



National Policy Recommendations for France

*Recommendations for local and national policy on retrofitting
multi-occupancy, mixed tenure buildings.*

NATIONAL REPORT (Deliverable 7.1)

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CONTENTS

1	Summary	4
2	Introduction	5
2.1	Aims and objectives	5
2.2	Methodology	5
3	Policy context	8
3.1	Overview	8
3.2	National policies: France	9
4	Policy recommendations (EU wide)	11
4.1	Background	11
4.2	EU wide recommendations	12
4.3	Discussion of EU wide recommendations	12
4.4	Good practice examples	14
5	National policy recommendations: France	16
6	Recommendations for further research	19

1 Summary

Low Energy Apartment Futures (LEAF) is a European-wide project to improve the energy efficiency of apartment blocks. It aims to identify and overcome key barriers to retrofitting these properties. The project is funded by the EU's Intelligent Energy Europe (IEE) programme and partner organisations in six countries.

Background

Energy use in homes makes up a quarter of energy-related greenhouse gas emissions in Europe and the EU has committed to a 20% reduction in these by 2020 from 1990 levels. An estimated 43% of the European population live in apartment blocks, but this is a sector that is greatly overlooked in policy and in practice. Retrofitting apartment blocks is more complex than other domestic buildings and there are additional challenges to overcome, but there are also great opportunities for achieving significant energy savings and reductions in greenhouse gas emissions.

The three year LEAF project included the development of toolkits for retrofitting apartment blocks and pilot retrofit projects on 24 case study buildings. Feedback has been collected from a wide range of stakeholders involved in multi-occupancy retrofit projects, and extensive policy research and analysis has been carried out. As such LEAF partners are in a unique position to make policy recommendations, based on recent experience of carrying out retrofit projects in six European countries to improve retrofit of multi-occupancy buildings across Europe.

Key findings and recommendations

A key issue to improving apartment blocks identified through the LEAF project was the financial barrier (including funding schemes, financial incentives and difficulties in agreeing personal contributions for improvements which affect multiple householders within a building). However this is far from being the only challenge. For retrofit to be successful, additional effort must also go into addressing the difficulties associated with buildings under multiple ownership. These include information provision, engagement of building occupants and other stakeholders, and working with installers on technically complex retrofit projects. There are also specific legal and regulatory barriers to overcome, such as decision making with multiple stakeholders, limitations of EPCs, requirements for minimum standards and planning regulations.

Recommendations were developed in response to these key issues and include calls for:

- improvements to EPC methodology and accreditation schemes
- changes to the format and content of EPC reports
- improvements to public funding schemes
- expansion of financial support initiatives
- introduction of more stringent minimum standards
- improved information provision on low carbon retrofit
- upskilling of the workforce
- implementation of maintenance plans and improved management structures in multi-occupancy buildings

2 Introduction

2.1 Aims and objectives

This report aims to provide recommendations for local and national policy on retrofitting multi-occupancy, mixed tenure buildings in France.

The policy recommendations are designed to address a range of issues broadly affecting the uptake of energy efficiency measures (as recommended in an EPC) in multi-occupancy buildings. Where applicable, recommendations address relevant regulations and initiatives which impact both on the overall retrofit process in multi-occupancy buildings, and on the installation of specific measures, such as communal heating/power solutions; internal and external insulation; and measures appropriate in protected (historic) multi-occupancy buildings.

This report reflects a package of work within the Low Energy Apartment Futures (LEAF) project which has the following objectives:

- 1 Analysis and assessment of existing policy relating to uptake of EPC recommendations in partner countries and at the EU level, and how it may be better applied to multi-occupancy buildings.
- 2 Identification of changes or additional policies that may aid and promote retrofit of multi-occupancy buildings.
- 3 Utilisation of evidence from project pilots and stakeholder interviews to provide justification for these changes.
- 4 Presentation of recommendations within the wider context of local, national and EU targets for carbon emission and energy reduction.
- 5 Facilitation of local and national policy changes through dissemination events.

2.2 Methodology

The policy recommendations are the result of extensive policy research, practical retrofit experience on case study buildings, and engagement with stakeholders (summarised in Figure 2-1).

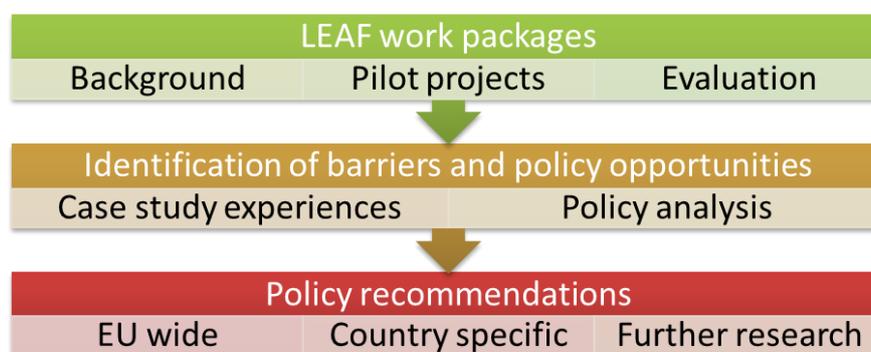


Figure 2-1: Methodology for producing policy recommendations

The work involved in creating the policy recommendations draws on findings from three other LEAF work packages: background research on national carbon emissions and energy reduction policies to inform the delivery of the LEAF toolkits (WP2), delivery of pilot retrofit projects (case study buildings) in partner countries (WP5), and monitoring and evaluation including stakeholder consultation and feedback (WP6).

These inputs were used as the basis for further work exploring barriers and policy opportunities in the retrofit of multi-occupancy buildings as part of the LEAF work package solely looking at policy recommendations (WP7). This used: experiences from case study buildings (questionnaires, discussions with partners, identification of lessons learned); further policy analysis including a review of EPBD implementation in the partner countries, identification of other relevant policies, review of policy impact and relevance, and cross country comparisons.

The key barriers and opportunities were then used to draw out and refine policy recommendations, leading to:

- Examples of best practice
- A core set of policy recommendations relevant across all partner countries
- Specific national recommendations
- Recommendations for further research

Case studies and questionnaires

As part of the LEAF project, seven partner organisations identified a selection of multi-occupancy, mixed tenure buildings to work with and offer support to install energy efficiency and low carbon measures¹. Partners' experiences of identifying and working with these pilot project case study sites has provided a wealth of learning and lessons about the challenges, barriers and opportunities for retrofitting multi-occupancy buildings. Some of these are country-specific, whilst others apply across many (or all) countries.

Work on the case study buildings spanned two and a half years (April 2013 to December 2015), although initial contact with many of the buildings was made prior to the project starting (late 2012). To help monitor progress and capture lessons from this aspect of the project, all partners kept a record of key communications and actions at each site. These were then reviewed in detail to develop an in-depth understanding of the key processes, challenges and success factors in implementing energy efficiency measures at each site.

A questionnaire was also developed to capture partners' perceptions of barriers and success factors in retrofitting multi-occupancy buildings based on their experiences of working on the case study buildings, their considerable expertise in this sector (outside the LEAF project), and also building on the findings from previous LEAF activity (WP2) which explored perceived barriers and opportunities to retrofit. It listed a number of factors associated with retrofitting multi-occupancy buildings. Project partners were asked to rate each factor

¹ The eighth partner, FLAME, did not directly work with case study buildings but worked with local energy agencies in France involved in the pilots.

according to how much it applies to their experiences working on case study buildings, which triggered further discussion and exploration of the issues. Results are discussed below.

Further research and policy analysis

Responses to the first round of questionnaires (carried out in October 2014) were used to guide the development of early policy recommendations, discussed at partner meetings throughout 2015.

Between April 2014 and October 2015, further policy research and analysis was carried out, identifying and exploring local, national and EU level policies in partner countries, examining their relevance, usefulness, and potential for replication, with a particular focus on policy recommendations based on case study experiences. Further input from partners and stakeholders was also taken into account and used to help shape and prioritise the recommendations, drawing on findings from:

- local and national stakeholder meetings and events
- additional feedback from partners experiences with case study buildings
- toolkit evaluation

Policy recommendations were further developed and then discussed, revised and finalised as a collective at the October 2015 and December 2015 partner meetings².

² Includes online meetings

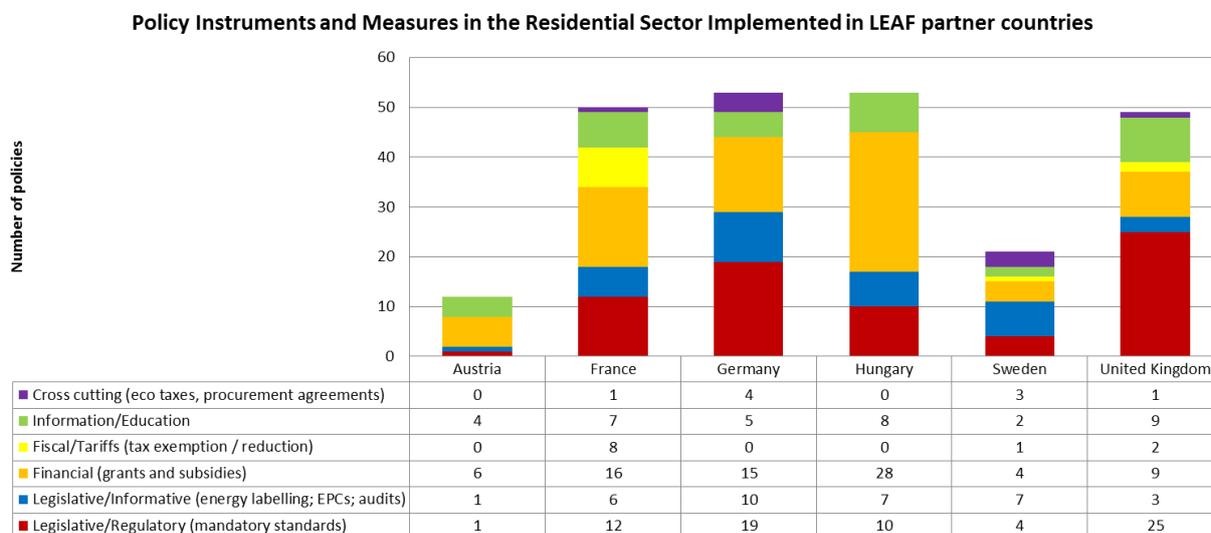
3 Policy context

3.1 Overview

The 2010 Energy Performance of Buildings Directive (EPBD) and the 2012 Energy Efficiency Directive (EED) represent the EU's principle legislation governing energy consumption in buildings. The full LEAF report on policy recommendations presents a brief overview of EU law and EPC regulations. LEAF project research³ was also conducted on national and local policies and legislation, prevalence of multi-occupancy housing, the EPC situation and finance mechanisms.

Across the European Union Member States, there are a large number of national policies and policy instruments which aim to improve energy efficiency in buildings. That number reduces when policies are narrowed down to those which specifically impact on retrofit of measures in existing multi-occupancy buildings (i.e. excluding new buildings and individual owner-occupied dwellings). Nonetheless the ODYSSEE and MURE Databases⁴ identify several hundred policy instruments and measures (current, completed and proposed) for energy efficiency policy measures in the six LEAF partner countries (see **Error! Reference source not found.**).

Figure 3-1: Policy instruments and measures in the residential sector implemented in LEAF partner countries



Source: MURE database, November 2014 <http://www.odyssee-mure.eu/http://www.odyssee-mure.eu/>

³ http://www.lowenergyapartments.eu/wp-content/uploads/2014/01/LEAF_Background_Context_D2.1_Jan14.pdf

⁴ www.odyssee-mure.eu and www.measures-odyssee-mure.eu/summarytype_mr.asp

3.2 National policies: France

Based on further examination of policies and discussions with LEAF partner organisations, the most relevant national policies were identified and are listed below. Making use of these policies, and in some cases making improvements to them, provides opportunities to facilitate retrofit in multi-occupancy buildings. Note these national policies are in addition to, or run alongside, EU wide legislation including the EPBD.

*Key to policy type abbreviations used in this table:
 'Information' means information provision; 'Demand' refers to those policies directed at creating demand; 'Supply' to those affecting the supply chain; 'Financial' includes funding and fiscal measures; 'Regulatory' includes legal and regulatory policy.*

Policy	What is it	Type	Relevance
Sustainable Development Tax Credit	30% tax credit for purchase and installation of energy efficient materials and equipment	Financial	High
VAT reduction on energy efficiency investments (fiscal)	Lower VAT on refurbishment works for buildings, including energy efficiency improvements	Financial	High; it helps with financing
OPAH subsidies for retrofitting for low income owner occupiers	Grants distributed by local government for renovation of older buildings	Financial	High; the low income owners are identified and vote for energy performance measures
Zero interest loan (individual or communal)	Loans to help finance improvements, from a list of 6 measures	Financial	High
ADEME subsidised energy audits	50% of the cost of carrying out an audit in buildings with individual heating systems	Financial, Information	High; information provision to small buildings
Relief from property tax on existing buildings		Financial	Low; it depends on city-level adoption & very few cities choose to adopt
Mandatory energy performance diagnosis and audits in co-ownership properties with common heating system	Co-owned residential dwellings with 50+ lots, built before 2001 must undergo an independent energy audit with proposals for measures to improve energy performance of the building.	Regulatory, Information	High; it highlights energy consumption and measures that could be taken

ADEME energy-saving awareness campaign	TV, radio and press campaign backed up with call centres to provide information and advice to members of the public	Information	High; it creates a background noise of energy performance that motivates owners to conduct energy performance actions
Local energy information centres (EIE)	Co- financed by ADEME and local authorities, 241 centres across France provide energy advice to householders, and organisations.	Information	High; they give independent advice on project management
Energy efficiency of residential and tertiary buildings – Program OPATB	Local authority led support to improve thermal and energy efficiency of residential and tertiary buildings.	Regulatory, financial, information	Low; it only concerns a small area
Refurbishment plan for housing (PREH)	National programme to increase retrofit in private and social housing. 3 core elements: information and impartial advice; financial support for improvements; training and qualification of professionals.	Regulatory, financial, information	Related to local energy information centres
EPC (DPE) ratings in house purchases and leases	EPC ratings must be shown when properties are leased or sold.	Regulatory, Information	High, recent surveys show that buyers look for house with low energy consumption
2015 law for an energy transition: Requirement to include energy efficiency improvements with maintenance work	This created an obligation (from 2017 onwards) for energy efficiency work to be addressed at the same time as maintenance work (façade and roof) is carried out.	Regulatory	
2015 law for an energy transition: Planning permission for external wall insulation	The 2015 energy transition law gives power to French cities to set local planning permission in order to allow external insulation (overruling national laws)	Regulatory	
2015 law for an energy transition: decision making excludes people not present at AGM	Changes to decision making rules so that a majority of owners in a shared building <i>present at the general assembly</i> meeting can vote for improvements to be made.	Regulatory	

Fund for energy efficiency works/maintenance	Minimum of 5% of annual budget has to go into a bank account to pay for work	Financial	
“reconnu garant de l’environnement” certification for contractor	Minimum of qualification for contractor. Certification needed to have access to subsidies	Financial Regulatory	

4 Policy recommendations (EU wide)

4.1 Background

The LEAF project addresses barriers and identifies opportunities to retrofit apartment blocks. Key issues identified through the project have been used to develop EU and national policy recommendations for addressing the challenges and barriers to undertaking energy efficiency refurbishment in multi-occupancy buildings.

The recommendations are framed around the experiences and lessons learned in the LEAF project, particularly the work with case study sites, and take into account partner expertise in this sector, stakeholder feedback, in depth policy analysis by the project partners, and evaluation of the LEAF toolkits. Recommendations should be read in the context of the full discussion of issues and opportunities identified during the LEAF project, including local considerations to be taken into account when considering suitable policy changes.

The key issues identified through partners’ experiences in retrofitting case study buildings, policy analysis and stakeholder feedback are summarised in Figure 4-1. National policy recommendations in this report are grouped using these topic headings.

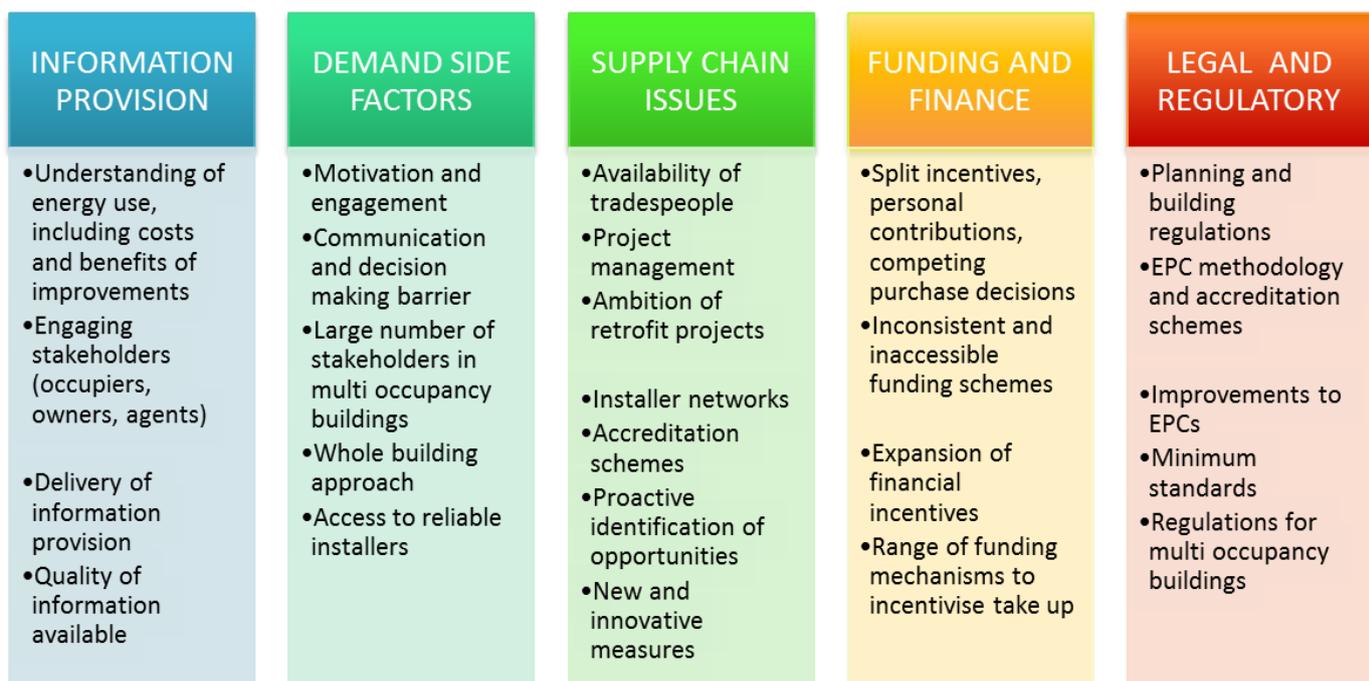


Figure 4-1 Key barriers and opportunities in retrofit of multi-occupancy buildings

4.2 EU wide recommendations

1. Develop and maintain a publicly available database of all EPCs
2. Improve quality of energy saving calculations presented in the EPC
3. Improve communication of recommended measures on EPCs
4. Improve overall clarity and explanation of content of EPCs
5. Improve comparability of EPCs between different MS
6. Ensure there are whole building EPCs in all MS (with minimum standards linking to communal areas)
7. Improve the availability, design and management of public funding schemes,
8. Expand the level and type of financial support initiatives
9. Develop the role of EPCs in financial support initiatives for energy efficiency improvements
10. Introduce minimum requirements at the point of renovation
11. Introduce minimum requirements at the point of sale and/or lease
12. Improve the provision of information on low carbon retrofit
13. Expand local energy advice services and demonstration projects
14. Implement accreditation schemes for installers and EPC assessors
15. Upskill the workforce, with a focus on developing local networks and improving ambition and quality of retrofit projects
16. Improve integration between low carbon retrofit and maintenance and renovation work
17. Require maintenance plans and funds for multi-occupancy buildings
18. Require management arrangements for multi-occupancy buildings which include communication structures and decision making processes.

4.3 Discussion of EU wide recommendations

Information provision

Recommendations include a strong focus on improvements to EPCs so that they can be used more effectively as a driver for low carbon retrofit. There are also recommendations around provision of information to address barriers which have been identified.

Demand-side factors

Stimulating demand is a challenge for policy makers since so much depends on consumer attitudes and behaviour. Many of the core LEAF recommendations focus again on EPCs and information provision in order to address the information barrier which is one step in the process leading to a decision to install energy efficiency improvements. Access to finance and funding also features here since money to pay for improvements is obviously crucial, and subsidies have been shown to stimulate demand. Incentives (implying voluntary take

up) should be combined with regulations to mandate improvements to properties at key points in time (i.e. when a building is renovated; when a dwelling is sold or a new tenant takes on a lease). We also note the importance of combining low carbon improvements with other retrofit and maintenance work (including a supply chain role in identifying opportunities and a requirement for long term building maintenance plans so that works can be planned ahead and carried out more cost effectively). Finally there is a recommendation for basic management structures to be in place in all multi-occupancy buildings to overcome communication and decision making barriers where multiple stakeholders are involved.

Supply-side factors

The supply chain of course has a vital role to play in any retrofit project, but there are currently barriers around the accessibility of trained and reliable installers, the difficulties in co-ordinating where multiple contractors are needed, and the overall lack of a joined up approach integrating the supply chain. Our recommendations are twofold, looking at improving quality of retrofit works on the one side, and on the other improving support for the sector so that it can expand to deliver the scale of retrofit which is required. This second area includes improving funding schemes (where appropriate moving away from single-measure schemes) and expanding financial support initiatives so that builders and installers have more leverage to market low carbon measures to householders, including making improvements alongside existing retrofit and maintenance work.

Funding & finance

Issues related to paying for low carbon retrofit are exacerbated in multiple-occupancy buildings because of the number of different stakeholders involved, limited resources in building maintenance funds, length of time to make a decision between multiple stakeholders, and low priority given to energy efficiency improvements compared to essential maintenance work and other demands on limited funds. Most countries have some form of state support for energy efficiency measures, but funding is often inconsistent and piecemeal, in some cases actually acting as a barrier rather than a facilitator of retrofit. These issues are reflected in our recommendations, which reinforce the need for improved public funding, greater access to other financial support and development of the role of EPCs in identifying and paying for improvements. The recommendation for longer term maintenance plans with ring fenced funding is repeated since this affects the way that energy efficiency improvements are paid for and also the ability to plan ahead and achieve cost effectiveness in retrofit projects. Where there is not already a process, basic management arrangements need to be in place so that decisions affecting multiple stakeholders can be made, allowing improvements to go ahead and not be stalled by problems with communication or one party preventing progress.

Regulations

There is a strong case to be made for legal and regulatory mechanisms to be put in place or tightened or to help to stimulate retrofit in multi-occupancy buildings. We have already mentioned recommendations to improve EPCs, including addressing inconsistencies between different member states which make enforcing the EPBD a challenge. There are also recommendations for appropriate minimum requirements (for energy performance) at the point of sale and lease, and when renovations are carried out. Finally the recommendation is reiterated for management arrangements to be in place to improve

communication between residents and other stakeholders, and facilitate decision making and co-ordination on retrofit projects.

4.4 Good practice examples

Long term national renovation strategies are not sufficient to stimulate the level of renovation which is needed. Some countries have done more to address this than others (e.g. Germany). The LEAF project has flagged up some examples of best practice, several of which are listed below. These include both national strategies and also regional/national schemes which could be replicated elsewhere.

- a) **Maintenance funds ring-fenced for energy efficiency improvements.** This only exists in very few situations currently and tends to be specific to management arrangements in certain multi-occupancy buildings. It stimulates renovation of buildings by making funding accessible for energy efficiency improvements (as distinct from general building maintenance), getting around the financial barrier to retrofit. This could be adopted as a national strategy and could be used to target, for example, the worst EPC-rated multi-occupancy buildings to ensure funding is available to undertake essential work. As a policy it would work effectively alongside the introduction of minimum requirements.
- b) **Requirement to do energy efficiency work at the same time as maintenance work is carried out.** This policy is being introduced in France from 2017 and is an excellent example of best practice which not only stimulates energy efficient retrofit but also makes improvements more cost effective. When improvements are made alongside other maintenance work rather than separately, there are associated cost savings on, for example, scaffolding, access to pipes and wires, or re-decoration following building work.
- c) **Funding for measures which exceed legal requirements.** In Germany a national programme offers grants or cheaper interest rates for retrofit of residential buildings and buildings of communal and social infrastructure. Measures supported exceed the legal requirements of the Energieeinsparverordnung and as such, encourage a level of retrofit beyond simply meeting requirements. Similarly, Austrian subsidy systems calculate the amount of funding based on the quality of the refurbishment achieved in order to improve energy performance in buildings (i.e. beyond legal requirements).
- d) **Minimum standards for energy performance at point of sale / let.** This policy measure, currently in place in Scotland for housing associations, sets a minimum rating (in Scotland a D rating is currently required), and ensures that when a property is sold or leased to new tenants, improvement work must be carried out if the property does not meet minimum energy performance levels.
- e) **Rental Price Points System.** In the Netherlands, rent setting is based on a 'home points system', in which various features like space and facilities add points. Energy efficient improvements add points, meaning that a higher rent can be charged so the landlord or building owner can recoup the cost of making improvements, whilst the occupier benefits from cheaper running costs which balance out a higher rent.

- f) **Local trade support programmes.** A UK scheme run by CSE as part of a Local Authority retrofit programme provides training courses to help local skilled tradesmen, like plasters and renderers, enter the market for external solid wall insulation, addressing the barrier of gaps in the supply chain.
- g) **Scottish area based programmes for home energy efficiency improvements.** In Scotland, the Home Energy Efficiency Programmes' (HEEPS) Area Based Schemes form a 10 year programme which is funded by the Scottish Government and tops up ECO funds. Schemes are delivered through local authorities, who are best placed to understand the nature of local housing provision and co-ordinate a local supply-chain. The programme is focussed on the most deprived areas in the country and hard-to-treat measures, such as external wall insulation (with previous programmes having installed easier low-cost measures).
- h) **Long term leases.** In Germany leases tend to be long term and residents have more of a vested interest in paying for improvements to properties which they do not own. In addition, management arrangements in multi-occupancy buildings are well structured and improvements can be co-ordinated centrally.
- i) **Subsidies paid directly to installers.** The Energy Company Obligation is a UK scheme which provides funding for energy efficiency improvements. Unlike most other schemes, payments for improvements go straight to the installers (not the resident), ensuring that funds are actually used to pay for energy efficiency improvements, and making it easier for residents to manage payments in multi-occupancy buildings. This system limits consumer choice of installer, but in some situations this drawback is outweighed by the advantage of simplifying the payment process.
- j) **Subsidies for building-wide energy efficiency improvements paid to building management committees.** The greater Lyon federation of cities offers subsidies to owners associations to pay for works which are implemented across multi-occupancy buildings such as external wall insulation, shared ventilation systems, and shared heating system.
- k) **Demonstration homes.** The UK Green Open Homes programme was set up with funding from central government in the UK and stimulates renovation through demonstration projects and using the principle of social norming. Householders who have made energy efficiency improvements to their homes open them to visitors to explain what they have done, how it works and what the benefits are. Evaluation data show that visitors are influenced to make improvements to their own homes.
- l) **Combining subsidies and loans.** In France, subsidies are often combined with loans. Loans are easily to obtain for owner associations because of lending arrangements which are not dependent on age, health or income. The only criterion is that the borrower pays building management fees (i.e. costs requested by the property manager to pay for cleaning and lighting of the shared parts of the building). The amount borrowed can be as much as the total cost of improvement measures minus the subsidies and the length

of the repayment period is flexible (monthly instalments spread over 3, 5, 7 or 10 years). This is an opportunity which could be trialled in other countries.

- m) **Paying for improvements linked to energy bills.** The Green Deal model in the UK (no longer running) provided a way around occupiers not having access to funds to pay for up-front costs of low carbon improvements. Finance packages were calculated based on potential improvements and anticipated energy savings, with costs recovered through an additional payment added to electricity bills. The energy saving improvements which are installed reduce energy use in the property (and therefore the running costs), so the overall bill, in theory, does not increase. The Green Deal itself did not prove to be a success for a number of reasons (such as the interest rate applied) but the premise of up-front costs paid back through a payment added to energy bills is replicable.

5 National policy recommendations: France

In addition to the core policy recommendations identified during the LEAF project, there are recommendations specific to individual partner countries which reflect experiences of the LEAF case study buildings, local stakeholder feedback, and national policy research.

France

These national recommendations are in addition to, but also complement, the core LEAF findings and recommendations for low carbon retrofit of multi-occupancy buildings, which include:

- EU wide policy recommendations
- Recommendations for the implementation and improvement of the EPBD
- Examples of best practice in different European countries

Information provision

- **Improve information contained in EPC reports.** Changes are needed to the format and presentation of the standardised EPC report. Currently recommendations for improvements are lacking altogether from French EPCs; options should be clearly integrated and explained within the report.
- **Include maintenance work in energy audits and EPCs.** ADEME subsidised energy audits in the LEAF case studies helped professionals to acquire experience, and helped small and co-ownership buildings with decision making on energy performance measures. LEAF experiences have shown that audits which consider only energy are less effective in terms of getting retrofit work done than audits which also address maintenance work (and specifically energy performance measures which can be incorporated with maintenance work). Encouraging energy performance measures within maintenance work also means that work is more likely to be voted for by owners, and the idea can be used to make EPCs more accurate.

- **Include shared measures in EPC reports.** Energy saving improvements and maintenance work recommended for the building as a whole should be included in individual EPC reports when the dwelling is part of a multi-occupancy building. This will help occupiers to compare the costs and benefits of proceeding individually with improvements just to their apartment with the costs and benefits of shared improvements.
- **Local information campaigns on energy saving.** The very positive national ADEME energy-saving awareness campaign provides a background for discussing energy performance in buildings. It could be further strengthened with local communication campaigns which back up the national messaging.
- **Financial support for local energy advice services.** Local energy information centres play a vital role in providing impartial advice to building owners and residents. Further support for local centres is needed to ensure they can provide the best impartial and reliable information about subsidies and technical aspects of retrofit, as well as providing support for building managers and committees with communication and project management.
- **Link up information provision, national strategies and financial incentives.** The national refurbishment plan for housing (PREH) has a very positive impact in terms of encouraging more people to consider energy performance works. It is important that it links closely with the national awareness raising campaign on energy saving, and with provision of subsidies.

Demand side

- **Increase awareness of link between EPC ratings and property value.** There is evidence to show that EPC ratings impact on property value. A-rated properties are 10% more expensive than D-rated properties, and F-rated buildings are sold for 15% less than their D rated equivalents. This is therefore an opportunity to improve awareness of the benefits of energy efficiency improvements and stimulate demand in the market.

Funding and finance

- **Improve availability, design and management of public funding schemes.** As with most other EU countries, there are difficulties in France with inconsistent and unreliable offers of state funding, which vary (and can even be contradictory) from one region to the next, creating a complex picture of support. The core LEAF recommendation regarding improvements to the availability, design and management of public funding schemes should be prioritised in France. Financial incentives need to be long term, easy to understand, and easy to access.
- **Improve consistency.** Financial incentives should be standardised across different regions of France in order to improve public awareness of subsidies and also avoid supply chain problems and the tendency to focus on promotion of single measures depending on where the funding is. Subsidies should also be set so that they are complementary and do not operate in competition.
- **More promotion of the sustainable development tax credit.** The sustainable development tax credit had a positive impact in the LEAF case study buildings, and this policy could be used more to stimulate low carbon retrofit. The financial incentive

encourages owners to think about energy performance measures. We therefore recommend more promotion of the subsidy to encourage take up.

- **Improve systems for awarding tax credit.** Tax credits are claimed one year after the end of the works, using an invoice as evidence. However, work often takes more than one year and tax credit policy can change between the date on which agreement is reached to proceed with measures and the date on which work is completed. Our policy recommendations are that the decision to apply for tax credit should be included in the general assembly minutes, and the rate in place at that time is the rate which should be paid on completion of the work.
- **Increase awareness of VAT reduction on energy efficiency investments.** This is another financial incentive which can be used to incentivise retrofit. However, the criteria need to be clearer and awareness of it improved so that more people are able to access it.
- **Expand use of OPAH Subsidies for retrofit.** The OPAH can be used by cities to encourage energy performance measures in older buildings owned by those on lower incomes. They are not used everywhere and there is potential to expand their use to encourage low carbon retrofit.
- **Provide financial support for professional expertise at the planning stage.** Because improvements are often driven by subsidies, owners have often decided on improvements before applying for a subsidy. Before this decision, they may employ an architect or engineer for professional advice but on that specific improvement (rather than an overall building assessment). Funding this kind of advice would help to ensure impartiality and open up opportunities for a wider range of energy efficiency improvements to be made.

Legal and regulatory

- **Set minimum requirements for energy performance for all renovation projects.** Currently minimum requirements apply only to insulation work, not general refurbishment of buildings. Changing minimum energy performance requirements to cover all building renovation work would make a significant impact.
- **Introduce long term building maintenance plans in all multi-occupancy buildings.** The lack of management structures in multiple ownership buildings means that making contact with decision makers, communicating opportunities, and reaching a decision to proceed with energy efficiency improvement is incredibly hard, especially when building managers change and when the general assembly (meeting of building managers and owners) only takes place once a year. Use of long term whole-building maintenance plans is therefore strongly recommended so that improvements can be planned ahead, avoiding the need to wait several years for decisions to be finalised and reducing costs by combining energy efficiency improvements with maintenance work where possible. We strongly recommend the rollout of long term maintenance plans in all multi-occupancy buildings.
- **Set requirements for building management and communication plans.** Building maintenance plans would be strengthened further by mandating requirements to have comprehensive systems in place for communication with tenants, owners and stakeholders in multi-occupancy buildings. Such agreements could potentially include

standardised methods of calculating financial contributions from residents to pay for works (based on how much different residents would benefit from the work proposed).

- **Publicise and implement new decision making regulations in multi-occupancy buildings.** Similarly, the changes introduced within the 2015 law for an energy transition which make it easier for decisions to be reached should be publicised and utilised to facilitate retrofit projects. The new regulations mean that energy efficiency improvements can go ahead if they are voted for by more than 50% of owners present at the general assembly (rather than needing a majority of owners to vote even if they do not attend the meeting) making it easier to get agreement.
- **Improve guidance on permissible low carbon improvements in conservation zones.** In France the regulations governing measures permitted in listed and protected buildings extend to buildings within a 500m vicinity of a protected building. Information provision and clear guidance on the types of improvements which are allowable under these circumstances would help to overcome a perceived barrier that no retrofit work can be carried out across quite wide areas of towns and cities.
- **Implement local planning exemptions to encourage solid wall insulation.** The new regulations under the 2015 energy transition law devolve powers to local government to simplify the process of getting planning permission for external wall insulation. These could be made use of more widely in cities across France and applied sensitively to enable energy efficiency retrofit in circumstances where the historic and aesthetic value of buildings would not be adversely affected by improvements, but where national regulations would otherwise prohibit it.

6 Recommendations for further research

The LEAF project, and in particular project partner experiences of working with multi-occupancy buildings attempting to undertake energy efficiency refurbishment, raised various issues and questions for further consideration. These are explained in more detail in the full report and are summarised below.

Data

- Further data is required specifically on multi-occupancy buildings – their number, the number of occupants, tenure type, energy performance, and opportunities to improve energy efficiency and install renewable energy technologies.
- Further data is needed in all countries for research to establish conclusively whether or not there is a direct link between EPC energy performance ratings and market value. If there is strong evidence it can be used to stimulate retrofit and improve public understanding of EPCs.
- There is a need for professional and impartial advice services to be mapped so that gaps can be identified and support provided to help fill those gaps.

Motivations and engagement

- The factors affecting the level of priority residents of different countries place on energy efficiency and low carbon retrofit needs to be understood better to help stimulate demand.
- The level of (perceived) success of the EPC system varies in different countries. Critically analysing and understanding reasons behind these varying levels of success with implementation should remain a priority, to ensure learning is shared effectively.
- More research is also needed on buyer / tenant understanding of EPCs, and the extent to which this affects sale/rental value and the buyer / renter's choice of property.

Funding and finance

- Research into a 'minimal level of support' that appears sufficient to stimulate and ensure measures are taken up would aid the development and targeting of funding schemes.
- Payback periods were identified by LEAF partners as a factor affecting decision making but there are questions about how payback is calculated and how it can be modelled to help to set optimal funding levels.
- Similarly, different levels of affluence of occupants within one property can mean some residents are able and willing to pay for measures, but others are not. Useful research could be conducted into financing mechanisms that could be designed to specifically address this issue specifically for multi-occupied buildings, and at the macro-level.
- The role of EPCs as a mechanism for leveraging financial support for improvement measures is still evolving, with many schemes making no formal or direct link to EPCs. The full potential of EPCs to influence energy efficiency retrofits is yet to be realised and there is work to do in most MS in making this link.

Regulatory and property factors

- Little work has been done to explore the effectiveness of enforced implementation of energy efficiency improvements. Research into models for calculating acceptable levels of energy performance and mechanisms for enforcing regulations would help develop this concept.
- Protected building status may restrict certain energy efficiency solutions, and it is important that the aesthetic, heritage and cultural value of buildings are recognised. However, there is a need in some countries to review legislation and guidance given the need to drastically reduce household energy consumption to meet emissions targets and reduce fuel poverty.
- LEAF recommendations include setting a requirement for management structures in multi-occupancy buildings and implementing long term maintenance plans. Critically important is research into what sort of management structures are most effective and what the success factors are.