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Overcoming the split incentive barrier in the building sector

Unlocking the energy efficiency potential in the rental & multifamily sectors

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Abstract

While the rental and multifamily sectors are associated with a significant energy efficiency potential, it is widely recognised that these are difficult sectors to tap into. Asymmetric information and split incentives are typically regarded as major barriers to fostering energy efficiency upgrades in rented and multi-unit properties both in the private and public as well as residential and commercial sectors. As Article 19 of the Directive 2012/27/EU on energy efficiency calls for Member States to take appropriate measures addressing this barrier, increased interest is drawn on how to design policies and measures that unlock the energy efficiency potential in these difficult-to-access sectors. Current solutions vary in nature, ranging from revised rent acts, green leases, on-bill finance mechanisms, minimum energy performance standards, use of inclusive rents and others.

In this context, the European Commission's Joint Research Centre, on behalf of DG Energy, organised a workshop in Brussels on 20/1/2016 on unlocking the energy efficiency potential in the rental & multifamily sectors with the aim to exchange information about the extent at which split incentives act as a barrier to energy efficiency investments in the building sector as well as investigate current solutions, their effectiveness and ways forward. This report provides an overview of the split incentive issue with some recommendation on how to address it and the workshop presentation summaries.

1. Introduction

Improving energy efficiency is often seen as the most cost-effective means of achieving the EU greenhouse gas emission targets. In particular, the energy efficiency potential of the building sector has enjoyed increasing attention in recent years. Modernising the building sector, however, is associated with a number of barriers. Split incentives are common barriers between building owners and tenants that, in practice, hinder the uptake of energy efficiency investments.

The presence of split incentives, in particular, inhibits the deployment of energy efficiency upgrades in various segments in the building sector such as privately rented homes, multi-apartment buildings, social housing units and leased commercial or public premises. It stems from the misplacement of incentives between different actors (e.g. landlords and tenants), which discourage energy efficiency improvements to come into effect in reality. Despite this long-lasting barrier, little attention has been drawn on how to resolve it and current public policy interventions have made relatively little progress towards providing effective solutions that align incentives between concerned actors.

In order to help overcome this issue, the Energy Efficiency Directive (Directive 2012/27/EU) includes a provision in its Article 19(1)(a), of the Energy Efficiency Directive (Directive 2012/27/EU), that recognises the importance of addressing the barrier of split incentives in the building sector. It states:

Member States shall evaluate and if necessary take appropriate measures to remove regulatory and non-regulatory barriers to energy efficiency, without prejudice to the basic principles of the property and tenancy law of the Member States, in particular as regards:

(a) the split of incentives between the owner and the tenant of a building or among owners, with a view to ensuring that these parties are not deterred from making efficiency-improving investments that they would otherwise have made by the fact that they will not individually obtain the full benefits or by the absence of rules for dividing the costs and benefits between them, including national rules and measures regulating decision-making processes in multi-owner properties

In this context, the European Commission's Joint Research Centre, on behalf of DG Energy, organised a workshop on unlocking the energy efficiency potential in the rental & multifamily sectors with the aim to exchange information about the extent at which split incentives act as a barrier to energy efficiency investments in the building sector as well as investigate current solutions, their effectiveness and ways forward. This report provides an overview of the split incentive issue with some recommendation on how to address it and the workshop presentation summaries.

The workshop agenda and all presentation material can be downloaded [here](https://e3p.jrc.ec.europa.eu/events/unlocking-energy-efficiency-potential-rental-multifamily-sectors)¹.

¹ <https://e3p.jrc.ec.europa.eu/events/unlocking-energy-efficiency-potential-rental-multifamily-sectors>

2. Problem definition

Split incentives refer to any situation where the benefits of a transaction do not accrue to the actor who pays for the transaction. In the context of energy efficiency in buildings, split incentives are linked with cost recovery issues related to energy efficiency upgrade investments due to the failure of distributing effectively financial obligations and rewards of these investments between concerned actors. This can ultimately result in inaction from either actor's side, despite the fact that many of these upgrades are of positive net present values. Investment costs of energy efficiency upgrades are part of the capital expenses, while its financial benefits, in the simplest form, are seen as reduced energy bills in the operational expenses side. If the actor who invests in energy efficiency measures (i.e. actor in charge of capital expenses) is not the same as the actor who reaps the subsequent financial benefits (i.e. actor in charge of operational expenses), split incentives can arise. They simply refer to the misplacement of incentives between the actor selecting the equipment or technologies of the upgrade and the actor who pays the energy costs.

There are several types of split incentives that affect the building sector. These, together with examples, are discussed hereunder.

Efficiency-related split incentives (ESI): These refer to situations where the end user is in charge of the energy bills but cannot choose the technology needed to improve the energy efficiency of their property and thereby has limited power in reducing their energy bills or negotiating an energy efficiency upgrade. The landlord-tenant dilemma in rental housing and commercial leasing cases based on 'net' or 'cold' type of lease is the most typical example. In these cases, the landlords lack incentives for investing in energy efficiency upgrades as they do not directly reap the benefit and often cannot capitalise these upgrades into higher rents due to the uncertainty over the impact of the upgrade on the property value and lack of experience on rent premiums. Efficiency-related split incentives are also a concern in new properties, often sold to new owners after the design and construction has been completed. In this case, the new owner is not involved in the decision making process and the selection of energy-related features, while the property developer's main concern is to reduce the construction costs. The issue of asymmetric information and premium charges exacerbates the problem.

Usage-related split incentives (USI): These have also been referred to as the "reverse" split incentives in the literature (Bird & Hernandez, 2012). They occur when occupants are not responsible for paying their utility bills and thereby have little or no interest to conserve energy. In other words, the occupants do not face the marginal cost of their own energy use and are not given any incentives in using energy efficiently. They occur under "warm rent"² and gross rent structures where utility costs for heating, other operating and capital expenses are all borne by the landlord. Evidence exist that tenants, under such rent structures, tend to consume more energy, e.g. several studies have provided empirical evidence showing higher indoor temperatures during winter periods in the case of heat inclusion in the rent (e.g. Levinson & Niemann, 2004). This type of incentives is also present in the hotel industry.

Multi-tenant, multi-owner split incentives (MSI): Multi-tenant and multi-owner buildings face an additional challenge associated with collective decision making between various actors. Energy efficiency projects in these buildings can only be realised if consensus is reached by all decision-making parties. Current decision structures act as a barrier in collective agreements between owner-occupants of many existing buildings such as condominiums (Matschoss, et al., 2013). In both multi-tenant and multi-owner buildings,

² The term "warm rent" is a term typically used in some Western or Northern European countries (e.g. Germany and Sweden) to refer to rent structures which include heating costs. Cold rent, on the contrary, refers to rent structures which do not include heating costs (Bullier & Milin, 2013 Blom & Sandquist, 2014).

the benefits and costs of an energy efficiency upgrade may vary from apartment to apartment, which further complicates the situation.

Temporal split incentives (TSI): This refers to situations where the energy efficiency investment does not pay off before the property gets transferred to its next occupant/owner. In this situation, the occupant (tenant or owner-occupier) does not have a clear idea of how long they will live in their property or simply plan to move relatively soon. An energy efficiency upgrade attached to a high upfront capital cost will not be an appealing investment in this situation and may be perceived as risky (Bird & Hernandez, 2012).

3. Possible solutions to overcome incentive misalignments

In this section current solutions to split incentives practiced in the EU and beyond are presented. A discussion of each solution together with a description of their applicability for each segment of the building sector is presented below.

3.1 Regulatory solutions

Minimum performance levels in rented units

Mandating minimum standards for rented properties is a powerful measure which can ensure that very inefficient buildings undergo energy efficiency upgrades or are simply removed from the rental market. This can primarily protect social tenants or tenants facing efficiency-related split incentives, who would otherwise have no power to negotiate an energy efficiency upgrade in their rented properties. Under such regulation, the responsibility rests with the owners, who are called to ensure a reasonable level of energy efficiency in rental units, thereby sending a clear signal to the market. Based on the same motivation behind minimum standards for equipment set by the Eco-design directive (Directive 2009/125/EC), this can apply to both residential and commercial properties, and can target both private and social landlords. The measure can complement existing requirements set in the building codes for minimum energy performance levels which currently apply only for new and major renovated buildings³. To ease the burden of compliance by landlords, the availability of financial incentives or the use of models that overcome the barrier of the upfront costs can be considered alongside this regulation (see the following section on Financial incentives & models).

Revisions in rent acts and condominium acts

Improving the rent and condominium acts is essential for encouraging investments in energy efficiency in rented properties or multi-unit buildings. Revisions to lift barriers in regulations that inhibit the adoption of energy efficiency in these segments of the building sector need to be considered in order to support the dialogue between involved parties and introduce flexibility that would facilitate voluntary agreements between the tenant and landlord (e.g. green leases). These should lay out legal framework and specific conditions for the redistribution of investment cost and energy cost savings of an energy efficiency upgrade between the landlord and the tenant or between multiple owners. This should be accompanied with guidelines on cost- and benefit-sharing practices. For example, when an energy efficiency upgrade is undertaken by a landlord, a contribution from the saved energy costs can be asked from the tenant, provided that both the landlord and tenant directly benefit from the undertaken work. Additional issues that need to be addressed include extent to which the rent can be increased and conditions under which the tenants can reject rent rises. Condominium laws should also better define the democratic rules with respect to changes and maintenance work undertaken in the building and the roles of all actors involved including the owners. A single owner should not be allowed to stand in the way of the improvements, and majority-based rules should be adopted.

3.2 Information tools

Energy labelling

Building energy labelling is a powerful disclosure tool which provides potential buyers, tenants, financiers and other real estate actors with information on a property's energy performance. It offers the possibility to make more informed decisions during sale and lease transactions and overcome, to a certain extent, information asymmetry issues, which typically exacerbate the split incentive barrier. Through this information, the actor

³ As required by Directives 2002/31/EC and 2010/91/EU on the energy performance of buildings.

can make comparisons with other similar properties of interest, gain a better understanding of the holistic costs associated with a property, and identify where and how to invest in energy efficiency upgrades.

In the EU, the main policy framework through which this information tool has been introduced is the Energy Performance of Buildings Directive (EPBD, Directive 2002/31/EC). Under this Directive, all Member States were required to set up the mechanisms and establish systems of certification of the energy performance of buildings which make it possible for owners and tenants to identify the energy class of their building together with recommended improvement measures on how to further increase its energy performance. These mandatory Energy Performance Certificate (EPCs) schemes set up by the Member States were further strengthened with additional requirements, introduced with the recast of the EPBD (Directive 2010/91/EU). EPCs are currently among the most important sources of information on the energy performance of buildings, which, historically, has been very hard to obtain⁴. Available at the point of lease or purchase, they can guide a potential owner or tenant during their decision making process, can be used as a tool for calculating the pre and post-performance of a renovated building and predict energy cost savings as a result of an energy efficiency upgrade.

Individual metering, sub-metering and direct feedback

Individual metering is a prerequisite for the development of innovative rental structures which can encourage energy efficiency upgrades in rented properties. Measurement of individual energy consumption provides consumption feedback and increases awareness on the usage patterns, which can ultimately change the behaviour of the tenant. It also allows for detailed monitoring of energy efficiency upgrades based on actual, rather than predicted energy savings. The measured energy consumption can be a more useful indicator when the redistribution calculation of costs and benefits are made. They are particularly important for overcoming the usage-related split incentives. For example, a gross warm rent model with direct feedback can allow landlord and tenant to agree on a set of comfort conditions (e.g. indoor temperature during winter time). All costs including heating are covered in the rent but direct feedback means that tenants can get compensation if they consume less. Individual metering therefore encourages tenants to adopt a more energy efficiency behaviour. Conversely, if tenants exceed the pre-set consumption levels, the additional energy costs are borne by the tenants. The functionality of real-time information on consumption for the users offered by smart meters can further strengthen this feature and indeed align incentives between landlords and tenants. Sub-metering can ensure detailed energy monitoring of apartments in multi-family buildings and allow apartment tenants and owners to become more aware of the monetary implications of energy consumption and savings.

The Energy Efficiency Directive includes a set of articles (namely Articles 9, 10 and 11) on metering and billing which intend to have a profound impact in cases where individual and sub-metering is not available. In particular, Articles 9 (1) & (3) of the Directive impose metering requirements on district heating, district cooling and communal heating/hot water systems. Article 9 (2) sets requirements for the roll-out of smart meters. Article 9 (3) calls for individual metering in multi-unit buildings and also states that Member States may consider the introduction of transparent rules on the allocation of the costs of heat consumption in multi-apartment buildings. The impact of these articles on metering practices, together how they can assist in energy efficiency investments should be further examined.

⁴ A small number of countries (Netherlands, Denmark and some regions of Austria) had an energy rating system before the adoption of EPBD in 2002 (Arcipowska, et al., 2014).

3.3 Financial incentives & models

Financial and fiscal incentives

Energy-efficiency incentives from governments, energy suppliers and other sources are intended to overcome upfront costs barriers. They are however not designed to meet the unique challenges faced by multi-unit buildings or rented properties. A survey carried out by the JRC in 2013 showed that a large share of financial instruments targeted homeowners, while many schemes whose eligible recipient list included multi-apartment or rented units, did not use financing options that were carefully designed to meet the specific needs of these segments of the building sector (Economidou & Bertoldi, 2014).

Various financial and fiscal incentive schemes can be designed to support specific segments of the building sector in which involved parties would refrain from improving the energy efficiency of the building under normal circumstances. In the UK, a tax break scheme (with a dedicated budget of £35 million) has been designed to support residential landlords in the period 2014 to March 2017. In the Netherlands, the state plans to make available a €400 million subsidy for landlords in the rental social housing sector for investments in energy efficiency for the period 2014–2017 with the aim of contributing to the objectives of the Energy Saving Agreement for the Rental Sector.

Financial incentive programmes specifically designed to provide grants to multi-apartment buildings include the National Renovation Programme for Residential Buildings in Bulgaria and Latvian Improvement of Heat Insulation Programme. In the Flanders region of Belgium, the procedures for energy grants were reformed in 2011 to simplify applications from multi-owner apartments.

On-bill finance

On-bill financing is a mechanism of obtaining access to capital to fund building energy efficiency upgrades, where repayments are made through the energy bill. On-bill financing allocates the financing responsibility to the utility and maintains the loan attached to the property, thereby offering an appropriate solution to overcome temporal split incentives. It can also avoid the need to obtain upfront capital to cover the cost of buying energy efficient equipment, which can be beneficial to the landlord. The energy utility will typically aim to make the monthly payments equal to or less than the energy savings achieved through the upgrade, which means that the tenant will be no worse off financially.

While an on-bill finance scheme can address both owner-occupied and rented properties, Bird & Hernandez (2012) stressed the need for a careful design of such schemes specifically targeting rented properties. A successful on-bill finance programme should create incentives for all stakeholders: tenants (savings), landlords (savings/investment), utilities (protection/decoupling) and by extension, banks. As high transaction costs linked to the realisation of investments deter landlords from upgrading their rented property, the authors proposed a small incentive to be considered for landlords of rented properties in the private and/or social housing sectors. If landlords are allowed to get an incentive in the form of a small share of savings, covering the transaction costs attached to the upgrade, this could trigger participation in on-bill programmes on behalf of landlords.

Property Assessment Clean Energy (PACE)

Property Assessed Clean Energy (PACE) is a means of financing energy efficiency upgrade through the use of specific bonds offered by municipal governments to investors. As in the case of on-bill finance, they can provide a solution to the temporal split incentive problem. With PACE, the difference is that governments use the funds raised by these bonds to loan money towards energy efficiency upgrades in residential and commercial buildings. The loans are repaid over the assigned term – typically 15 or 20 years – via an annual assessment on their property tax bill. The long repayment term attached to PACE programmes allows for investments with long payback times to be

considered in the upgrade. This additional tax assessment is placed on the property rather than the property owner, which means that PACE assessments are also transferable and can help overcome the split incentives between tenants and owners in commercial and multi-tenant residential buildings. PACE programmes are secured by a senior lien on the owner's property, which avoids repayment security to be attached to the borrower's creditworthiness and is therefore more attractive to financiers and borrowers alike.

3.4 Voluntary approaches

Green leases

As discussed previously, traditional forms of lease create asymmetries in the relationship between landlords and tenants and therefore do not set the ground for energy efficiency investments. Green leases can bridge these differences by splitting costs and benefits between the parties in such a way that both parties can benefit from an energy efficiency upgrade. Given that the necessary legislative foundations exist (see section on rent and condominium acts), they can bridge the differences between landlords and tenants in a way that both parties can gain from an energy efficiency upgrade.

Through a green lease, a clause or separate agreement is made between the concerned actors that allows a property owner to raise the rent to finance energy efficiency improvements to a property. As in the case of on-bill financing model, green leases assume that energy cost savings should exceed finance charges, and should be set at a percentage of monthly energy cost savings to the tenant. The cost recovery, typically done by amortisation, can be based on the actual or predicted energy savings. In New York City, recovering the cost based on predicted energy savings is considered risky by tenants in case energy upgrades underperform. For this reason, the owners' capital expense that can pass through can be up to 80% of predicted savings in a given year. This is based on industry's experience which showed that actual savings are generally within $\pm 20\%$ of predicted savings. Tenants are therefore protected from underperformance by a 20% "performance buffer" (performance corrector factor).

This type of leases has gained increasing popularity in the past few years in the U.S. and Australia. They are appropriate for large, commercial buildings rather than small units such as houses. Despite their potential, green leases are not currently widely used in Europe. A survey carried out by European Property Federation highlighted that there are still various regulatory and non-regulatory hurdles that inhibit a wider use of green leases in Europe. Sharing standard green lease guidelines can increase awareness among key interest groups. The public rental sector can also lead by example by adopting green leases for their rented premises.

4. Workshop presentation summaries

In this section the summaries of the presentations of the workshop on “Unlocking the energy efficiency potential in the rental & multifamily sectors Workshop taken place in Brussels on 20 January 2016, are presented.

4.1 Session 1: The role of rent structures in scaling-up energy renovations

The economics of capitalising efficiency investments

Erdal Aydin, Maastricht University, Netherlands

According to EUROSTAT, in 2010, the residential sector accounted for nearly 27% of the total energy consumption in the EU-27 countries. In order to achieve the 2020 energy and climate targets, EU member states have been introducing a variety of policy measures that aim to promote energy efficiency within the residential sector, considering its high potential for energy conservation. As one of these policy measures, member states were required to implement energy performance certification (EPC) schemes for residential properties by 2009. By providing information to market participants about buildings' energy performance, policy makers expect an increase in the demand for energy-efficient buildings, which in return, will lead to higher investment in energy efficiency. However, the effectiveness of this policy depends on how much buyers are willing to pay for increased EE. Furthermore, as upgrading a dwelling to improve its energy efficiency could involve a significant financial investment, the uncertainty regarding its financial return may be a reason for households not to undertake profitable investments in energy efficiency. These market failures could cause what is termed as “Energy Efficiency Gap”– the difference between the optimal level of energy efficiency and the level actually realized. Therefore, from both the policy maker's and investor's perspective, it is important to identify the market value of energy efficiency in the housing sector.

In the presented study, using a large representative dataset from the Netherlands, it is proposed an instrumental variable approach in order to correctly identify the capitalization of energy efficiency in the housing market. The authors benefit from a continuous energy efficiency measure provided by EPCs, which enabled them to estimate the elasticity of house price with respect to its energy efficiency. As well as including detailed dwelling characteristics in the hedonic model, an instrumental variable approach was used to deal with the potential omitted variable bias. The 1973-74 oil crisis, which created an exogenous discontinuity in the energy efficiency levels of the dwellings constructed before and after this date, and the evolution of building codes are used as instruments for energy efficiency. The results indicate as the energy efficiency level increases by 50% for an average dwelling, the value of the dwelling increases by around 10%.

In order to examine whether the value of energy efficiency increases by the disclosure of EPC, a common energy efficiency measure, this is based on actual energy consumption, for certified and non-certified dwellings has been created. It has been found that the market value of a percentage change in actual gas consumption is close to the value of the energy efficiency change that is estimated based on EPC energy efficiency indicator. The study findings do not provide any evidence suggesting a larger capitalization rate for the dwellings that are transacted with EPCs. Regression discontinuity approach was also used to test whether the label (classification), itself, has a market value. The results do not indicate a significant change in transaction price at the threshold energy efficiency level that is used to assign the dwellings into different label classes. Finally, in order to examine the over-time variation in the capitalization of energy efficiency, the hedonic model for each year separately from 2003 to 2011 was estimated. It was found that the value of energy efficiency has doubled from 2003 to 2011, which might be partly explained by the increase of energy prices, the relative decrease in house prices after 2008 and the general impact of policies and campaigns indicating the importance of EE.

Monetary value of energy efficiency and its impact on aligning incentives ***Dr. Risto Kosonen, Aalto University, Finland***

Energy efficient indoor environment is a common goal for all building project stakeholders. Excellent indoor environment quality increases wellbeing and performance of workers. Together with reducing of operation cost, high quality environment increase value for investor and building owner. At the moment, there is a lack of understanding on how good indoor environment can improve business based on earning logics of owners, investors and tenants. Currently a good indoor environment is often fostered by regulations not business interests. Thus, only few investor and owners have realized the potential of sustainable indoor environments for their business.

Building owners and investors can financially benefit from sustainability and improved indoor environmental quality. These improvements can result in increased property value such as:

- Reduced life-cycle costs;
- Extended building and equipment life span;
- Longer tenant occupancy and lease renewals;
- Reduced churn costs;
- Reduced insurance costs;
- Reduced liability risks;
- Brand value.

In the facility management, the main concern of the net operation income is to reduce running costs. Beside the improved occupancy and asset value, excellent indoor environment affects rental yield. According the research results, better building rent ability and lower maintenance costs can be achieved through good and energy efficient indoor environment. Good indoor environment and energy efficiency attract tenants.

In fact, based on the findings it could be estimated that asset value of buildings with excellent indoor environment is 10% higher that with the standard buildings and the price premium is likely to significantly increase in the next 5 years. Moreover, in buildings with high quality indoor environment the occupancy rate is approximately 10% higher and the rent is 5% higher that with standard building.

Willingness to Pay for Energy Efficiency in the rental sector ***Adan L. Martinez-Cruz, ETH Zurich, Switzerland***

The results of two empirical studies performed at the Centre for Energy Policy (CEPE), ETH Zurich, on the preferences and willingness to pay of tenants and landlords for energy saving renovation of buildings have been presented and discussed.

The results of the first study show that tenants are willing to pay more for the rent (between 3 and 13%) if an energy-saving renovation is carried out (3% for an enhanced insulated façade and 13% for a general insulation of the buildings, including natural ventilation). The second study shows that owners of multi-family buildings consider energy-saving renovations as risky and uncertain. These results have straightforward public policy implications: if tenants are willing to pay for energy-saving renovations, but owners perceive this type of investment as risky, then policies can be directed to subsidize landlords to invest in energy-saving measures.

Finally, the first ideas of a new project on home buyers' willingness to pay for green homes have been presented. ETH aims to implement a field experiment with the help of construction companies and it identified that architects, construction consultants, and building companies are the most important source of information to perform renovations. This finding justifies ETH attempt to include credible providers of information for the experiment.

How to avoid the poverty trap for tenants and prevent “renovictions” **Pasquale Davide Lanzillotti, International Union of Tenants**

In the EU there is an Energy poverty issue:

- 52 million people cannot keep their home adequately warm;
- 161 million are facing disproportionate housing expenditure;
- 87 million are living in poor quality dwellings;
- 41 million face arrears on their utility bills.

There is an "housing deprivation" issue as well: 15.7% EU population living in dwellings with a leaking roof, damp walls, floors or foundations, or rot in window frames of floor (SILC, 2014).

According to EUROSTAT there is also a worrying housing overburden rate for tenants in private market, with significant share of tenants living in households where total housing costs (including energy) represent more than 40% of their disposable income;

On average, 27.1% of tenants renting at market price have a housing cost overburden in the EU 28⁵.

Being a tenant is *per se* a driver of energy poverty, because tenants live generally in more inefficient dwellings and don't have same resources as landlords to invest in EE measures nor the legal possibilities to require them.

In 21 European countries, renovation costs may be passed on to tenants through rent increase - leading often to welfare losses or «renoviction» (displacement) and gentrification.

Energy-efficient renovation should be at least cost neutral for tenants, i.e. balance between rent increase and energy savings

At present, the Energy Efficiency Directive does not protect tenants against potential losses resulting from EE improvements. It rather ask MS to «remove barriers» (Art. 19), without taking social considerations into account.

Art. 7 par. 7(a) is deemed too weak and should be revised as follow:

«Within the energy efficiency obligation scheme, Member States have to:

(a) include requirements with a social aim in the saving obligations they impose, including by requiring a share of energy efficiency measures to be implemented as a priority in households affected by energy poverty or in social housing»

Moreover, “private rental housing” should be explicitly mentioned. IUT claims for a review of the EED to ensure that tenants are not financially penalized by energy-efficient renovation the “new deal for energy consumers” should be balanced as they are “at the core of the Energy Union”.

Energy performance generally is not considered when setting the rent price in the residential sector and it should be part of rent levels (as in the Dutch “points system” and in a few German *Mietspiegel*) in order to stimulate investment in EE improvements especially in the private rented sector.

For more market transparency ensure MS enforcement and compliance with Art. 12 - energy performance certificates to be handed over to tenants/buyers, together with training/ information campaigns for residents. When revising EPBD the mandatory display of energy certificates in common parts of all buildings should be introduced.

⁵ Belgium, Denmark, Italy, Lithuania, Portugal, Romania, UK (>30%); • Bulgaria, Croatia, Hungary and Spain (>40%); Greece (>50%); Source: Eurostat, 2014

In order to achieve socially balanced energy renovations some member states introduced some innovative schemes:

- The Netherlands "points system" including energy label, plus a covenant on energy savings in the rental housing sector providing for a total housing costs guarantee: savings made in energy costs are greater than the increase in rent due to the energy-savings
- The Swedish system of "gross rent" i.e. rent includes heating and hot water charges and thus it is an incentive for landlord to make investments.

The shortage of decent and affordable housing, in combination with the inability of residents/tenants to afford energy costs, maintenance & renovation can cause poverty and social exclusion (e.g. displacement of tenants and gentrification of quarters). It is thus crucial to put social/affordable rental housing and rent stabilisation mechanisms at the centre of EE policies. A good example is the German rent law, which stated that costs of EE measures financed through public loans may not be passed on the rents.

IUT welcomes new policy line of the European Commission (prioritize energy efficiency investment in rental housing e.g. through EIB loans and EFSI)

Some actions are needed at different levels of governance to overcome the split incentive issue. At EU level, financial instruments to support energy improvements in rental housing have to be put in place.

At National level, binding energy-efficiency objective agreements together with schemes to ensure that total housing costs are not higher after energy improvements (e.g. Dutch covenant on energy savings) shall be set up, together with rent stabilisation mechanisms. Finally, at local level energy performance shall be considered as a component of rent to stimulate investment in both private and social sector, awareness raising campaigns shall be developed and the display of EPCs should be mandatory in all buildings.

4.2 Session 2: Engaging commercial tenants in energy efficiency

Tenancy ratings under the Australian Built Environment Rating System

Dr Paul Bannister, Exergy Australia

Australia launched the NABERS (National Australian Built Environment Rating System) energy rating program for office buildings in 1999, with ratings for other commodities (water, waste, indoor environment), and additional building types (shopping centres, hotels, data centres) introduced over subsequent years. NABERS is a performance based building greenhouse rating tool, where an existing building is compared against the building stock based upon its actual energy consumption and its productive outputs (occupied m², hours per week, climate etc). Ratings are valid for 12 months, requiring the ongoing maintenance of building performance. The rating is on a zero to 6 star scale, in half star increments. In 1999, 2.5 stars was set to the median building performance in the market, with 6 stars representing emissions approximately 75% lower than median. Ratings are separately assessed on base buildings (land lord energy use) and tenancies (tenant light and power).

NABERS policy has generally been market based, as opposed to compliance focused. For example, there is no mandatory requirement for buildings to achieve a particular star level. However, there are numerous policies to encourage market value of high NABERS ratings, such as incentives through green lease requirements for government tenancies (government being a significant tenant of Australian office buildings), and mandatory public disclosure of existing building performance. This has been reflected in a significant building valuation premium in the Australian office market for high NABERS rating office buildings. Based on 2014 data, market wide total returns for buildings of 4 stars and above was 10%p.a. vs 8.8%p.a for buildings of less than 4 stars. This was reflected in both income and capital return. The value of NABERS ratings to owners was supported

by over 70% of the floor area in the market paying voluntarily to have an independent assessment of their building by 2011, prior to the program becoming mandatory.

This alignment of energy performance with building valuations has had a profound impact on the energy efficiency of landlords in the Australian office market, with the majority of institutional property owners pledging to achieve ratings above 4.5 stars, or emissions approximately 50% below the median emissions of the 1999 baseline. By 2015, the majority of these portfolios have achieved this, and has been reflected in the performance across the whole building stock, with the median rating improving from 2.5 stars in 1999 to 4.2 stars in 2014, and capture of approximately 90% of the Australian office building stock.

The adoption by building tenants has been considerably lower than that for landlords. Anecdotal feedback indicates that this is due to less tangible alignment with core business (property valuations are tangible for landlords) and energy representing a smaller portion of business costs – of the order of 10% of rental for landlords, but under 1% of square meter equivalent wage costs for tenants. Further, adoption in building classes with a poorer split between owner and user energy consumption has been poor, a reflection of reluctance to report on consumption outside of the operational control of the reporting entity.

The Australian experience has shown strong effect of measurement based rating tools in driving market emissions, provided the market structure is supportive of utilising performance ratings to inform purchasing decisions, and that complementary policy is provided to assist the market valuation of high performing buildings.

From Energy Star to Tenant Star: the US experience

Adam Sledd, Institute for Market Transformation US

In fall 2015, US Congress passed the Energy Efficiency Improvement Act of 2015, a small but important bipartisan bill focused on improving efficiency in U.S. buildings. For many in the real estate industry, the most notable portion of the bill directed the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) to create a tenant-focused version of EPA's very successful Energy Star for buildings program. The new initiative, which the bill gives EPA the option of calling Tenant Star, is being hailed by a wide range of industry stakeholders as the next great tool for driving energy savings in commercial buildings. It's not hard to see the allure of Tenant Star. Energy Star's Portfolio Manager is already successfully helping more than 400,000 commercial buildings measure, track, assess and report their energy and water use. And last year Energy Star expanded its reach to multifamily housing with the help of Fannie Mae. To test the program's effectiveness, in 2012 EPA conducted a study of 35,000 buildings. The results showed that organizations benchmarking whole building energy data (PDF) consistently in Portfolio Manager achieved average energy savings of 7 percent over three years. The key words there, however, are "whole building." As property owners have become more sophisticated about managing energy use in their buildings, the composition of that usage has changed. Plug and process loads, which include tenant space items such as refrigerators, computers and printers, are widely considered the fastest-growing category of energy use in office buildings. So while base building systems such as boilers and chillers are getting more efficient, tenant spaces may offset savings by ignoring efficiency in their space design and occupant behavior. Owners who invest millions of dollars to have high-performing buildings are rightfully worried that inefficient tenant spaces are, to some extent, undoing their good work. Tenant Star could help secure investments in high-performing buildings by providing owners with a federally funded engagement platform to present to prospective tenants. The program's savings potential is staggering when considering only the roughly 6 billion square feet of existing leased office space in the U.S., and estimating about \$1.10 per square foot for lights and plug and process loads, just 15 percent savings in tenant spaces would be worth almost a billion dollars in avoided energy costs — and that's not counting potential savings for retail, education and other types of tenants. Despite the

large potential, there is still a long road ahead to reach a world full of Tenant Star-certified spaces.

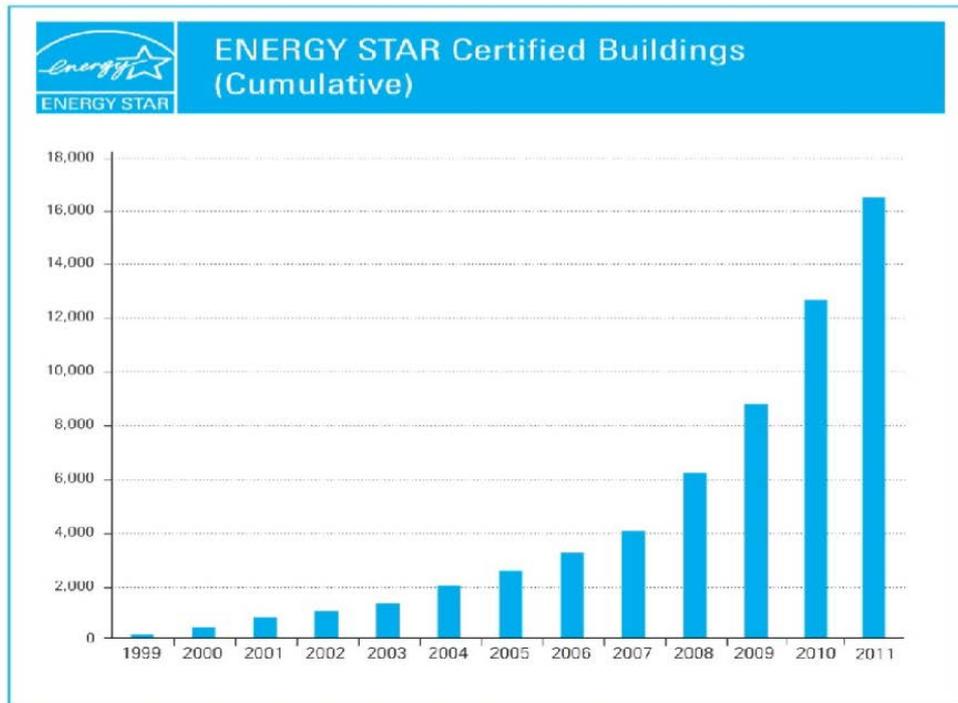
From bill to real building efficiency

The bill didn't actually provide funding for the program, which was a particular problem because the EPA and DOE will have to build the program from scratch, and ENERGY STAR already runs on a shoestring budget. ENERGY STAR uses data from the Energy Information Administration's (EIA) Commercial Building Energy Consumption Survey (CBECS) as its baseline for whole building consumption, and there is no comparable study for tenant spaces. Even in a best case scenario that Congress immediately funds EIA to develop a tenant version of CBECS, results will not be seen before 2018. The agencies have about six months to lay out a plan to capture enough data to build a baseline for Tenant Star, and they'll run into a considerable roadblock: the vast majority of leased office spaces are not sub- or separately metered, meaning there isn't an obvious way to obtain detailed energy usage information. This is a really significant problem. There are only a handful of markets around the country (New York, Chicago, San Diego, and Cleveland, for example) where many office tenants receive utility bills from either the landlord or utility that reflect real energy consumption, rather than a per-square-foot estimation. So Tenant Star either will have to be built with a limited data set, reflecting relatively few markets or types of buildings, or there will have to be a major data collection process that could involve sub-metering tenant spaces around the country. While we're on the topic of office buildings, the same problem applies to a large portion of the enclosed retail spaces not currently covered by Energy Star/CBECS: most malls charge retailers for utility costs on a per-square-foot basis rather than actual meter readings.

Information overload

One way to establish the program could be to focus on the space design rather than operational data. However, LEED Commercial Interiors already has a well-established market for certifying the design and projected performance of a tenant space — and Energy Star is known for rewarding buildings' energy performance, rather than projected numbers. To change that now would likely only further confuse a marketplace already bogged down by information overload. A better solution likely will involve EPA and DOE working with as many owners and tenants from as many markets as possible to get confidential access to sub- and separately metered data. The EPA then could base the Tenant Star scoring system on this data in the same way it bases Energy Star on CBECS data. The agency already did something very similar in creating Energy Star for data centers. If we're thinking about long-term impacts of Tenant Star, it's a good bet that the first widely felt one will be a potential surge in sub-metered tenant spaces, likely accompanied by billing tenants for lights and plug load usage separate from other operating expenses. Landlords mostly have avoided this structure until now, but it's hard to imagine that tenants will want to pursue Tenant Star certification without accruing the benefits of a more-efficient space. A new Energy Star program won't magically provoke tenants to think or act differently about how they occupy their space, either. Figure 1 shows the adoption curve for the original buildings program.

Figure 1. Energy STAR Certified buildings (1999-2011)



Matching the same track record will require time and effort on the part of building owners, and likely some changes to the way they currently interact with tenants and structure their leases. Some leading owners and managers already understand this and have solid tenant engagement programs in place. If you're wondering which companies have done so, the list of the 2014 and 2015 Green Lease Leaders is a great starting point. For many owners and managers, the establishment of Tenant Star could provide greater motivation for many owners and managers to develop a tenant engagement plan that tackles reducing energy use. The potential is extraordinary, but realizing it will require sustained effort to nail each step along the way

Latest developments on the use of green leases in Europe

Bruno Duquesne, Lawyer at the Brussels Bar Partner CMS DeBacker Belgium

As a pan-European legal organization present in 59 cities, CMS has taken on the task of developing a uniform European standard on Green Lease.

In a first phase, legal position in 21 European countries were compared. A questionnaire was set up and answers were provided by each jurisdiction. This study makes recommendations on how to draft a green lease. Hereunder are provided the main conclusion of the study.

The green lease should regulate the recording and calculation of operating costs based on consumption (especially heating, refrigeration, electricity, water, etc.); in some countries this has already been prescribed by law. Tenant should be obliged by contract to accept the measures undertaken by the landlord (in particular refurbishment) to improve energy efficiency in the building and to promote environmental protection. Lease should grant landlord the right to pass an appropriate amount of the costs of improving energy efficiency and observing environmental principles onto tenant or to increase the rent by a reasonable amount. If a building has been certified as "green", tenant should undertake to observe the certification conditions and act accordingly, e.g. only install elements in the building which are made of energy-efficient and eco-friendly materials. The parties should agree to act in such a way as to save energy and promote environmental protection (e.g. correct conduct as regards heating or refrigeration, water

consumption or recycling waste). Landlord should inform tenant about possible ways to save energy and be environmentally responsible.

The following definition (proposed regulation) describes the content and the target of a green lease:

A green lease is a lease agreement which is intended to ensure that a leased property is used and managed in a manner which fosters sustainability. The tenant and the landlord thus mutually undertake to conserve natural resources and energy with regard to the leased property. The parties may also document the sustainability of the leased property by acquiring or receiving certification and creating the conditions for the environmentally friendly use of resources.

Across Europe there is a largely uniform understanding of the term "green leases". The content and the aim is to comply with aspects of sustainability when engaging in a lease relationship. As a rule green leases are not regulated under statute.

Only in France is there a duty to attach an environmental appendix to certain leases. This is for leased properties with an area greater than 2,000 m² and leased properties which are used as offices or for commercial purposes.

The IBGE's initiative on Green Leases in the Brussels Region (an example)

The Brussels Environment Agency (BIM/IBGE) has launched a project aiming at setting up a new technique for the financing of energy saving renovation works. CMS is involved in this project. The project is articulated in two phases:

- First phase: technical, financial and legal analyses relating to possible actions in this field.
- Second phase : preparing a lease template aimed at organizing the landlord/tenant relationship in the framework of a live test.

Selected lease relationship is the residential lease entered into in respect of a property that does not make part of a co-ownership. Bottom line of proposed system is that both landlord and tenant must benefit from the system. Landlord carries out the energy saving works at own costs, but can recharge a part of those costs to tenant through a monthly energy service charge. Tenant will however benefit from a part of the energy saving. Landlord to recover 75% of his net investment. Remaining 25% will be regarded as a capital gain for the property. The Net cost of the investment shall be equal to the cost of the investment less any subsidies, grants, tax reductions, etc., and less any deduction that should in any event have been borne by landlord (for ex. in order to comply with certain statutory requirements).

IBGE prepared a list of authorized/qualifying investments and has created a calculator enabling to calculate the energy savings for a given investment, taking the lifetime of the investment into account.

Overcoming barriers to energy upgrades in multi-owned properties: lessons from the WICKED retail project and residential issues

Susan Bright, Oxford University, UK

The retail sector is diverse, and about half the space is rented. Because of complex interdependencies between stakeholders, energy management in the retail sector can be defined as a 'wicked' problem (Rittel and Weber, 1973). The "Working with Infrastructure, Creation of Knowledge and Energy strategy Development - WICKED" initiative is an Engineering and Physical Sciences Research Council (EPSRC) funded research project, exploring energy management issues and opportunities in the UK retail sector. The WICKED academic research team combines expertise in energy use, maths, computing, engineering, physics, law and organisational behaviour, and uses a multi-level, interdisciplinary research approach. Alongside 'big data' analysis and the development of new smart meters, WICKED carries out qualitative analysis of

organisational issues, focusing on energy management, the landlord-tenant relationship and the role of green leases.

A number of findings emerged, based on interviews and document analysis. The 'split incentive' manifests itself in complex and diverse ways, typically where a landlord wishes to pass on costs of energy efficiency improvements to the tenant through the service charge, but the tenant resists. This is only part of the picture and related issues and barriers include capital and rental valuation, trade disruption, retailer focus on sales, lack of access to upfront funding, long pay-backs, lack of data, distrust. The lease typically reinforces these barriers on paper, e.g. by not allowing access and/ or cost recovery for upgrades; but in practice is less relevant than other barriers.

There are examples of landlords and tenants cooperating to overcome these barriers; generally 'outside the lease', and recovering costs through the service charge or other, voluntary financial arrangements for cost sharing. These collaborations are driven by trust, common interest and mutual benefit, and require commitment and resources.

'Green' lease clauses are typically used by large landlords in the prime market and tend to be general, non-binding and aspirational; or to prevent the worsening of environmental performance. Some leases allow landlord access to carry out energy efficiency upgrades, but very few provide for cost recovery. Many retailers are resisting green lease clauses due to lack of awareness, cost considerations, other pressures and priorities, general distrust and/ or a reluctance to relinquish control and flexibility.

Views about the role of green leases are mixed and presented below.

To many they are irrelevant and seen as being 'in the cupboard'; conversely, what matters is what is 'on the ground'. Some view green lease clauses as unhelpful, reinforcing the traditional adversarial relationship between landlord and tenant.

On the other hand, for some green clauses can provide a framework for dialogue and cooperation (possibly simply reflecting existing drivers).

The expected introduction of minimum energy efficiency standards (in 2018) is high on the agenda for landlords and their advisers, and some retailers. Companies are reviewing their property portfolios and their leases to manage risks. Responses to MEES remain uncertain and could include energy efficiency improvements, but also offloading of sub-standard properties, issues around enforcement and increased tension between landlords and tenants over the cost of improvements.

A second project on the split incentive issue in the residential sector, "Future proofing flats: Overcoming barriers to energy upgrades in private flats (apartments)" has then been presented. This project, a research partnership with "Future Climate" NGO, the City of Westminster, TLT solicitors, and the University of Oxford, is concerned with investigating the legal and governance barriers to upgrades in apartments in the United Kingdom. In UK one in five homes are apartments, and apartments are less likely than houses to have key energy efficiency measures. Older flats in converted houses perform worst. In the City of Westminster, 90% of homes are flats and the council is very concerned about the legal and governance barriers to upgrading apartments.

A number of findings emerged:

- In England, apartments are sold on a leasehold basis. Leases present serious barriers to energy upgrades: leaseholders commonly own only the unit that is their home and have no power to make decisions in relation to the management of the common/shared parts of the building, there is no standard wording in leases, and they are often poorly drafted;
- The major problem in the context of energy upgrades is that leases — and the legal rights in many European countries — give no power to improve the buildings.

- There is often 'title complexity' in apartment buildings: so any action taken needs to be consistent with the rights of rental tenants, apartment owners, those with security rights (mortgagees) and any commercial and retail leases.;
- In so far as action can be taken with consent, in England this will usually be 100%. Even in countries with lower consent requirements, the barriers to obtaining consent make action difficult. The barriers include difficulties in identifying and contacting owners, and reaching consensus.

The research project has proposed a number of legal reforms: (a) a duty on the building owner to undertake an energy efficiency survey of the whole building; (b) a right for unit owners to improve the energy efficiency of the building; (c) changing the meaning of leases to permit energy efficiency; and (d) a right for individual apartment owners to make energy upgrades that are internal to the apartment.

4.3 Session 3: Legislations as an energy efficiency driver

An European comparison of tenancy regulation and energy efficient refurbishment

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With a view to furthering climate protection and a sustainable reform of energy supply, the European Union has committed itself to ambitious objectives in energy policy. Directive 2012/27/EU, which had to be implemented into national law until June 2014, specifically aims at increasing energy efficiency in the existing building stock. Indeed, a huge potential for energy savings may be supposed to exist in this sector. Rental dwellings therefore play a significant role in this context.

The presented study starts off from a socio-economic and comparative description of tenancy law and markets in 12 EU Member States respectively 13 countries (as within the UK, England and Scotland have been analysed separately) and Switzerland. The comparative analysis of tenancy law provisions relevant to energy renovation in the rental stock is based on this description, which extends to both the European and the national level. On the basis of this analysis, the countries under review were divided into several groups. This categorization aims at locating national tenancy law provisions within the overall energy policy context and explaining under which conditions progress in energy efficiency in buildings may be reached.

Beyond that, the study examines which approaches the various countries have chosen to implement European provisions into national tenancy and housing law (in Switzerland in the framework of autonomous alignment to European legal standards). To this end, the study first needs to identify those fields of law and policy which have a strong bearing on energy efficiency. The central legal basis in European primary law is Art. 194 TFEU, which explicitly focuses on the promotion of energy efficiency and energy savings as objectives of European energy policy.

Starting in January 2014, the research project underlying the present study analysed the situation of the housing market with a particular focus on energy performance and its interconnections with private tenancy law and public law regulations aiming at increasing energy efficiency in the rental stock. This analysis was carried out in 14 selected European legal orders: DK, DE, FI, EE, FR, IT, LV, NL, AT, PL, SE, England, Scotland and Swiss. This selection encompasses both countries which are very different from Germany and countries exhibiting similar legislative provisions as well as court and administrative practice. This approach enables the identification of different regulatory models and elements of best practice. In a methodological perspective, the project is based on a synthesis of different approaches. First, secondary literature and own sources of information were used. In this respect, the broad preliminary work undertaken by the project team in the framework of the Tenlaw project (implemented by the Centre of

European Law and Politics at Bremen University (ZERP) under the 7th Framework Programme of the EU could be relied upon.⁶

As the central source of information, a detailed questionnaire was answered by specialized national reporters for each of the countries under review. Its contents and structure had a qualitative focus. This knowledge base of the project was reflected and broadened in various workshops, which were organized together with the contracting authority and to which representatives of other federal ministries and external experts (from Spain, the Netherlands and Austria) were invited. In the final phase of the project, the national reporters were consulted again to control its key results.

Scientific approach and intermediary results

Step 1: Country profiles

For each country, a profile was drafted which is based on multiple sources of information and data including the expert answers to the questionnaire. The uniform structure of the profiles may be summarized as follows:

- Basic features of the national housing system;
- Typology of rental buildings;
- Trends in housing policy and supply;
- Rental markets;
- Excursus on national tenancy law;
- Networks of actors active in rental housing;
- Energetic efficiency: basic features and trends.

These profiles contain a structured and coordinated information base on all covered areas of research and for each of the countries under review.

Step 2: Influence of EU legislation on national tenancy law

In this step, stock is taken of the relevant EU legislation on energy efficiency. This analysis shows that a large number of European directives and regulations considerably influence housing markets and tenancy laws. These range from public procurement law to technical standards and consumer law. These legislative instruments are structured and evaluated according to whether they exercise direct or indirect influence on national tenancy law.

Step 3: Comparative analysis of national tenancy law provision relevant to energy renovation of buildings

The comparative analysis of national tenancy laws including the regulation of energy renovation makes a distinction between (a) general tenancy law, (b) legal prescriptions on the distribution of additional costs and utilities and (c) tenancy law provisions on energy efficiency.

An evaluation of general tenancy law provisions shows that three types of countries may be distinguished with respect to the duration of tenancy relationships:

- Countries in which fixed-term and open-ended tenancy contracts are lawful (e.g. Austria);
- Countries in which only fixed-term tenancy contracts (normally covering longer periods) are lawful (e.g. France, Italy);
- Countries in which fixed-term tenancy contracts are lawful only exceptionally (e.g. Germany).

⁶ Vgl. www.tenlaw.uni-bremen.de

As regards termination of open-ended tenancy contracts, the countries under review may be divided into three categories:

- Countries where open-ended contracts may be terminated without restrictions (e.g. Switzerland);
- Countries where open-ended contracts may be terminated only for important, legally pre-defined reasons (e.g. Denmark, Germany);
- Countries where open-ended contracts cannot, factually, be terminated (e.g. Sweden).

The following further issues, which are relevant to a comparative law analysis and an overall categorization of countries, are analysed:

- Rent regulation (in the case of the conclusion of new contracts and rent increases in existing contracts);
- Obligations of the tenant to tolerate refurbishment works;
- The distribution in fact and in law of running costs and additional charges between landlord and tenant;
- Information duties relating to the energetic state of rental dwellings and the remedies available in case of their violation;
- Obligations to carry out energy refurbishment measures, e.g. in the case of certain measures or of violation of certain technical or environmental standards;
- Special regulations on the division of costs of measures of energy renovation between landlord and tenant (in countries allowing rent increases in existing contracts);
- State aid for measures of energy renovation (tax incentives and direct subsidies).

Step 4: Categorisation and path developments in the countries under review

A further step, already completed, is devoted to the comparative description of different framework conditions and implementation strategies. According to this analysis, the countries under review may be subdivided into three main types:

- Type 1: "High share of non-profit rental dwellings with a comparatively high degree of regulation of energy renovation": Denmark, Sweden, Netherlands. The countries pertaining to this group are characterised by a comparatively high degree of regulation aimed at implementing measures of energy renovation and shifting costs on tenants. The requests for public subsidies are low until medium in this group. Non-profit housing associations and cooperatives have mostly high relevance in these countries and security of tenure is likewise high;
- Type 2: "Medium degree of regulation on energy renovation combined with high degree of security of tenure": France, Germany, Austria. This group displays a medium degree of regulation on energy renovation (normally, this regulation has a procedural focus, except in Austria). The allocation of costs on tenants is legally possible to different degrees (no uniform regulation in Austria). The requests for subsidies are medium until high. Security of tenure is generally high in these countries (in Austria, it depends on the type of rental buildings);
- Type 3: "Low degree of regulation on energy renovation combined with a rather low degree of security of tenure": Switzerland, England, Scotland, Italy and Estonia. This group is made up of countries in which energy renovation measures are comparatively little regulated. Thus, in England, Scotland and Switzerland, only the procedure to be observed for energy renovation works is regulated. In Estonia and Italy, the consent of the tenant is required; alternatively, the landlord may terminate a rental contract in a medium term perspective. The allocation of renovation costs on the tenant is not legally regulated but market-based. Security of tenure in the private rental sector is generally low in this group.

Finland, Poland and Latvia display individual features in central issues, for which reason they cannot be accommodated plausibly in this categorisation. For this reason, they could not be integrated into final analysis either.

Moreover, the project has shown that, despite the close resemblance of central parameters (e.g., the share of rental dwellings in the overall stock), the national framework conditions and therefore also the national strategies to adapt the housing stock to the objectives of energetic renovation may be very different. The following factors are relevant in this respect: Stability of tenancy relationships

- High degree of regulation of energetic renovations
- Obligation of the tenant to tolerate energy refurbishment works
- Share of non-profit housing in the overall stock

Key results and conclusions

To promote energetic renovation of buildings, the European Commission primarily relies on existing measures and strategies in the countries under review. These measures and strategies have been shaped during the last decades against the background of different national framework conditions (including the structure of the building stock, climatic conditions and legal provisos) and constitute the basis of European energy policy.

At European level, EU Member States are subject to notification and reporting requirements and obliged to elaborate national action plans for energetic efficiency and strategies for the refurbishment of the existing housing stock.

An assessment of the impact of energy renovation measures on landlord and tenant depends primarily on general tenancy law at national level. National provisions also determine whether an adequate division of the benefits of such measures may be achieved, as prescribed by Art. 19 Directive 2012/17/EU.

In most countries under review, the amount of the rent may be agreed upon freely by the parties at the conclusion of the contract. Conversely, rent increases in existing contracts are limited by regulatory provisions in most countries; in addition, their interaction with the rules on termination of the tenancy relationship is relevant as termination may constitute an obvious alternative for the landlord if legally possible.

As regards duration of tenancy contracts, open-ended contracts are predominant in practice in most countries under review. Countries with fixed-term contracts do not normally allow termination to achieve rent increases whereas termination to enable core refurbishment works to enhance the energy performance of the building is generally possible. At least in theory, short term contracts seem to offer the possibility of implementing energy renovation measures at the end of each term. However, the data show that in countries characterized by short term contracts such as the UK the volume of energy renovation measures carried out up until now is rather low. This may be explained by the fact that landlords may refrain from investments into old buildings in particular on account of insufficient rates of return.

As regards the obligation of the tenant to tolerate energy refurbishment works, it seems that most countries allow energy refurbishment measures to be carried out within a reasonable delay and without prohibitive additional costs for the landlord. However, in a few countries including e.g. Poland, problems with such measures may arise as neither obligations of the tenant to tolerate refurbishment works exist nor may tenancy contracts be lawfully terminated within shorter periods of time.

The landlord's right to increase the rent after completion of energy refurbishment measures is regulated in very different ways, irrespective of whether the pertinent provisions are contained in special legislation or general tenancy law. However, the possibility of allocating renovation costs on the tenant through rent increases constitutes an essential precondition for an adequate distribution of the benefits of refurbishment measures in the sense of Art. 19 Directive 2012/27/EU. This is so for the simple reason

that the tenant profits most from energy savings according to the usual allocation of heating costs among the parties whereas the landlord is obliged to finance the refurbishment in the first place.

In those countries where the rent is not regulated in existing contracts and, therefore, depends on the market, there exist no special provisions on rent increases after the completion of energy refurbishment works. The categorization shows that those countries typically show a higher need for enhancing the energy performance of buildings.

Financial incentives become relevant when rental dwellings are subject to framework conditions which render cost-effective (i.e. capable of being refinanced from rental income) investments difficult or impossible (in particular when rental dwellings are predominantly occupied by low income, vulnerable tenants). For the subsidization of energy refurbishment measures, most countries use a combination of facilitated loans and benefits as well as tax incentives in the field of VAT, income and/or corporate taxes.

In sum, which framework conditions would seem to be suitable to strategically promote energy refurbishment measures? The results of this research show that countries with differentiated rental markets which strong associations and interest representations, a high share of non-profit landlords as well as specific and effective legal provisions to enable the allocation of the costs of energy refurbishment measures on tenants seem to score best.

Energy efficiency and tenancy law – the German experience

Thomas Wölfel KPMG (Germany)

The German Federal Government has adopted a comprehensive action plan for national energy efficiency including measures to tackle remaining obstacles to its effective implementation. The notification of the German Federal Government to the European Commission is dated 5 June 2014. Adopting amended tenancy law as well as federal legislation on the energetic quality of buildings and the provision of energy services form an integral part of the German national energy efficiency action plan.

Tenancy Amendment Act of 2013

The Tenancy Amendment Act of 2013 implemented rather far reaching provisions for housing and commercial leases alike. In particular, a concept of so-called energetic improvement was introduced (i.e., refurbishment of a building or apartment that results in less consumption of end-use energy). Tenants' legal powers to oppose such refurbishment and/or to reduce rent on statutory grounds have been curtailed, thus, minimising the landlords' cost risks in connection with energetic improvements. Notably, a statutory rent-raise of up to 11 per cent of the refurbishment costs has become available to the landlord after successful completion of works.

The law furthermore provides that shifting to energy contracting in an existing lease does not require tenant's consent, even if the tenant pays the contracting fees under the lease as operating costs. The amended tenancy law now reflects the legal prerequisites in greater detail than the judiciary have previously approved already, hence, affording more legal certainty to landlords who consider energy contracting.

Condominium law

The German condominium law remains unchanged. Amended legislation comparable to the provisions in tenancy law was not deemed necessary as the principle of majority voting is already a part of the applicable legal framework for multi-ownership properties including condominium structures. Challenges for introducing energetic improvements in multi-hold structures are in practice more related to issues of opinion forming in order to enable an informed and successful voting process among the stakeholders.

Experiences and outlook

The tenancy law provisions introduced have over-all been well received. From a practitioner's point of view the new law is "practice approved". However, potential for legal dispute still lies with the distinction between (recoverable) refurbishment costs and (non-recoverable) maintenance and repair costs.

According to federal market monitoring, Germany has a growing energy services industry in particular in the field of energy contracting. It seems that transparency and trust-building in energy contracting is still necessary due to the (still frequently perceived) complexity of the service and/or product. Although German legislation has tackled the issue of energetic standards for buildings, the issue of retrofiting persists. On the one hand, this can be attributed to the legal principle of grandfathering, which to some extent still applies under the applicable legislation. On the other hand, financial considerations, such as a possible lack of mid-term profitability of energetic refurbishments in existing buildings, remain to be influential drivers

Energy efficiency friendly tenancy & condominium laws – the French experience

Elodie Trauchessec, ADEME

The French government has launched for many years different measures to support energy efficiency in tenancy sector and condominium, by helping energy performance measurement and supporting energy efficiency works. Indeed, the law n°323 voted in 2009, has allowed landlords to ask tenants for financial contribution to EE refurbishment works; the *Grenelle 2* law put into force in 2010, made energy audit mandatory for all co-ownerships of a building of 50 units minimum that benefit from a common heating installation; whereas the article 241-9 of the French Energy Code has made mandatory since 2011 the individual measurement of heating and hot water consumption in condominium having a common heating system⁷. In addition, the French government has improved existing schemes and adapted them to co-ownerships, and introduced new mechanisms to keep easing energy efficiency works in condominiums and rent dwellings such as those introduced by the law for Energy Transition and Green Growth (*Loi transition Energétique pour la Croissance Verte*).

Novelties introduced by the Energy Transition law⁸

The energy transition law voted in August 2015 has introduced a bunch of measures to ease the energy performances improvement in condominiums and rent dwellings:

- art.7 may allow outdoor wall and roof energy renovation works that do not respect urban planning rules;
- art. 12 will force lessor to rent dwellings having minimal energy performances;
- art. 14-I has announced the publication of a decree forcing co-owners to take into account energy performances when performing important isolating or restoring works, roof rehabilitation or room fitting;
- art. 14-IV has allowed the single majority vote of energy renovation works for co-owners;
- art. 26⁹ (whose implementation is expected within March 2016) will constrain owners of a multi-unit rental or the condominium management agent to assess the individual heating and hot water provided to each individual unit (in case of common heating system);

⁷ The law for energy transition voted in August 2015 has forced condominium management agent to set up this measure and to present quotations for works. It has also introduced control scheme and sanction measures and maintains financial support to energy performance improvement works

⁸ More information (in English) about this law may be founded on the website of the French Ministry of Ecology, Sustainable Development and Energy at the following link

<http://www.developpement-durable.gouv.fr/Energy-transition-for-Green-growth>

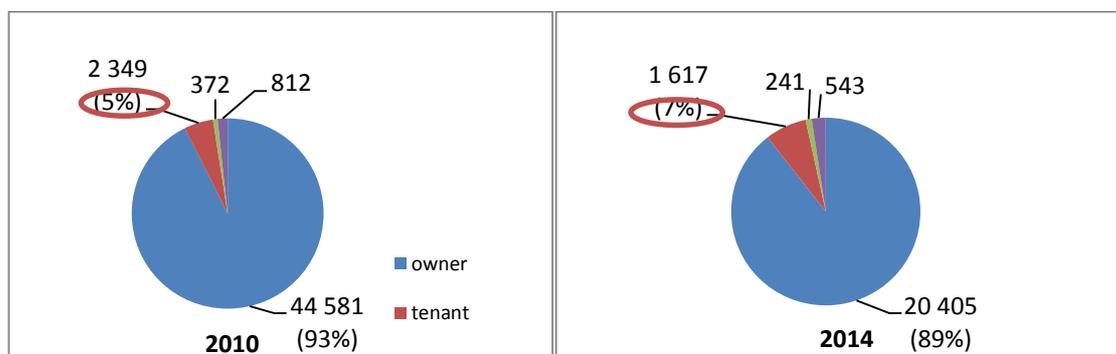
⁹ in force 6 month after the vote of the energy transition law

- art. 27 clarifies which authorities are in charge of offences recording and sanctions when individual measurement is not operational, and introduces financial penalty per dwelling for owner or management agent that do not respect their obligations.

The Zero-rated eco-loan¹⁰ : a French incentive adapted to co-owners

The zero-rated eco-loan scheme (*eco-prêt à taux zéro*) has been introduced in France by the "Finance law 2009" (*loi de finance 2009*) to allow landlords to get a loan to fund energy efficiency works (insulation, heating or water heating using renewable energies) for their main residence (if built before January, 1st 1990). This loan is granted by banks¹¹ which have concluded specific agreement with the French State under conditions fixed in the General Taxes Code (*Code Général des impôts*). From January 2015, this loan may be granted to co-ownership in the limit of €10,000 per flat over 10 years (or up to €30,000 over 15 years if the co-owners perform 3 different works). Contrary to individual zero-rated eco-loan, there is no obligation for co-owners to perform a bunch of works to benefit from this scheme. Works improving energy performances or enabling to reach a minimal global energy performance threshold or renovating water treatment system are eligible¹². The SGFGAS (Society of Management of Funds for Guarantee of home purchasing – *Société de Gestion des Financements et de la Garantie de l'Accession Sociale à la propriété*), the agency which manages both traditional 0% rate loans to support households in purchasing housings, and the 0% eco-loan from the French State, has collected since 2009 different statistics data. Figure 2 shows that the direct beneficiaries of this scheme are mostly owners but that the proportion of tenants interested by this scheme is slowly increasing.

Figure 2. Distribution of direct beneficiaries of the zero-rate eco-loan scheme by type (for operation closed respectively between the 1st Jan. and the 30th Sept. 2010 and 2014)¹³



Conclusion and perspectives

Legislation is clearly an energy efficiency driver but the assessment of its sole impact is difficult because it is often supported by additional measures such as executive orders, information campaigns, practical guidance and financial supports.

France, which has implemented energy efficiency measures for condominiums and tenancies for many years keeps improving existing measures and adapting its schemes as illustrated by the recent voted law for Energy Transition, and by the announcement of a study aiming at assessing the benefits of financial mechanism based on bonus-malus scheme to promote good energy performances buildings. Nevertheless, many decrees

¹⁰ Full description of this scheme (in English) may be founded on the website of the EU funded project ODYSSEE-MURE: <http://www.measures-odyssee-mure.eu/>

¹¹ The banks which grant these loans may ask for a financial guarantee but it is not mandatory

¹² Source: http://www.developpement-durable.gouv.fr/L-eco-pret-a-taux-zero_36649.html

¹³ Source: SGFGAS <https://www2.sgfgas.fr/web/guest/eco-pret-a-taux-zero1>

and orders are expected in the coming months to specify the way to implement the articles of the Energy Transition law, as well as practical guidance for stakeholders.

Roof insulation requirements in the rental sector in Flanders

Dorien Van Cauwenberge, Flemish Housing Agency, Belgium

The Belgian constitution declares that everyone is entitled to decent housing. Because in Belgium the regions have full authorization and full responsibility concerning housing policy, the Flemish housing law was created in order to realize that fundamental right on housing. In accordance with the Belgian constitution, the Flemish housing law stipulates that everyone is entitled to affordable and good quality housing.

The housing law sets minimum standards for all existing dwellings. These minimum requirements apply to all properties and are established for the purposes of safe and healthy housing with minimum basic comfort. The six main categories of the Flemish housing law resulted in a list of defects. That list, which is drawn up by the Flemish Government, is our so-called "technical report". Each defect in that technical report results in penalty points. A minor defect is 1 or 3 points (for example insufficient lighting or humidity in the basement). A serious defect is 9 or 15 points (for example fire or explosion risk, or serious humidity problems). From 15 penalty points, the dwelling is unsuitable for living. When is establish a clear and obvious safety or health risk, the dwelling is uninhabitable as well.

The Flemish Housing Agency (FHA) works on three different pillars. First it informs and tries to raise awareness. Besides information points in the municipalities, its local services and FHA website, an important tool is the conformity certificate in the rental market. FHA or the municipalities give this certificate of conformity when a dwelling has:

- less than 15 point on the technical report;
- shows no safety or healthy risks;
- Has sufficient smoke detectors.

The second is to encourage the improvement of dwellings. There is a grant for the extensive renovation of dwellings and "smaller improvement and adjustment" grants for older and disabled people who adjust their houses. Next to those grants, there are tax benefits as well. Moreover some of the Flemish municipalities have grants of their own.

The last pillar, is inspection and sanction; FHA investigates 14000 dwellings a year, especially following complaints by tenants¹⁴. When a dwelling is unsuitable or uninhabitable FHA follows, in collaboration with the municipalities, an administrative procedure that results in an annual tax. For the worst cases, FHA also has a criminal procedure. Both of these procedures are aimed at the rental market.

Roof insulation requirement

The new roof insulation requirement is included in the inspection methodology for housing quality (technical report). It is an absolute minimum requirement: R value¹⁵ for roof insulation at least 0.75m² K/W (= specific insulating material of 3 to 4 cm). The number of penalty points for dwellings that do not meet the requirement increases over 5 years and is shown in Table 1.

¹⁴ The municipalities inspect thousands of houses as well, but the exact number is unknown.

¹⁵ The R-value is a measure of thermal resistance, or ability of heat to transfer from hot to cold, through materials (such as insulation) and assemblies of materials (such as walls and floors). The higher the R-value, the more a material prevents heat transfer.

Table 1. Amount of penalty points evolution from 2015 and beyond 2020

Amount of penalty points	Roofs <16m ² with R<0,75m ² K/W	Roofs ≥16m ² with R<0,75m ² K/W
1/1/2015-31/12/2017	1	3
1/1/2018-31/12/2109	3	9
From 1/1/2020	9	15

The absence of (sufficient) roof insulation must be established on-site, either in the context of the energy policy or in the context of the housing policy. No exceptions are provided in the regulations, so the requirements are also applicable to apartment buildings (all apartments get the same penalty points) and listed monuments.

The findings after the first year are the following:

- Wide spread communication and a supporting policy (end-of-life grants, focus on vulnerable target groups) are crucial;
- The pressure on the small private rental market increases, but remains limited due to the phased introduction and the low minimum requirement;
- Remaining bottlenecks: roof insulation is often difficult to inspect on-site and the sanction-procedures have no impact on owner-occupant (problem in apartment buildings with both owner-occupants as tenants).

There is a political and social foundation for new minimum requirement for glazing. It is therefore likely that there will be penalty points for single glazing from 2020.

Further details can be found at the following links:

- Housing quality requirements in Flanders:
www.wonenvlaanderen.be/woningkwaliteitsbewaking/opdracht-de-conformiteit-van-huurwoningen-onderzoeken
- Flemish roof insulation requirement:
www.wonenvlaanderen.be/woningkwaliteitsbewaking/de-minimale-dakisolatiennorm
- Major Housing Survey 2013 (scientific research into, among others, the sub-markets, housing quality and energy performance of existing Flemish housing market): www.steunpuntwonen.be/Publicaties/Aflaadbare-rapporten

4.4 Session 4: Aligning multi-actor incentives through innovative financial instruments

Success stories of on-bill finance programmes from the US and lessons for reaching rented properties

Philip Henderson, Natural Resources Defense Council, USA

Loans made through the utility to the owner of multifamily residential buildings and to owners and tenants in commercial offices can help make energy efficiency projects happen. Experience suggests such financing programs must have carefully tailored terms to reach specified properties. Typical program design questions are presented in table 2.

Table 2. Typical program design issues to be considered

Who is the borrower?	Few issues with commercial borrowers (owners or tenants); Loans to residential tenants and single-family homeowners raises more complex issues
Eligible properties?	Commercial office and multifamily apartment buildings
What projects are eligible?	Consider both: a) loan product for specific equipment (like boilers), and b) loans for "deeper" renovations geared to energy savings
Who is lender?	Utility or commercial lender (utility can always sell loan portfolio.)
Loan collateral?	Lien on the property lien is hard -- complicated for existing lenders; Tenants not likely to be able to arrange a lien or UCC
What is credit risk?	For property owners and commercial tenants, bankruptcy risk Consumer lending creates more issues
Balance due on sale?	No evidence that "transferability" adds value.
Incentives?	Reduce financing costs; Limit financing to installed items eligible for incentives

Notable program experiences:

- PSE&G – targets subsidized multifamily bldgs. Funded \$37 million in projects. Utility pays full cost of improvements, borrower (building owner) repays with payments on utility bill;
- PG&E – loans available to commercial customers (including office tenants). 1,300 loans/\$57m since 2011. Avg. loan amount about \$25,000 for small businesses, \$100,000 municipal customers;
- TVA – Utility backstops a small loan made by regional lender to consumers -- only for installation of heat pump air conditioner. About 80,000 loans, \$500 million. Average loan \$7,000. Reports less than 3% default.

Lessons learned:

- To reach residential rental property, design a program to work for projects undertaken by multifamily owners. To reach "in-unit," target loans for specific equipment upgrade (e.g., air conditioners) with simple process -- low balance loans, deemed savings approach;
- To reach commercial properties, target common projects of owners and office tenants, such as "build out" of new tenant space, HVAC upgrade, lighting replacement;
- Beware complexities of lending too low to moderate income consumers.
- Keep it simple.

Open Questions:

- Cost effectiveness?
- Does requiring payoff at sale change borrower demand?
- Is central, shared loan administration for utilities an opportunity?
- Do owners and tenants use lease that allows "pass through" of on bill loan payments to tenants?

The Dutch experience with the revolving fund for landlords

Kees Jan Hoogelander, Netherlands Enterprise Agency, The Netherlands

In the Netherlands, the main initiatives for financing energy efficiency in the rental sector include the Energy Efficiency in the Property Evaluation System ("Point System") for social housing, the Energy Performance rental sector subsidy scheme (STEP), the government-supported Revolving Fund for Energy Saving in Dwellings (FEH) and a deal between housing corporations and buildings through the "Acceleration programme" (Energisprong), which will enable the renovation of 100,000 of housing corporation dwellings to zero-on-the-meter standard.

Energy Efficiency in the Property Evaluation System ("Point System")

In the Netherlands the problem of the split incentive in social housing is addressed by the Housing Valuation System in which investments in improving energy efficiency are encouraged by means of a points system based on the energy label. An energy-efficient dwelling delivers more points under the points system than a dwelling that is not energy efficient.

Prior to 2011, the rent ceiling was evaluated using a point system established in order to take into account various criteria such as the dwelling quality, location and size. This ceiling defined the maximum rent social landlords could charge. A bill, however, which was approved in March 2011, enabled the incorporation of the energy performance of the dwelling in the criteria list used in the evaluation. This change now offers landlords the opportunity to increase the rent if the energy label improves and thereby an opportunity to recuperate part of the investment costs for energy efficiency upgrades. This scheme encourages housing corporations to invest in energy efficiency. It solves the problem of split incentive between investments and savings.

The Energy Performance rental sector subsidy scheme (STEP)

The state will provide a € 400 million subsidy for landlords in the rental social housing sector for investments in energy efficiency for the period 2014 - 2017 with the aim of contributing to the objectives of the Energy Saving Agreement for the Rental Sector. Amount of subsidy depends on the improvement of the "Energy Index" and apply only to existing rental houses.

The Energy efficiency rental sector revolving fund (FEH)

Under the Housing Agreement (Parliamentary Papers II, 2012/2013, 32 847 No 42) the cabinet contributed a total of € 150 million in 2013 and 2014 to a fund for energy saving in the built environment. This acts as a revolving fund, which means that the expenditure of the fund will returned to the fund over time in the form of interest and repayment. This revolving fund is aimed at energy saving for tenants and homeowners and will be supplemented with funds from the market, to achieve a total investment of € 600 million. The revolving fund started in 2013, with the following characteristics:

- Maximum loan 25% of the total investment
- minimum € 75.000,-, maximum € 8 million
- maximum € 15.000,- per home

- FEH interest rate:
 - < € 711,- : 0,5% (WSW-guarantee)
 - > € 711,- : 1,9%
- Term loans: 15 year
- Based on the improvement of the Energy Index
- Loans for private landlords and housing corporations

Revolving fund Energy Efficiency

Starting from 2016, the Government Buildings Agency always takes energy costs into account in housing costs. The Government Buildings Agency will therefore also take on the costs of energy for offices and will be entirely responsible for the energy management of the buildings owned by it. This avoids a split incentive. For other buildings, different market participants will work together to remove obstacles in a Platform for Sustainable Housing. A possible solution to the split incentive problem is sustainable building leases and this is currently being investigated and worked out in more detail by the Platform for Sustainable Housing.

Energiesprong initiative

Energiesprong is a non-for-profit market development programme that, through an agreement between construction companies and housing associations, created deal to refurbish 111,000 houses to Net Zero Energy levels by 2020 in The Netherlands. The program is targeted at relatively poor tenants of homes with high energy bills: the savings on energy bills will be used to finance the building renovation, in an Energy Performance Contractor scheme. The retrofit characteristics are the following:

Costs:

- About €75.000,- per house (some 500 already refurbished to E=0);
- Goal: €45.000,- per house, to be achieved through innovation and scale.

Typical energy performance:

- Very good insulation, comparable with Dutch regulations for new built houses (mostly 30kWh/m².year);
- Renewable energy production sufficient for heating, hot water and electricity use of occupant;
- Average use of the occupant: no energy bill, except for the fixed charge.

Technical specifications:

- A new shell (roof, facade) to be placed over the new house;
- Typically, but not necessarily: solar cells, heat pump, heat generating ventilation;
- triple glass. Mostly integrated in the new facade and roof.

Addressing the barriers to energy efficiency - split incentives

Katarzyna Wardal, The Coalition for Energy Savings

The analysis by the Coalition for Energy Savings of implementation of Art.19, the Energy Efficiency Directive shows that the EU is still only beginning to remove regulatory and non-regulatory barriers to deploying energy efficiency measures that could save vast amounts of energy in a cost-effective way.

Split incentives dilemma was a barrier mostly reported by Member States in their NEEAPs which were made available on the website of DG Energy, European Commission before July 2015¹⁶. Other barriers reported by Member States involved: barriers to energy-efficiency service contracts including Energy Performance Contracting, barriers related to accounting and budgeting of public bodies including Eurostat rules on public

¹⁶ NEEAPs from Hungary and Slovenia were not made available on the website of DG Energy, European Commission before the analysis was finished.

debt and deficit¹⁷, lack of personalised information, lack of financing options as well as rules on public procurement.

Among measures aimed to address split incentive dilemma, Member States listed solutions, planned measures and recommendations, which could be ordered in the following categories:

- Housing regulation/programmes aimed at dividing financial contribution or gains from energy saving actions among tenants and owners (FR, DK, BE)
- Amendments to the housing regulations: voting rules on energy efficiency measures/loans for renovation projects between co-owners (FR, ES, AT)
- Provisions to take into account energy efficiency aspects in property management/lease contracts (FI, LU, SK, NL)
- Considering minimum thermal efficiency performance standards in properties offered for rent/lease in residential and commercial sectors (UK, IE)
- System of points in social housing, which forms the basis for the rental price - investments in energy efficiency can thus lead to an increase in the rents (NL)
- Requirements for dividing financial contribution between tenants and landlords depending on who has a direct agreement with an energy supplier (UK)
- An exception allowing actual users of public buildings to use appropriations funds to improve energy efficiency in public buildings, the surplus of these funds could be left in their discretion (LT)
- Accelerated tax write-off of investments in energy renovation (LU).

In general, most measures are linked to introducing new legislation or amending existing laws. The Coalition for Energy Savings recommends Member States to make a comprehensive inventory and evaluation of barriers to energy efficiency and solutions to remove them and work closely with stakeholders and the European Commission. The European Commission should streamline reporting by defining a mandatory template for Member States, facilitate sharing best practice between Member States, consider further studies and guidance notes to facilitate the removal of barriers and start infringement procedures, if necessary.

¹⁷ These rules do not take into account that investments in energy efficiency under Energy Performance Contracting (EPC) generate monetary savings that can refund all or part of the cost or that EPCs can provide a performance guarantee.

5. Conclusions

Split incentives are common barriers between building owners and tenants that, in practice, hinder the uptake of energy efficiency investments in various segments in the building sector such as privately rented homes, multi-apartment buildings, social housing units and leased commercial or public premises.

Several points of this issue have been touched during the workshop presentations documented in this report.

There are many individual measures that can help mitigate this hurdle between various actors. A comprehensive approach to remove the barrier, however, should consider multiple measures in order to be effective. Indeed, a successful approach should consist of the following elements: accurate and regular information, appropriate incentives and effective enforcement of regulations or policies driving demand. Based on the findings of this workshop, the following principles can be drawn to determine a successful approach:

- In order to align incentives, redistribution of costs and savings between involved parties should be considered, e.g. a landlord can be entitled to amortize the capital expenses of an energy efficiency investment by passing a share of the costs to the tenant;
- Agreements between involved parties should be structured in a way that the energy efficiency investment benefits all of them. Owners should also take into consideration the positive impact of an energy efficiency upgrade that will have on their rented property value, while tenants should consider the gains in increased comfort. More research is needed to quantify non-energy benefits, which are often neglected in either's party decision making process;
- To overcome accuracy issues between actual and predicted energy savings in cost recovery models, a performance correction factor, derived from empirical evidence, should be considered. This incorporates a buffer to protect tenants against the possibility of underperforming energy efficiency measures. The correction factor should be based on robust evidence on the performance gap from real case studies;
- Energy use and costs need to be made more transparent. While energy performance certificates offer a valuable tool for understanding the energy performance of a building during sale and lease transactions, the information provided in the certificate does not directly determine the energy-related operating expenses for the user. More transparent information can lead to more informed decisions;
- Building occupants, whether owner-occupiers or tenants, need to be more closely engaged in energy efficiency. This could be achieved through energy tenancy rating systems, which assess their own impact on the overall consumption and separates it from the building-related impact. Landlords should be in charge of the efficiency of the building, while tenants in charge of the efficiency of their own premises. The installation of smart meters and provision of direct feedback of consumption can help occupants identify wasteful habits, have a better control of their own operating expenses and appreciate the benefits of simple improvement measures;
- Attaching the energy efficiency upgrade to the property rather than the owner or tenant offers the flexibility of engaging in energy efficiency upgrades whose payback time is longer than the occupancy or ownership duration, effectively removing the barrier of temporal split incentives. This can be done by attaching the capital cost recovery to the utility bills (on-bill finance model) or property tax (PACE model);
- Owners and tenants are required to take expert decisions and engage in complex projects despite their lack of technical knowledge. Good planning and project

execution are particularly essential, especially in large and complex projects such as renovations of multi-apartment buildings. The involvement of an independent energy expert is necessary in order to facilitate and co-ordinate the process.

References

- Arcipowska, A., Anagnostopoulos, F., Mariottini, F. & Kunkel, S., 2014. *Energy performance certificates across the EU – a mapping of national approaches*, Brussels: Buildings Performance Institute Europe (BPIE).
- Ástmarsson, B., Jensen, P. A. & Maslesa, E., 2013. Sustainable renovation of residential buildings. *Energy Policy*, Volume 63, pp. 355–362.
- Bird, S. & Hernandez, D., 2012. Policy options for the split incentive: Increasing energy efficiency for low-income renters. *Energy Policy*, Volume 48, pp. 506–514.
- Blom, A. & Sandquist, A., 2014. *Energieffektiva kunder: genom informativ fastighetsförvaltning – Kostnadseffektiv Individuell Mätning och Debitering*, s.l.: s.n.
- Bullier, A. & Milin, C., 2013. *Alternative financing schemes for energy efficiency in buildings*. s.l., s.n., pp. 795–805.
- Economidou, M. & Bertoldi, P., 2014. *Financing building energy renovations*, Ispra: European Commission Joint Research Centre.
- Levinson, A. & Niemann, S., 2004. Energy use by apartment tenants when landlords pay for utilities. *Resource and Energy Economics*, 26 (1), p. 51–75.
- Matschoss, K., Heiskanen, E., Atanasiu, B. & Kranzl, L., 2013. *Energy renovations of EU multifamily buildings: do current policies target the real problems?*. s.l., eceee.

List of abbreviations and definitions

'Cold rent' refers to the base rent.

'Green lease' is a lease between a landlord and tenant of a commercial building which provides obligations on both parties to minimise adverse environmental impact in areas such as energy, water and waste.

'Gross lease' is a lease whereby all operating expenses are borne by the landlord. Any capital expense that reduces operating expenses is solely in the landlord's domain.

'Inclusive rent' see 'gross lease'

'Modified gross lease' is a lease in which the tenant pays base rent at the lease's inception but in subsequent years pays the base rent plus a proportional share of some of the other costs associated with the property. In building-related energy terms, tenants may be required to pay their proportional share of the heating expenses under a modified gross lease.

'Net lease' is a lease in which the tenant is responsible for some of the additional costs associated with the property. There are three types of net leases: single net, double net and triple net. Under a single net lease, the tenant pays rent plus property taxes. Under a double net lease, the tenant pays rent plus property taxes and insurance. Under a triple net lease, the tenant pays for rent plus property taxes, insurance and maintenance.

'Property Assessed Clean Energy (PACE)' is a means of financing energy efficiency upgrades in a building where the upgrade is financed by bonds issued by municipalities and paid back by an additional charge on the property tax bill.

'Reverse split incentive' refers to situations where tenants are not responsible for paying their utility bills and thereby have little or no incentive to conserve energy.

'Split or misaligned incentive' refers to transactions where the benefits do not accrue to the person who pays for the transaction. In the context of building-related energy, it refers to the situation where the building owner pays for energy retrofits efficiency upgrades but cannot recover savings from reduced energy use that accrue to the tenant.

'Temporal split incentive' refers to situations where the energy efficiency investment does not pay off before the agent transfers the property.

'Transaction costs' in the energy efficiency investments are costs related to gathering and assessing information of equipment or material, making agreements in order to carry out and enforce the contract, monitoring and verifying the actual level of energy efficiency improvement, etc.

'Warm rent' refers to the base rent plus utility costs for heating and sometimes hot water.

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