Tracking Statewide Code Compliance

October 2020

Table of Contents

Acknowledgements

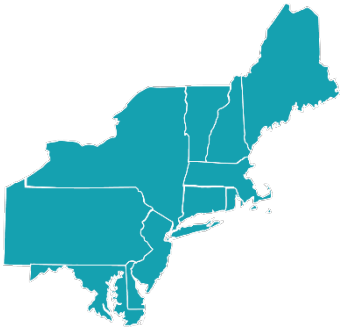
This report reflects the invaluable contributions of multiple individuals. We would like to recognize the report's authors, Darren Port, Moses Riley, Kai Palmer-Dunning. Several NEEP staff served key roles in the development of the report including Carolyn Sarno-Goldthwaite, and research interns Stephanie Berger and Arjun Behra. Formatting and edits were provided by Lisa Cascio, Director of Partner Engagement and Victoria Salvatore, Marketing Associate.

About NEEP

NEEP was founded in 1996 as a non-profit whose mission is to serve the Northeast and Mid-Atlantic to accelerate regional collaboration to promote advanced energy efficiency and related solutions in home, buildings, industry, and communities. Our vision is that the region's homes, buildings, and communities are transformed into efficient, affordable, low-carbon resilient places to live, work, and play. To learn more about NEEP, visit our website at http://www.neep.org.

Disclaimer: NEEP verified the data used for this brief to the best of our ability. This paper reflects the opinion and judgments of the NEEP staff and does not necessarily reflect those of NEEP Board members, NEEP Sponsors, or project participants and funders.

Introduction



Statewide energy code adoptions have increased dramatically in the Northeast and Mid-Atlantic region since the first energy code was published in the 1970s. Simple resources like compliance checklists to comply with and enforce the energy code at local and state levels, however, are still lacking in many communities. And while adoption is a critical step, compliance and enforcement is the best way to realize the energy, cost, and life safety benefits of energy codes.

Complying with and enforcing energy codes relies on design, construction, and quality assurance professionals like code officials. When properly done, compliance brings energy and cost savings to consumers. Understanding how specific communities comply with and enforce energy codes is critical to consistently increasing energy compliance rates. Tracking initiatives, mechanisms, and industry practices related to energy code compliance and enforcement provide states and program administrators with valuable data and insight into how the built environment consumes energy. This information illuminates actions that will improve the built environment's energy efficiency, affordability, and life safety.

This brief tracks code compliance studies from across the region and analyzes their value, identifying trends and informing best practices regarding improving energy code compliance. It explores available resources, provides key best practices, and includes survey answers from stakeholders from across the region who facilitate energy code adoption, compliance and enforcement in their communities.

Energy Code Compliance and Enforcement

Energy codes set home and building energy efficiency levels. There are different model energy codes for residential and commercial homes and buildings that individual states and municipalities adopt. Some energy codes require buildings to follow one specific set of requirements, while others, including the most commonly adopted International Energy Conservation Code (IECC), have multiple compliance pathways. Visit NEEP's Energy Code Adoption Page to learn more.

Energy codes bring about energy, cost, carbon, and health and life safety benefits. They also work to lower energy burden and energy insecurity, which affects nearly one-third of Americans and disproportionately impacts underserved communities.[1] In prescribing a minimum energy efficiency level for new homes or buildings, energy codes help homes and buildings consume less energy and reduce utility bills and carbon emissions. They also improve indoor air quality and occupant health and comfort. For little to no upfront costs that are quickly recovered, energy codes are the best and most cost-effective way to reduce energy and carbon consumption and improve occupant health in new homes and buildings, but only when projects comply with the code.

[1] Energy insecurity is when energy costs are so high they force occupants to use less energy than required for health and safety or cut back on other essential costs to pay for energy. https://ips-dc.org/wp-content/uploads/2018/08/Basav-report-final-online-1.pdf

Regional Trends

- States use different methodologies for baseline studies and report values differently between studies, making trends and progress difficult to track and measure.
- States conduct compliance baseline studies on residential homes and buildings more often than with commercial buildings (16 vs. 10, respectively).
- All states struggle to adapt to updates to the energy code, highlighting the importance of creating supporting resources that directly address changes to the code ahead of its effective date.
- Generally, the more studies a state conducts, the more improvement they achieve with energy code compliance (Appendix B)
- States with code compliance enhancement and attribution programs exhibit the highest increases in energy code compliance rates.
- In 2019 and 2020, several states (NH, CT, NJ, DE, WV) started new initiatives to measure their baseline compliance levels, suggesting growing commitment to high energy code compliance levels.

Compliance vs. Enforcement

Once energy codes are adopted, compliance and enforcement are the next vital steps. Compliance begins at the design phase to ensure home or building designs meet code requirements. Architects and building professionals must design homes or buildings that will comply with the energy code using one of the code's compliance pathways. For instance, the prescriptive path may include provisions for specific window SHGC levels or insulation R values. Compliance activities continue throughout construction, meaning architects, designers, engineers, builders, contractors, and other stakeholders must comply with the energy code.

Energy code compliance requires enforcement. Enforcement includes building plan and permitting review, inspections of homes or buildings during construction, and reviewing the tests, products, and certifications of structures. Enforcement mechanisms vary; enforcement for some projects, such as schools and hospitals, are handled at the state level and local code officials are involved. Other times, local building departments are exclusively responsible for code enforcement.

Compliance Pathways

Prescriptive Path – Prescriptive energy code requirements must be done in all buildings, "by the book," meaning they follow the guidelines outlined in the code during construction. There is no performance testing for this pathway.

Performance Based Compliance - The proposed design must show, through energy modeling, that the annual energy use of a building is less than or equal to its annual energy use of the standard reference design.

Total UA Alternative - A method for performing conductive energy tradeoffs based on the area weighted average U-factor for the home or building (U), and the total area of the building envelope (A). The designer must demonstrate that the area weighted average U-factor for the entire home or building is less than that prescribed by the prescriptive method.

Energy Rating Index Compliance Alternative (ERI) *- A numerical score where 100 is equivalent to the 2006 IECC and 0 is equivalent to a zero energy home or building. A table indicating the required ERI Index for each climate zone is within the energy code. Verification of ERI compliance is completed by an approved third party, a RESENT certified Home Energy rater that provides the local code official a compliance report.*

Alternative Compliance Pathways *- Some states offer alternative compliance pathways such as building to or obtaining Passive House or Energy Star certification, using a "package" system with efficiency "points" thresholds.*

Regardless, there must be enough resources to support code enforcement, whether funding, staffing, or technical guidance.

Best Practice #1: Establish a Statewide Energy Code Compliance Enhancement and Attribution Program with Dedicated Funding

A statewide energy code compliance enhancement program with dedicated funding that allows utilities to attribute and claim savings for their interventions will direct attention and resources towards supporting energy code compliance. Convening stakeholders who work closely with energy code compliance – utility program administrators, code officials, contractors, architects, energy efficiency specialists, consumers – will create initiatives and resources that reach all relevant professions and improve compliance levels.

Why Measure Energy Code Compliance

Energy code compliance studies determine a state's energy code compliance level, identify opportunities for increasing compliance and savings, and reveals gaps in knowledge and common areas of non-compliance. The U.S. Department of Energy provides support to conduct these field studies.

Tracking compliance rate information across code compliance studies allows governments and utilities to set baselines, understand where there is and is not code compliance, attribute savings, and support and comprehend improvements or shortcomings. If conducted appropriately, study outcomes can drastically improve workforce development and create an effective, adaptable, and informed workforce.

Compliance data yields metrics on single-family homes that are useful for both state and national code development, adoption, enforcement and compliance; builder and design professional training; utility planning; and incentive program design. The following are general compliance study outcomes:

- Establishing the average Energy Use Intensity (kBtu/sf./year) of code-regulated energy in single-family homes.
- Identifying code requirements with high savings potential and low compliance to target design professional and code inspector education and training.
- Calculating the potential energy, cost, and emissions benefits from increased compliance with targeted requirements.

Benefits of Energy Code Compliance

- **Reduced Emissions and Energy Usage:** Buildings produce approximately 40% of U.S. carbon emissions, and compliance with energy codes is an essential mechanism for decreasing building emissions and meeting climate goals.
- **Cost Savings:** By increasing energy efficiency and reducing energy usage, energy codes produce cost savings. It's estimated that every dollar invested in energy code compliance creates $6 in energy savings.
- **Better Indoor Environments:** Energy efficient buildings, such as ones that comply with energy codes, create better indoor environments that can increase the health and productivity of occupants.
- **Increased Energy Security:** Compliance with the energy code lowers utility bills and decreases energy burden, which disproportionately affects underserved and LMI[1] communities. The NEEP region exhibits some of the highest rates of energy burden for LMI communities in the country.

- Establishing a business case for private investment to increase energy code savings.
- Identifying deficiencies and strengths in construction practices and code compliance statewide.
- Creating a training curriculum to strengthen building energy code compliance.
- Understanding the potential for increased energy savings and reduction of carbon emissions from future and more rigorous code adoptions.
- Refining utility efficiency programs to assist design professionals, builders, and homeowners in creating beyond code energy-efficient buildings.

Best Practice #2: Conduct an Energy Code Compliance Baseline Study for All Building Types After of Each New Code Adoption

Conducting an energy code baseline study is the best way to analyze how the industry in a community builds to, complies with, and enforces the energy code. Conducting these studies as part of a code compliance enhancement program ahead of code updates will reveal how the community complied with the previous energy code and determine what training or support the industry needs in order to comply with the next energy code. Measurement of specific requirements (window U-Factor, envelope tightness, duct tightness, etc.) is really helpful to target energy code trainings to improve areas that yielded lower compliance rates.

Tracking Energy Code Compliance

Tracking code compliance means compiling data on industry practices, compliance rates, and anything related to energy code administration. Code compliance baseline studies are an optimal way to develop and acquire this data. These studies provide detailed insight into industry practices, common areas of non-compliance, and potential energy savings. Consistently conducting baseline studies (every three years, ideally a year after code adoptions to ensure stock built to new code is compliant) yields robust data on how states and communities can increase code compliance and optimize the associated benefits.

Additionally, including electronic plan review, online building permitting, and virtual inspections for everyday building inspections into code compliance enhancement programs will produce even more data and modernize energy code compliance tracking, streamlining these processes and expanding capacity to address non-compliance.

Should I Measure Compliance with Residential, Multifamily or Commercial Buildings?

Ideally, all – but this ultimately depends on the area's construction activity and the data acquired from any previous code compliance baseline studies. Some states have significantly more residential construction than commercial construction, while others exhibit the opposite. If bandwidth or funding is a barrier, pick the sector with the newest construction – that way, there is more savings from the start. Prepare to measure compliance in the other sectors later on.

Best Practice #3: Develop Electronic Plan Review, Online Building Permitting, and Virtual Inspection Infrastructure

Electronic, virtual, and digital alternatives to paper permitting can streamline work and improve data tracking capacity. Having all permits, plan review, and inspection data online creates data sets that can be integrated with other energy data, assisting communities in analyzing energy program performance, forecasting construction trends, and crafting energy efficiency policies.

Data from compliance studies are best applied when they are part of state code compliance enhancement programs. These programs use baseline studies and the data they yield to convene state utilities and program administrators to undertake activities that improve energy code compliance, such as training, implementing a circuit rider,[2] and conducting outreach. They also often allow utilities to claim savings and attribute activities to code compliance improvements. Massachusetts and Rhode Island have code compliance enhancement programs that have helped them achieve high code compliance levels and have even led to synergistic policies like benchmarking and energy use disclosure mandates.

If a state has a stretch energy code, measuring compliance with the stretch code is just as important as measuring compliance with the base code. Like the base code, when a community adopts a stretch code, it becomes law in that jurisdiction. Measuring compliance with the stretch code is also a great way to assess industry readiness ahead of future base code adoptions as it provides insight into how the industry complies with more advanced energy code provisions that could become part of the base code.

Best Practice #4: Continuously Apply Data to Support the Workforce Via Targeted Trainings, Resources, and Technical Support

Code officials, designers, contractors, and other stakeholders who work closely with energy code compliance require targeted training and technical support to comply with the energy code. Training that directly references the energy code, an energy code circuit rider, compliance checklists, best practice guidance, and other resources will prepare the industry to comply with the energy code and realize its many associated benefits.

Barriers

Tracking code compliance requires state and building department resources, programming, and staffing. The primary barriers to tracking code compliance include cost/funding, staffing, and availability of resources. A misunderstanding of the energy code and its benefits and a lack of infrastructure or programming present additional challenges.

Above all, tracking code compliance relies on supporting compliance and enforcement efforts in states or communities. That means ensuring comprehensive, continuous, and accessible training and education for all

[2] A circuit rider is a technical expert on the energy code in the area that is available via phone or online to answer questions about energy code compliance to stakeholders.

relevant stakeholders, proper resources and guidance for verifying compliance, and sufficient staffing to carry out the work. Visit NEEP's Code Compliance Toolkit to learn more.

Cost: Tracking code compliance requires a significant monetary investment to fund staff, training, outreach, and code compliance studies, which ideally are done every few years to understand code compliance and opportunities for improvement. The Department of Energy can help with funding code compliance studies and analyses.

Staffing: Some municipalities don't enforce the energy code due to bandwidth and staffing constraints. Ensuring there is sufficient education on the value of energy code compliance or that municipalities have the ability to contract third-party specialists to inspect for the energy code can bridge this gap.

Need for Ongoing Education: Effective energy codes are updated regularly (the IECC releases a new code every three years). Builders, code officials, architects, and other relevant stakeholders must be educated on these updates so that industry practices can stay up to date.

Lack of expertise: Some municipalities have no full-time staff dedicated to energy code enforcement, and generally, a shortage of code officials is looming. Outside organizations, such as the City Energy Project, can help provide technical and financial assistance to help municipalities. Third-party specialists are also an option to help alleviate the burden on staff.

Best Practice #5: Conduct Ongoing Outreach and Provide Educational Opportunities on the Importance of the Energy Code and Energy Code Compliance

Overall, the industry and consumers regard the energy code as less important than other codes, such as plumbing, electrical, or fire codes. This pervasive lack of knowledge surrounding energy codes and their benefits wrongly diminishes their importance during the construction and inspection phase, often leading to the energy code not being enforced at all. Outreach and content outlining the benefits of energy codes will create demand on behalf of both the industry and the market to comply with the energy code.

State Code Compliance Profiles

Most states in the NEEP region have conducted code compliance baseline studies. A couple of states have gone further and have regularly measured code compliance rates to track progress and provide support mechanisms. Even with these states, compliance rates will vary between code updates, a testament to the difficulty of continuously achieving high compliance rates.

States use several code compliance baseline study methodologies, such as DOE/PNNL's, NMR's, or state-developed approaches. Whichever method is used, consistency is vital to ensure each study yields comparable data that can directly track progress. Measuring specific requirements in the code (see Maryland below) is incredibly useful and should be considered a best practice when assessing energy code compliance. This parameter-specific data can help target trainings and workforce support resources so that time is not spent on improving compliance for a requirement that already exhibits high compliance rates. Still, measuring statewide compliance helps calculate savings potential – ideally, both compliance with specific parameters and statewide rates are measured.

Survey

A survey effort by NEEP paints a comprehensive picture of the current state of energy code compliance across the Northeast and Mid-Atlantic. The single largest barrier to complying with the energy code was ranked as staffing, closely followed by resources. Due to the COVID-19 pandemic, several building departments fell behind on permitting and site inspections as they adapted to a virtual or remote format to follow necessary precautions. The volume of permits and inspections created a bottleneck that responses show will be best fixed by improving staffing and virtual and remote resources.

While responses indicate that staffing is universally ranked as the biggest hurdle to tracking code compliance in the Northeast and Mid-Atlantic, the situation is more nuanced. There is a need not only for more employees, but better training systems, resources, and technical support as well. This not only helps new employees seamlessly integrate into the institution, but can also help improve worker productivity. Respondents across all states believe that more technical resources and compliance training can also help improve code compliance.

Summary Findings

- 80 percent of respondents mention that code officials are offered code compliance training, while 54 percent say the same for the construction and design community.
- Licensing and permitting fees (45 percent), followed by state funds (25 percent) were the primary funding sources, with local funds and combinations of these sources making up the rest.
- 60 percent of the Northeast and Mid-Atlantic uses prescriptive pathways, followed by 20 percent for performance pathways, with ERI and other alternative pathways making up the rest.
- The most common software used is RESCheck, due to its simple user interface and low cost.
- Respondents across all states mentioned that people might use specific pathways due to a lack of awareness about all of the options.

Appendix A: State Code Compliance Summaries

Connecticut

- Summary:
    - Connecticut's most recent residential study (2018) estimated that 86 percent complied with Connecticut's 2012 IECC and its most recent commercial study (2015) determined that 73 percent of buildings complied with the ASHRAE Standards 90.1 – 2007.
    - Survey results from Connecticut stakeholders indicate that, while trainings for code officials and the design community are offered and well attended, there is a need for electronic permitting and plan review. Responses also indicated that a savings attribution program would work to improve energy code compliance.

Delaware

- Summary:
    - Delaware has not conducted a code compliance baseline study, but it plans on releasing an RFP in 2020 to conduct its first one.
      Survey results from Delaware stakeholders indicate a need for additional training to expand the knowledge of the benefits of and methods for improving energy code compliance. Specifically, few trainings are offered for the design and construction community, a critical undertaking as

energy code compliance begins with the structure's design. Trainings are often not required and attendance to follow-up sessions was refered to as "haphazard."

Maine

- Summary:
  - Maine's last code compliance study was conducted in 2008 on residential homes, finding that 17 percent complied with Maine's version of the 2003 IECC. Maine has not formally measured code compliance for commercial buildings.
    Survey results from Maine stakeholders identified the need for additional funding, staffing, and technical resources in order to effectively meet and enforce the energy code. Training programs are mainly funded through system benefit charges as well as licensing permitting, and other fees, but code enforcement is unilateraly sponsored by state and local general funds. Ensuring these funds are sufficient to enforce the code is critical going forward.

Maryland

- Summary:
  - Maryland's most recent energy code compliance study (2016) comprehensively measured compliance rates for specific requirements in residential buildings. Maryland hasn't recently measured code compliance for commercial buildings.
  - Survey results from Maryland stakeholders identify good training programs but a need for additional staffing and knowledge regarding code compliance and its benefits. Technical guidance and support could serve Maryland well, as well as a code savings attribution program, which could free up additional funding and infrastructure to improve energy code compliance.

Massachusetts

- Summary:
  - Massachusetts' most recent energy code compliance study (2018) found that 88-94 percent of commercial buildings complied with the 2012 IECC using two different methodologies.
  - Survey results in Massachusetts indicate virtual or electronic alternatives to current systems would help streamline and improve energy code compliance and enforcement, particularly during the COVID-19 pandemic. Additionally, Massachusetts is fairly evenly split between the prescriptive, performance, and ERI compliance pathways in terms of rate of use.

New Hampshire

- Summary:
  - New Hampshire's last energy code compliance study estimated that 43 percent of residential and commercial buildings complied with the 2009 IECC and ASHRAE 90.1 Standards – 2007, respectively.
  - Survey results from New Hampshire indicated a need for additional staffing and technical resources in order to meet the energy code. While training is largely available and helpful for code officials, traning is significantly less common and relevant for the design and construction community, with one response saying these trainings are "not detailed enough for designers, architects, engineers."

New Jersey

- Summary:
  - New Jersey's training and workforce support resources include a continuing education program for those who enforce their uniform construction codes. A multifamily and more general energy code baseline studies is in the works, which will provide great information given it just updated its base code to the 2018 IECC.
  - Survey results from New Jersey paint a comprehensive picture of code compliance methods and infrastructure in the state. While training for both the compliance and enforcement and design and construction communities are widely available, many indicated they are not required to participate and they aren't always well-attended. And while some mentioned New Jersey does track code compliance data, it is not readily available to the industry
- No statewide code compliance data found

New York

- Summary:
  - New York's most recent energy code compliance study (2015) found that 98 percent of commercial buildings complied with the 2009 IECC. New York last measured residential home energy code compliance in 2013, finding that 73 percent complied with the base code.
  - Survey results from New York indicate that training for both the compliance and enforcement and the design and construction communities are widely available, though not always well-attended, especially for the design and construction community. More technical training requirements and resources were identified as areas that would improve code compliance, though staffing was also identified as an area of need.

Pennsylvania

- Summary:
  - Pennsylvania's latest energy code compliance study (2017) measured specific requirements for residential homes against the 2009 IECC and determined the potential for great energy savings.
  - Survey results from Pennsylvania indicate that a lack of expertise in energy codes, compliance, and enforcement is the major barrier to improved code compliance. Training is also much less available to the design and construction community, according to responses, and additional staffing was identified as an area that would improve compliance and enforcement capacity.

Rhode Island

- Summary:
  - Rhode Island consistently conducts energy code baseline compliance studies as part of its code compliance enhancement initiative (CCEI). Its latest one (2018), conducted by NMR group, determined through two methodologies (PNNL and MA-REC, respectively) that 63 percent and 80 percent of single-family residential homes complied with the 2012 IECC.
  - Survey results from Rhode Island identified a need for additional staffing and enforcement funding to improve energy code compliance, though no code officials from the state responded to this survey. Respondents indicated that the state's code compliance enhancement program was effectively used to update claimable savings and inform trainings.

Vermont

- Summary:
  - Vermont's most recent new construction compliance baseline report (2015-2016) determined that 66 percent of residential buildings complied with Vermont's Residential Building Energy Standards (RBES), its version of the 2009 IECC.
  - Survey results from Vermont indicate that code compliance baseline studies are very useful for updating trainings and measuring savings over the study period. Funding was universally acknowledged as an area of need to improve code compliance, while up to 40 percent of buildings follow an alternative code paths and standards, such as Passive House or LEED.

Washington D.C.

- Summary:
  - The District's last code compliance study (2016) determined that between studies conducted in 2014 and 2016, and as a result of intervention activities, compliance rates increased from 74 percent to 99 percent.
  - Survey results from Washington D.C. indicate that staffing and additional compliance resources would help improve energy code compliance, though previous studies have provided D.C. with very valuable data on its gaps and needs in this regard. Virtual and electronic alternatives were identified as a go to next step for the District to take to further streamline and track energy code compliance.

West Virginia

- Summary:
  - West Virginia is in the process of measuring the residential energy code compliance rate for the current state energy code, the 2009 IECC. The study will quantify the energy savings and help identify areas of improvement.
  - West Virginia Energy Code Field Study
- No statewide code compliance data found

Appendix B: Changes in Statewide Code Compliance

Though most states in NEEP's region (10 out of 13) have conducted a code compliance baseline study for the energy code, only five have conducted these studies for both residential and commercial buildings. Of those five, only three states have conducted three or more separate studies total (MA, RI, VT). These states saw a higher average increase in code compliance between their first and last studies than states that conducted two or fewer compliance studies (+31.67 percent compared to +10 percent for residential; insufficient data to calculate commercial change). Three states have conducted only one baseline study.

Of the three states that have performed three or more separate baseline studies (MA, RI, VT), two of them are the only states with code attribution programs in the region (MA and RI). These states saw better results in terms of increasing compliance from their first to most recent study than the third state (VT), which doesn't have an attribution program (+29 percent and +72 percent change in compliance rates for Massachusetts and Rhode Island, respectively, compared to -6 percent for VT). Even if a state conducts several studies, code attribution savings programs provide an incentive structure to better apply acquired information towards improving energy code compliance.

All states struggle with adapting to new energy code adoptions. Rhode Island and Vermont, which have conducted the most studies per state in the region, still saw *decreases* in compliance rates following an adoption of a new statewide code, highlighting the importance of creating supporting resources that directly address changes to the code ahead of its effective date. These are most effective and impactful when part of a code compliance enhancement and attribution program.

* Aggregated estimates of statewide code compliance rates calculated from varying results due to multiple methodologies used or fragmented data available in studies

States that have conducted three or more separate code compliance baseline studies for the energy code are in italics

Connecticut

- Two Residential Code Compliance Studies
    - 2015: 73 percent compliance
    - 2018: 83 percent compliance
        - +10 percent change in compliance*
- Zero Commercial Code Compliance Studies

Maine

- One Residential Code Compliance Studies
    - 2008: 17 percent compliance
- Zero Commercial Code Compliance Studies

Maryland

- Two Residential Code Compliance Studies
    - 2012: 70 percent compliance
    - 2016: 60 percent compliance*
        - -10 percent change in compliance
- Zero Commercial Code Compliance Studies

Massachusetts

- Two Residential Code Compliance Studies
    - 2001: 46 percent compliance
    - 2015: 75 percent compliance*
        - +29 percent change in compliance
- One Commercial Code Compliance Studies
    - 2018: 90 percent compliance

New Hampshire

- One Residential Code Compliance Studies
    - 2012: 46 percent compliance
- One Commercial Code Compliance Studies
    - 2012: 49 percent compliance
- One 2012 study included measurements for both residential and commercial/industrial

New York

- One Residential Code Compliance Studies
  - 2013: 73 percent compliance
- Two Commercial Code Compliance Studies
  - 2013: 85 percent compliance
  - 2015: 98 percent compliance
    - +13 percent change in compliance
- One 2013 study included measurements for both residential and commercial/industrial

Pennsylvania

- One Residential Code Compliance Studies
  - 2017: 65 percent compliance*
- Zero Commercial Code Compliance Studies

Rhode Island

- Three Residential Code Compliance Studies
  - 2011: 0 percent compliance
  - 2013: 56 percent compliance
  - 2018: 72 percent compliance
    - +72 percent change in compliance
- Three Commercial Code Compliance Studies
  - 2012: 73 percent compliance
  - 2013: 53 percent compliance
  - 2016: 86 percent compliance
    - +13 percent change in compliance

Vermont

- Three Residential Code Compliance Studies
  - 2009: 72 percent compliance
  - 2014: 74 percent compliance
  - 2015: 66 percent compliance
    - -6 percent change in compliance
- One Commercial Code Compliance Studies
  - 2011: 88 percent compliance

* Aggregated estimates of statewide code compliance rates calculated from varying results due to multiple methodologies used or fragmented data available in studies

Additional Code Compliance Resources

- NEEP Code Compliance Toolkit
- NEEP Energy Code Compliance Attribution Framework 2019
- NEEP Code Attribution 2014 webinar
- Enhancing Code Compliance Through Utility Claimed Savings
- State Code Compliance Study Matrix

- National Grid RI Claimed Savings 2014 webinar
- Rhode Island Vocational Schools Workforce Development Case Study