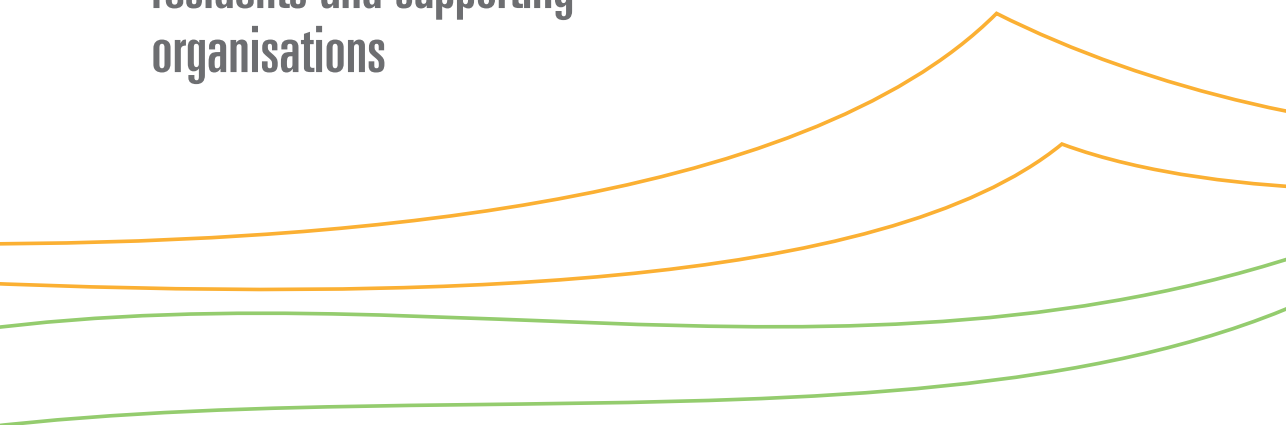




# Affordable Warmth for all



A guide to improving energy  
efficiency in the social housing stock,  
for social housing providers,  
residents and supporting  
organisations



This guidebook has been produced as part of the FinSH project - Financial and Support Instruments for Fuel Poverty in Social Housing.

The FinSH project was established to develop support materials with regard to 'energy poverty' in social housing. It is a partnership of organisations in 5 countries: France, Germany, Italy, Poland and the UK. The project runs from December 2007 to May 2010.

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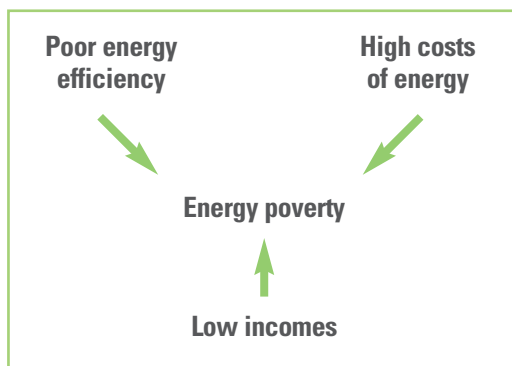
# Energy poverty—an issue calling for sustainable solutions

**Energy or “fuel” poverty is a term used to describe the situation a household finds itself in when it is not able to afford the energy bills for its everyday needs, such as heating, lighting and hot water. This is only one of many potential difficulties faced by people living on low incomes, but has become the subject of particular attention all over Europe with rising energy costs, and energy bills forming such a large part of household expenditure.**

The number of end-users unable to pay their bills (with a risk of disconnection) is high, with for instance 800,000 per year in Germany<sup>1</sup>, 300,000 in France<sup>2</sup> and 185,000 in Poland<sup>3</sup>. Even though they represent the most visible, measurable aspect of energy poverty - they unquestionably only represent the tip of the iceberg. The UK Fuel Poverty Strategy 6th Annual Progress Report 2008, for instance, gives estimates for the level of fuel poverty in the UK indicating that in 2006 there were approximately 3.5 million households in fuel poverty (14% of total number of households), an increase of around 1m households since 2005.

Residents associations, social institutions and politicians are ringing the alarm bells. Besides increasing the risk of running into debt, energy poverty can, in the long run, cause severe health problems due to cold and damp homes. The need for sustainable solutions is strong.

One major factor affecting energy costs and the risk of energy poverty is the energy efficiency of the home, and those most at risk are the households on lower incomes - hence the importance of energy efficiency in social housing. The aim of improving energy efficiency is also in line with the longer term need to reduce carbon emissions, although for many people living in energy poverty improvements in energy efficiency may raise comfort conditions rather than reduce overall emissions in the first instance.



Tackling the issues of energy poverty aligns well with different aims followed by housing providers, social and environmental institutions, for example:

- Social participation and support for those most in need by providing affordable and decent homes as well as by assistance in coping with the numerous burdens of every-day life
- “Future-proofing” of housing stock by improving its energy performance and by avoiding damage caused by damp and mould growth
- Reduction of costs and inconvenience due to unpaid bills
- Environmental protection, action on climate change and reduction in carbon dioxide emissions or emissions per capita

The challenge is therefore in effectively linking existing strategies to each other and to other organisational aims (such as quality of service). What is to be done in order to explicitly reach low-income households with retrofit measures and energy consultations? How can energy-related topics be included in social support strategies ?



<sup>1</sup> Source: German Consumer Association (VZBV, Verbraucherzentrale Bundesverband), 2008.

[http://www.vzbv.de/mediapics/eckpunkt Papier\\_energiearmut\\_14\\_04\\_2008.pdf](http://www.vzbv.de/mediapics/eckpunkt Papier_energiearmut_14_04_2008.pdf)

<sup>2</sup> Source: Groupe de travail Précarité énergétique - Résumé de la démarche et propositions principales - janvier 2010

<http://www2.ademe.fr/servlet/getBin?name=8F5C951F85179A2A839A7554CB334F761265643069909.pdf>

<sup>3</sup> Source: ERO (Energy Regulatory Office) Final report - Iwona Figaszewska March 2008

# Content

**This guidance document summarises the main issues to be considered relating to the successful improvement of energy efficiency in social housing.** Given the relatively slow replacement of housing stock, retrofit is of prime importance. Since behavioural change can result in potential savings that should not be underestimated and helps tap the full potential of efficient technical solutions, the guidance given includes both “hard” (installations and building work) and “soft” (communications and behaviour change) measures.

It is designed for anyone working within this sector, including social housing providers, residents and supporting organisations of all kinds. We intend it to be useful to those wishing to improve performance with respect to addressing energy poverty in social housing, or to assess their performance against good practice.

This guide is based on the good practice FinSH partners have observed in communications with social housing and supporting organisations, as well as a review of residents’ views and behaviour. It is divided into sections that are key success factors to be considered for sustainable retrofitting in social housing in order to alleviate energy poverty. Each section is illustrated by success stories reviewed in the FinSH project.

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# Taking a comprehensive and strategic approach

1

Tackling energy poverty can have many different faces, depending on the individual resources and main objectives of an organisation. In all cases, the benefits go far beyond the reduction of energy bills, comfort improvement and CO<sub>2</sub> emissions, and include effects such as job creation, health and community cohesion. Taking a strategic approach enables an organisation to plan for goals with both short and long term timescales, and provides a framework against which to assess progress. In addition, including a comprehensive raft of measures in the overall process will increase the strategy's immediate and long-term effects.

Here you have a summary of the keys to success, they will all appear again in the document and be described in more detail.

Good practice factors for an effective and sustainable strategy include:

- The definition of a clear, long-term perspective and aims, including achievable long and short-term objectives, for example in the form of action plans detailing tasks, responsibilities and outcomes
- Linkages made with local, regional, national, EU, global strategic objectives
- A strategic approach to evaluation and monitoring of achievement of aims
- Well-chosen retrofit measures respecting the individual requirements of a building and its users
- A communication policy, ensuring:
  - strategy is adopted and understood by decision makers within the organisation, residents and all relevant stakeholders
  - advice and information on energy use is freely available and accessible in the right format for all
  - awareness raising proactively seeks to engage the interest and attention of residents and staff, and to ensure a consistent message from all involved in the organisation
- A partnership approach, ensuring a strategic and practical connection with other relevant key actors across sectors, such as:
  - residents or neighbourhood groups
  - other housing providers
  - local authorities
  - health and social care agencies
  - climate action groups
  - energy suppliers
- Effective links with the wider community and reflection of particular community characteristics and needs, including knowledge of the range of vulnerable groups and how to reach them
- A policy with regard to staff training and skills development on energy issues
- Financial and human resources allocated to ensure the implementation of the strategy
- Offering the most energy efficient homes to the lowest income/most vulnerable households



## Holistic approach to tackling fuel poverty

### Lincolnshire - England

Boston Mayflower Limited is a Housing Association in the East of the UK, with around 4,700 homes. Their "Energy Efficiency and Affordable Warmth Strategy" sets out their corporate legislative and social responsibilities for alleviating fuel poverty, what they need to do, how they are going to finance it, target achievement dates and how activity is monitored. The financial strategy is embedded within their 30-year Asset Management Plan, with specific emphasis on the first 5 years. It is a key aspiration that any instances of energy poverty be eliminated from the Associations housing by 2015.



## Setting targets, joint commitment and monitoring

### Berlin - Germany

The STADT UND LAND GmbH, with 45 000 apartments, is one of the six biggest communal housing providers in Berlin.

As a member company of the Berlin-Brandenburgischer Association of Housing Providers, STADT UND LAND supports the Cooperation agreement for Climate Protection within the Energy Programme 2006-2010. This agreement aims at "joint actions that contribute towards climate protection in Berlin's building stock, promote renewable energies, modernise the building stock in a sustainable and socially acceptable way for the users and to enlist the latter for energy saving".

By signing the agreement STADT UND LAND pledged to reducing the CO<sub>2</sub> emissions of their building stock by an additional 8,100t. In order to analyse the results an extensive monitoring programme was agreed on.



## County-wide partnership approach

### Gloucestershire and South Gloucestershire - England

An Affordable Warmth strategy was developed and adopted within the counties of Gloucestershire and South Gloucestershire in South West England in 2001, engaging forty organisations in a participatory development process, with nine going on to form a steering group to oversee implementation of the strategy. This is the "Affordable Warmth Partnership", and it includes the seven local authorities and two area health authorities, as well as the Severn Wye Energy Agency.

The strategy is centred on partnership working and awareness-raising, and has a focus on outreach to vulnerable households, strategy integration and access to finance, with an overall aim that "all homes in Gloucestershire and South Gloucestershire will be warm homes by 2016".

The strategy is set out in three time scales (short: 0-1 year, medium: 1-3 years, and long: more than 3 years), with annual reports and work plans. A seven year strategy review undertaken in 2008 acknowledges legislative changes and local priorities including those adopted within the new "Local Area Agreements" which include carbon dioxide reduction from local authority operations (Indicator 185), reducing carbon emissions per capita (186), and tackling fuel poverty (187).

The partnership has its own dedicated website where the strategies, action plans and yearly updates can be viewed.

<http://www.swea.co.uk/AffordableWarmth/partners.shtml>

## Targets and monitoring

### Drôme - France

ADIL 26

In the Drôme department, an evaluation of 100 homes where work had been undertaken with assistance from ANAH (National Housing Agency) helped to determine the likely level of energy charges that could be achieved following rehabilitation projects. After the evaluation, a level of €14/m<sup>2</sup> per year was set as a target that owners wishing to obtain funding for rehabilitation work in the Drôme must meet.

The target is set in euros and not energy consumption (kWh) so as to keep levels of charges sufficiently low for low-income groups.

The evaluation was conducted in partnership by ADIL 26 (Drôme Energy Information Centre), Cal PACT (organization helping to compile applications to ANAH) and ANAH.

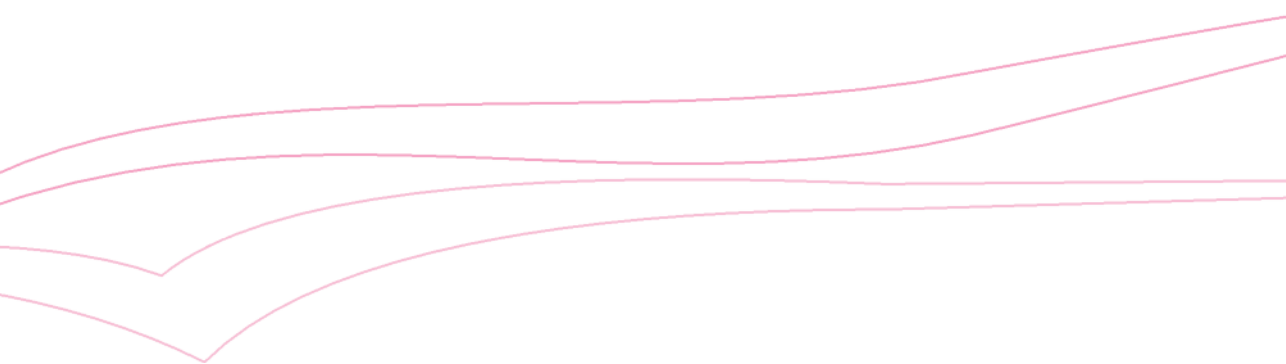
## Doing more with less

### Ferrara - Italy

ACER Ferrara's strategy foresees the identification of "cost effective" actions. The main objective is not the achievement of the best energy saving, but the best result compared to the investment made. This strategy is in coherence with "green" paper indications on energy efficiency published by European Commission in June 2005 "Doing more with less".

It is a flexible model and foresees different approaches with reference to new buildings, restoration interventions, façade maintenance, centralized or autonomous heating plants.







# How to identify and reach residents at risk

2

Knowing who has the greatest need for help is the first step to tackling energy poverty and enables the appropriate targeting of resources.

Various statistics indicate that there are certain characteristics which increase a household's risk of energy poverty. The most vulnerable are those with low incomes, most noticeably the elderly, those living alone, single parents, people with long term illness, disability or mental health problems, and recent immigrants of low socio-economic status.

The energy performance of the home is the second pillar for identifying those at risk of energy poverty - this additionally endangers those households living slightly above the poverty line. The structural conditions of a building and the characteristics of each apartment in it have the biggest influence on a household's energy bill and level of comfort. Thus, those living in the most energy inefficient and "hard to treat" homes, households with inefficient or expensive heating systems, those living on the ground floor, homes without double glazing, or widowers still living in large homes etc. are at particular risk of energy poverty.

Additionally - even if the effects are lesser - a household's energy demand increases with the amount of time an individual spends at home, and with an individual's need for warmth (which makes unemployed, elderly and households with infants and people in need of care even more vulnerable), as well as with inefficient energy use behaviour.

FinSH research has found that organisations are using many different methods to identify residents at risk, the majority of which are pro-active techniques whilst adopting some re-active practices to complement the on-going work. A key issue is whether the organisation looks solely at building fabric and heating type or investigates and takes into account the characteristics (age, health, financial) of residents as separate or additional criteria.

## Focusing on the buildings

One approach is the use of tailor-made computer software for analysis of the energy performance of housing stock, enabling the housing provider to estimate running costs for standard usage and identify the most expensive to run. The introduction of energy performance certification for homes for rent as well as for sale under the Energy Performance of Buildings Directive (EPBD) means that social housing providers have to provide a certificate for prospective new residents. As certificates can last for up to 10 years (depending on how the EPBD has been implemented at national level), some providers may choose to analyse their stock as a whole, offering economies of scale as against carrying out a single assessment on each property as it comes onto the market. This has the added advantage of providing the data for review of the energy performance of the whole stock.

If the energy performance data for an individual home is put together with current fuel costs to estimate the energy running costs, and this is set against income levels (such as that provided by unemployment benefits or state pensions) this can give an indication of risk for different households that might be living in the homes.

This approach might be applied to sample common dwelling types, or to a database set up to collect all the relevant data for housing in an area.

To populate these databases different approaches are used, including desk top studies using known data or physical surveys such as stock condition or resident questionnaires. Some organisations use this data to create physical maps, for example using Geographical Information Service (GIS) software.

An approach used by a few organisations is the use of thermal imaging technology either by air or drive-by survey, cross referenced with GIS or other maps. The aim is to identify homes with high heat loss - however, while this will highlight occupied, well heated but poorly insulated homes, it is unlikely to be an ideal indicator of energy poverty as a household struggling to pay fuel bills may have the heating turned off or low at the time of the survey. Empty properties could also be misleading, so ideally thermal imaging should be cross referenced with other data-bases to understand the full picture.



## Focusing on the residents

A key to success is the use of intermediaries to identify those at risk of energy poverty, and links made with these intermediaries to make the appropriate referrals for assistance - either through retrofit measures or consultation offers. Intermediaries can be any agencies or community groups that have direct contact with those at risk of energy poverty, for example health and social care workers, neighbourhood groups, and those working with households that tend to be disadvantaged.

An example of a practical approach to reaching vulnerable people is the practice which has evolved amongst UK local energy advice providers of attending the annual clinics for free influenza inoculations. This is particularly appropriate as the population group eligible for the free “flu-jab” correlates closely to those whose health would be at risk if also living in fuel poverty: that is the elderly and those suffering from cardio-vascular or respiratory illness.

Pro-active methods used by housing providers to identify potential risk include:

- Means test of residents as they enter the residency of the housing provider
- Noting where residents are living either in under-occupied dwellings (having to heat too big a space) or in over-occupied dwellings (risk of damp), and potentially offering “house-swap” opportunities
- Where metering / billing arrangements make this possible, noting residents with unusually high consumption and contacting them to assess whether there is an opportunity for energy efficiency improvements or other support



## **Focussing on buildings: global energy audit system**

### **Venice - Italy**

ATER of Venice has used a new simplified energy certification method to examine their housing stock, identifying those buildings with the worst energy performance. The method consists of a global energy audit of the complete building, instead of many energy audits of all the apartments in the building, which is more time consuming and expensive.



## **Focussing on both building features and residents' characteristics**

### **Yorkshire - England**

East Riding of Yorkshire Council covers a large, predominantly rural area in England. It is the largest unitary authority by area and has over 12,000 dwellings within its housing stock.

The Council has used Energy Profiling Software to store stock survey information of council houses and private sector houses with high deprivation indicators and poorer quality housing stock to residents in receipt of benefits. In 1999, a major survey of residents was carried out; following this, five community aims were adopted, three of which were "improved health", "greater prosperity" and "a healthy environment", which are all related to tackling energy poverty.

As part of the Council's Affordable Warmth programme, an energy efficiency database was developed, to contain data on all of the housing stock, and target the most inefficient dwellings to reduce the risk of fuel poverty. The Council's HECA Working Group produced a report based on collected and compiled relevant information of known energy efficiency levels against housing conditions data and area energy poverty data, to identify households living in the worst conditions and produce an area profile.



## **Canvassing of opinions of residents on their homes**

### **Lincolnshire - England**

Boston Mayflower Limited is a Housing Association in the East of the UK, with around 4,700 homes.

When a tenant decides to leave their property the organisation arranges an "exit" interview to establish why the tenant chose to leave, and whether this includes thermal discomfort or high heating costs.

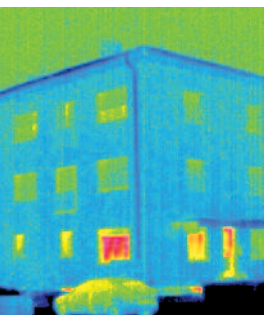


## Partnership approach: social and technical actors involved

### Isère - France

Un Toit Pour Tous (A roof over everyone's head)

People who access accommodation or housing through this association's services are people in great social and financial difficulty who, in many cases, have not yet had any access to housing. In return for the financial assistance granted to projects which purchase and renovate housing (PLAI), Un Toit Pour Tous receive suggestions of potential tenants from committees from outside the association with members from central government, the department and municipalities, usually under the aegis of PALDI (Housing Action Plan for Deprived People in Isère). PALDI will put forward three households for housing and then Un Toit pour Tous will make a choice based mainly on the characteristics of the housing available.



## Focussing on residents energy consumption

### Berlin - Germany

The Bewohnergenossenschaft FriedrichsHeim eG in Berlin is a relatively small housing company with a stock of around 600 apartments. The billing for all their buildings' incidental expenses takes place at the same time in order to facilitate a comparison of consumption within the building and between all buildings.

Households with high consumption or high incidental expenses are contacted to investigate the cause and find a solution together. In cases of mould, monitoring equipment is installed which can help to determine whether a change in behaviour is needed with respect to ventilation. The issue of high energy consumption is also broached at residents' meetings.



## Focussing on residents' characteristics: an opportunity for municipalities

### Crema - Italy

The Social Housing Foundation 1 (SHF1), in the City of Crema in Italy was constituted with the participation and support of the Lombardy Region and the National Association of Italian Municipalities (ANCI). The core aim is that of social solidarity. Features include:

- Housing finance geared to support for households within the (majority) medium socio-economic category, unable to rent or buy a flat on the free market but not poor enough to be offered social housing apartments
- The involvement of private interests in a low revenue investment with ethical aims
- An opportunity for municipalities to increase their building stock with high quality flats at a relatively low price
- Municipalities are free to rent class A flats to very poor families, sparing them high energy bills. They control the selection of the tenant families, focusing on low-income, families with handicapped children, young and/or newly wed couples.
- The Foundation is committed to rent flats for 15 years at the fixed rent to such households in agreement with the Municipality of Crema

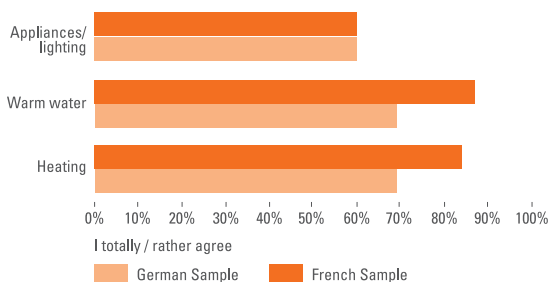
# Raising awareness and changing energy behaviour

3

Energy poverty can be worsened by inefficient energy using habits and/or provoke energy use behaviour, which is risky for both the residents and the building structure in the long run, such as partial or under heating. In contrast, enabling residents to save energy efficiently can improve thermal comfort, help residents avoid health risks, can reduce energy consumption up to 15%, and hence reduce average energy costs, and will improve the households' self-confidence. If offered post-retrofit, training in energy use behaviour and advice will help to realise the full benefits of structural or technical improvements.

In organisations working on the issue of energy poverty, the most vulnerable households are sometimes described as "hard to reach" - this is of course from the standpoint of the housing and social care services, while from the perspective of the households concerned they may be unaware of the support available or see it as inaccessible or unattractive in some way, as is shown in FinSH investigation (see figure\*). Even if the

## I'm interested in information about how to save energy with...



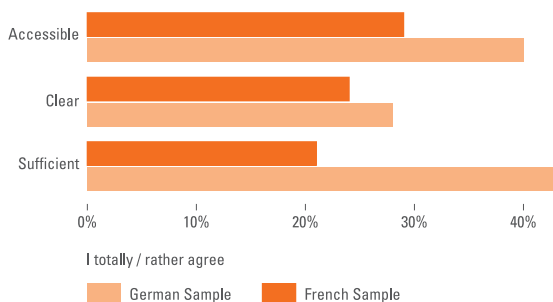
households they were designed for do access them, these services often do not succeed in causing permanent behavioural changes. This illustrates the dilemma of the "disconnect" that can exist between the needy and the services designed to help them.

How can energy poor households be reached and motivated? How can sustained behaviour changes be achieved?

## Reaching and motivating energy poor households

Personal experience of the financial burdens of energy consumption is an important driver for being open to information and advice on how to take action. However, simple, but sadly wide-spread barriers to take-up of services are fees, unaffordable for people living on very low incomes, and a language that they are not familiar with. In addition, energy poverty is not the only deprivation low-income households may be suffering from. In many cases they may be experiencing social exclusion and be in need of more comprehensive assistance, and uneasy about further control or intrusion by authorities, energy suppliers, landlords or other

## Overall, advice and information services are...



\* based on a survey among 117 German and 68 French low-income households.



institutions they might depend on due to their precarious situation. Independent of income and social background, giving up habits is in general an unappealing endeavour. In particular, the idea of consuming less energy is often associated with a decrease of comfort. It may also be seen as a characteristic that one would not be appreciated for by peers. There are several possibilities to overcome those barriers:

- Offering the service free of charge and in a language the target groups will understand
- Offering small incentives such as energy saving kits has been shown to motivate low-income residents to call for energy advice. In addition, the households' savings will be increased by measures they might not be able to afford on their own
- Designing the service in cooperation with social institutions, social networks or other intermediaries (such as janitors), who can help to get in touch with the households and address their needs, including foreign languages as well as foreign energy and communication cultures
- Linking problems with energy bills to financial advice with regard to costs in other areas where people are struggling
- Using social networks in order to disseminate services - personal recommendations are often perceived as the most trustworthy. The creative use of different media channels (such as leaflets, resident's magazines, local newspapers, radio, television, internet) can be an attractive supplement in order to increase peoples' awareness of the issue of energy
- Providing group-based activities around the topic, such as showing movies, offering group consultations and workshops, organising excursions and events
- Providing social models by training households to advise their peers, or by including target group specific role models in the communication strategy
- Setting a good example as an organisation, by raising

awareness among staff of energy saving measures applied to day to day activities of the organisation, and encouraging and enabling this, such as low carbon travel and energy efficiency in the office

- Organising energy saving competitions (awarding individual "energy saving champions" or teams)
- Choosing the right emphasis in the way information is presented. Studies show that individuals are more willing to take action when the costs they can avoid (including loss of comfort, health) by behavioural changes are emphasised rather than the benefits they can expect, and behaviour is directed by immediate effects rather than long-term effects

### Providing information and advice

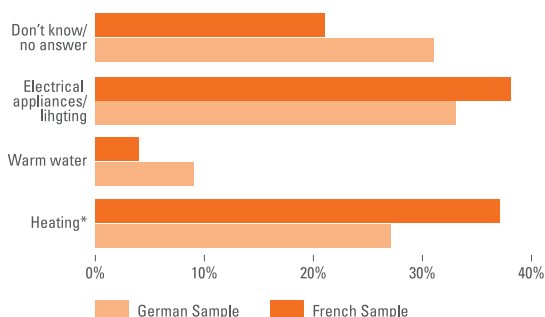
Literature, experiences and FinSH investigations all indicate that (vulnerable) households lack knowledge (see graphs for examples) regarding the issue of energy and energy saving strategies. Energy itself is not visible, which makes it difficult to be aware of one's own consumption. Energy bills are often not understood and even if they are, the effects of behavioural change are not immediately recognised if presented once a year. Being aware that there is a need for action without knowing one's scope of action can result in a feeling of helplessness and resignation, which in the long run might even be worse than not having dealt with a topic at all, especially when working with people who might already have to struggle with prejudices and low self-esteem. Hence it is important to improve households' theoretical and operational knowledge by:

- Providing information on the multiple impacts of energy use, such as energy supply security, climate change, savings, indoor comfort levels, including temperature and humidity, links between indoor conditions and health as well as the importance of ventilation, and the distinction between uncomfortable draughts and the right ventilation, in the right place and at the right time - and the links between temperature, insulation, ventilation and condensation
- Giving precise information on where one consumes energy and how exactly energy can be saved as well as which effects can be expected - by single measures and in total

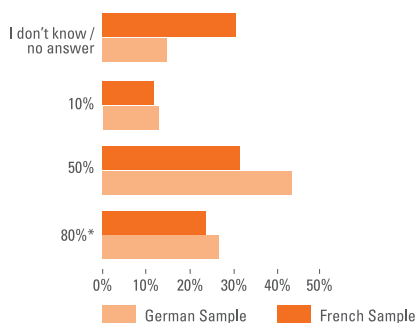


- Making the issue understandable and visible:
  - by translating abstract indicators such as kWh, CO<sub>2</sub>, m<sup>3</sup> etc. to a language of every-day life, such as by using examples like “the same amount of energy would make a car drive for xy km/provide lighting for xy hours etc.”
  - by using meters, for example to show the increase of a refrigerator’s energy consumption when opening the door or filling it with warm food, to illustrate that the actual indoor temperature might vary from the subjective perception, or to make humidity visible
  - by providing fuel bill advice, which includes helping residents to understand what is on the bills and to relate this to energy consumption, giving benchmarks for average, under- and over-average consumptions, teaching meter reading, and giving advice for the repayment of debts and choice of tariff and supplier

#### What do you think, which domain causes the highest energy consumption in private households?



#### How much energy can be saved by using low-energy light bulbs compared to conventional light bulbs?



- Giving personal advice on site. Written information should be provided alongside, but not substituted for face-to-face interaction. Personal advice can be tailored to the household’s individual energy-related requirements, and makes it possible to provide comprehensive assistance which takes into account their precarious socio-economic situation

#### Giving support to maintaining efficient habits

While sometimes a single action suffices to reduce one’s energy consumption (such as lowering the temperature of a boiler, or un-covering heaters), a large part of a households’ energy consumption is due to repeated behaviour (such as heating and ventilation patterns or washing). Such habits have been built up over a long period of time, and are executed more or less unconsciously. Hence, they are difficult to break in the first instance, and difficult to be maintained in the long run. Households can be helped to overcome some of the barriers to behaviour change by

- Providing assistance and advice over the longer term, for example through training and resourcing of relevant staff such as janitors and resident liaison, and community volunteers
- Encouraging household’s ambition by setting clear targets and encouraging self-commitment (for example “I will save 5% energy within six months”)
- Providing regular and understandable feedback on the households’ energy consumption and the effects of their behaviour change
- Providing prompts, which remind them of their intentions (such as stickers put on the light switches saying “switch me off before you leave”)



## Advice, training and resident participation

### Cardiff - Wales

Cardiff is the capital city of Wales and Cardiff Council owns, manages and maintains 13,900 houses. The development of Cardiff's Tenant Participation Strategy looked at the ways in which tenants are currently involved.

The Council runs a quarterly tenant magazine that provides information relating to issues around fuel poverty, such as planned works, tenant participation, and advice around debt, fuel suppliers, energy efficiency and welfare benefits. This is also available on audio-CD and in relevant languages. Tenant and resident groups are invited to input ideas and to discuss planned works and editorial content.

Direct tenant involvement includes support for the Federation of Tenants and Residents Associations, with resources for tenant participation including a Federation office and training facilities. It is intended to use these facilities to provide energy awareness training for tenants in partnership with the council's own energy and housing team. There is an annual tenant's bus tour to highlight schemes that are under way or recently completed across the city.



## Using a range of events and tools to involve residents

### Hampshire - England

Drum Housing is a charitable housing association in Hampshire, in the south of England, with approximately 4,450 properties. Drum has been awarded "excellent" status for their focus on resident involvement by the UK Tenant Participation Advisory Service (TPAS).

Various methods are used to involve and engage with tenants, and tenants are themselves often involved in developing these approaches, which include letters, leaflets, newsletters, posters, surveys and questionnaires, road-shows, exhibitions, public meetings, question and answer sessions, drop-in sessions, small workshops, formal and informal discussions. There is a "Top Tips" booklet on energy efficiency for residents, and resident 'eco-champions' are appointed and trained.

Efforts are made to offer a wide range of opportunities for contact and involvement, including through tenant and residents groups, networks of local contacts and representatives, forums and panels, area "walk-about", working parties, workshops and focus groups, training sessions, seminars and conferences, and a Good Neighbours Awards scheme. Drum has dedicated Resident Involvement web-pages with on-line meetings and an events calendar. A communications protocol is used and overseen by a project management team which includes the resident's association, and sustainability groups are being set up to facilitate consultation.





## Partnership approach: several awareness-raising measures

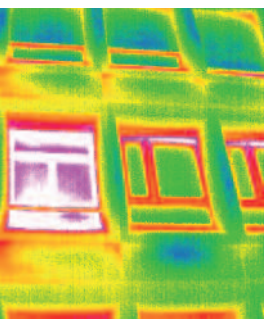
### Marseille - France

Experimentation at La Bricarde (Marseille) saw mobilization for energy saving at two levels - landlords and the community - in a project run by three associations specialising in energy management, Ecopolenergie, Loubatas and GERES, who helped to mobilize the estate's residents around the theme of energy.

An assessment was made of energy and water use in the communal parts of the social housing stock, which helped to get the landlord involved. An interactive display on energy and water saving behaviour was set up in a room made available by the landlord, and a film made on the estate with community participation, working with the estate's social workers and advisers.

Following this, a second project experimenting with water and energy-saving kits was set up by the Logirem company, with support from Ecopolenergie. Awareness-raising and information work was carried out with Logirem employees, to explain the project and discuss energy-saving behaviour.

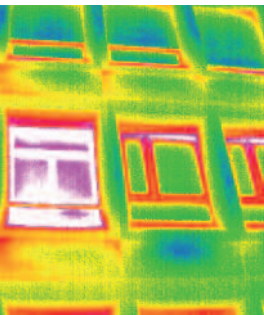
Having seen the potential savings that could be made for tenants, the landlord decided to launch a more comprehensive rehabilitation of the estate, including replacing all taps and toilet flushes with efficiency equipment and heating improvements. The aim of the project is to optimise service charges and thereby reduce the number of unpaid bills. According to Logirem, as it is difficult to bring rents down, it is important to try to bring service charges down through technical improvements to equipment.



## Janitors training to raise awareness of residents

### Bremen - Germany

The GEWOBA Aktiengesellschaft Wohnen und Bauen, with around 56,000 apartments, is the biggest real estate company in Bremen province. They have taken the initiative to train their janitors in energy saving, so that they can in turn advise tenants. This has several advantages: janitors are on site and available, tenants typically know and trust their janitors, and they are well-placed to notice where households could make relevant behavioural changes and to advise them accordingly. The training was provided by a local energy agency (Umweltberatung Bremen).



## Multitude of possibilities to raise awareness and provide behavioural training

### Potsdam - Germany

The PRO POTSDAM GmbH features a wide range of measures to raise tenants' awareness of energy saving and climate change, for example:

- Regular contributions to the tenant magazine with practical information and reports on retrofit projects
- Detailed accounts of operating costs and presentation of energy calculations, including comparison with average use of the other tenants in the same building
- Distribution of free energy saving thermometers for all tenants, that show optimal temperature and how much energy may be saved through reducing room temperature
- Promotion carried out with the local energy provider, providing a free "Powersaver" for selected households in order to prevent stand-by loss
- Model apartments for demonstrating energy efficient living technologies
- Co-founding the "Energie-Forum Potsdam", which promotes initiatives for climate protection in schools
- Live coverage of the "live earth" concert against climate change. Here people had the chance to exchange their old light bulbs for new energy saving ones free of charge

Attention is also given to raising awareness of employees, through information campaigns on energy efficient behaviour at work, such as prompts to switch off lights when leaving the room, and supply of bicycles for business trips within the city.

In cooperation with the municipality and several social institutions, the organisation is involved in the model project "Klima schützen - Wohnen lernen" (protecting the climate - learning how to live). The project includes a training for unemployed as energy consultants. Households living on a low income will receive a consultation on site and an "energy saving" kit, both free of charge.



# Involving residents in the retrofit process

4

Retrofitting buildings offers many benefits for landlords and residents. At the same time, it is not only a technical and financial challenge for the housing provider, but will also involve inconvenience for residents, such as construction noise and dirt, an intrusion in their privacy, and increased rents, and hence might not be accepted by those affected by it. In addition, even the best technical solutions might fail to achieve their full beneficial effects if the residents are not trained how to use them and how to adjust (for example their heating and ventilation habits) to the new conditions. Hence, it is of prime importance to involve residents pre, during and after retrofit. This can help to avoid trouble and discord, which can result in expensive delays of the whole process or residents moving out, as well as mould and the misuse of technical appliances. Benefits can include the ability to:

- Tailor services to those wanted and needed by residents
- Realise the full benefits of technical improvements



- Improve residents' commitment to the providers organisation
- Increase the households' social participation and self-determination

Participation strategies can be differentiated at different stages, as regards the degree of involvement of those they are offered to:

- Unidirectional information and advice
- Bidirectional discussion communicating with those being affected in order to learn more about their worries and opinions, and considering the results in the decision making process
- Including residents in the decision making process by giving them an equal vote
- Encouragement of self-help initiatives

Participation can be facilitated by written communication, online tools, and face-to-face communication via individual consultation, group meetings, round tables and so on. Personal, interactive communication is generally more effective than solely written information. Communication training with staff and the cooperation with social institutions will help to find the "right language" accepted and understood by residents. The degree of involvement required depends on different factors, such as the impact of retrofit measures, the resident's competences and interests as well as on resources.

While the process can vary in different phases of the retrofit process it is important that all phases are covered:

- Pre retrofit: Precise information on what will be implemented and why, what the residents have to expect as regards inconvenience, rent increases and benefits. Enquiry into what residents need and want (and don't need and don't want), discussion of different scenarios, adjustment of the whole process to the needs of the residents (including for example the question of when it should take place ) and/or facilitating the initiative of residents prior to retrofit or financial participation.
- During retrofit: Information about the progress of the works, the opportunity to give feedback and adjust the processes if necessary, and assistance for those struggling with inconvenience, and the opportunity for residents themselves to be involved in the implementation of structural and/or creative works.
- After retrofit: Information about the actual impact, and advice concerning the new technologies and behavioural changes emerging from those measures. Assessment of how the residents experienced the whole process and the results, if they are able to deal with the new technologies, and feed the information back into strategy.





## Residents involvement in all stage of retrofitting

### Nürnberg - Germany

The WbG Nürnberg GmbH, a network of affiliated companies, manages around 18,000 apartments. Retrofit activity has a major impact on residents, who usually have to stay in their homes while building works are undertaken, due to a lack of vacant homes to move them to. In the run-up to retrofit tenants often become unsettled by rumours about the extensiveness and impact of measures, so the company regards it as vital to inform the tenants thoroughly at an early stage, including:

Written notification:

- 3-6 months before retrofit starts, if whole quarters are effected even earlier
- Information: Measures' extensiveness and course of events, estimated rent increases and energy savings
- Inviting all tenants of a compound to a tenant meeting

Tenant meeting:

- Hosted by the PR department
- Detailed explanation of the measures planned and answering of questions by the responsible architect and a representative of the local branch office, who is later available as a contact person
- Social workers as contact persons for problems that may arise through rent increases for example

Household inspections:

- Measures effecting the apartments' interior are individually coordinated

Tenant liaison and support during construction work:

- Single contact person in the local branch and social workers
- With bigger projects: local field office

After construction:

- Brochures on the correct use of the structural changes
- Tenant festival

General PR:

- Reports in the tenant magazine and in the local press
- Own website "housing innovative", which gives examples of best practice

## Residents initiatives and creative events in cooperation with social workers

### Seclin - France

Jardins Estate, Seclin, in France, provides an example of residents mobilising to raise the landlord's awareness. The trigger point for the overall renovation project was a petition submitted by residents in 2002 asking for a second round of renovation of the 73 homes on the estate. The petition was launched with support from the management structure in contact with residents, the Cal Pact. Co-operation with Cal Pact provided tenants with the necessary, well-thought-out arguments to get in touch with their landlord and demand renovation as part of a sustainable development approach, putting forward ambitious targets for energy efficiency, improving green areas, and involving residents.

Mobilising the landlord took a few years but resulted in overall renovation of the estate in 2008.

Residents are fully involved in the life of their estate, and have established the Friends of the Jardins Estate Association. An information bulletin is published every three months with news about the rehabilitation work. Energy-saving workshops are conducted with the association and UTPAS (Unité Territoriale de Prévention et d'Action Sociale: local preventive action and welfare unit). A festival was organised, including a play about energy saving written by residents, in co-operation with the social workers. A steering meeting takes place every three months, with tenants' representatives, Seclin Town Hall, landlords and the Lille CAL PACT, which has supported residents throughout the project.



### Self rehabilitation work

#### Provence-Alpes-Côte d'Azur - France

Compagnons Bâisseurs Provence is an association that promotes integration through housing by means of assisted self-rehabilitation work. They oversee sites where disadvantaged households will take part in rehabilitation work. This fosters engagement on the part of the assisted person and a genuine sense of ownership of the new equipment when the work is finished. The households helped are generally receiving basic welfare benefits and experiencing both housing and social exclusion difficulties.







## Door to door campaign - cooperation with residents association Pre and post retrofit advice

### Modena - Italy

The ACER Association of Modena manages about 7,000 social housing flats in the Modena Province (Emilia Romagna Region). They have carried out communication and training activities mainly by public meetings, supported by the Tenants Syndicate Association. A broad "door to door" campaign has been set up combining pre-retrofit information, energy issues and advice, and house calls are also made at the request of tenants. The ACER Association of Reggio Emilia has a similar approach.

ACER staff select one or more tenant representatives, chosen from those more confident in using new technologies, to be the reference person for communications and monitoring of energy efficiency measures. An informative user-friendly leaflet is used as supporting material.



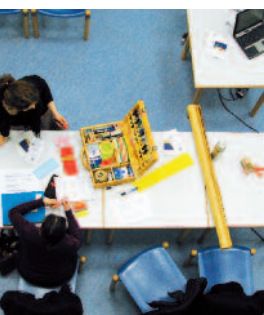
## Self rehabilitation

### Doubs - France

Julienne Javel Association is the majority shareholder in the work integration company SYNECO, a SARL (limited liability company) under French law, which operates a semi-industrial joinery workshop, with 10 work integration jobs on maximum two-year fixed-term contracts. These employees are supervised by three or four team leaders and the company manager.

SYNECO is the project manager for rehabilitation planned as part of projects run by Julienne Javel and, in this connection, carries out the improvement work. SYNECO enables owners themselves (one or several members of the family) to be employed to take part in rehabilitation work in their homes.

These contracts mean that beneficiary members of the family have a job again, albeit on a short-term basis but nevertheless providing motivation for a future return to employment. The household's involvement in the work also helps to foster commitment and better understanding of the renovated housing.



## Residents consultation

### Cornwall - England

Penwith Housing Association is a Registered Social Landlord formed in 1994 as a voluntary transfer from the local authority and is responsible for managing some 6,000 houses in Cornwall, England.

A recent stock condition programme led to a 5-year programme of works which, following consultation directly with the tenants, decided that the works should be grouped together i.e. dwellings will be refurbished in one go rather than over several different stages and that prioritisation is given to neighbourhoods which require the most modernisation.



## Canvassing of opinion of residents pre-retrofit

### Warsaw - Poland

The programme for the “Revitalization of the Tragówek Precinct” in Poland was the subject of a public consultation, which aimed to reach as many residents as possible, within all the social groups. It was carried out through three lectures, telephone interviews (in particular with the elderly resident) and internet questionnaires (aimed at younger people, who are familiar with computers). Straight from the beginning of its preparation, the residents showed a lot of interest in the program and were more than happy to join.

The residents, representatives of the non governmental associations and the precinct’s authorities, who took part in the public survey, agreed that the modernisation project should start from the Industrial Targówek and Residential Targówek, because these areas struggle with increasing problems.



## Providing multiple opportunities for two-way dialogue with residents

### Essex - England

Chelmer Housing Partnership (CHP) is one of the largest registered social landlords in Essex, England, with around 7,000 properties. It was set up in 2002 to take on ownership and management of homes previously provided by the local authority.

All tenants are given the opportunity to discuss energy matters, with resulting actions fed into each strategy and incorporated into the annual report of progress for the relevant strategy documents.

CHP always seeks to obtain feedback from affected residents on proposed heating and insulation improvements. Written information is provided so that tenants are able to make informed choices of heating.

A range of methods are used to involve tenants, including surveys, central and area forums, community events, focus groups to discuss one-off topics, “mystery shopping”, customer panels meeting regularly to discuss specific services, estate inspections, tenant auditors, shareholding members, leaseholder forum, board membership, and inclusion on recruitment panels.

Their “street voices” initiative is a way to ensure two way communication by allocating this role to an individual tenant to act as the “voice” in each location. Tenant forum members and street voices are invited to attend a one-day energy awareness course.

All tenants are offered an energy advice visit by CHP’s Energy Officer who provides an energy efficiency leaflet pack to new tenants. Tenants with a new heating system are provided with a handbook containing system specific information as well as generic advice about energy efficiency, heating and condensation.

As part of the annual review, tenants are asked whether or not they are satisfied with opportunities to participate in management and decision-making processes.





# Choosing the right retrofit measures

5

Short-term planning and neglecting that buildings are a system which needs to be taken a look at in a holistic way risks an inefficient use of resources. An example is that it is necessary to decide on insulation before sizing a new heating system, to avoid over-sizing. Strategic planning with the help of experts can help in coping with the complexity, and developing different scenarios can help to choosing the best solution for each individual situation.

This section is about the choice of retrofit measures to be implemented, and how this is managed in practice. In general retrofit housing energy efficiency technologies can be grouped into the following categories, all of which are due periodic consideration, as the availability and costs of different technologies change over time.

- Thermal insulation
- Heating, cooling and hot water equipment and controls
- Lighting equipment and controls
- On site renewable energy generation
- Ventilation

There are many issues to consider regarding how measures are prioritised, what criteria are used for making these choices, and whether these are transparent. It is also interesting to assess whether these choices follow a strategic path or are opportunistic in nature.

Criteria identified include:

- The energy or carbon saving potential of the measures - either as a criteria for cost-benefit of individual measures, or as a package to achieve a target standard
- Regulatory standards set for energy efficiency within renovation work
- Initial cost against budgets
- Ability to source capital / availability of finance in general
- Return on investment in terms of savings on fuel bills (in tenanted properties, this may be only theoretical unless residents are paying an additional charge to repay investment by owner)
- Residents' wishes, (and methods used to inform and consult them)
- Practical opportunity offered by need for maintenance, repair, replacement, or general refurbishment
- Convenience and level of disruption, especially whether a need to re-house residents during works
- Following example of others - using same technologies to avoid risk or time taken to explore new possibilities
- Following contractor or designer recommendation, where they have chosen technologies they are familiar with for the same reasons as above, or because there is a good profit to be made from the installation due perhaps to ease of installation in bulk/discounts on supply

- Potential improvement to Energy Performance as indicated by Certificate required for sale or rent, or other standardised energy audit procedure
- With reference to the previous point, the selection of measures which raise performance standards may be part of overall strategic targets for the housing stock of a particular provider. Some differences in strategic targets might be for example :
  - a decision to focus more on raising the performance of the most energy inefficient, with packages of measures
  - a rolling programme of the most cost-effective measure(s) across the whole stock
  - a target to raise the average efficiency / reduce the average carbon emissions by a certain amount
  - concentrating on making the homes for the most vulnerable highly efficient





## Cooperation between social and technical experts

### Provence-Alpes-Côte d'Azur - France

Compagnons Bâisseurs Provence is an association that promotes integration through housing by means of assisted self-rehabilitation work.

In 2005-6, a project emerged in co-operation with GERES to help Compagnons Bâisseurs households to reduce their water and energy consumption. They made site assessments of more than 100 households, identifying the amounts of water and energy bills as well as distribution of consumption per use. The results of these assessments helped to direct choices of technical efficiency solutions to causes of over-consumption of water and energy, and energy saving kits containing items such as low energy light bulbs and flow reducers. Compagnons Bâisseurs have built links to field practitioners including social care agencies who refer households in need of help.

## Standard-based choice

### Val de Marne - France

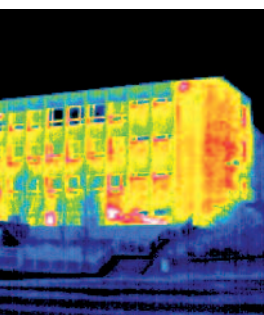
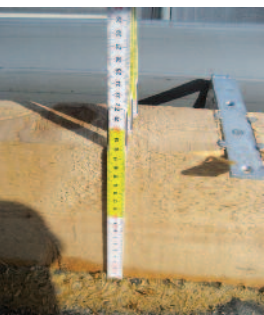
Société Nouvelle pour le Logement du Val de Marne (SNL) - Low-Consumption Building Standard is a charitable association that rehabilitates housing for the use of people in (social and financial) difficulties. Despite the obstacles encountered, it seeks to tackle energy issues in its rehabilitation projects.

With the aid of the Abbé Pierre Foundation, it rehabilitated a block of five flats in connection with a rental loan to aid integration (Prêt Locatif Aidé d'Intégration), and with a focus on reducing energy consumption.

The choice of retrofit technologies was guided by the "BBC-Effinergie" Low-Consumption Building standard, which requires household consumption following rehabilitation to be below 104 kWh/m<sup>2</sup>/year in the Paris region. The SNL project goes even further, reducing households' primary energy consumption by a factor of 7, reducing from 579 kWh/ m<sup>2</sup>/year (rating G) to 78 kWh/ m<sup>2</sup>/year (rating B).

To achieve this result, following the recommendations of the architect working with SNL, the work undertaken included double glazing, external insulation, controlled mechanical ventilation, solar thermal panels, condensing boilers, and thermostatic taps.





## Regulation

### Poland

Towarzystwo Budownictwa Społecznego Sp. z o.o. w Ciechanowie

Retrofitting measures are chosen in the framework of the Thermomodernisation Act.

- 1) The minimum reduction in the annual energy consumption after the implementation of retrofitting measures have to be:
  - a) 10% in buildings where only the heating system is being modernized
  - b) 15% in buildings where the heating system was modernized after 1984
  - c) 25% in other buildings
- 2) Or minimum reduction of 25% in annual energy losses, in local heat district networks, and in local heat sources that support such networks
- 3) 20% reduction in the annual costs of heat procurement, in central heat source related to removal of a local heat source,
- 4) Or change of the heating source to a renewable source or implementation of highly efficient cogeneration

## Professional and systematic long term planning

### Bremen - Germany

The GEWOBA Bremen AG features a professional project planning, which it also offers as a service to other companies. On the one hand, selecting the appropriate retrofit measures depends on the need for retrofit, which is based on information from the energy information system and the portfolio. The organisation aims at a holistic approach, which stipulates optimising first the casing then the technical assets. On the other hand economic calculations are a central element of selecting the retrofit measures. They follow a period of 20 years, but also consider the real estates' location and its successful lease in past years. There is an internally fixed limit for the profitability of measures that must not be under-run.

## Cooperation between architects and residents

### Seclin - France

The Jardins Estate in Seclin

The experiment conducted in Seclin is unusual in that the residents, who were the initiators of the project, were also involved in choosing the work from which they could benefit.

The estate's residents set up an association known as "Friends of the Jardins Estate". Some of the members of that association took part in the works monitoring committee that met weekly. All residents were able to express their points of view through a complaints book.

The architects' practice made proposals in response to complaints that were then submitted for approval to landlords and residents.



## Professional and systematic planning combining technical and financial expertise

### Berlin - Germany

In early 2009 the STADT UND LAND GmbH started a project for planning energy efficiency. Working closely together with experts from the sectors of technology, inventory management and finances ideally warrants an extensive and sustainable investment planning and thus the selection of the optimal retrofit measures for each case. In order to do that the project group systemically maps the building's energetic status and its savings capacity. Possible scenarios of action are generated and the necessary investment costs are calculated.

## Building up different scenarios based on building features, possible interventions and their costs

### Venice - Italy

ATER of Venice

The intervention is part of a redevelopment plan of a specific area. Existing social housing apartments will be restored and also new constructions will be built.

The main criterion to establish which kind of measure was to prefer above another has been to consider the life cycle of the building, neglecting the theoretical pay back period of possible interventions. Important issue therefore was to understand if the building examined would justify intervention costs or if it would be more reasonable (cheaper over the same period of time) to construct new homes with high energy performance standards.



## Building a comprehensive picture of the housing stock

### Cardiff - Wales

Cardiff Council's Commissioning Team is working to centralise all the information from various departments and contractors to build a comprehensive picture of the various aspects of each property that contribute to the overall energy efficiency. This includes, heating systems, insulation, SAP and Energy Performance Certificates (EPCs). The intention is to use the SAP and EPC ratings to identify the poorest stock to additionally inform and target programmes of work.

## Choice based on energy audit

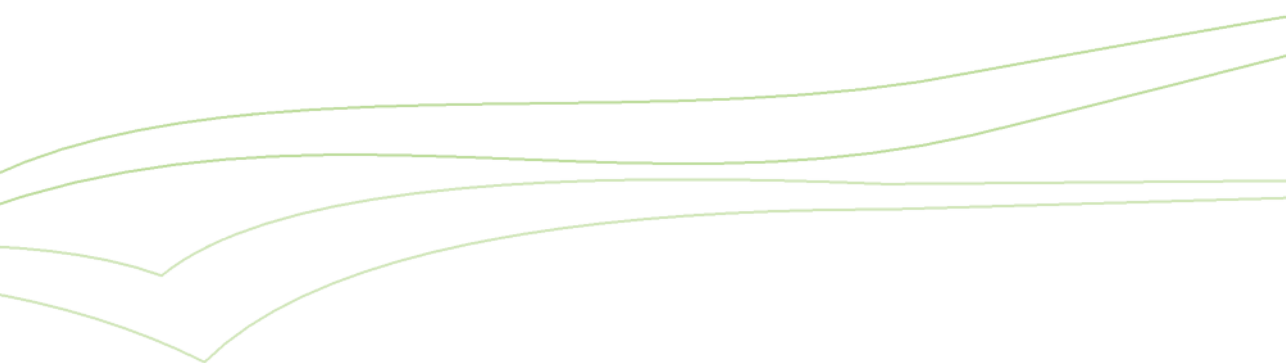
### Warsaw - Poland

The modernization of the Targówek Precinct

The micro program "Revitalization of the Targówek Precinct 2005-2013" was developed to tackle the social, economical and infrastructural problems of the Targówek precinct (district), a part of Warsaw city.

The choice of retrofitting technology depends on the results of the energy audit of the building - a study is carried out, detailing the scope and technical parameters of a thermomodernisation undertaking, which presents a solution that is optimal in the light of the costs of the undertaking and energy savings, and constitutes a basis for a construction plan.





Financing retrofitting measures requires the matching of different types of financial resources. This section helps you to be better aware of the financial resources available and their provenance. It is then very important to check the criteria of eligibility in order to ensure the complementarity of the financial measures.

The types of financial product identified have, as far as possible, been grouped into generic types, and described below.

The categorisation of financial products is more complex than this might imply however, as there is a great deal of variation in terms of such features as:

- The types of partnership formed and partners engaged
- Details of loan or grants offers, such as:
  - capital available per property, per landlord or in total fund, and limitations this places on measures and scale of activity possible
  - levels of interest charged
  - security required against loans
  - repayment terms and conditions
  - penalties for arrears

In providing assistance to individual households (as opposed to a landlord carrying out renovation work), advisory groups can become expert at drawing together a range of different sources of financial help to meet the needs of a single household.

A particular issue for rented homes (which form a high proportion of what is generally considered to be social housing), is that energy savings accrue to the tenant while capital costs for investment are usually the responsibility of the landlord. Of particular interest, therefore, is how this “split incentive” can be shared or managed.

It is important to note that associated costs have also to be considered in the financial plan: for advice, consultation, evaluation, feedback.

With this in mind the following general types of finance have been identified:

## Government grants

This category includes grants for housing refurbishment in general, or specifically for social housing, which may include energy improvements. A different approach is grants programmes specifically targeting energy efficiency, and in some cases only for (or with additional support for) lower income households.

These grants may be directed either to the social housing provider or directly to the individual resident, and vary in scale from large regeneration projects through to the household level.





Another variation in approach is whether single measures are covered or a “whole house” approach, identifying and financing the measures necessary to achieve a certain standard of energy efficiency, environmental performance or affordability.

The limit to the capital resources available is a significant factor, given competition for such funds. It is also observed that the maximum finance allowed per project or home is a significant factor with regard to the energy efficiency standards that can be achieved.

### Capital loans

These generally cover the same range of variations as the grants described above, with the same issues arising.

Additional factors are interest charged on loans, the length of time allowed for repayment, and how to source the revenues for repayments. Where the loan is made to the social housing provider, there will be limitations on how much rent may be raised to provide for repayments - either regulatory or practical, in terms of what residents can afford. One approach is to set repayments at a level no more than anticipated savings on fuel bills resulting from the energy improvements. Where loans are made to lower income owner-occupiers or private landlords, different arrangements are needed.

### Micro credit

This is a term used to describe a small loan, especially one given to people living in relative poverty, to enable them to develop earnings capacity and establish small businesses. The concept can also be useful in relation to the economy of a household, or to support community groups (for example in regeneration activity) in that it is a way to extend credit to people without the collateral or previous credit record normally required for loans.

By avoiding some of the bureaucracy involved in conventional loans, it is adapted better to lending relatively small amounts, and if targeted only to community benefit and socio-economically deprived groups, it may be possible to raise capital from sources with social aims. Examples include Credit Unions and Community Loan funds.

### Tax credit

Tax credits are a way to incentivise investment in energy improvements, for example by reducing liability for income tax by an amount equivalent to that spent on retrofit measures. It may be applied to owner-occupiers (although in this case is less likely to be attractive to lower-income households) or to private landlords.

### Bulk purchase

Social housing providers may be able to use their procurement power (either alone or in purchasing consortia) to achieve lower unit costs for retrofit measures through economies of scale. This might (for example) be applied to advantage to expensive technologies which have not yet achieved their potential market penetration such as heat pumps or photovoltaic panels. An additional advantage may be gained by making an agreement with contractors to extend the offer within a limited geographical area for a period of time - for example to owner occupiers in the vicinity of a social housing area to which a bulk retrofit has been applied.

### Feed in tariffs

In some countries there is an agreed and guaranteed price paid for energy generated by small and medium scale renewable resources feeding back into the grid. This is generally significantly higher than the market has otherwise delivered, and provides an income stream which can help to repay capital loans.

### Generating capital or income from related assets

Social housing providers hold capital assets, which may offer potential for raising funds for retrofit - either as capital from sales or revenue to help with





repayment of loans. Examples are the use of some premises for private housing or for commercial or services activity (such as shops or leisure facilities). The latter may bring added benefits in terms of facilities available to the community, and employment.

**Fuel supplier obligation**

An obligation placed on fuel suppliers to achieve energy or carbon savings through their own investment. In effect this is paid for through energy bills across the whole customer base, and is a way to structure the allocation of private profits to achieve social and environmental goals related to the impact of the industry generating the profits.

**Energy Services Company (ESCO)**

An energy service company is a term that has been used more or less loosely, but a useful definition is that it is a company that sells an energy service (such as heating) as opposed to just energy. This might for example involve provision of the heating equipment, fuel and maintenance, as well as energy saving measures. The primary relevance in this context is that this provides an incentive for the company to finance and implement retrofit measures where these make provision of the service more economical.

**Energy Performance Contracting (EPC)**

Under an energy performance contracting arrangement, an external organisation develops, implements and finances (or arranges financing of) an energy efficiency project or a renewable energy project, and uses the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project, including the costs of the investment. The external organisation takes the risk, in that they may not recover all of its costs unless the project delivers all of the energy savings guaranteed. An ESCO might set up an EPC agreement, in practice.



**European Union funding**

European regional policy and the funding that supports it aims to reduce the gap between the development levels of different regions, and there are various finance programmes that can help to finance retrofit projects, particularly where these have employment generation potential. Each member state prepares their own framework for implementation, and there can be variation in application between regions. Examples of relevant programmes are ERDF, JESSICA and JASPERS.



## Retrofitting project pre financing: a result of social housing associations mobilisation

### Alpes-de-Haute-Provence - France

Pact Arim 04, an association with, amongst other things, social housing stock intended for very low-income groups, calls on Finantoit when necessary to pre-fund the operations it undertakes.

Finantoit is the result of a partnership between integration project sponsors, the Abbé Pierre Foundation and the Crédit Coopératif bank. Organisations whose applications are accepted have access to an authorised overdraft at a lower interest rate than the market rate (as a result of using solidarity-based savings funds).



## Using revenues from PV and commercial spaces

### Milan - Italy

At the CARIPLO Foundation project in Barona Village in Italy, the 68 social housing flats are divided, so that about 15% are for the lowest income residents, with a rent charged of about 2.8 € sq.m./month and 85% are for medium level residents, paying about 5.4 € sq.m./month (in both cases with additional joint owner expenses).

Some of the finance is drawn from commercial space, let to small enterprises (shops, gymnasium open to public clients and social services), or from selling electricity produced by the 300 square meters of photovoltaic panels installed on the village roofs to the public grid (as well as supplying the villages public lighting).

This choice has been made as a result of the recent government "Energy Bill" to support investments in photovoltaic plants by paying a "feed in tariff" of around twice the normal price, resulting in a reduction in the anticipated payback time for the investment from 20 years to 7.



## Renovation lease

### Loire Atlantique - France

Une Famille Un Toit 44 is involved in integration through housing activities and makes use of the renovation lease in its projects. The renovation lease is a contract concluded between the owner of a property and a "lessee" with regard to:

- Work to improve/rehabilitate the property
- Renting for housing purposes only, particularly to deprived people
- Returning the property to the owner in a good state of repair on expiry of the lease

To set up this arrangement, there needs agreement with an operator in the local area approved by the government to house deprived people, such as a social housing agency, semi-public company, integration project sponsor, or local authority. The lease lasts for a minimum of 12 years and the operator carrying out the work may receive subsidies (e.g. from the National Housing Agency). The arrangement means taking over from a landlord who does not wish to accept the technical, administrative and financial burden of rehabilitation and renting out.



As a result, the notion of energy management can be introduced into the renovation work (with a single organization undertaking several rehabilitation projects). Project funding is a matter for the operator, which must raise the funds needed to renovate the property.

Through this arrangement, the Pays de la Loire Regional Council has given Une Famille Un Toit 44 responsibility for a number of buildings with a view to putting them back on the rental market for low-income groups.

This solution transfers fundraising to a voluntary organisation or one working to house the poorest groups. There is then a possibility of involving funders who would not otherwise have funded private landlords to renovate buildings.

## Financial residents involvement

### Sant Ilario d'Enza - Italy

In the Municipality of Sant Ilario d'Enza the kind of mechanism used is a common loan procured by a bank and granted by the municipality. ACER Reggio Emilia has in charge management, retrofitting works and communication campaign.

Tenants agree to finance in part the retrofitting through a monthly increase of the rent (warm rent), the other part will be financed by the Municipality (loan).

The financial mechanism in itself is not new but the agreement between the parties is innovative. The agreed parties will open a regular loan by a regular bank, running time 15 years, and the costs are divided as follows: 66% will be financed by the Municipality and 33% by the tenants.

The augment in rent is 50% lower than the estimated monthly savings on the energy bill by the interventions on energy performance of the apartments. Tenants rent increase is 10 € a month; monthly energy bill saving is 20 €.

The signed agreement between Municipality and tenants is an important step forwards to a higher energy consciousness of the governmental body combined with a more direct social concern.



## Procurement groups to reduce costs

### Cornwall - England

Penwith Housing Association in the UK is a member of the Advantage South West (ASW) consortium with other social housing providers which operates a group procurement strategy in which purchasing of all products, services and activities takes account of price, quality, time and sustainability. They have recently set up groups to focus particularly on new technologies and energy poverty.

Penwith HA has made a potentially significant contribution to fuel poverty in demonstrating the value of extensive use of external wall insulation (they have around 1,000 externally insulated properties in their stock) and in the pioneering of ground source heat pumps in UK social housing.

Similarly, Drum Housing developed a consortium of social housing providers called the "Sustainable Housing Renewable Energy Consortium" (SHREC) - which has more than 50 members and works to reduce the costs of renewables through the procurement of bulk purchasing deals.



## Long term loan

### UK

#### Pay As You Save

In the UK, the fact that people move house so frequently is seen as a major barrier to investing in energy improvements with long payback times. The government have decided to trial a new kind of loan for whole-house energy efficiency retrofits, called Pay As You Save. This aims to spread the cost over a substantial period of time, with repayments less than the predicted savings made from installing measures, and with arrangements to enable the loan to stay with the property and be passed on to new occupants if people move.

Of the five pilots running from December 2009 to March 2010, one is being run by Gentoo Sunderland for rented social housing. Properties will be improved when empty, and repayments set up as part of a revised form of tenancy agreement. Another pilot in Birmingham will be for private homeowners, with repayments collected through a credit union, and a third, in Stroud, will collect repayments alongside the local "council" tax.



## Dedicated micro credit

### Hérault - France

GEFOSAT, an association specialising in energy management and renewable energy, has been experimenting with social microcredit, in partnership with the Crédit Coopératif bank. This experimental arrangement is funded by ADEME (Environment and Energy Management Agency), ANAH, PUCA (urban development, construction and architecture plan) and the Caisse des Dépôts et Consignations (a government office responsible for investing and lending public money).

This form of personal microcredit is a new financial tool tested in connection with the FATMEE (Aid Fund for Energy and Water Management Work) to combat energy poverty.

In 2008, GEFOSAT was selected by PREBAT (Research and Experimentation Programme on Energy in the Building Sector) to test personal microcredit as a means of facilitating work in the homes of owner occupiers with modest incomes. Planned over three years (June 2008-May 2011), the experiment should benefit twenty households, which will receive support throughout the repayment period from the housing department of UDAF (Union of Family Associations).

The microcredit amounts to €3,000 on average and is intended to fund the remaining energy-related work such as (insulation, changing heating systems, double glazing, repairing roofs, and eliminating leaks).





## Matching several financing resources

### Seclin - France

In Seclin, in northern France, multi-stakeholder financial participation in a project resulted in rehabilitation of 73 social housing units belonging to the provider Habitat 59/62. Substantial work was carried out, including replacing boilers, installing thermal solar panels, photovoltaic panels, water-saving taps and double-glazed windows.

Tenants' contribution to funding the work is a rent rise of around 4%. This rise is entirely covered by the urban district authority for the first two years (about €40,000) in view of the disruption suffered by tenants during the work, but also to ensure that the rent rise will be much lower than the savings made by tenants on service charges.

This project received an award from the MIEL 21 (Mutualisation des Initiatives Ecocitoyennes Locales [pooling local eco-citizen initiatives]) programme launched by Lille Métropole urban district authority, which topped up the funding.

Many other stakeholders provided financial support to this project: the Regional Energy Management and Environment Aid Fund, Lille Métropole Urban District Authority, Departmental Council, FSL (housing solidarity fund), ADEME and Habitats 62/59 SA.

## 0% interest rate loan

### Province of Milan - Italy

The Province of Milan, with the support of several local banks, has established a programme to co-finance retrofitting for home owners. The loan is offered at a zero interest rate and is only for energy efficiency and renewable energy measures for heating and hot water.

There is no income threshold set at present, and the interest is entirely supported by the Province and banks (50% + 50%).

## Financial involvement of fuel providers

### UK

The Carbon Emission Reduction Target (CERT) programme in the UK is a four year programme under which suppliers of gas and electricity to the domestic market are obliged to achieve carbon savings targets set by the energy regulator. It applies to all housing, but has specific targets for priority households, defined by low income (receipt of welfare benefits), and factors affecting vulnerability to the effects of energy poverty, such as age or disability.

Under this programme energy suppliers finance the installation of retrofit measures for homes, focusing mainly on those measures with the best return on investment in terms of carbon saving.

This is the third four year programme of this kind, and the UK government have indicated their intention to continue and expand this approach.





## Financing consultancy

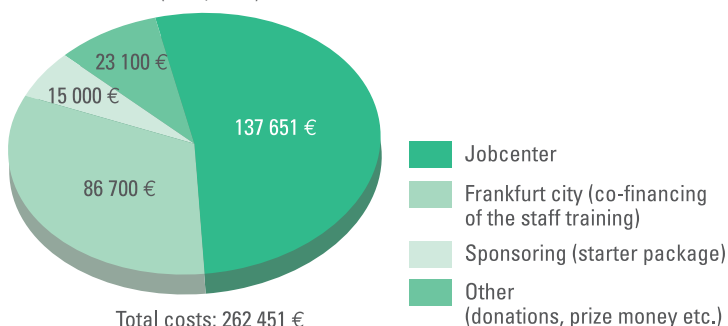
### Frankfurt - Germany

The cariteam-Energiesparservice (energy savings service) from Frankfurt (Main) illustrates financing through local co-operations between Jobcenter, Caritas and other sponsors. The biggest part is paid for by the Jobcenter Frankfurt in line with employment promotion through federal funds. Frankfurt city takes over part of the costs for an energy consultant for training the consultants. The starter packages free of charge are covered by sponsors: Equipment manufacturers, the energy provider Mainova and Frankfurt city's Youth and Social Services Department. The costs for the town council are amortized by the energy savings, which in line with Arbeitslosengeld I (unemployment money) are covered by the municipality.

A comparable project offered in Potsdam, Germany, (see p 18) is financed with the support of the European Social Fund (ESF).

#### Project costs / financing

400 consultations (2007/2008)



Source of the graphic/numbers: Dünhoff, E., Stieß, I., Gigli, M. & Birzle-Harder, B. (2009). Evaluation des Cariteam- Energiesparservice in Frankfurt a.M. - Endbericht im Rahmen des Projekts: Energieeffizienz und Energieeinsparung in Arbeitslosengeld II- und Sozialhilfehaushalten

## State grant for repayment of the loan

### Poland

TBS Czeszochowa organization

An investor who conducts a thermomodernisation undertaking is eligible for a bonus to cover part of the loan contracted in order to carry out the energy efficiency retrofitting measures. The "thermomodernisation bonus" is paid from the Thermomodernisation Fund by the National Economy Bank, if the energy audit states that due to the thermomodernisation undertaking the following shall be accomplished.

The amount of the thermomodernisation bonus is equal to 20% of the utilized amount of the loan, with the proviso that :

The amount of the thermomodernisation bonus shall not exceed:

- 1) 16% of the costs incurred during realization of a thermomodernisation undertaking, and
- 2) twice the amount of expected annual energy savings, calculated on the basis of the energy audit.

# What skills are needed?

7

In addition to the need to control the quality of the physical works carried out, communication needs specific skills, especially when dealing with households at high risk of energy poverty. For longer term impact, consideration needs to be given to awareness and skills of social housing staff in particular.

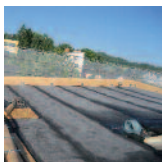
This section examines the skills needed by people involved in retrofit, either in designing or installing the measures, and in advice and communication. Linked to skills are training, qualifications and accreditation.

This is of relevance to:

- Staff of organisations that provide housing
- Support organisations
- Contractors and installers
- The residents themselves

Relevant skills identified include:

- Technical skills in energy or environmental audit, to identify and prioritise measures, and quantify anticipated costs and benefits
- Resident consultation and engagement
- The specific trade skills required to ensure quality installation of relevant technologies
- Advice, information and communications
- Leading and supporting behavioural change, and putting together appropriate behavioural change programmes
- Partnership and community development





## Platform to ensure high quality provision

### Hérault - France

In 2002, the GEFOSAT association set up the FATMEE (Aid Fund for Energy and Water Management Work). The technical partners associated with the project include the Pléiades Services employment platform.

The latter's aim is to develop the activity of personal services, ensure high-quality provision and act as an interface between supply and demand.

All building trades are represented. This helps to save time and ensure that good quality contractors are used. Service providers must comply with a benchmarking procedure and undergo an assessment (in both administrative and commercial terms) of their activities.

The attraction for contractors is that they obtain a steady supply of reliable customers. In exchange, they must pay between 5 and 10% (depending on the sector of activity) of the amount invoiced back to Pléiades Services.

Apart from the technical aspects, the quality and composition of the partnership are vital to the success of this kind of arrangement: apart from the social workers who assist households throughout the rehabilitation process, FATMEE relies on the skills of the CLCV Association for legal aspects and mediation.

Gefosat is in charge of co-ordinating all the parties involved.

## Training young unemployed

### Luton Borough - UK

Luton Borough Council is a Local Authority managing 8,500 council owned properties, representing 13.6% of the total housing stock in the Borough.

The council is part of an initiative which targets young people between the ages of 16 to 19 years who are not in education, employment or training, and trains them in energy efficiency. They will sit a 12 week training programme that would award them with a City & Guilds in Insulation. This is a platform for these young people to re-enter employment or gain valuable work experience to empower them to address their employment situation.

## Training peers as energy experts

### Berlin - Germany

The Turkish environmental group of BUND (Friends of the Earth) Yesil Cember trains volunteers as energy consultants for Turkish speaking households among other things. A training course over 25 hours teaches background knowledge about saving electricity and water, mould and waste separation. The course also includes a communications training for passing on the knowledge (through role-play for example) and an introduction to the use with an instrument for gauging electricity. Often a senior consultant accompanies a new consultant's first sessions.





## **Raising awareness of staff and contractors**

### **Berlin - Germany**

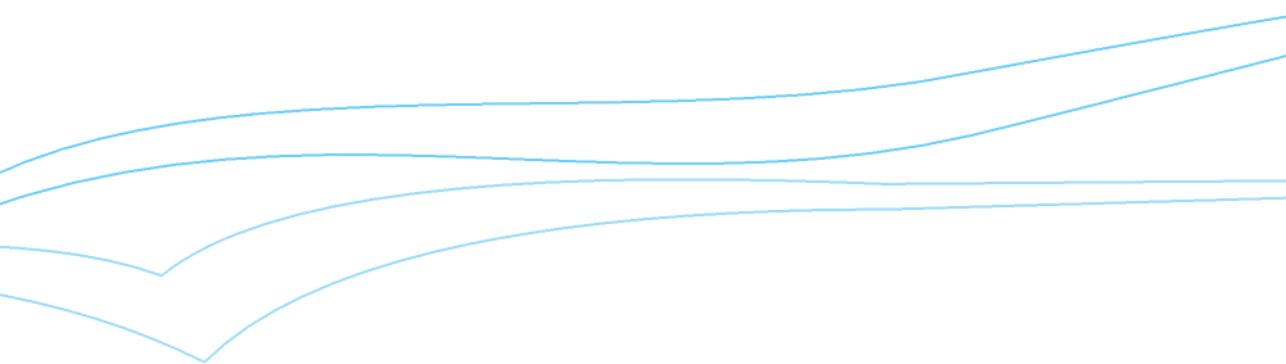
The STADT UND LAND GmbH has been conducting an extensive environment management since the 1990s. Management includes among other features further training for employees and binding rules for suppliers and contractors alike. Activities are published in form of an annual environmental statement and are presented on panels.



## **Twofold in-house expertise (energy and social)**

### **Alpes-de-Haute-Provence - France**

Pact Arim 04 (France) combines various skills enabling it to carry out rehabilitation projects. As an Energy Information Centre, Pact Arim informs and advises the general public on energy saving and renewable energy. It also has expertise in putting together projects and providing welfare assistance to households living in housing that it owns or where it monitors rentals. Through their Energy Information Centre and its adviser, the association's social workers have been educated about the issues of energy savings and renewable energy. When setting up operations (purchasing and renovating old housing stock), the architect also works in partnership with the Energy Information Centre adviser.



# Evaluation of retrofit programmes

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Programmes are monitored and evaluated to inform the housing provider, residents and decision-makers, or other partners and funders, so that they can improve future programmes for both advice and measures. It is essential in order to ensure that the advantages and disadvantages of an intervention are understood.

A quality issue arising is for feedback to be a 3-way process, with open communications between landlord, resident and contractors.

FinSH review indicated a range of possibilities for what is usefully evaluated, such as:

- Energy and carbon savings resulting from retrofit
- Financial savings on energy bills
- Improvement in comfort conditions, quantitative (temperature and humidity measurements) and qualitative (resident perception)
- The ease with which a measure was installed by the contractor
- Reliability of the technology installed/level of “teething problems” encountered
- Residents’ experience of using /living with a new technology
- Residents’ satisfaction with the process and results (during and after the work)

Surveying actual energy consumption after retrofit programs (and sometimes before) will provide useful data to monitor changes and put a figure on the savings made. The installation of meters and the related costs (meters and data analysis) have to be planned in the retrofit program.

An additional related element of significance is the evaluation of the overall environmental performance of organisations such as social housing providers: such as the carbon emissions from their own operation and activities as a company.





## Professional certified evaluation

### Berlin - Germany

In order to review and continually improve their environment management system STADT UND LAND GmbH conducts yearly internal audit programmes. In these programmes the system effectiveness, the compliance with the relevant environment guidelines as well as the effectiveness of the measures used are evaluated. The internal auditors, now more than 18, primarily focus on personal talks with the employees. The procedure is certified according to the EMAS (Environmental Management and Audit Scheme).

## Different indicators for outcomes

### Berlin - Germany

The Energiesparclub (energy savings club) by co2online gGmbH in Germany offers households not only numerous tips on saving energy, but also the chance to regularly monitor their energy consumption, thus making an important contribution towards permanent behaviour change. By entering energy consumption data online on a regular basis, the effects of behaviour changes or retrofit energy efficiency measures can easily be monitored.

co2online also regularly estimate the impact of their numerous online tools with regard to savings in energy and carbon emissions. They also monitor employment in and the business volume of the building industry through users' surveys. The results are made available online. The methods used have been examined and verified by an independent research institute.

## Involving residents in reading meters

### Marseille - France

La Bricarde, Marseille

As part of the experimental project conducted by Ecopolenergie with 14 households in La Bricarde, energy consumption is monitored remotely by the Association, which uses the readings taken by the project beneficiaries themselves to assess the water and energy savings that households can make after installation of a kit (low-energy lamps, flow reducer, eco-sac for the toilets).

The printout of readings is shown to families periodically so that they can monitor changes in their consumption throughout the operation.

## Renewable energy system monitoring

### Cardiff - Wales

Cardiff Council is working with Energy Saving Trust to participate in a UK wide field trial of monitoring renewable energy systems that have been installed in the council stock. This will include the monitoring of solar thermal, solar PV, ground source heat pumps and grey water recycling systems. They will also have access to all other monitoring information across the UK. The information to be analysed will include residents' satisfaction with the systems, efficiency, coefficient of performance, and suitability to particular build types. It will be used to help determine the best systems to retrofit into the housing stock thereafter.



## Data collection

### Hampshire - England

At Drum Housing pre and post refurbishment is run through computer software called EcoHomes XB to fully understand the effect that improvements have made.

Drum includes monitoring equipment and meters with renewable energy installations e.g. electricity consumption meter and heat & flow meter for Ground Source Heat Pumps; heat and flow meter for Waste Water Heat Recovery; Electricity generation meter for Solar PV; Internal / external single point temperature logger. They undertake trend analysis on data collected to look for possible problems. Tenants also have access to "smart meters".

They review success by questionnaire or interview of residents on their experience of living with a new system e.g. one year post installation. Lessons are learnt from the project and applied to future projects e.g. what worked well and what did not and how they can improve next time.

They regularly celebrate successful projects and share performance data with their tenants and other interested parties.

# References for further information

## Links

Intelligent Energy - Europe (IEE)  
<http://ec.europa.eu/energy/intelligent>

CECODHAS - Housing Europe  
[www.cecodhas.org](http://www.cecodhas.org)

EU projects websites:  
EI-Education: Energy Intelligent Education for  
Retrofitting of Social Housing  
[www.ei-education.aarch.dk](http://www.ei-education.aarch.dk)

EPEE: European fuel Poverty and Energy Efficiency  
[www.fuel-poverty.org](http://www.fuel-poverty.org)

Inofin: Innovative Financing of Social Housing Refurbishment  
in Enlarged Europe  
[www.join-inofin.eu](http://www.join-inofin.eu)

Fina Ret: Financing products for investments in small-scale  
renewable energy and energy efficiency technologies  
[www.finaret.eu](http://www.finaret.eu)

ROSH: Retrofitting of Social Housing  
[www.rosh-project.eu](http://www.rosh-project.eu)

SHARE: Social Housing Action to Reduce Energy consumption  
[www.socialhousingaction.com](http://www.socialhousingaction.com)

Tackobst: Tackling Obstacles to energy efficiency in social housing  
[www.tackobst.eu](http://www.tackobst.eu)

Power House Europe: the Big Green Housing and Energy Exchange  
[www.powerhouseeurope.eu](http://www.powerhouseeurope.eu)

Build Up: Energy solutions for better buildings  
[www.buildup.eu](http://www.buildup.eu)





### Most relevant references:

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and "Keeping Warm in your Home - a Housing Association  
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[www.nea.org.uk](http://www.nea.org.uk)

Abrahamse, W., Steg, L. & Rothengatter, T. (2005).  
A review of intervention studies aimed at  
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Journal of Environmental Psychology, 25, pp. 273-291.



Design: L'agence Mars

April 2010

Pictures have been provided by:

Forschungsgruppe Umweltpsychologie, Thorsten Hoos, SWEA,  
GERES, ECUBA, SNL Val de Marne, KAPE

