THE FINANCING OF RENOVATION

IN THE SOCIAL HOUSING SECTOR

A comparative study in 6 European countries

HOUSING EUROPE
GROUPE Caisse des Dépôts
L'UNION SOCIALE POUR L'HABITAT

CONTENT

INTRODUCTION

If one wants to have a short look back at how the European policy makers have dealt with the topic of renovation of housing over the last few years, 2010 would probably be a turning point. That year, on the one hand, the Global Financial Crisis and the various attempts to launch economic recovery plans at the EU and national level effectively put the housing sector and in particular the renovation of the existing stock at the centre of political concern because of its growth-enhancing role. On the other hand, the European Directive on Energy Performance of Building was adopted and it paved the way for more energy efficient new dwellings as well as set the incentives for the renovation of existing dwellings. Almost 6 years on, the role of renovation of existing buildings has been even more stressed by a wide range of stakeholders and policy makers, referring in particular to the Paris Climate Agreement and its translation at the EU level. In a recent publication the EU Joint Research Centre called energy renovation the "trump card for the new start for Europe" [1].Furthermore, the European Commission published in December 2016 a set of new proposals on how to step up the renovation of the building stock as a way to meet the EU climate targets [2].

There is therefore a clear consensus about the important role of housing retrofitting in meeting the climate objectives that have been collectively agreed in order to halt global warming. However, there is a lack of detailed understanding about the drivers for energy renovation, despite a vast number of recent EU projects and reports[3]. The variety of national financial and regulatory frameworks applicable to renovation of housing is one of the reasons why it is difficult to have clear comparative view as well as clear policy recommendations at the EU level.

The present study aims at addressing this lack of precise understanding and will focus on and compare the financing schemes supporting the renovation of social housing in 6 countries. The social housing segment is indeed particularly relevant for policy makers: although social housing, cooperative and public housing make on average only 11% of the housing stock of the EU countries, as this study will show, their energy performance is on average better than the private rental or the homeowners sectors, the expertise of social housing providers in renovation activities is growing in strong and it is the segment who cater for low-income families, people with special housing needs and more generally speaking people who can't find a decent and affordable accommodation on the private rental market or through access homeownership. This is therefore a key segment of the housing market and a key area of intervention of national and regional housing policies.

The renovation of social housing is the most obvious example of how environment and social justice considerations can be combined. Making renovation affordable for low-income social housing residents is the key question for social housing providers.

In this context, the cost of renovation and the various schemes and mechanisms to finance it are determining factors. Bringing down the cost of renovation and, at the same time, the cost of finance are the challenges housing providers are confronted with. The regulatory and financial frameworks in the different countries can either help or on hamper the search for such cost efficient investments.

The study looked at what financial frameworks, policies and measures are in place to support the renovation of social, cooperative and public housing (here after referred to as "social housing") in the sample of countries.

In the following parts, we will present the result of a survey conducted among providers of social housing in 6 countries: Austria (GbV), France (USH), Germany (GdW), Sweden (SABO), the Netherlands (AEDES) and England (NHF). Those countries have been chosen because of the importance of the social housing stock in terms of proportion of the total housing stock [4] as well as due to the experience of social housing providers in the renovation activities [5] . Therefore, the figures and information below relate to the social housing sector except in England where it refers to the general housing sector and in Germany, where the figures refer to GdW companies which, while encompassing almost the entire social housing sector, are also housing cooperatives and private rental companies.

After presenting the result country by country, we will present a comparison in a synthetic manner and we will eventually conclude by a set of policy observations aimed at enriching the current policy debate about the role of housing retrofitting to meet the EU climate objectives.

This study has been commissioned by Caisse des Dépôts et Consignations (CDC) and Union Sociale pour l'Habitat (USH).

[1] European Commission-Joint Research Centre, Institute for Energy and Transport, Energy Renovation: The Trump Card for the New Start for Europe, ISBN: 978-92-79-43603-1. 2015. Web 6 Apr. 2017. https://www.researchgate.net/publication/276929901_Energy_Renovation_The_Trump_Card_for_the_New_Start_for_Europe

[2] European Commission, DG Energy (ENER), Commission proposes new rules for consumer centred clean energy transition, 30 Nov.2016. Web 6 Apr. 2017. http://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition

[3] The European Commission's science and knowledge service, Energy Efficiency. Web 6 Apr. 2017 https://ec.europa.eu/jrc/en/energy-efficiency

[4] For general presentation of the social housing sector in those countries, see the State of Housing 2015: http://www.housingeurope.eu/resource-468/the-state-of-housing-in-the-eu-2015 ; for a presentation of the system of financing of some of those countries (Austria, France, Germany, UK), see the study "Financing of social housing in 6 European countries http://www.housingeurope.eu/resource-369/financing-of-social-housing"

[5] See for instance the findings of the Nearly Zero Energy Challenge (NZEC) Project http://www.powerhouseeurope.eu/index.php?eID=tx_nawsecuredl&u=0&file=fileadmin/users/phe/PH_NZC_Project_Partners_Zone/WP1_Coordination_and_Management/POWER_HOUSE_nZEC_Final_Publishable_Report.pdf&t=1499853098&hash=68d115e66d84200bdccd46485fb8e11d

NOTE ON METHODOLOGY

This study relied on information provided by experts in national social housing organisations in 6 countries. In all countries, except England, those organisations represent almost the entire social housing sector. They have used existing data provided by social housing companies or national statistics databases and refer to the terminology used in their countries.

For this reason, we faced challenges in finding comparable data and figures, as well as common definitions of used terms:

DEFINITION OF RENOVATION

We chose to embrace the wide spectrum of renovation, in other terms not only focusing on thermal renovation as it is not always possible to differentiate what is energetic and non-energetic renovation. However, whenever possible, we have tried to isolate energetic renovation from other types.

DEFINITION OF ENERGY PERFORMANCE

We chose to consider the energy performance certificates [6] as set in the different national context although this might limit the possibility to compare with precision the performance of the stocks in each country.

Data and figures related to the cost and financing of renovation are either taken from an average from different projects or from one single project which is deemed to be typical.

This study has been coordinated by Julien Dijol (Housing Europe) with the help of Abderrahim Khairi (Housing Europe) and is based on the inputs of Johanna Ode and Therese Rydstedt (SABO, Sweden), Ingrid Vogler (Germany), Eva Bauer (GBV, Austria), Ronald Franken and Marlou Boerbooms (AEDES, the Netherlands), Chloe McLaren Webb (England), Martin de Bettignies (France). Julien Garnier (Caisse des Dépots) was a member of the steering committee, with Martin de Bettignies (USH), Pierre Frick (USH), Carine Puyol (USH) and Julien Dijol (Housing Europe).

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EXECUTIVE SUMMARY

The study has looked at 6 European countries (France, Germany, Sweden, the Netherlands, Austria and England), where social housing makes an important part of the housing stock and where housing providers have a strong experience in the renovation activities.

For each country, the study has tried to give answers to the 5 following questions:

a. When and how do renovation projects take place?
b. How much do renovation projects cost?
c. How are those projects financed?
d. How are those projects financed?
e. What are the results of renovation projects?

This study relied on information provided by experts in national social housing organisations in 6 countries. In all countries, except England, those organisations represent almost the entire social housing sector. They have used existing data provided by social housing companies or national statistics databases and refer to the terminology used in their countries. For this reason, we faced challenges in finding comparable data and figures. However we managed to extract some relevant information regarding the policy mix for the renovation of social housing in the selected countries.

The following table is a summary of the main findings of the study:

[6] Dr. B. Atanasiu, Dr. T. Constantinescu, A comparative analysis of the energy performance certificates schemes within the European Union: Implementing options and policy recommendations. 2011. Web 6 Apr. 2017.http://proceedings.eceee.org/visabstrakt.php?event=1&doc=2-562-11

Country	Main type of works undertaken	Average cost total renovation energy retrofit only	Does SH need agreement of tenants to carry out renovation?	Is there rent increase/tenants contribution to finance renovation?	Main sources of finance	Financial conditions linked to the type of works/expected savings	Achieved energy performance
AUSTRIA	**Energy related retrofitting:** insulation of the façade + in some cases heating systems **Non energy related works:** lighting, elevator, living space Energetic retrofitting is always undertaken in the course of a substantial renovation project which usually takes place after 30 – 40 years	21,000 € 17,500 € [7]	Agreement with tenants or court settlement. Only in case of rent increases: measures inside dwellings need approval.	Tenants' contribution through rent provision. On top of that, rent increases are possible for up to 15 years but need to be approved by tenants or court.	**33%** soft loans (bank loans with 15 year maturity + subsidies by the regional (provincial) government **17%** grants (from the provinces) **50%** rent provision	Yes Special grants available for renovation of heating/ ventilation systems. Energy ratings are always required; some schemes also require regular observation of energy consumption	A political commitment by the federal government (2007) of reaching a 3% retrofitting rate for the housing stock Every year about 10,000 – 15,000 units are retrofitted. At least 80 per cent of the buildings constructed before 1980 are renovated.
FRANCE	**Energy related retrofitting:** interior isolation, carpentry works, heating and ventilation system, roof covering isolation **Non energy related works:** lighting, elevator, living space	29,000 € 9,500 €	No agreement needed, except for "3rd line contribution from tenant".	Yes, up to 10% within the limit of rent ceiling. In practice, rents are increased on average by 3%.	**65%** soft loans (Eco loan and others) **20%** subsidies **12%** own funds **3%** other (rent increase, certificates, property tax rebate)	Yes Components of energetic retrofittings (windows, boilers, etc.) are obliged to reach a certain level of energetic performance, which makes obsolete older components (for instance simple glaze windows or old style boilers). These new components are required in order to be eligible for certificates and tax deductions.	Objective is to renovate 70, 000 dwellings per year with ecological loan from Caisse des Dépôts. Around 40,000 dwellings are currently retrofitted yearly. Social rental stock is now rated as follows: A+B = 7% C = 28% D = 41% E = 18% F+G = 6% F+G to be eliminated by 2025 In practice, energetic gain in a retrofitting with ecological loan reaches 145 kilowatt per hour per m² per annum or a jump of 2,1 ratings on the energetic labelling.

[7] Due to a special VAT regime, VAT on construction costs for rental dwellings may be deducted since VAT is levied on rents (10%). Thus, any costs mentioned refer to costs without VAT

Country	Main type of works undertaken	Average cost total renovation energy retrofit only	Does SH need agreement of tenants to carry out renovation?	Is there rent increase/tenants contribution to finance renovation?	Main sources of finance	Financial conditions linked to the type of works/expected savings	Achieved energy performance
GERMANY	**Energy related retrofitting:** insulation + in some cases heating systems **Non energy related works:** lighting, elevator, living space	36,000€ 12,000€	No agreement needed.	Yes, up to 11% of the cost of energy renovation per year, but capped for social housing But public subsidies can reduce the cost (lower rent increase)	**80%** soft loan at 1.5%, duration 10 a, possible subsidy depending on levels of efficiency up to 27.5% (max. 30,000 €) **20%** own means [8]	Yes Under the KfW programme the best standard receives the highest support. In order to meet the high energy standard of a KfW Efficiency House, extensive investments are required such as the renewal of heating systems, thermal insulation and replacement of windows, are usually required.	Between 2005 and 2020, roughly 15% of final energy consumption can be reduced. 20% of the final energy savings can be achieved by roughly 2025 compared to 2005
SWEDEN	**Energy related retrofitting:** attic insulation, sealed windows, installation of heat recovery for ventilation air, energy efficient pumps and fans, switch to energy efficient lighting. **Non energy related works:** changing all pipework for tap and waste water, new waterproof layers, new clinker and tiles, new toilets, washbasins, etc.	35,000€ 17,500	Rents are negotiated yearly with tenants association on a case by case basis.	Yes. The amount of increase depend on the local market Rent increase on average of 25% over 3 years if renovation improves characte-ristics of dwelling. However there is no direct link to the cost of renovation. Economic situation of residents and their capacity to pay is taken into account in the type of works and the amount of rent increase	**80%** public loans (and in some cases use of green bonds) **20%** commercial loans. State subsidies in some cases for most efficient works.	Yes Loans from the public bank Kommuninvest are conditioned to the following : Energy efficiency measures in existing buildings, activities and operations leading to at least 25% less energy use Major renovation of buildings leading to a reduced energy use per square metre per year of at least 35% or compliance with applicable regulations for new buildings.	Energy consumption in 105 Sabo companies declined by 17%, between 2007 and 2015.

[8] Please note: rent increase is no source of finance, but a source of refinancing (paying back the loan)

Country	Main type of works undertaken	Average cost total renovation energy retrofit only	Does SH need agreement of tenants to carry out renovation?	Is there rent increase/tenants contribution to finance renovation?	Main sources of finance	Financial conditions linked to the type of works/expected savings	Achieved energy performance
NETHERLANDS	**Energy related retrofitting:** insulation + in some cases heating systems **Non energy related works :** lighting, elevator, living space + new kitchen, bathroom etc.	46,000€ 9,000€	Agreement needed if rent increase is required 75% of the housing associations ask their current tenants rent for measures such as insulation, new heating system or PV. 25% of the housing associations ask no extra rent to current tenants so they need no permission for the investment.	System of points linked to the EPC reached	**75%** own funds (rental income, surpluses) **25%** state subsidies	Yes the higher the energy performance, the higher the state subsidies (STEP programme)	36,000 dwellings retrofitted for energy efficiency in 2015. Social dwellings to have an average of Energy label B in 2020. The average label of social dwellings is D.
ENGLAND	**Energy related retrofitting:** insulation + in some cases heating systems **Non energy related works :** lighting, elevator, living space	20,000€ 14,000€	No	Rents cannot be raised above the legal ceilings in case of energy retrofitting, and energy savings cannot be recouped from tenants	**53%** own means (including 20% from own funds and 33% from sales of apartments) **33%** Subsidies **2%** Energy suppliers obligation **12%** private developers obligations	Yes For Energy Company Obligation funding, energy suppliers are required to conduct technical monitoring inspections on ECO measures to ensure the required standards of installation are met and measures are scored accurately for carbon saving. Solar PV requires ongoing metering.	Currently around 45% of all HA stock rated either A, B (2%) or C (43%) D (45%) and E-G (10%) all social homes to meet rating C by 2030.

The question of the financing of renovation of social housing remains an important one in the debate about the energy transition. The volume of investment needed for the renovation of one apartment is still an obstacle for many owners (be they homeowners, private or social landlords), despite all the long term costs of inadequate homes and the benefits that energy savings can bring. It is also an obstacle for public authorities if they have to finance the entirety of the energy renovation in the social housing sector. It is therefore crucial that the cost of financing is brought down. The right mix between private finance, public support and own capital needs to be found by social housing providers in various national legislative contexts. This study has tried to highlight those specific contexts and the impact they have on the cost of financing and the average energy performance achieved.

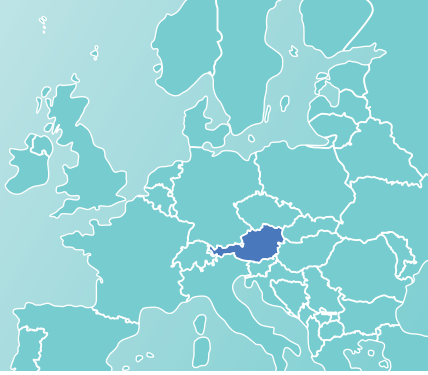
The study's main findings can be summarized as follows (more detailed figures can be found in Annex):

- Renovations have almost always energy and a non-energy related component. The non-energy component usually makes most of the cost of renovation. It might come from the fact that from the housing providers point of view, there is not (yet) a specific approach for energy efficiency but rather an approach of building modernization and increased comfort for tenants.
- The total cost of renovation (per housing unit) varies from 20,000€ (in England) to 46,000€ (in the Netherlands). This variation comes from many factors, including labour cost, the competitiveness of the construction/renovation sector or the building typology (semi-detached homes which are more common in the Netherlands).
- The cost of the energy related part of renovation makes on average below 50% of the total cost of renovation. In several countries, typical energetic renovation works cost around 10k€, meaning large scale intervention can be contemplated.
- Renovation are financed via a mix of own funding, soft loans related to the energy part of the renovation, bank loans, bonds issue, non-repayable grants, and contribution of tenants in the form of rent increase.
- Favourable fiscal treatment is also in place in several countries (mostly in the form of reduced VAT rate) but there are exceptions to this rule.
- Soft loans related to the energy part of the renovation are conditioned to the attainment of specific levels of energy efficiency and they are all the more favourable as this level is high.
- Subsidies are also conditioned to the realisation of energy efficiency objectives.
- In most of the cases, major renovations and the related rent increase need the agreement of the tenants, however this is not always the case.
- Some countries involve tenants' choice more than others in the type of renovation that will be implemented but broadly speaking tenants do not have a major role in this field.

The question of the right or best policy mix (beyond the financial mix) for the renovation of social housing remains open. The countries studied here have all set up objectives in terms of either renovation of social housing or overall energy efficiency but at various speed and intensity (some countries have clear objectives to renovate a certain number of dwellings per year or will ban the letting of dwellings in the worst EPC categories). But it was not possible to identify any correlation between the nature of the obligations and objectives and the general performance of the stock.

The countries also have different funding measures although all of them (except England and the Netherlands) rely heavily on soft loans or banking loans. In general, combining different sources of funding with an important public support either in the form of grants or soft loans, and a contribution of tenants remain the most widespread business model of energy efficiency in the social housing sector. Other tools (third party, green bonds, certificates, European subsidies and loans) are marginally used. For instance, in almost none of the countries, market finance in the form of green bonds play an important role: it is only really used in Sweden and lightly so far. It maybe shows that social housing providers need a stable and known financial framework in order to mitigate the financial risk. As we have seen in countries like France and Austria, the economic case for renovation of social housing remains fragile and dependent upon public support in one way or another. Market finance does not seem to be a major element so far, probably due to the low rate of return in the sector. And the fact that only Sweden has embraced it so far may stem from the fact that municipal housing companies in Sweden are for profit companies and are required to provide a financial return for their shareholders (municipalities) and investors.

AUSTRIA



1 Legislative context in the field of renovation of social housing

Legislation with regard to renovation in Austria is based on incentives rather than on compulsory instruments. Obligations concerning renovation are covered by OIB guidelines (OIB = Austria Institute of construction engineering) stating energetic standards in case of major renovations. There are no specific provisions for social housing.

Schemes or plans for achieving certain levels of energy consumption or greenhouse gas emissions do exist on different levels:

- a political commitment by the federal government (2007) of reaching a 3% retrofitting rate for the housing stock;
- the federal law of climate protection (2011) implementing the EU effort sharing decision and setting sectoral limits for greenhouse gas emissions.ites sectorielles pour les émissions de gaz à effets de serre.

There are subsidy schemes for (energetic) retrofitting on side of the federal provinces and the central state. They are open for all type of housing providers. These schemes have more impact on energetic retrofitting than other instruments.

2 Social housing and energy efficiency

The stock of rental dwellings owned by limited profit housing associations (members of the Austrian federation, GBV) amounted to 600,000 units at the end of 2015.

First, we will have a brief description of the current situation in terms of energy performance of the housing stock. The following table shows the distribution of the dwellings by building period. Since only rental units are taken in consideration for our purpose we find the peak production after 1990 when construction of units for sale decreased. Thus 45% of GBV's rental stock was produced within the last 25 years. A big share (approx. 75%) of the older stock has undergone energetic retrofitting within the last 30 years. In the table we find the average "heating warmth demand" (i.e heating requirement) per m^2 of habitable surface, which has been the main calculated parameter in the energy certificates in the past. This average is a mixture of buildings which have undergone energetic retrofitting (insulation) and those which have not. The parameter does not include losses by the heating system and no heating requirements for hot water production.

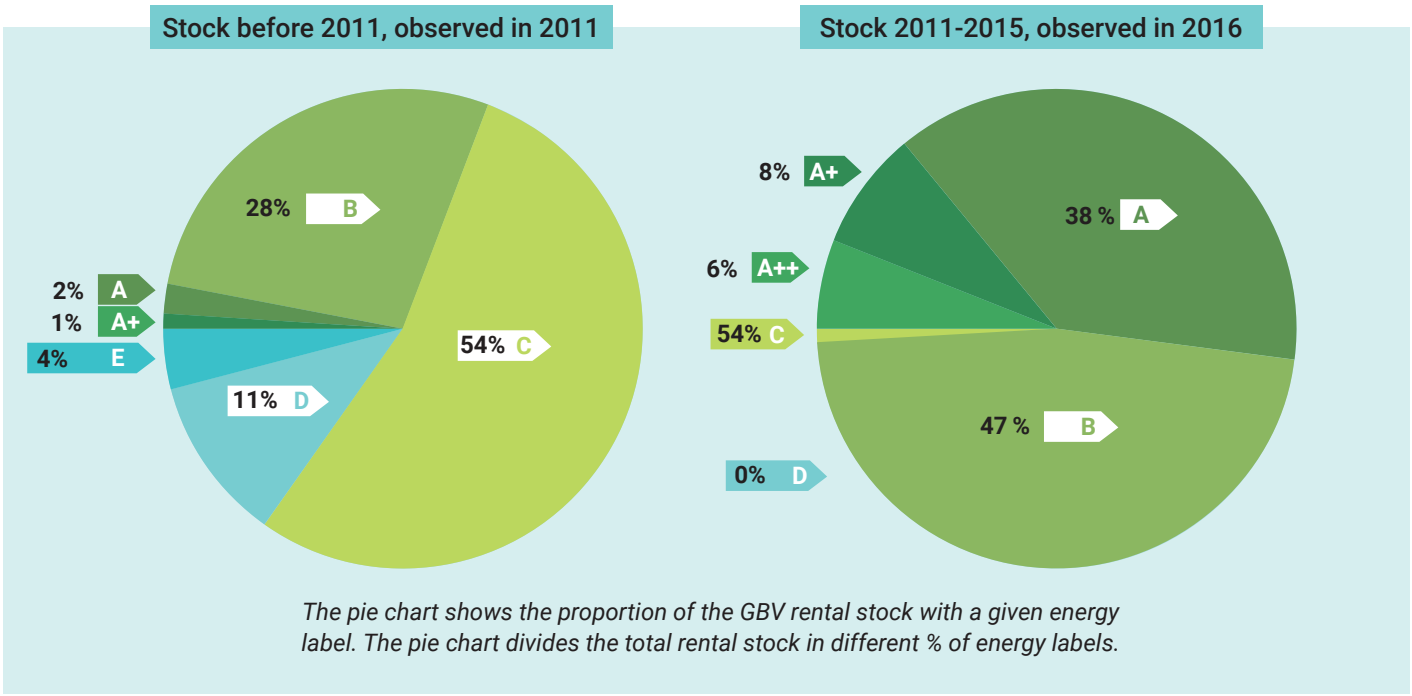
Limited Profit Rental Dwellings by building period – Autriche 2015

Building Period	Number of dwellings	Habitable surface m^2	heating requirement m^2a kWh (energy certificate)
Before 1945	51,700	63	150
1945 - 1960	54,400	58	100
1961 - 1970	85,700	62	80
1971 - 1980	68,800	72	80
1981 - 1990	70,700	77	80
1991 - 2000	101,000	74	80
2001 - 2010	101,200	75	55
2011 - 2015	70,000	75	35
Total	**603,500**	**70**	**77**

This graph represents the energy consumption of dwellings in the year 2015. The dwellings are divided according to the year of construction.

The difference between the older stock (partially renovated) and new constructed dwellings as regards energy labels is illustrated in the following graph. While the stock is dominated by B and C label, new constructed rental housing is nearly 50% for label A and 50% for label B. But as observations of actual energy consumption show, the calculated range (1:5) is wider than the span of measured consumption (1:2). This is due to the fact that in older buildings consumption is by far lower than expected while in very low energy buildings it is higher.

GBV rental stock by energy label – parameter: heating warmth demand

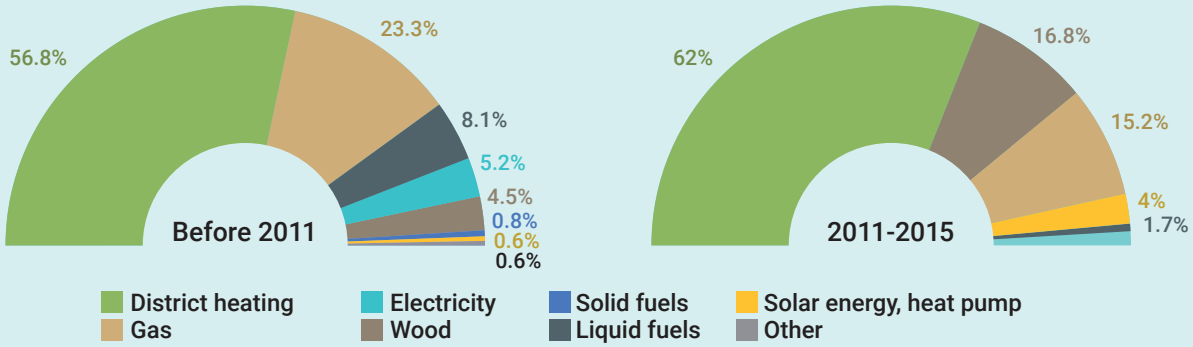


The pie chart shows the proportion of the GBV rental stock with a given energy label. The pie chart divides the total rental stock in different % of energy labels.

It is also relevant to look at the energy and heating systems used to provide energy to those dwellings.

The majority of GBV-buildings are connected to a district heating system distributing energy from different sources, partially renewables and partially conventional (e.g. gas). Next to district heating is gas heating, mainly in use with collective heating or central heating for single dwellings (not any longer in newly constructed housing). In the new stock pellets (or other wood products) are of similar importance as gas; there is often a combination with solar energy for hot water production. These systems are used for collective heating in smaller buildings rather than in large buildings (in bigger cities).

GBV rental stock: heating energy source by construction period %



The semi-circle shows the percentage of the heating energy source in two different periods of time. The graph on the left shows the first period (before 2011), the graph on the right shows the second period (from 2011 until 2015).

Regarding the modernization of heating systems (which is one of the possible elements of renovation as understood in this study), the most common measure is the connection to a district heating system. It must be said however that the modernisation of the heating systems do not occur systematically when renovation works are decided.

3 Financing of concrete renovation projects

a. When and how do renovation projects take place?

In Austria, energetic retrofitting is always undertaken in the course of a substantial renovation project which usually takes place after 30 – 40 years after completion of the building. The measures taken are mainly insulation of the outer façade, the roof and cellar; partially together with the renewal or rather exchange of windows. The heating system is not always integrated in the renovation operation. Additional measures are the renewal of the roofs, modernisation of the elevator, the lightening system and some other minor repairs. Adding elevators is done in a part of smaller buildings not equipped with that facility from the beginning. This is a huge costs factor, depending on the size of the building.

Regarding modernization works within the dwellings, they are integrated in the renovation of the building only for vacant units or are done separately at the occasion of a terminated rent contract.

b. How much do renovation projects cost?

Before going into the details of costs one general clarification regarding building costs in Austria: Due to a special VAT regime, VAT on construction costs for rental dwellings may be deducted since VAT is levied on rents (10%). Thus, any costs mentioned refer to costs without VAT.

There is a variety of costs of major retrofitting. If only the heating system is renewed that amounts to about 4,000 € per dwelling. Costs for outer insulation of the façade are higher, they amount to 14,000 € per dwelling (200 €/m^2). In combination with renewal of windows the costs are about 250 €/m^2 which makes 17,500 per dwelling. The average investment for a major renovation operation for energetic retrofitting (insulation of the façade + renewal of windows) plus other general measures in the building but without (heavy) renovation of individual dwellings amounts to 300 €/m^2 which is 21,000 € per dwelling. In some cases when in addition elevators are installed and part of the vacant dwellings are modernized and balconies are added, costs can add up to 1,000 €/ m^2. There is also variation depending on the size of the building; renewal operations in small buildings are more expensive per m^2 than in larger buildings.

The energetic improvement according to energy certificates for this "average" renovation is about 65 kwH / m^2a – heating demand only. However, observations show that the margin of actual consumption is only around half of that reported by energy certificates.

c. How are renovation projects financed?

In the limited profit housing stock regulated by the Austrian limited profit housing act, special conditions for the financing of renovations operations apply due to the specific rent regulation.

Rents in the limited profit sector are cost-based and include a compulsory provision for regular and extra maintenance, repair, renovations and modernization. This provision has to be invested, otherwise must be repaid to tenants. This means there is a regular income also for major (energetic) improvement operations.

The following table presents the maximum provision which can be collected; it increases with the age of the building. In 2016 a reform took place; so both models are shown. The system has been introduced in the 1970s; thus the older buildings have minor means stemming from regular dotation. Experience shows that between the years 10 and 15 often a deficit occurs which has to be covered either by loans or own funds of the housing provider. An estimation for the total stock finds that about 0,70 € /m^2 per month are required for regular maintenance and minor repairs both in buildings and dwellings.

Provision for the maintenance, repair and renovation
– according to Austrian Limited Profit Rent Regulation

Age of building	Until 2015	From 2016	Until 2015	From 2016
	€ / month and m²		per 70 m² accumulated	
1 year	0.43	0.50	361	420
2 years			722	840
3 years			1,084	1,260
4 years			1,445	1,680
5 years			1,806	2,100
6 years		0.56	2,167	2,570
7 years		0.62	2,528	3,091
8 years		0.68	2,890	3,662
9 years		0.74	3,251	4,284
10 years		0.80	3,612	4,956
11 years	1.14	0.86	4,570	5,678
12 years		0.92	5,527	6,451
13 years		0.98	6,485	7,274
14 years		1.04	7,442	8,148
15 years		1.10	8,400	9,072
16 years		1.16	9,358	10,046
17 years		1.22	10,315	11,071
18 years		1.28	11,273	12,146
19 years		1.34	12,230	13,272
20 years		1.40	13,188	14,448
21 years	1.71	1.46	14,624	15,674
22 years		1.52	16,061	16,951
23 years		1.58	17,497	18,278
24 years		1.64	18,934	19,656
25 years		1.70	20,370	21,084
26 years		1.76	21,806	22,562
27 years		1.82	23,243	24,091
28 years		1.88	24,679	25,670
29 years		1.94	26,116	27,300
30 years		2.00	27,552	28,980
31 years			28,988	30,660
32 years			30,425	32,340
33 years			31,861	34,020
34 years			33,298	35,700
35 years			34,734	37,380
36 years			36,170	39,060
37 years			37,607	40,740
38 years			39,043	42,420
39 years			40,480	44,100
40 years			41,916	45,780

Age of building	Until 2015	From 2016	Until 2015	From 2016
	€ / month and m²		per 70 m² accumulated	
41 years	1.71	2.00	43,352	47,460
42 years			44,789	49,140
43 years			46,225	50,820
44 years			47,662	52,500
45 years			49,098	54,180
46 years			50,534	55,860
47 years			51,971	57,540
48 years			53,407	59,220
49 years			54,844	60,900
50 years			56,280	62,580
51 years			57,716	64,260
52 years			59,153	65,940
53 years			60,589	67,620
54 years			62,026	69,300
55 years			63,462	70,980
56 years			64,898	72,660
57 years			66,335	74,340
58 years			67,771	76,020
59 years			69,208	77,700
60 years			70,644	79,380
61 years			72,080	81,060
62 years			73,517	82,740
63 years			74,953	84,420
64 years			76,390	86,100
65 years			77,826	87,780
66 years			79,262	89,460
67 years			80,699	91,140
68 years			82,135	92,820
69 years			83,572	94,500
70 years			85,008	96,180
71 years			86,444	97,860
72 years			87,881	99,540
73 years			89,317	101,220
74 years			90,754	102,900
75 years			92,190	104,580
76 years			93,626	106,260
77 years			95,063	107,940
78 years			96,499	109,620
79 years			97,936	111,300
80 years			99,372	112,980

The table shows the maximum provision that can be collected; it increases with the age of the building (1st column). The provision according to the previous law provisions are reported in the column titled "until 2015". Since 2016 a legal reform took place, the changes are under the box "from 2016". For a 70m² flat, this provision is 30€/month until 2015 and 35€/month from 2016.

Dans ce système, le financement dUnder this system, financing of renovation is only partially dependent on subsidies and loans. There are non-repayable subsidies and soft loans by the provinces' promotion systems available as well as regular subsidies for reducing the repayments for bank loans. In practice, the province pays part of the instalment (indirectly as the province passes on the subsidy to the housing provider who uses the subsidy to cover the instalment). That depends on the provincial scheme as well as kind of operation: for big investments – such as a deep renovation of the total building – there are loans; for less costly measures (e.g. the change of windows) there are only subsidies for the instalments. The average maturity for a loan is 15 years and it applies for any renovation operation. It is shorter than the maturity of loans for new buildings as it is assumed that the remaining life span of an older building is shorter than that of a new building.

In general, the rent provision for maintenance and future renovation is collected from the beginning of the rent contract. The part of the money not used is saved for the future; either to pay directly for operations or to be spent for repayments of loans when the saved means do not cover the expenses.

For extra measures such as complex heating/ventilation systems, passive housing components, elevators etc. extra subsidisation is available, either in form of non-repayable grant or soft loans (a loan with a low interest rate and a longer maturity than a bank loan). They are not calculated in the example above as that does not comprise such measures.

Other general subsidies do not exist; there have been extra funds stemming from the central state, but they are rather tailored for single family homes.

Rent increases do not occur regularly. The older stock is more often affected than newer buildings. Rent increases may only be implemented if tenants agree to 100 per cent or after a court approval. This approval is only given if the economic efficiency is proved – which is not always the case for energetic improvement. The increases are limited to a period of 15 years; housing benefits are available.

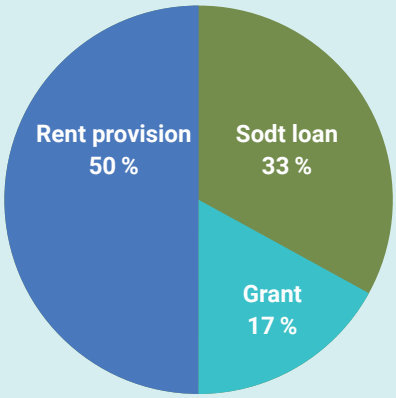
To better understand the role of the rent contribution, here is a brief explanation of the rent calculation. There are different rent components, which have to be strictly separated:

There are different rent components, which have to be strictly separated:

- **Basis rent:** covering the depreciation and costs of financing for construction of the building + a component for the land;
- **Rent increases** depend on the dynamics of the costs; after the maturity of the loans there is a rent ceiling (2016: € 1,75 + land component) which is increased every second year with the consumer price index;
- **Provision for maintenance/renovation** (covering the regular expenses and repayments of renovation loans); they are not charged according to the actual expenses but are limited by law depending on the age of the building (compare table above); if they are not invested they have to be repaid to the tenants;
- **Utilities** (electricity in the building for lightening + elevator etc., cleaning, insurance, charge for administration etc.); the actual costs are divided by habitable surface and passed on to tenants;
- **Costs of heating/hot water:** if there is collective heating, costs are charged by the landlord; in case of connection to the district heating, individual contracts are in use.
- **For collective heating special legislation applies** (for any type of housing): it is required that a certain share of the costs is charged according to individual consumption (exemptions exist).
- **VAT** (10%, 20% for heating).

In a nutshell, the average costs of major renovations are financed as follows:

GBV financing major renovation



The pie chart is about the financing of major renovation. The pie chart divides the total cost of renovation (€ 21,000) based on the % of the contributions: Non-repayable grant by provinces, soft loan by provinces, Rent provision.

d. Are there any obligations related to the financing of renovation measures?

There are many different schemes for public promotion of and (energetic) renovation. Grants and soft loans in some of these schemes depend on the intensity of the operation. There are special grants available for renovation of heating/ventilation systems. Energy ratings are always required; some schemes also require regular observation of energy consumption.

The subsidisation schemes are on the level of the 9 federal provinces – there are therefore 9 different schemes. Depending on the energy level in reference to a defined low energy building, the level of – non-repayable grants vary. In Vienna for instance, if for example the energy level after renovation is the low energy building standard x 1.15 (15% worse than the low energy building standard) you get 50 € per m^2 of non-repayable grant; if the level after renovation is low energy building x 0.9 (10% better than the low energy standard) you get 100 € per m^2.

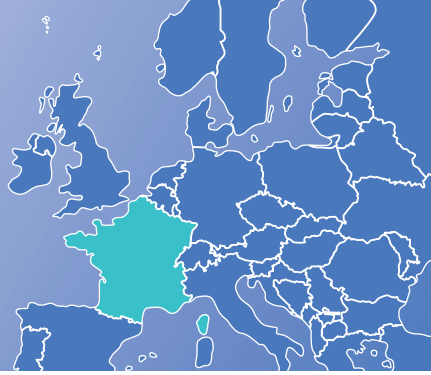
The low-energy building standard is defined by the "heating warmth need" in kWh depending on the building density (volume/surface). The heating need is calculated without losses of the heating system.

e. Results, achievements, costs and revenues (cash flow) of energetic retrofitting so far

In the limited-profit sector the pattern of major retrofitting including energetic upgrading follows the requirements of the regular renovation process in housing. Every year about 10,000 – 15,000 units are retrofitted; that is a number very close to activities in new construction (of the past) and shows that after a certain period, major interventions must be made and are achieved if the financial base is guaranteed. The model relies therefore on the regular rent provision combined with public support. Today at least 80 per cent of the buildings constructed before 1980 are renovated.

However, there is some concern not related to energetic retrofitting but other qualities of older housing: As mentioned many of the smaller buildings are not equipped with elevators or do not have balconies. Upgrading older buildings with those components would represent a significant financial burden.

FRANCE



1 Legislative context in the field of renovation of social housing

The French Parliament has adopted in 2015 an overarching legislation aiming at boosting the energy transition.[9] This law has important impact on the renovation of residential housing, in particular social housing.

The legislation enshrines the following obligations:

- **Renovation of 500,000 dwellings per year as from year 2017** (half of them should house low income households)
- Obligation by 2025 for all landlords **to renovate dwellings with an energy performance rating of F and G.**
- **The reinforcement of the role of third party financing** with the creation of public third-party entities, although this is more relevant for the private homeowners' sector
- **Retrofit of 70 000 social rental dwellings per year** with ecological loan from Caisse des Dépôts. Around 40, 000 dwellings are retrofitted per year for the moment.
- **Reinforcement of the requirements** related to renovation of all kinds (not only major renovations) in order to bring the performance of renovated dwellings closer to the one of newly built homes

2 Social housing and energy efficiency

There are 5.3 million social dwellings in France, average dwelling size is 66 m². Peak construction of social housing was recorded in 1960s and 1970s. Average social housing dwelling is today 37 years old. First regulation for energetic performance dates back to 1974, after peak construction. Although some retrofitting has taken place in the past, there is still a real need for energetic retrofitting in social dwellings. This has been acknowledged by the creation of a dedicated loan (called « ecoloan ») by the bank Caisse des Dépôts in 2009. It will be detailed below; alongside with other financial tools now available for this goal. For the moment, the sector is behind on meeting objectives for energy retrofitting.

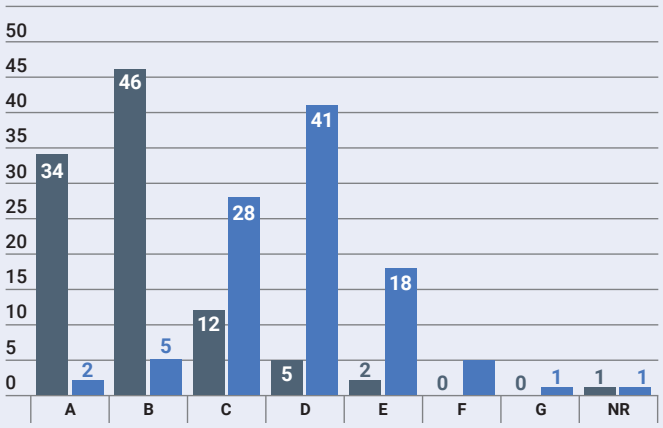
At the time of the survey, USH had recently finished a study about the use of ecoloans during the period 2010-2014 and the latest figures are reported here to present the most typical operation for energetic retrofitting financed using « ecoloan ».

[9] French Parliament, legislation. Law No 2015-992 of 17 August 2015 on the energy transition for green growth. Legifrance, 18 Aug. 2015. Web 6 Apr. 2017 https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000031044385&categorieLien=id

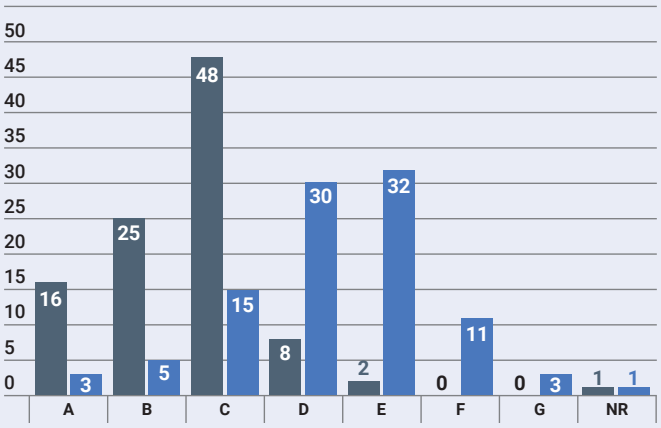
75% of social dwelling stock has so far been assessed and rated (in blue in the graphs below). Ratings range from A (most efficient) to G (least efficient).

In the figures below, the grey bars correspond to the percentage of dwellings built in 2013 and 2014, with stringent energy efficiency norms. In blue, those are the proportion of dwellings built before that period.

Energy consumption ratings of social dwellings



Greenhouse gas emissions ratings of social dwellings



Social dwellings built in 2013 or 2014 having been rated

Social dwellings having been rated

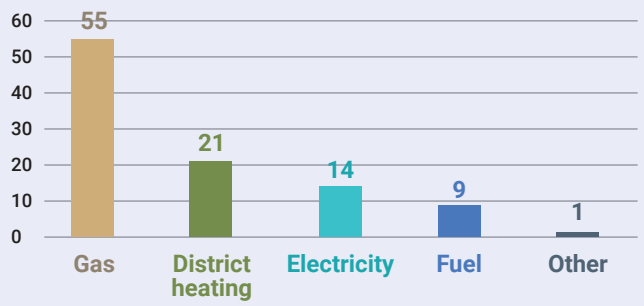
The bar charts show the greenhouse gas emissions and the energy consumption tag social housing. The grey bars correspond to the percentage of dwellings built in 2013 and 2014, with stringent energy efficiency norms. In blue, those are the proportion of dwellings built before that period.

Source : SOeS, RPLS au 1er janvier 2015, France métropolitaine, Parc social

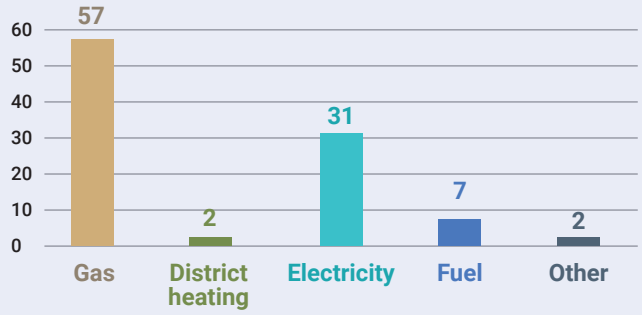
The charts show that 70% of social dwelling stock is tagged C and D for energy consumption. With tag E, the figure reaches 87%.

The most common energy source in USH dwelling stocks for collective social dwelling is gas (55%), followed by district heating (21%) and electricity (14%). Fuel is less common (9%). Use of renewable energies (heat pump, PV, wood pellet) is limited so far but it is growing and gas and electricity are also coming from greener sources. Energy sources in individual social dwellings is slightly different: gas 57%, electricity 31%, fuel 7%, district heating 2% and other 2%.

Energy source in USH collective social dwellings (%)



Energy source in USH individual social dwellings (%)



In France, 85% of social dwellings are collective buildings (flats) and 15% are individual dwellings (houses).

3 Financing of concrete renovation projects

a. When and how do renovation projects take place?

Each social housing provider negotiates with State civil servants their objectives for a period of 6 years (number of social dwellings they have to retrofit). Usually, energetic retrofits are made along with other types of works. There is no automatic schedule for renovation. Decisions are made on case by case basis.

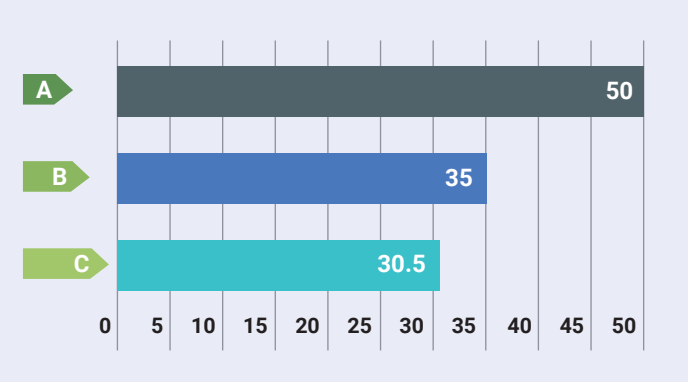
b. How much do renovation projects cost?

The average cost of a retrofitting in the period 2009-2014 was 30.5K€/dwelling or 470€/m² habitable. This is inclusive of 5.5% VAT. Excluding tax, the figure is 29 K€/dwelling. Out of 29K€, energetic investment in itself is 9.2K€, or 32%.

For the 30.5K€ investment, the dwelling reaches on average rating C after works. To reach rating B, investment is 35K€/dwelling and to reach rating A, investment is 50K€/dwelling.

It is common that energy efficiency works involve change of energy. Electricity is frequently replaced with natural gas and wood. The cost of these changes is high and operations where they occur have higher costs, somewhere in the range between 40K and 60K€ per dwelling depending on the nature of the works.

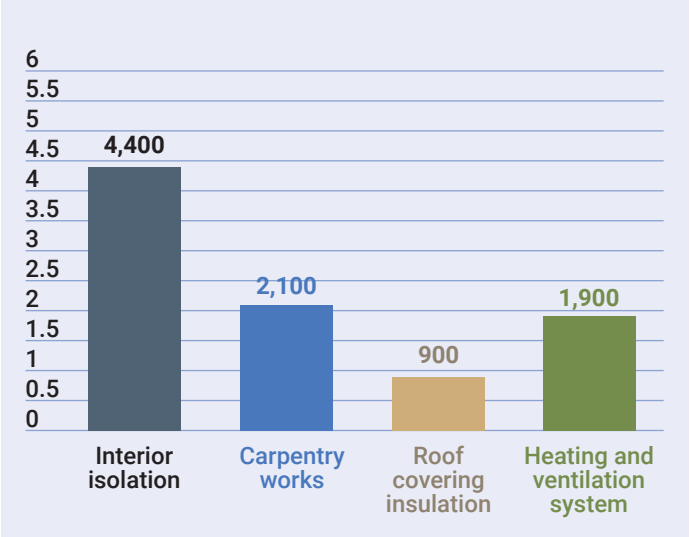
Average cost of energetic retrofitting (2009-2014) – per dwelling, K€



The bar chart shows the costs of energetic retrofitting tag per dwelling in the period 2009-2014. The pie chart is divided in three bars. The 1st bar (Grey) shows the total amount of investment needed to reach tag A. The 2nd bar (blue) shows the total amount investment needed to reach tag B. The 3rd bar (orange) shows the total amount of investment needed to reach tag C.

Energetic investment is 9,2K€ on average out of 29K€, or 32%. These 9,2K€ are broken down into:

Average cost of typical works (2009-2014) – K€



The bar chart breaks down the cost of the work undertaken. The effective energetic investment is €9.200 on average out of €29.000

- 4,4 K€ for interior insulation (47%)
- 2,1 K€ for carpentry works (23%)
- 1,9 K€ for heating and ventilation system (20%)
- 0,9 K€ for roof covering isolation (10%)

Works are contracted to a separate building company which may itself outsource part or all of the works.

[10] In 2012, VAT rate was increased to 7% but has since returned to 5.5% .

c. How are renovation projects financed?

The financing of energetic retrofitting of social dwellings in France relies on several tools. To start with, Caisse des Dépôts offers « ecoloan » whose features have evolved over time. Since 2013, they consist of:

Ecoloan

Length	From 5 to 25 years max
Interest rate	Variable, follows Livret A oscillations Livret A interest rate - 75 basis points for length 5 to 15 years Livret A interest rate - 45 basis points for length 16 to 21 years Livret A interest rate - 25 basis points for length 21 to 25 years
Prefinancing	3 to 24 months
Revisability	Yes (to mitigate payment oscillations when Livret A rate is revised)
Due date	Annual

To be eligible for ecoloan, there must be an energetic audit of the building according to a stringent method called « TH-C-E ex », or for buildings older than 1948, diagnosis based on real energy consumption. Ecoloan upper limit is 16K€/dwelling. It can be complemented with improvement loan and frequently is. Operations must be granted a subsidy from State or local authority and be eligible to housing benefits during the loan.

For dwellings whose primary energy consumption is higher than 230 Kilowatt per hour per m² per annum:

- Works must lead to energy consumption inferior to 150Kwh/m² per annum (with modulation according to climate and altitude) ;
- Energy gain must be 80 Kwh/m² per annum minimum.

For dwellings rating D with energy consumption ranging between 151 et 230 kWh/m² per annum, criteria are needed: either minimal energy gain of 85kWh/m² per annum (with modulation according to climate and altitude) and consumption of building less than 151 kWh/m² per annum; or consumption of building less than 80 kWh/m² per annum (with modulation according to climate and altitude).

For houses whose consumption is higher than à 330 kWhep/m² per annum, maximal consumption after works is 230 kWhep/m² per annum. Given that energetic retrofitting is most frequently done in conjunction with other works, this « ecoloan » is combined with « improvement loan » designed for general maintenance works.

Improvement loan

Length	From 5 to 10 years max for small maintenance works From 5 to 25 years max for standard improvement works From 26 to 35 years max for heavy improvement works
Interest rate	Variable, follows Livret A interest rate + 60 basis points. In the last few months, fixed rate has been introduced in addition to variable but only for the period 2015-2017. The fixed rate varies monthly dependent on market conditions to stay competitive. The pool of money for fixed rate comes from EIB.
Prefinancing	3 to 24 months
Revisability	Yes (to mitigate payment oscillations when Livret A rate is revised)
Due date	Annual, bi-annual or quarterly

Just like for ecoloan, retrofit operations with improvement loan must be granted a subsidy from State or local authority and be eligible for housing benefits. Together, these two loans account for 62% of the financing of an energetic retrofitting. Apart from Caisse des Dépôts, loans from employers contribution (Action Logement) are also available, as well as loans from commercial banks. These loans amount for 6% of the cost. Employer loan average 500€/dwelling and loans from other banks reach 1,300€/dwelling. But these averages do not reflect reality. Most renovations have none of these loans while a small number do with higher amounts. Broadly speaking, there are no State subsidies for energetic retrofitting. However, operations located in areas under urban renewal program can be subsidised by urban renewal agency (which is an extension of the State) along with other works. This represents on average 2K€/dwelling.

Regional or local authorities (department) give grants for energetic retrofitting. On average these two sources represent 2,2K€/dwelling.

European subsidies (ERDF) have been a contribution in the past. They amount to 700€/dwelling on average. For the new programming period 2014-2020, they should still play a role but maybe less so because projects will be in competition with other infrastructures (transport, plants).

Other subsidies come from the national agency for environment and energy management (ADEME) which helps the development of renewable energies and other miscellaneous financial backers. In all, subsidies represent 20% of the financing plan during the period 2010-2014.

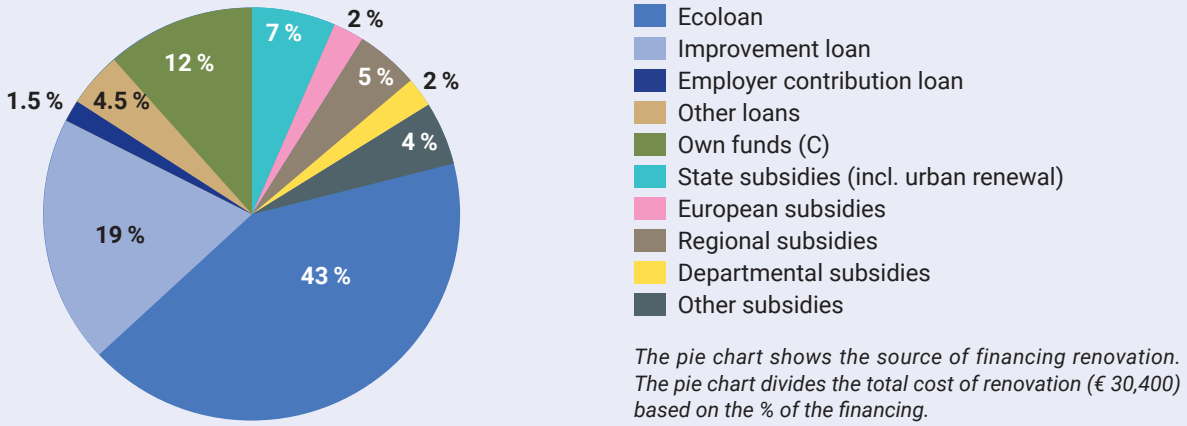
Another major source of finance come from providers' own funds (11% of financing). These are usually not reconstituted and should be viewed as a burden on the provider. However, the dwelling once retrofitted may have a higher value and in certain areas, one can expect a fall of vacancy rate after retrofitting.

Energetic retrofitting works create rights to issue certificates of energy savings. These certificates can be sold to energy sector companies that are obliged to buy a certain amount by law. This attempt to create a market hasn't really met expectations and the certificates are trading at a cheap price. It amounts to 900 €/dwelling on average during the period 2010-2014. Lately, it is even less and they only play a minor role in energetic retrofitting financing.

The same can be said of the attempt to involve the tenant via the creation of a « third line » on total receipt dedicated to energetic retrofitting over and above rent and common area expenditures and service fees. So far, few providers have used it and few tenants (who must approve of the works and their contribution) have shown enthusiasm for it. It amounts to 35€ per year per dwelling on average during the period 2010-2014. But this average does not reflect reality. Most renovations have none while a small number do with higher amounts. Finally, social housing providers in France do not issue bonds or securities on the financial markets, nor do they rely strongly on selling assets as a source of financing energetic retrofitting [11]. Social housing providers have little used loans from European Investment Bank, although this is a source of financing that could be more sought after in the future.

To sum up, energetic retrofitting in France is mostly financed via 'soft' loans, a combination of subsidies and the income generated by the debt-free social dwellings stock. The average financing plan for a social dwelling retrofitting (30.5K€ incl. 5.5% VAT rate) during the period 2010-2014 was:

USH Energetic retrofitting financing (2010-2014)



The pie chart shows the source of financing renovation. The pie chart divides the total cost of renovation (€ 30,400) based on the % of the financing.

As for the role of other schemes, energetic works benefit from reduced VAT rate at 5.5%. This reduced VAT concerns all types of works and not only energetic ones. Because they are operating under SGEI status, social housing providers are also exempt from corporate profit tax (would otherwise be 33% tax on net income).

They are also granted 25 years land property tax exemption for new dwellings but older buildings that require energetic retrofitting are in general taxed for land property. Average amount of land property tax for dwellings that are taxed reaches 560€/dwelling/year. Energetic works open rights for property tax deductions for up to 25% of the amount of retro fittings works (but only in the same tax collection centre and the year following payment of the works). In average, during the period 2010-2014, land property tax deduction caused by energetic works reached 2K€/dwelling on average.

Social housing providers loans are typically guaranteed by local authorities for free, and this applies to energetic retrofittings too. When local authorities refuse to offer their guarantee, 2% of the value of the loan must be paid to the guarantee fund (Caisse de Garantie du Logement Locatif Social). In the event of default by the provider, the guarantee fund will pay the amount due to CDC. 2% of 19K€ means 380€/dwelling.

Regarding the **contribution of tenants to the financing of renovation**, rents can be increased usually up to 10%[12] after works (within the limit of ceiling rent). In practice, rents have seen increases by around 3% on average in operations with eco loan financing, or 121 € per year. Monthly rent before was 318€ and is 328€ after. Therefore, tenants only finance a minor part of the investment through rent increase and this certainly is an obstacle to larger scale intervention. However, some of the rent increase will be covered by housing benefits.

In France, rents can be increased by law at most at the rate of inflation of the preceding year (Consumer price index computed by INSEE). Boards of social housing providers vote on rents increase once a year and may not fully increase to the maximum possible.

Rents increase last as long as the dwelling is used, and most of the time last longer than underlying loans, thus generating cashflow afterwards. Rents are computed to cover loans reimbursement,

[11] About 0.2% of social dwelling stock (8,000) is sold every year but the receipts are reinvested over all activities, not just energy retrofit.

[12] Sometimes more, sometimes less, depend on the nature and importance of works and property.

annual expenditure on repair and maintenance, management costs, tax on land property. Common area expenditures are invoiced separately and housing benefits cover them on a flat rate (53€/dwelling/month for a couple incremented by 12€ per dependent person). On average they amount to 180€/dwelling. Typically, they include renovations such as lift maintenance, lighting of common area, cleaning of common area, caretaking, cold water …according to statutory law. Collective heating and hot water can also be included but this depends on the heating system and the period it was installed. Electric heating is typically private consumption and not included in common area expenditures.

d. Are there any obligations related to the financing of renovation measures?

Conditions of loans by Caisse des Dépôts in terms of energetic gains have been shown above. There are several labels that certify for very high energetic performance which housing providers can apply for but these are voluntary and not compulsory. What is compulsory is a level of minimum energetic performance for new buildings. Components of energetic retrofittings (windows, boilers, etc) are obliged to reach a certain level of energetic performance, which makes obsolete older components (for instance simple glaze windows or old style boilers). These new components are required in order to be eligible for certificates and tax deductions.

There has been an attempt a few years ago to introduce a binding contract for energetic performance whereby building companies are legally bound to reach a certain level of energy performance after works. Should they not reach that level, they would have to redo works. But again, so far there has not been strong appetite, with very few contracts signed.

In France, financial backers do not request rents and/or common area expenditures to decrease after retrofittings. Climate variations, energy price variations and behavioural changes from tenants are difficult to disentangle and there is no obligation to show proof of energy consumption reduction. But providers care about common area expenditures reductions. A special attention is paid to this, especially in the new urban renewal programs.

The installation of renewable energies is also not made compulsory in retrofittings, except for certain voluntary labels mentioned above.

e. Results, achievements, costs and revenues (cash flow) of energetic retrofitting so far

Around 125,000 HLM dwellings are retrofitted every year but not only for energy efficiency. Around 35,000-40,000 HLM dwellings benefit from ecoloans every year (the objective is 70,000).

In practice, energetic gain in a retrofitting with Ecoloan reaches 145 kilowatt per hour per m² per annum or a jump of 2.1 ratings on the energetic labelling[13].

Operations that have been financed with Ecoloan have generated on average a 14% fall in common areas expenditures. This represents a saving of 245€ per annum for a 65 habitable m² dwelling. Heating and hot water expenditures fall most. Total receipt falls 2,6% (rent increase 3% and service fees fall 14%), saving 121€ per year for the tenant.

Energetic works are expected to generate the following income over 20 years life-span
– gross values not discounted, €/dwelling

3 % rent increase, growing with inflation (assumed to equal Livret A rate - 0.25%)	2,800
Energetic certificates	900
« 3rd line » contribution	525
Property tax deduction	2,000
Total income	6,225

The table shows the shows the expected income over 20 year's life-span (gross values not discounted for present value). The amount is expressed in euro per dwelling.

Another way to show the challenge of balancing cost and revenue for an energy efficiency investment is to look at the cash flow projections. Below is a model of the social housing sector in France in the current conditions. Energetic retrofitting's show a clear disequilibrium with a necessity to put down money every year, except year 2.

[13] Note these figures are computed estimations, rather than actual recorded data.

Years	Ecoloan reimbursement	Improvement loan reimbursement	Employer loan reimbursement[14]	Other loans reimbursement	Total costs	Rents after 3% increase, growing at Livret A-0.25%	Certificates[14]	« 3rd line » contribution [14]	Property tax deduction	Total income	Annual cashflow	Cumulated cashflow
1	-756 €	-477 €	-59 €	-152 €	-1,443 €	120 €	900 €	35 €		1 055 €	-388 €	-388 €
2	-756 €	-477 €	-59 €	-152 €	-1,443 €	122 €	0 €	35 €	2 000 €	2 157 €	714 €	326 €
3	-756 €	-477 €	-59 €	-152 €	-1,443 €	124 €		35 €		159 €	-1 284 €	-958 €
4	-756 €	-477 €	-59 €	-152 €	-1,443 €	126 €		35 €		161 €	-1 282 €	-2,240 €
5	-756 €	-477 €	-59 €	-152 €	-1,443 €	128 €		35 €		163 €	-1 280 €	-3,520 €
6	-756 €	-477 €	-59 €	-152 €	-1,443 €	130 €		35 €		165 €	-1 278 €	-4,798 €
7	-756 €	-477 €	-59 €	-152 €	-1,443 €	132 €		35 €		167 €	-1 276 €	-6,074 €
8	-756 €	-477 €	-59 €	-152 €	-1,443 €	135 €		35 €		170 €	-1 273 €	-7,347 €
9	-756 €	-477 €	-59 €	-152 €	-1,443 €	137 €		35 €		172 €	-1 271 €	-8,618 €
10	-756 €	-477 €	-59 €	-152 €	-1,443 €	139 €		35 €		174 €	-1 269 €	-9,887 €
11	-756 €	-477 €			-1,232 €	141 €		35 €		176 €	-1 056 €	-10,943 €
12	-756 €	-477 €			-1,232 €	144 €		35 €		179 €	-1 053 €	-11,996 €
13	-756 €	-477 €			-1,232 €	146 €		35 €		181 €	-1 051 €	-13,047 €
14	-756 €	-477 €			-1,232 €	148 €		35 €		183 €	-1 049 €	-14,096 €
15	-756 €	-477 €			-1,232 €	151 €		35 €		186 €	-1 046 €	-15,142 €
16	-756 €				-756 €	153 €				153 €	-602 €	-15,744 €
17	-756 €				-756 €	156 €				156 €	-600 €	-16,344 €
18	-756 €				-756 €	158 €				158 €	-597 €	-16,941 €
19	-756 €				-756 €	161 €				161 €	-594 €	-17,535 €
20	-756 €				-756 €	164 €				164 €	-592 €	-18,127 €
Sum nominal values	-15,110 €	-7,148 €	-586 €	-1,524 €	-24,368 €	2,816 €	900 €	525 €	2,000 €	6,241 €	-18,127 €	
Net present value discounted for inflation of 1.65 % per annum	-12,992 €	-6,390 €	-545 €	-1,417 €	-21,345 €	2,400 €	900 €	469 €	1,968 €	5,737 €	-15,608 €	

[14] These are averages, not reflecting reality. Most retrofitting projects do not have any but some do with higher amounts.

GERMANY

1 Legislative context in the field of renovation of social housing

Energy Saving Legislation and other regulatory law for buildings Energy Saving Act (EnEG)/Energy Saving Ordinance (EnEV) The Energy Saving Act (EnEG) and the Energy Saving Ordinance (EnEV) which is based on it are an important instrument of the Federal Government's energy efficiency policy. Continuous updating of the energy-saving requirements for buildings oriented towards the state of the art and economic efficiency is an important contribution towards energy savings. The revised Energy Saving Ordinance (EnEV 2014) came into effect on 1 May 2014. Increasing primary energy requirements for new buildings by on average 25 per-cent beginning 1 January 2016 is a core element of these efforts. The new building standard of the Energy Saving Ordinance, which will be valid from 2016 on, transposes a key requirement of the EU's Energy Performance of Buildings Directive into German law and forms the basis for the National Action Plan on Energy Efficiency (NAPE) and the Federal Government's Climate Action Programme 2020. It is a step towards the nearly zero-energy building whose standard – i.e. the technically and economically feasible minimum requirements – will be introduced in order to transpose the EU's Energy Performance of Buildings Directive into German law. From 2019, new public-sector buildings then, from 2021, all new buildings must be built as nearly zero-energy buildings[15].

2 Social housing and energy efficiency

The number of dwellings managed by housing companies members of GdW (the German Housing Federation) is 5,837,280 with average living space 61.42 m² in 2015. Regarding the year of construction of the dwellings owned by GdW, we have the following data from 2007 available:

GdW year of construction

Before 1948	15%
Between 1949 and 1959	19%
Between 1960 and 1970	26%
Between 1971 and 1980	19%
Between 1981 and 1990	15%
After 1991	7%

Source: annual statistics GdW

On top of that, between 2008 and 2015 about 110,000 new dwellings have been built by GdW companies (social housing companies, cooperative and private rental companies).

Regarding the energy performance of the stock (energy tag/label), we have the following data:

The average energy consumption of the total GdW housing stock decreases by 1.3% per year between 2007 and 2013. The average energy consumption in 2013 was 133.6 kwh/m²/year (from 112.1 kwh/m²/year for district heating, up to 146.9 kwh/m²/year for gas). Regarding energy sources, district heating represents 47.6% of the dwelling stock; gas 29.8%; and oil 2,2%. Other, undefined energy sources represent 20%.

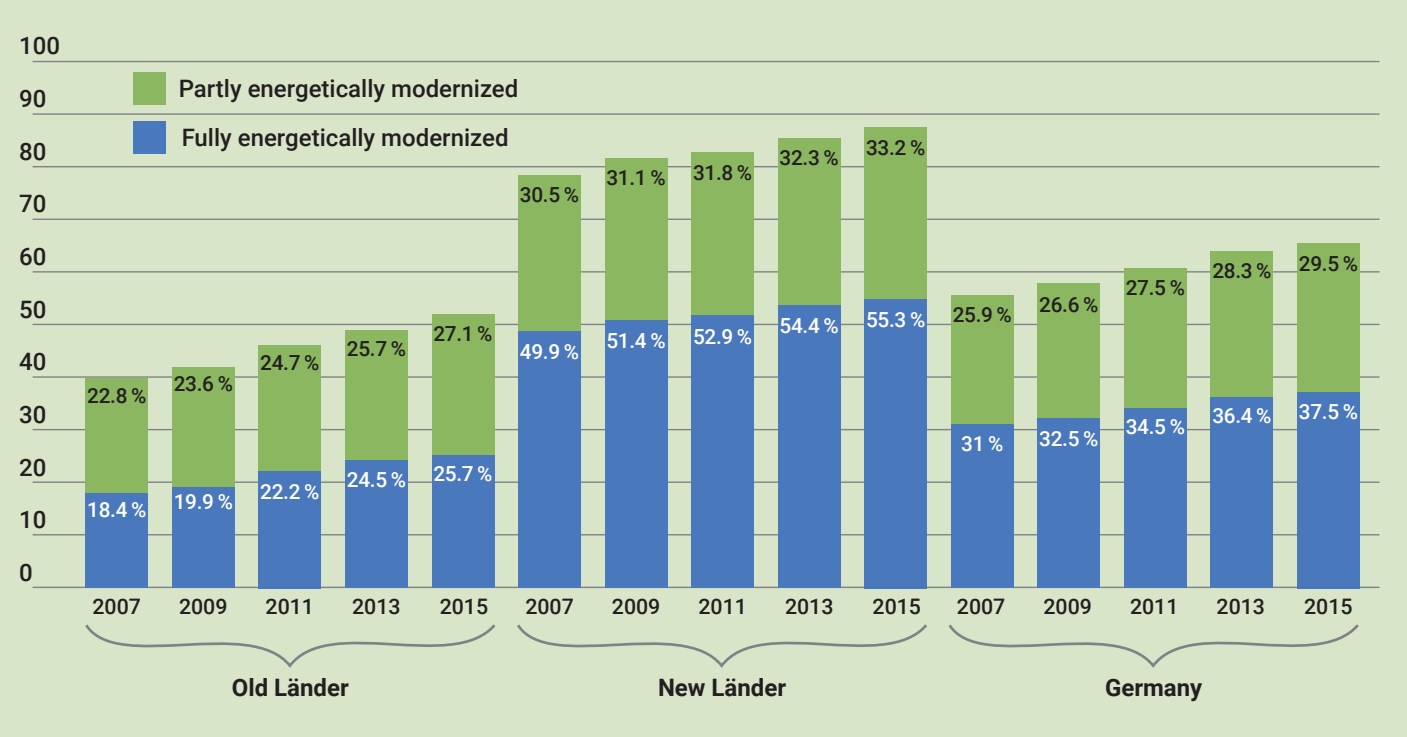
The performance of the housing stock of GdW affiliated companies has steadily increased (the energy consumption has decreased) since 2007 for all kind of energy systems, the best performance achieved by dwellings connected with district heating.

The repartition between East and West Germany shows big differences: East Germany is mostly district heating (around 70%) while West Germany is more balanced (gas around 40%; district heating around 30%).

[15] Federal Ministry for Economic Affairs and Energy, Energy Efficiency Strategy for buildings. 18 Nov. 2015. Web 6 Apr. 2017. https://www.bmwi.de/Redaktion/EN/Publikationen/energy-efficiency-strategy-buildings.pdf?__blob=publicationFile&v=4

In the following, we provide date on the renovation of dwellings: the data are divided in 3 categories: the West Germany Länder ("Old Länder") on the left side, the East Germany ("New Länder") in the middle and the whole Germany on the right side. For each category, we look at the evolution over 2007-2015. For instance, for the West Germany Länder, the graph shows that while in 2007 18.4% of the stock had been fully renovated (since 1990), in 2015, it was 25.7% of the stock which had been fully renovated.

GdW companies – Energy saving modernization measures share of housing, which has been modernized since 1990, partly or fully



The bar chart shows the percentage of the stock renovated by year and new/old Länder. Each bar is divided into two colors, the full energetic modernization is in blue, and the partial energetic modernization is in green. The first 5 bars deal with the Old Länder, the second five bars deal with the New Länder. The last group of bars deals with whole Germany.

3 Financing of concrete renovation projects

a. When and how do renovation projects take place?

Within the framework of their building portfolio management, housing companies decide about their optimal strategy for each residential area and individual property. The following options are usually considered:

- **Withdrawal – Minimum maintenance**
- **Component restoration – successive modernization**
- **Only energetic refurbishment**
- **Complete refurbishment**
- **Demolition and new construction**

b. How much do renovation projects cost?

For a typical renovation project, the costs are divided as follows: 600 € /m² living space (for all); divided in 200 €/m² for maintenance; 200 €/m² for non-energetic modernization; 200 €/m² for energetic renovation. Higher energetic standards cost more than 200 €/m²: 300-400 €/m².

For a 60m² flat, that's 36K€/dwelling and 12K€ for energetic renovation only.

c. How are renovation projects financed?

The KfW programmes "Energy-efficient Refurbishment" (Energieeffizient Sanieren) and "Energy-efficient Construction" (Energieeffizient Bauen), funded by federal grants, are the most significant providers of financial incentives for more energy efficiency in the German housing sector. The two programmes aim to promote energy savings and greenhouse gas reductions as well as encouraging investments and creating or safeguarding jobs. Under the programme, energy-saving refurbishment projects are supported by loans at favourable conditions or grants. In 2014, just over 97,000 supporting schemes to modernise about 230,000 dwellings were allocated.

KfW makes use of a scaling system, on which the amount of funding is tied: the more energy-efficient (based on theoretical calculation, not real consumption), the higher is the grant. Hence, if the minimum energy performance standards are tightened, the scaling system's criteria automatically become stricter. The basic principle is the use of soft loans (max. 100,000 € per housing unit at a fixed average interest rate of 1.5% for 10 years) with partial debt relief possible (see point d. below for more details).

The classification of energy efficiency level[16]

The government's current legislative standard for new buildings (EnEV 2014, valid since 2016) is set at on average about 70 kwh/m²/year[17]. This presents the reference value (100% of the reference). Therefore this is the KfW Effiency House 100 standard. A KfW Efficiency House 85 requires 85% of the energy of the reference building, and a KfW efficiency house 55 requires 55% of the energy of the reference building. KfW supports programme for residential buildings are for standards which are better than the reference value but also for the KfW Energy House 115 standard, i.e. for a building that require 15% more energy than the reference value.

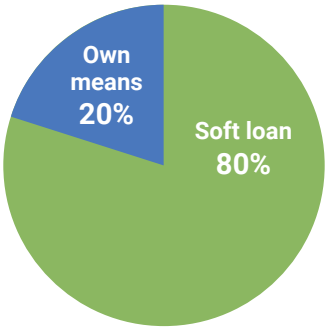
Example of a KfW efficiency house 55:

The following measures can be part of an overall concept to reach the standard KfW-Effizienzhaus 55:

- Wood pellet, biomass heating or heat pump
- Solar heating system for DHW heating
- Exterior wall insulation 18 cm
- Roof insulation 24 cm
- Windows with triple glazing and special frame

Beyond the support of KfW in terms of soft loans and debt relief, the typical financing plan for a renovation project is made of the housing company own capital (see illustration below):

The typical financing plan corresponding to this retrofitting



The pie chart is about typical financing plan for a renovation project in percentage. The pie chart divides the total cost of renovation (€ 36,000) based on the % of the contributions: Soft loans (including possible debt relief) 80% (28,800), 20% (7,200) own means.

NOTE

A financing plan in Germany does not include rent increase, but soft loan (and or normal loan) and own means. Explanation: «Financing» in Germany means the time of the measure. The whole rent – including the rent increase - is for repaying the loan(s) and for equity return. In a complete finance plan the rent and the rent increase are revenues, and the interest payment is an expenditure.

Regarding the rent increase after renovation, the legislation allows housing companies to increase the yearly rent by an amount equivalent to a maximum of 11% of the investment cost related to the energy modernization (maintenance has to be subtracted). For instance, for 200€/m² of energetic modernization, i.e 12,000€ per dwelling (for a 61m² apartment), 11% of that sum (i.e. 1,342€) can be charged annually, in other words 111€/ month.

However, for the social housing sector, this increase is capped to a maximum of 0.50€/m² per month (i.e. 30.5€ on rent per month for a 61 m² dwelling).

When the landlord applies a rent increase, there is no limited period. The rent increase for modernization has also to finance the future maintenance and a future replacement invests.

[16] https://www.kfw.de/inlandsfoerderung/Privatpersonen/Bestandsimmobilie/Energieeffizient-Sanieren/Das-KfW-Effizienzhaus/

[17] This reference value varies according to building type and climatic zone.

d. Are there any obligations related to the financing of renovation measures?

Under the KfW programme the best standard (KfW Energy Efficiency House 55) receives the highest support. In order to meet the high energy standard of a KfW Efficiency House, extensive investments are required such as the renewal of heating systems, thermal insulation and replacement of windows, are usually required. If the costs and effort of a complete refurbishment would be too high it is also possible to implement single measures only.

Financing is available for:

- **Renewal of windows and exterior doors**
- **Installation/renewal of a ventilation system or ventilation package**
- **Renewal of the heating system/heating package**
- **Optimisation of heat distribution for existing heating systems**
- **Thermal insulation of walls, roof and floor space**

Regarding the debt relief, those are grants which will transfer to the housing companies after completion of the refurbishment measures.

Maximum debt relief
– in % of the total cost and in €

- **30%** for a KfW Efficiency House 55, **not more than 30,000 €**
- **25%** for a KfW Efficiency House 70, **not more than 25,000 €**
- **20%** for a KfW Efficiency House 85, **not more than 20,000 €**
- **17.5%** for a KfW Efficiency House 100, **not more than 17,500 €**
- **15%** for a KfW Efficiency House 115, **not more than 15,000 €**

This scheme works for all building owners and all landlords. The amount is on a case by case basis. The landlord does the investment, takes the loan and receives the debt relief. The tenant has lower rent increase.

e. Results, achievements, costs and revenues (cash flow) of energetic retrofitting so far

It is important to note that in Germany the costs of retrofitting operations are not decreasing due to innovative techniques or process, they tend to increase because of higher standards, new technologies, shorter lifetimes of technologies. Furthermore, in general energy efficient buildings use more energy than predicted.

GdW energy forecast [18] shows that from 1990 to 2011, housing and real estate enterprises modernised more than 60 % of their portfolio of apartments: over 34 % of these apartments were completely modernised in terms of energy efficiency, i.e. including thermal insulation, and approx. 28% were partially modernised in terms of energy efficiency.

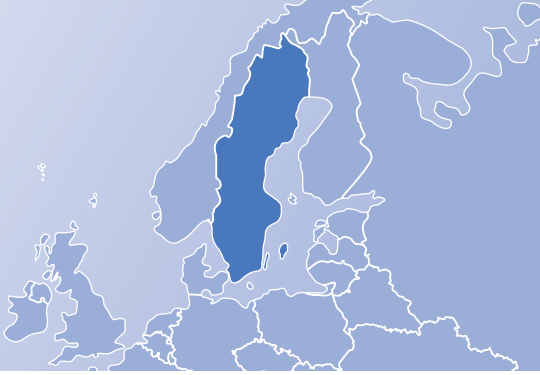
According to the energy forecast, the following savings in final energy consumption for heating and heating water can be achieved for the portfolios of GdW by the year 2050:

- **In comparison with 1990, almost 57%**
- **In comparison with 2005, almost 42%**

Between 2005 and 2020, roughly 15% of final energy consumption can be reduced. 20% of the final energy savings can be achieved by roughly 2025 (baseline year 2005).

[18] http://web.gdw.de/uploads/pdf/GdW_Position_Energieprognose_web.pdf

SWEDEN



1 Legislative context in the field of renovation of social housing[19]

The Riksdag (Swedish Parliament) has set a target of halving energy use in Swedish homes by 50 per cent by 2050. Essentially this means that all of Sweden's existing buildings must halve their energy use compared with their consumption in 1995. Now this target no longer applies.

In Sweden the energy efficiency target is that by 2020 energy efficiency should increase by 20 per cent. This is expressed as a cross-sectoral target of a 20 per cent reduction in energy intensity by 2020 relative to 2008. For the moment there is a proposal for a new energy efficiency target that by 2030, Sweden's energy use is to be 50 per cent more efficient than in 2005. The target is expressed in terms of primary energy use in relation to gross domestic product (GDP).

In the case of a renovation, or change of a building, the starting point is that the energy-efficiency requirements of the national building codes are applied. The difference between these two situations is that energy efficiency requirements should be sought for the entire building during a renovation, while a change normally only imposes requirements on the modified part. If it can be considered unreasonable to meet the requirements of an amendment, there are five detailed requirements in the building codes that should instead be achieved. They are formulated as requirements for u-value for ceilings, walls, floors, windows and exterior doors. The assessment of what is reasonable to pursue should take into account, among other things, the building's other property requirements, conservation and cautionary requirements.

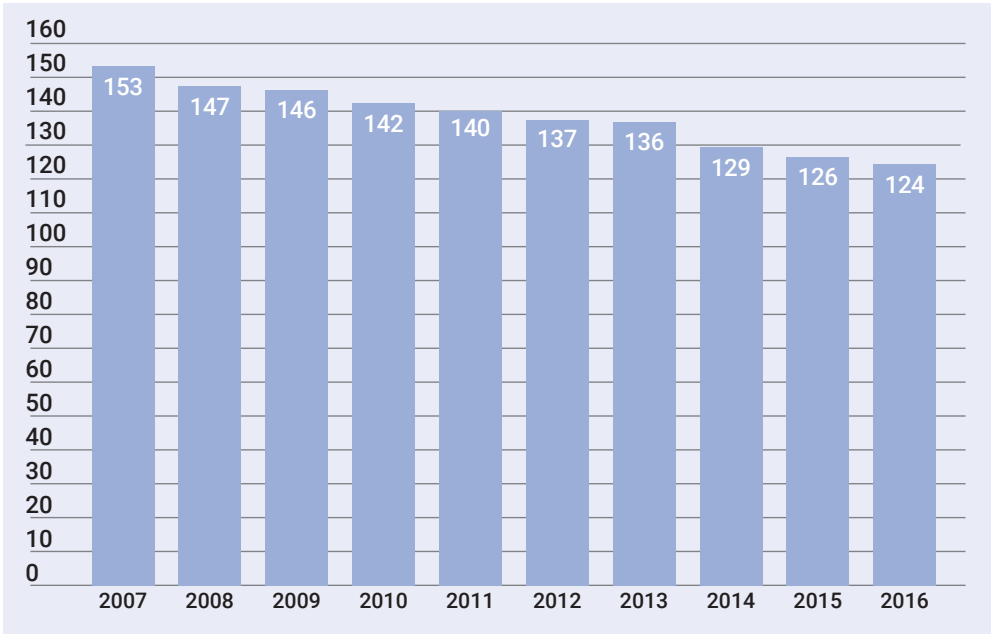
For new buildings in Stockholm for example the energy requirement is 80 kWh/m^2, year (including energy for heating, hot water and building electricity). There are different requirements depending on where the building is situated in the country. Currently, a review of the energy requirements in Sweden is done to implement legislation on nearly zero energy buildings.

2 Social housing and energy efficiency

When it comes to energy statistics we have data from 105 of the SABO members that altogether have 400, 000 apartments. These companies have a common goal, to reduce the energy consumption for all the 400,000 apartments by 20 per cent between 2007 and 2016. SABO has followed up the goal between 2007-2015 so far and the energy consumption in these 105 companies declined by 17 per cent. The diagram shows energy use for heat, energy for hot water and building electricity per square meter.

The diagram shows the energy use for heat, energy for hot water and building electricity per square meter.

SABO – Energy use for hot water and building electricity
– kWh/m^2/year



[19] In this chapter we refer to public housing, since the term of social housing does not exist in Sweden

The energy use for heating is corrected for the weather of a 'normal' year. We are currently following up the last year of the goal, 2016. Compared to the national statistics for the entire housing sector the rate of energy efficiency improvement has been much faster in these 105 companies. Between 1995 to 2013 (18 years) energy consumption in buildings decreased by 16% in Sweden.

In the following text, we have used an example from a individual housing company, who owns a building of 36 dwellings, with a surface of 2,200 m² and therefore an average dwelling size of 61 m². Most of the housing company's stock was built between 1950 and 1975.

The average energy performance (energy tag/label) is 124 kWh/m² (includes energy for heating, hot water and building electricity).

As for the energy mix, the dwellings are connected to district heating (84 per cent of the energy that the building consumes come from district heating). The rest central heating with gas or energy generated on site (mostly heat pumps).

3 Financing of concrete renovation projects

a. When and how do renovation projects take place?

In Sweden, decisions about how renovation work should be carried out or what should be renovated are not made by the Government, but are down to the property owners. However, Swedish public authorities have issued rules that may sometimes result in consequential requirements when renovation work is being carried out. For example, there may be a consequential requirement for improved accessibility if a property owner wants to renovate bathrooms.

Typical maintenance work for public housing companies includes new bathrooms and new cabling and pipework in kitchens.

- **Changing all pipework for tap and waste water.**
- **New waterproof layers**
- **New clinker and tiles**
- **New toilets, washbasins, etc.**

It is normal for other work to be added at the same time, for example painting stairways, new kitchen cupboards, improvement work to the outdoor environment.

As for energetic part of the renovation, the following measures is usual to carry through in the building: attic insulation, sealed windows, installation of heat recovery for ventilation air, energy efficient pumps and fans, switch to energy efficient lighting.

When renovation work is being carried out, a few of our members have started to offer their tenants greater freedom of choice regarding choice of quality (e.g. various models of cooker) and scope (e.g. choice of surface finish in other rooms, such as bedrooms and living rooms).

b. How much do renovation projects cost?

The cost of this example varies considerably depending on factors such as the size of the project, the project's location in Sweden, whether there are local subcontractors, etc. A typical estimate for complete renovation is 35 000 € out of which about 50% is dedicated to the necessary technical upgrading of installations, in particular, pipeworks, kitchens, bathrooms and 50% for the energy related activities such as insulation of ceilings and facades etc.

c. How are renovation projects financed?

Renovation projects are mainly financed by an increase of the net operating income of the property after the renovation is accomplished. Lower operating costs through lower energy consumption and a possible increase of rents according to a higher standard of kitchen and bathroom. The higher net operating income which should normally be consequence of a renovation will also raise the market value of the property and thus improve the possibilities to invest both equity and borrowed money in the property.

The possibility to increase the rent

Regarding the possibility to increase rent after the renovation, the amount by which the rent can be increased depends on the market to which the property belongs. Companies operating in districts where increased rents result in vacant apartments, must adapt the scope of the input resources so that lower operating costs finance the energy savings measures. The economic situation of residents and their capacity to pay obviously play a key role in the scope of improvement works and the amount by which rent can increase.

Measures that raise standards justify rent adjustments following renovation work. The size of the increase thus depends on the measures taken to raise standards. Landlords usually decide to raise the standard of kitchens and bathrooms when carrying out renovation work. If we proceed on the basis of an average apartment in the public housing sector's stock, with two rooms and kitchen (65m²) and an average rent level of approximately 100€ / m², we consider that the average rent adjustment could amount to approximately 25%, corresponding to approximately 25€/m² and year. For a 60m² dwelling, this amounts to around 1,500 € per year or 125€/month.

The rent setting system in Sweden

Rents are not regulated, but are set during negotiations between the landlord and a tenant organisation. The rent should reflect how tenants generally assess the characteristics of an apartment; i.e. the rent should be the same for apartments that are assessed to have the same characteristics. There is no direct link to the cost of the renovation work. This means that the rent adjustment should be 0 if, from the tenant's perspective, the apartment's characteristics are assessed to be the same as they were prior to renovation. A rent adjustment is only generated by measures that raise the standard. Annual negotiations to adjust rents are held between landlords and tenant organisations every year. The negotiation agreement regulates how the rent will be passed on to the tenant; i.e. the agreement could include a time limit, although this is very unusual. The point of departure in Sweden is that rents include heating but not household electricity. The landlord may install individual metering and billing of hot water in the course of renovation work. The cost of hot water is then specified in the rent payment advice.

State subsidies

There has been a recent new support for renovation work and energy efficiency improvements in certain residential areas. In the Budget Bill for 2017, the Government has proposed SEK 1 billion (102 million €) annually from 2017.

Renovation support is provided for buildings in residential areas with socio-economic challenges. The aid amounts to 20 per cent of the costs of carrying out the renovation measure, but no more than SEK 1,000 per m² (Atemp) (102€) for the building being renovated. A special energy efficiency support is provided if the building's energy performance as a result of the renovation action is improved by more than 20 percent. Aid for energy efficiency is calculated only on the part of the energy performance improvement exceeding 20 per cent.

The property owner applies for support from the provincial government of the county in which the property is located. The County Board decides on the support and the National Board of Housing pays the aid to the property owner.

External financing

Kommuninvest [20], the Bank of Swedish Municipalities and Regions, provides 80% of the financing through loans, while Swedish banks provide the remainder with traditional loans. The average interest rate for a loan from Kommuninvest was 2.3% for all SABO-companies in 2015.

The use of green bonds

Only five to ten public housing companies (out of approximately 300) currently borrow on the capital market by raising bonds. It has become popular for companies to issue their own green bonds, and interest has increased both on the part of borrowers and investors (those purchasing). The municipal housing companies who have issued their own green bonds have so far only got slightly better conditions and this has not affected the profitability of the projects. There were previously no price differences, but there is now a small 'discount' of approximately 0.03% for the party issuing the bond.

To issue a green bond, the company needs to demonstrate that the money is going to a 'green property', and it is preferable that the money is held in a special account to facilitate follow-up. Companies must comply with a regulatory framework and the property be classed by an external party to assure that they are achieving specified environmental objectives. Most of our companies use a Norwegian company called Cicero and opt for the 'Silver' level, which is the second highest level on the environmental standard. In other words, a lot of preparatory work is required as well as follow-up, which naturally costs money, although many have still chosen to do this to demonstrate that they are pioneers in the environmental area. It should also be added that only the larger companies can issue bonds on the capital market as this requires a certain volume (100 million SEK or preferably more). The company is also required to undergo a rating process and be given a good rating so that investors know the risk they assume when they invest through buying a bond.

[20] La Kommuninvest prête aux sociétés municipales de logement. Les prêts sont toujours soutenus par un accord explicite des 272 municipalités et les 8 conseils du comté auxquels la Kommuninvest appartient. Plus d'informations sur Kommuninvest ici : http://kommuninvest.se/wp-content/uploads/2017/03/Kommuninvest-2017-03-24_ENG-1.pdf

d. Are there any obligations related to the financing of renovation measures?

All projects financed by Kommuninvest through loans must comply with the following obligations:

- Promote the transition to a low-carbon and climate-resilient society
- Be part of the systematic environmental work in the applicant municipality or county council/region;
- Be related to Sweden's national environmental objectives, or to regional environmental goals;
- Target either mitigation of climate change, adaptation to climate change, or be a project related to environmental management in other areas than climate change.

There are additional requirement for buildings and energy efficiency:

1. New buildings with at least 25 per cent less energy use per square metre and year than required by applicable regulations (Swedish Building Regulations – BBR 21). Preferably a minimum certification of either:
    1) LEED Gold
    2) BREEAM Very Good
    3) Environmental Building (Miljöbyggnad silver)
    4) Svanen
    5) EU Green Building
    6) Feby-12 (Mini-energy building)

2. Energy efficiency measures in existing buildings, activities and operations leading to at least 25 per cent less energy use

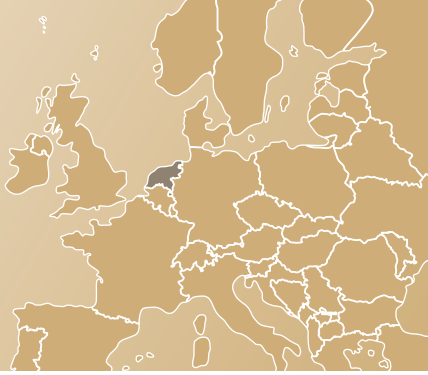
3. Major renovation of buildings leading to a reduced energy use per square metre per year of at least 35 per cent or compliance with applicable regulations for new buildings (Swedish Building Regulations – BBR 21).

e. Results, achievements, costs and revenues (cash flow) of energetic retrofitting so far

Renovation work often entails an increase in rent. It is common for housing companies to agree during negotiations with tenant organisations on a gradual stepping up of the rent to avoid tenants having to move out following completion of the renovation work. The rent may be stepped up, for example, over three years.

It has become more common for housing companies to offer their tenants different levels of improvement and rent. The rent increase for tenants who only want the bare essentials to be carried out (usually a plumbing overhaul) is lower than for those requesting additional options during renovation work. If the apartment becomes vacant, the housing company usually decides whether or not the apartment should be upgraded. Renovating apartment by apartment is also more common in conjunction with tenants moving. This is felt to both increase choice and customer satisfaction among existing tenants and housing companies can generate a differentiated stock that appeals to different target groups.

NETHERLANDS



1 Legislative context in the field of renovation of social housing

The Housing Law 2015 is the most important law for social housing associations. The local community makes a residential vision of 4 years with includes policy on social dwellings, affordability, new buildings for tenants with low income. Renovation and energy efficiency is part of this vision. Each year the local social housing association(s) do an offer to contribute to this policy. The local tenant organization is an equal partner in the decision making of the local performance agreements. The local community is duty bounded to inform the government each year in December on the performance agreements that are made. The town council is informed of the results reached every year before new negotiations of local performance agreements start.

The housing allowance is a law to subsidize the rent of tenants with a low income. The price regulation is strict. The government gives every year the maximum rent as fixed. Social housing associations are duty bounded to assign new tenants appropriate to their income. Above these fixed rents the dwellings are liberalized and not considered as social housing.

Social housing associations have the rent law in to regulate the rent of social dwellings as part of the Civil Code. The government has a Property Valuation for social housing for the maximum rent given a certain quality measured in points. The average point price is around 5€/point/year. (see more chapter III Financing).

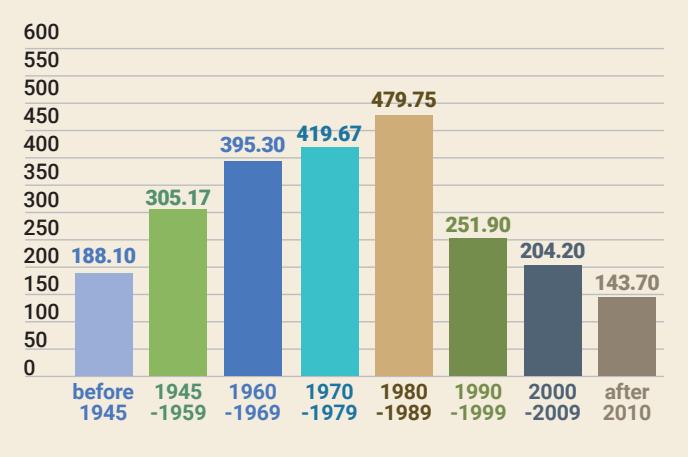
The quality of a dwelling is expressed in points representing the maximum rent allowed. The more energy efficient the dwelling is, the higher the maximum rent allowed. For social housing, there is a maximum rent as fixed by the government. Therefore the investment in energy efficiency is mostly not profitable because the rent is fixed to maintain the dwelling affordable for social tenants. The financial gap for the housing associations increases as the investment in the energy efficiency increases. Therefore, there is a new law for zero transition renovation called energy fee. The energy costs the tenant spent for renovation are an energy fee after renovation to cover up the investment of the housing association. The law regulates the affordability so that the tenant is guaranteed to have equal or lower costs after zero transition renovation.

2 Social housing and energy efficiency

There are about 2,4 million social dwellings in the Netherlands owned by housing associations. This represents 32% of all households. Average dwelling size is 80 m^2. Peak construction was recorded between 1960 and 1990. Average age of dwellings is about 41 years. In the Netherlands 53% of social dwellings are collective buildings (flats) and 41% are individual dwellings (houses) and 6% other houses (for groups).

AEDES – Building period

– thousands of dwellings, housing associations 2015



The bar chart shows the number of dwellings (times 1000) constructed for a given time period from 1945 to 2015.

AEDES – Distribution of dwellings

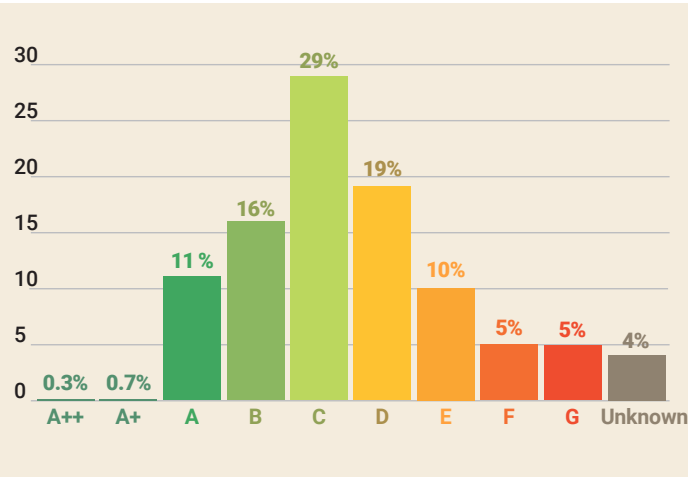
– CBS 2015

Rural	< 500 dwellings / km^2	3%
Rural / suburban	500-1,000 dwellings / km^2	16%
Suburban	1,000-1,500 dwellings / km^2	12%
Suburban / citycenter	1,500-2,500 dwellings / km^2	36%
Citycenter	> 2,500 dwellings / km^2	33%

The table shows the distribution of dwellings by area: rural, rural/suburban, suburban, suburban/center, city center.

AEDES – Energy-label social housing 2015

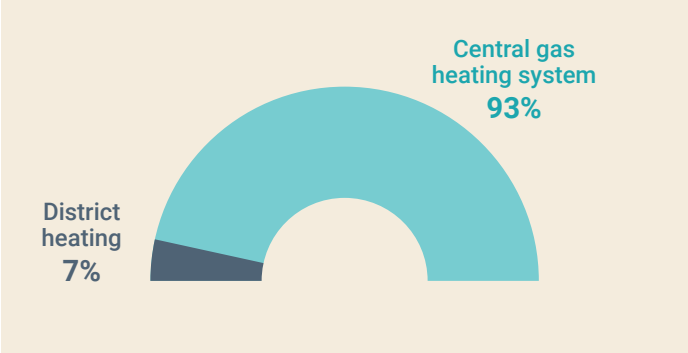
– % of dwellings, social housing 2015



The bar chart shows the proportion of the Aedes rental stock with a given energy label. The bar chart divides the total rental stock in different % of energy labels.

As for the energy mix, almost every dwelling (93%) has a central gas heating system. 75% of the central heating systems are efficient. Some city areas have district heating, 7% of the dwellings is provided by the extern district heating.

AEDES – Heating system of social dwellings



The semi-circle shows the percentage of the heating energy source of social housing dwellings. The graph has two colors; in red, you have central gas heating system that covers the 93% of the overall heating system, in green, the remaining 7% covered by district heating

The State initiated The Energy Agreement for Sustainable Growth. More than 40 participants signed this Agreement. The housing associations also signed the Agreement. Their contribution is to all the social dwellings have an average of Energy label B in 2020.

3 Financing of concrete renovation projects

a. When and how do renovation projects take place?

The most important factor that leads to decision of renovation is the lifetime cycle of maintenance. Social housing associations make a maintenance schedule over the lifetime of their social dwellings. In this schedule, most of the social housing associations integrate energy efficiency measures. Each year they inspect their dwellings to decide about the investment needed in the years ahead.

There is a new increasing development of total cost of ownership and performance-procurement. Social housing associations make agreements with contractors to outsource the maintenance and energy efficiency of the social dwellings. They ask contractors to fulfil certain performances. The contractors who build or renovate the social dwellings have influence on the decision which measures on energy efficiency are taken and carry out the long-term maintenance.

b. How much do renovation projects cost?

In 2015, 145,000 AEDES dwellings were retrofitted. Below you will find the average cost according to the type of renovation.

16.500 dwellings were completely retrofitted; the average cost is € 46,000 /dwelling. In these dwellings, new kitchens and bathrooms were placed even as a complete energetic retrofitting.

36.000 dwellings went under energy retrofitting only, the average cost is € 9,000/dwelling. The typical works of energetic retrofitting is insulation (mostly HR++ glass and wall insulation) in combination with a new efficient central heating systems inclusive water heating (HR). The average cost of a new efficient central heating systems is € 1,500/dwelling or € 19/m². The cost of insulation depends on the construction. The average cost of insulation in 2015 was € 7,500/dwelling or € 94/m² habitable (83% of the total cost of energy retrofitting). This is exclusive VAT. Mostly two measures of insulation are taken at once. Glass and wall insulation are most popular combined with a new heating system. On top of that 1,5 K€ go to renovate heating and water heating system (17% of costs of energy retrofitting).

In zero energy home renovation involves a change of energy. Gas is replaced with electricity by PV or other alternative energy sources. The cost of these changes in the range between 65K and 85K€/dwelling depending on the nature of the works. Social housing associations have now renovated 1,000 dwellings to zero energy homes mainly individual houses and some collective buildings.

Energetic investment is 9 K€ on average out of 46K€, or 20%. These 9 K€ are broken down into: 7,5 K€ for insulation (83%), 1,5 K€ for heating and water heating system (17%).

Below the tables show the cost of going from a specific energy rating to another.

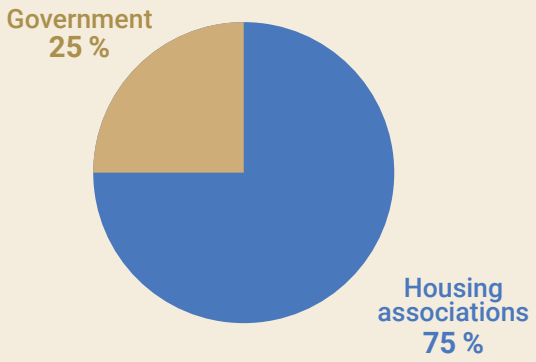
Cost per label step improvement in total renovations

Initial Energy Label	Cost to reach Label B	Cost to reach Label A++
C	30 744 €	66 376 €
D	34 486 €	70 118 €
E	37 497 €	73 129 €
F	40 274 €	75 905 €
G	42 518 €	78 150 €
H	43 518 €	79 150 €

The table shows the costs of the label step improvement in total renovations. The first column deals with the energy labels to be improved, the second column shows the cost to reach label B, the third column shows the costs to reach A++ from a label of reference.

c. How are renovation projects financed?

AEDES – Investment in energy efficiency



The pie chart shows the investment in energy efficiency. The pie chart divides the total cost of renovation based on the % of the contributions. The chart is divided into two parts, in green, the 75% of the financing is provided by housing associations, including rent contribution when agreed by the tenants. In red, the remaining 25% provided by the Dutch government.

Most investment (75%) in energy efficiency comes from the means of housing associations (mostly rental income), 25% comes from government in the form of so called STEP subsidies. For installation of renewable energy there are also subsidies by the government for about 15% of the investment, but these subsidies are not common because the return on investment is too low.

Regarding the **contribution of tenants**, every social housing association has its own rent policy within the rules of the government. The government has a Property Valuation for social housing for the maximum rent given a certain quality measured in points. The average point price is around 5€/year. The energy rating or Energy Index gives more quality and therefore the social housing association can ask the tenant more rent. In the table below, the quality points are given.

Most of the Dutch social housing associations calculate the rent of energy measures related to the theoretical decrease of the energy bill. Some social housing association guarantee their tenants that they will have a decrease of total costs after energy measures are taken (energy bill goes down and the rent goes up but in the end the tenant will have a decrease of total costs). We call this a housing cost warranty.

When a tenant moves the housing association increases the rent for a new tenant because a better energy label leads towards a higher rent. The current tenant needs to agree with a higher rent before the housing association can invest in energy efficiency measures. Therefore 25% of the housing associations ask no extra rent to current tenants so they need no permission for the investment. 75% of the housing associations ask their current tenants rent for measures such as insulation, new heating system or PV. Most all tenant get profit from lower energy costs even after a higher rent. The tenants contribute financially through increased rent costs but benefit from lower energy costs. Some housing associations guarantee the tenants that their total cost after the increased rent is lower because of the lower energy bill. In the zero-housing renovation, the tenant is guaranteed to maintain the same total costs after renovation. The building company gives this guarantee to the housing associations.

AEDES – Energy Label

Energy Label	Houses	Apartments
A++	44	40
A+	40	36
A	36	32
B	32	28
C	22	15
D	14	11
E	8	5
F	4	1
G	0	0

The table showing quality points for houses and apartments by energy label. For instance, for an apartment, as a social landlord if you renovate it and go from label D to label B, you will be allowed to raise rent by 17 points (28-11) multiplied by 5€ (price of the point), which means 85€ per year extra rent.

d. Are there any obligations related to the financing of renovation measures?

The State support is called STEP subsidies and related to the "Energy Index" the social housing association will reach after retrofitting. Below you will find table summarising the different subsidy level according to the energy index reached.

Subsidies 2016

The table shows the level per dwelling of State subsidies called "STEP" related to the "Energy Index" that the social housing association will reach after retrofitting.

		Energy Index (EI) reached after retrofitting				
		EI ≤ 0.40	EI ≤ 0.60	EI ≤ 0.80	EI ≤ 1.20	EI ≤ 1.40
Initial Energy Index (EI)	EI 1.41 ≤ 1.80	4,800 €	3,600 €	2,800 €	1,500 €	0 €
	EI 1.81 ≤ 2.10	6,200 €	4,800 €	3,600 €	2,800 €	1,500 €
	EI 2.11 ≤ 2.40	7,200 €	6,200 €	4,800 €	3,600 €	2,800 €
	EI 2.41 ≤ 2.70	8,300 €	7,200 €	6,200 €	4,800 €	3,600 €
	IE > 2.70	9,500 €	8,300 €	7,200 €	6 200 €	4,800 €

e. Results, achievements, costs and revenues (cash flow) of energetic retrofitting so far

2.4 million social dwellings in the Netherlands owned by housings associations have:

- more than 25% energy label B or A,
- the average label is D
- but apartments with label C are the most represented in the total stock

AEDES – Results, achievement, costs on energetic retrofitting

2,4 million dwellings in the Netherlands owned by housing associations (2015)		
Elements of operation	**Amount in €**	**%**
HR++ or triple glass	2.15 mio	88 %
Insulation roof	1.85 mio	76 %
Insulation walls	1.86 mio	77 %
Insulation floor	1 mio	42 %
New heating system (incl. water heating)	1.8 mio	75 %
Heat recovery ventilation	0.09 mio	4 %
PV and sun heater (warm water)	0.005 mio	1,25 %

The table shows the amount and proportion of the housing stock owned by housing corporations with the type of energy efficiency renovation. The entries on the left of the table show type of works undertaken; the entries on the right show amount and percentage of the total housing stock owned by housing corporations which have completed that renovation.

UNITED-KINGDOM (ENGLAND)

1 Legislative context in the field of renovation of social housing

The UK has a target for all new residential buildings to be zero carbon by 2016 and all other new buildings to be zero carbon by 2020. To help the construction sector meet this stretching target, an off-setting system called 'allowable solutions' has been designed, and come into practice in 2016. This means that developers who cannot make their new buildings 'zero carbon' can contribute to other carbon abatement strategies. Retrofitting existing buildings can be one of these solutions and local authorities "either individually or in multi local authority partnerships, or in partnership with the private sector, [can come] forward with Allowable Solutions' projects or measures" for private sector developers.

From 1 April 2018, private sector landlords (but not social housing landlords) must ensure that their properties have an Energy Performance Certificate (EPC) rating of at least band E before granting a tenancy to new or existing tenants. By 1 April 2020, all private rented homes (including those with existing tenancies) must have a minimum EPC band E rating. The regulations include a number of exemptions to the minimum standard.

As far as housing associations (social housing) are concerned, they take a strategic approach to investment in their stock – usually concentrating on the worst properties first, often with a target to improve all homes to a minimum energy standard within a set time frame (e.g. all homes to meet EPC C by 2030).

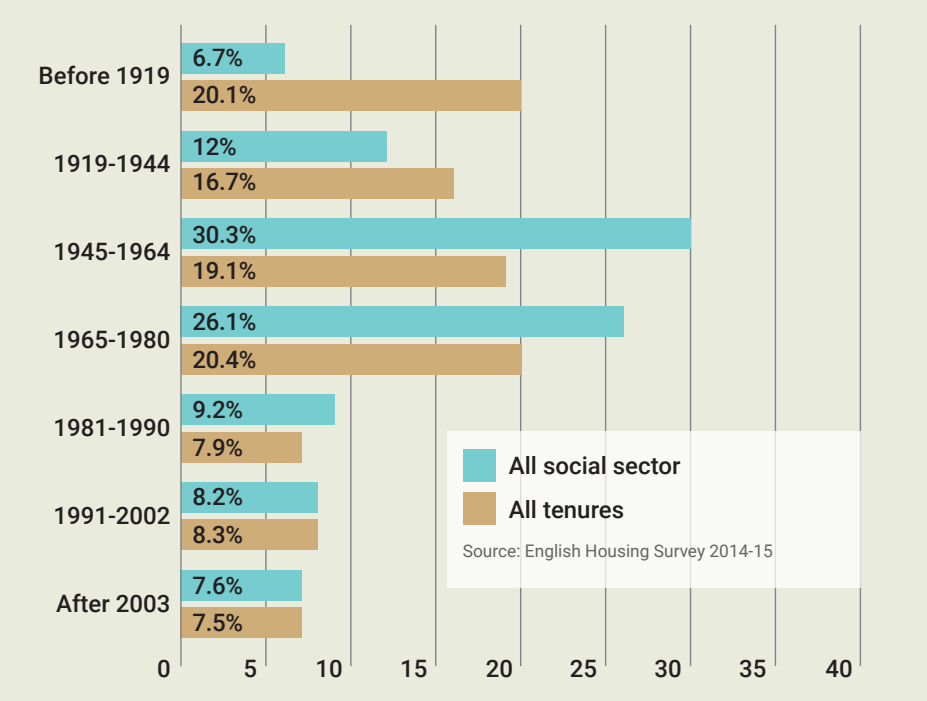
2 Social housing and energy efficiency

There are about 3.9 million social rented homes managed by housing associations in England, which represents 17% of all households.

England's housing stock is among the oldest in Europe. Around 1 in 5 (20.1%) of all English dwellings were built before 1919. The picture looks very different however for the social sector, which, on average, is much newer, with a higher proportion built in the post-war era.

Social housing in England is provided by both local authorities – public sector local government, and housing associations – not-for-profit businesses and social enterprises. Within the social housing sector, housing association is newer than local authority housing. While more than a third (36%) of all housing association homes were built after 1980, it is only 9% of local authority housing.

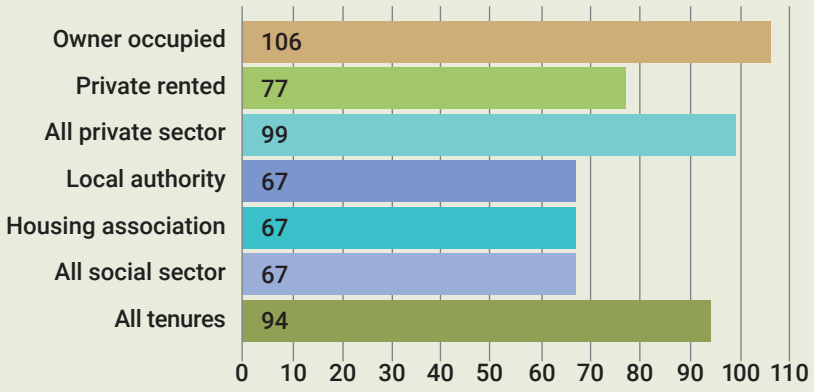
Dwelling age – % of total



The table shows the dwelling age of the stock. The blue bar shows the dwelling age of all social sector, the red bar shows the dwelling age of all tenures.

The average size of a social rented home is 67m², which is significantly smaller than the average size of owner-occupied (106m²) and of private rented (77m²) housing.

Mean floor area by tenure – en m²



The bar chart shows the average size of social rented dwellings. On the left hand you have the type of tenure; on the right, you find the square meter on the stock.

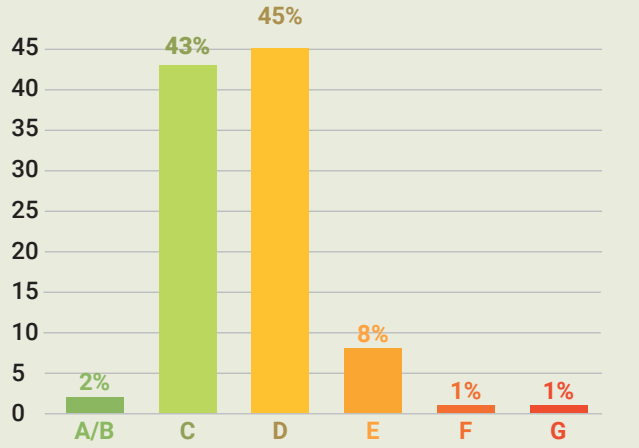
Source : English Housing Survey 2014-15

Energy efficiency [21]

While A or B rated stock is still rare across all tenures, including housing association stock, 43% of all housing association homes fall into band C, a band which is considered to be of good energy efficiency. This represents almost double the proportion found in the total English housing stock (22%). Another 45% of housing association stock is classed in Energy Performance Certificate (EPC) band D – considered as average energy efficiency – and around 10% of housing association stock is grouped in EPC bands E–G, which are of low energy efficiency. This compares to around a quarter (26%) of all homes across England rated E–G.

Housing association homes are built to or have been upgraded to a higher energy efficiency standard than the average English home when it comes to elements such as wall insulation, double glazing, loft insulation or boiler type. However, when we look at the least energy efficient housing association homes (E–G rated), they have a high incidence of property characteristics that are typically difficult or expensive to treat.

Energy efficiency rating (EPC), housing associations



Source : English Housing Survey 2014-15

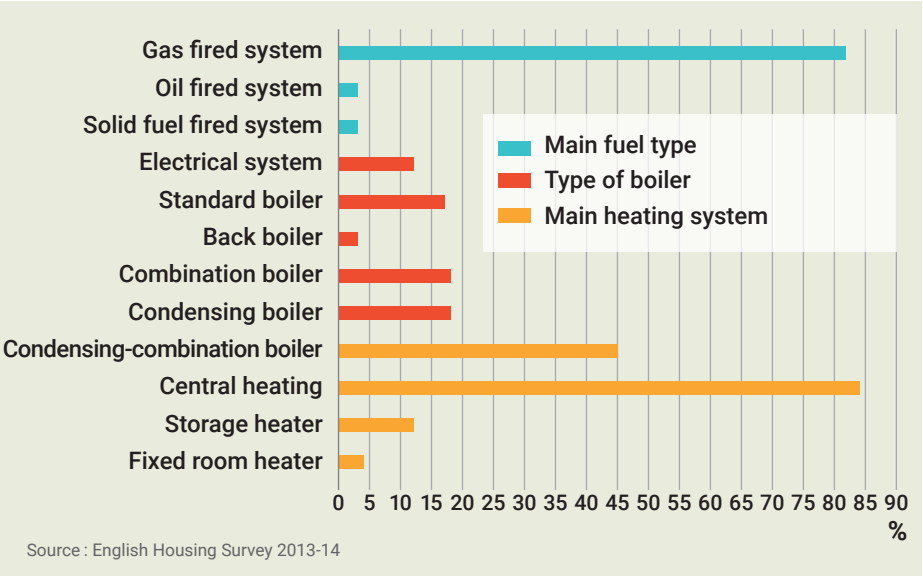
The bar chart shows the proportion of the NHF rental stock with a given energy label. The bar chart divides the total rental stock in different % of energy labels.

Heating systems

More than 9 in 10 (92%) of all households in England have central heating with individual invoicing, with the highest proportion found in the owner-occupied sector. Around 1 in 10 social homes use storage heaters (an electrical heater which stores thermal energy during the evening) or fixed room/portable heaters.

The bar chart shows the percentage of the heating energy source of social housing dwellings. In the graph, the blue color refers to the main fuel type, the red refers to the type of boiler, and the orange color refers to the main heating system.

Heating and boiler types, housing associations



Source : English Housing Survey 2013-14

[21] http://s3-eu-west-1.amazonaws.com/pub.housing.org.uk/Taking_stock_-_Understanding_the_quality_and_energy_efficiency_of_housing_association_homes_(2016).pdf

3 Financing of concrete renovation projects

a. When and how do renovation projects take place?

Typical energy efficiency works in the UK include lower cost measures such as boiler and heating system upgrades, loft and cavity wall insulation and draught proofing, to more expensive measures such as solid wall insulation [22] and renewable energy systems.

Housing associations take a strategic approach to investment in their stock – usually concentrating on the worst properties first, often with a target to improve all homes to a minimum energy standard within a set time frame (e.g. all homes to meet EPC C by 2030).

b. How much do renovation projects cost?

The average cost per dwelling of installing all the recommended energy efficiency measures is around 20,000€, out of which 3,000€ are for basic repairs [24] and 3,000€ other maintenance costs. Solid wall insulation, floor insulation, solar water heating and photovoltaics are relatively high cost measures. Low energy lighting, although an easy improvement to install at a relatively low cost, will typically not provide as much of an energy saving as some of the other measures [25].

To go into more details, the following table outlines the costs (in £), cost savings and carbon reductions for a range of energy efficiency measures in a typical home in England. The costs provided are for private homes and may be lower for social housing providers that can benefit from efficiencies through purchasing at scale and through established trade relationships with suppliers. Energy efficiency works will typically be undertaken by contractors commissioned by housing providers, or (less often) by in-house teams employed directly in larger organisations.

Typical social housing energetic retrofitting

Source: Energy Saving Trust	Detached	Semi-detached	Mid terrace	Bungalow	Flat
Cavity wall insulation					
Fuel bill savings (£/year)	£ 275	£ 155	£ 105	£ 110	£ 90
Typical installation cost	£ 720	£ 475	£ 370	£ 430	£ 330
Payback ime	5 years or less				
Carbon dioxide savings ($kgC0_2e$/year)	1 100 kg	660 kg	430 kg	450 kg	360 kg
Solid wall insulation					
Fuel bill savings (£/year)	£ 455	£ 260	£ 175	£ 180	£ 145
Typical installation cost	**External wall insulation:** £ 8,000 to £ 22 000				
	Internal wall insulation: £ 3,500 to £ 14 000				
Carbon dioxide savings ($kgC0_2e$/year)	1 900 kg	1 100 kg	720 kg	740 kg	610 kg
Loft insulation (0 à 270 mm)					
Fuel bill savings (£/year)	£ 240	£ 140	£ 135	£ 200	
Typical installation cost	£ 395	£ 300	£ 285	£ 375	
Carbon dioxide savings ($kgC0_2e$/year)	990 kg	590 kg	550 kg	820 kg	
Loft insulation top up (120 à 270 mm)					
Fuel bill savings (£/year)	£ 25	£ 15	£ 15	£ 20	
Typical installation cost	£ 310	£ 250	£ 240	£ 295	
Carbon dioxide savings ($kgC0_2e$/year)	95 kg	55 kg	50 kg	80 kg	

The table shows the costs of the typical social housing energetic retrofitting (in £).

[22] A cavity wall is made up of two walls with a gap in between, known as the cavity; the outer leaf is usually made of brick, and the inner layer of brick or concrete block.

[23] A solid wall has no cavity; each wall is a single solid wall, usually made of brick or stone

[24] Basic repairs include urgent work required in the short term to tackle problems presenting a risk to health, safety, security or further significant deterioration plus any additional work that will become necessary within the next five years.

[25] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627688/Potential_stock_improvements_Report_2015-16.pdf

c. How are renovation projects financed?

In general, costs related to energy are paid as follows: Energy costs are always paid by tenants, who directly benefit from any energy retrofitting; there is no legal definition of who should pay for the operation and maintenance costs. Major repairs are paid by housing associations; creation or replacement of the energy production systems is paid by housing associations.

Energy retrofitting does not benefit from tax discounts or low interest rates, but energy savings certificates delivered in the framework of the Carbon Emission Reduction target can finance up to 90% of investments. Rents cannot be raised above the legal ceilings in case of energy retrofitting, and energy savings cannot be recouped from tenants.

The majority of investment in energy efficiency of the existing stock comes from a combination of housing associations' own means (either from rental income, surpluses), or bank loans and grant funding from government.

AN EXAMPLE OF SOCIAL HOUSING REFURBISHMENT [26]

About 900 housing units built in the 1970s in Edward Woods Estate, London Borough of Hammersmith and Fulham have been refurbished for 18 million € (about 20,000€ per dwelling or about 300€/m^2), with the money generated from the sale of 12 new penthouse flats constructed in the project and grant funding:

Funding from the Greater London Authority
for energy saving: **6 million €**
Subsidies from local authorities **= 33%**

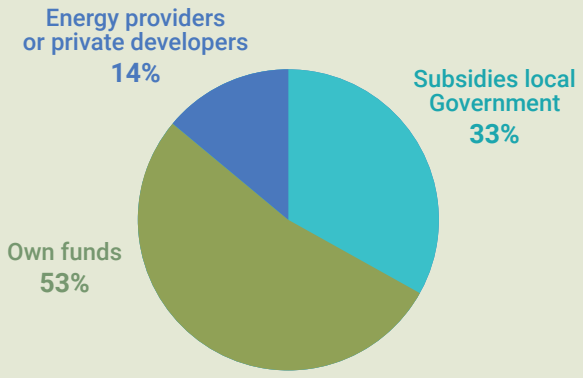
CESP Funding [27] for energy saving: **0.4 million €**
Non-repayable support by energy providers **= 2%**

Section 106 (from previous regeneration scheme): **1.87 million €**
Aide non remboursable des promoteurs privés **= 12%**

Capital Receipts: **6 million €**
Sale of flats **= 33%**

HRA capital: 4 million €
Own capital **= 20%**

Financing social housing refurbishment
– % of total cost



The pie chart shows the financing of social housing refurbishment. The pie chart divides the total cost of renovation (€ 20,000) based on the % of the contributions. Contributions from energy providers or private developers 14%, subsidies from local government 33%, Own funds 53% (20% own capital and 33% sale of flats).

Housing associations set their business plan and carry out investment appraisals on the basis that rental income funds the repairs and maintenance for the property, alongside servicing the debt borrowed against the property, for its lifetime. Net rental surplus adds to reserves for future investment, new development and contingencies.

Housing associations also secure funding for capital expenditure through bank loans and bond finance etc. This is most typically used for building new developments but they may also use it to carry out major cyclical works including investment in energy efficiency programmes.

[26] Figures are rounded up. For more details see: http://www.engineering.ucl.ac.uk/engineering-exchange/files/2014/10/Report-Refurbishment-Demolition-Social-Housing.pdf

[27] CESP targets households across Great Britain, in areas of low income, to improve energy efficiency standards, and reduce fuel bills. There are 4,500 areas eligible for CESP. CESP is funded by an obligation on energy suppliers and electricity generators

Grant funding – Energy Company Obligation

The national supplier obligation scheme in the UK is the Energy Company Obligation (ECO). Funded by the energy suppliers through a levy on household energy bills, the ECO fund works including cavity and loft insulation, solid wall insulation, heating improvements, some renewable energy and district heating measures.

In previous years, ECO funding has contributed significantly to energy efficiency works (even up to 100% of the total cost of some works in social housing). However, the scale of funding available is now reduced and the subsidy available per tonne of carbon saved has gone down considerably. At its highest point (around 2013) housing providers could get a subsidy of up to £150 per tonne of carbon saved, more recently this is closer to £20 per tonne of carbon saved.

Due to numerous changes to the policy in recent years that have resulted energy efficiency schemes being cancelled at short notice, and because of the much lower level of subsidy now available through ECO, many housing providers are wary of the scheme and less likely to seek grant funding for energy efficiency investment, preferring instead to fund it through their own means.

Energy Company Obligation funding is currently targeted at low income households and the least energy efficient properties. For the next phase of ECO (2017-18) all E-G rated social housing properties will be automatically eligible for funding. There is also a minimum target for delivery of solid wall insulation – designed to tackle some of the least energy efficient homes in the UK.

Renewable energy

Householders including social housing providers can receive payment from the government over a 7 or 20 year period for the generation of renewable heat through the **Renewable Heat Incentive.** They can receive a similar ongoing payment for the generation of electricity through solar PV, wind power etc through the Feed in Tariff. Both of these schemes provide some level of financial support to housing providers to improve building energy performance.

Tax exemption

L'utilisation de certains matériaux ou l'installation de systèmes de chauffage permettant des économies d'énergie peuvent bénéficier d'un taux de TVA réduit de 5 % au lieu du taux habituel de 20 %.

Rent increase after refurbishment

Generally in social housing households are responsible for their own electricity, heating and water bills through direct contracts with energy and water companies.

This may vary if there is a communal heating system - in which case the heating charge will be contained within the rent or service charge. Or in supported or sheltered housing for vulnerable people where bills and services are contained within the rent or service charge.

In the UK the national rent setting standard prevents social landlords from charging higher rents for more energy efficient properties (unlike the other countries studied in this report).

Maximum rents in social housing are set within the regulatory framework, varying to reflect a range of housing market parameters such as location and tenure type. On top of this, national legislation is currently in place requiring social housing providers to reduce their rents by 1% each year from 2016 to 2020.

These factors prevent housing associations seeking a return on investment in energy efficiency through contributions from residents.

d. Are there any obligations related to the financing of renovation measures?

For Energy Company Obligation funding, energy suppliers are required to conduct technical monitoring inspections on ECO measures to ensure the required standards of installation are met and measures are scored accurately for carbon saving. There is no ongoing monitoring reporting required from housing providers.

The feed in tariff for solar PV requires ongoing metering of energy generated in order to calculate the payment to householders per kWh of electricity generated and exported.

The renewable heat incentive is similarly paid to householders for each kWh of heat generated, however for domestic properties this is not metered but is calculated based on a 'deemed' score – the expected contribution that the renewable heat system makes to the estimated heat load of the property.

e. Results, achievements, costs and revenues (cash flow) of energetic retrofitting so far

On average, housing association properties have a better energy performance than any other tenure. Energy performance has improved significantly over the last decades. Currently around 45% of all housing associations' stock rated either A, B (2%) or C (43%). More than 4 in 10 (45%) of all housing association homes are rated D.

Over recent years, the average performance rating has increased across all tenures. Social rented housing has kept ahead and is still the most energy efficient tenure in England. There are however homes across all tenures that are still relatively energy inefficient.

Challenges

Although huge improvements have been made in energy efficiency in social housing, there remain some key challenges faced by housing associations, with 10% of the stock still rated E-G (compared to 25% in France for instance). Annual household incomes in the sector are around £20,000 lower than those in privately owned homes, which mean that fuel poverty is still a significant problem.

Improving solid wall properties presents one of the biggest challenges to the housing association sector. Due to the high cost of solid wall insulation even highly efficient retrofit programmes struggle to deliver improvements at a manageable cost. It is vital that government, industry and housing providers work together to support new and innovative approaches to solid wall insulation and other deeper retrofit measures that help bring down costs for all customers.

Innovation

Though ECO and its predecessors have supported significant improvements in energy efficiency over the last two decades, it does not support innovation or particular efficiency but instead encourages a piecemeal approach to installing energy efficiency measures.

Housing associations offer a unique opportunity to deliver effective energy efficiency programmes at scale - with expert knowledge of their stock, understanding of customer behaviour, track record of innovation and established partnerships with industry, government and service providers. New models of delivery that drive innovation, efficiency and collaboration would enable housing associations to do more, creating a competitive and commercial supply chain that would benefit all sectors and support the delivery of the UK government's 2030 fuel poverty target.

MAIN FINDINGS & CONCLUSION

The question of the financing of renovation of social housing remains an important one in the debate about the energy transition. The volume of investment needed for the renovation of one apartment is still an obstacle for many owners, despite all the long-term costs of inadequate homes [28] and the benefits that energy savings can bring. [29] It is also an obstacle for public authorities if they have to finance the entirety of the energy renovation. It is therefore crucial that the cost of financing is brought down. The right mix between private finance, public support and own capital needs to be found by social housing providers in various national legislative contexts and economic models. This study has tried to highlight those specific contexts and the impact they have on the cost of financing and the average energy performance achieved.

The study's main findings can be summarized as follows:

Renovations have almost always energy and non-energy related component. The non-energy component usually makes most of the cost of renovation. It might come from the fact that from the housing providers point of view, there is not (yet) a specific approach for energy efficiency but rather an approach of building modernization and increased comfort for tenants

The total cost of renovation per dwelling varies from 20,000€ (in England) to 46,000€ (in the Netherlands). This variation comes from many factors, including labour cost, the competitiveness of the construction/renovation sector, the building typology (semi-detached homes which are more common in the Netherlands) and the nature of works carried out

The cost of the energy related part of renovation makes on average below 50% of the total cost of renovation. In several countries, typical energetic renovation works cost around 10K€, meaning large scale intervention can be contemplated

Renovations are financed via a mix of own funding, soft loans related to the energy part of the renovation, bank loans, bonds issue, non-repayable grants, and contribution of tenants in the form of rent increase or rent provision in Austria

Favourable fiscal treatment is also in place in several countries (mostly in the form of reduced VAT rate) but there are exceptions to this rule

Soft loans related to the energy part of the renovation are conditioned to the attainment of specific levels of energy efficiency and they are all the more favourable as this level is high

Subsidies are also conditioned to the realisation of energy efficiency objectives

In most of the cases, major renovations and the related rent increase need the agreement of the tenants, however this is not always the case

Some countries involve tenants' choice more than others regarding nature of works and improvements

The question of the right policy mix (beyond the financial mix) for the renovation of social housing remains open. The countries studied here have all set up objectives in terms of either renovation of social housing or overall energy efficiency but at various speed and intensity (some countries have clear objectives to renovate a certain number of dwellings per year or will ban the letting of dwellings in the worst EPC categories). But it was not possible to identify any correlation between the nature of the obligations and objectives and the general performance of the stock.

The countries also have different funding measures although all of them (except England and Netherlands) rely heavily on soft loans or banking loans. In general, combining different sources of funding with an important public support either in the form of grants or soft loans, and a contribution of tenants remain the most widespread business model of energy efficiency in the social housing sector. Other tools (third party, green bonds, certificates, European subsidies and loans) are marginally used. For instance, in only one of the countries, market finance in the form of green bonds play an important role: it is only really used in Sweden and lightly so far. It maybe shows that social housing providers need a stable and known financial framework in order to mitigate the financial risk. As we have seen in several countries, the economic case for renovation of social housing remains fragile and dependent upon public support in one way or another. Market finance does not seem to be a major element so far, probably due to the low rate of return in the sector. And the fact that only Sweden has embraced it so far may stem from the fact that municipal housing companies in Sweden are for profit companies and are required to provide a financial return for their shareholders (municipalities) and investors.

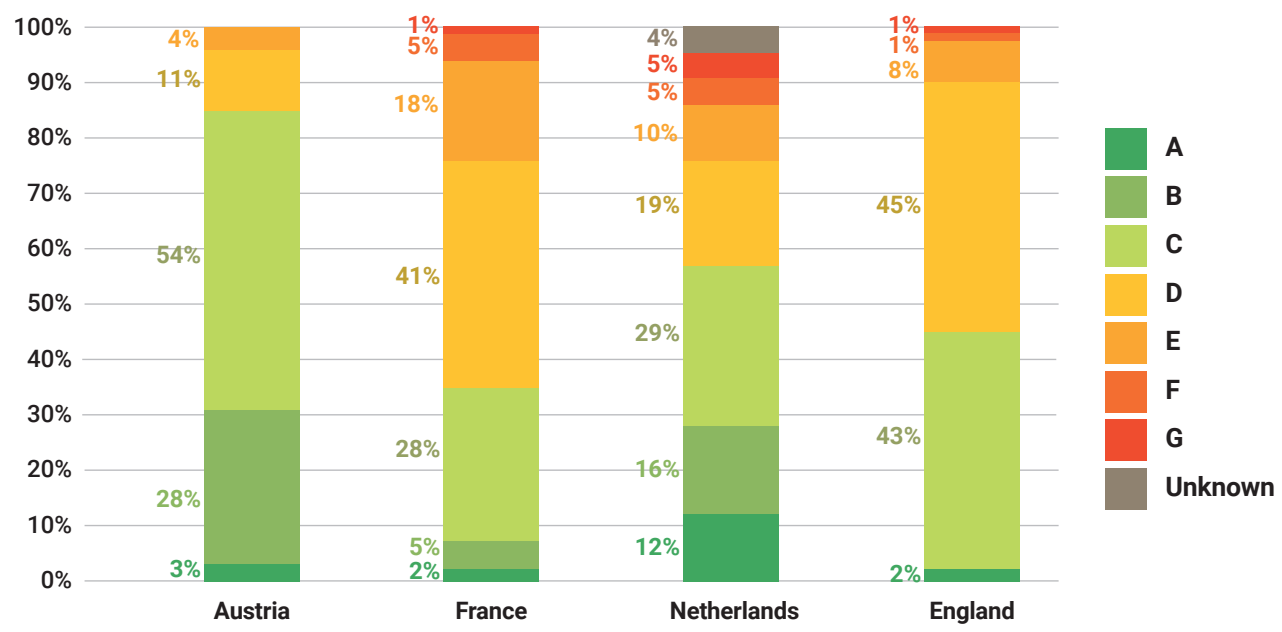
[28] Eurofound, Inadequate housing in Europe: Costs and consequences, 4 Aug. 2016. Web 6 Apr. 2017. https://www.eurofound.europa.eu/fr/publications/report/2016/quality-of-life-social-policies/inadequate-housing-in-europe-costs-and-consequences

[29] International Energy Agency (IEA) Capturing the Multiple Benefits of Energy Efficiency: 2014. Web 6 Apr. 2017. http://www.iea.org/publications/freepublications/publication/Captur_the_MultiplBenef_ofEnergyEficiency.pdf

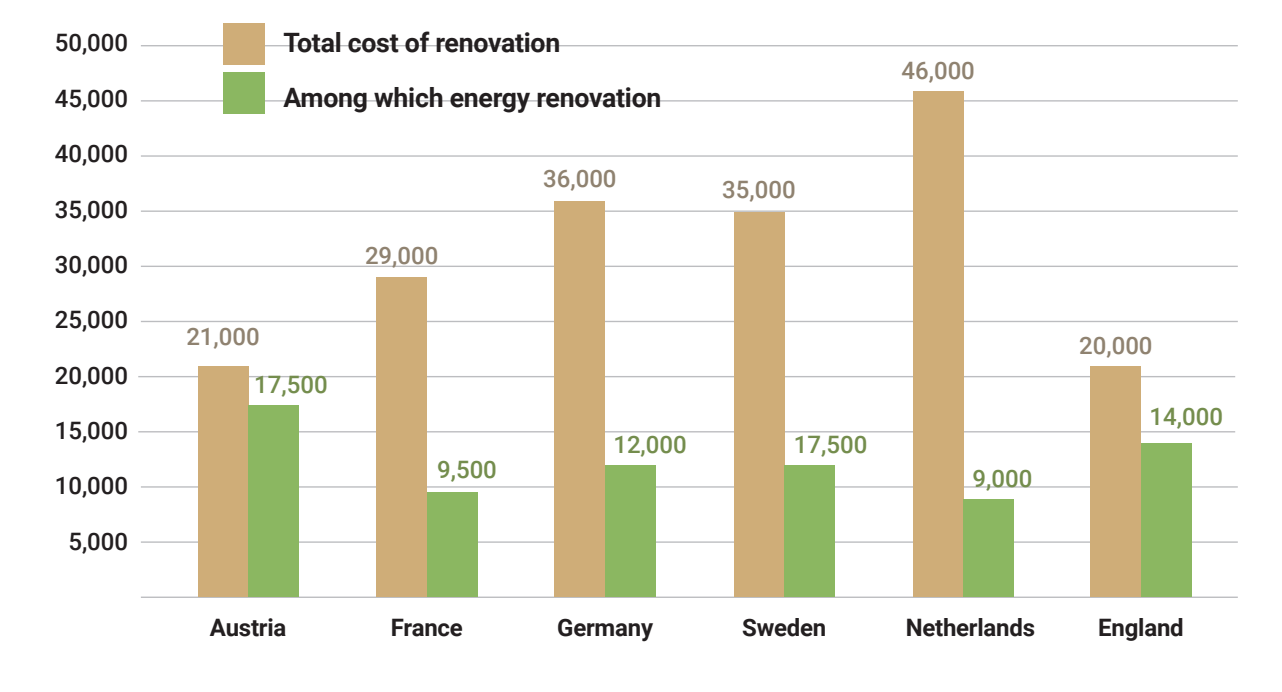
ANNEX

Synthetic information on stock rating by country,
average cost of renovation and main sources of funding

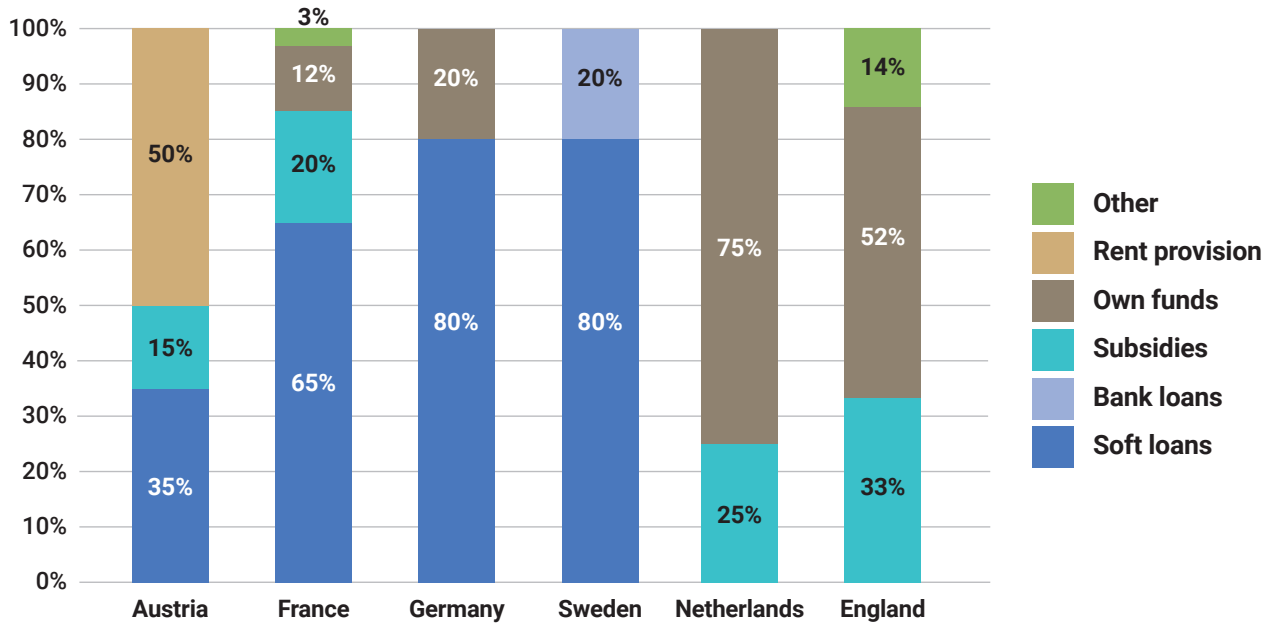
Energy ratings of social dwellings



Average cost of renovation



Main sources of finance



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