Investigation of Building Code Compliance and Enforcement Methods

Conducted by the
Public Utilities Commission

Presented to the
Utilities and Energy Committee
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Building Energy Code Compliance and Enforcement Methods Investigation by the Maine Public Utilities Commission Presented to the Utilities and Energy Commission December 2004

EXECUTIVE SUMMARY

P.L. 2003 ch. 645 (the Energy Code Act) requires that the Public Utilities Commission (Commission) examine compliance and enforcement methods designed to ensure that residential and commercial building construction complies with building energy codes that exist in Maine. The examination complements the statute's directive that, through a major substantive rule, the Commission adopt a model building energy code. This report presents the results of the Commission's investigation.

Maine has enacted statewide energy codes for commercial construction, but we have found that enforcement is not pervasive. With respect to residential construction, municipalities may or may not adopt an energy code as they see fit, and we have found that very few municipalities currently do so.

Six Enforcement Models

There are six enforcement methods typically used across the country.

Local municipal enforcement. In this model, code enforcement is performed by municipal officials, who review plans and conduct site inspections as the municipality deems appropriate. In a municipality that already has an enforcement staff, additional staffing requirements to enforce a residential energy code would likely be modest. However, increases in enforcement costs could be substantial if the municipality has a significant amount of commercial construction.

State agency enforcement. In this model, state inspectors enforce codes and provide consistent information and code interpretation, typically supplementing but not replacing local code officials. This model would require as many as eight additional state employees and additional infrastructure.

Privatization. In this model, a state agency certifies private companies to perform plan review and site inspections. The builder hires a certified inspector, or municipalities may supplement their own staff with an inspector. Privatized enforcement generally has the advantages and disadvantages of state agency enforcement, but entails less state infrastructure and cost.

Self-certification to homeowner. In this model, a builder affixes a sticker in the building certifying that the building complies with the energy code. This

method requires virtually no cost to the state or municipality, but does not inherently guarantee compliance.

Self-certification to a state agency. In this model, a builder provides certification of code compliance to a state agency. The process requires minimal state staffing. Its effectiveness is improved if licensed professionals must stamp the documents because those individuals' licenses depend upon professional performance and ethics.

Enforcement by building owner. In this model, a building owner may take a builder to court for engaging in unfair and deceptive practices. This method requires time and effort by a private citizen, and apparently results in relatively few actions.

Recommendation

In developing its recommendation, the Commission has assumed the following:

- Because virtually no commercial energy code enforcement exists today, a new enforcement method that is reasonably, but not perfectly, effective is a step in the right direction.
- Because state and municipal financial resources are limited, a new enforcement method should not increase budgets or staffing significantly.
- Because no code agency exists within the State to direct the implementation of a new enforcement method, the method should make use of existing processes and infrastructure.
- Municipalities that choose to enforce building codes should continue to be allowed to do so in a manner that they conclude is most effective.

Based on these assumptions, we offer the following recommendations.

For residential construction, we do not recommend changes to the status quo under which municipalities decide whether, and to what extent, to enforce an energy code. This is consistent with letting the municipality decide in the first instance whether to adopt an energy code and indeed, mandating an enforcement approach might deter municipalities from adopting a code.

For commercial construction, we recommend that municipalities be able to carry out enforcement with their own personnel as is the case today.[1] For municipalities without a commercial inspection program, we recommend that the Legislature require that before construction, a licensed professional engineer or architect submit plans showing energy code compliance and after construction,

[1] At a minimum, municipal enforcement should include the requirements that a builder develop a plan that shows code compliance and that a knowledgeable individual perform site inspections adequate to observe energy efficiency practices.

certify in writing that the building in fact complies.[2] The submissions would be made to the local transmission and distribution utility, which would not provide temporary or final electric service until each was received. The Commission would oversee the utilities' compliance. The method involves no independent plan or site review, but depends for its effectiveness on the professional knowledge and ethics of licensed design professionals.

An alternative approach for municipalities that chose not to enforce the energy code for commercial buildings would be to require that the builder arrange for an inspection by a private energy code inspector certified by the State. This would ensure that the building was inspected by a person specifically trained in energy code compliance. We do not make this our primary recommendation because certifying the private inspectors (and resolving inevitable disputes) would entail additional costs to the State.

Training

Before active enforcement begins, state agencies (e.g., the State Planning Office, the Commission, and the relevant professional boards) should carry out proactive outreach and training for design professionals. This would require additional funding, a portion of which may be available from federal and regional sources.

[2] If the Legislature were to utilize this approach, it should consider excluding from the submission requirement commercial construction for which the services of an architect are not required by virtue of 32 M.R.S.A. § 226(2).

I. BACKGROUND

A. Legislative Directive. This report responds to legislative directive enacted as Section 7 of P.L. 2003 ch. 645 (the Energy Code Act). Section 7 states that:

> The Public Utilities Commission shall examine compliance and enforcement alternatives[3] designed to ensure that residential and commercial buildings are constructed in conformance with statutory building energy codes. In particular, the commission shall examine the funding level and resources required for effective enforcement; possible sources of enforcement funding; which public or private entities could be charged with enforcement authority; the sanctions that could be imposed for violations; the effectiveness of different enforcement alternatives; and means by which energy code enforcement can be integrated with the enforcement of other building codes. In conducting its examination, the commission shall examine compliance and enforcement alternatives used in other states.

The Act requires the Commission to report its results, including the advantages and disadvantages of implementing the examined models, to the Utilities and Energy Committee.

B. Building Energy Codes in Maine. Currently, Maine law requires that all commercial and institutional new construction or substantial renovation comply with ASHRAE Standard 90.1-2001 governing energy efficiency and ASHRAE Standard 62-2001 governing ventilation.[4] There are no mandatory energy codes for most residential buildings.[5]

State law does not establish mandatory building codes in all areas of building design.[6] Nonetheless, approximately 15% of Maine's municipalities, representing more than 50% of Maine's citizens, have adopted building codes through ordinance. Most of these municipalities choose to focus on health and safety, rather than energy, codes.

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[3] While "compliance" and "enforcement" are not identical, in this report we use the term "enforcement" to mean the procedures that encompass both.

[4] 10 M.R.S.A. § 1415-D. ASHRAE is the American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., an organization that establishes widely-used building standards. The standards may be obtained through ASHRAE's web site, www.ashrae.org.

[5] Publicly subsidized, multifamily, residential housing heated with electricity must attain minimum efficiencies established in Maine law, but virtually no buildings of this type are currently built. 10 M.R.S.A. §1415-G. "Spec built" residential homes, log homes, and residential buildings of more than two dwellings must attain minimum efficiencies, but this requirement will end 90 days after the adjournment of the first session of the 122nd Legislature. 10 M.R.S.A. § 1415-C.

[6] State law does establish certain mandatory codes, such as fire and electrical codes.

Finally, the Energy Code Act requires that the Commission establish a model energy code, including ventilation requirements, through a major substantive rulemaking. Adoption would be voluntary, meaning that each municipality may choose whether or not to adopt the code, and any municipality that adopts a code in the future must adopt the model energy code. The Commission's rulemaking is currently underway and the provisional rule will be submitted to the Legislature during the 2005 session.

C. Dispersed Building Code Oversight in Maine. Unlike most other states, Maine does not have a single state agency that develops and maintains building codes, disseminates information, and contributes to enforcement. These functions are dispersed among many agencies, including the Department of Professional and Financial Regulation (PFR), which oversees licensing and assists with enforcement and maintenance of licensed professionals' requirements; the Department of Public Safety, which houses the State Fire Marshal's Office; the State Planning Office (SPO), which coordinates codes training; municipalities, which interpret and enforce the codes that they adopt as well as some of the state mandated codes; and the Department of Economic and Community Development (DECD), which has the statutory authority to enforce energy codes. This balkanized approach increases the overall cost of code development and enforcement, while decreasing the State's ability to maintain comprehensive, effective building-wide codes.

D. Differentiating between Residential and Commercial Code Enforcement. There are important differences between residential code enforcement and commercial code enforcement. Residential and small commercial buildings are constructed relatively uniformly, and allow relatively few choices in insulation, glazing, and heating system equipment and practices. Thus, building code officials can learn and understand the codes relatively easily and inspections take relatively little time. The situation is different for larger commercial buildings. Energy systems and the effects of the building's business use on its energy and ventilation systems may be more complex (requiring a higher level of technical knowledge), and buildings are larger and often are constructed in stages (requiring more visits). Municipalities are likely to find it relatively easy to add residential energy code enforcement to the responsibility of a small code enforcement staff. However, it is necessary to develop deeper expertise – even engineering skills – to adequately inspect large commercial buildings, the time to complete the reviews is greater, and the resulting costs are extremely variable. Thus, the best enforcement method for residential energy codes may not be identical to the best enforcement method for commercial energy codes.

In addition, because residential energy codes are voluntarily adopted, it is likely that a municipality that chooses to adopt codes will also choose to enforce them. However, commercial codes are mandatory in all

municipalities, so an enforcement model must be effective in municipalities that do not adopt energy codes as well as in municipalities that do.

E. Differentiating between Voluntary and Mandatory Code Adoption. Maine law specifies a *voluntary adoption model* for residential energy codes, meaning that each municipality may decide whether or not to adopt the code. Thus, the enforcement models discussed in this report are only applicable (and thus only result in costs) in towns that adopt the residential codes.

In contrast, Maine law establishes energy codes that are *mandatory* for all commercial buildings. Thus, commercial energy codes must be complied with in every municipality and require some type of enforcement to be effective.

F. Inconsistent Codes Statewide. Maine law establishes a model statewide energy code, but grandfathers codes that are already adopted by municipalities at the time the model code is established. Thus, in the near future, Maine will not have a consistent residential energy code statewide.

G. Housing Starts in Maine. To assess the overall State requirements for building code enforcement, it is instructive to know the number of new residential and commercial buildings constructed in Maine annually. According to U.S. Census Bureau figures for 2000, approximately 6,000[7] single-family "stick-built" (i.e., not manufactured housing) homes were built in Maine.[8] Because energy code adoption is voluntary, only a fraction of the new stick-built homes are likely to be subject to code enforcement in the near future. We are unable to judge what that fraction might be.

The Commission has found no reliable estimate of how many new commercial buildings are constructed annually in Maine.

H. Investigation Method. In conducting its investigation, the Commission placed significant emphasis on other states' experience. We interviewed state government agencies, relevant environmental agencies, and members of the building community in other states, and researched written material related to other states' procedures. In addition, we held discussions with code enforcement officials in some of Maine's municipalities to learn their procedures and problems. Finally, the Commission interviewed state agencies and members of the building community to understand models in place in other fields.

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[7] There were approximately 652,000 housing units in Maine, of which 371,000 were owned (not rented), and 454,000 were single-family homes.

[8] Maine law establishes that Maine's Manufactured Housing Board shall adopt standards for the construction of manufactured homes and that manufactured housing is exempt from municipal and state procedures that regulate the same matters. 10 M.R.S.A. § 9001-§ 9090. Thus, municipal building codes do not apply to manufactured housing and local code officials would not enforce energy or ventilation codes for manufactured housing.

The law directing this study requires that the Commission study the "funding level and resources required for effective enforcement." This report includes general estimates of the most significant enforcement functions, to allow overall comparison among approaches. Precise budget calculations require more precise knowledge of any final decision that the Legislature might make.

A copy of this report, relevant building energy code laws, and other state or Commission reports on building energy codes may be found on the Commission's web page at www.state.me.us/mpuc/2004legislation/buildingcodes.htm.

I. Draft Legislation. This report presents a variety of enforcement models that require changes to Maine statute. Section 8 of the Energy Code Act provides authority for the Utilities and Energy Committee to report out legislation related to building codes. This authority provides the opportunity to implement any enforcement models that the Legislature concludes should be adopted.[9]

II. COMPLIANCE AND ENFORCEMENT MODELS

There are six methods typically used to enforce state building codes. They are not mutually exclusive, and are used in combination in some states.

A. Local Municipal Enforcement

Procedures. Local code enforcement is used in the vast majority of states and in Maine today by municipalities that have adopted building codes. Even states that employ other models usually allow municipalities the option to enforce energy codes within their boundaries. A municipality employs code officials who perform plan reviews, on-site inspections, and post-construction inspection at a level the municipality deems appropriate. Some municipalities employ multiple officials with specialized areas of expertise; others employ one official who covers all functions.[10] Not surprisingly, larger municipalities with a staff of officials are more likely to have adopted the more complex codes such as commercial building codes and energy codes.

Staffing. For municipalities with code officials in place, the incremental funding for *residential* energy code enforcement would be relatively small once initial training had occurred. The incremental time to consider energy during a residential plan review would range from 15 to 45 minutes, with 15 minutes being typical as builders and officials become familiar with the software tools available. Incremental inspection time during an already-occurring site visit would range from 30 minutes to 1 hour, on each of two visits. Some towns might

[9] At a minimum, legislation should be developed to remove from DECD the responsibility to enforce building energy codes, since DECD does not have the resources to perform this function and in fact does not perform it.

[10] Code officials may consider electrical, plumbing, fire protection, structural construction, access, elevators, land-use, and set-backs, to name only a few.

require an additional visit[11] and some level of additional dispute resolution and homeowner interaction would occur occasionally.[12] It is likely that existing staff could absorb residential code enforcement. However, it is worth noting that code officials are often overburdened, so adding to their responsibilities should not be taken lightly. To put this staffing need in perspective, over 60 residential homes were built in Auburn during 2004; at minimum, this level of activity could translate into 75 to 180 hours of ongoing incremental work, plus one-time training and start-up expense.

Commercial energy code review requires a deeper level of expertise and thus would generally be more difficult to absorb with existing staff.[13] Estimates of the time and expense to review and inspect a commercial building have been impossible to obtain from persons in the field, as they depend on the type of commercial building constructed. The ICBO study estimates an average of 4 to 6 hours for common building types such as banks, office buildings, and retail stores, but show widely varying estimates for individual buildings. A code official already visits a large commercial building many times, and might add energy code inspection without additional visits, but the incremental time to inspect for energy codes would be more than required for a residential building or a common building of the type contained in the ICBO study. Thus, the addition of energy code enforcement would require many municipalities to hire additional staff or to contract for assistance.

Cost. In towns that have already adopted codes, a reasonable estimate of employee costs associated with *residential* energy enforcement ranges from $50 to $100 per home.[14] Estimates for enforcement associated with a small, common commercial building might cost less than $500,[15] but the costs associated with a more complex commercial building would be in the thousands of dollars, depending upon the complexity of the building and the salary or fee

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[11] For example, insulation inspection might be done at the same time as the framing, electrical, and plumbing inspection. Alternatively, a town might conclude that framing must be inspected before insulation is in place, and require an additional visit after insulation is installed.

[12] These estimates are derived from three sources: Maine code enforcement officers, the New Hampshire state residential plan reviewer, and a study by the International Conference of Building Officials (ICBO). Local officials' estimates are based on professional judgment. New Hampshire estimates are based on the reviewer's current experience. The ICBO estimates are based on surveys of reviewers in California and include estimates of the portion of total review time devoted to energy codes.

[13] The difficulty of absorbing energy code enforcement with existing staff would also depend upon the amount of construction occurring in a community, and whether the construction was residential or commercial.

[14] These estimates assume approximately $30 per hour for up to 3 hours of incremental work. The International Codes Council recommends charging a permit fee of $0.15 per square foot ($300 for a modest home) and a minimum of $400, for plan review and inspection of all building codes. As mentioned in the next section, Pennsylvania private inspectors charge between $200 and $800 to inspect for all residential codes. The ICBO study estimates that 7% of a full residential inspection can be attributable to energy codes, suggesting that residential energy code inspection may cost less than $50 if combined with other inspections.

[15] This figure assumes the ICBO time estimate of 6 hours at $30 per hour or more.

required by the inspector[16] and the amount of additional travel expenses. While these estimates are useful, they do not predict actual funding needs of a particular municipality, which will depend upon whether the municipality anticipates construction of large commercial buildings and whether the municipality hires an additional employee or absorbs energy code enforcement into its existing staff work.

Sources of Funding. Local enforcement is typically funded by a combination of permit fees and municipal taxes. Permit fees in many localities do not cover the full cost of code enforcement activity. Each municipality may decide whether to increase permit fees or taxes (if needed) to fund the cost of energy inspection. To fully fund the cost of energy code enforcement, increases would be in the range quoted in the previous paragraphs - $50 to $100 for residential permit fees and $500 or more for commercial permit fees.

Advantages and Disadvantages. Local enforcement is the most cost-effective enforcement model because traveling and coordination between building owners and officials are made easier by geographic proximity, energy inspections can be done at the same time that other inspections occur, and notification is simplified when it is done as part of the normal building permit process. If codes are not consistent across the State, local enforcement is virtually mandatory, because the official must be familiar with the unique municipal code. The disadvantage of local enforcement is that small municipalities, often with only one code official, must maintain expertise in a wide range of sometimes complex codes and have limited scheduling flexibility.

B. State Agency Enforcement

Procedures. In the most common form of this model, a state agency supplements (but does not replace) the enforcement functions of local officials. In Maine, this model works effectively for electrical, plumbing, and propane/oil enforcement. State employees carry out three primary functions:

- Provide on-demand information, code interpretation, and training to local enforcement officials. Over the long run, this function may be the most important, because it shifts skill to the local level where enforcement can be done at the least cost.
- Investigate complaints. This procedure ensures that knowledgeable individuals deal with complaints.[17]

[16] A reasonable estimate of a professional engineer's fee is $85-$135 per hour.

[17] Under Maine's electrical inspection model, inspectors require electricians to correct work that is found to be in conflict with electrical codes. Disputes generally do not occur, probably because electricians are licensed, the Electricians Examining Board is active and effective, and training is extensive. In contrast, builders are not licensed and there is not central builders' board. Because of this fact and because enforcement will be new to the State, disputes between builders and inspectors may be frequent and a dispute resolution process must be established by law.

- Inspect upon request. State employees back up towns whose code official does not have adequate expertise or time to perform inspections. This function is most likely to be performed for the more complex commercial buildings, which require specialized expertise. Relatively few residential inspections would occur under this model.

Staffing. The State's electrical inspection procedure is instructive when considering energy code enforcement, in that local inspectors typically inspect residential homes but may request state assistance for commercial inspections, buildings must comply with code even in towns that do not adopt codes,[18] commercial inspection usually requires more than one site visit, and inspectors provide advice and information to local officials. PFR employs five electrical inspectors.[19] Thus, it is reasonable to estimate that a state agency would require five inspectors to perform energy code inspections under this model .[20]

It is worth noting that, whether intended or not, the state agency would serve as the clearinghouse for questions, interpretations, pro-active planning, and dispute resolution regarding the energy codes. As mentioned earlier, there is no single agency in Maine with responsibility for building codes, leaving a significant gap in the State's ability to start up any of these models. Because fulltime coverage is required and tasks include codes research and explanation as well as administrative and legal functions, this function, for energy codes only, would need the equivalent of two to three full-time state employees. It would be performed more cost-effectively if the energy code function were part of a broader codes agency that managed similar functions for all building codes.

Cost. While the level of staffing would clearly depend upon the extent to which municipalities sought assistance from the state inspectors, this report uses the electrical model as a basis for estimates. A staff of five inspectors and three central office employees, including their equipment and housing, would require approximately $960,000 in funding including travel.[21] In addition, the function requires some level of overheads. If this agency performs training, an additional employee is required for that function. Because training is currently being conducted by the SPO, we do not include training cost in the cost estimate of this model.

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[18] This is similar to the situation with commercial building energy codes.
[19] PFR employs two plumbing inspectors and three oil/propane inspectors.
[20] This estimate is reinforced by the fact that, at one time, approximately 1.5 fulltime Central Maine Power Company employees inspected the majority of new commercial construction in the service territory. Thorough code enforcement inspection and follow-up dispute resolution, extended to the entire State, would increase staffing requirements.
[21] As discussed later in this report, these employees need not all be state employees, but could be contracted by the State or could perform the tasks privately. This section considers a model in which the State employs all the people performing the required functions.

Sources of Funding: There are three possible sources of funding for this model:

- Licensing fees. A possible source of funding is licensing fees, which are a significant funding source for the state's electrical, plumbing, and oil/propane inspection functions. However, builders are not licensed, so no licensing fees are available. Architect and engineer license fees could fund the function, although this source would be somewhat inequitable since many homes are built without an architect or engineer. If funded by architects and engineers, license fees would increase by approximately $130 per year, a significant increase.[22]
- Building permit fees. Funding could be obtained through a state permit fee. Builders who use the special inspector would pay the State a cost-based fee. This approach would involve some administrative overhead. The disadvantages of this method are that it increases the cost of construction and it could place some municipalities in the difficult position of providing free (i.e., town-provided) inspections to some building owners but requiring others to pay the State an inspection fee. This disadvantage is removed if permit fees are consistent regardless of the inspection method.
- Maine taxpayers. The State's general fund is a potential funding source.

Advantages and Disadvantages. State enforcement is less cost-effective than local enforcement because traveling and coordination between building owners and officials are made more difficult by distance. In addition, local enforcement may be more timely than waiting for one of a few state employees to schedule a visit to a construction site.[23] If codes are not consistent across the state (as is the case for residential energy codes), state enforcement is more time consuming, since the state official must be familiar with unique municipal codes (although, state enforcement could be limited to only municipalities that have adopted the state code). The advantage of state enforcement is that state inspectors can focus on only one or a few complex areas, avoiding the cost of training every code official in Maine.

A model that combines optional local enforcement with supplemental state enforcement upon request can take advantage of the beneficial features of each. Such a model would be most effective for commercial code enforcement, because commercial codes are complex and consistent statewide. Approximately six states use this model.

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[22] There are approximately 1,300 licensed architects and approximately 6,000 licensed engineers in Maine. The fee increase is calculated by dividing $960,000 by 7,300. Engineers pay a biennial licensing fee of $80.

[23] However, our investigation did not reveal that long wait times occurred or were problematic.

C. Privatization

Procedures. Under this model as practiced in other states, private companies replace or supplement the enforcement functions of local officials. A state agency determines a certification procedure (e.g., passing an International Codes Council course) and maintains a publicly available list of certified individuals and companies. A builder contacts a certified inspector to review plans and perform on-site inspections (or carry out whatever enforcement function is required by the State[24]). The builder pays the private inspector a fee for services. As with the previous model, towns may choose to perform all, some, or no inspections, turning to the private inspectors to perform the remaining work. The bulk of private inspection in Maine would be for commercial construction because it is more complex and because it is required even in municipalities that have no building code officials. In some cases, this model is considered transitional while municipal officials become familiar with newly enacted codes. This model is used in Pennsylvania and Washington.[25]

Private companies would be less active in performing certain functions necessary to ensure effective code enforcement (specifically, providing on-demand information, code interpretation, and training to local officials and complaint investigation).

Staffing. By itself, this model would require minimal time commitment by state or municipal agencies. However, as noted in the previous section, a state agency must retain two employees to carry out a variety of informational and oversight functions and to carry out dispute resolution, and other staff time would be required to some degree.

Cost. A private inspector charges a fee for reviews or inspections that covers the cost of the task plus a reasonable profit. In Pennsylvania, the residential fee ranges from $200 to $800,[26] but covers all code inspections, not just energy codes. As discussed earlier, adding energy code inspection to

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[24] Requiring plan review, on-site construction inspections, and a post-construction inspection would be the most effective approach. However, some states with limited resources require only plan review. These states claim that the plan review stage offers the most effective opportunity to train and interact with builders.

[25] Pennsylvania enacted new mandatory codes within the past year. The private enforcement industry is widespread and active. Towns may "opt out," in which case all inspections are performed by private companies at the expense of the builder, or they may "opt in," in which case local officials enforce, using private companies as a supplement when necessary. Washington has had mandatory codes in place for many years. The private enforcement industry was active in the early years of code enactment, but became less widespread as local officials became knowledgeable in energy codes.

[26] One private company charges $0.10 per sq foot ($200 for a typical moderate home); another charges $545 up to 2500 sq ft and $10 per additional 100 sq feet ($545 for a typical moderate home). It appears that this higher amount is likely to represent a mid-range cost for a moderate home in Pennsylvania.

existing home inspection would add an incremental $50-$100. However, in Maine, privatized inspection is not done for other codes, so a fee would necessarily include the full cost of travel, overhead, and profit. Thus, a fee of at least $200 should be expected for residential homes. In addition, the two to three state employees would require $200,000 to $300,000 in funding, including overhead.

Sources of Funding. The most effective source of funding would be the builder. An alternative would be for the State or the municipality to pay the private inspector's fee. In Pennsylvania, towns that choose to enforce codes locally may contact (and pay) a private inspector when the local official lacks the expertise to perform the inspection.

The state employees required by this model could be funded by one of the three sources described in the state agency enforcement model. An alternative source of funding is a certification fee, paid by the private companies certified to perform review and inspection. To fund $200,000 or more from perhaps 20 private inspection companies would require the collection of $10,000 per year from each company, an amount significantly in excess of typical licensing fees. However, if the inspector collected this amount from 25 buildings, the average cost per building would be $400.

Advantages and Disadvantages. In general, privatization has the advantages and disadvantages of the previous model. It is less cost-effective than local enforcement because travel and coordination between building owners and officials is necessary, it may be less timely than local enforcement (but may be more timely than state enforcement), and it is problematic if codes are not consistent across the state. An advantage of privatized enforcement is that private inspectors can focus on one or a few complex areas, avoiding the cost of training every code official in Maine. Privatization has an advantage over state inspection in that it avoids a level of state infrastructure and cost.

A model that combines optional local enforcement with supplemental privatized enforcement upon request can take advantage of the beneficial features of each. Pennsylvania is the active practitioner of this model.

D. Self-certification to Homeowner

Procedure. Under this model, the builder affixes a sticker in the building, certifying that the building complies with code. In addition, the builder may be required to instruct the owner in the operation of some energy systems and the homeowner may be required to certify that this occurred. Massachusetts requires this certification of instruction. The builder may also be required to send the form to a municipal or a state office, essentially combining this model with the next described in this report.

Cost. There is very little additional cost to this model.

Funding. No additional funding is needed.

Advantages and Disadvantages. Whether this model effectively results in building code compliance is a matter of conjecture. Requiring the homeowner to consciously sign a form related to energy efficiency would cause some home and business owners to be more knowledgeable in their building's operation than would be the case otherwise. In addition, builders would be more likely to comply with codes, knowing that they must certify in writing that they have done so. However, this model does not guarantee compliance or building owner interest.[27] This model has the advantage that it does not cost money. Five or more states use a variation of this model.

E. Self-certification to a State Agency

Procedure. Under this model, the builder sends to a state agency a certification that the building complies with the energy code. The agency often has authority to inspect a building, but typically does so rarely if at all. Vermont uses this enforcement model. A variation of this model is to require that a licensed design professional sign the certification. This variation may be more costly than builder self-certification, and resembles the privatization model described earlier in this report. Massachusetts requires post-construction certification by a variety of licensed professionals.[28]

Cost. If the builder performs the certification, there is virtually no cost to the builder and minimal administrative cost to the agency.

Funding. If the builder performs the certification, no additional funding is required.

Advantages and Disadvantages. As with the previous model, the effectiveness of this model is a matter of conjecture. This model lacks the benefits of including the homeowner in the process. It retains the possible benefit that builders would be more likely to comply with codes, knowing that they must certify in writing that they have done so. However, this benefit is offset if the state agency simply files the certification and takes no follow-up action.[29]

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[27] Discussions with representatives of some states that use this model generally confirm these impressions; however, quantifiable studies have not been performed.

[28] Massachusetts has had mandatory statewide codes for many years, and by law, each municipality must have a code enforcement official.

[29] Maine is an example of this model. Each commercial building owner must certify to the T&D utility that a newly constructed building complies with statutory code; the utility sends the certification form to the Commission (previously to DECD). Anecdotal evidence suggests that many owners do not become aware of the code or the certification requirement until construction has been completed. Furthermore, some utilities do not seek the certification and neither the Commission nor DECD performs any follow-up actions.

The model does not guarantee compliance, but it has the advantage that it does not cost money if the builder performs the certification. It is used in ten or more states. The method is more effective if a licensed individual must provide the certification, because his or her license is jeopardized by false certification. The model also could be improved if a state or municipal agency performed random inspections (and if builders knew this would occur). The Commission is unaware of any state where such inspections occur.

F. Enforcement by Building Owner

Procedure. Under this model, the only means for enforcing building codes is for a building owner to take the builder to court for engaging in unfair and deceptive practices. Typically, very few actions are brought against builders for non-compliance with building codes generally, much less energy efficiency practices.[30] Effort and expense undoubtedly contribute to consumers' lack of interest in this path. An additional approach in Maine would be to use the Attorney General's mediation procedures, which would significantly lower the cost to consumers and builders. Despite the limited use of civil suits in Maine in recent years, public concern regarding unhealthy indoor air quality has heightened, and the building industry expresses active concern that building owner suits related to air quality will increase.

Cost. The cost of this model is comprised of attorney's fees, which could be substantial for both the building owner and the builder. In the event the builder is found guilty, court-ordered restitution could be considerable, because it would cover the cost of repairing damaged buildings.[31] Because few actions are likely against builders, the total cost of this model would probably be small.

Sources of Funding. Costs would be borne primarily by the owners and builders involved in the litigation.

Advantages and Disadvantages. This model is not likely to be effective in causing general, widespread compliance with energy codes because few consumers are likely to risk the expense and effort to bring suit against a builder.[32] To lower the risk to consumers who wish to prosecute a builder, the

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[30] During both 2000 and 2002, we know of two instances when the courts found a builder guilty of unfair and deceptive trade practices. We have no reason to believe these cases involved energy codes. New Hampshire recently has experienced an increase in consumer suits against builders related to energy efficiency, although the number is still small.

[31] In two cases completed in 2002, in which builders were found to have engaged in unfair and deceptive trade practices, the Court ordered one builder to pay restitution of over $220,000 plus plaintiff's attorney fees, and the other builder to pay over $54,000 in restitution, the AG's attorney fees, and $45,000 in civil penalty.

[32] Private actions might be more frequently brought if the Legislature created an express cause of action for the failure of a builder to meet energy code requirements. On the other hand, it is difficult to predict whether such a change might produce frivolous litigation and drive up the costs of construction.

law could be revised to direct that a successful homeowner is compensated for attorney's fees or in excess of damages.

III. SUMMARY OF COMPLIANCE AND ENFORCEMENT METHODS

Advantages and Disadvantages

Enforcement Model	*Description*	*Advantages*	*Disadvantages*
Municipal	Municipal code officials perform plan review and inspection. Code adoption (and thus enforcement) is often voluntary.	- Cost effective – minimizes travel and coordination time. - Allows timely inspection. - Allows municipalities to have unique codes. - If adoption is voluntary, allows local control of costs, procedures, and decisions. - Strong inducement to comply with code.	- Increases costs to municipalities, especially when code is complex and town is small.
State agency	State agency inspectors supplement municipal code officials. Agent is notified by the builder or the town. License and permit fees fund the inspectors.	- Allows inspectors to specialize in complex areas. - Reduces municipal staffing burden, especially in small towns where specializing is not viable. - Strong inducement to comply with code.	- Long-distance travel and coordination adds cost. - Difficulty scheduling. - Requires significant state infrastructure and cost. - Not viable if codes are significantly inconsistent statewide. - Model is weakened if builders not licensed.
Privatization	Private companies, certified by the State, supplement municipal code officials. Private company is most typically contacted and paid by the builder.	- Allows inspectors to specialize in complex areas. - Reduces municipal staffing burden, especially in small towns where specializing is not viable. - Minimizes need for government beauracracy and cost. - Strong inducement to comply with code.	- Long-distance travel and coordination adds cost. - Not viable if codes are significantly inconsistent statewide. - Model is weakened if builders not licensed.
Self-certification to homeowner	Builder provides owner with certification of code compliance and possibly operating instructions.	- Virtually no cost. - Improves efficiency knowledge of building owner.	- Weak inducement to comply with code. - No process oversite.
Self-certification to state agency	Builder submits certification of code compliance to municipality and/or state agency.	- Virtually no cost, unless agency adds an inspection function.	- Weak inducement to comply with code. - Model is weakened if agency takes no action.
Courts	Building owner may take builder to court.	- No municipal or state infrastructure required. - Minimal cost to municipalities or State.	- Costly and cumbersome for building owners. - Extremely weak inducement to comply with code.

Resource Considerations

Enforcement Model	*Cost*	*Staffing*	*Source of Funds*
Municipal	- $50-$100 per home if incremental or $125-$400 if not incremental. If half of new homes are inspected, $150,000 - $1.2M per year. - Significantly higher cost for commercial building inspection.	- For residential codes in towns with a staff already: perhaps no additional staff - For commercial codes in towns with a staff already: will need additional staff or contracted assistance. - For towns with no staff already: significant staff increase.	- Local taxes. - Local permit fees.
State agency	- Approximately $960,000 in state salary and travel.	- 8 state employees.	- Licensing fees. - Permit fees. - State taxes.
Privatization	- $200 per home. - $300,000 in state salary and overhead. - $600,000 in fees to private residential inspectors if half of new homes are inspected. - Significantly higher cost for commercial inspection.	- 3 state employees.	For inspectors: - Fee to builder. For State employees: - Licensing fees. - Permit fees. - State taxes.
Self-certification to homeowner	- Virtually none.	- None.	
Self-certification to state agency	- Minimal if no inspections occur. - $200,000 in state salary and overheads if spot inspections occur.	- Less than one employee unless inspections occur. - If spot inspections occur, 2 state or contracted employees.	- State taxes.
Courts	- Significant for a small number of builders and owners.	- Absorbed by existing AG staff.	- Builder and homeowner attorney fees.

IV. COMPLIANCE AND ENFORCEMENT MODELS IN OTHER STATES

Appendix A displays enforcement models used in other states. In the majority of states, enforcement falls into one of two models – local enforcement or self-certification to a state agency (although recent events in Pennsylvania have highlighted the privatization model). Approximately half the states have mandatory statewide codes, while the remainder maintain a voluntary model similar to Maine's. The vigor with which enforcement occurs varies widely among states.

V. RECOMMENDATIONS

The Commission understands the legislation to ask the Commission for a recommendation. Our recommendation is based on four assumptions:

- Because virtually no commercial energy code enforcement exists today, a new enforcement method that is reasonably, but not perfectly, effective is a step in the right direction.
- Because state and municipal financial resources are limited, a new enforcement method should not increase budgets or staffing significantly.
- Because no central code agency exists within the State to direct the implementation of a new enforcement method, the method should make use of existing processes and infrastructure.
- Municipalities that choose to enforce building codes should continue to be allowed to do so in a manner that they conclude is most effective.

Should the Legislature disagree with any of these assumptions, its conclusion regarding the most effective enforcement method would differ from ours. For example, if funding and staffing increases are viable options, the two models described in the report as the State Enforcement model and the Privatization model are workable, effective approaches.

A. Recommendation: Hybrid Municipal and Professional Certification. The goal of this proposal is to ensure a reasonable likelihood of commercial code compliance while minimizing the costs and changes to procedures required by municipalities, the State, and the building community. Its effectiveness relies on the knowledge and the ethical standards maintained by design professionals (licensed architects and engineers). Under this hybrid proposal, enforcement would be done through one of two alternative methods – municipal enforcement or professional certification.

Municipal Enforcement Alternative. Each municipality would choose whether and how to enforce building energy codes for residential and commercial construction within its boundaries, as it does now. A municipality would determine the documents it requires for submission and the extent of on-

site inspection.[33] Thus, this recommendation would not change the procedures followed now by municipalities that choose to enforce energy codes.

Alternative for Residential Buildings. In municipalities that chose not to enforce residential energy codes, there would be no statutory energy code enforcement procedures for construction of residential one- and two-family dwellings, farms, unoccupied structures, single-story buildings of less than 1,000 square feet, and alterations with value less than 15% of the assessed building value or $50,000.[34] The adoption of residential energy codes is voluntary,[35] and enforcement would be performed only voluntarily at the municipal level.

Alternative for Commercial Buildings - Professional Certification. For all other construction (i.e., construction of commercial buildings that are not "small" or unoccupied) that is not enforced locally, a licensed design professional – either a professional engineer (PE) or an architect -- would perform two actions that together give reasonable likelihood of compliance:

- Pre-construction. Before construction could begin, the design professional would submit stamped plans that show compliance with energy codes.
- Post-construction. After construction is complete, the design professional would submit certification that the building complies with energy codes.[36]

This would not significantly affect design procedures, because Maine law requires that architectural design and engineering activities be performed by licensed architects or PEs respectively.[37] Design submission is currently required in many Maine towns and is a reasonable action to require of a professional.

In some cases this proposal would require design professionals to observe the construction or installation of buildings or systems to a greater extent than they do now, in order to guarantee that results conform with codes and

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[33] For commercial construction, at a minimum, municipal enforcement should require that a builder develop a pre-construction plan that shows code compliance and that a knowledgeable individual perform site inspections adequate to observe energy efficient construction.
[34] These limitations, including more specific details about each, are contained in 32 M.R.S.A. § 226(2), which states that a person may not be prevented from preparing technical design submissions for construction of these types.
[35] As stated earlier, Maine has not yet adopted energy codes. However, the Energy Code Act requires that residential codes be voluntary.
[36] On its face, it appears to make sense that the design professional certify that the building complies with *all* codes and laws, as is required in Massachusetts. However, this report is confined to energy code.
[37] 32 M.R.S.A. § 220 and § 1351

practices embodied in the design. Based on our investigation, requiring this additional oversight or verification by design professionals is reasonable. Post-construction certification is already required in some Maine towns and in many states - most notably in Massachusetts, where the PE, the architect, and the electrician must all certify that a building is constructed to code.

Furthermore, state law currently requires a commercial building owner to certify code compliance to the local T&D utility.[38] Requiring the design professional, rather than the owner, to submit the certification improves upon the current requirement because it avoids the current situation in which building owners (who may rarely construct a new building) are unaware of the requirement until after construction is complete.

In municipalities that so chose, the pre-construction design and the post-construction certification would be submitted to the code enforcement officer before the municipality would grant a building and an occupancy permit respectively. In all other municipalities and in unorganized territories, the appropriate entity to receive these two documents is problematic. To avoid new State infrastructure and procedures, we do not recommend that they be sent to a State agency. Rather, the documents would be submitted to the local electric utility, which would not provide temporary or final electricity until obtaining the pre-construction design or compliance certification respectively. The Commission would provide oversight regarding utilities' compliance with this requirement, eliminating the current erratic implementation of the law.

The model would require the architect and PE (if any) associated with the building to determine whether the certification should be done by the architect, the PE, or both. These individuals are professionally able to make this determination.[39]

The recommendation does not require the municipal official or the T&D utility to review the design plan or judge the validity of the certification. It simply requires them to recognize the presence of a design professional's stamp. As mentioned earlier in this report, interaction between a code official and the building designer at the planning stage is the most effective means of improving code compliance in a state. However, our recommendation seeks to avoid additional cost, and thus does not include a requirement for substantive plan or certification review.

For the same reason, the recommendation requires no follow-up monitoring or inspections. Because design professionals are licensed, it is likely

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[38] 10 M.R.S.A. § 1415-H. Currently, many building owners and some utilities are not complying with this law, and the state agencies referred to in the law (the Commission and DECD) are not monitoring the process.

[39] For example, functions associated with space heating and air conditioning might be engineering, whereas functions associated with insulation might be architectural.

that they will follow appropriate procedures. A citizen that employs a professional may lodge a complaint with the appropriate licensing board and the board will investigate and take corrective action if appropriate.[40]

B. Variation on the Recommendation: Private Third-party Inspection. The post-construction certification requirement in the recommendation discussed above could be altered. Rather than requiring the design professional to submit certification of compliance, the enforcement method could require private third-party certification. Pennsylvania uses this enforcement model. This variation would add a level of insurance that code compliance occurs, but would also add the cost of additional state employees to oversee the program.

Under this variation, a state agency would certify private individuals as special inspectors based on successful attendance of state-approved energy code training. The builder would contact a certified private inspector, who would provide the compliance certification (a municipality that adopts energy codes could also choose to require private third-party verification). The certified private inspector would perform on-site inspections as often as necessary to determine that codes are met.

This model requires a state agency to employ two or three new full-time employees to oversee certification and training, coordinate code interpretation, and carry out dispute resolution.[41] Funding for the state employees would best be provided through a permit fee paid by each building owner that uses the services of a private inspector.[42]

As discussed earlier, it is unclear which state agency should house the certification function. PFR appears to be the most appropriate choice because it houses architect and professional engineer licensing functions. However, certifying and overseeing private inspectors who are not licensed through statute and developing dispute resolution procedures are not entirely consistent with PFR's procedures for licensed professions.

C. Training. Neither the recommended model nor its variation would require that the design professional receive formal training in energy codes.

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[40] The architect and engineering boards do not proactively inspect their members' work, but do have complaint procedures.

[41] Under Maine's electrical inspection model, inspectors require electricians to correct work that is found to be in conflict with electrical codes. Disputes generally do not occur, probably because electricians are licensed, the Electricians Examining Board is active and effective, and training is extensive. Because commercial energy code enforcement would be new to the State, disputes between builders and inspectors may be frequent and a dispute resolution process must be established and funded.

[42] An annual cost of $200,000 including overheads, paid by, say, twenty private inspectors, would cost each inspector $10,000 annually. Collected from, say, 25 buildings each, would cost $400 per building on average.

However, for a year or more after this method is enacted, the SPO and the professional boards (and perhaps other state agencies such as the Commission) must increase proactive outreach to design professionals and increase the frequency and availability of energy code training. This would require funding, some of which might be available from federal and regional sources. Training should place strong emphasis on using the RES*Check* and COM*Check* software tools,[43] because these tools are effective in ensuring that a building is code compliant.

VI. CONCLUSION

Residential energy codes are currently enforced by municipal code officials in Maine towns that have voluntarily adopted energy codes. This enforcement method is not overly costly for a municipality and is likely to continue as an effective enforcement method.

However, enforcement of Maine's mandatory commercial energy codes is virtually non-existent. It would not be so easily absorbed by municipal code offices, and many municipalities do not have code officials at all. Thus, an enforcement model must be implemented that results in compliance with Maine's commercial energy codes.

This report describes six commonly used enforcement models. They vary from more effective (and more costly) to less effective but easier and less costly to implement. Each model could be implemented in combination with voluntary municipal enforcement. Enforcement beyond the municipal level could be done by state special inspectors, private special inspectors, or licensed design professionals.

The report recommends an enforcement approach that relies upon the knowledge and professional ethics of design professionals (licensed architects and professional engineers). The proposal would continue to allow municipal enforcement in municipalities that choose to do so. In other communities, the proposal would require design professionals to submit stamped pre-construction plans and post-construction certification to ensure code compliance. These documents would be submitted to the local code officer (if the municipality so chose) or to the local T&D utility. The documents would not be reviewed except to ensure that they had been submitted by a design professional and that the building was certified as compliant. This recommendation would minimize increases in cost to the State, municipalities, and the building community.

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[43] RES*Check* and COM*Check* are PC-based tools developed by the U.S. Department of Energy and used extensively throughout the country to determine that a building complies with a state's energy codes.

The report presents a variation that would add mandatory private third-party certification to the process. The variation would add cost but might be more effective.

Regardless of the method chosen by the Legislature, the current method of enforcing the State's mandatory commercial energy codes appears to be ineffective and should be replaced. More effective enforcement will help ensure that the energy and cost savings of energy code compliant buildings are achieved in Maine.

Appendix A
Building Energy Code Enforcement in Other States

State	Mandatory/Vol.	Compliance	Enforcement	If Known, Responsible State Agency
AL	Res: Voluntary - city may adopt or not	Design review and inspection by local official - part of normal permit process	Local	
	State-owned: Mandatory	AL Bldg Commission reviews plans	Designer works with AL Bldg Comm	Alabama Building Commission
Alaska	State-financed res'l: Mandatory	Standardized form submitted with mortgage application. Certification & inspection done by: 1) registered architect, engineer, or ICBO certified building inspector, 2) state-approved home energy rating methods, 3) local building code official when local energy code at least as stringent as the BEES requirements, or 4) builder who has taken the appropriate Building Science Training.	Local bldg officials, banks, or Alaska Housing Finance Corp	
	State-owned: Mandatory			
AZ	Res: Voluntary - city may adopt or not	Determined by the city	Local	
	Com: Voluntary - city may adopt or not	Determined by the city	Local	
	State-owned: Mandatory			
ARK	Res & Com: Voluntary - city may adopt or not	Self-certification by builder whether or not city adopts codes. Sticker afixed in bldg.	If city adopts code: Normal inspection process. If city does not adopt code: state enforcement staff makes spot inspections	Seems to be Arkansas Energy Office
CA	Res & Com: Mandatory - cities can adopt more-stringent code		Local officials review plans during permit process and inspect before occupancy	
	State-owned: Mandatory		Dept of General Services	
CO	Hotels, motels, multi-family: Mandatory or city can adopt its own	Determined by the city	Local	
	State-owned: City determines	Determined by the city	Local	
	Res: Seems to be voluntary - city may adopt or not	Determined by the city	Local	
	Commercial: No state-determined codes	Determined by the city	Local	
CT	Res'l & Com'l - Mandatory		State-owned bldgs: State building inspector and codes & standards	Codes and Standards Committee maintains codes.
DE	Res'l & Comm'l: Mandatory; cities may revise	Determined by city or county	Certification by licensed architect/engineer (& alternatives)	
	Agricultural bldg - exempt			
	State-owned: size exemptions			Dept of Administrative Services
DC	Res'l & Com'l - Mandatory			DC Dept of Consumer & Regulatory Affairs
FL	Res'l & Com'l - Mandatory	Owner certifies to local officials during permitting process. Local officials submit to Dept of Community Affairs quarterly	Local officials may inspect	FL Building Commission maintains codes
GA	Res'l & Com'l - Mandatory	Architect/engineer certifies to city or city inspects - city determines method.	Local officials if town chooses to enforce. Town may choose not to enforce.	GA Dept of Community Affairs maintains codes
HA	All buildings - Mandatory in some counties, not others	Architect/engineer certifies to city. Varies. State bldgs overseen by State department.		
	Agricultural bldgs, air conditioned bldgs, industrial process bldgs (somewhat complex & varies) - exempt			
Idaho	Res'l & Comm'l: Mandatory; cities may revise	Contractors certifies to owner (& local officials if town chooses to enforce). May have to provide plans as well as after-the-fact certification.		
IL	State- or town-owned - mandatory under directive			
	Res'l and comm'l - appear to be no codes			

Appendix A Continued
Building Energy Code Enforcement in Other States

IND	Res'l & Comm'l: Mandatory; cities may revise	Architect/engineer certifies to Dept of Bldg/Fire Svc for all except 1- and 2-family residences. Architects may have to submit plans of 1- and 2-family residences to city.	IN Dept of Building and Fire Services	IN Dept of Building and Fire Services
	Agricultural - exempt			
Iowa	Res'l & Comm'l: Mandatory; cities may adopt more stringent codes	Bldgs over a certain size, architect/engineer certifies to Bldg Code Bureau. Otherwise, none. Some cities set own procedures	Local and IO Building Code Bureau	IO Building Code Bureau maintains codes
KA	Res'l & Com'l - Mandatory	Comply or disclose. Architect/engineer certifies to owner of res'l bldgs.	No local or state enforcement. Consumer must litigate.	
KEN	Res'l & Comm'l - Mandatory; minor alternatives	Design review and inspection by local official - part of normal permit process	Local or KE Dept of Housing, Bldgs & Construction	KE Dept of Housing, Bldgs, & Construction maintains codes
LA	Com'l and 3-story-or-less res'l: mandatory	Architect/engineer sends plans and final certification to Office of State Fire Marshall.	Of. Of St. Fire Marshall sends letter of approval	LA Office of State Fire Marshall maintains codes
	> 3-story res'l - city chooses its own code			
	State-owned bldgs - Mandatory	Div. Of Admin determines		LA Div. Of Administration
ME	Com'l - Mandatory	Some cities inspect as part of normal permitting procedures. Building owner certifies to utility.	DECD	
	Res'l spec built - Mandatory until 2005. Single-family homes built by owner, log cabins - currently none			
MD	Res'l & Com'l - Mandatory; cities may modify	If city adopts code, contractor certifies to city. If city does not adopt, arch/eng certifies to utility	Local inspection if city adopts code. Utility inspection if city does not.	
MA	Res'l & Com'l - Mandatory	Design review and inspection by local official - part of normal permit process. Design professionals certify compliance. Each town has code official.	Local	MA Board of Building Regulations Standards maintains code
MICH	Res'l & Com'l - Mandatory	Design review and inspection by local official - part of normal permit process	Local	
MINN	Res'l & Com'l - Mandatory for large towns, voluntary for small towns	If city adopts code, contractor certifies submits plans and certification to city. City inspects.	Local	Local. MI Dept of Administration, Bldg Codes & Standards Divison maintains codes
MISS	Res: Voluntary - city may adopt or not	Design review and inspection by local official - part of normal permit process	Local	
	State-owned, public, highrises: Mandatory	State-owned or -funded: designer works with B of B. High rises: local	Bureau of Buildings for state-owned or -funded	
Missouri	State-owned res'l or comm'l - Mandatory.	Designer works with Div. Of Design & Construction	Div. Of Design & Construction	State-owned bldgs: Div. Of Design and Construction
	All other bldgs - no statewide codes; city may adopt its own	Local	Local	
MONT	Res'l & Com'l - Voluntary	Contractor puts sticker in home. In addition: if town adopts, locals determine process. Not clear what happens if town does not adopt.	Local or MO Building Codes Bureau	MO Building Codes Bureau
NEB	Res'l & Com'l - Voluntary	Determined by the city	Local officials	
NEV	Res: Voluntary	City or county determines	Local	
	State-owned: Mandatory	Registered designer certifies to PWB	Nev Public Wks Bd	NEV Public Works Board
NH	Res'l & Comm'l - Mandatory; cities may adopt more stringent	Plans and certification of complaince sent to local official if one exists, or to PUC.		PUC maintains codes
NJ	Res'l & Com'l - Mandatory; cities may not modify	Design review and inspection by local official - part of normal permit process	Locally, official licensed by Bureau of Codes and Standards. If no local official, Dept of Community Affairs	
NMex	Res'l & Com'l - Mandatory; cities may adopt more stringent	Local officials if they exist. If no local official, CID.	Construction Industries Division	
NY	Res'l & Com'l - Mandatory	Normal permit process - contractor submits plans and local official inspects. If no local official, not clear what is required.	Local or NY Dept of State	State Energy Office

Appendix A Continued
Building Energy Code Enforcement in Other States

NC	Res'l & Com'l - Mandatory	Design review and inspection by local official - part of normal permit process	Local. NC Commissioner of Insurance oversees process statewide	NC State Building Code Council maintains codes
NDak	Res'l & Com'l - Voluntary. Cities may adopt or not	City determines.	Local	ND Div. Of Community Service maintains codes
	State-owned - Mandatory	Overseen by agency building the building	Agency building	
Ohio	Res'l & Com'l - Mandatory	Local officials review plans and inspect bldg. If no local official, OH Dept of Commerce Div of Industrial Compliance reviews and inspects com'l bldgs; no inspection of res'l bldgs.	Local or OH Dept of Com. Div. Of Ind. Compliance. OH Bd of Bldg Standards certifies local officials to enforce codes	OH Board of Building Standards maintains codes
OK	Res'l & Com'l - Voluntary. Cities may adopt state's code or other code.			
	State-owned - Mandatory	Dept of Central Svcs reviews plans and inspects bldgs	Dept. of Central Services	Fire marshalls appear to
OR	Res'l & Com'l - Mandatory. More stringent than ASHRAE.	Plans and certification of complaince sent to city or county official if one exists, or the State	City or county, or Bldg Codes Div.	OR Building Codes Division maintains codes
PA	Res'l & Com'l - Mandatory. Cities cannot modify	Privatized inspection and certification. Town opts in and inspect locally, or town opts out and builders obtain private inspectors.		PA Dept of Labor & Industry and PA Dept of Community & Econ Devt maintain codes
RI	Res'l & Com'l - Mandatory.	Design review and inspection by local official - part of normal permit process		RI Building Codes Standards Committee maintains codes
	State-owned - Mandatory	State Building Commissioner certifies	State Building Commisioner	
SC	Res'l & Com'l - Voluntary	Local officials review plans and inspect bldg. If no local official, fire or other local official may act as enforcement officer	Local	SC Residential Builders Commission maintains codes
SDak	None. Cities may adopt their own	City determines.	Local	
Tenn	Res'l - Voluntary	City determines. Plan review and inspection in some cities; self-certification by designer in other cities.	Local. If not adopted, there is no enforcement	
	Com'l - Voluntary			
Tex	Res'l & Com'l - Voluntary	City determines. Usually plan review and inspection.	Local	
	State-owned - Mandatory	Designer certifies to State agency	State agency	
Utah	Res'l & Com'l - Mandatory. Cities may revise	City determines.	Local	Uniform Building Code Commission maintains codes
	State-owned - Mandatory		Div of Occupational and Professional Licensing	
VT	Res'l - Mandatory.	Regional District Environmental Commissions determine. Designer self-certifies, must afix certification in the bldg and send to DPS	District Env. Commissions	VT Dept of Public Service and Efficiency VT active in determining codes
	Com'l - Voluntary	Uncertain		
VA	Res'l & Com'l - Mandatory.	Design review and inspection by local official - part of normal permit process.		VA Board of Housing and Community Development maintains codes
	State-owned - Mandatory	Dept of General Service conducts plan reviews and inspections		
WA	Res'l and Com'l - Mandatory	Design review and building inspection, done by city or county. Also, privatized inspectors.	WA Association of Building Officials certifies local com'l building inspectors	State Building Code Council maintains codes
WVir	Res'l and Com'l - Voluntary	Design review and inspection by local officials if town adopts. Otherwise, not clear whether there's enforcement.	Local or State Fire Marshalls (not clear what SFMs do)	State Fire Marshalls maintain codes
WI	Res'l and Com'l - Mandatory	Design review and inspection by local officials if town adopts. Otherwise, Dept of Commerce inspects.	Dept of Commerce licenses private inspectors for res'l rental units	WI Dept of Commerce maintains codes
WY	Res'l and Com'l - "Voluntary. Citites may adopt or not, or may adopt stricter codes	Design review and inspection by local officials if town adopts. Otherwise, Dept of Commerce inspects.	Local	WY Dept of Fire Protection and Safety maintains codes

Notes:

1. Many states have a state agency that does enforcement if no local officials exist. However, it is usually not clear exactly what the state agency does - e.g., whether the state agency receives plans or inspects.
2. The term "mandatory" and "voluntary" are used inconsistently. Almost all states have codes that must be accepted if a town accepts any code. However, many state have "voluntary" codes that a town may choose not to adopt.
   And, many states have "mandatory" codes and make provisions for towns that don't have enforcement agencies.
3. Data appears to be up-to-date through 2001-2002 for some states, older for others.