



Minimum Energy Standards for Rented Properties

An International Review

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Executive Summary

This report provides an overview of key regulatory policies, particularly minimum energy standards, that have been used internationally to require energy efficiency improvements to rented properties.

Determining the most effective set of policies to significantly improve the existing building stock is a key challenge for energy policy makers around the world. One strategy to address existing buildings is to understand “triggers,” or certain points in an existing building’s life cycle, where there might be other capital improvements to be made, or an opportunity where other types of building regulations are in place and energy efficiency requirements can be added at the same time. The times when there is a change of tenants or some other major occupancy change, is an obvious opportunity to trigger building renovation.

A significant portion of existing commercial and residential buildings are occupied and used by persons other than the building owner, and rented by the building occupants. In some jurisdictions, rental properties are a significant portion of the building stock, for both residential and commercial building occupancies. In many cases, rented properties also house a large portion of lower income residents, and sometimes relative to owner-occupied housing, rental properties are poor quality, insecure, and unaffordable to a large portion of the tenants; high energy costs can add to the affordability challenge.

There are a variety of policies that could be considered minimum energy standards, though our analysis indicates that it is useful to group them based on how those standards are set: **Performance standards** focus on the overall energy efficiency or carbon intensity of the building, while **prescriptive standards** tend to require very specific minimum levels of insulation or other building equipment which will improve the energy efficiency or carbon intensity of the building. In contrast, **minimum housing quality standards** focus more generally on improving minimum quality standards of the rental unit for residential tenants, and often include prescriptive energy standards as one component of a broader set of regulations.

This report catalogs case study policies that have been adopted in jurisdictions around the world in these categories. Many of these policies have either just been implemented or have just been designed and enacted, so the compliance date is still several years away. As a result, there is minimal data available to show how effective these policies are in demonstrably reducing energy consumption in rental buildings. Without this data, it is challenging to discern the effectiveness of these policies overall or to assess these different approaches on a comparative basis. That said, the table below summarizes the benefits and challenges of the three approaches based on experience to date.

Type of Policy	Benefits	Challenges
Performance Standards	<ul style="list-style-type: none"> • Results in all covered buildings attaining a specific energy performance level • Provides flexibility to building owners to identify the energy efficiency measures that make the most sense for that specific building • Potentially easier compliance checking and enforcement 	<ul style="list-style-type: none"> • Ensuring that performance standard accurately assesses actual level of energy performance • Low value real estate may have significant challenges meeting the standard without financial assistance • Could create a considerable burden on low income housing without adequate funding
Prescriptive Standards	<ul style="list-style-type: none"> • Creates a minimum level of energy performance in the building 	<ul style="list-style-type: none"> • Prescribed measures may not move the needle on actual energy performance in many buildings, minimizing policy impact
Minimum Housing Quality Standards	<ul style="list-style-type: none"> • Provides for a minimum level of rental unit conditions • Improves tenant health and comfort 	<ul style="list-style-type: none"> • Does not maximize energy or carbon savings • Does not address the savings that might be harnessed in the whole building (outside of tenant spaces) • May result in increased energy use from new equipment and services

Some of the more basic prescriptive efficiency policies have been in place in some US jurisdictions for many years. The first of the newer building performance policies are just now beginning their early years for compliance, and not enough is yet known about how the variety of these policies will play out with the most ambitious having compliance deadlines several years still into the future. The policy category of minimum housing quality standards is a subset of a much broader set of regulations aimed at improving overall rental housing quality and comfort conditions, though even with very efficient new equipment, the much-improved comfort conditions may actually result in higher energy consumption.

This variation in different policy types will ultimately be useful to compare, though realistically, with the current situation of compliance periods starting a few years from now, it will be several years before realistic policy effectiveness evaluation and comparison of relative success can be measured.

Some elements of the policies reviewed seem to appear successful, including:

- Market signaling that is impacting the lender community policies, as in the Netherlands;
- Extensive stakeholder outreach to consider industry needs and links to capital planning cycles;

- Programs that include specific triggers and specific metrics that enable better enforcement; and,
- Complementary programs that offer technical advice and financial incentives.

With the significant growth of new policies in the past two to five years, and increased urgency with climate policies, it is likely that there will be additional new policies enacted and implemented in the near future. Identifying and refining policies to improve the energy performance of rental buildings is likely to continue to evolve as data emerge that help to identify best practices.

Introduction

Background, Purpose of Report

This report provides an overview of key regulatory policies, particularly minimum energy standards, that have been used internationally to require energy efficiency improvements to rented properties.

There has been significant progress in recent years in improving the energy efficiency of new buildings, driven by technological improvements and government policy, and there is beginning to be a critical mass of very low energy buildings or even zero energy buildings in various regions of the world. However, there are a large percentage of existing buildings that are significantly less efficient than new construction, and have major opportunities for improvement. Determining the most effective set of policies to significantly improve the existing building stock is a key challenge for energy policy makers around the world.

One strategy to address existing buildings is to understand “triggers,” or certain points in an existing building’s life cycle, where there might be other capital improvements to be made, or an opportunity where other types of building regulations beyond energy are in place and energy efficiency requirements can be added at the same time, sometimes at a lower cost than if they were implemented in isolation. Moreover, integrating energy efficiency measures into larger capital retrofits reduces the administrative work involved in financing such projects.

An obvious opportunity in any building life cycle (after its initial construction and occupancy) is when the building goes through some sort of significant renovation or remodeling. In 2017, an international review of regulatory policies aimed toward existing building energy efficiency renovation was conducted (IPEEC 2017) and found four major policy instruments aimed towards existing building energy efficiency renovation:

- Performance based renovation targets and requirements;
- Building energy codes/standards applied to existing buildings;
- Mandatory energy performance disclosure, sometimes linked to upgrade requirements; and,
- Voluntary standards that become mandatory with financing from certain sources.

In addition, the times when a building is sold, or when there is a change of tenants or some other major occupancy change, is an obvious opportunity to trigger building renovation.

Why Policies for Rented Buildings?

A significant portion of existing commercial and residential buildings are occupied and used by persons other than the building owner, and rented by the building occupants. In some jurisdictions, rental properties are a significant portion of the building stock, for both residential and commercial building occupancies. In some European countries, privately rented units account for around 30% or more of all dwellings, and as much as 50% of commercial properties (Economidou 2014). In large US cities, rental properties comprise about 50% of the residential building stock (Petersen and Lalit 2018).

In many cases, rented properties also house a large portion of lower income residents, and sometimes relative to owner-occupied housing, rental properties are poor quality, insecure, and unaffordable to a large portion of the tenants. High energy costs can add to the affordability challenge, driving fuel poverty concerns where a substantial portion of income might go to energy costs (to the detriment of other needs such as medicine, food and transport), and some residents do not have adequate energy services.

Lower quality housing can bring on other challenges, exacerbating other social issues. A large body of research has established that inadequate housing, predominantly with poor physical characteristics, is associated with worse mental and physical outcomes (Singh et.al. 2019). Effective policies that improve the energy efficiency of rental housing can help toward more general improvement of the quality of the property. Some of these concerns are addressed through broader social housing policies, particularly throughout Europe, where there are many requirements for housing quality including energy services. Also, in many northern climates with cold winters, many rental housing blocks are served by district heating systems, providing at least some minimal heat quality to those rental units.

Addressing energy efficiency in rental properties is made more challenging due to the “split incentive” situation.¹ In many rental properties, tenants are responsible for paying the utility bill while the owner is responsible for capital investments. This arrangement creates a disincentive for the building owner to invest in energy efficiency upgrades, because only the tenant will see the benefits of lower energy bills and increased thermal comfort. The owner wants to minimize capital costs and investment while maximizing rental revenues, and generally has no incentive to invest in measures that could improve the energy efficiency.

Addressing the Split Incentive: Differentiating “Standards” from Voluntary Policies

There are a number of approaches to overcoming the split incentive challenge, with both policies and various informational and contractual initiatives. One type of approach that has received a lot of attention, with some significant success in Australia and the US, is a “Green Lease,” a contractual approach where some

1. The split incentive issue, more formally known as the “principle-agent problem,” has been well documented with much literature investigating potential solutions (IEA 2007, Economidou 2014).

additional clauses can be added to traditional rental/leasing language to provide for the management and improvement of the energy or environmental performance of space within a building. This approach is generally used in commercial buildings, and while generally a voluntary approach, can be required by governments or other major occupiers, with some minimum energy performance as a condition for being considered an acceptable space for that occupier.

Another approach is some form of Energy Performance Disclosure, either voluntary or mandatory. This approach began in Europe through the Energy Performance of Buildings Directive, initially introduced in 2002, which requires that all buildings have “Energy Performance Certificates” as a way to communicate energy performance to various market participants. These requirements are often required of all buildings above a certain size, including those that are rented to third parties. Related performance disclosure, and energy rating and labeling systems, have been developed in many countries around the world, and mandatory performance disclosure is required in a growing number of countries and sub-national jurisdictions.

It seems that mandatory energy performance disclosure is providing some incentive for landlords to improve energy efficiency as there is some evidence that properties with higher energy efficiency ratings can command higher rents (Fuerst and Adan 2020). However, it is not known if this correlation is widely known or accepted by landlords and whether it is changing their attitudes and/or behavior to a significant extent.

In addition, a variety of jurisdictions around the world have developed policies that require some minimum energy performance improvements in rented properties, often at the time of turnover of tenants in the rented space. Several municipalities and countries have developed rental property minimum energy standards, and they are being considered in other regions of the world. These mandatory regulatory minimum energy standards for rented properties are the focus of this report though the other policies outlined above can serve as important complementary policies.

Research Process, and Organization of Remainder of Report

The information in this report is based on a review of relevant reports prepared on the subject of rented property energy efficiency policies, as well as interviews with a variety of both governmental and non-governmental building energy efficiency experts. Information and data sources were reviewed to understand the current state of policy activity aimed at improving energy standards for both residential and commercial rented properties, evaluation of policy effectiveness and any challenges identified during implementation.

The next section of this report details the different types of minimum energy standards and reviews international experience with the implementation of such standards. The remainder of the report focuses on lessons learned from this experience and challenges that remain to be overcome.

Policies Currently in Place

There are a variety of policies that could be considered minimum energy standards, based on the findings from the literature review and discussions with experts. However, there are many nuances to these policies and our analysis indicates that it is useful to group them based on how those standards are set. The policies implemented to date fall into three major policy types: performance standards, prescriptive standards, and “minimum housing quality” standards. **Performance standards** focus on the overall energy efficiency or carbon intensity of the building, while **prescriptive standards** tend to require very specific minimum levels of insulation or other building equipment which will improve the energy efficiency or carbon intensity of the building. In contrast, **minimum housing quality standards** focus more generally on improving minimum quality standards of the rental unit for residential tenants, and often include prescriptive energy standards as one component of a broader set of regulations.

We discuss each of these categories in the following subsections along with the examples found in our international policy review. These case studies include a summary of the policy, and any key complementary policies and results, depending on what information is publicly available. Note that several of the minimum energy standards have only been introduced in the last couple of years, or are in the process of being implemented. For those examples we summarize only the policies as enacted. The case studies in each of the subsections are presented in order of their initial implementation date.

For many of these policies, specific information about requirements and results have been adapted from two recent reports from the American Council for an Energy Efficient Economy and the Regulatory Assistance Project, where research was being conducted concurrently with the preparation of this report (Nadel and Hinge 2020, and Sunderland and Santini 2020a). Where not otherwise noted, those reports provide foundational information to this document.

Performance Standards

While prescriptive standards establish certain minimum requirements for elements of the building, such as insulation levels or appliance or heating/air-conditioning efficiency levels, performance standards attempt to go beyond just individual building components to address overall building energy performance. The performance may be based on the “asset” rating of a building (modeled, or calculated, and more common for residential buildings), or on the “operational” energy use in the building, as measured by actual building energy consumption, the more common standard in commercial buildings. In other cases, performance can be assessed based on the carbon intensity of the building.

Boulder, Colorado USA

Policy summary. In 2010, the Boulder City Council approved the “SmartRegs” regulation, requiring that all rental housing (including single family homes and apartment buildings) in the city demonstrate that they are as energy and water efficient as buildings built to Boulder’s 1999 Energy Code. Boulder already required rental properties to obtain and renew a license every four years for health and safety measures, and the energy efficiency requirements were incorporated into that process. The city gives property owners two rental license cycles (eight years in total) to bring their units into compliance, thus the SmartRegs became fully effective starting at the beginning of 2019.

Building owners can demonstrate compliance by: (1) achieving a score of 120 or better through the Home Energy Rating Score (HERS), a nationwide rating system, or (2) achieving at least 100 points on a prescriptive scoring checklist the City of Boulder developed based on energy and carbon savings for specific measures. Inspections are done by private inspectors certified by the City. The cost of an inspection is around US\$120 per rental unit inspected.

Complementary policies and programs. The City of Boulder provides additional technical and financial resources above what the local utility provides to support such regulations. For example, Boulder’s EnergySmart program provides technical assistance, help with selecting contractors for energy efficiency improvements, and additional financial incentives. EnergySmart is mostly financed by Boulder County (which taxes electricity consumption to help fund its climate action programs).

Results. By the end of 2019, about 22,500 units of the total 22,700 licensed rental units had achieved compliance, with just over 200 units not yet compliant.¹ Nearly all licensed rental units were inspected using the prescriptive checklist. The units needing upgrades required two measures on average to reach the required 100 points. The most common required cost-effective upgrades were: attic, crawlspace and wall insulation, which cost on average US\$3,022 per unit, and US\$579 of which was paid by rebates on average, resulting in about US\$2,500 per unit cost to the building owner.

Boulder officials state that they are satisfied with the program: it has achieved energy savings and emissions reductions and improved rental stock quality. As of the end of 2018, the City estimated the program had cumulatively saved since the program launch about 1.9 million kWh of electricity, 460,000 therms of natural gas, US\$520,000 in energy costs and 3,900 metric tons of carbon dioxide.

England and Wales

Policy summary. England and Wales have regulated a minimum energy performance standard of rental properties since April 2018 using the building’s Energy Performance Certificate (EPC) rating as the standard’s metric. The EPC in the UK

1. Most recent compliance statistics at: https://www-static.bouldercolorado.gov/docs/2019_RHL_Smart_Regs_Stats_for_web-1-202001230915.pdf

ranks buildings from an “A” (best performing) to a “G” (worst performing) based on the calculated energy performance for that building. The Energy Efficiency (Private Rented Property) Regulations which were passed in 2015 and updated in 2017 require that all commercial and residential rented buildings are required to be improved to an EPC rating of at least “E” starting in April 2018. The regulations initially targeted buildings at time of a new, renewed or extended lease but applies to all rented residential buildings starting April 2020 and all rented commercial buildings as of April 2023, meaning that after those dates, properties with an “F” or “G” rating cannot rent out units without improving their energy performance.

The regulations do provide for many exemptions, which include but are not limited to:

- Residential building owners do not have to spend more than £3,500 (about US\$4,500) per apartment unit.
- Commercial building owners will be limited to investing in measures that have a payback of seven years or less.
- If the building owner has invested funds that meet those thresholds and property cannot improve to an EPC rating of “E,” the building owner is required to submit an “all improvements made” exemption with the government which is valid for five years.

In 2019, the UK government began a consultation process to understand how to transition the commercial building standards more quickly to help them meet their economy wide carbon targets. The government’s proposal was to require all commercial buildings achieve an EPC rating of “B” by 2030. The consultation closed January 2020 and no regulations have been issued or updated as of the writing of this report.

Complementary policies and programs. The government attempted to introduce a pay-as-you save finance initiative called Green Deal Finance, which was intended along with other subsidies, to make compliance with the standard possible at no upfront costs to the building owner. However, the Green Deal Finance initiative was not successful, so there has not been the additional financial support that was anticipated. There is funding for low income households through the Energy Efficiency Obligation though it is limited to high cost measures. In addition, some subsidies may be available on a piecemeal basis through individual local authorities.

Results. A recent analysis of the program to date (Sayce and Hussein, 2020) indicated that the industry welcomed the minimum standards and they were not overly burdensome. However, the improvements required under the standard were viewed as quite easy for the residential sector to pass (or manipulate) and as a result it was not expected that the minimum standards would result in any major changes in the efficiency of the units. Indeed, the broad takeaway was

that the minimum standards were more impactful in terms of raising awareness and educating the lender and valuation community to start to pay attention to building energy performance. However, in a recent review of the policy (RSM 2019) for the government, a number of measures were identified to improve enforcement and impact.

Netherlands

Policy summary. In 2018, the Dutch government enacted the Environmental Management Activities Decree, mandating that as of January 1, 2023, all office buildings (including many buildings with rental units) in the Netherlands will be required to have an energy label of “C” or better. This applies to buildings with an electricity consumption of 50,000 kWh/year or more or an annual gas consumption of 25,000 m³. It is estimated that this will impact approximately 38% of all registered office buildings that must be upgraded by 2023 to meet the new requirement (IGBC 2019a). In addition, it is expected that the regulation will tighten over time; requiring all office buildings to have an energy label of “A” by 2030.

In addition to these mandates on office property, another environmental decree (the Activities Decree) mandates that commercial properties implement a set of energy saving measures. It has the same thresholds as the Environmental Management Activities Decree outlined above and requires that these buildings implement all energy saving measures that have a payback of five years or less (deSnoo et. al. 2019).

Complementary policies and programs. There are several support mechanisms in place for the office minimum standards requirement. The Netherlands Enterprise Agency offers technical support, which includes an online tool that estimates the cost and anticipated payback for the measures to meet the standard. The government also provides a list of qualified service providers and building owners can get subsidies if they install measures. There are also tax incentives to provide additional economic support for investing in energy efficiency as well as loans at discounted interest rates.

Results. While the compliance date of the Dutch policy is not until 2023, there has been movement within the commercial real estate market already. Most importantly, major Dutch lenders have stopped lending to office buildings that do not have a rating of C or above.

Scotland

Scotland has approved regulations very similar to the England and Wales rental housing standard discussed previously. The Scottish regulations apply only to residential rented properties (as compared to England and Wales where the policy applied to all rental buildings) and they would require a minimum standard of “E” for rental homes at change of tenancy starting in 2020.²

2. April 2020 had been the original deadline, then was extended to October 2020 due to delays in

In 2022, the policy would apply to all rented homes, which are supposed to achieve a minimum standard of “D” at change in tenancy and the policy would apply to all privately rented homes starting in 2025. Scotland has a grant program for lower income households (which they call homes in fuel poverty), several energy efficiency loan programs, and a technical assistance program, to help households comply with the proposed standards.

Emerging “Building Performance Standards” in US Cities

In addition to the minimum energy performance policies outlined above, it bears noting that several US cities have passed what are commonly referred to as “Building Performance Standards,” which set a minimum energy performance level for buildings, usually above a certain size threshold (usually at least 25,000 square feet (2,320 square meters), but sometimes starting at 50,000 square feet (4,650 square meters)). While these policies do not explicitly target rental properties, they do include rental properties that meet or exceed the size threshold and covered building typologies.

All of these policies have been passed in the last couple of years and all cities are still in the process of developing the implementation guidelines. The standard being used varies widely from a score using an operational energy rating/benchmarking program such as Energy Star Portfolio Manager to a median energy utilization index to a carbon-based metric. Effective implementation of these requirements have initial compliance dates in the mid-2020s. US cities with such policies include Reno, Nevada; New York City; St. Louis, Missouri; and Washington, DC (summary information on the two most advanced programs – New York City and Washington, DC – is included in the tables at the end of this section and the Appendix, and more detailed information about these and other building performance policies can be found in Nadel and Hinge 2020).

Prescriptive Standards

In contrast to performance standards, prescriptive standards identify specific minimum standards such as insulation levels or appliance efficiency levels that are intended to improve the efficiency of the building. These types of minimum performance standards, all targeting residential rented properties, are the ones that have been in place the longest (such as in Burlington, Vermont and Berkeley, California in the US). Several jurisdictions, which have had these policies in effect for some period of time, are now attempting to integrate additional elements into these standards, such as more frequent triggers, expanded requirements, or additional rental tenant protection.

finalizing the regulations, though now are further postponed because of the COVID crisis.

Berkeley, California USA

Policy summary. The City of Berkeley's Residential Energy Conservation Ordinance (RECO), passed in 1982, is triggered at the time of sale, as well as at the time of a major renovation valued at US\$50,000 or more. The RECO was most recently updated in 2008. It requires installation of a prescriptive set of 11 basic energy and water saving measures, such as faucet aerators, water-efficient shower heads, duct sealing, weather stripping, attic insulation, and high-efficiency lighting in common areas of multifamily buildings. The Berkeley RECO has a cost cap. Building owners do not need to spend more than:

- • 0.75% of the final property sales price
- • US\$0.50 per square foot when any one structure with three or more housing units is sold; or
- • 1% of renovation costs when a property is undergoing a renovation of \$50,000 or more.

In 2014, Berkeley adopted a broader building energy savings ordinance, requiring energy information and disclosure for all buildings (not just rental properties), and repealed the RECO policy upon adoption of that broader ordinance.³

Complementary policies and programs. The City of Berkeley publishes a detailed RECO guide, which specifies that the measures pay for themselves and that many of them are “do-it-yourself.” For the DIY items, the guide provides directions for specific directions for the homeowner to follow. The guide also provides information to existing rebates and subsidies to cover the cost of some of the items.

Results. While Berkeley does not currently analyze the impact of this program any longer, given that it has been in place for so long and has now been superseded by a broader ordinance, past analysis indicates that it is impactful and cost-effective. For example, a C-40 case study determined that the policy “reduced residential energy consumption by over 13 percent, annually reduced CO₂ emissions by over 5,000 tons and allowed households to save up to US\$450 dollars on their energy bills.”⁴

Burlington, Vermont USA

Policy summary. Burlington, VT adopted its Residential Rental Housing Time of Sale Energy Efficiency Ordinance in 1997, because it realized that these

3. See Recommendation to Replace the RECO with an Updated Building Energy Saving Ordinance at https://www.cityofberkeley.info/uploadedFiles/Rent_Stabilization_Board/Level_3_-_General/5.a._Recommend.%20to%20replace%20RECO%20and%20CECO%20with%20BESO_from%20Energy%20Comm..pdf The new Building Energy Saving Ordinance can be found as Chapter 19.81 of the Berkeley Municipal Code at <https://www.codepublishing.com/CA/Berkeley/?Berkeley03/Berkeley0324/Berkeley0324.html>

4. https://www.c40.org/case_studies/berkeleys-building-standards-mandate-increases-efficiency-and-pays-back-householders-in-two-years

properties were inefficient and did not have enough insulation. The policy only applies to apartments where the tenants are responsible for directly paying the heating costs and is triggered at time of sale.

The ordinance requires certain energy upgrade measures at the time a residential building with rental units is sold. The standard includes certain required actions such as insulated exterior walls, insulated attics and other areas, multiple-glazed windows or storm windows and the sealing of large holes and gaps. The standard also strongly recommends but does not mandate that all heating equipment and appliances be inspected within 12 months of contract transfer. The total cost of the required energy improvements must not exceed three percent of the sale price or US\$1,300 per rental unit, whichever is less. In addition, the ordinance only mandates installation of measures with a simple payback of seven years or less. The average cost of the energy upgrades is estimated at approximately US\$650-\$750 per apartment and who pays for the work is negotiated between the buyer and seller of the building.

Burlington is currently considering changing the ordinance so that it would not just be triggered at time of sale, but rather be applied to all buildings, which would be evaluated on a cycle of one to five years. The city is also increasing the cost cap on the program to enable more cost-effective energy efficiency implementation.

Complementary policies and programs. The Burlington Electric Department (BED), the local electricity supplier, administers the program and provides a list of recommended contractors and additional advice. If building owners take on investments beyond the minimum ordinance requirements, BED offers optional technical assistance and financing that help property owners take advantage of these additional savings.

Energy as Part of Minimum Housing Quality Standards

Finally, the third category of minimum performance standards focuses more on setting minimum overall standards of housing quality and comfort. Energy efficiency standards can be applied to residential buildings as part of a broader housing quality improvement policy, and while the minimum requirements contain elements that will improve energy efficiency, that is not their primary goal.

As noted in the Introduction, rented properties often house a large portion of lower income residents, and can be poor quality, insecure, and unaffordable to a large portion of the tenants. Lower quality housing can bring on other challenges, including mental and physical health issues, exacerbating other social challenges. Analysis has shown that poor housing conditions have a measurable and statistically significant impact on self-assessed mental, physical and general health (Baker et al 2016). Numerous jurisdictions have policies in place that require minimum housing quality, and some of these include energy efficiency requirements.

These types of policies were recently implemented in New Zealand and in Flanders, Belgium, and is proposed to take effect later this year in Victoria,

Australia. A similar policy has been in place for a long time in Ann Arbor, Michigan in the US.

Ann Arbor, Michigan USA

Policy summary. In 1985, Ann Arbor in Michigan introduced basic weatherization requirements into their existing rental certification policy to reduce high energy costs and the environmental impact of excess energy consumption. The requirements outlined specific measures, including sealing all gaps and cracks in the building shell and requiring attic or top floor insulation. Certain types of rental properties were exempted from the requirement, including owner-occupied units or units where the owner pays all the energy bills and does not charge the tenant for heat or electricity bill increases. Ann Arbor has not published any documentation analyzing the effectiveness of this requirement or its compliance, and in 2019 removed the penalty for non-compliance with this provision of the housing code.

New Zealand

Policy summary. The national Healthy Homes Guarantee Act, passed in 2017, established the basis for a range of new regulations that set a minimum standard for heating (requiring “fixed heating devices in living rooms, which can warm rooms to at least 18o C”) along with ceiling and underfloor insulation, ventilation, draft-stopping, and moisture and drainage control. For the first deadline, landlords must ensure that their rental properties have the proper ceiling and underfloor insulation installed by July 2019.

The main purpose of the Act is to ensure that all New Zealanders have a warm dry rental home as a way of improving the wellbeing of citizens and their families, and to improve the quality of New Zealand’s nearly 600,000 households that rent housing that is generally poorer quality than other housing stock in the country.

While the Healthy Homes Standards (HHS) include requirements for ceiling and underfloor insulation, as well as draft-stopping, the requirements for new fixed heating devices and ventilation may result in increased energy use resulting from the new standards.

Starting in July 2021, private landlords must ensure that their rental properties comply with all aspects of the HHS within 90 days of any new tenancy, and by July 2024 all rental homes must comply with the HHS.⁵

Flanders, Belgium

Policy summary. As part of the Flemish Renovation Pact, the Flanders region of Belgium has introduced minimum roof and floor insulation requirements for all dwellings including rental properties. This policy is part of a comprehensive “Optimization of Housing Quality Decree” that amends the Flemish Housing Code and aims to improve housing quality through the region, requiring a range

5. More details at <https://www.tenancy.govt.nz/about-tenancy-services/news/healthy-homes-standards-announced/>

of different measures to improve the safety and quality of the housing stock. The changes to the Housing Code were enacted through a March 2019 Decree amending the Flemish Housing Code (Flemish Government 2019).

The housing code has set minimum roof insulation requirements since 2015, as well as will set a double-glazing standard, starting in 2020.⁶ These minimum requirements will be able to be demonstrated in the future if the energy score of the home as stated on its Energy Performance Certificate, meets a maximum energy score to be set by the Flemish Government.

There is a phased implementation over five years, with the first buildings impacted in 2020.

Complementary policies and programs. There are renovation grants available to meet the new housing standards (beyond just energy efficiency) of up to 23 Euro per square meter for vulnerable tenants, as well as other tax benefits. The changes have been the subject of a widespread communication campaign with information points in municipalities.

Results. With the policy just taking effect in 2020, it is premature to understand any results, though it appears that there is new pressure on small private landlords to begin improvements in advance of any enforcement activities.

Victoria, Australia

The Victoria Government is considering making residential tenancy regulations which set rental minimum standards to improve the utility and appliance standards in rental units to improve tenant comfort and reduce energy costs. The Regulations were expected to be introduced in July 2020, but have been delayed due to COVID-19, and are now due to be commence by 27 April 2021.

The first phase, which is under consideration by the government, would require building owners to install compliant heaters that meet a minimum standard in homes with no fixed heating (where tenants currently use inefficient and expensive plug in electric heaters). The second phase would require that all installed heaters are compliant with the minimum standard. Other requirements are also under consideration such as a minimum water rating for showers and faucets and a minimum energy and water rating for dishwashers. Rental minimum standards would be phased to reduce the impact on landlords, and compliance with the rental minimum standards would be triggered by a lease.

Consultation on the proposed regulations closed in December 2019 and the regulations are expected to be finalized late in 2020. In addition, the Victoria Government is also looking into ceiling insulation standards in rental properties and hot water systems in 2021, both of which may eventually be included in the minimum standards.

6. Specific requirements: Roof insulation—<https://www.vlaanderen.be/bouwen-wonen-en-energie/energie-besparen/dakisolatie-verplicht-voor-woningen-en-huurwoningen> and Double glazing—<https://www.vlaanderen.be/bouwen-wonen-en-energie/energie-besparen/dubbel-glas-verplicht-in-elke-woning-vanaf-2020>

Summary of Current Policies

The policies that have been enacted to date are summarized in the following table. Links to more information about all of these policies are included in the Appendix.

Sectors Covered: R – Residential; C–Commercial

Jurisdiction	Policy	Sectors Covered	Year Enacted	First Compliance Deadline
Performance standards				
Boulder, Colorado (US)	SmartRegs	R	2010	2019
England & Wales	Domestic Minimum Energy Efficiency Standards	R	2015	2018
England & Wales	Non-Domestic Minimum Energy Efficiency Standards	C	2015	2018
Netherlands	Environmental Management Activities Decree	C	2018	2023
Scotland	Energy Efficiency (Private Rented Properties) Regulations	R	2019	2020
New York City (US)	Climate Mobilization Act/Local Law 97 of 2019	R, C	2019	2024
Washington, DC (US)	Building Energy Performance Standards	R, C	2019	2026
Prescriptive standards				
Berkeley, California (US)	Residential Energy Conservation Ordinance	R	1982	1987
Burlington, Vermont (US)	Rental Housing Time of Sale Energy Efficiency Ordinance	R	1997	1997
Minimum utility and appliance standards				
Ann Arbor, Michigan (US)	Housing Code	R	1985	1985
New Zealand	Healthy Homes Standard	R	2017	2019
Flanders, Belgium	Minimum Energy Performance Requirement	R	2019	2020
Victoria, Australia	Fairer, Safer Housing/Residential Tenancies Act	R	2019	2021

Discussion and Preliminary Lessons Learned

Early Days

Many of the policies discussed previously have either just been implemented or have just been designed and enacted, so the compliance date is still several years away. As a result, there is minimal data available to show how effective these policies are in demonstrably reducing energy consumption in rental buildings, or the wider benefits to the environment, the economy and society. Without this data, it is challenging to discern the effectiveness of these policies overall or to assess these different approaches on a comparative basis. In addition, several very old policies, for example in Ann Arbor, are now so integrated into day to day compliance that they are considered part of the status quo and are not being assessed for impact. Given this dearth of data, the comments below should be reviewed as indicative findings that need to be corroborated as these policies become more mature and data on energy performance becomes available.

What is Working?

In the absence of demonstrated efficiency improvement results, we can identify program design parameters and characteristics that seem to be effective based on experience with other building policies and mandates. There are several that appear to have a positive impact, such as aligning the government's goal to its policy design, tailoring policies by building segment, and putting in place additional supporting programs to enable the policy's success depending on specific market conditions and other regulations and industry customs.

The primary benefits and challenges of the different policy approaches are summarized in the table below.

Clear Goal

The different categories of minimum rental energy requirements discussed in this paper and summarized in the table below, have ultimately emerged due to the fact that policymakers have different goals. Jurisdictions with a focus on energy performance or carbon emissions tend to focus on energy performance standards or prescriptive requirements that reduce energy use and carbon emissions. Conversely, policymakers who are more focused about ensuring that rental units have minimum quality standards generally will be more attracted to policies like the minimum housing quality standards. These variations are important and enable policymakers to shape these policies to meet their specific priorities and needs.

Where minimum rental housing quality is the main goal, with added utility and comfort appliances and level of service in the living unit, there is potential

Type of Policy	Benefits	Challenges
Performance Standards	<ul style="list-style-type: none"> • Results in all covered buildings attaining a specific energy performance level • Provides flexibility to building owners to identify the energy efficiency measures that make the most sense for that specific building • Potentially easier compliance checking and enforcement 	<ul style="list-style-type: none"> • Ensuring that performance standard accurately assesses actual level of energy performance • Low value real estate may have significant challenges meeting the standard without financial assistance • Could create a considerable burden on low income housing without adequate funding
Prescriptive Standards	<ul style="list-style-type: none"> • Creates a minimum level of energy performance in the building 	<ul style="list-style-type: none"> • Prescribed measures may not move the needle on actual energy performance in many buildings, minimizing policy impact
Minimum Housing Quality Standards	<ul style="list-style-type: none"> • Provides for a minimum level of rental unit conditions • Improves tenant health and comfort 	<ul style="list-style-type: none"> • Does not maximize energy or carbon savings • Does not address the savings that might be harnessed in the whole building (outside of tenant spaces) • May result in increased energy use from new equipment and services

for increased energy use resulting from the standards, despite requirements for efficient equipment and systems.

Building Segment

In addition, there appear to be different approaches that work better for residential rented properties than commercial leased properties. The longest operating policies have focused on the residential buildings stock and mandated prescriptive measures that have resulted in substantial upgrades to the rental building stock in the jurisdiction where they have been applied. Most of the commercial building policies, much more recent and generally only taking effect now or in the future, are performance-based policies and little is known yet about the long-term effectiveness of these policies, though they seem to have potential for addressing a challenging building segment and are being expanded in new jurisdictions around the US and Europe.

Thoughtful Timelines

It is important to design the compliance timelines for these policies in a way that gives the real estate sector adequate time to integrate these measures into the building’s economic lifecycle, especially for any measures that have a payback above three to five years and for buildings with low income tenants. Many of the

more challenging requirements (i.e., England and Wales, and the Netherlands, for example) gave approximately five years (or more) until the initial compliance deadline. Conversely, jurisdictions that are requiring more minimal standards, essentially measures that many buildings already have, can set shorter deadlines.

Alternatively, there may be options for gradual phase-in of enforcement, such as having policies only apply to largest, or lowest performing, buildings in the first years of implementation to ramp up capacity for implementation and enforcement.

Supporting Policies and Programs

There is a strong need for complementary, supportive policies and programs. Technical and financial support are crucial in particular, although jurisdictions should also be sure to conduct building owner outreach and education about the new policy to ensure that the affected building owners understand the policy, deadlines and tools available to help them comply.

Technical support will vary depending on the category of policy. For policies that identify prescriptive measures to implement, a basic guide to those measures can be helpful, such as the City of Berkeley provides on their website. Having the local utility or energy efficiency providers be able to provide advice or guidance can also be useful. Ideally a variety of energy efficiency programs should be able to help building owners comply. Governments can also play a useful role in providing a list of energy service companies that may be able to provide support to aid with compliance.

Financial support should be focused on the neediest buildings (for example, low income housing) and on achieving the costliest measures. Indeed, it is important to ensure that the costs of imposing the minimum requirements should not outweigh benefits of the implemented measures that accrue to the tenants and building owners. It is important to consider not just energy savings benefits, but also other quantifiable societal benefits from the policies.

Financial incentives are only sometimes provided by local governments. In cases, where they are not, policymakers should at a minimum provide information about other regional or national incentives that are available and provide direction for how to access such incentives.

Challenges

Even without energy performance data or information about compliance, certain issues have already been identified as being challenging across several jurisdictions, some of which are in the process of amending their policies or processes in response.

Enforcement

Several experts have already noted concerns related to the ability of jurisdictions to enforce these policies. This may be more of a problem for jurisdictions that require compliance by a certain date without a specific trigger, such as filing a

certification or compliance report. There is a trade-off here between the ease of using a trigger (such as the time of sale of a property), which happens less frequently, as opposed to a periodic update, which would result in the property improving gradually over time. In the latter case, it would then be important to create some kind of reporting requirement to facilitate the regulating administration's tracking of the process. Indeed, attaching the reporting requirement to a pre-existing reporting requirement that already has a process in place and staff to manage it would be ideal.

Exemptions

Crafting reasonable exemptions for these policies is tricky. The property and housing industries and their trade associations tend to lobby for exemptions in case the required retrofits are too expensive for the building owner. However, this loophole is usually cumbersome for both the building owner (who has to solicit one or more cost proposals for such estimates) as well as for the municipality to administer.

Another issue that is increasingly discussed is how such policies affect low income and affordable housing. The prevailing concern is that they would result in rents in such properties being increased to account for compliance costs, and that such properties will no longer be affordable for low income households. Restrictions on raising rents in response to such policies create their own complications, with owners preferring not to own real estate with such inherent tensions. It is crucial that the impact of such policies on the continued availability of affordable housing be assessed as part of program design and that a priority for subsidies be directed at enabling affordable housing to comply with the minimum requirements to reduce the need to increase rents, which will ultimately benefit their lower income residents.

Data for Evaluation

As noted above, we are in relatively early days with many of the policies, so there is not a lot of data available for evaluation of policy effectiveness. In the coming years, as the newer policies impact larger number of buildings, there will more formal evaluation reports and data that will allow for better understanding of effectiveness.

Where the policies have been in place for a while, such as the programs noted in the report in some leading US jurisdictions, some of those programs have had formal impact evaluations conducted, with results noted. Many of the newer policies highlighted in the report have just had initial compliance periods in the past year or two, and some have had delays (particularly in 2020, with COVID pandemic delays in implementation as well as any evaluation).

Some studies reviewing impacts of policies are based on projected energy savings benefits relative to estimated rent increases to meet established standards. As an example, a report on the impact of minimum energy efficiency

standards in the private sector found that the standards would increase welfare overall, however the study assumed that the regulations will be enforced and that landlords will comply with the regulations (Frontier Economics 2017). As early evaluations are completed, it is not clear that those are valid assumptions.

The emerging Building Performance/Minimum Energy Efficiency Standards in Europe based on cost-optimality appear from early evaluation to be having substantial impacts in driving market awareness and some retrofit work, though initial results seem to be relatively minor efficiency improvement work and not deep retrofits (Sayce and Hossain 2020).

As with all energy efficiency policies, in order to understand the policy effectiveness, there will need to be adequate budget for data collection to allow for reasonable policy evaluation. At this point it is too early to have much useful data for real evaluation.

Concluding Thoughts

Rented properties are an important sector that has special challenges to overcome in improving their energy efficiency. The split incentive barrier is significant, though experience in some of the jurisdictions highlighted in this report have made dramatic progress upgrading the efficiency of the rented building stock, a substantial portion of the existing building sector.

Many residential rental properties serve low-income households and tend to be the worst performing buildings from an energy perspective as well as other measures of housing quality. In order to protect low-income households from the burden of costs of regulation, and further distortions in the housing market, appropriate financial support must be specifically targeted.

Some of the more basic prescriptive efficiency policies have been in place in some US jurisdictions for many years. The earliest of the newer building performance policies are just now beginning their early years for compliance, and not enough is yet known about how the variety of these policies will play out with the most ambitious having compliance deadlines several years still into the future. The policy category of minimum housing quality standards is a subset of a much broader set of regulations aimed at improving overall rental housing quality and comfort conditions, though even with very efficient new equipment, the much-improved comfort conditions may actually result in higher energy consumption.

This variation in different policy types will ultimately be useful to compare, though realistically, with the current situation of compliance periods starting a few years from now, it will be several years before realistic policy effectiveness evaluation and comparison of relative success can be measured.

Some elements of the policies reviewed seem to appear successful, including:

- Market signaling that impacts lender community actions, as in the Netherlands;
- Extensive stakeholder outreach to consider industry needs and links to capital planning cycles;
- Programs that include specific triggers and specific metrics that enable better enforcement; and,
- Complementary programs that offer technical advice and financial incentives.

With the significant growth of new policies in the past two to five years, and increased urgency with climate policies, it is likely that there will be additional new policies enacted and implemented in the near future. This is an important area that should be revisited again in three to five years to understand policy best practices as more buildings are subject to the emerging policies.

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Appendix: Links to Further Information

Sectors Covered: R – Residential; C–Commercial

Jurisdiction	Policy	Sectors Covered	Link for more Information
Berkeley, California (US)	Residential Energy Conservation Ordinance	R	https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/compliance%20guide.pdf
Ann Arbor, Michigan (US)	Housing Code	R	https://library.municode.com/mi/ann_arbor/codes/code_of_ordinances?nodeId=TITVIIIIBURE_CH105HOCO_8_507PLSY&showChanges=true
Burlington, Vermont (US)	Rental Housing Time of Sale Energy Efficiency Ordinance	R	https://burlingtonelectric.com/time-sale-energy-efficiency-ordinance
Boulder, Colorado (US)	SmartRegs	R	https://bouldercolorado.gov/plan-develop/smartregs
England & Wales	Domestic Minimum Energy Efficiency Standards	R	www.assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/824037/Domestic_Private_Rented_Property_Minimum_Standard_-_Landlord_Guidance.pdf
England & Wales	Non-Domestic Minimum Energy Efficiency Standards	C	www.gov.uk/government/publications/non-domestic-private-rented-property-minimum-energy-efficiency-standard-landlord-guidance
Netherlands	Environmental Management Activities Decree	C	www.rvo.nl/onderwerpen/duurzaam-ondernemen/gebouwen/wetten-en-regels/bestaandebouw/energielabel-c-kantoren/veelgestelde-vragen
Scotland	Energy Efficiency (Private Rented Properties) Regulations	R	https://www.gov.scot/publications/energy-efficiency-private-rented-property-scotland-regulations-2019-guidance/pages/1/

Jurisdiction	Policy	Sectors Covered	Link for more Information
New York City (US)	Climate Mobilization Act/ Local Law 97 of 2019	R, C	www1.nyc.gov/assets/buildings/local_laws/ll97of2019.pdf
Washington, DC (US)	Building Energy Performance Standards	R, C	https://doee.dc.gov/node/1406676
New Zealand	Healthy Homes Standard	R	https://www.hud.govt.nz/residential-housing/healthy-rental-homes/healthy-homes-standards/
Flanders, Belgium	Minimum Energy Performance Requirement	R	https://www.wonenvlaanderen.be/woningkwaliteitsbewaking/de-minimale-dakisolatiennorm
Victoria, Australia	Fairer, Safer Housing/ Residential Tenancies Act	R	https://engage.vic.gov.au/rentingregulations

