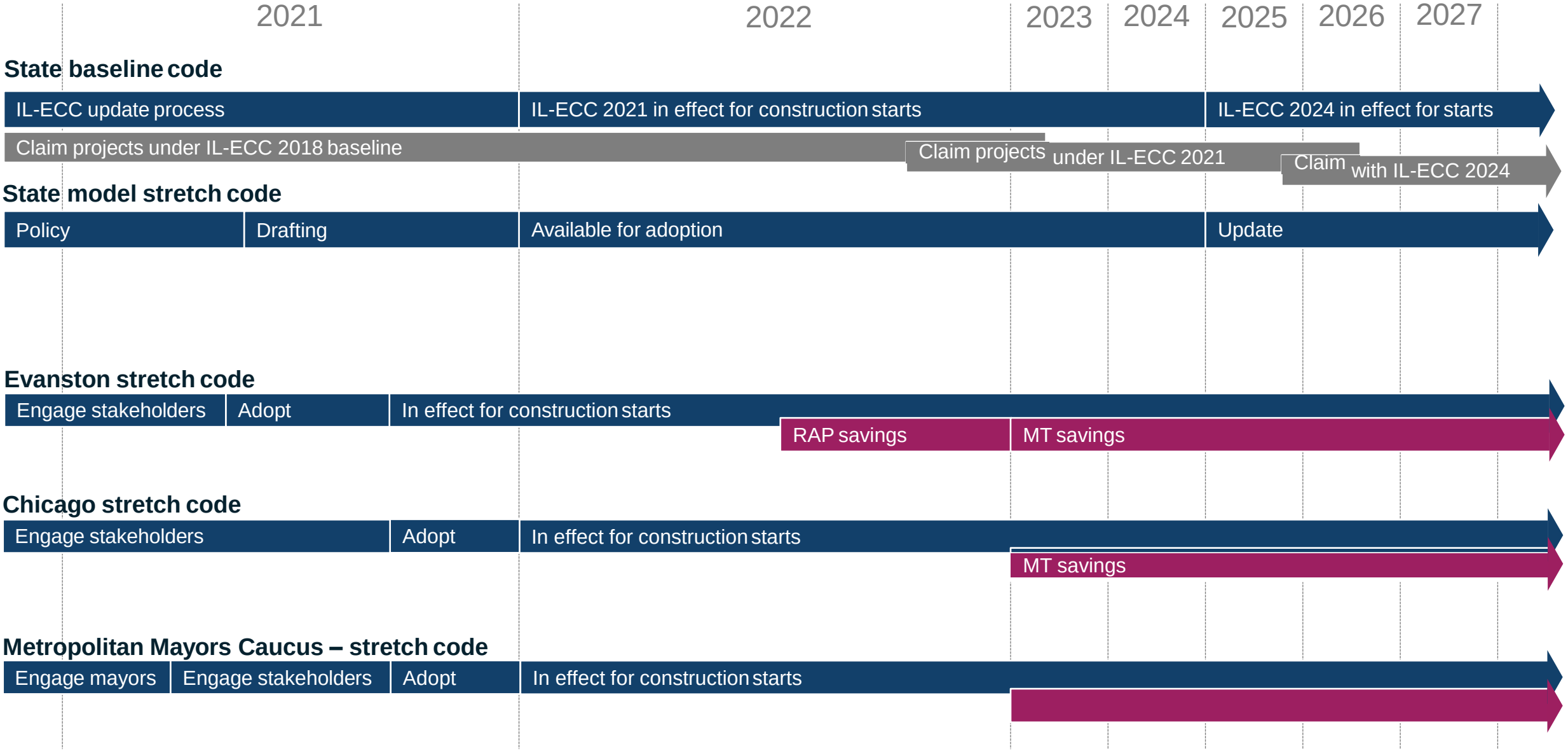
- Measuring the Baseline Compliance Rate for Residential and Non-Residential Buildings in Illinois Against the 2009 International Energy Conservation Code (2011 Study)
  - Examined 44 Residential Buildings and 10 Non-residential Buildings (NS)

- Evaluation of Illinois Baseline Building Code Compliance (2014 Study)
  - Assessed 30 Residential Buildings and 13 Non-residential Buildings (NS)
  - Limited study to projects permitted after Jan 1st, 2013, to assess recently adopted IECC 2012

- 2021 IL TRM Vol. 4 Attachment C: Framework for Counting Market Transformation Savings in Illinois
  - Includes practical guidance on aspects such as data collection, baseline calculations, market adoption estimates, coordination with other programs, and attribution strategies
  - Provides specific recommendations for energy code compliance/adoption efforts

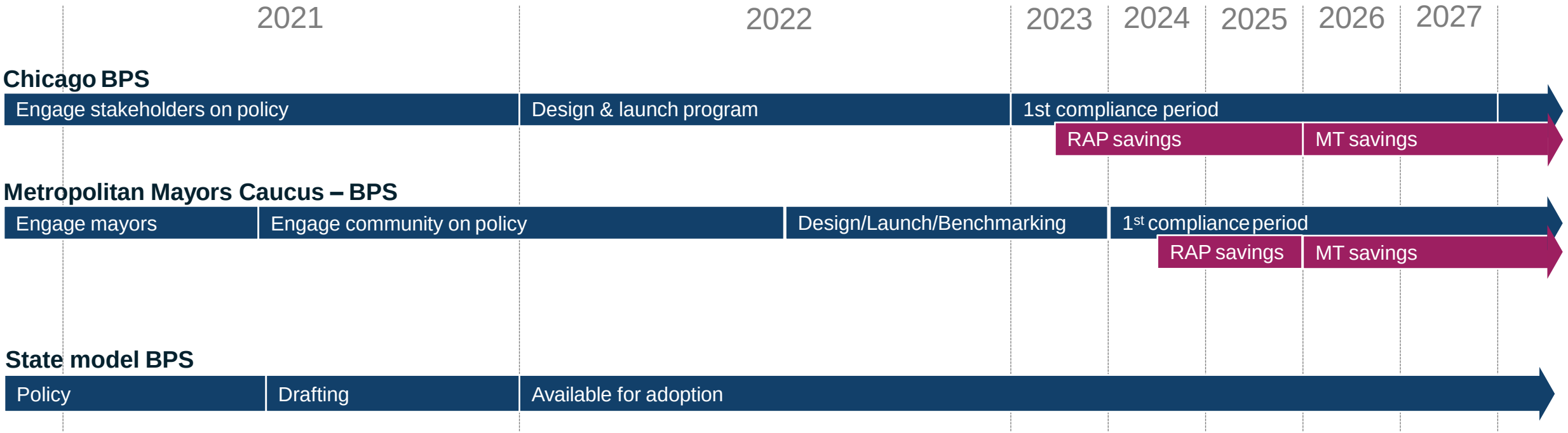
IL Codes Program Timeline (Illustrative)

Where are the opportunities to advance attribution models



Note: Timelines are for discussion purposes only. To-date all programs are proposed only.

IL BPS Program Timeline (Illustrative)



Note: Timelines are for discussion purposes only. To-date all programs are proposed only.

Potential IL State Code Adoption Process

Advancement

Technical Assistance

State Adopts 2021 IECC As Written

Design compliance program based on those elements

Administer program

State Adopts 2021 IECC with Advanced Amendments

Participate in base code development; design compliance program based on those elements

Administer program

State Creates Appendix Chapter During Baseline Adoption Process (Could include both R & C)

Design compliance program based on those elements

Encourage local municipality adoption

Administer program

Potential IL Stretch Code Pathways

Advancement

Technical Assistance

State Creates Appendix Chapter During Baseline Adoption Process (Could include both R & C)

Participate in stretch code development; design program based on those elements

Encourage local municipality adoption

Administer program

CEJA Passes (R&C)

Participate in final state stretch code development; design program based on those elements

Encourage local municipality adoption

Administer program

Individual Cities Develop Own Stretch Codes (Commercial only)

Participate in stretch code development; design program based on those elements

Administer program

Potential BPS Pathways

Advancement

Technical Assistance

CEJA Passes
(BPS to be created by CDB)

Participate in BPS development; design program based on those elements

Encourage local municipality adoption

Administer program

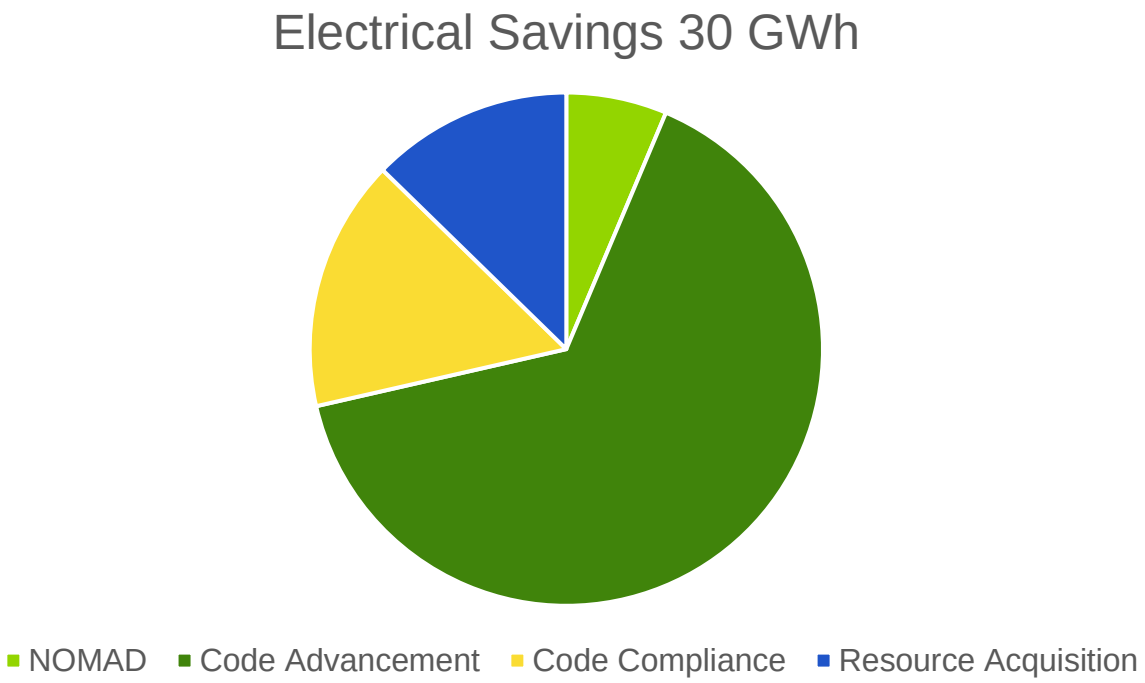
Individual Cities Develop Own BPS

Participate in BPS development; design program based on those elements

Administer program

Hypothetical: City of Chicago Passes a Stretch Code

New buildings consume 15% less, achieving 30 GWh and 800,000 therms in savings



- What are the factors in the marketplace responsible for the savings?
- What is the baseline?

Appendix: Policy Elements and Considerations

Stretch codes – national examples

Location	Savings	Attribution framework
Massachusetts	20% savings over base code, performance based	Utilities were able to claim savings for stretch code projects until 2016. Delphi panels plus compliance field studies used for attribution. Attribution does not include advancement?
New York	10-15% savings over IECC 2015	NYSERDA helps encourage local stretch code adoption (not utilities). So far Con Edison only does baseline compliance?
Seattle, WA	EUI target by building type, measured performance	Utilities do not receive savings attribution but fund the program as a market transformation effort
Denver, CO	Net zero new construction by 2035, voluntary, incentivized green code. Expected to be mandatory in future code update.	Xcel has proposed local residential energy code adoption for Colorado, with initiative rollout in 2021 and savings claimed in 2023. They are using attribution of 19% for 2021 and 2022. Xcel's Energy Design Assistance program may help meet commercial provisions.

Best practices for Stretch Codes

Stretch codes created and administered in conjunction with utility partners have seen the highest rates of success (California, Massachusetts).

Mandatory-once-adopted policies with financial incentives are more successful than voluntary stretch codes (Oregon voluntary reach code saw low levels of participation).

Schedule systematic updates that allow coordination with the model energy code update cycles and the baseline energy code adoption cycles of the state or local jurisdiction (Massachusetts).

Building Performance Standards
Overview

St. Louis, MO:

- Standards enacted in 2021, enforced 4 years later (updated every 4 years after)
- Performance standard will be no lower than the 65th percentile of current buildings of each type
- Local utilities plan to offer energy efficiency programs & incentives to help meet standards, and should be able to claim savings for these efforts as targets are performance-based rather than prescriptive

Washington, DC:

- Requirements phase-in from 2026 (>50,000sqft) to 2031 (>10,000sqft), using various benchmark dates
- Specific requirements have not yet been determined, but multiple pathways are expected including a 20% decrease in normalized site energy use intensity over the program cycle
- Increased funding for program admin DC Sustainable Energy Utility as well as DC Green Bank

Washington State:

- Early compliance incentives from 2021-2026, after which a mandatory phase-in occurs (>50,000sqft)
- Targets will generally focus on EUI compared to ASHRAE standards as well as comparable structures
- Utilities may still pay incentives for energy savings, despite the standards being mandatory

Addressing equity concerns

Boston Emissions Performance Standard includes a Hardship Compliance Plan:

A Hardship Compliance Plan may be approved by the Review Board for substantial obstacles to compliance, such as historic designation, deed restricted affordable housing financing constraints, pre-existing long-term energy contracts without reopeners, uniquely difficult building uses to decarbonize, or financial hardship.

Boston Draft Amendments to Building Energy Reporting and Disclosure Ordinance Including a Building Performance Standard, Jan 2021.

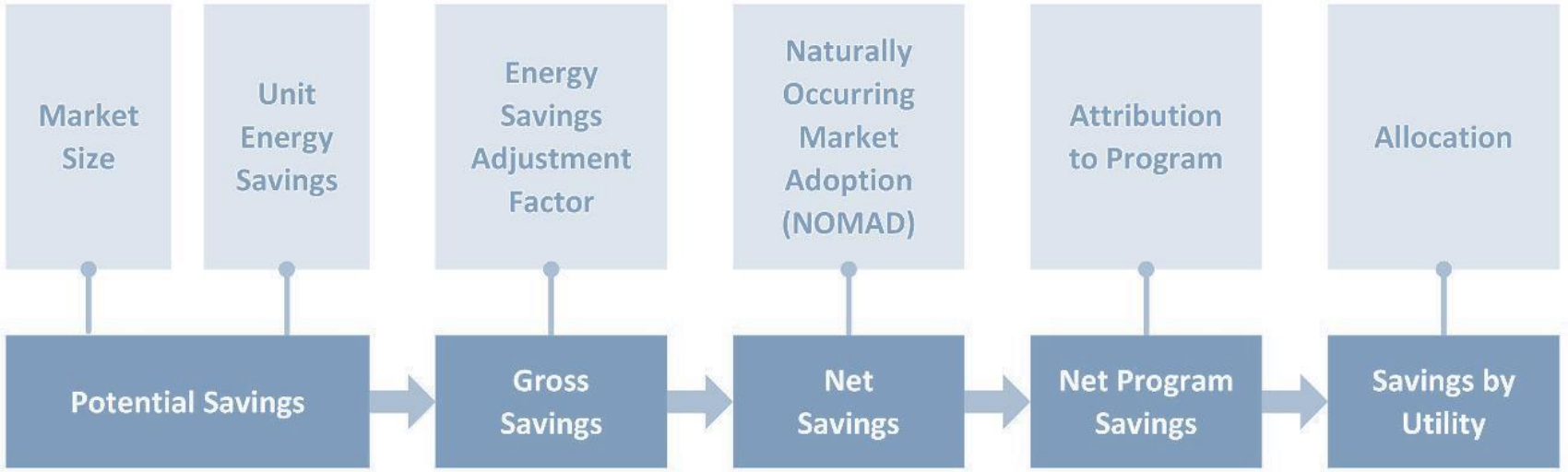
Appendix: Examples from Other States

California
Overview

- California IOUs implement a Statewide Codes and Standards Program which saved 3,923 GWh and accounted for **53% of savings** but only 3% of energy efficiency budget in the 2013-15 cycle (CPUC 2018)
  - Majority of C&S savings from building and appliance advocacy (appliance advocacy = 63%)
  - Stretch code efforts include Cool Roof codes research for City of Los Angeles and City of Pasadena
- The Statewide Codes and Standards Program includes five subprograms:
  - Building Codes Advocacy, Appliance Standards Advocacy, Compliance Improvement, Reach Codes, and Planning and Coordination
- The C&S Program contributes expertise, research, analysis, and other support
- The Planning and Coordination subprogram works with the CEC, CPUC, Emerging Technologies, Workforce Education and Training, rebate and other voluntary programs, to conduct strategic planning in support of the Strategic Plan policy goals, including Zero Net Energy (ZNE) goals for new construction.
- As part of the expanded outreach and communications efforts, the C&S program maintains a codes and standards collaborative and continues to facilitate the Compliance Improvement Advisory Group (CIAG).

California

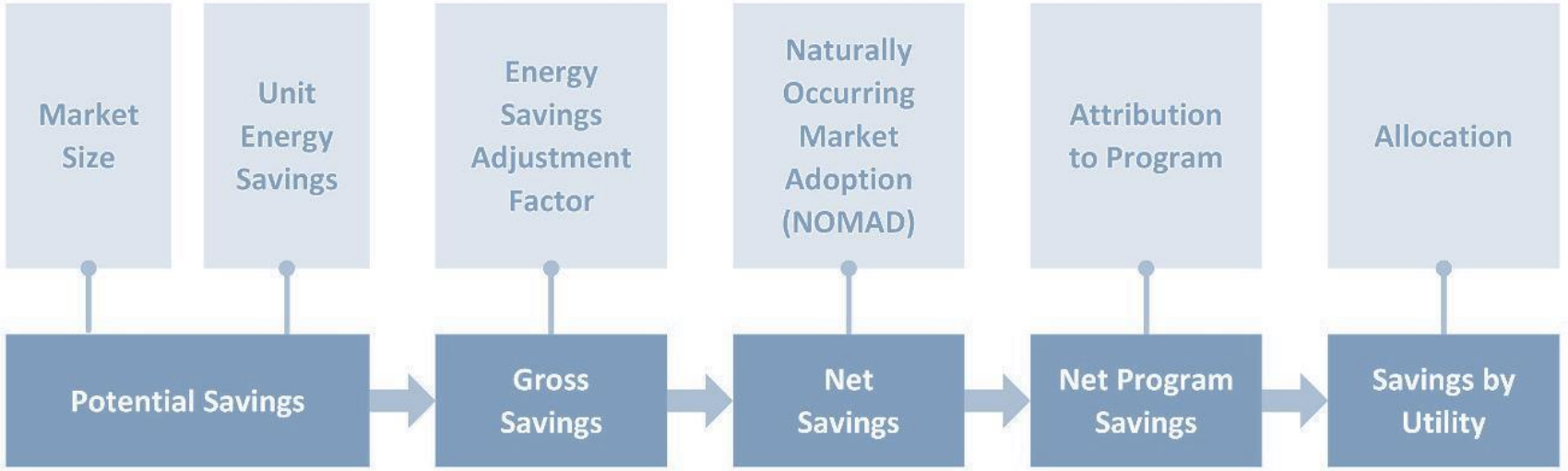
Process: The evaluation model has 5 steps (IEE 2011)



1. Potential Savings Analysis: A per-measure energy savings is calculated estimating the benefit of the new code, which is then multiplied by the expected number of units constructed or installed the following year.
2. Compliance: Realized energy savings are estimated by factoring in compliance rates for a given measure. Utilities currently support increased compliance through virtual and in-person training sessions.
3. Normally Occurring Market Adoption (NOMAD): Energy savings are adjusted for the naturally occurring adoption of more energy efficient appliances, equipment, and building techniques in the marketplace.

California

Process: The evaluation model has 5 steps (IEE 2011)



4. Attribution: Final statewide energy savings are estimated by discounting for how much the utilities' efforts contribute to codes and standards adoption compared to other relevant entities.
5. Allocation: Final statewide energy savings are assigned to each utility based on the IOU's percentage of statewide electricity sales.

California
Process Details

- Attribution step includes:
  - Data Collection
    - Review of public and Codes & Standards program documents
    - Stakeholder interviews
  - Estimation of Factor Scores, Factor Weights, and Attribution Scores determined by “panel of independent codes and standards experts”
- Default baseline measure is the previously applicable set of codes
- No attribution given for compliance improvement programs
- Specific code changes undergo Codes and Standards Enhancement (CASE) studies
- Code compliance is capped at 100%

California Advocacy Efforts Documentation

Table 18: Title 24 Standards

Title 24 - 2013-2015			
Sectors	Research and Analysis	Docketed	Adopted
Nonresidential	11	11	11
Residential	6	6	6
Total	17	17	17

The majority of Codes and Standards Enhancement study preparation for the 2016 building standard was also conducted during the 2013-2015 timeframe. Work on twenty-two 2016 building code measures was undertaken during the 2013-2015 timeframe, but not included in the total shown above or in the table showing totals across advocacy efforts below.

Table 19: Codes and Standards

All Codes and Standards - 2013-2015			
Sectors	Research and Analysis	Docketed	Adopted
Nonresidential	12	62	11
Residential	7	35	6
Crosscutting	13	77	4
Total	32	174	21

California Delphi panel results example

Figure 29. Rankings of recommendations by building department members

Theme	Description	Mean Rating	Value
Outside influence	Permit applicants were knowledgeable of the energy code (213)	6.0	
Outside influence	Permit applicants were aware of the value of complying with the energy code (213)	5.5	
Experts	Design professionals could receive accreditation of expertise in energy code compliance (213)	5.4	
Documentation	Provide "Plans Examiner Priority Sheet" to help Plan Examiners prioritize energy code (70)	5.4	
Simplify	Standardize building department energy code enforcement across jurisdictions (211)	5.4	
Time	More time to prepare to enforce energy code (211)	5.2	
Training	Energy code training provided at my facility (213)	5.2	
Simplify	Standardize over-the-counter permits across jurisdictions (213)	5.2	
Simplify	Expand the prescriptive approach options (209)	5.1	
Experts	Support for in-house energy code Expert/Champion (215)	5.0	
Outside influence	Permit applicants were provided an incentive to comply with energy code (211)	5.0	
Experts	Contractors could be pre-qualified to self-certify their energy code work (211)	4.9	
Tracking	Rewrite energy code to integrate into city code more easily (213)	4.9	
Others	Invest in stronger relationships with building industry community (213)	4.8	
Simplify	Streamline permitting process (211)	4.7	
Tracking	Provide compliance tracking software for Building Inspectors to use onsite (215)	4.7	
Tracking	Integrate energy code into computer software that tracks permit process (209)	4.5	

California Example

(3) Demonstrating the Feasibility of Standard Adoption

An implicit requirement for adopting a new standard is that compliance with the standard be practical and feasible. Supporters of the standard must address stakeholder concerns and demonstrate through market research that stakeholders can comply with the standard. There are a number of conditions that must be met to satisfy this requirement. First, the market must be capable of supplying the products and services necessary to comply with the standard. If a product is not readily available in the marketplace, the technology must be well developed and manufacturers capable of increasing supply before the standard goes into effect. Second, the standard must not impose unreasonable and avoidable costs on end-users, manufacturers, and other stakeholders. Like most regulation, the benefits and costs of energy-efficiency standards may be distributed unevenly; the CEC does not require complete support among all stakeholders before standards adoption, but it must be able to defend the standard against opponents. Third, the standard must not create significant negative externalities related to human health or the environment.

California Example

Review of Public Documents: The evaluation team collected information about Program and other stakeholder contributions to development and adoption of each standard from a large number of primary and secondary public sources, including the Code Change Theory, the CASE report, transcripts of CEC hearings and workshops, and stakeholder letters, e-mails, and comments to the CEC. These sources were carefully read and information about C&S Program and other stakeholder activities was extracted and entered into a spreadsheet for future reference in determining C&S Program credit.

Request for Information about Codes and Standards Program Undocumented Activities: In conversations and interviews with stakeholders, it became clear that some activities for which the Program might receive credit were not documented in the Code Change Theory, the CASE Report, or other written sources. In July of 2009, Cadmus requested that the California IOUs provide information about the following undocumented activities of the Codes and Standards Program:

1. How support of key stakeholders such as manufacturers, trade associations, etc. for the adoption of the standard was obtained.
2. The funding or other support of research by third parties that was critical to the development of the standard but not noted in the CASE report or other public documents.

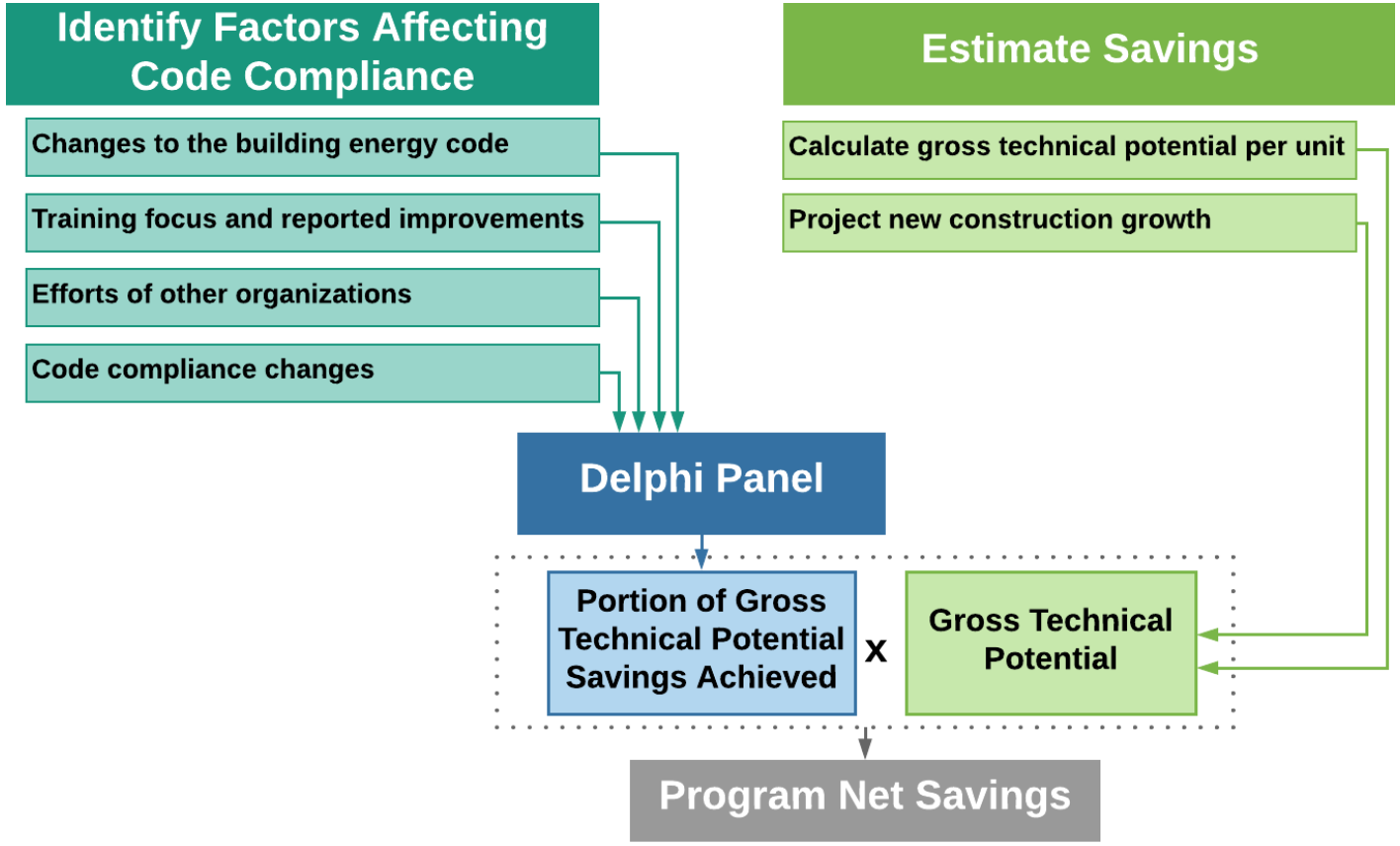
Massachusetts
Overview

- Since 2014, the Massachusetts Program Administrators (PAs) have funded the Code Compliance Support Initiative (CCSI) to help improve compliance with residential and non-residential building codes in the state
- Following each three-year program cycle, Massachusetts PAs and the Energy Efficiency Advisory Council (EEAC) assemble an evaluation team to estimate the savings attributable to the commercial portion of the CCSI
- National Grid's code compliance activities include:

1. **Trainings:** Classroom, in-field, and web trainings updating builders and code officials
2. **Circuit Rider:** Technical phone and email support answering code-related questions
3. **Stakeholder Engagement:** Building department visits, participation in industry groups
4. **Resource Development and Delivery:** Checklists, field guides, FAQs, bulletins, pocket guides
5. **Third-party compliance support:** Supporting use of third-party specialists in code compliance

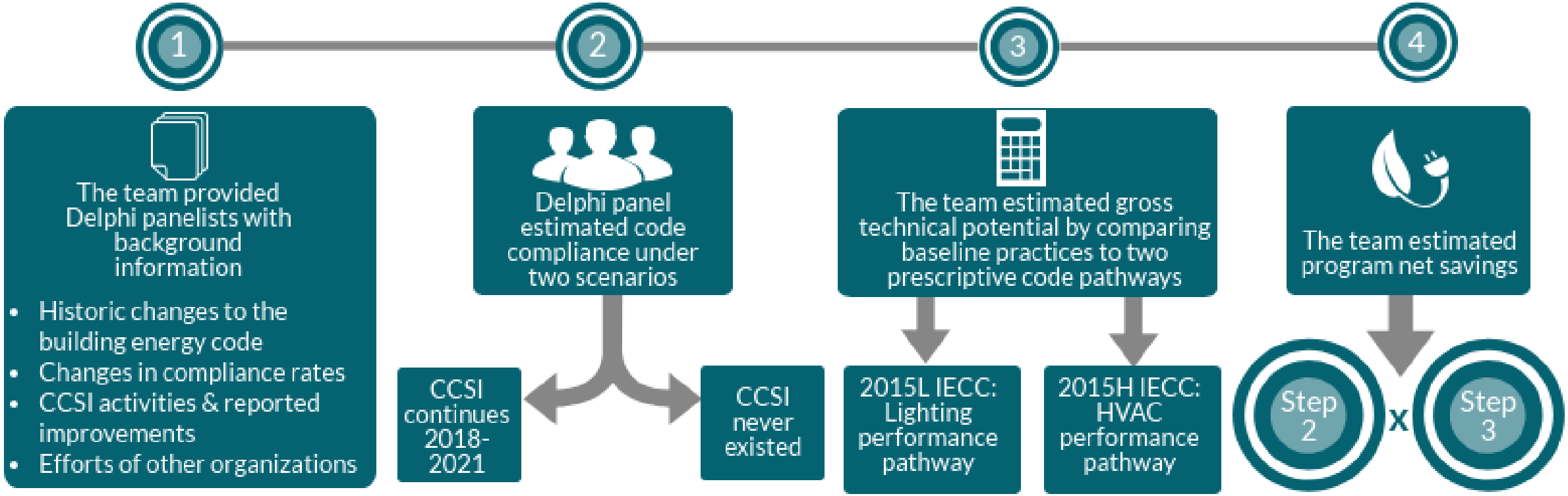
Massachusetts
Process

- Utilize statewide 2012, 2014, and 2018 code compliance baseline studies in conjunction with CCSI survey data, Dodge new construction data, and building energy modeling to determine program impact on compliance rates and the resulting energy savings attributable to these efforts



Massachusetts

Delphi Panel Diagram



MA Code and Stretch Code Compliance Checklist

COMMERCIAL NEW CONSTRUCTION
Massachusetts Energy Code 9th Edition
Checklist of Required Documentation
(To be completed by the permit applicant)

mass save Energy Code Technical Support Program

Applicant Name _____ Applicant Phone _____

Project Address _____

Type of Construction:

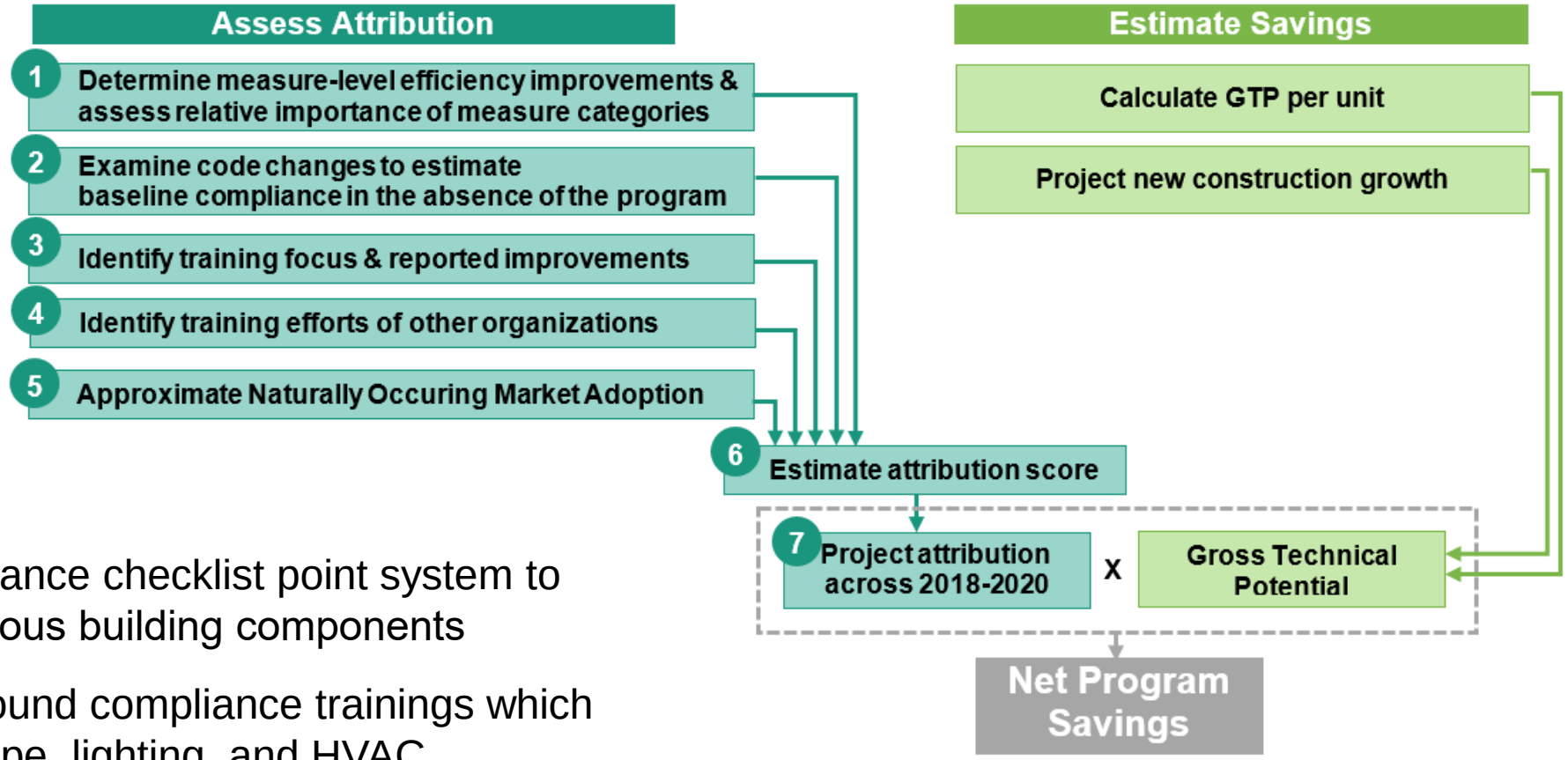
☐ New Construction	☐ Addition	☐ Alteration	☐ Change of Occupancy

Stretch Code communities only:

- **R-use Buildings.** In all R-use buildings, of four stories or less above grade plane with one or more dwelling units, each dwelling unit shall comply with section N1106 (R406) of 780 CMR 51.00: *Massachusetts Residential Code* (Residential Code). Choose Compliance Path #4 below.
- **Large Area and High Energy Use Buildings.** All buildings over 100,000 ft², and new supermarkets, laboratories and conditioned warehouses over 40,000 ft² must demonstrate energy use per square foot at least 10% below the energy requirements of ASHRAE 90.1-2013 Appendix G. Choose Compliance Path #1 below and select Performance Rating (Appendix G).

Select Compliance Path (C401.2):
☐ **#1: ASHRAE Standard 90.1-2013 (select one):**
☐ Prescriptive: Provide plans and specifications demonstrating compliance with all measures of Section 5, 6,7,8,9.
☐ Energy Cost Budget (Chapter 11): Provide plans and specifications demonstrating compliance with all mandatory measures of Section 5 and all measures in 6,7,8,9.
☐ Performance Rating (Appendix G): Provide plans and specifications demonstrating compliance with all mandatory requirements. Provide energy model documentation including inputs and outputs of the energy model and a summary report. Energy model must be based on Section 11.
☐ **#2: IECC Prescriptive Path:** Provide plans and specifications demonstrating compliance with all measures of Sections C402 through C405. COM*check* may be used for tradeoffs.
☐ **#3: IECC Performance Path:** Provide plans and specifications demonstrating compliance with all measures of Sections C402.5, C403.2, C404, C405.2, C405.3, C405.5, C405.6, and C407. Provide energy model documentation including inputs and outputs of the energy model and a summary report. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.
☐ **#4: 780 CMR 51.00: Massachusetts Residential Code (Residential Buildings up to 5 stories only)**

Rhode Island
Process



Process Notes:

- Utilized PNNL code compliance checklist point system to determine “weights” of various building components
- Efforts centered largely around compliance trainings which focused on building envelope, lighting, and HVAC
- Examined 2 RI residential and 2 RI commercial studies to determine the baseline, with 2 additional MA studies helping with the residential NOMAD estimation

Rhode Island
Overview

- Rhode Island's Code Compliance Enhancement Initiative (CCEI) is designed to improve compliance with the state's residential and commercial building energy codes.
- 2017 CCEI savings attributed to National Grid totaled over **5,200 MWh** and 56,000 therms
- Evaluators utilize analytical approach to determine total savings realized and attribute a portion of those savings to CCEI program activities and initiatives
- Offer classroom and in-field trainings to building professionals and code compliance officials
  – Training topics focus on low-compliance areas recognized in previous program cycle
- CCEI program realized greater savings in 2015-2017 program cycle, when compliance improvements to existing structures were eligible for savings credit
  – Lack of relevant baseline data pushed regulators to only count savings for new construction projects during the most recent program cycle

Rhode Island Measure-level NOMAD

Table 11 summarizes the factors related to the measure-level attribution assessment that is described above.

Table 11: Factors Related to Measure-Level Attribution

Measures (Units)	Improved Efficiency	Measure's Relative Importance	Impact of Training	Is improved efficiency in RI > NOMAD?
Window and skylight	Yes	20%	Low	No
Air leakage	Yes	19%	High	Yes
Above grade wall insulation	Yes	17%	Medium	Yes
Ceiling insulation	Yes	12%	Medium	No
Duct leakage	Yes	10%	High	Yes
Frame floor insulation	Yes	8%	Medium	No
Lighting	Yes	8%	Low	Yes
Slab insulation	Yes	3%	Low	--
Foundation wall insulation	No	3%	Low	--
	High/Yes	Medium	Low/No	

Based on this information, as noted above, it seems reasonable to apply an attribution score of 60% to air leakage, 35% to above grade wall insulation, 45% to duct leakage and insulation, and 20% to lighting. The overall attribution score of 23% is calculated by multiplying the measure-level attribution scores by their relative importance (Table 12).

Northwest Energy Efficiency Alliance

Idaho, Montana, Oregon, Washington

- Codes-related market transformation efforts contributed 24% of total 2019 electric portfolio savings
- NEEA operates as the PA for code adoption and compliance programs in these states
- Major efforts include advocacy for code advancement, educational trainings on code compliance, and on-site investigations used for benchmarking and analysis
- Savings are estimated using a combination of billing analysis and site tests compared to baseline
- More detailed methods for estimating savings as a result of the program are laid out here:

Arizona
Overview

- Guidehouse evaluates Salt River Project's Building Energy Codes Program
  - Average 2018 savings of 1,430 kWh per home, totaling over **8,000 MWh**
  - For commercial buildings, SRP tracks building type (NAICS code) and uses EUI in conjunction with building size to calculate savings over IECC 2006 values
  - For residential homes, Guidehouse uses billing data from past years to calculate energy savings
- Legislation: "An affected utility may count toward meeting the standard up to one third of the energy savings resulting from energy efficiency building codes that are quantified and reported through a measurement and evaluation study undertaken by the affected utility."
- Arizona does not maintain state-level codes, so these adoptions occur in individual cities/counties
- IOUs in Arizona have similar programs in place, which perform activities such as: training and support for code officials and building professionals, documentation of the local benefits of code enforcement, advocacy for and research to inform code updates, and collaboration with other stakeholders.

NYStretch Adoption Guide and Model Resolution Language

NYStretch Energy Code–2020

Adoption Guide and Model Resolution Language

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

A. Sample Model Energy Code Resolution

Jurisdiction Name
City/Town, NY
[Municipal Governing Body] [Resolution Reference Number]
Resolution to Adopt Amendments to Article [# pertaining to e.g., Building Code, Building Energy Code, Energy Conservation, etc.] **[or "to Add provisions for a local energy code under Article #"] of the [Municipal] Code**

Information

Department:
[MUNICIPALITY]
Attorney

Category:
Local Laws

Sponsors:
[Chief Executive of Municipality]

Functions:
None