Federal Preemption as a Barrier to Cost Savings and High-Performance Buildings in Local Energy Codes

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History & Context

Roughly 80% of U.S. building energy consumption is associated with end-use categories, such as mechanical equipment and appliances, covered by federal appliance standards[1]. Appliance standards have helped the nation achieve significant energy savings by ensuring that these products regulated for energy efficiency reflect technology improvements and market conditions. When Congress enacted the National Appliance Energy Conservation Act (NAECA) in 1987 to set national standards, they also disallowed states and other jurisdictions from setting their own more stringent standards on these same products. These products are generally known as "covered products." The most often stated reason for federal preemption is that it avoids an unworkable fifty-state patchwork of standards[2]. The Energy Policy and Conservation Act (EPCA) of 1975 extended preemption to certain HVAC and hot water equipment.

Relationship to Energy Codes and Standards

Due to federal preemption, the national model codes are pre-empted from setting a more stringent national appliance and equipment standard than is promulgated by the federal government, or in the instance of certain "covered product," promulgated by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE). For items like boilers and rooftop air conditioners, this means that the International Code Council (ICC) and the states or cities who adopt any energy code whatsoever are strictly limited in how much efficiency they can achieve in those covered products that are regulated by their codes. NAECA states, "No State regulation, or revision thereof, concerning the energy efficiency, energy use, or water use of a product covered by a federal efficiency standard shall be effective with respect of such covered product".

The size of energy savings from appliance standards is significant. A fact sheet from the US Department of Energy (DOE) estimates that current appliance standards will, on a cumulative basis, save more than 130 quads of energy through 2030, reducing energy bills for Americans by nearly $2 trillion[3]. This size of savings hints at the additional savings that are not being realized and passed on to consumers because state and local entities are preempted from including more stringent appliance requirements in local energy codes.

1 Alex Chase et al, *Federal Appliance Standards Should be the Floor, Not the Ceiling: Strategies for Innovative State Codes & Standards,* (ACEEE 2012)
2 Ibid
3 US Department of Energy, *Savings Energy and Money with Appliance and Equipment Standards in the United States*, https://energy.gov/sites/prod/files/2017/01/f34/Appliance and Equipment Standards Fact Sheet-011917_0.pdf (accessed May 12th 2017)

Jurisdictions and Federal Preemption

Regulation of most components of a building energy code are left to the states and cities. Alexandra Klass explored this exception to federalism as it is applied to building codes for this set of equipment and appliance standards in a 2010 publication[4]:

> *While this top-down, federal approach may result in more uniformity, many of the DOE efficiency standards for appliances are extremely out of date, resulting in a situation where there is no regulatory incentive for industry to increase energy efficiency and extremely limited tools for the states to use more stringent energy efficiency standards as part of green building efforts. Granting states the right to innovate in this area can result in optimal energy efficiency standards for appliances without producing an unworkable fifty-state patchwork of regulation.*

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Preemption has served as a barrier in many jurisdictions, keeping them from enacting building codes that are consistent with their other policies, such as climate action plans. Especially in large cities, where the City Energy Project estimates that the building sector can represent up to 75% of all energy consumption, the preemption barrier is increasingly encountered when considered against climate goals. Two recent court cases tested the limits of the preemption provision of NAECA. These cases, brought by the Air Conditioning, Heating and Refrigeration Institute (AHRI) against the city of Albuquerque and the state of Washington, respectively, have helped define the parameters local energy codes can use in regulating HVAC equipment.

The Washington State example is illustrative. Washington has a statutory requirement that *"the 2013 state energy code must achieve a 70 percent reduction in annual net energy consumption (compared to the 2006 state energy code)".* To help analyze how Washington might achieve these statutory goals, a "Washington State Energy Code Roadmap" was developed in 2015[5]. Regarding preemption, it states:

> *While the issue of multiple regulations may have been valid for the industry, the outcome (of preemption) has been an on-going resistance to updates to these requirements that would lead to higher efficiency requirements, and active legal battles by industry organizations to prevent individual states and jurisdictions from adopting efficiency upgrades. The industry continues to defend this preemption, precluding even modest improvements in heating equipment efficiency requirements in states and cities across the country. This preemption represents a significant barrier to achieving the performance goals that Washington has set for code stringency increases.*

4 Alexandra Klass, "State Standards for Nationwide Products Revisited: Federalism, Green Building Codes, and Appliance Efficiency Standards," *Harvard Environmental Law Review,* Vol. 34 (2010): 349

5 Mark Frankel and Jim Edelson, *Washington State Energy Code Roadmap,* (New Buildings Institute 2015)

Pathways to Confusion

EPCA allows local and state codes to require more efficient equipment, as long as the code includes at least one combination of measures which includes covered products that do not exceed the federally mandated minimums, many

national and local codes have been utilizing these pathways. Thus, several local and state codes utilize legal mechanisms that cite higher efficiency levels for covered equipment while also providing at least one option for using the covered equipment levels in a compliance path. These mechanisms, now being written into local codes across the country, take into account this lowest-common-denominator approach to accommodate preemption. The four options have been defined and are summarized as follows[6]:

Dual-Path
In a "Dual Path" approach, a building would have to install at least one of two required options for compliance. (Not currently in use, but has been discussed/ proposed)

Multi-Path
In a "Multi-Path" approach, in order to comply, a building would have multiple (more than two) paths to compliance (e.g. Oregon's "pick 1 of 7 requirements" menu approach for its residential energy code).

Alternate Renewables Approach
The "Alternate Renewables Approach" would require a certain amount of renewable energy, which could be reduced only if other premium efficiency design options and federally covered equipment were installed (such as in ASHRAE 189.1).

Market Based Incentives
Market Based Incentives (MBI) is another building code concept which has been discussed as a strategy to circumvent federal preemption laws. An MBI code, similar to the State of Washington's "additional residential energy efficiency requirements" or Leadership in Energy and Environmental Design (LEED), would be based on a point system where each building (or a comprehensive requirement for the building) required a certain number of points to comply.

Three multi-path code approaches, plus one voluntary approach, offer limited headroom for states and jurisdictions who want to significantly advance energy efficiency in the building sector and stay within the purview of federal statutes. This situation also has resulted in less user-friendly codes. With multiple code pathways in play, it can be difficult for design teams to know which pathway best suits their project and what the basic requirements are, and for code officials to ensure code compliance. It has also resulted in a scenario where it can be difficult to quantify code stringency levels due to the fact that not all pathways deliver comparable energy savings.

6 Chad Worth and Michael McGaraghan, *Overcoming Preemption: Strategies for Pushing Beyond Federal Equipment in California,* (Energy Solutions 2013)

The Cost Burden of Federal Preemption

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The net result of setting a maximum national efficiency threshold for mechanical equipment is that it is has forced states with aggressive emissions reduction and energy performance targets to seek energy savings from options that are in some cases less cost-effective. Setting more stringent building envelope requirements, for example, can undoubtedly save energy but the cost associated with requiring more efficient windows and walls can come at a premium when considered on a per square foot basis. Further adding to the cost burden is the issue of diminishing returns when you consider the fact that preemption has prevented minimum mechanical equipment efficiencies from keeping pace with those in the envelope and lighting chapters of code.

Two Codes – Scenario Development

An ASHRAE report[7] released in 2015 focuses on the range of energy savings that might be realized if designers and builders utilized the most efficient technology available in newly constructed buildings. Using the highest efficiency technology currently available, or that could be "reasonably expected to be available by 2030 by at least two manufacturers," the analysis concluded that the reduction in site energy consumption across climates zones and building types was 48% when using an ASHRAE 90.1 2013 baseline. The report goes on to identify the top ten measures that made the largest impact on site energy reduction which included nine measures that apply to HVAC equipment. Of the ten listed measures, seven included "covered" equipment, meaning that a majority of the measures that have the greatest potential to help jurisdictions achieve 40% or more energy savings are not available because they are regulated at the federal level.

By combining an energy savings analysis derived from computer modeling with costing data, we are able to estimate and compare the costs associated for two scenarios. The two scenarios compared the cost of including, and not including, covered equipment in achieving a beyond code energy savings target for a medium sized office building located in the Northwest. The energy simulations analyzed measures published in the Advanced Buildings (AB) *New Construction Guide*[8]. The cost data was compiled by Skanska Building USA for discrete measures in AB[9] and for measures proposed to 2015 Washington State energy code[10].

Scenario One:

Scenario One energy saving features included a highly efficient envelope design, reduced lighting power density levels with optimized daylighting and controls, and a high-efficiency supply of hot water. But these features were required to compensate for heating and cooling equipment comprised of 2012 code level rooftop units (RTUs). Given these parameters, the measure analysis projectedwhole building energy savings in the range of 10%–15% beyond a 2012 IECC baseline. The incremental cost for this collection of building measures in the Northwest was about 6.20 $/ft^2.

7 Jason Glazer, *Development of Maximum Technically Achievable Energy Targets for Commercial Buildings*, (ASHRAE 2015)

8 Sean Denniston et al, *New Construction Guide* (New Buildings Institute 2013)

9 Sean Denniston and Steve Clem, *Technical Document: Incremental Cost Impact Study of Tier 2 of the Advanced Buildings New Construction Guide*, (New Buildings Institute 2014)

10 Washington State Building Code Council, *Final cost-benefit analysis WAC 51-11R & WAC 51-11CC 2015 Washington State Energy Code*, https://fortress.wa.gov/ga/apps/sbcc/Page.aspx?nid=215 (accessed May 15 2017)

	Scenario1		Scenario 2	
	Details	Incremental Costs	Details	Incremental Costs
Envelope	Enhanced insulation levels, window performance and air barrier test	$1.82	Code Level	$ –
Lighting & Controls	Low LPD (0.67) and enhanced daylighting and controls	$3.88	Code Level	$ –
Hot Water System	Energy Star	$0.50	Code Level	$ –
HVAC	Code level RTU	$ –	VRF	$4.53
Total Incremental Cost	$6.20		$4.53	
Whole Building Savings Estimate	10%–15%		10%–15%	

Table 1: Incremental Cost Comparison of a Medium Sized Office Building in the Northwest

Without the limitations of preemption, the prescriptive path of code compliance would yield an approach to delivering projects at an energy-saving target that could be more cost-effective.

Scenario Two:

The second scenario we examined featured the same prototypical medium sized office building located in the Northwest with standard code level envelope components, lighting systems and service hot water but swapped out the code level RTU with an efficient, variable capacity heat pump that exceeded federally preempted efficiency levels. Energy analysis on this approach, as defined by the Advanced Buildings *New Construction Guide*[11], projected whole building energy savings in the 10%–15% range—similar to the range of energy savings observed for the combination of measures described in scenario one.

The estimated incremental cost of this measure for a medium sized office building was between 4.50 and 5.00 $/ft^2, depending on the configuration of the system.

Two Codes–Challenges and Costs

While there are a myriad of variables and design factors that can ultimately impact potential energy savings associated with a building project and the range of construction costs, the examination of these two different scenarios highlights the economic impact of preempting heating and cooling equipment regulation as states, cities, and jurisdictions strive to reduce the energy consumption associated with their building stock. Without the limitations of preemption, the prescriptive path of code compliance would yield an approach to delivering projects at an energy-saving target that could be more cost-effective. Moving to lift this barrier also would provide policy makers the opportunity to provide additional paths to meeting energy and carbon reduction goals.

11 Sean Denniston et al, *New Construction Guide* (New Buildings Institute 2013)

Preemption as a Barrier in High-Performance and Zero Net Energy Building Policies

Proportion of Building Energy Use at Issue

A very large percentage of building energy use is directly derived from covered equipment. An analysis done by Chase et al[12] estimated that 78% of energy use in residences and 59% of energy use in commercial buildings was used by equipment fully preempted by federal standards. They estimated an additional 14% of energy use in residences and 33% of energy use in commercial buildings was used by equipment partially preempted by federal standards.

The periodic commercial and residential building surveys for the Northwest region provide corroborating detail. An analysis (Figure 2) of the northwest data published in the Washington Roadmap found that in this relatively moderate climatic region, up to 65% of commercial building energy (plugs + hot water + heating + cooling + ventilation) is used by equipment that is preempted by federal standards[13].

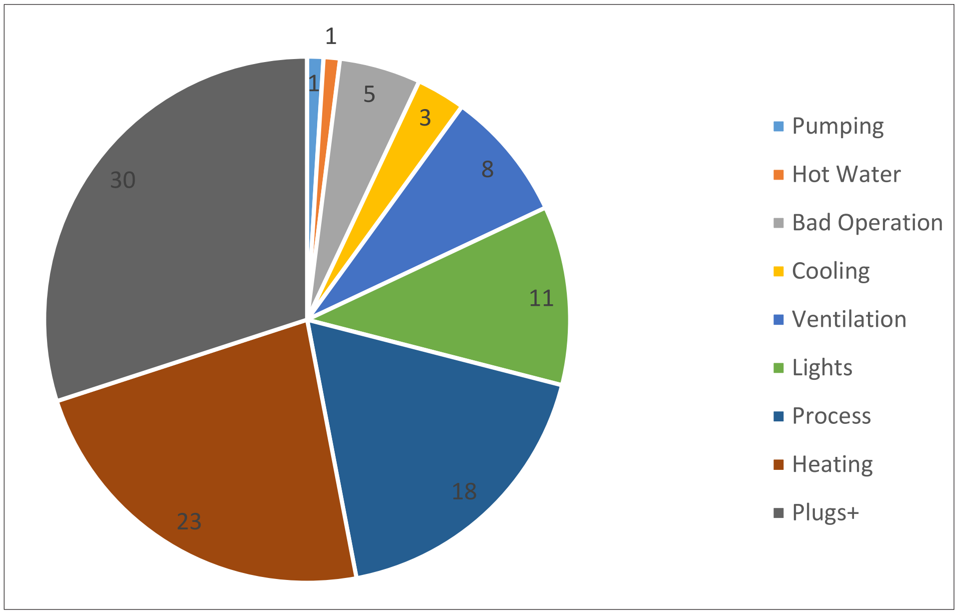

Figure 1: Combined end use energy across building type and population

Nationally, the percentage of energy used by pre-empted equipment in 2011 was 78% in residences and 59% in commercial buildings. The greater percentage in residences is due to their greater use of appliances that are plugged into receptacles. However, energy codes and associated policies need to address all energy use in buildings as city and state policies drive towards zero net energy (ZNE) goals.

Service Water Heating and Preemption

The impact of preemption is not limited to HVAC equipment and electricity consumption. Potential natural gas savings are likewise limited in local energy codes because nearly all natural gas-using equipment is preempted. This is especially prevalent with water heating equipment. Analysis conducted by the Pacific Northwest National Lab (PNNL) reveals that a building built to ASHRAE 90.1-2013 standards will spend the same amount of money on water heating as one built to

12 Chase et al, *Federal Appliance Standards Should be the Floor, Not the Ceiling* (ACEEE 2012)
13 Frankel and Edelson, *Washington State Energy Code Roadmap,* (New Buildings Institute 2015)

ASHRAE 90.1-2004 standards, primarily due to federal preemption. Even though more efficient condensing and other technologies are widely used in the industry for water heating, preemption prevents cities and states ensuring their building stock is employing this equipment. As demonstrated in Figure 2, this issue results in an especially costly end use for restaurants, apartment buildings and hotels as very little progress has been made between the 2004 and 2013 savings levels.

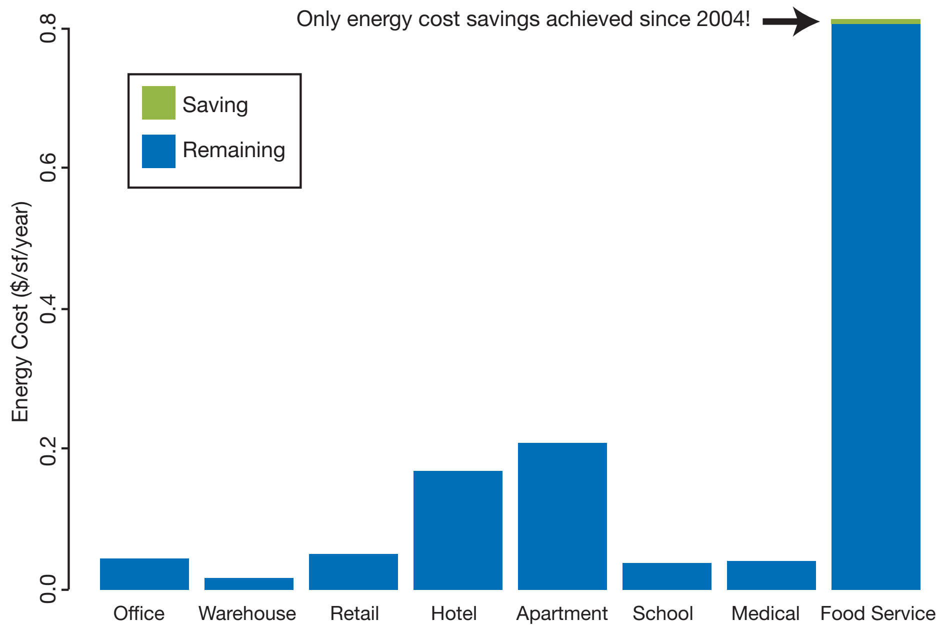

Figure 2: Service hot water: 90.1-2013 vs 90.1-2004; US energy cost[14]

Biased Metrics for Single Components Exacerbate the Preemption Constraint

The metrics specified by federal preemption for mechanical equipment focus predominately on equipment efficiencies (EER, SEER, IEER, AFUE, COP etc.) and don't take into account the performance of the entire system. These metrics are less than perfect given that most of these pieces of equipment will be operating in conditions other than those used to measure efficiency ratings, which will significantly impact their ability to deliver the efficiency levels that they claim. For example, EER is simply the unit power consumption (in Watts) versus the output of cooling (in Btu/h) at a single point during a test performed in a lab. There are numerous variables in the field that can impact efficiency that are not addressed. Additionally, these metrics do not create a level playing field for comparing the performance of different pieces of equipment available in the market place. A single metric that does not necessarily account for the distribution system (i.e. air, refrigerant or water) to which it is attached, or its typical operating conditions, when combined with preempted efficiency requirements leave local codes even farther from achieving performance requirements. To the extent that metrics used to set standards do not reflect actual performance, codes that cite these standards exacerbate the preemption problem by creating sub-optimal equipment and system selection criteria.

14 R. Hart and Y. Xie, End-Use Opportunity Analysis from Progress Indicator Results for ASHRAE Standard 90.1-2013

Zero Energy Building Barriers

The size of the Zero Net Energy building market is expanding rapidly. New Buildings Institute has documented 394 commercial buildings in the United States that, as of September 2016, are either ZNE - Verified, ZNE - Emerging, or Ultra-Low Energy performers[15]. The Net-Zero Energy Coalition has identified more than 3,000 Zero Net Energy (ZNE) or ZNE-ready homes and residential buildings in the United States that collectively contain more than 6,000 housing units[16]. More and more private entities are offering zero energy construction specifications in both the residential and commercial markets. The Department of Energy's Zero Energy Ready home program is very popular and making inroads into the market. The non-profit organization Earth Advantage regularly certifies Zero Energy and Zero Energy Ready residential and multifamily buildings.

At the same time, more and more governments are enacting aggressive climate goals to mitigate emissions contributing to climate change. These climate action plans, in one form or another, cite the need to work towards zero net energy goals in their municipal and general building stocks to meet their climate goals. While many jurisdictions have set goals to meet the ZNE building objectives, only a limited number of jurisdictions have set statutory dates for ZNE codes. And only a few cities have begun mandating ZNE codes for new construction.

The savings from ZNE Codes can be huge. Nadel estimates that if 80% of new construction nationwide is built to ZNE code specifications in 2030, there would be 50% more emissions reduction than with an acceleration in the Corporate Average Fuel Economy (CAFÉ) standards for light-duty vehicles to 70 miles per gallon by 2040[17]. This means that ZNE building policies provide a greater opportunity for the nation to reduce emissions than the most aggressive single action in the transportation sector.

As more states and jurisdictions consider ZNE regulatory practices as a way to make communities less dependent on fossil fuels and to improve their local economies, the preemption of covered equipment that already limits the flexibility of code development becomes further exacerbated the closer a code gets to prescribing ZNE. Figure 3 from the Pacific Northwest National Lab[18] shows how little progress has been made in reducing the energy use from heating and cooling equipment covered by energy codes relative to other end-uses because such equipment is preempted by federal regulations. The graph also illustrates how progress in commercial building codes to ZNE will be most constrained by these two components of the building design.

Our current path to the development of ZNE building codes is constrained by the inability of energy codes to ensure that the more efficient equipment in the marketplace can be required in construction.

16 New Buildings Institute, *2016 List of Zero Net Energy Buildings*, http://newbuildings.org/wp-content/uploads/2016/10/GTZ_2016_List.pdf (accessed May 19, 2017)

17 Net-Zero Energy Coalition, To Zero and Beyond, http://netzeroenergycoalition.com/wp-content/uploads/2015/04/20150105_nzec_zero_energy_homes_report_booklet_fnl_02.pdf (accessed May 19, 2017)

18 Pacific Northwest National Lab, *ASHRAE 90.1 End Use Opportunity Analysis* (PNNL 2014)

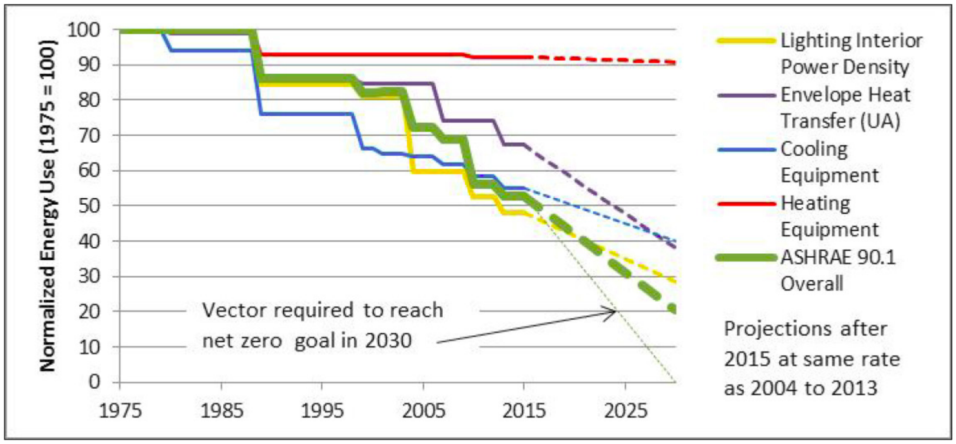

Figure 3: ASHRAE 90.1 End Use Opportunity Analysis

Exploring Solutions and a Path Forward

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As communities meet local employment and environmental needs by targeting reductions in building related energy usage, it quickly becomes apparent that states and policy makers need every tool available to them. Building energy codes are a key policy tools and need to be able to evolve in step with the policy goals of jurisdictions while also providing communities avenues for increased innovation in the design and construction markets. The following pathways provide some guidance for these leading communities. Strategies 1 and 2 are taken from Klass[19] and we added strategies 3 and 4.

Multi-State Standards

One option would be to build on the idea of state collaboration. States, usually led by California, have already followed a pattern to set uniform appliance standards for products not yet covered by federal standards. These standards help create uniformity rather than a fifty-state "patchwork". A cooperative approach by multiple states, or a joint petition to the Secretary of Energy pursuant to provisions in EPCA, could lead to agreement with trade industry groups to establish a single level of more efficiency equipment for covered equipment that could be cited in local codes.

A "Technology Ratchet/Top Runner" Approach

Another option is to adopt a system similar to that in Japan and Australia where, instead of using a "technical/economic" balancing test as required under EPCA, standards are set based on the highest level of efficiency achieved in the market to date. For instance, in 1998 Japan introduced a new philosophy toward appliance efficiency standards as a strategy to help meet the greenhouse gas reduction goals specified in the Kyoto Protocol. The Top Runner Program was introduced as an energy conservation measure to establish efficiency standards for machinery, equipment and other items.

Japan will continue its Top Runner Program, under which the government sets the efficiency of the most efficient product in a given category as the standard. Manufacturers and importers are required to comply with the new standard within three to ten years. As of 2015, the Program covered 31 categories of products[20].

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19 A. Klass, "State Standards for Nationwide Products Revisited," *Harvard Environmental Law Review,* Vol. 34 (2010): 349

Uniform "Stretch Efficiency Levels" in the United States

There are several examples of countries that have taken a best-on-market approach to setting efficiency standards that could offer insights into what this might look like and what the relative magnitude of impact might be on manufactures. Sticking domestically to the U.S, one such best-in-class case is the alternate HVAC tables in appendix b of ASHRAE 189.1-2014. These tables will be likely revised every 3 years, including for ASHRAE 189.1-2017. The preferred alternative would be a national agreement among jurisdictions and industry that would allow local codes to adopt these uniform, but more advanced, efficiency levels for equipment. Alternatively, these advanced levels could be made available on a locale-by-locale basis with a waiver from the Secretary of Energy.

There is also a precedent of Air-Conditioning, Heating, and Refrigeration Institute (AHRI) and ASHRAE supporting two national levels of minimum EERs in national standards. In ASHRAE Standard 90.1 from 1999 through 2007, there were two sets of minimum efficiency tables for heat pumps and other unitary equipment. One set of requirements required the use of an economizer while the other more stringent set of requirements did not. The ASHRAE 90.1 Committee could consider incorporating the "advanced" tables in a normative appendix and be cited as an alternative for local adoption.

System-Based Metrics (e.g. Singapore)

It has long been an objective of many interested parties to find a way to set efficiency performance on a system basis rather than on a component or "widget-by-widget" basis. This approach seems most ready to be applied to interior lighting systems, for which the energy code has an increasingly complicated number of provisions to account for control strategies. One performance metric for lighting in offices based on measured performance has been proposed by (NBI)[21] which could largely simplify compliance and enforcement in energy codes, especially with regards to what are now very complex lighting control requirements.

The variety and complexity of HVAC systems also makes it amenable but challenging to come to workable and consistent systems metrics. A recent effort by the Alliance to Save Energy to examine the metrics for HVAC systems included over 30 recommendations for next steps to further develop systems metrics[22]. Regarding other system metrics, they recommended:**Recommendation 4-7.1: DOE** should continue its support for building energy code development and implementation, and should focus specifically on opportunities for systems energy efficiency to be included in the model codes.

> **Recommendation 4-7.2: DOE** should work with ASHRAE and with state and local code setting and enforcement officials to promote use of the multiple new performance rating methods available under the ASHRAE Standard 90.1 Appendix G alternative compliance pathway and other building codes, to encourage systems-efficient building design and construction.

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20 Ministry of Economy, Trade and Industry Agency for Natural Resource and Energy, *Top Runner Program,* http://www.enecho.meti.go.jp/category/saving_and_new/saving/data/toprunner2015e.pdf (accessed May 19, 2017)

21 Cortese, A. Et al, *Establishing a Data Collection Methodology, Common Metrics and the Lighting Energy Code Comparison for Lighting Control Systems Research* (NBI 2012)

22 Alliance to Save Energy, *Systems Efficiency Roadmap* (ASE, 2017)

One example of an HVAC system metric that has been vetted is Singapore's Building Control Regulations that include mandatory audit reports of chilled water plants. The Green Mark System sets a rating level for these plants, and there are a series of adopted protocols to monitor and report performance. The performance requirements for the entire chilled water system are set at a single kW per ton target performance level. The target depends on the size of the system (greater or less than 500 tons). As stated in the Regulation, "The kW includes all chiller, condenser, and chilled water pumping, cooling tower fans and other power related to the chilled water system"[23].

Singapore also provides one example of a system-based *outcomes* approach. Much has been written about whole building outcome-based approaches to energy codes[24]. A whole-building outcomes approach again will provide an important mechanism that will not have to address individual component regulations. The outcome-based regulations will provide maximum flexibility in building design and will allow local and state codes to avoid the limits on equipment regulation put on them by preemptive federal standards.

Conclusion

Preemption places a hard limit on how far prescriptive codes can go to meet community and state goals, including climate action plans and ZNE targets for new buildings in the most cost-effective manner.

The Congressional Acts that created the current federal preemption of HVAC equipment, EPCA and NAECA, are now 30-40 years old respectively and need common sense reform. EPCA's preemption provisions never envisioned a country that had so many of its states and jurisdictions seeking to achieve climate goals, in part through steadily more efficient energy codes. Each one of these local codes processes is running headlong into federal preemption of covered equipment—whether on the component or the system level. As steady increases are realized in the code provisions for lighting and envelope systems, the code bodies find themselves hamstrung in their ability to require that less energy be used to deliver either conditioned air or conditioned water. Preemption places a hard limit on how far prescriptive codes can go to meet community and state goals, including climate action plans and ZNE targets for new buildings in the most cost-effective manner. This unfortunate convergence of a 40-year-old law not keeping up with the innovations in the HVAC and water heating industries is creating unintended costs to consumers and local governments to accommodate the least efficient types of systems in energy codes. Energy codes could be simplified with actions by ASHRAE, the Secretary of Energy, or multiple jurisdictions that address the markets as they are today, rather than as they were 40 years ago. Without those actions, much of the energy savings that are delivered by today's innovative HVAC and water heating products cannot be realized in local and state energy codes.

This paper suggests some regulatory and research paths to allow states and cities to begin fully applying this innovation to their climate action goals. Given the significant energy and cost saving opportunities identified, now is the time to act and bring sensible reform to these outdated policies.

23 Lee Eng Lock et al, *Improving Commercial Building Energy Performance* (ASHRAE Journal, vol. 58, no.11 2016)
24 Mark Frankel et al, *Getting to Outcome-Based Building Performance* (NBI 2015)

New Buildings Institute (NBI) is a nonprofit organization driving better energy performance in commercial buildings. We work collaboratively with industry market players—governments, utilities, energy efficiency advocates and building professionals—to promote advanced design practices, innovative technologies, public policies and programs that improve energy efficiency. We also develop and offer guidance and tools to support the design and construction of energy efficient buildings.

Throughout its 20-year history, NBI has become a trusted and independent resource helping to drive buildings that are better for people and the environment. Our theory of change includes setting a vision and defining a path forward. We then set out to create the research that serves as the basis for tool and policy development necessary to create market change. Learn more at newbuildings.org

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