



Catrin Maby
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Minimum standards for existing buildings to accelerate the energy renovation of homes

Ensuring a socially just approach

Introduction

This discussion paper has been produced by independent consultant, Catrin Maby, as the result of a project commissioned by the European Climate Foundation concerning the energy renovation of Europe's homes. The aim of the work was to consider the key social and welfare issues arising with regard to the application of minimum energy efficiency or carbon emission standards for existing buildings, and to develop a set of key principles to help ensure that the multiple benefits of renovation are maximised, and potential pitfalls avoided

The focus of project activity was on gathering the views of stakeholders concerned with housing and social welfare. Interviews were carried out during the second half of 2018 with 38 stakeholders in 13 countries, including social welfare organisations, housing providers, policy and finance specialists, and a

round table discussion was held with representatives of organisations with an EU-wide focus in Brussels in March 2019.

Through this process of dialogue, a perspective was developed on the main issues considered important by stakeholders. These are summarised in this paper, together with a set of key principles based upon consideration of these issues.

This paper is intended as supporting information and a basis for discussion of the development of policy to achieve crucial climate targets in a manner which is positive for the enhancement of social justice in the short as well as the long term. It does not represent the specific position of the European Climate Foundation or any one of the consultees.

Why do we need to accelerate the energy renovation of homes?

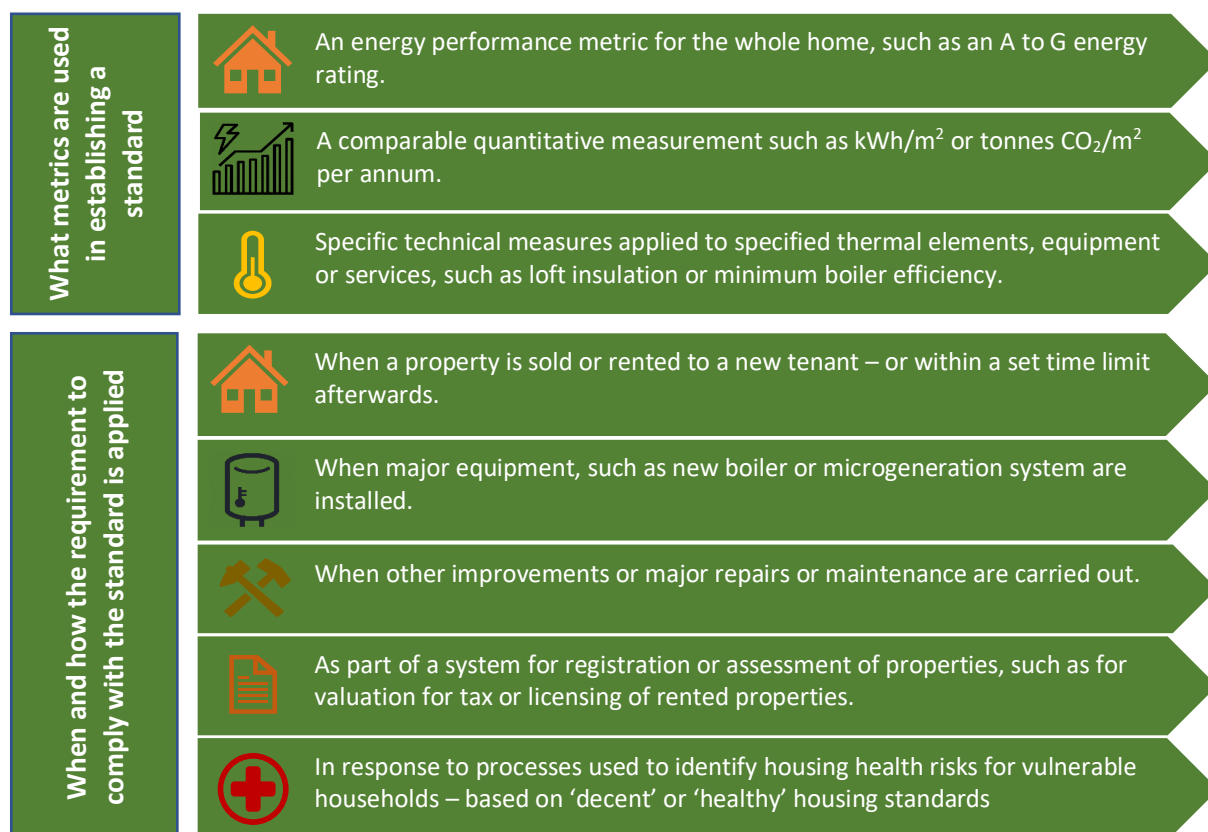
The pressing need for action to mitigate climate change includes a significant contribution from housing to carbon emission reduction targets. Buildings represent 36% of Europe’s CO2 emissions. We cannot get to net zero emissions in 2050 across the whole economy without decarbonising the housing stock.

New homes can be built to much higher standards in terms of energy performance and carbon emissions, but replacement of the housing stock is slow. The challenge is to achieve the necessary improvements to existing homes. The current rate and depth of renovation is insufficient to achieve agreed climate targets, and awareness is growing of the need to make much faster progress.

Improving home energy performance brings a wide range of potential co-benefits, not least a reduced risk of energy poverty. Comfortable indoor temperatures and affordable energy costs are a boost to well-being and health. Building renovation work tends to benefit the local economy, offering local and community-based employment opportunities within a market served largely by small businesses.

The policies that might be applied in order to achieve an acceleration in renovation rate are varied, ranging across tax or other financial incentives, major national or regional renovation programmes, information and awareness-raising, regulations for increased energy efficiency when other works are done on a home, or mandatory minimum requirements for the energy performance of the home. This latter approach is commonly referred to as ‘minimum energy efficiency standards’ (MEES), and seems increasingly likely to form part of effective policy going forward.

Figure 1 How MEES might be applied in practice.



What are mandatory minimum energy efficiency standards?

The application of mandatory MEES to housing has not yet been widely used as a policy tool, and where it has been applied, the approach is only partially developed or at an early stage of implementation. There are many possible

variations to how it might be done, such as when and how the requirement is applied in practice, what metrics are used, how the measurements are made, and how high a standard is required. The main variations used are described in Figure 1, and current examples of the application of mandatory MEES in different countries are indicated in Figure 2.

Figure 2 Examples of the application of mandatory MEES in Europe.

Minimum requirement for roof insulation in Flanders, Belgium

A new standard introduced in January 2015 sets a minimum requirement for roof insulation in residential buildings, applied when the home is rented out. If a residential building does not meet the minimum requirements, it receives penalty points. From 2020 if a building or apartment receives more than 15 penalty points, the building will be ineligible for renting.

The 2015 Law for Energy Transition and Green Growth, France

By 2050, all buildings in France must be in class A or B (based on the French EPC), reaching *Bâtiment Basse Consommation* level or equivalent. Article 5 states that all inefficient buildings are to be phased out by 2025, and that this means bringing them up to a class B (51-90 kWh/m²). However, full implementation is not yet in place.

Minimum Energy Efficiency Standards for the private rental sector in England and Wales

New Minimum Energy Efficiency Standards came into force on 1st April 2018, requiring all rental properties to have a minimum Energy Performance Certificate (EPC) rating of E. The regulations came into force for new lets and renewals of tenancies in April 2018 and will apply to all existing tenancies from April 2020. It will be unlawful to rent a property below the minimum E rating, unless there is an applicable exemption.

Minimum EPC rating for social housing in the Netherlands

Social housing providers have reached a voluntary agreement with the national government to bring their building stock down an average Energy Performance Certificate rating of B across their stock by 2020, which represents around 30% of housing in the Netherlands.

Key issues related to implementing MEES

Mandatory MEES have been implemented only to a limited extent, but are increasingly being discussed as an option, in view of the relatively slow progress towards climate and energy targets through voluntary efforts alone. But what are the wider issues that may be raised when implementing such policies? It is critical to ensure that the social and economic implications of new policies are well understood in order to avoid creating new problems. At the same time, it's necessary to understand and value the co-benefits of improved energy efficiency - to health, well-being, comfort, household economy and the local economy – and to ensure that these are realised in practice. These concerns were the stimulus for the dialogue with stakeholders, and the key points are summarised below.

It became apparent at an early stage in discussions that the question of MEES could not be treated in isolation, and that many of the issues raised concerned the wider challenge of housing energy renovation and decarbonisation. MEES can be seen as one part of the solution to the wider challenge.

Ensuring that housing is both energy efficient and affordable for all

The problem

Implementing MEES results in need for capital investments for renovation. The higher the level of energy efficiency required, the higher the cost is likely to be. A critical risk with regard to mandatory MEES is that the burden of cost falls on those who are least able to afford it. The underlying issue is who pays for the capital costs of renovation, and how.

It is easier to finance shallow retrofits, focusing on measures with a relatively quick return on investment – but this is not enough to achieve climate targets or to avoid energy poverty.

The challenge and the potential consequences vary with different ownership structures.

Discussion

In the owner-occupied sector, the costs of renovating to achieve a certain MEES could create a barrier to sale of a house for a homeowner without access to the capital required. It could also contribute to a homeowner deciding not to carry out repairs or replace their boilers because they cannot afford the (additional) energy renovation work that is required. Owner-occupiers vary a great deal in terms of disposable income and savings.

How long the occupant expects to stay in the property and how this relates to the expected timeframe of return on investment also has a bearing on their ability or willingness to invest in making improvements. The potential for increase in property value with improvements is a potential advantage, but is subject to other powerful factors, such as location.

Rented properties face the issue of the 'split incentive', with the landlord making the capital investment and the tenant benefitting from the improved conditions and/or energy bill savings. The ability for landlords to recoup their investment in charges to the tenant is limited to what is affordable, and may be subject to rent level regulations.

In the social housing sector, where rent levels are restricted, retrofit beyond a certain level cannot be paid for through increased rents. Funding renovations beyond this level becomes in effect a social investment.

In the private rented sector, if the landlord passes the cost on to the tenant through rent rises to a level that the tenant cannot afford, this can result in the tenant having to leave the property – this has been referred to as 'renovictions', which can also happen through a process of 'gentrification'. In either case, the effect is the loss of affordable housing in those areas. An associated problem is the lack of housing for key workers without whom the city

cannot function. Private landlords may range from individuals with a single or small portfolio of property to (large) housing companies, and both their access to capital and their ability to manage complex renovations may be equally variable. Tenants similarly may range from wealthy to vulnerable, and short to long term.

In the case of a shallow retrofit, applying only a few of the most cost-effective measures, it is possible to get a return on investment through energy bill savings in a timeframe that an owner-occupier or lender can accept – or that a tenant can afford as a rent increase, set against savings on energy bills. However, this is unlikely to work for households who are already struggling to afford energy costs, who may benefit (at least partially) from increased comfort rather than energy saving.

Consideration must be given to the particular complexities of different ownership models, arrangements for billing for utilities and services (including for group or district heating systems), and paying for repairs, maintenance and improvements in apartment blocks. Systems for decision making about investing in improvements (or the lack of them) can create barriers. This applies to works on common areas and shared structures such as external walls and roof as well as to getting new services to a building, such as a district heating pipe or gas supply. Where tenants and owner-occupiers reside in the same block, this gets even more complicated. Challenge also arises where residents have different economic circumstances. In the case of shared district heating costs, this can mean that heating is turned off for the block, and those who can afford it use portable electric or bottled gas heaters for their own apartments.

The split between fixed and ‘per consumption’ costs in district heating can also be a barrier to financing. Where the fixed cost to the resident is high, and most of the variation in consumption costs is covered by the supplier at some level, savings also mainly accrue at that level. In some cases, all heating costs are included with the rent. This raises the question of who pays for capital works and who pays for

energy consumption, when parties such as building owners, occupants, and district heating suppliers are involved. In some cases, blocks are managed by committees of residents, rather than building management professionals. Even where housing managers are employed, expertise in procurement may be lacking – especially as regards new technologies.

Solutions

The question of how to finance energy renovations is unlikely to be solved by a single solution. A range of financial solutions catering to different needs is required, with flexibility as to which are further scaled up or down depending both on the volume and type of take-up. Some successful funding programmes achieve a market transformation such that they are no longer needed – for example by increasing homeowner confidence in a technology, and bringing costs down through increased volume. On the other hand, even a very successful and popular financing solution may not reach some sectors of the population, or cater for all types of building.

Several financing models tailored to various income levels and tenures have been developed and tested, for example green mortgages (with preferential terms to achieve lower carbon target), low-cost loans with public sector guarantees to reduce risk, loans linked to repayment through utility bills (i.e. pay-as-you-save schemes), loans attached to the building rather than the individual (such as PACE), and financing net-zero or deep energy renovation through comfort as a service (such as Energiesprong).

The process of applying for funds can be so complex that it limits accessibility by some. Application systems should be simple and streamlined, and the ability to combine different sources of funding considered.

Where public funds are needed to fill the gap between what private investment can deliver and the need for deep retrofit, these should be focused on reducing the risk of energy poverty and loss of supply of affordable housing for

lower income or otherwise vulnerable households.

Regulations regarding rent rises after renovation can help to protect the affordability of tenancies, in the private as well as the social housing sectors. Applying mandatory standards to the private rented sector alone could risk loss of rental properties to the market – but this risk is reduced if mandatory standards are applied across all tenures (including holiday rentals). This is part of wider considerations to avoid ‘stranding’ properties in the owner-occupied sector, and to maintain or increase the supply of affordable homes for rent.

The need to have good quality and affordable housing provision for all are powerful reasons

for energy renovations to be part of an integrated housing and spatial planning strategy, rather than considered in isolation. MEES might be more acceptable and enforceable if applied as part of a wider set of housing quality standards, with an emphasis on health, safety and well-being. There are examples of housing quality standards used for social housing that this could be built upon, and relevant inspection systems (such as the UK’s Housing Health and Safety Rating System).

Also noted is that home energy use is just one aspect of wider household sustainability issues, including water, transport, the production and disposal of materials, and food.

Recommendations for ensuring that housing is both energy efficient and affordable for all

- Energy standards as an integral part of wider housing quality strategy, to include affordability, sustainability, and access for all sectors of society;
- Tenancies protected through rent regulations to maintain affordability after renovation;
- Finance tailored to different tenures, ownership structures and duration, and owner income levels, e.g. full subsidy, loans attached to buildings, green mortgages, loans with public sector guarantee to reduce risk;
- Options for including loan repayments within other existing collection mechanisms such as energy, water, local property taxes;
- Simple and clear public financial support systems to maximise access and enable easy combination with private funds;
- Segmentation of private rental market and support mechanisms to cover full range of landlord financial capacity and expertise;
- Systems for cost and benefit sharing and decision-making in case of apartment blocks and group heating, including where there is mixed tenure and mixed income levels.

[Applying a long term perspective to decarbonisation of the housing stock](#)

The problem

Achieving the necessary decarbonisation of the housing stock will not be achieved overnight. A long term programme of action is needed (with 2030 and 2050 target in mind), but one which must be moved forward with urgency. Political timeframes and the life of particular administrations tend to be much

shorter. Home ownership and landlord investment timescales may differ widely. The challenge is to bridge these different timeframes and maintain momentum.

Discussion

The provision of both the capital investment needed, and adequate enabling and enforcement mechanisms to achieve ambitious carbon and energy targets demands resources, and it is essential that these are

provided with sufficient robustness, independence and fairness (in terms of accessibility to all). It is unlikely that this can be provided without an effective combination of private and public resources.

For a consistent long term programme, a long term public sector commitment to support it is needed – and this must be justified to political decision makers. This might be supported by communicating the multiple benefits of improved energy efficiency. In addition to the environmental benefits, these can include improved comfort and health (such as in relation to respiratory and cardiovascular illness), social benefits from greater usability of all parts of home, and jobs and employment generated by renovation works.

The multiple co-benefits of improving energy efficiency are well-known and support the argument for MEES, but are not necessarily easy to assess quantitatively. Gaining long term public sector support and commitment of resources may be encouraged by developing and sharing transparent systems for monetising the co-benefits of improving energy efficiency standards. Additional cost implications (both social and financial) to take into account are the long term impacts of climate change and damage that will be caused if action is not taken.

In terms of the investment by private home owners, a return on investment may be realised in an increase in capital value of the home, but this also requires a longer term perspective, and is heavily dependent on the local housing market, as well as the way in which homes are valued for sale or mortgage purposes.

Assuming that the ultimate goal is a deep retrofit, taking a whole-house approach is more cost-effective than starting with shallow retrofit. However, deep retrofit in one go is not always possible, due to numerous factors, including the cost and disruption involved. Both approaches need to be supported. An extended timeframe is needed to get a return (either directly or via rent increases) on investment in deep renovation. This is the case

whether the renovation is done in one step or in several stages – in the latter case, it becomes increasingly difficult to get a financial return as you move closer to zero emissions, particularly if the most cost-effective measures are done first.

One of the concerns raised in relation to energy renovations is the availability (at scale) of the necessary technologies and skills. A longer term perspective provides the context for the supply chain to invest in products and skills, and education for construction and related building professionals to incorporate sustainability across trades and functions.

A barrier to energy renovations is the lack of acceptability of change of external appearance of some buildings – such as where external wall insulation, change of window type or solar panels are retrofitted. A long-term strategy could support the development of acceptable solutions, such as less visually intrusive technologies suited to different building characteristics, alongside allowing time to stimulate a possible gradual shift in public perception of what is visually acceptable.

Solutions

A long-term strategy with a clear direction of travel would enable home owners and housing providers to plan investment over time, and integrate them with other needs for repair, maintenance and improvements. It puts questions around the depth of renovation to aim for in context. Mandatory standards should be clearly tailored to the long term targets, with interim targets with specific dates and long lead in times to ensure progress is made and is measurable.

Mass communications and public engagement efforts support the message on energy performance improvement from building professionals working with home owners and housing providers. A long term strategy must be well-communicated, for credibility to citizens and the building and energy efficiency industry.

Recommendations for applying a long-term perspective to decarbonisation of the housing stock

- Plan for increasing standards over time, with a clear link to interim climate targets with long term political support;
- Mass communications and extensive public engagement to garner citizen support and understanding of programme, purpose and benefits.

Enabling first – enforcing second

The problem

If mandatory MEES are applied without the enabling and support mechanisms in place, there could be negative consequences in terms of the housing market, where people struggle to comply, or experience hardship. There is also a risk that if it is too difficult to comply, non-compliance avoidance tactics become widespread. Bad news stories can damage public engagement and acceptability.

The enabling and support mechanisms needed are multi-faceted. In addition to finance, there must be effective systems for advice and information, building assessments, quality control and enforcement, so that people know what to do and how to do it, and with confidence that it will be done well and that their property as well as their well-being will be enhanced.

Discussion

One-size-fits-all programmes are not likely to work – and can result in being discredited on the basis of bad news stories about things that have gone wrong. It is essential to have programmes ready before they are publicised (including political announcements), to avoid the negative impact of people wanting to take action and finding that they cannot (yet).

Building in flexibility tends to take more planning and resources, so needs to be thought through in advance. Another option is

to start with small pilots and iterate over time with real time measurement and evaluation of impacts before rolling out a single big programme.

Advice and assessments

Help is needed at several stages of the complex process of renovation, including understanding when an obligation to meet a minimum standard is triggered, deciding what to do, finding contractors, and financing the work. Where funding exists, the application processes can be challenging. Low carbon renovation can involve unfamiliar technologies, and deep retrofit in particular can be a step change for many, requiring adaptation in user behaviour.

Systematic assessments of building energy characteristics, which quantify potential energy and carbon emissions and compare the impact of improvements, can be a useful advice tool. Energy Performance Certificates (EPCs) are an example, but they were designed to be an ‘asset rating’ rather than an advice tool and tend to be too basic for accurate estimates of costs and saving, particularly as regards advice on deep retrofit. They generally use relatively limited data sets (in order to keep down the costs and complexity of carrying out the assessment), and do not always take into account all the details of a home, particularly if it has been extended or added to over time. Furthermore, there are concerns about the quality and reliability of EPCs in the face of pressure to drive down costs.

In the case of apartment blocks, EPCs are not always carried out for each flat – but in reality, the energy performance is different depending on position in a block. They are also limited in terms of advice to a household on costs and savings as they are based only on the building fabric and building services (such as installed heating and hot water systems), and do not take account of actual occupancy and user behaviour, or of electrical appliances which are not seen as building services (such as laundry or ICT).

More detailed and thorough assessment processes than the basic EPC have been developed but tend to be more expensive.

Quality control, compliance, monitoring and enforcement

Enforcement must be put in place and well-resourced to ensure a 'level playing field' and a fair application of mandatory standards. Clarity is needed as to who is responsible for ensuring and enforcing compliance and how this can be achieved in practice.

Compliance with standards includes quality of works, and actual performance, as well as the inclusion of relevant measures designed to achieve energy and carbon savings. Many of the concerns about quality control, and the need for an accessible system for consumer redress if things go wrong, are the same as those in the construction industry generally. They are however highlighted by the relatively high cost of some low carbon technologies and the fact that there are particular technical risks associated with making changes to the thermal characteristics of existing buildings, such as over-heating, inadequate ventilation and interstitial condensation causing damp.

There are also design sensitivities with low carbon technologies, which can cause poor performance if the whole system design (including building fabric) is not right – and where considerable costs have been incurred in the expectation of savings, this can cause major problems.

It is inevitable that making a major change to buildings such as the shift to low carbon will require learning and face technical challenges (not least because some of the technologies needed have not been rolled out at scale before), and it is crucial that problems are not hidden, and the solutions and learning are shared. To avoid programmes being

abandoned when problems occur, the shared learning and transparency need to be embedded from the outset, and problems identified at an early stage.

In the private rented sector, the lack of regulation and systems for enforcement in some countries, such as landlord registration and/or licensing, presents challenges for the implementation of MEES.

Solutions

Commercially independent advisory support helps to avoid technology bias in decisions, enable a more holistic approach, and engender trust. Involving trusted intermediaries such as community groups or health professionals can broaden the outreach. These facilitating mechanisms can create public and political acceptance for a minimum standards policy. They can offer a route for a two-way dialogue with policy-makers, to identify problems at an early stage and find practical solutions.

The concept of the Building Energy Passport is an advice tool which supports staged renovation by providing a 'roadmap' to deep renovation for each building. It can be updated with a record of what has been done, and could be extended to include a range of building information. This could be particularly helpful to pass on to new occupants.

The one-stop-shop concept makes the process of renovation easier for building owners, by offering services through the same contact/coordinating point. It could be a commercial business model, a non-profit or a public sector provision. Some examples include [Picardie Pass Renovation](#) in France, [BetterHome](#) in Denmark, [Home Energy Scotland](#), [Energy Communities Tipperary Cooperative](#), [RetrofitWorks](#) in London.

Recommendations for enabling first – enforcing second

- Independent local advisory services to support throughout the renovation process
- User behavior support to enable households to adapt to new circumstances
- One-stop-shops to simplify access to support
- High quality detailed energy assessments to identify measures and potential savings, and how to take the building to deep energy renovation
- Quality standards for design, products, and installation
- Monitoring of compliance and enforcement mechanisms established at the outset, and adequately resourced
- Complaints and redress mechanisms established and communicated
- Independent evaluation of programmes maintained
- Regular public communication of results, together with plans for improvement
- Clear communication at the outset that the aim of evaluation is to enable improvement, not as a basis for discontinuation if problems occur

Key principles for a socially just application of minimum standards

Building upon the issues raised in discussion with stakeholders, a set of key principles are presented below (see Figure 3 and Table 1), consisting of two overarching principles, underpinned by the pillars of three supporting principles. For each of these principles, the recommendations for supporting actions are suggested.

Figure 3 Key principles for applying mandatory minimum energy efficiency standards.

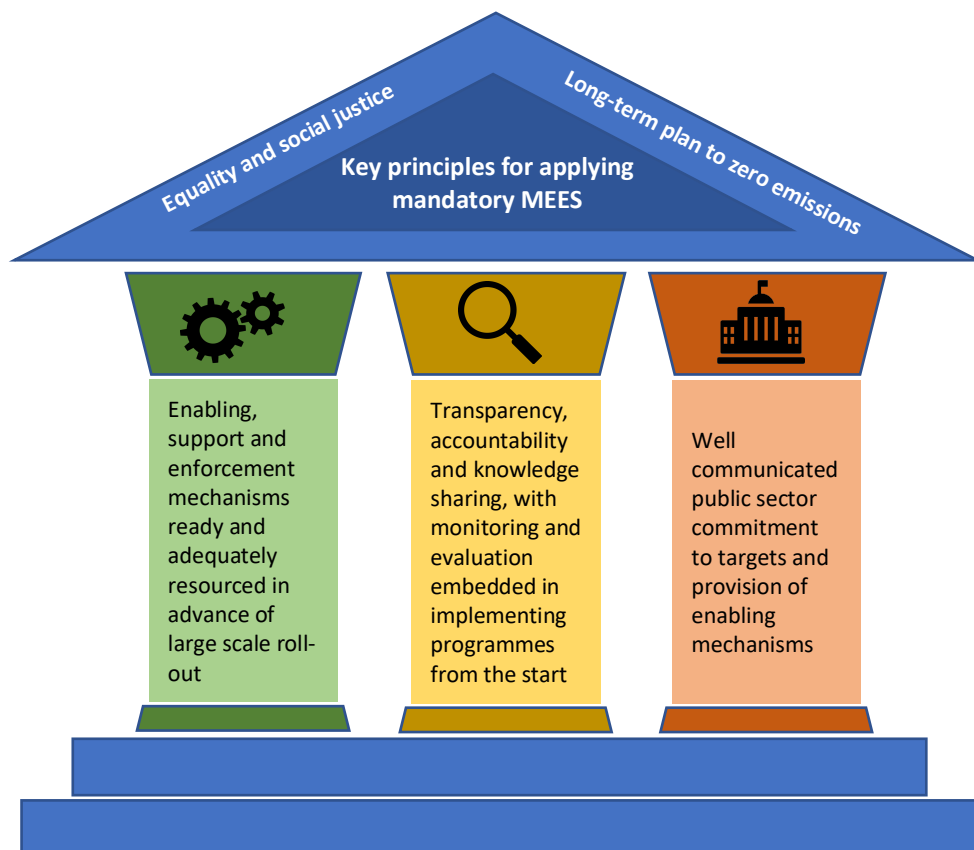


Table 1 Recommendations for action that support the key principles for applying MEES.

<p>Overarching principle 1: Minimum energy efficiency standards applied in a manner which aims to decrease, and never increases, inequalities or social injustice</p>	<ul style="list-style-type: none"> • Energy standards as an integral part of wider housing quality strategy, which should include affordability, sustainability, and access for all sectors of society • Tenancies protected through rent regulations to maintain affordability after renovation.
<p>Overarching principle 2: Minimum energy efficiency standards set at levels commensurate with a long-term plan to zero emissions to meet climate targets</p>	<ul style="list-style-type: none"> • Plan for progressively tightening standards over time, with a clear link to interim climate targets with long term political support
<p>Supporting principle 1: Enabling, support and enforcement mechanisms ready and adequately resourced in advance of large-scale roll-out</p>	<ul style="list-style-type: none"> • Advice and assessments <ul style="list-style-type: none"> ○ Independent local advisory services to support throughout the renovation process ○ User behavior support to enable households to adapt to new circumstances ○ High quality detailed energy assessments to identify measures and potential savings, and how to take the building to deep energy renovation ○ One-stop-shops to simplify access to support • Finance <ul style="list-style-type: none"> ○ Finance tailored to different tenures, ownership structures and duration, and owner income levels, e.g. full subsidy, loans attached to buildings, green mortgages, loans with public sector guarantee to reduce risk; ○ Options for including loan repayments within other existing collection mechanisms such as energy, water, local property taxes; ○ Simple and clear public financial support systems to maximise access and enable easy combination with private funds; ○ Segmentation of private rental market and support mechanisms to cover full range of landlord financial capacity and expertise;

- Systems for cost and benefit sharing and decision-making in case of apartment blocks and group heating, including where there is mixed tenure and mixed income levels.

Supporting principle 2: Transparency, accountability and knowledge sharing, with monitoring and evaluation embedded in implementing programmes from the start

- Quality standards for design, products, and installation
- Monitoring of compliance and enforcement mechanisms established at the outset, and adequately resourced
- Complaints and redress mechanisms established and communicated
- Independent evaluation of programmes maintained
- Regular public communication of results, together with plans for improvement
- Clear communication at the outset that the aim of evaluation is to enable improvement, not as a basis for discontinuation if problems occur

Supporting principle 3: Well communicated public sector commitment to targets and provision of enabling mechanisms

- Mass communications and extensive public engagement to garner citizen support and understanding of programmes, their purpose and the benefits