



Intelligent Energy  Europe

Grant agreement no. EIE/05/045/SI2.419851

Project acronym: RESHAPE

Full title of the action: Retrofitting Social Housing and Preparing for EPBD

Intelligent Energy – Europe (IEE)

Horizontal Key Actions

Key action: Type 1, Multiplying success in buildings

Cross country report on:

**Energy performance certification in operational processes of
social housing actors (WP2)**

Author:

Pavel Kárník

SEVEN, Stredisko pro efektivni vyuzivani energie, o.p.s.

The Energy Efficiency Center

Americka 17

120 00 Praha 2, CR

pavel.karnik@svn.cz

tel.: + 420- 224 252 115

fax: + 420- 224 247 597

Project website: www.reshape-social-housing.eu

Abstract

The ambition of the RESHAPE team has been to collect relevant data from each participating country. The Ecofys template, which was discussed among all participants, enabled to gain comparable data and common approach to gathering and presenting data. It is not easy to successfully manage both the depth and breadth of housing statistics when as many as six countries are involved. We hope that the cross country report will be completed by the end of the project. A Cross country report summarizes data from countries and gives basic information about social housing. Each country has its own report which is enclosed.

Index

Abstract	2
Index	3
1. Introduction of housing policy of each country	4
Belgium.....	4
Bulgaria.....	5
Czech Republic	5
Estonia.....	6
Netherlands	7
Spain	9
2. Social housing sector	12
Housing key figures	12
3. Operational process in social housing.....	16
Czech Republic	16
Estonia.....	19
Netherlands	21
Spain	24
4. EPBD status and role in social housing	25
Belgium.....	25
Czech Republic	27
Estonia.....	28
Netherlands	28
Spain	31
5. Energy performance of the housing stock	35
Belgium.....	35
Czech Republic	36
Estonia.....	38
Netherlands	38
Spain	39

1. Introduction of housing policy of each country

Belgium

In the early 1980's a massive decrease in state investment started to take place. Since 1980, social housing has been decentralised and is now the competence of three regions: the Flemish Region, the Walloon Region, and the Brussels Region. Due to interest-rate evolutions in the financial markets, this actually meant that huge debts were being divided among the newly established regional players. In 1980, social housing represented 25% of new housing in that year while in 1989 it dropped to 2,7%. More recently, greater emphasis has been put on renovation and rehabilitation.

Key features of government housing policy include the construction of social housing by the public sector within the budgetary limit imposed by the Regions and the priority of improving the existing housing policy, with its strong historical orientation towards ownership, is still embedded in a national legal framework since tax law and its incentives towards the acquisition of a first property are a national, i.e. federal competence.

Definition of social housing in the Flemish Region

Rented (or owner-occupied) social house = house rented as principal residence (or build) for underprivileged families or singles by the VMSW, a local social housing company, a municipality, the Flemish Housing Fund of Large Families or a Public Centre for Social Welfare

Underprivileged means that income not exceeds a certain amount fixed by the government and not owns a habitable dwelling.

"The VMSW: - is responsible for in time realization and financing of social housing

- Projects as planned by the Flemish Government
- stimulates, supports and assists local organizations in the development of
- Affordable and qualitative projects.

The RWC (control organism of the Flemish Government) controls of the Flemish regulations are respected

Criteria for tenants for renting a social dwelling are:

- Be of age
- Upper limits net taxable income (2007):
 - Single : 16 984 EUR ;
 - Disabled single : 18 399 EUR
 - Other cases : 25 476 EUR, increased by 1 416 EUR for each person in charge
- Not being owner of a habitable dwelling

Key housing policy statement:

The aim is to promote home ownership and provide sufficient social housing.

Bulgaria

Bulgaria like the other Eastern European countries implemented a radical change in political and economic system after 1989. During previous years new houses were built predominantly by the Government in a set of tight limits in size and quality which gives us grounds to consider all housing provided during this period as social housing.

However, unlike other countries in the period 1945-1989, the state as a main developer used to build houses which property was immediately transferred to the residents. Due to this peculiarity Bulgaria was among the few countries with extremely high owner occupancy share (about 90% by the end of 1989.)

Due to the fact of very high share of private homes the changes after 1989 influenced housing in much more severe extent. Since there was almost nothing to privatize in housing sector, the ownership structure change was negligible (about 5% privatized state houses in 15 years)

The small share rental (state owned) houses before the changes (about 10%) was additionally minimized thus avoiding any opportunity to allow implementing of reasonable scale of social housing policy.

It could be concluded that after the changes in 1989 since 2005 (when the National Housing Strategy was approved) Bulgaria had no social housing policy at all.

A critical assessment of the transitional period reforms (1989-2005) could be summarized in:

- abolishment of all legal restrictions on real estate property;
- full removal of subsidies for new housing needs;
lack of affordable new housing provision;
- emerging of a quasi housing market, developing within 10% of the potential demand;
- remaining very small insignificant share of public/affordable housing;
- lack of adequate system for housing management and maintenance.

The state shifted from the pole of full responsibility for provision of housing to that of full irresponsibility, withdrawing most of the elements of a social housing policy.

Czech Republic

The Ministry for Regional development has implemented two programmes targeting disadvantaged people. The objective of the first program is to stimulate construction of rental housing and technical infrastructure by municipalities.

There are three types of subsidised apartments: protected dwelling (rental dwelling in a special-purpose residential building with home care services reserved for persons having special housing needs due to a medical condition or

old age and that meets the technical requirements for a modifiable dwelling), 'halfway dwelling' (rental dwelling intended for persons having special housing needs due to social problems or high-risk living environment, and who are unable to resolve their unfavourable social situation without external assistance) and 'entry-level dwelling' (rental dwelling intended to satisfy housing needs of persons who do not have access to housing even if all existing social and housing policy measures are used, while such persons are capable of leading independent lives, especially in respect of fulfilling the duties under a lease agreement).

Definition of social housing

The support not only new building but obtaining older and cheaper dwelling. Orient to various groups of population who don't have the same access to housing

It is aimed to three groups of housing:

1. This group was described in upper text.
2. Rent (social) houses which were built from public funds or with their direct support. Owners of these houses can be municipalities, condominiums or other organizations.
3. The rest of social houses are flats with the limit of flat area 90m² and family houses 150m².

Criteria for tenants for renting a social dwelling are:

A new municipal dwelling constructed with a subsidy granted under this program can be rented only to a person living in a single-member household whose average monthly income during the six calendar months preceding the entering into a lease agreement did not exceed 0.8 times the average monthly income in the national economy, or to a person living in a multiple-member household, if the household's average monthly income during the six calendar months preceding the entering into a lease agreement did not exceed 1.5 times the average monthly income in the national economy

Key housing policy statement:

The aim is to create conditions under which every household is able to secure adequate housing, appropriate to its needs and financial situation, either by its own means or with the State's assistance.

Estonia

In Estonia, during the post-communist process of privatisation of public housing, large-scale privatisation of former public housing took place mainly because of the application of the tenants' right to buy. The central legislation defined the general terms for privatisation (right to buy for tenants in public housing, calculation of privatisation prices, condominium registration, public loan conditions occasionally) and municipalities had only limited possibilities to influence the scale or the most fundamental conditions of privatisation.. In 2001,

the urban population represented 69.4%. Between 1992 and 2000, the tenure structure had the following developments in relation to the total housing stock: state rental housing decreased from 25.8% to 0.7%, municipal rental housing decreased from 34.7% to 3.3%, cooperative housing decreased from 5% to 3.9%, and homeownership increased from 34.5% to 85.9%. The share of private rental housing was estimated in 2000 at a level of 10% of total housing stock and 1.1% of housing stock was owned by other owners, while the owner of 5.1% was unknown. In the same period, the number of dwellings per 1,000 inhabitants increased from 407 to 434. By 2001, the share of households receiving housing allowance from total number of households represented 12%. According to the 1999 Poverty Study, the following types of households were most affected by poverty: households with an unemployed member (62% were in direct poverty), families with 3 or more children (45% in direct poverty, the poverty risk increasing with each following child) and single-parent households (37% in direct poverty).

The privatisation of public housing was accomplished in the following manner: all adult persons permanently living and working in Estonia received 'privatisation vouchers' according to the length of time they had worked in Estonia since 1945 and the purchase of apartments was realised mostly through such vouchers. All tenants had a right to buy the public rental housing that they occupied for very low prices (with vouchers). Direct financial costs mainly consisted of only the legal fees for the transaction, not exceeding 1% of the total privatisation price. Due to these very soft terms, no particular financial programmes had to be introduced to help cope with paying the privatisation costs. Part of the housing stock underwent a restitution process to the former owners. There was an ethnic dimension to the restitution process, since it concerned mainly Estonians, while Russian immigrants could benefit from the privatisation of the more recently constructed dwellings.

Definition of social housing

Social housing" is commonly understood as an equivalent to affordable and good quality housing. In Estonia it includes municipal housing as well as housing cooperatives and apartment associations.

Key housing policy statement:

The aim is to provide all Estonia's residents with an option to choose their place of dwelling and to create conditions in the housing market (through legal regulation, intuitional regulation and support measures) that would allow owners, tenants and citizen-initiated housing organisations to solve thin problem indecently and to carry out individual housing strategy

Netherlands

Around 1900 the shortage of housing led to the establishment of housing associations, which operated as branches of the government. In effect, it was the central government that determined rent, subsidies and loans. Local government

supervised the construction of housing and were responsible for allocation. In order to cut costs and increase efficiency, there was mass production meaning the erection of many high-rise flats after World War II. In the 1980's the government withdrew from the belief that a state could be governed by precise regulation, thus owing to the decline in the shortage of housing, housing was relegated to the minister of state level. This also marked the beginning of a financial retreat by the government. The government ceased to provide state loans and guarantees, although local authorities continued, and sometimes still do.

The 1990's witnessed further financial retreat as not only was the housing associations were granted independence, and financial ties between them and the government were cut. This cut was epitomised by the 'Brutering' operation in 1993, whereby the government cancelled outstanding loans from housing associations in exchange for an end to new subsidies. Moreover the housing shortage declined, and in certain regions there were even vacancies. There was greater emphasis placed on market forces to allocate housing, and initiatives for a self-regulating sector were taken with the establishment of the Central Housing Fund (CFV) and the Social Housing Guarantee Fund (WSW)

Housing association managed accommodation is available to any seekers who conform to their maximum income criteria, which are set out in the BBSH (see below) other criteria which require conformity include; eligibility criteria. This determines which kinds of households may register and usually feature requirements of being over 18 years of age and economic or personal ties to the area. The suitability criteria, governs the kind of dwelling which is most suited to households including dwelling size and income levels. The process of allocation is coordinated by the housing associations themselves and is subject to the Housing Allocation Act. A residential permit is required before an applicant is permitted to move into a property and is in turn issued on the condition that they meet income and possibly age and family size requirements. In practice applicants are allocated by either the waiting list or by bidding. The traditional waiting list is where home seekers register with the local authority or the landlord with their preferences and then have to wait until they make them an offer. Their position in the waiting list is determined by a points system based on their needs. Those seekers with urgent circumstances, such as those who have had their homes demolished are given priority. The problem is that if applicants experience a change in personal circumstances such as new child, they must register again, Secondly there is the bidding system, now widely adopted, based on the Delft model where housing associations advertise vacancies in a special housing newspaper. Home-seekers are then invited to complete a form indicating the type of housing they want. Some homes are reserved by the associations for specific target groups such as the elderly, handicapped people, 'upgrades'-those wanting to move into better homes - or first time tenants.

Definition of social housing

IUT (Int. Union of tenants)

“Social housing is sustainable housing with non-profit rents where the access is controlled by the existence of allocation rules favouring households that have difficulties in finding accommodation on the market.”

Draft Ordinance regional development ERDF:

“The provision of good quality accommodation for lower income groups including recently privatised housing stock as well as accommodation for vulnerable social groups.”

Social housing is rental housing offered by accepted legal entities to people who have difficulties, due to their income or other circumstances, in providing their own appropriate accommodation.. [Woningwet, artikel 70c]

Criteria for tenants for renting a social dwelling are:

Appropriate accommodation for the primary target group is further detailed as: the target group has an income below the income cap for national rent subsidy scheme (17-25,000€/year depending age and family size) and is living in a rental dwelling with a rent below the rent cap for the national rent subsidy scheme (7250€/year). [BBSH, art 13]

Key housing policy statement:

The aim is to accelerate the restructuring of neighbourhoods and housing production, especially in cities, to achieve and maintain a sound, sustainable living climate, to tackle unsafe and run-down neighbourhoods and to prevent other areas from declining in this way, to promote home-ownership, to make city living more attractive for middle and higher income households and to ensure that housing is affordable

Spain

One significant observation is that the rental social housing sector is underdeveloped in Spain. It was hoped that decentralisation to the regions would improve the situation, as the regions would know the interests of their local population. As previously mentioned, since 1978 housing and planning have been decentralised from the government to the municipalities and the autonomous regions. The municipalities and the autonomous regions are responsible for housing issues under the State Housing Plan and their own plans. Since 1999, there have been two ‘Housing and Land Plans’, which last three years. The first was from 1999-2001 and it built on previous initiatives such as financially assisting those who did not possess any other home who wanted to either buy or rent accommodation, financially assisting those families on low incomes. The plan also introduced the aspects of housing policy and land policy. Housing policy essentially involved subsidised housing, new state protected housing (VPP), rental housing for unspecific groups and rehabilitation. Whereas land policy included initiatives such as land urbanisation, buying land to constitute public patrimonies. The plan also introduced financial instruments such

as qualified loans, (which are agreed upon between public and private credit companies together with the state), grants and subsidies. The 2002-2005 Housing and Land Plan is the most recent, and it includes ideas such as financial aid through government aid, and tax concessions. Such financial aid is targets VPP housing, rental housing, pilot projects encouraging sustainable housing, etc.

Current key trend in Spanish social housing at the moment is that of an ageing population, which may mean economic difficulties in the future, and also the increasing rate of immigration raises the issue of social exclusion.

In order to benefit from a state protected home (VPP) applicants must abide by certain conditions. These include, that applicants must not have another state protected or any other home in the same locality. In such a case, the value of the home must be less than 40% of the maximum sale price of a VPP, or 60% in the case of large families. The VPP must then be used as a habitual and permanent address. General conditions entail that the home cannot be relinquished or sold for 10 years, and it remains under state protection for 10 years (meaning that it cannot be sold at a higher price than one which has legally been established under the rules afore mentioned). There are various forms of assistance available to home-seekers, the first being qualified loans. These loans are agreed upon by those responsible for general housing management and credit institutions. Essentially applicants need to conform to the general conditions, and in return they can benefit from reduced interest loans (3.96% in 2003). Other subsidies available are subject to applicants' incomes being 4.5 times less than the inter professional wage (SMI). Those on the lowest incomes receive greater subsidies. For example, those with incomes which are 1.5 times less than the SMI receive subsidies of 20% of the bank loan quota for 10 years, whereas those with incomes between 1.5 and 2.5 of the SMI receive 15% subsidies. Direct economic aid (AEDES) apply to those on higher incomes should be 3.5 times less than the SMI. This form of financial assistance increases for those on lower incomes. State protected rental homes are available for those on incomes which are 4.5 times less than the SMI.

Definition of social housing

Protected housing is a type of housing created in 1963 in Spain, for the purpose of bringing uniformity and order into the housing legislation existing in the country. These dwellings have a maximum legal sale price and are fitted into a protected housing plan under the public authorities. The name and definition of the category of housing to be protected corresponds to the autonomous legislator (article 149 of the Spanish Constitution).

In Spain, protected housing has developed basically through the public financing of privately developed new building for transfer of ownership, articulated through a complex system of qualified loans, subsidies for them, subventions and various aids, both for the developer and for the acquirer, in relation to the latter's income, the definition of typical features of these dwellings, control over their maximum

sales price (depending on the Autonomous Community and the particular municipality) and the establishment of a maximum period, limited in time, during which the housing developed is linked with public investment in the regime of protection.

There are different types of official protected dwellings. Those of public development are built on land owned by the town hall by a Public Authority company, and their owner can receive some subventions. Those of private development are of private ownership, built on private land by a private company.

Criteria for tenants for renting a social dwelling are:

If the beneficiaries of the dwellings meet the conditions defined in the National Plan, they can have recourse to these aids, provided that their Autonomous Community has signed an agreement with the Ministry of Housing, that there are actions planned in this ambit and that the sum agreed in this territory has not been exceeded.

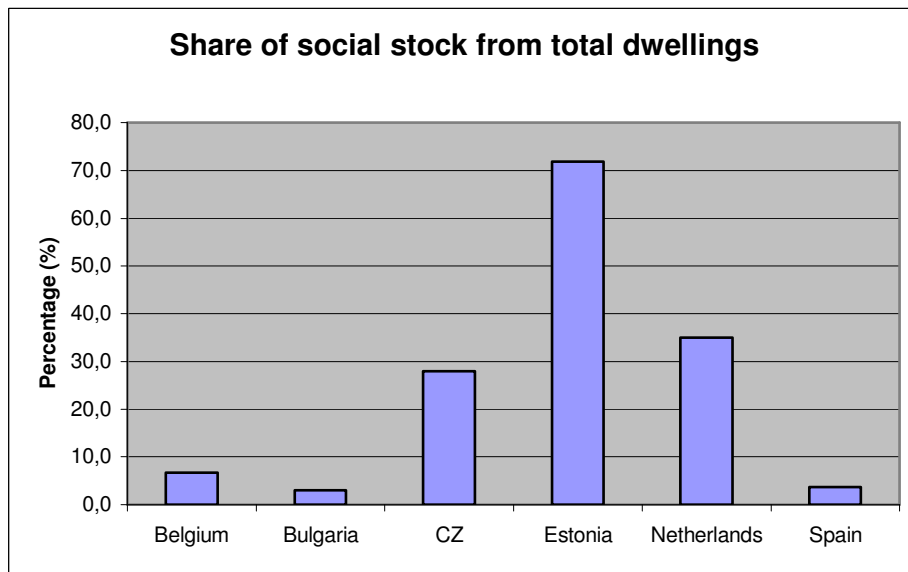
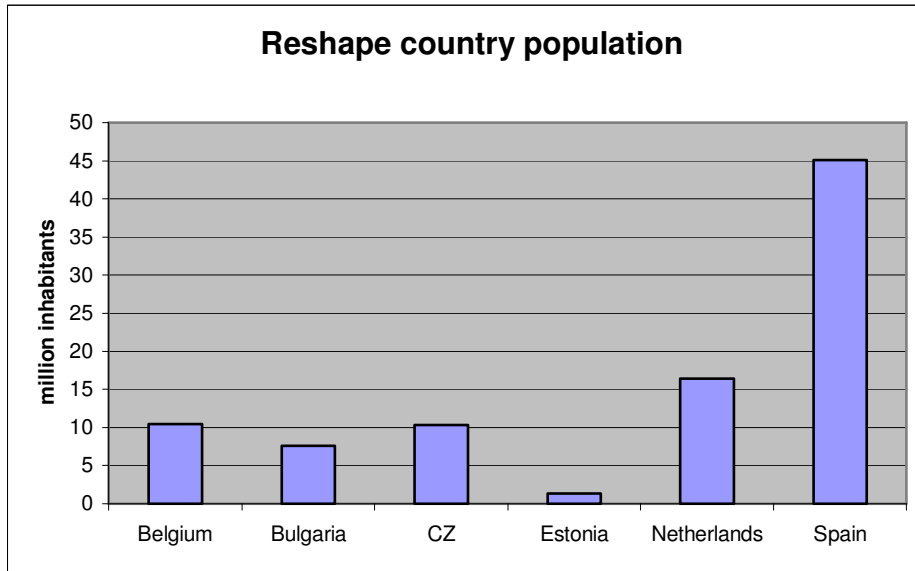
For their part, the Autonomous Communities, as well as signing agreements with the Ministry of Housing, can define both aids supplementary to those defined by the Ministry, and actions apart from the National Plan. The actions outside the National Plan can take the form of different types of aid or protected dwellings and the Autonomous Community exclusively accepts, in this case, the cost of the measures.

Key housing policy statement:

In recent years the key aim of the Central Government housing financing plans has been to increase the proportion of rented dwellings in the Spanish housing stock

2. Social housing sector

Housing key figures



The tables below describe national housing stock, building constructions social housing, energy consumption and cost in six participant countries of the project Reshape.

National housing stock

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Total housing stock	2 250 000	2 127 378	3 827 678	633 000	6 710 000	2 304 942
Social housing stock for rent	137 000	63 821	650 000	13 000	2 350 000	28 876
Social housing stock owner occupied	70.000	?	420 000	443 000	0	56 741
Private housing stock for rent	To be filled in later	0	1 197 678	0	740 000	251 243
Private owner-occupied housing stock	To be filled in later	?	1 560 000	177 000	3 620 000	1 967 999

Ownership structure social housing

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Total social housing stock	150 000	63 821	1 070 000	455 000	2 350 000	85 617
Social housing associations	137 000	0	100 000	0	~2.35 million	
Private social housing companies	To be filled in later	0	170 000	0		
Municipalities	To be filled in later	63 821	150 000	12 000	n.a. (minimal)	
Housing cooperatives / condominium ownership (private)	To be filled in later		650 000	443 000	not considered as social housing	

Building type in social housing stock

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Total social housing stock	137.000	63 821	1 070 000	455 000	2 350 000	85 617
Single family dwellings (ground level dwellings: free standing, row and attached dwellings)	70.000	0	0	0	1 210 000	
Multi family housing – nr. of dwellings:	67.000	63 821	1 070 000	455 000	1 140 000	
Multi family housing – nr. of buildings:	To be filled in later	0	195 270	14 500	n.a.	

Construction periods social housing

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Total social housing stock	6 397		1 070 000	455	2 350 000	85 617
<1960	88 712		58 700	ca 150 000	53 000	441
1960-1980	14 025		344 800	ca 250 000	992 000	58 667
1980-2000	20 173		267 100	ca 52 000	1 190 000	19 610
2000-now			294 400	ca 3000		6 899
Or other relevant construction period categories	3 434		105 000		2 235 000	

Rotation rate

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Tenant change	x	12 059	21 600	x	202 100	x
Tenant change (%)	x	0,567	x	x	8,6	x
New construction rate	2 500	x	10 800	x	13 800	6 132

Building construction social housing

Tables of partners are not comparable. For each country is possible to find out in enclosure.

Energy consumption

There is a big range of consumptions (insulated and non insulated houses.)

These tables described non insulated cases. More details are in country reports.

Energy consumption in an apartment house

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Space heating [GJ/a.dwelling]	x	x	49,7	x	41,6	5,027
Cooling (GJ/a.dwelling) + fans	x	x	0	x	0	0,157
Domestic hot water [m ³ /a. dwelling]	x	x	8,3	x	14,7	96
Lighting [kWh/a.dwelling]	x	x	3,2	x	1,3	245,2
Domestic appliances [kWh/a.dwelling] + pumps	x	x	4,9	x	1,3	2.469
Total final energy consumption [GJ]	x	x	66,1	x	58,9	14,955
Specific. consumption[kWh / m ² floor area]	x	x	229,5	x	277	136,721
Specific energy consumption for space heating and ho	x	x	172,6	x	256	22,893

Energy consumption in a family house

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Space heating [GJ/a.dwelling]	x	x	91	x	47,7	6,964
Cooling (GJ/a.dwelling) + fans	x	x	0	x	0	0,195
Domestic hot water [m ³ /a. dwelling]	x	x	8,6	x	19,1	96
Lighting [kWh/a.dwelling]	x	x	2,2	x	1,4	103,812
Domestic appliances [kWh/a.dwelling] + pumps	x	x	4,9	x	1,9	2.469
Total final energy consumption [GJ]	x	x	106,7	x	70,1	16,421
Specific consumption consumption (kWh/m2)	x	x	148,2	x	216	115,678
Specific energy consumption for space heating and ho	x	x	126,4	x	206	23,883

Energy sources used for space heating in last five - ten years (%)

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Individual or block heating	x	x	10	x	x	0
Electricity	x	36,5	13	100	x	36
Natural gas	x	0,2	15	x	≥95	39
Coal+wood	x	42,3	15	x	x	3
Oil	x	1	2	x	x	22
District heating	x	20	45	x	x	0

Social housing actors

Social housing actors and description of their role is described in each report.

Energy costs in social housing

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Average energy costs	x	x	600-1.200€	770	x	600-1.200€
Average net overall housing costs	x	x	1200 - 2000	960	x	10.000€
Average net family income	x	x	4000-8000	8256	x	14.094€
Energy costs as % of housing costs	x	x	20 ÷ 50	80,2	20 ÷ 50	6 ÷ 12
Energy costs as % of family income	x	x	13%	9,3	4 ÷ 12,5	4 ÷ 8

Fuel costs for end users

	Belgium	Bulgaria	CZ	Estonia	Netherlands	Spain
Electricity [€/kWh] [†]	x	x	0,12	0,06	x	0.100
Natural gas [€/m ³]	x	x	0,35	0,3	x	0.493
District heating [€/GJ]	x	x	16	115,4	x	x
Oil [€/l]	x	x	x	x	x	x

3. Operational process in social housing

Czech Republic

Barriers for renovation in social housing

No.	Barrier	Proposed measure
1.	Necessity for unanimous agreement in decision-making about reconstruction in the case of <i>associations of flat owners</i> ¹	Cuts in demand of a quorum to a qualified majority
2.	High transaction costs for <i>small housing cooperatives</i> ² and <i>associations of flat owners</i>	Higher quality of consulting help in the preparation of projects and their financing
3.	Insufficient credibility of small housing cooperatives and associations of flat owners for gaining loans	Special loan products which accept other guarantees than individual flats, for example guarantees made by ČMZRB, CEEF and funds put up by associations of flat owners
4.	- // -	Acceleration of the process of execution of claims in the case of non-payment
5.	- // -	Introduction of insurance products in the case of inability to execute payment
6.	Low professional level of management and administration of small housing coops and associations of flat owners	Program increasing the level of education and quality of firms providing real estate services
7.	Difficulty with complying to the demands of complex repairs	Only motivate to complex solutions, but not demand them strictly
8.	Demanding administrative work in meeting the requirements for state support	Adaptation of the demands to the context of the size of small housing coops and associations of flat owners
9.	Inability or unwillingness of economically weaker owners of flats to co-finance the renovation of a building	Possibility to take out a reverse mortgage
10.	Low motivation to reconstruction of rental accommodation	Allow costs of a reconstruction to be transferred to rental costs
11.	Low motivation to reconstruction of some flat owners	Tax breaks for investment into renovation
12.	- // -	Marketing renovation – active propagation

13.	Exclusion of non-panelled buildings from access to state support	Change in the rules of the PANEL program and other Ministry of Regional Development programs
14.	Economically weaker owners of flats are not able to carry the financial burden of ownership form of accommodation	Creation of national / regional association which purchases flats including in some cases the debts of owners who are not able to cover the costs for their own accommodation

Best practice solutions to barriers

The first barrier is seen in the necessity to **achieve unanimous agreement** in the carrying out of any type of construction adjustment above the framework of necessary maintenance. This demand hampers all activity of an association of flat owners in this direction. The proposal to **cut the demanded quorum** to a qualified majority and increase the power of statutory organs would make it possible to pass and effectively carry out more serious reconstructions of buildings owned by these types of associations.

Another barrier is seen in the **expert and administrative difficulty** in carrying out a reconstruction, especially for small housing cooperatives and associations of flat owners, which causes serious complications. Overcoming this barrier would help to increase quality and **expand expert technical help** provided by consulting centres in the framework of the PANEL program, or given by other commercial subjects which would help in the process of finding proposals for solutions and increasing the quality of materials for the whole project.

Associations of flat owners and small housing cooperatives are further from the point of view of financial institutions **insufficiently credible partners**, because they have not been established to actually do business and do not have the possibility to sufficiently guarantee loans. One of the solutions could be the **expansion** of these **guarantees** to private funds, bank guarantee programs such as PANEL, CEEF/IFC and loan insurance and building savings, as the case may be.

The low credibility of applicants for loans is a result of the long and complicated execution of debts in the case of non-paying participants. Changes in the law would, however, allow this **process of execution of debts to be accelerated** and introduce for example mortgage law or the setting up of a lien on a flat unit to the advantage of an association, or directly to a creditor, without the necessity of the usual court admissions of claims.

Low credibility could also be raised by introduction of special **insurance products** in the case of “inability to pay” debts which had been incurred in connection with the renovation of a building. The same as insurance which now normally covers the payment of a mortgage, this type could become a part of the loan product for renovation of panelled buildings.

Low interest in loans for the reconstruction of buildings is caused also by the **low professional level of management and administration of the buildings** with small administrators and owners. The raising of this level would be helped by **the introduction of specialised programs** aimed at ensuring complex technical, legal, administrative and other help in the administration of dwelling stock. These could be either voluntary or mandatory for membership in common associations.

Another problem that has to do with gaining state support in the framework of the PANEL program is the **demand for complex repairs**, which is most often quite financially demanding and difficult to fulfil. The solution would be to **motivate to complex repairs only**, but not to force them and thus to allow associations to put off certain phases of repair and renovation for later, but then that these would be realized without state support.

In connection with gaining state support from the PANEL program there is the obstacle of **the great administrative difficulty of working through the prerequisite demands**. Opening of such programs to a wider group of applicants would be allowed by **the adaptation of conditions and rules of providing support** according to the size and type of applicant and the co-financing of its preparation.

Introduction of so-called reverse mortgages would allow associations to **overcome the disagreement** of economically weaker flat owners. This “far side” mortgage would allow associations, by selling off and exchange of flats, to gain payments and the right to further use of the flats of non-paying owners. This mechanism is already used in some countries of Western Europe and North America.

In the case of the sector of rental accommodation with regulated rent, another barrier is **low motivation to renovation** of buildings, and that on the side of the owners as well as renting tenants. Increased motivation would be secured by the **possibility to transfer the costs** of reconstruction to the renters, or possibly to partially deduct the costs from the income tax base of renters.

Also with other forms of ownership there is **low motivation** to renovation. Here motivation would be increased by including those repairs that meet increased energy demands of the construction in a **lower income tax base** or even tax amnesty from real estate taxes.

The above mentioned barrier would also be partially overcome by the introduction of **active marketing renovation**, that is to say purposeful direction of qualified and accurate information together with the presentation of successful projects. This marketing would lead to the attempt to carry out a number of reconstructions at once, in the framework of one project, thereby achieving a smaller total cost.

For owners of flats in **non-panelled buildings** one fundamental barrier is their **exclusion from the program** of state support, PANEL, and other programs of support sponsored by the Ministry of Regional Development. At the same time its

expansion to non-panelled buildings could have the potential to double the size of the group of potential interested parties in renovation.

It has been shown that **economically weaker flat owners are not able to meet the expenses of the private ownership mode of accommodation.** But because of the current rigid conditions on the market with flats, the sale and evacuation of a flat would mean a problem with finding another form of accommodation. **The creation of a national/regional association** which would buy up flats and if necessary the debts of their owners who were not able to meet the financial requirements of this form of accommodation, but would however allow them the possibility to use the form of rental accommodation further, would mean the strengthening of the ownership sector and at the same time help accelerate and ease the process of renovation

Estonia

Renovation process in social housing

The definition of social housing in Estonia is still based on fact that 96% of living stock is privatised and social housing is just in the beginning. Some bigger local governments are or planning to built social houses.

Based on this situation privatised flat owners associations are considered as social housing companies, because they are dealing with similar problems as social housing companies, having a role in renovation processes and energy efficient use in housing. The “soviet time” housing stock has been built in conditions where U value for external walls was designed to be about 1, windows close to 3; hot tap water norm per person was 110 litres per day.

To change those conditions investments are needed and specific support lines (after bank loans) for houses located out of living stock high demand area.

The target to save energy is well advertised and some small support for renovation (10%) from Kredex (in this context - financial support organization for flat owners association, www.kredex.ee) is in limits available.

Common is that windows in the flats are changed by owners individually (usually new windows have U value about 1, 7, envelope and roof are covered by additional insulation 5 – 10 cm (U value after renovation about 0, 3), external wooden doors changed by metal ones and maintained with locks (security).

The renovation process and actions should be agreed by flat owner’s general meeting. Usually this is not the easy meeting and some times the energy audit as the document for planning energy efficient measures for renovation is used to persuade flat owners take decisions. Another problem is the quality of the energy audit.

In long term the renovation of houses gives additional value for the flat price, even the energy specific consumption has not decline, but comfort level might be rise.

Renovation is financed through own financing per used living area m², support from Kredex or by bank loan or by mixture of those possibilities.

Communication process in social housing

Energy price has been rise many times during last 3 years. This gives the reason to think about how to avoid high energy bills, because in average energy costs are usually high in family budget compared with income.

Estonian Union of Flat Owners Associations (EKYL) have given advice to save energy in housing by organizing seminars and training courses, giving advice true organization magazine Elamu about renovation and savings.

This information together with possible 10% support from Kredex has been forcing to make decision to insulate the envelope or make some renovations.

Usually the board of the flat owners association (based on one house) is the initiator of the energy savings related renovation process in house.

Usually the board members have been participating in some of the events organized by EKYL.

With the help of energy audit or energy consumption analyse the board member or leader will prepare report for the general meeting and after that the general meeting will agree or not the energy related renovation and financing.

Barriers for renovation in social housing

Main barriers are that the general meeting members are in very different understanding level about energy systems and energy saving possibilities in house and also social background is different.

For one flat the energy does not mean anything, for other the cost of energy is really important meaning that possibilities not only for pay the energy bill but also pay for the planned renovation are different. This makes the decision process of general meeting difficult.

The level of understanding is possible to improve by giving lectures or producing articles for flat owners, but improve the level of income and capability to finance the renovation measures is more difficult.

Best practice solutions to barriers

We can find couple of really good examples about energy efficient renovation of flat owners association houses. The main factor for success is the homogenous common understanding between flat owners (decision makers) about the importance of energy savings and also understandings about how to save energy with the help of renovated envelope, new windows and installed equipment (thermostatic valves). Good example is also the individualism – only after installing heat allocators to the radiators specific energy consumption has been drop.

- Training for energy users – flat owners
- Individual accounting and measuring system

Netherlands

Renovation process in social housing

In The Netherlands housing associations are owners and investors for social housing. Social housing organisations are entrepreneurs with a social objective. The smallest owns 22 dwellings, the largest more than 70.000. In total the social housing organisations in The Netherlands manage 2.4 million dwellings. Social housing associations continuously maintain and improve the quality of their building stock by regular maintenance programs, renovations, demolition and new construction.

Housing associations typically develop long term maintenance plans. Based on typical maintenance intervals and yearly inspections long term maintenance budgets are reserved and kept up to date. Typical intervals for regular maintenance are: roofs 36 years, windows 30 year, kitchen 20 year, painting 6 year. Regular maintenance activities have no impact on rents and are decided by the housing association.

Large scale renovations that improve the housing quality require a rent increase; approval of the rent increase by the tenant is required. In the case of apartments buildings collective renovation can be done if a minimum of 70% of the tenants agrees on the renovation and the related rent increase. Sometimes with disapproval by the tenant, the housing association may still decide to renovate without rent increase. The pay back on investment by a rent increase than needs to wait for a tenant change. For a new tenant the rent can be adjusted without approval as long as the rent stays does not exceed the maximum allowed level. The housing association always makes the investment decision.

Most housing associations work with long-term strategic asset management plans. In these plans the housing stock is categorised and labelled according to target group, building quality, popularity and market value. Dwellings receive labels like: improve, maintain, sell, demolish/new construction. Furthermore desired quality levels can be attached to dwelling categories (single family dwellings, apartments) and target groups (starters, families, singles, senior people). The strategic asset management plans form the basis for building improvement planning.

Communication process in social housing

Communication towards new tenants

Housing associations mostly advertise vacant dwellings on their website and in local/regional papers. Mostly the advertisements contain a picture, a short description of the type and size of the dwelling (number of rooms), rent and service costs. Potential tenants that meet the criteria (max. income, local housing

permit) can apply for these dwellings. Tenants can be selected based on urgency, time on the waiting list, response time.

Typically energy costs are not communicated.

Communication on renovations

- For renovations that require a rent increase, approval of the rent increase by the tenants is required. In the case of apartments buildings collective renovation can be done if a minimum of 70% of the tenants agrees on the renovation and the related rent increase.
- Tenants can be organised in local tenant committees that are consulted as tenant representatives by the housing association on relevant issues like renovations.
- Normally housing associations distribute information regarding renovations and may organise information sessions as well for tenants.

Barriers for renovation in social housing

The major barriers for investments in energy saving measures are:

- The investments are for the housing association, the savings are for the tenant.
- Rent increases that enable the recurrence of the investments are legally regulated and maximised.
- Recurrence of investments by rent increases is only possible with the consent of the (majority of the) tenants. Tenants may not agree on higher rents in return for lower energy cost because they do not believe the promised energy savings will be met in practice.
- Investing in energy efficient or renewable energy systems may lead to rents above the rent cap for state rent subsidies. People lose their rent subsidy which makes the energy efficient dwellings unaffordable for lower income groups.
- The main interests of tenants focus on improving: comfort, health, safety, lower costs not on energy saving. However with the increase of energy costs energy costs more and more become a topic.
- Housing associations make covenants with municipalities regarding the number of dwellings with maximum rents they keep available for the target group of low income people. These covenants are normally based on maximum rent agreements. This impedes quality investments in dwellings for low income groups as the investment cost can not be recurred by rent increases.

Best practice solutions to barriers

In the Dutch legal and institutional social housing context some good practice examples for overcoming the barriers mentioned are:

- **The ‘robin hood’ principle:** Housing association mix social rent and commercial rent or sale dwellings in new construction. The profits that can be realised in the commercial part finance measures taken in the social rent dwellings.
- **Social housing association as Energy Company:** Investing in energy efficient or renewable energy may lead to rents above the rent cap for state rent subsidies. Even in the case the lower energy costs would compensate the higher rent, people would lose their rent subsidy which makes the energy efficient dwellings unaffordable for the lower income groups. When the housing association invests in a collective efficient energy infrastructure providing heat, the installations can be left out of the dwelling and out of the rent. This keeps the rent below the social rent cap. Heat is sold to tenant for the nationally regulated maximum heat price that enables recurrence of the investment by the housing association.
- **Outsourcing of energy supply / lease constructions:** Similar to the housing association becoming a ‘energy company’ energy supply can also be outsourced to commercial Osco’s (energy service companies) that are eligible for profit tax deduction schemes or other incentive schemes only available for the profit sector.
- **The overall housing cost guarantee:** There is a barrier that tenants do not to agree on higher rents in return for lower energy cost because they do not believe the energy savings will be met in practice. Housing associations have successfully experimented with guarantees for overall housing costs (rent plus energy costs). Tenants agree on a higher rent for renovations which include also energy saving measures and the housing association guarantees that the energy cost savings are met and compensates financially if the promised saving is not met. The savings guarantee is given as average saving on a block or district level in order to average out the individual user behaviour on the savings.
- **Integral renovation packages:** The implementation of energy saving measures may also improve comfort and health in dwellings. If in addition the related rent increase is compensated by a lower energy bill, the consent of tenants on a rent increase for the overall quality improvement package is more likely.
- **Embed energy measures in regular maintenance** schedules (natural moments): when the boiler is at the end of it’s lifetime it needs to be replaced, the additional costs for a high efficiency boiler are relatively low and consent of the tenant for a related limited rent increase is more likely. The same holds e.g. also for the renovation of window frames at the end of their life time and the implementation of high insulating glazing.
- **Communicating energy cost and integral housing cost** based on energy performance certification: Energy performance certification becoming obliged under the EPBD enables the communication of energy consumption as well

as energy costs to prospective tenants. Low energy homes with higher rents, but lower energy costs, may than become more attractive for prospective tenants. This will create a stimulus for investments in energy saving measures by housing associations.

- Embed **integral housing cost in performance covenants** with municipalities: Housing associations make covenants with municipalities regarding the number of dwellings with maximum rents they keep available for the target group of low income people. These covenants are based on maximum rent agreements. This impedes quality investments in dwellings for low income groups as the investment cost can not be recurred by rent increases. Energy performance certification enables basing these agreements on maximum housing costs (rent and energy costs) instead of maximum rents. This enables investments in energy saving measures as long the required rent increases are compensated by lower energy costs.

Spain

Barriers for renovation in social housing

Type of Barrier	Name	Description
Financial	Low purchasing power of the owners of social housing.	Large investments in renovation projects cannot be made.
	Non-existence of public budgets directed to energy renovation.	Ambit still not a matter on political agendas.
Technical	Difficulty of intervention in occupied dwellings.	Problem at the time of doing the renovation, because the owners or tenants have to be removed.
	Lack of information in order to give priority to actions for the improvement of energy efficiency.	Great diversity between the dwellings of the existing stock.
	Serious deficiencies in the existing social housing stock (habitability)	These deficiencies have meant that the existing budget is used up simply to overcome them.
Legal	Regulations on energy efficiency directed to new works.	The current regulation on energy efficiency does not cover old works.
	The rent of dwellings is not increased according to their energy quality.	The current regulation does not consider energy efficiency in dwellings as an important factor.
Organisational	Complex procedures in applying for aid.	The administrative process that has to be gone through to apply for aid is complex, so that some applications never actually get through.

4. EPBD status and role in social housing

Belgium

Legislation

The implementation of the EPBD is a regional matter. Three legislation processes are ongoing in the three Regions. Some aspects of the implementation process should be common to all regions or at least similar approaches should be adopted even if final decisions still have to be taken. A considered option for the certification process of the existing residential buildings is the conversion of the existing Energy Advice Procedure (EAP), currently applied in the whole country on a voluntary basis.

The Flemish region has since the beginning of 2006 a regulation for new buildings complying with the EPBD. The energy certificate for these buildings will be produced via this regulation (EPW and EPU). This regulation only contains a calculation procedure and doesn't give any indication on how to collect data in existing buildings. The time schedule relative to the introduction of the energy certification of the other types of buildings has also been announced. For existing residential buildings the existing Energy Advice Procedure could be converted to a certification procedure.

In the two other regions, the development of the new regulations is ongoing. No official position about energy certification has been taken yet. For existing residential buildings, the converted version of the EAP could also be used.

Actors

Actor	Description specific role of actor for EPBD implementation
Vlaamse Energie Agentschap (VAE)	Administration for Energy - Implementation of the EPBD in Flemish Region
Direction Générale des Technologies et de la Recherche (DGTRE)	Administration for Energy - Implementation of the EPBD in Walloon Region
Bruxelles Environnement	Administration for Energy - Implementation of the EPBD in the Brussels Region

Calculation of energy performance

Name of tool / calculation method	Description of tool or calculation method	Status of the tool / method
EPBD	Software tool to calculate and check if a new building project fits with the new Flemish EPBD regulation	available since May 2006

The Flemish region has since January 2006 a specific regulation for new buildings (residential buildings / offices and schools) complying with the requirements of the EPBD. For the other type of buildings, specific procedures for the calculation of the energy performance still have to be adopted. A single tool implementing the regulation allows treating all types of buildings. The energy certificate for new buildings will be directly produced via this tool.

The regulation on itself is designed for new buildings and does only contain a calculation procedure. All necessary data needed to realize the calculation have to be obtained via the file (plan of the building and/or product data). The regulation doesn't say anything about the way to collect information in existing buildings nor about recommendations to improve the building.

Experts

Type of expert	Description of expert including it's qualification	Nr. available
Agreed energy expert	Architect, engineer architect, civil engineer or industrial engineer	326
Expert for voluntary energy advice of existing residential building	Any person having a degree of the secondary school may follow the training (if succeed an entrance test) followed by an exam	326

Quality control

Qualification for experts: Experts need to follow a training course in a recognised training facility. They need to be architect, engineer architect, civil engineer or industrial engineer.

Training facilities for experts: The Flemish governments is working together with the Sinatra training facilities which are used to give continuous training to technical man and professionals of the building sector

Control mechanism: The Flemish region will organise the control of the quality of the experts and of the results (candidate files, checks on-site,)

Certificate

The official certificates that will be valid in Belgium are not officially available yet. A draft version of the certificate for new building in the Flemish Region has been presented.

The voluntary energy advice procedure delivers also documents to the end-users. One of these documents is an attest (not the certificate!) of the energy performance of the building. The documents are also containing the advice on itself. The advice contains a.o. a description of the current situation as well as technical documentation and tailor-made recommendations adapted to the specific building analysed.

Czech Republic

Legislation

Basic requirements were put into the Czech legislation by act 406/2000Sb. And improved by act 177/2006Sb. Some of § are in use from beginning, the others comes in January 1/2007 and the last one Jan 1/2009. Energy demand of a building is described in §6a. Methodology, certification and minimal requirements will be described in improved regulation nr. 291/2001Sb and 213/200Sb.

Technical standards going with act and regulations are:

ČSN 73 0540 – thermal requirements of buildings

ČSN EN ISO 1379 or ČSN EN 832 are harmonised by EN standards which are used for calculation of heat demand

ČSN EN 12831 – calculation of heat power

ČSN EN 12 828 – requirements for heating system

prEN 14 335 – put forward EU standard for evaluation of technical equipment of building

prEN 15378 – put forward EU standard for checking of boilers and heating systems.

Actors

Actor	Description specific role of actor for EPBD implementation
MPO	Ministry is a supervisor of preparation of all documents to be completed and in time
ČEA	Agency organizes the whole process of preparation EPBD for implementation
Regional authorities	Regional authorities prepare their staff to new conditions of evaluation energy demand of building

Calculation of energy performance

Name of tool / calculation method	Description of tool or calculation method	Status of the tool / method
Name of tool / calculation method	Description of tool or calculation method (please specify if the tool/method complies with certain standards)	Status of the tool / method
National methodology of calculation of energy demand of building	This tool is gone fully with EU requirements. It is based on balance evaluation. Benchmark of the evaluation is annual consumption of energy.	On going

Experts

Type of expert	Description of expert including it's qualification	Nr. available
Energy auditor	Energy auditors are certified. For new conditions there will be trained.	250 - 300
Authorised engineer	Authorised engineers are specialist for various technical branches. Their capability will be used for demanding tasks. Special training will be prepared.	3000 - 4000

Quality control

In 2006 several seminars were done for energy auditors, authorised engineers and staff of ministry, regional authority and municipality. EPBD was performed like a very important document which in the next years comes to life.

In 2007 and 2008 training facilities for experts and qualification continue

Certificate

Estonia

Actors

Housing actor	Description specific role of actor for social housing	Nr. of actors
Ministry of Economy and Communication	Department of housing and constructions coordinates housing in Estonia	1
Estonian Union of Cooperative Housing Associations	Provides services and defends the interests of housing cooperatives and associations	1
housing cooperatives and associations	manage and maintain their buildings	8500
municipalities	provide municipal housing	250
state foundation Kredex	gives out state subsidies on housing	1

Netherlands

Legislation

Element of EPBD	Status	Expected date of full implementation
Adoption of methodology	No	January 1 st , 2007
Energy performance requirements	Yes	1995
New buildings: alternative systems	No	January 1 st , 2007
Existing buildings energy performance certification	No	January 1 st , 2007

The implementation of the Energy Performance of Buildings Directive in The Netherlands falls under the responsibility of the Ministry of Housing, Spatial Planning and the Environment. On November 1st 2005 the Dutch government notified the European Commission on the status of the implementation of the EPBD in the Netherlands. The Netherlands fully underlines the importance of the EPBD and strives for a full implementation of the Directive. The Dutch government aims at complete implementation of the EPBD in the Netherlands, from January 1st 2007. The first step is the training and accreditation of assessors or inspectors who will then be qualified to issue the Energy Performance Certificate. Once the Netherlands has sufficient qualified inspectors, the Energy Performance Certificate will become mandatory for every transaction in the building sector.

Actors

Actor	Description specific role of actor for EPBD implementation
Ministry of Housing	Responsible for implementation of the EPBD legislation in The Netherlands
SenterNovem	National energy agency on behalf of the ministry responsible for the development of the methodology and EPBD implementation.
Stichting KBI	Responsible for the development of the certification system for experts

Calculation of energy performance

BRL9501 - For existing dwellings the calculation method and software tool need to comply with BRL 9501 describing the quality of the calculation method according to ISSO-publication 54 'Energie Diagnose Referentie (EDR) - eengezinswoningen en kantoorgebouwen'. A national software tool exists EPA-W 4.02. Other software tools developed by market actors can be become certified according to this BRL9501.

Experts

Type of expert	Description of expert including it's qualification	Nr. available
BRL9500	Update of existing national accreditation and certification scheme BRL9502 en 9503 according to 'EPBD requirements. The organisation is certified, not the individual expert.	
BRL9502 existing	In the current voluntary Energy Performance Advice (EPA) scheme approximately 200 full time units (FTU) of experts are available. For EPBD implementation approximately 1000 FTU's are required. In 2004 more than 130 certified expert companies were registe	200FTU

Quality control

Quality control in EPA-W scheme for existing dwellings

In 2002 the Council of Acknowledgement agreed to a final version of a process certification system for energy audit companies for dwelling (BRL9502). With these final terms the five certification institutes, established in the Netherlands, could officially start certifying EPA companies.

For the following topics quality requirements are set in these final terms for certified EPA audit companies:

The advice (the EPA-report, the use of certain EPA-software, monitoring file);

The process (scope, assignment, preparation, inventory of recent situation, choice of energy saving measures, delivering advice);

The company (registered with the Chamber of Commerce, third-party insurance against damage following the giving advice (in so far as this damage is attributable to the advice), personnel, tools and instruments);

The internal quality control (general, quality handbook, quality policy, responsibility/competence, internal quality chart, description of procedures, requirements of procedures);

The external quality control (access procedure, follow-up controls, dealing of complaints by certification institute);

The process certificate.

The certification institutes check randomly chosen projects. The number of checks depend on the number of EPA's reported.

The minimum educational levels for experts of the EPA scheme are (this level is required for at least one person of an EPA consultancy company):

Level of basic education:

Higher vocational education (HBO) in the fields of civil, mechanical or electrical engineering,

or an intermediate vocational education + (MBO+) in the same fields with additional training on building physics or installation engineering.

Level of additional training:

Training for EPA consultants given by one of the recognised training centres.

Experience:

Several years' experience in the field of energy conservation techniques (knowledge of matters relating to comfort and indoor environment is a must).

The EPA consultant must also have advice skills (communication, anticipate on the wishes of the client).

The consultants do not have to be certified themselves, the organisation however has to be certified based on the process certification scheme. As described above at least one of the consultants needs to meet the minimum requirements on education and experience. In practice this can result in EPA's done by under qualified persons.

In 2005 the ministry of housing has started a development for updating this certification system with the goal to meet EPBD criteria and improve the quality of the process certification system. Draft terms were published and made public for feedback.

Certificate

The implementation of the EU Directive on the Energy Performance of Buildings (EPBD) in the Netherlands will make it compulsory to present an Energy Performance Certificate to the new owner or tenant of any house that is sold or rented out. The Dutch government has decided to introduce a simple and concise mandatory EP certificate that can be supplemented on a voluntary base by a more comprehensive tailored advisory report, like the existing tailored Energy Performance Advice (EPA). The tailored advice goes further than the planned EP certificate, which only shows current energy performance and offers a standardised list of cost-effective improvement measures.

No certificate lay-out has been published so far.

Spain

Legislation

Element of EPBD	Status	Expected date of full implementation
Adoption of methodology	No	Unknown
Energy performance requirements	Partially	Unknown
New buildings: alternative systems	No	Unknown
Existing buildings energy performance certification	No	Unknown

Minimum criteria's for new building and major renovation projects, and certification scheme for buildings.

In March 2006 the Spanish government adopted and publish the new Spanish building code (CTE: Código Técnico de la Edificación, RD 314/2006) as part of the implementation of the EPBD. For energy issues (HE) the building code will become into force as from 29th September onwards. The CTE set the minimum national criterias for new buildings and major renovation projects divided into 5 major parts:

HE1: Limitation of energy demand for buildings

HE2: Efficiencies climate installation (heating and cooling)

HE3: Energy efficient lighting

HE4: Minimum contribution solar thermal energy (all buildings)

HE5: Minimum contribution solar PV (all non-residential buildings)

Actors

Actor	Description specific role of actor for EPBD implementation
Ministry of Housing	Development of the regulating framework. Definition of the basic requirements to be met by the methodology of calculation for energy certification.
Ministry of Industry, Tourism and Trade	
IDAE (Institute of Diversification and Energy Saving)	
AICIA – Seville University Higher School of Engineers	Development the computer tools of CTE and certification (LIDER and CALENER)
General Directorate of Housing	How certification will be introduced in Catalunya. The Government will define who will do this and how. Also what the procedure will be and accreditation of the bodies or entities of Control and independent technicians to do it.
	In charge of inspection.
	Definition of the processes of renewing the certificate.
	Development of documents recognised for Catalunya.
ICAEN	Development of tools of certification alternatives, specific to the Catalan territory.
Advisory Committee for Energy Certification (under the Ministry of Industry, Tourism and Trade)	Created to develop all the competences of the Government in matters of certification of energy: maintenance and updating of certification procedures, analysis of results, exchange of information with all the agents involved and definition of requirements
Building and installations project planner	Project certificate.
Professional construction management	Certificate of finished building
Developer	Delivery of Certificate to the competent authorities.
External control entity	Organisation, entity of control or independent technician who evaluates the veracity of the certificate
Owner	Renewal of certification every 10 years. Obligation of delivering this information to the vendor or tenant of the building.

Calculation of energy performance

Name of tool / calculation method	Description of tool or calculation method (please specify if the tool/method complies with certain standards)	Status of the tool / method
LIDER	Not for Certification but for fulfilling the CTE – DB HI	Final version is available in http://www.codigotecnico.org/index.php?id=33
CALENER VYP	Certification tool for new residential and little non residential buildings. It is no officially available. For the Reshape project Adigsa is working with a draft version.*	Under development
CALENER	Certification tool for the rest of non residential new b	Under development
Alternative Tools	Certification tool for new residential buildings for Cat	Under development
	CEPEC tool. Developed by Energy Agency of Barce	Developed in CEPEC European project

Experts

There are no official experts because there are no official tools available.

Quality control

There is no quality control because there are no certification official tools.

Certificate

At the moment there is only a draft version described in the latest draft versions of royal decree about new buildings energy performance (See annex 1).

It will give information about:

A letter of certification (in composition of minimum energy requirements of new CTE).

Energy consumption per year and per m².

Carbon dioxide emissions per year and per m².

5. Energy performance of the housing stock

Belgium

Country specific preparatory work

In Belgium VMSW has been focused only on the north region, so called the Flemish region.

- Exchange of information on building stock of VMSW and working on available database
- Meeting with Ecofys and Woonwell planned in September 2006

Selection of reference dwellings

The building stock owned by the partner VMSW represents almost 90% of the building stock of Flanders. There are more than 137.000 dwellings with a majority of small one-family houses. Buildings with apartments higher than three building layers represent only 25% of the dwellings.

The database of VMSW (ex-VHM) is used to classify the buildings.

The database is composed of almost all the 136.000 dwellings of the VMSW.

The main figures are the number of dwellings per building, the type of dwelling (housing or apartment), the number of building layers, type of roof, type of heating (collective or not, type of energy), the state of the façade and the glazing (simple or double glass).

The aim is to use the information we have with this database to classify the buildings and to make a selection on dwellings.

The aim is to link the available data's with an Energy level. All the buildings were classified in several categories. The first criteria are the building's type; apartments (A) and houses (H). For the apartments a difference is made for the buildings having more or less than three floors (Low Building and High Buildings). The second criteria are the building's year. There were five different milestones identified: 1950, 1983, 1994 and 2003.

Before 1950 there are not so many buildings and they are spread around 30 years with less than 5% of the total amount of housings. In 1981 the VMSW set a minimum level of energy performance for new housings of K70. We assume that two years later all the projects were at this energy level. In 1994 this energy level was set at K55. In 2003 the energy level was set at K45. The category with the buildings between 1950 and 1983 were divided in three sub-categories. The buildings that never were renovated, the buildings that get a small renovation in the past with changing the windows and getting double glass and the buildings that were totally renovated is third sub-category.

EPC audits

The building stock owned by the partner VMSW represents almost 90% of the building stock of Flanders. There are more than 137.000 dwellings with a majority

of small one-family houses. Buildings with apartments higher than three building layers represent only 25% of the dwellings.

The database of VMSW (ex-VHM) is used to classify the buildings.

The database is composed of almost all the 136.000 dwellings of the VMSW. The main figures are the number of dwellings per building, the type of dwelling (housing or apartment), the number of building layers, type of roof, type of heating (collective or not, type of energy), the state of the façade and the glazing (simple or dubbel glass).

The aim is to use the information we have with this database to classify the buildings and to make a selection on dwellings.

The aim is to link the available data's with a Energy level. All the buildings were classified in several categories. The first criteria is the building's type ; apartments (A) and houses (H). For the apartments a difference is made for the buildings having more or less than three floors (Low Building and High Buildings). The second criteria is the building's year. There were five different milestones identified : 1950, 1983, 1994 and 2003.

Before 1950 there are not so many buildings and they are spread around 30 years with less than 5% of the total amount of housings. In 1981 the VMSW set a minimum level of energy performance for new housings of K70. We assume that two years later all the projects were at this energy level. In 1994 this energylevel was set at K55. In 2003 the energylevel was set at K45. The category with the buildings between 1950 and 1983 were divided in three sub-categories. The buildings that never were renovated, the buildings that get a small renovation in the past with changing the windows and getting dubbel glass and the buildings that were totally renovated is third sub-category.

A selection of projects was done regarding to the representativity of the different heating systems (collective, individual) and heating sources (gas, oil, electricity).

The database of the VMSW was used to make a selection of the different projects regarding the available parameters.

Czech Republic

Country specific preparatory work

A team of auditors prepared a plan with various types of constructions and heating systems for social housing with various owners – municipality, condominium etc. All types of these buildings were chosen and worked out the plan of auditing.

Selection of reference dwellings

From fifties to nineties there were built 13 various constructions with additional modifications. We aimed only to basic constructions and various sizes. All thirteen types were panel houses. Houses of schools which have been reconstructed to senior houses and other specific municipal buildings were

included, too. The houses had different grade of wearing out and modernization. It was done about hundred energy audits.

EPC audits

The plan covered all types of panel houses and some other brick houses. Results of this audit cover proportionally the construction structure.

EPC for communication to tenants

All energy audits were done by the old methodology because new one was not prepared at the time. The difference between new and old methodology is that all consumption of energy is calculated into the new specific value instead of old criteria uses only energy for heating.

Energy quality of the housing stock

All non modernised panel building need additional thermal insulation. We recommend 120mm polystyrene or other insulation the same quality to remove thermal bridges.

Thermo insulation for roofs and ceilings of non heated areas are calculated individually. We calculate with requirement values of construction or recommend ones. New windows have $k = 1,1 - 1,7 \text{ W/m}^2 \text{ K}$ and better.

Energy audit contains a set of recommended measures. Some of them touch construction but many of them are about heating system, energy management etc. We separate them into low cost group and others. Low cost measures can be realized relatively quickly and can be paid from savings – EPC financing. The others need financial support.

Questionnaires with found out data were presented to tenants of condominium. Dwellers did not imagine that their house needs retrofit. In spite of the possible savings they did not solve the new situation. They were very careful and at the third meeting they decided to replace only windows. The project would pay dwellers themselves.

Experience from several meetings with tenants show that main problem is not money but imagination that something wrong with their building. They realize that should pay for reconstruction of lift, envelope of their building, replacement of piping system of hot water and plane water etc. There are several methods how to do it. All of them are necessary to tell them. Decision making process is long and managers have to be patient.

Financing of retrofit can be done by:

- own money (smaller projects),

- bank loan
- Energy performance contracting

Estonia

Country specific preparatory work

Selection of reference dwellings

EPC audits

EPC for communication to tenants

Energy quality of the housing stock

Netherlands

Country specific preparatory work

Selection of reference dwellings

EPC audits

EPC for communication to tenants

Energy quality of the housing stock

Housing Association Etten-Leur (WEL) is a local social housing association active in the municipality of Etten-Leur. WEL employs 60 staff members. The housing portfolio amounts to 4.500 dwellings of several types, all built after 1948. The portfolio predominantly exists of single family dwellings, in the last years more apartments have been built. The client base exists of 4,500 regular tenants and 6,000 potential tenants; mostly Dutch, partly covering a lot off different nationalities. Separate to the rental activities WEL runs a sales program of new and existing houses. Planned investments for the coming 4-5 years amount to €200 million.

WEL is an ambitious housing association and intends to do more than its primary tasks: building, renting out and maintaining dwellings for low income groups. From a an environmental and social responsibility perspective, but also in order to keep energy cost low and dwellings affordable for it's target group, housing association Etten-Leur aims at investing in innovative energy saving projects

WEL works strongly client focused and based on information gathered trough a client interest's survey system (Woonwensenwijzer) is well informed on the interests of (prospective) tenants. This enables WEL to tune the programs for development of new housing complexes, improvement of existing services and development of new services. A good communication on housing quality in relation to housing cost fits in this approach.

WEL aims at:

- Give tenants insight in the provided housing quality in relation to the overall housing cost

- Communicate on integral housing cost (rent plus energy costs) instead of only rent.
- Embed information on housing quality and energy quality and cost in strategic asset management
- Embed information on integral housing cost and quality in performance covenants with municipalities. This could facilitate investments in energy saving measures.

These aims connect well to the introduction of the EPBD energy certificate. The certificate can be used as a tool to communicate energy quality and related energy cost to tenants. By communication on integral housing cost (rent plus energy costs) and housing comfort, energy efficient and comfortable homes with higher rent become more attractive than 'cheaper' dwellings with low comfort. Lower rent but high energy costs.

These aims also connect well to the goals of the Reshape:

- Testing the opportunities for embedding energy certification in the operational processes of social housing actors
- Test the potential added value of energy certification in the communication to tenants and for strategic asset management .
- Knowledge exchange with and to other housing actors.

Spain

Country specific preparatory work

- Training seminar's content

One of the country specific preparation works in Catalunya/Spain consisted of a training course for the technical staff of ADIGSA in order to use the official national tools needed for Building Energy Certification.

This seminar was subcontracted to Ecofys SL and had as main points the new Building Code (CTE) and the tools (software) needed to fulfil the requirements of the CTE and the Energy Certification of Buildings.

The seminar was organized in 9 (I count only 8) different sessions of 3 hours of duration.

- Session 1: the RESHAPE project, the new Building Code, CTE (Código Técnico de la Edificación), the specific document related to Energy Saving, DB HE 1. In this first session was given an explanation about the two methods that can be used for fulfilling the DB HE 1 Limitation of Energy Demand. These two methods are the Simple Method (compare buildings values against minimum

requirements) and the General Method (standard calculation method). This second one uses a tool that is also necessary for the Energy Certification of the Buildings. This tool is called LIDER. This lesson also worked on Energy Certification of Buildings: what is it? Why is it necessary? The EPBD European Directive. The transposition of the Directive in Spain.

- Session 2: introduction to the tools of Energy Certification of Buildings, LIDER, LIDER VMPT I CALENER-VPMT.
- Session 3: Energy Certification of buildings. Examples.
- Session 4: Energy Certification of buildings. Examples.
- Session 5: Energy Certification of buildings. Reshape buildings.
- Session 6: Energy Certification of buildings. Reshape buildings.
- Session 7: Energy Certification of buildings. Reshape buildings.
- Session 8: Energy Certification of buildings. Reshape buildings.
- Session 9: Energy Certification of buildings. Reshape buildings. Questions and discussion

- Training seminar's evaluation

During the training seminar, some barriers for the application of the official tools for fulfilling the building code (CTE) and the energy certification have appeared. See below for a summary of these barriers:

The tools to fulfil the CTE DB HE 1 (LIDER) and the Energy Certification of Buildings (CALENER) were not the final versions. Because of that, many problems occurred related to the use and calculation of the software (software bugs, etc).

LIDER and CALENER are both quite complicated tools to use. They are simulation tools and the amount of data needed and the 3D introduction of the building is complicated. Tools are not adapted for existing buildings (yet)

The tools are not flexible to changes neither to solve errors. It is not user friendly. The amount of time needed to introduce a building is high. For a standard simple cubic building, at least 30 hours are needed to introduce all the data for the calculation of the certification.

The results coming out from the tools are poor. LIDER only shows if the building fulfils or not the CTE DB HE 1 requirements, without helping the designer to re-design the building in case of not fulfilling. CALENER gives only the Energy Certification without telling where or what are the main points in the objective building. The results coming out from CALENER give the results in the amount of energy use and CO2 emissions.

Apart from the barriers shown above, the evaluation of the training course was good. The ADIGSA staff is now capable to use the tools needed for fulfilling the CTE DB HE 1 (LIDER) but not the future Official Certification Tool in Spain, CALENER VPMT (VYP). The seminar has reached almost all the set objectives: dissemination of the new Building Code CTE and how it is related to the EPBD about Energy Certification of Buildings. The Energy Certification results of the ADIGSA buildings are still under preparation, mainly because of the tools.

The general evaluation of the training preparatory work is positive.

Selection of reference dwellings

Adigsa housing stock

Type	Year built	Dwellings	Percentage
Old Works (developed by central gover	1930-1980	58,613	68
New Works (developed by the Government of Catalunya)	1980-2006	26,509	31
Unknown	...	495	1
TOTAL		85,617	100

In relation of the difficulties find with future certification tool in Spain (CALENER) Adigsa is evaluating a new strategy to obtain useful and interesting results for the energy improvement of refurbishment practices. There are two other new certification tools (one developed by the Barcelona Energy Agency, and the other under development by ICAEN, Catalan Energy Agency) but they are under development and focused in new buildings too..