**Addendum to Attachment C:**

**Evaluating Stretch Code Market Transformation Programs**

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# Definitions

**Achievability Factor:** A number created through evaluation of policy advancement that reflects the expected compliance rate of the stretch code for municipalities that adopt the stretch code without stretch code compliance support program.

**Achievable Market Savings (AMS):** The amount of MPS that are considered to be achievable because 100% compliance is likely never achieved, especially in the beginning of a code change; evaluators may apply an estimated compliance rate to either increase or decrease the MPS, depending on compliance rates with code elements, and the AMS may change over time. Also known as Total Market Savings.

**Attribution**: The assessment of the extent to which observed outcomes are caused by the program(s) of interest as opposed to events that would have happened regardless of any intervention. According to [TRM v. 10 vol 4, Attachment C](https://ilsag.s3.amazonaws.com/IL-TRM_Effective_010122_v10.0_Vol_4_X-Cutting_Measures_and_Attach_09242021.pdf), market transformation paints a qualitative case as to whether the initiative was generally successful in causing the intended market changes, rather than treating attribution as a continuous variable that can be quantitatively scored (often in the form of a net-to-gross ratio that adjusts for free ridership and spillover) as in resource acquisition programs.

**Attribution Factor:** A number created through evaluation that reflects the impact of utility efforts to advance policies in municipalities that adopt the stretch code.

**Base Code Baseline (BCB):** The estimate of what would have happened if any policy advancement (utility or otherwise) did not exist; similar to the definition of the NMB/NOMAD, but does not account for the impact attributed by utilities.

**Compliance Rate:** The rate at which a standard or building code is complied, ie., the opposite of non-compliance. The compliance rate may reflect individual measure, percentage of square footage, or amount of energy savings. There are two separate compliance rates in this document: compliance rate with the base code, and compliance rate with the stretch code.

**Delphi Process:** Working group of 10 to 15 market experts from a range of professions with deep knowledge of the Illinois residential new construction market, codes and code compliance, stretch codes, residential energy modeling, and/or other perinate market & regulatory attributes. Members are selected not only for market expertise, but also (as much as possible) with preference to independent third parties that can contribute and advise without prejudice. Once assembled, this working group is responsible for assessing and commenting on program facets that are otherwise obscure or otherwise cost prohibitive. E.g., the Delphi process may leverage their industry experience to estimate preliminary compliance rates until further research is available. The Delphi process can also offer additional review of key inputs and arbitrate between stakeholders in the event consensus is not met.

**Effectiveness Score**: A number created through evaluation that reflects the impact of utility efforts to increase compliance with both base energy and stretch energy codes for municipalities that adopt the stretch code.

**Energy Savings per Unit**: Estimating total market savings requires unit energy savings for each unit. The definition of “units” will depend on the energy-efficient product or service that is the focal point for the MT initiative. Units are defined upfront and typically are measured as: a device; square footage; number of housing units; number of operators; pound of product, etc. The appropriate unit definition will have been identified in the MT Business Plan. Savings are measured in kwh/unit, therms/unit, and kW/unit. Note that the average savings per unit for that market likely will be the weighted average savings per unit for different categories of product (such as top-load or front-load clothes washer categories).

**Natural Market Baseline (NMB)/Naturally Occurring Market Adoption (NOMAD):** A forecast of the future in which no utility-funded energy efficiency programmatic intervention exists, according to [TRM v. 10 vol 4, Attachment C](https://ilsag.s3.amazonaws.com/IL-TRM_Effective_010122_v10.0_Vol_4_X-Cutting_Measures_and_Attach_09242021.pdf). In this initiative, NMB is a consideration of utility attribution as determined through the Attribution Factor and the BCB (policy advancement) or the Effectiveness Score and the SCCB (code support).

**Market Potential Savings (MPS):** The total possible savings in the market that potentially could occur because of advancement efforts to get all municipalities to adopt stretch code and achieve 100% compliance; also known as Gross Technical Potential in other utility-funded code programs or Total Market Savings in [TRM v. 10 vol 4, Attachment C](https://ilsag.s3.amazonaws.com/IL-TRM_Effective_010122_v10.0_Vol_4_X-Cutting_Measures_and_Attach_09242021.pdf).

**Market Progress Indicators (MPI):** Qualitative and/or quantitative indicators to help measure changes in the market due to the market transformation initiative (MTI).

**Market Transformation**: The strategic process of intervening in a market to create lasting change that results in the accelerated adoption of energy efficient products, services, and practices. ([from TRM v. 10 vol 4, Attachment C](https://ilsag.s3.amazonaws.com/IL-TRM_Effective_010122_v10.0_Vol_4_X-Cutting_Measures_and_Attach_09242021.pdf))

**MT Savings:** The estimated net savings of the Market Transformation Initiative prior to attributing utilities impacts; determined by subtracting the BCB from the AMS for policy advancement, or by subtracting the SCCB from the AMS for code support.

**MT Savings Attributed to Utility:** The MT Savings multiplied by the Attribution Factor (policy advancement) or Effectiveness Score (code support); the savings the utilities can claim for their program efforts.

**Total Market Savings**: The savings that would result from the entire market adoption of the MT energy efficiency products or services ([from TRM v. 10 vol 4, Attachment C](https://ilsag.s3.amazonaws.com/IL-TRM_Effective_010122_v10.0_Vol_4_X-Cutting_Measures_and_Attach_09242021.pdf)).

**Total Market Units:** Both the total number of units in the market and the portion of units that meet the efficiency specification in the MT initiative (efficient units). Over time, Market Progress Evaluation Reports will work to track shifts in the relationship between efficient units and total units – which represents the market share of efficient units. For residential stretch codes, this would include number of homes built per year, and for commercial stretch codes, this includes square footage of commercial new construction.

**Stretch Code Compliance Baseline (SCCB):** The estimate of what would have happened if no stretch code support programs existed; similar to the definition of the NMB/NOMAD but does not account for the impact attributed by utilities.

# List of Acronyms

ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers

BCB – Base Code Baseline (previously referred to as NOMAD/NMB of stretch code advancement program)

CEJA – Climate and Equitable Jobs Act

GTP - Gross Technical Potential (known as MPS in this document)

ICC – International Code Council

IECC – International Energy Conservation Code

MPS – Market Potential Savings (previously known as GTP)

MT – Market Transformation

MTI – Market Transformation Initiative

NMB – Natural Market Baseline

NOMAD – Naturally Occurring Market Adoption

RA/RAP – Resource Acquisition/Resource Acquisition Program

SAG – Stakeholder Advisory Group

SCCB - Stretch Code Compliance Baseline (previously referred to as NOMAD/NMB of code compliance support program)

TRM – Technical Reference Manual

# Introduction

Building codes are recognized as an effective way to move the market towards more energy efficient buildings. Several states have energy efficiency programs that are designed to influence the building energy code and allow the utility administering the program to claim savings through Market Transformation Initiatives (MTI). California utilities have been actively influencing codes and standards since the late 1990s. States that have more recently developed code programs include Arizona, Massachusetts, Rhode Island and Colorado.

Illinois utilities currently can claim energy savings for incentivizing new construction buildings to be built beyond current existing energy code requirements. The claimed savings are based on the baseline of the base energy code. Absent a new approach to credit utilities for code policy advancement, if a municipality were to adopt a stretch energy code—a locally mandated code or alternative compliance path that requires a higher level of energy efficiency than the adopted base code--a utility could provide program support to assist the building community or code officials but would not be able to claim savings for helping meet the mandated stretch energy code under a traditional resource acquisition evaluation framework.

Recognizing that utilities are well-positioned to provide support for municipalities to advance stretch codes and support code compliance, this document provides the evaluation pathways and methods for utilities to claim savings for stretch code policy advancement and compliance support under a market transformation evaluation framework.

## Overview of Market Transformation Framework

Stretch code programs will be evaluated under the MT framework and approach. Attachment C of the Illinois TRM defines market transformation (MT) as the strategic process of intervening in a market to create lasting change that results in the accelerated adoption of energy efficient products, services, and practices. Advancing a code change or stretch code adoption, rather than waiting for market adoption of a particular technology or product, is one method for promoting market transformation.

Additionally, energy code compliance support programs play an essential role in stretch code policy advancement MTIs. If a stretch code policy has low compliance rates, the expected market change may not be as penetrating or persistent as hoped, and there is less gained in updating the code to new efficiency levels or including more efficient technologies. Compliance support programs can address the shortcomings of low compliance rates and ensure that savings are achieved through building energy codes. These programs also provide important resources to code officials and the building community to ensure a lasting and significant impact.

## Introduction to Evaluation of Market Transformation

Stretch code policy advancement and compliance support require methods of evaluation that not only differ from methods used for Resource Acquisition Programs (RAPs), but which also differ between the two distinct stages of such an MTI. Stretch code policy advancement requires an evaluation process that focuses on the participation of a utility in advancing the policy, while code compliance support focuses on the technical resources and trainings that a utility can provide to increase compliance with the stretch code. The MTI evaluation also need to ensure that savings are not double counted with existing RAPs. Sections 3 and 4 of this document provide further detail regarding each of these evaluation pathways.

# Stretch Codes Paths in Illinois

A stretch code, also known as a “reach code,” is a locally mandated code or alternative compliance path that requires a higher level of energy efficiency or sustainability than the adopted base code. There are several ways that Illinois municipalities can move forward with adopting stretch codes, as described below.

## CEJA Stretch Code

Illinois Public Act 102-0662 (Climate and Equitable Jobs Act, or CEJA), passed in September 2021, directed the Illinois Capital Development Board (CDB), which manages the state building energy code adoption process, to create a residential and commercial stretch energy code that can be adopted by individual municipalities. Once formally adopted by a municipality, the stretch code would take the place of the state energy code and newly establish the minimum energy efficiency requirements for new construction, additions, and major renovations in those communities.

The CEJA stretch code, which will be available for adoption no later than January 1, 2024, is now currently one option for municipalities to consider for adoption. While the CEJA stretch code provides a model stretch code for municipalities to consider, the legislation does not require that a municipality adopt the stretch code and then enforce its compliance. Previously, Illinois municipalities could have adopted their own version of above-code energy conservation measures for commercial buildings, but no municipality has done so as of June 2022. Utilities’ efforts can influence local stretch code adoption and provide support of the CEJA stretch code. CEJA also maintains the previous statute that Chicago can choose to adopt any energy conservation code (for both commercial and residential buildings), as long as it is at least as efficient as the state energy code.

Prior to the mandated January 1, 2024 availability of the stretch code, a jurisdiction can choose to create its own commercial stretch code that is more stringent than the state base energy code. These early adopter cities could either adopt CEJA stretch code targets (prior to actual code language is developed by the State of Illinois) or adopt something different, and then adopt the state-developed CEJA stretch code once it is officially available.

For residential buildings, no jurisdiction can mandate that residential buildings could be stronger than the base state energy code prior to the mandated January 1, 2024 availability of the stretch code, with the small exception of home-rule cities that had adopted an energy code prior to 2006 (and municipalities with population greater than 1 million, as described in the section below). These few cities can choose to create their own residential stretch code that is more stringent than the state base energy code.

## Utility Role in Stretch Energy Codes

Utilities play a key role in implementing programs that help their customers use less energy. For example, traditional RAPs typically target a specific technology (e.g., LED lighting) or an individual building (e.g. new construction design assistance). Utilities are well positioned to help move the market of stretch energy codes by providing research and development on stretch code impacts, training for building professionals and officials, and incentives to bring down first costs of more stringent codes. For energy codes under an MT framework, a utility can play a role in two additional distinct ways: 1) supporting municipalities to adopt or advance the stretch code policy through technical guidance and policy development, or 2) providing stretch code support through programs that provide technical assistance, enforcement support, and incentives after an above-code option has been adopted by a jurisdiction.

These two roles require different methods of evaluation that are different from methods used for RAPs. Stretch code policy advancement requires an evaluation process that focuses on the participation of a utility in advancing the policy, while code compliance support focuses on the technical resources and trainings that a utility can provide to increase compliance with the stretch code. Later, this document outlines the distinct evaluation pathways for both policy advancement and code compliance support.

## Logic Model

As stated in Attachment C, “each MT initiative must establish its own unique overarching MT theory with an ‘umbrella hypothesis.’” As described above, a utility can play a role in reducing market barriers and leveraging opportunities to help make lasting change through policy adoption at the municipal level and ensure that stretch codes are complied with when adopted. There are several barriers identified that the MT framework seeks to address, as described in Table 1.

Table 1. Barriers to advancing and achieving full compliance with energy codes

| Barrier | Description |
| --- | --- |
| Business and contractor community may push back against new regulation and updates to the code. | There is a learning curve with new codes, and some within the contractor or business community may not want to add new regulations to their list of priorities, and may believe that their customers do not want to build higher performing buildings and that believe these policies will lead to a reduction in their business. |
| Municipalities often have limited resources to understand and enforce more complex code. | Energy codes are enforced by code officials that are funded through municipality budgets. Staff time and resources are limited to enforce the code as well as learn how to enforce increasingly more complex codes. |
| Design and construction contractors may not be aware of updated or more complex codes. | As new energy codes are adopted, building professionals need time to understand the implications on their current building practice. |
| Enforcement professionals may not prioritize energy code compliance. | Some code officials may not consider energy codes to be the same priority as other life safety codes (such as fire codes). |
| Higher upfront costs for some energy efficiency investments. | With some higher efficiency building technologies or methods, there can be a higher incremental cost as compared to less efficient alternatives. |

The stretch code MTI has several stakeholders that are called out in the logic model and can be involved in a utility supported code policy advancement or code compliance support program. These stakeholders, or target markets, are delineated into three main groups: the jurisdiction/policy-maker sector (TM1), the design and construction industry (TM2), and the enforcement industry (TM3); each group is described and defined below.

Table 2. Target markets for stretch code utility programs

|  |  |
| --- | --- |
| **Target market group** | **Description of actors** |
| **Jurisdiction/Policy-Making Sector - Target Market 1 (TM1)** | * Entities and persons that are involved in policy development and adoption, including Capital Development Board (CDB) Illinois Energy Codes Advisory Council, and public stakeholders * Jurisdiction-level code development or adoption bodies, such as city/county councils, mayors, sustainability managers, and/or working groups (e.g., the City of Chicago Decarbonization Working Group) * Local and state chapters of the International Code Council (ICC), ASHRAE, Illinois Council of Mayors, Metropolitan Mayors Caucus, and the numerous state and local code official associations in Illinois |
| **Design and construction industry** **- Target Market 2 (TM2)** | * Construction industry stakeholders including builders, subcontractors, material supply houses, site superintendents, energy modelers, building scientists, architects, engineers, and designers * Local and state chapters of Homebuilder Associations (HBA), American Institute of Architects (AIA), ASHRAE, International Code Council (ICC), Illinois Plumbing and Heating Association, and Illinois Green Alliance, Association of Licensed Architects, Illuminating Engineering Society, Lighting Controls Association, International Association of Lighting Designers, Building Performance Institute (BPI), Associated General Contractors of America, and others |
| **Enforcement industry - Target Market 3 (TM3)** | * Local building departments, code officials, and jurisdictional employees that review, permit, and inspect energy code requirements |

A logic model is presented below that that summarizes the conditions, constraints, actions, and outcomes expected with a stretch code MTI. The logic model may be refined over time without requiring change to the Illinois TRM. Further versions of logic models should align with utility program design (as the programs are developed), the development of market baselines, and evaluator-reviewed Market Progress Indicators (MPIs).

Figure 1. Draft Logic Model for Stretch Codes Policy Advancement and Compliance SupportDiagram

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# Calculation Methodology

This section introduces the terms and algorithms central to determining the utility savings attributable to a stretch code MTI for policy advancement and/or compliance support. Subsequent sections will expand on the terminology used in the following calculations and equations shown in Figure 2. However, this material is provided here as preliminary context, and provides a general framework for the following sections which discuss stretch code policy advancement, compliance support and the evaluation process. A utility would determine savings for its efforts to support either or both policy advancement and code compliance.

**Calculations for Policy Advancement**

1. Market Potential Savings (MPS) is determined through market research, typically through primary or secondary research (possibly including in-field market baseline study, building simulation modeling, and/or measure characterization), along with market data (number and type of buildings)
2. Market Potential Savings (MPS) x Achievability Factor = Achievable Market Savings (AMS)
3. AMS - Base Code Baseline (BCB) = Market Transformation (MT) Savings
4. MT Savings x Attribution Factor = MT Savings Attributed to Utility

**Calculation for Stretch Code Compliance Support, after first determining Policy Advancement**

1. (Savings Lost Due to Non-Compliance - Stretch Code Compliance Baseline (SCCB) - Compliance Limit) x Effectiveness Score = Code Compliance Savings Attributable to Utility

Figure 2. Attribution Model for Stretch Code Initiatives

Diagram

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# Stretch Energy Code Policy Advancement Programs and Evaluation

This section focuses on actions that a utility can take to receive attribution for aiding to advance the stretch code, and the methods for evaluating savings attributable to those utility activities.

## Utility Actions for Energy Code Policy Advancement

Utilities have unique opportunities to encourage and support municipality efforts to adopt stretch codes. There are three primary ways that a utility can help advance a stretch code policy: 1) utility-initiated research, 2) advocacy for advancing policy, and 3) the creation of utility programs to support implementation. Many of these efforts can and should be done while municipalities are considering policy advancement, and well in advance of the evaluation efforts described further in this document. In contrast to utility programs that are rolled out service territory-wide at the same time, a stretch code MTI must take into account that individual municipalities will adopt a stretch code policy at their own pace. While some municipalities will consider policy adoption in the near-term, more municipalities are expected to adopt stretch code policies gradually over the next several years.

### Utility Initiated Research

Utilities may advance research for stretch code policy advancement in the form of a study report. The purpose of a study report is to help inform municipalities that are considering adopting a stretch code policy and should be provided to those municipalities. Such a study report should contain:

* **Introduction:** Brief overview of the historical work that informed the study report.
* **Market Analysis:** Includes Market Structure, Technical Feasibility, Market Availability, Current Practices, Market Impacts, Economic Assessments, Economic Impacts.
* **Energy Analysis:** Includes Assumptions and Methodology.
* **Cost Effectiveness:** Includes Energy Cost Savings, Incremental First Cost, Lifetime Incremental Operation and Maintenance Costs, and Cost Effectiveness Results.
* **Energy Impacts:** Analysis includes first-year savings for each jurisdiction affected by the proposed stretch code.
* **Revisions to Code Language:** Precise language to be used in the stretch code.

The introduction would describe how utilities and other stakeholders advocate for code policy advancement. This section includes significant background information on the proposed update, including a recap of existing technologies, relevant literature, existing code, and comparable stretch codes in other states.

The market analysis would include an examination of the technical feasibility, and/or current practices, and should include examining the ability of the market to meet the proposed stretch code and potentially applicable products currently on the market that would help meet the stretch code. The market analysis would investigate the impacts on market actors like builders, designers, energy consultants, building owners and occupants, building inspectors, etc. The market analysis may also explore how the code might affect occupational health and safety as well as employment within the affected region. An economic impacts analysis could also be conducted with a detailed study on the labor market impact of the proposal (creation/negation of jobs and businesses). Economic impacts would also look at the competitive effects of the proposal, and whether it will benefit in-state business or state and local government entities.

The energy analysis should begin with stating energy analysis assumptions and detail the methodology, including how the savings will be calculated, and what engineering method will be used (e.g., prototypical building energy modeling). The energy impact analysis of a proposed stretch code would be calculated, generally using the previous minimum-compliance code as a baseline for the analysis. Energy costs savings and non-energy benefits associated with the stretch code will be estimated from the perspective of the constituents of the municipality.

Revisions to code language would detail the precise language to be used in the stretch code. Any references used would be included in the revised code language. Any changes to compliance manuals and compliance documents would also be described.

### Utility Involvement for Advancing Energy Codes

Utilities may influence stretch code policy advancement by creating, providing and/or presenting the utility-initiated research to a group of key stakeholders. The process by which a stretch code is adopted at a municipal level is driven by a specific municipality’s policy-making process. A utility is uniquely positioned to be involved and influence the process for stretch code adoption through activities such as:

1. Actively participating in discussion at public or decision-making meetings
2. Attending public meetings (information-gathering with little-to-no participation)
3. Writing and submitting comments
4. Creating, providing and/or presenting information to a group or key stakeholders
5. Convening stakeholder meetings to develop technical aspects/policy language
6. Submitting policy language or recommendations for consideration of adoption
7. Funding and conducting participation in public processes on behalf of the utilities
8. Giving public testimony in support/against specific policy language/ideas

See Table 3 for a more detailed explanation of each action and its relative impact on stretch code policy advancement.

### Utility Energy Code Compliance Support Programs

A common barrier to passing policies such as stretch codes is a lack of technical assistance and compliance support to implement the policy once passed. This hinderance can result in the weakening of a policy or ultimately halt its adoption. Policies have a much better likelihood of advancing if there is a promise of a program that will support implementation and compliance. One step utilities can take is to actively promote policies that they have the ability to support through a utility program. Another is to make the intention of program creation known to stakeholders. These utility programs may include providing financial incentives to new construction and major renovation projects in municipalities that adopt the stretch code. The creation of a utility-specific program to support code compliance is outlined in the section below, Utility Programs for Stretch Code Compliance Support.[[1]](#footnote-2)

## Stretch Energy Code Policy Advancement Evaluation Overview

While a utility can influence policy adoption well ahead of a municipality voting to adopt a stretch code, the evaluation of a stretch code policy advancement program begins *after* a municipality adopts a stretch code.

This section is divided into three key pieces of evaluation activities: 1) actions the evaluator can take when the stretch code is developed or when the base code changes, 2) evaluation actions immediately following municipality adoption of a stretch code, and 3) evaluation actions that occur 1 to 3 years after stretch code adoption.

### Evaluation Actions When Stretch Code is Adopted

When a stretch code is established or updated, the evaluator will review the utility’s deemed savings estimates (e.g., kWh per square foot) as well as the utility’s estimate of total Stretch Code MT savings by municipality. These deemed savings value are expected to vary by building type (e.g. office, food service, large multifamily, residential, etc.). Therefore, savings are calculated on a per square foot basis to enable extrapolation of savings (calculated on a per building basis) out to represent the full breadth of each municipality’s unique blend of building stock.

For code-based measures, the utility (or its agent) generally uses building energy simulation software to model whole building use for both the base code baseline building as well as the more efficient stretch code compliant building. These models could be developed by a utility or another policy advocate using building energy simulation software.[[2]](#footnote-3) The two energy models, base and stretch codes, are used to predict the annual energy savings attributable to development of a stretch code compliant building as opposed to a building built according to base code. The result is normalized by the modeled building’s floor area to establish the final *ex ante* savings estimate on a per unit (square foot) basis.

Once these models are established, the evaluator is responsible for intendent review of the models to confirm the inputs are properly populated and reflect conditions appropriate to the given building type, market, and applicable building energy code. Furthermore, the evaluator will review and confirm the utility’s estimation of potential market savings for each municipality that adopted the applicable stretch code. Market level data may be provided by the utility, participating municipality, federal databases, publicly available reports, manufacturer or other equipment sales data, and other secondary sources.

When either the stretch code or base code changes, the building energy simulation models are updated by the utility (or its agent) and the evaluator review cycle is repeated.

### Evaluation Actions After Municipality Adoption of Stretch Code

After a municipality adopts a stretch code, the evaluator can take several actions to prepare for the full evaluation that will take place after a set period of time after the stretch code has been in effect. These actions include deeming compliance rates, estimating attribution factors, and the development of the Base Code Baseline (BCB, also known as the natural occurring market adoption or NOMAD).

Once a municipality adopts a stretch code, the evaluator begins the evaluation by assessing the Market Potential Savings (MPS) determined by a utility based on current municipal conditions**.** This includes a review of construction subject to stretch code, as well as program practices and utility involvement in the stretch code policy advancement process.The evaluator deems[[3]](#footnote-4) compliance rates to estimate Achievable Market Savings (AMS) and a deemed Base Code Baseline (BCB) over the next three years.

#### Deemed Compliance Rates

Since it is expected that not every building would immediately achieve 100% stretch code compliance, the evaluator applies a compliance rate (Achievability Factor) to the MPS to estimate AMS. As no stretch code program has been in effect in Illinois as of June 2022, the evaluator will need to estimate the expected levels of compliance with the stretch codes. The Evaluator should review compliance rates with base energy codes and make assumptions about whether and if so, how stretch code compliance rates may differ among jurisdictions.

In Illinois, compliance rates most recently have been estimated through statewide baseline field studies of both commercial and residential buildings in 2019; these baseline studies (sometimes called baseline compliance studies) establish a starting point to measure from in the future, and help identify and prioritize the areas and building construction design, practices, components or installed equipment where compliance could be increased.[[4]](#footnote-5) Initially, using the 2019 baseline compliance studies, or other compliance studies and market research, a Delphi panel can be employed by the evaluator to deem compliance rates.

In lieu of conducing a compliance study every year to determine compliance, as an annual cadence may be cost-prohibitive, it is recommended to conduct a Delphi panel informed by market data and research to assess each year that a utility claims savings. At the same time, the evaluator will review municipal permit data to understand new construction building stock annually, including building type and square footage.

At least every sixth year of the evaluation process, and preferably after each base or stretch code update (expected to be on a three year cycle), a field-based compliance study should be conducted to assess compliance with the stretch code and record overall market trends in new construction. The compliance study will review new construction data in a sample of buildings built in the prior years. The compliance study should be stratified into three sets of buildings: 1) buildings built in the city of Chicago that are subject to Chicago’s stretch code if adopted, 2) buildings built outside of Chicago subject to stretch code, and 3) buildings built in municipalities where a stretch code is not adopted, but are subject to the latest statewide code. The compliance study should review construction practices within these locations to determine movement in the market.

#### Utility Attribution Factors

At this time, the evaluator can also estimate attribution factors, also known as an attribution score, for utility involvement. An attribution score is determined based on the three categories of utility involvement previously described: utility-initiated research, advocacy for advancing policy, and the development of utility programs to support implementation. Credit will also be given for utility activities that may not be previously defined.

Attribution values are reviewed and scored by a Delphi panel. The panel is presented with the relevant evidence, including utility-supported research, rulemaking dockets, activity and role reports from utilities, and stakeholder interviews. The Delphi panel may consider items such as amount of time spent, fiscal involvement (e.g., funding a study), and achievable level of influence resulting from an action. At the panel’s discretion, each of the three attribution areas may be further divided for weighting and scoring. For example, utility-initiated research may be divided into the development of technical information and feasibility research on meeting the stretch code requirements. The attribution factor is derived from the weighted scores.

Table 3 provides an initial set of attribution weights relative to specific utility actions. To help inform utility planning efforts, this list presents the relative weight and impact for a particular utility action which should result in attribution. The recommended weighting was derived from the weightings used in California, modified to fit Illinois policy as outlined in CEJA. The weights were refined by comments from SAG meetings.

Table 3. Examples of utility participation and categories of influence for stretch code policy advancement

| Category of Influence | Participation Action | Documentation Examples | Weight |
| --- | --- | --- | --- |
| Utility-Initiated Research (30%) | Funding and conducting research on market analysis, energy analysis, cost-effectiveness, and statewide impacts. | Scope of work and financial receipt for research papers, final research studies and supporting documentation. | 25 |
| Developing revisions to code language that can be used in stretch codes. Reviewing public documentation and information. | Meeting minutes, email discussions, written language revisions and rationale or included in research papers. List of reviewed public documentation and information included in research papers. | 5 |
| Advocacy for Advancing Policy (30%) | Actively participating in discussion at public or decision-making meetings. Attending public meetings. Writing and submitting comments in ordinance development process. | Meeting minutes, calendars. List of comments, email discussions, written comments and rationale. | 10 |
| Creating, providing and/or presenting information to a group or key stakeholders. Convening stakeholder meetings to develop technical aspects/policy language. | Meeting agendas, meeting minutes, calendars, stakeholder list, presentations, email discussions, written language, stakeholder survey. | 12.5 |
| Submitting policy language or recommendations for consideration of adoption. Funding and conducting participation in public processes on behalf of the utilities. Giving public testimony in support/against specific policy language/idea. | Submission receipt, email/physical copy of submission, policy language. Scope of work and financial receipts, list of public meetings and participation in processes. Testimony language, meeting minutes, stakeholder survey. | 7.5 |
| Utility program development (30%) | Submitting a plan to provide technical support or incentives via a utility program to support policy implementation. Creating a specific utility program to fit policy implementation needs. Receiving plan and program approval. | Meeting minutes, presentations, email discussions, written or testimony language, stakeholder survey, stakeholder feedback on utility effects. List and details of program components specifically designed to support stretch code. | 30 |
| Undefined or miscellaneous (10%) | Meaningful influence on code policy advancement outside of the categories of influence listed above. | To be determined. Depends on nature and content of influence. | 10 |

#### Deemed Base Code Baseline

The Base Code Baseline (BCB) is the estimate of what the market is expected to do without a stretch code policy in effect. The BCB can be influenced by several factors, including non-utility advocacy, utility incentive programs, voluntary standards, mandatory codes and standards, and non-compliance with statewide base code. The calculation of the BCB occurs when a municipality has officially adopted a stretch code policy. BCB will be calculated on a statewide basis, with the possible exception of Chicago which may have its own BCB per the evaluator’s discretion.

As done in other jurisdictions, such as California, it is recommended to leverage subject matter experts to determine the BCB. This approach includes several analytical steps:

* Review of existing Illinois field studies to understand market trends, including above code buildings and advanced building initiatives such as LEED.
* Compliance improvements naturally occurring without utility programs.
* Interviews with market actors, including building code officials, constructions firms (representing a mix of commercial, multifamily and residential new construction), and municipalities.
* A Delphi panel of up to 15 subject matter experts which will include building designers and engineers, building code officials, contractors and other market actors to help determine the BCB.

The Delphi panel should meet over several days to review the aforementioned data gathered and determine the market trajectory for the new construction building industry in Illinois over time absent utility intervention. For this evaluation, it is recommended that the evaluator act as a Delphi facilitator who is impartial and familiar with the research and data collection. As typical of Delphi panel processes, there would be multiple rounds of questions relating to the BCB, with questions progressing from general to specific questions and decision making. The panel could use a market adoption estimation approach such as fitting a Bass curve for the diffusion of innovation over time to historical market adoption data from subsequent baseline studies. The panel would consider other market mechanisms and how their influence would drive the BCB. Other market mechanisms may include:

* **Non-Utility EE Advocacy**: Usually run in parallel to utility activities, such as the Clean Jobs Coalition.
* **Statewide Base Code**: Advances in the statewide code may affect the BCB.
* **Compliance Intervention**: If non-utility stakeholders are actively engaging in code compliance support.

While a comprehensive evaluation effort and estimation of the BCB may take place every 3 years, for those municipalities that adopt policies in the non-BCB years, the evaluator may consider a streamlined effort that estimates the potential impact based on limited or secondary data provided to the evaluator without the use of a Delphi panel.

MT Savings persist beyond a three-year code update cycle; however, it needs to be reevaluated as compliance rates are updated and the BCB is updated. MTI Savings would go to zero when the AMS equals the BCB. Lifetime and peak savings should follow Illinois new construction TRM and evaluation conventions.

### Evaluation Actions After 1 to 3 years of Policy in Place

After a predetermined period of time after which the stretch code policy has been in place, the evaluator can finalize the MT savings in every municipality where a stretch code has been adopted. While ideally this savings calculation would happen every year that the stretch code policy is in effect, costs may be prohibitive; in this case, evaluation on a three-year cycle, aligning with the code update cycles, could be considered.

For each jurisdiction that has adopted a stretch code, the evaluator will review construction market data and evaluate the specific policy passed. The Policy Advancement MTI Savings is determined by subtracting the Base Code Baseline (BCB) from the AMS savings. This evaluation phase includes determining what building stock was actually built in a given jurisdiction to evaluate energy savings and a review of utility program practices and utility involvement to attribute those savings to utilities. Table 4 presents an overview of the review schedule for each of the primary data streams necessary for estimation and verification of MT Savings. Additionally, these data will be will used over time to assess market progress indicators as defined in the outcomes of the logic model.

Table 4. Data Stream Monitoring and Update Schedule

|  |  |
| --- | --- |
| **Variable** | **Review and Update Frequency** |
| Achievability Factor (for Policy Advancement) | * 3 years |
| Base Code Compliance Rate | * Delphi Review every 3 years * Study every 6 years |
| Attribution Factor (for Policy Advancement) | * 3 years |
| Stretch Code Compliance Rate | * Delphi Review every 3 years * Study every 6 years |
| Effectiveness Score (for Code Support) | * Annual |
| Base Code Baseline (BCB) | * Upon adoption of new base code |
| Stretch Code Compliance Baseline (SCCB) | * Upon adoption of new base code |
| (New) Municipal Stretch Code Adoption | * Annual |
| Evaluation of MTI Savings | * Annual |

# Stretch Code Compliance Support Programs and Evaluation

## Utility Programs for Stretch Code Compliance Support

A stretch code compliance support program works to increase compliance with an above-code policy that has been passed by the local jurisdiction where it would then become the minimum code. While the policy advancement work that a utility takes part in begins *before* a stretch code policy is adopted by a state or a municipality, the stretch code compliance support program is implemented once a policy is adopted. Not every building would immediately achieve 100% compliance with stretch code strategies where adopted; the inclusion of utility-support programs will increase compliance over time.

Utilities should consider how the compliance support programs and policy advancement programs works in tandem. One of the most effective ways to advance policy is to confirm that stretch code implementation will be backed by technical assistance and other support activities. Because utilities have experience running efficiency programs, and code compliance support programs conducted in other jurisdictions have proven to be effective in implementing stretch code policies, this strategy is one of the three main ways to support policy advancement, as outlined above. There are several ways that utilities could support stretch code compliance:

**Training programs targeting code officials, contractors, or city staff to address knowledge gaps about specific measures and/or ways to comply with the stretch code**. These training sessions can highlight new additions to the code, explain more confusing aspects of the code, or demonstrate test techniques for determining compliance. By utilizing data gathered in previous baseline studies, training sessions can target historically low-compliance, potentially high-impact areas.

**Technical assistance for professionals that may be unsure of how to comply with or assess the compliance of a specific code requirement**. This could include:

* Technical support answering code-related questions via email or over the telephone, with responses being tracked annually and provided to the evaluator
* Participation in industry groups to offer technical assistance and outreach
* Resource development and delivery for resources that can assist all target markets, which could include compliance checklists, field guides, FAQs, bulletins, pocket guides, online tools
* Supporting a circuit rider, or a third-party specialist (that is not a building code official or an installer) that is available to all building code officials, that can work with multiple jurisdictions to provide technical assistance
* Development of an energy efficiency resource hub/compliance collaborative to provide a singular place where information can be accessed

**Providing incentives for project or measures which meet or exceed minimum stretch energy code requirements**. This could include developing a specific programmatic option that provides financial incentives as part of either a dedicated program specific to supporting customers by providing funding for new construction or major renovation projects that meet or exceed the stretch code adopted by municipalities, or as part of an existing program, such as the Nonresidential New Construction program. Consistent with other DSM programs, the incentives provided should be reviewed and revised based on market research and evaluation.

## Stretch Code Compliance Support Evaluation Overview

While the policy advancement and compliance support programs can work together, the evaluation of the stretch code support program is separate from the code policy advancement evaluation. The stretch code compliance support evaluation examines utility activities that explicitly address aiding customers to meet the stretch code and reduce stretch code compliance gaps. Many of the same assumptions and data points would be used in both policy advancement and stretch code compliance support evaluations, and with planning recommended for both. Similar to code policy advancement evaluation actions, code compliance support program savings need to be evaluated whenever the statewide code is updated or when a municipality adopts a stretch code. The same Delphi panels or subject matter experts can be used in both policy advancement evaluation as well as stretch code compliance support evaluation.

The savings from stretch code compliance support programs are derived from the gap between what is actually constructed in a municipality that adopts a stretch code and what is prescribed to be construction through the stretch code. As previously described, the utility compliance support program demonstrates savings through closing that gap. Compliance support evaluation includes the Achievable Market Savings (AMS) calculation, using the MPS that is derived from the compliance rates used in the code policy advancement evaluation. The AMS also include an Achievability Factor which takes into consideration the achievability of a highly functioning code compliance program. This approach ensures there is no double counting of savings between the stretch code policy advancement and code compliance support efforts. These savings are compared to the Stretch Code Compliance Baseline (SCCB) which estimates the compliance levels and savings if there were no utility programs. Finally, an effectiveness score is applied to calculated MTI savings attributed to a given utility based on its code compliance actions. All of these evaluation activities take place after the stretch code compliance support program has been in place for 1 to 3 years after stretch code policy adoption and then continues to be conducted at regular intervals.

### MTI Savings for Code Compliance Support

The evaluator first verifies the utility’s estimate of savings that may be achieved through a stretch code compliance support program, this reflects savings otherwise lost due to non-compliance. This value also represents the upper limit of savings potential accessible through a code compliance support program. In practical application, adoption of any given code will rarely, if ever, achieve 100% adoption. Therefore, a Compliance Limit is used to estimate savings potential that is effectively unobtainable even through an ideal operated code compliance program. The remainder constitutes the savings available through a highly functioning stretch code compliance program.

The Code Compliance Support MTI Savings would then be determined by subtracting the SCCB from the AMS attributed to the utility’s Code Compliance Support efforts. This MTI Savings would follow a Delphi process to determine what portion of the Code Compliance Support savings achievable in each year of the code cycle relative to a highly functioning stretch code compliance program. Similar to the Delphi panel used in the code policy advancement evaluation, the panel should be comprised of industry experts, including building code officials, building commissioners, architects, design engineers, mechanical engineers, consultants, or academics. The Delphi panel, based on its experience and the data collected, then determines achievable energy code compliance levels under two scenarios:

1. Code compliance resulting from a highly functioning stretch code compliance program (Compliance Limit)
2. Assuming there was never a stretch code compliance support effort (SCCB)

The Delphi panel would examine stretch code compliance efforts both within Illinois if applicable, and in other states or jurisdictions.

### MTI Savings Attributed to Utility

The Delphi panel will also be assembled to determine the effectiveness of stretch code compliance program efforts that are attributable to a utility. Similar to the Delphi panel used in the code policy advancement evaluation, the panel should be comprised of industry experts, including building plans examiners, building commissioners, architects, design engineers, mechanical engineers, consultants, or academics. Data collected to inform savings estimations include collecting surveys, recording the number of attendees and the number of circuit rider visits for program participants. The portion of Market Potential Savings achieved is determined by calculating the MTI Savings and a code compliance support effectiveness score.

Table 5 demonstrates methods for determining the savings attributed to a utility. The weights and scores for effectiveness are developed in the areas described above in Utility Programs for Stretch Code Compliance Support. The effectiveness score is derived from the weighted scores outlined in Table 5. The code compliance support effectiveness score is then multiplied by the MTI Savings to determine the MTI Savings attributed to the utility derived in earlier evaluation steps. This is ultimately the savings values that will be allocated to a utility.

Table 5. Examples of utility participation and categories of influence for stretch code compliance support

| **Compliance Enhancement Activity** | **Scoring Metrics** | **Documentation Examples** | **Score** | **Notes** |
| --- | --- | --- | --- | --- |
| Training Sessions: Classroom, In-field, Webinar, etc. (25%) | Curriculum covers topics where compliance improvement is possible/necessary | Training materials such as PowerPoints or worksheets | 10 | Baseline studies can be used to highlight key areas of low compliance |
| Training sessions are frequent, accessible, and see high attendance as a result | List of trainings held and attendance numbers | 5 | Can show a mix of demographics in attendees i.e., builders, code officials, etc. |
| Training sessions increase knowledge/understanding of attendees | Participant surveys completed after the training sessions | 5 | Can utilize a simple rating system over various categories such as Lighting, HVAC, etc. |
| Training sessions result in improved practices by relevant attendees | Participant surveys completed 2-6 months after the session | 5 | Will need to determine which attendees receive this survey |
| Phone and Email Technical Support (20%) | Experts are consistently available to answer questions regarding code updates, and these resources are advertised to relevant stakeholders | Hours of availability for information resources, as well as marketing materials for/links to these resources | 10 | Could be undertaken by the utility, local government, or a third party with utility funding/support |
| Information resources are utilized by relevant stakeholders and useful responses are given in a timely manner | Call and email records to/from information hotlines | 10 | Could request to record calls to assess performance |
| Supporting a circuit rider or third-party specialist.  (25%) | Credentials and effectiveness of circuit riders or specialists. | Resume, CV and experience notes, as well as satisfaction surveys | 10 | Provided by utility |
| Full time equivalence (FTE) of circuit riders or specialists | Employment records and schedule information | 15 | Provided by utility |
| Resource Development: Checklists, Field Guides, FAQs, etc. (10%) | Useful resources are developed and distributed by the utility or a third party | Example materials and distribution pathways | 10 | These could be tied into the trainings as well as take-home materials |
| Stakeholder Engagement (5%) | Utility participates in industry groups, maintains contact with building departments to make sure information and resources are up to date | Meeting minutes, emails, etc. | 5 | Utility maintaining a list of active builders could be useful as well for training and documentation purposes |
| Offering incentives for construction to the stretch code standard (10%) | Utility includes a specific programmatic option that provides financial incentives for projects or specific measures that meet or exceed the stretch energy code minimum requirements | Plan submitted and program component in place to provide incentives | 10 | Provided by utility |
| Undefined or miscellaneous (5%) | Meaningful influence on code compliance outside of the categories of influence listed above | To be determined. Depends on nature and content of influence | 5 | Allows utilities to get credit for areas not identified |

1. A stretch code support program can help advance energy efficiency in the entire Illinois market, even in non-stretch code adopting communities. These stretch code support program elements could synergistically help customers comply with the state base energy code, or even exceed the state base energy code. Many of the same activities implemented for a stretch code support program would likely impact and improve base code compliance. [↑](#footnote-ref-2)
2. These energy simulations are typically developed by the Pacific Northwest National Laboratory (PNNL) and should be used as a starting point and modified based on changes in climate zones from the prototypical buildings and any changes between the statewide code and the code PNNL modeled. [↑](#footnote-ref-3)
3. If a compliance study is being performed in parallel to the evaluation, then compliance rates would only be estimates until the compliance study is complete. [↑](#footnote-ref-4)
4. Subsequent studies are simply called “compliance studies” to measure how much compliance improvement has been achieved since the initial baseline study. [↑](#footnote-ref-5)