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**Low energy and low cost social housing
for enlarged Europe
Acronym: LOCOSOC**

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EXECUTIVE SUMMARY

Although there is no common housing policy of the European Union (EU), all the EU member states (with the only exception of Greece) have the social rental housing sector composing between 3% (Spain) and 40% (Netherlands) of the total housing stock. In most of the EU accession countries a large privatisation of former state-owned housing stock has taken place. In some of them the rest of rental flats (mostly in ownership of municipalities) after the privatisation does not form, however, a marginal share, except the Czech Republic.

The rental housing construction decreased geometrically during the transition period in most of the EU accession countries due to the cuts in state/municipal housing expenditures and lacking private interest in such sector. This system leads to the partially artificial perception of lack of flats, to the rise in market rents and to the strengthening of social tensions between poor and rich households. The share of higher income households profiting from the rent regulation in the "social" sector is much higher in the EU accession countries with (e.g. Czech Republic) than in the EU countries and the real lack of housing allowance model worsen the situation of households of low income population and mostly pensioners.

In some of the EU accession countries the legislative conditions for new social housing construction (housing associations) have been prepared. Nevertheless the progress is still rather slow.

The paper presents information on the development in the sphere of "social" housing in 3 EU member states (Austria, Greece, the Netherlands) and 4 EU accession countries (Bulgaria, Czech Republic, Latvia, and Slovakia). Social housing policies in these countries have been analysed. The technical standards for energy consumption for space heating have been reviewed by country and conditions for implementation of low energy and low cost housing were identified.

The barriers to low energy and low cost social housing were identified in the following fields: legal, institutional, technical, awareness and financial.

Finally, conclusions on the outputs of the work are presented in the report and recommendations for next steps of the work are given as follows:

- ◆ To formulate recommendation for overcoming the barriers to low energy and low cost social housing;
- ◆ To increase awareness on low energy and low cost social housing among various groups (investors, municipalities, officers, architects, students, general public); and
- ◆ To develop a feasibility study of low energy and low cost social house by EU accession country participating in the project.

1. INTRODUCTION

The current Working paper was developed as a summary report of outcomes of the WP1 *Analysis of the sector and barriers* within the SAVE project *Low energy and low cost social housing for enlarged Europe*. The Working paper is based on background analytical studies prepared for each country of the project consortia by members of project teams. The paper was developed by the project team members from ENVIROS in close collaboration with other project team members.

The project includes 3 EU member states (Austria, the Netherlands and Greece) and 4 EU accession countries (Bulgaria, Czech Republic, Latvia, Slovakia). of which 3 have been accepted to join EU member states in 2004 and one (Bulgaria) is assessed for joining the EU in the following years (probably 2007).

The country reports for the following countries were prepared as follows:

- ◆ Austria – KWI and ACE Group
- ◆ Bulgaria – Sofia Energy Centre
- ◆ Czech Republic - ENVIROS
- ◆ Greece - Kantor
- ◆ Latvia – EKODOMA
- ◆ Netherlands - ECN
- ◆ Slovakia – Energy Centre Bratislava.

The working paper includes an assessment of patterns of existing energy policy and framework, patterns of technology and energy usage, legal environment, infrastructure, financial conditions of low energy and low costs social housing. Key financial, incentive, technical, information/awareness and legal/institutional barriers to innovative technologies that prevent the implementation of RUE and RES for the sector are identified as well as barriers for low energy low cost social housing in CEEC's. The working paper also deals with identification of barriers (institutional, legislative, financial, technological, awarness and other barriers) for old residential buildings retrofitting and ways to be addressed them. The current state-of-the-art of energy consumption and corresponding CO₂ emissions of existing and new social buildings in selected EU and accession countries by means of case studies are documented.

1.1 Identification of problems

A huge number of citizens in the CEE countries are facing problems with high living costs in which housing costs make higher and higher share. The low income of households and relatively high prices of real estates and also growing energy prices are forcing people to apply for social support package, which is operated from the state/municipal levels or to reduce their living standards if they cannot get the support. Currently costs of housing, energy and water use create 30 to 40% of expenditures of socially weak households (pensioners, young families with children, unemployed people), in which energy costs make up to 50%. Approximately 15% of the average income of population in EU accession countries - in relation with about 2% in EU member states – is spent for energy costs. Energy prices in these countries have not completely reached the EU level and have not finished their

growth. Thus further worsening of the situation can be expected in some the EU accession countries.

In some regions with a high unemployment rate, a large share of households cannot cover their growing living costs and thus do not pay their bills for housing, energy and water. This makes troubles not only for population but also for municipalities that are faced with the need of covering a part of the living costs of socially weak population from their limited budgets. Due to that there is a lack of money for new social housing, rehabilitation of infrastructure, security, etc. Therefore the importance of energy savings especially in the area of social housing will be one of the key issues of successful support programmes in accession countries. But this also includes the main problem which this project deals with: energy conservation measures in existing houses ask sometimes for large investments. By definition the low-income groups do not have money to do those investments or to cover such investment costs by rent increases.

The problem is growing and thus needs finding not only temporary but sustainable solution. In many EU member states the system of low energy and low cost social housing has been developed and successfully implemented. Among these countries the Netherlands and Austria are very much advanced. That is why partners from these EU countries are also key partners in the project. The general idea of the project is that EU accession countries might learn from the experience of the current EU member states. Of course the situation in various countries is not comparable in many respects. There is for instance a difference in climate, in economic development, in construction and living standards and even in definitions of social and low cost housing. Though as a consequence the quantitative goals cannot be the same in all countries, qualitative goals and strategy will be more or less similar: provide affordable, comfortable housing for everybody.

1.2 Raised questions

The questions the LOCOSOC project deals with are:

- ◆ What energy saving target per country can be defined (what is useful)?
- ◆ What energy saving target per country is feasible (technically, financially, socially/politically)?
- ◆ What should be done to reach those targets?
- ◆ Can the problem be solved anyway within the present social-political framework?

In order to get a better insight in the problem of low energy and low cost social housing the following questions should be asked per country:

- ◆ How large is our target group as a percentage of total population?
- ◆ What is the share of social housing as a percentage of the total housing stock?
- ◆ What is the share of housing costs on total expenditures of low-income households?
- ◆ What energy savings are technically feasible and economically viable in social housing?

- ◆ What do energy savings in social housing contribute to energy savings in housing in general?

The answers to the first three questions are given in the current report while the other two questions will be dealt with in the following work package of the LOCOSOC project.

1.3 Expected outcomes

The outcome of the study should be a comprehensive strategy per EU accession country involved in the project including action plans for implementation of the strategies.

The outcome of this working paper is to lay the basis for further analysis of the problem.

1.4 Definitions

A first inventory has shown that there is not a unity in definitions relevant for this project in various countries. For that reason, the project partners agreed on the following definitions that are applied in this project:

Dwelling

"A dwelling is a self-contained unit of accommodation. Self-containment is where all the rooms (in particular the basic facilities i.e. kitchen, bathroom and toilet) are behind a door that only the household can use. A dwelling can therefore be a single household or a number of households which share at least one of the basic facilities but do not share living accommodation."

Flat

"A flat is a separate and self-contained premises constructed or adapted for use for residential purposes and forming part of a building from some other part of which it is divided horizontally." Flats include maisonettes; maisonettes are flats containing more than one storey.

Household

"A household comprises one person living alone, or a group of people (not necessarily related) living at the same address either share at least one meal a day or share living accommodation, that is, a living or sitting room. The occupant(s) of a bedsit who do not share a sitting or living room with anyone else comprise a single household".

Family house

Family house is a construction in which over a half of the floor area of all rooms is designed for living. Each family house may have a maximum of three independent dwellings, not more than two storeys above the ground, and an attic. Any common auxiliary rooms and spaces are not taken into account.

Multi-dwelling building

Multi-dwelling building is a construction in which over a half of the floor area of all rooms is designed for living and the number of independent dwellings is 4 or more, the number of storeys make no difference.

Top extension, side extension and built-in extension

Top extension, side extension and built-in extension are building modifications to a dwelling or family house which result in new dwellings. Top extension always and built-in extension sometimes expand the volume of the construction under such a modification, mainly its plan view, while side extension extends the plan view, mainly the height of the construction.

Community care service homes and boarding houses

Community care service homes and boarding houses are multi-dwelling buildings of a special nature, whose technical facilities include community care service rooms (the former) or which make it possible to rent the furnishings of dwellings and buy services (the latter).

Tenure

There are up to four tenure categories for dwelling stock and household figures. These are:

- ◆ Owner-occupied (or private enterprise, i.e. dwellings built for owner occupiers or for private landlords, whether persons or companies). This includes accommodation that is owned outright or bought with a mortgage;
- ◆ Rented privately (defined as all non-owner-occupied property other than that rented from local authorities and housing associations plus that rented from private or public bodies by virtue of employment. This includes property occupied rent-free by someone other than the owner);
- ◆ Rented from housing associations; and
- ◆ Rented from Local Authorities.

Cooperative housing

Cooperative housing construction produces dwellings in residential buildings built up by housing cooperatives.

Municipal housing

Municipal housing construction is the construction of dwellings in tenant buildings; it is a responsibility of municipalities.

Enclosed volume of the house

Enclosed volume of the house is the sum of the enclosed volumes of foundations (cubic metres of foundation structures), lower and upper parts of the building and roofing (delimited by the outside surface areas of shall structures, the bottom level of floor structure and the outside surface areas of roof).

Habitable floor area

Habitable floor area is the floor area of habitable rooms. The habitable room is a directly lit and ventilated room of at least 8 m² in floor which can be directly or indirectly heated and which is designed and equipped to be occupied all the year round. The floor area of such a room excludes the floor area of auxiliary rooms (non-residential hall, larder and other unoccupied rooms designed for use together with the dwelling). Excluded from the auxiliary rooms are cellars, washroom, uninhabitable attic or garage, as well as conveniences (toilet, bathroom, shower and lander).

Useful floor area

Useful floor area of a dwelling is the floor area of habitable and auxiliary rooms, including conveniences of the dwelling. Excluded are cellars, washroom, uninhabitable attic room.

Public and Private Sectors

All local authority dwellings are public sector dwellings.

Where the term "*private sector*" is used in housing policy and housing statistics, it is generally meant "*private housing*" sector or non-social housing sector i.e. owner-occupied dwellings and those rented privately including those that go with a job or business and not those owned by housing associations.

Social Housing

Social housing comprises those dwellings owned by housing associations and Local Authorities as defined above. "*Social housing is housing of an adequate standard, which is provided to rent (or on a shared ownership basis) at below market cost for households in need by Local Authorities or housing associations operating on a basis of accepted and regulated standards of good practice in relation to physical conditions, management, allocation, equal opportunities and accountability to tenants and other stakeholders*".

Affordable (Low Cost) Housing

Affordable housing is subsidised or "low" cost housing of any tenure.

"Affordable or low cost housing is housing of an adequate standard which is cheaper than that which is generally available in the local housing market. This can comprise a combination of subsidised rented housing, subsidised low cost home ownership including shared ownership, and in some market situations cheap housing for sale. Local planning policies can provide for the provision of appropriate quantities of affordable housing in this sense".

2. ANALYSIS OF CURRENT SITUATION IN THE HOUSING SECTOR

The variety of countries participating in the project is reflected in the variety of their economic, social, cultural and also housing situation. There is also rather big difference in the housing situation among the EU member states and EU accession countries.

2.1 Housing Sector Overview

In all countries in concern the basic source of information on housing is a Public Census which is done once ten years and in some cases (e.g. Austria) also micro census is done regularly. The latest data were available for the period 2000-2003 and thus rather fresh information on housing was used. for preparation of the paper.

2.1.1 Availability of housing

Availability of housing is one of the basic needs of people and access to affordable housing is one of the basic rights of people despite the fact that no one constitution of observed countries stays it explicitly.

There is rather big difference among countries as concern availability of housing expressed in the number of dwellings per 1,000 inhabitants. The highest figure can be seen in EU member states - Greece (526 dwellings per 1,000 inhabitants) Austria (420) and the Netherlands (408). In EU accession countries the highest figure is in Latvia (341) followed by the Czech Republic (379), Bulgaria (356) and Slovakia (315).

Table 1: Number of dwellings per 1,000 inhabitants

	A	BG	CR	GR ¹	LV	NL	SK
Number of dwellings	420	422	379	526	341	408	315

• *Total number of dwellings reduced by dwellings unfit for occupancy*

If we also take into account the occupancy rate of dwellings (see the following table) it might be concluded that EU accession countries may show higher shortage for housing than analysed EU member states² in general. Nevertheless in some areas or some housing categories (e.g. student apartments or high quality middle class dwellings) in EU member states a shortage can exist as well. In EU accession countries we may also find some regions with an excess of housing due to decreasing population after collapse of industry in these regions.

¹ Very high number of dwellings per 1,000 inhabitants in Greece is due to 34% of the dwellings considered vacant and also due to 14% of Greek households ownership of a second house. If the total number of dwellings is reduced by number of unoccupied ones the number of dwellings per 1,000 inhabitants in Greece is 347.

² For example, about 200,000 dwellings were lacking in the Slovak Republic. For apartment provision to reach the average level of the EU, the intensity of construction of 5 to 6 apartments per 1000 inhabitants per year is required over a long-term perspective.

Table 2: Occupancy rate of dwellings

	A	BG	CR	GR	LV	NL	SK
Number of inhabitants per dwelling	2.38	2.81	2.64	2.88	2,93	2.45	3,21
Number of households per dwelling	1.51	.	1.13	1.01	.	2,4*	1,22

- Total number of dwellings reduced by unoccupied dwellings estimated

2.1.2 Structure of housing stock

2.1.2.1 Quality of housing

There is rather big difference among countries in the structure of housing stock according to number of dwellings per house. While in Bulgaria most of houses are single dwelling houses and only 3% of houses have 10 and more dwellings, in Austria only about 1/3 of houses are single dwelling houses and 1/3 are in large residential houses.

Table 3: Structure of housing stock according to number of dwellings per house, in %

	A	BG	CR	GR	LV	NL	SK
1 dwelling	35	83	29,3	41	87	80	88,7
2 dwellings	13	10	12,2	18	3	20	3,7
3 to 10 dwellings	20	4	4,5	41	10		3,5
More than 10 dwellings	32	3	54,0				

In general, an average useful floor area of dwellings in analysed EU accession countries is by 20-40% lower than in Austria.

Table 4: Average size of dwellings, in m²

	A	BG	CR	GR	LV	NL*	SK
Average useful floor area per inhabited dwelling	91,8	66	73	79,6		124	83,9
Average living area per inhabited dwelling	.	42	49,1	84,7	51,0	.	56,1
Average living area per capita	37	15	18,6	29,1	22,8	41	17,5

- *Average sizes of newly constructed houses in 1985 Figures for recently built houses are much higher, of old houses lower. Average figures over the whole housing stock are not available
- ** For Greece, the useful floor area is defined as the whole floor area of the dwelling, including the surface of the outer walls.
- In Bulgaria there is no data concerning the number of inhabitable rooms per person. The average is 15 m² per inhabitant. 42.7% of the dwellings are with one or two rooms and the average number of inhabitants per dwelling is 2.8.

Rather high share of dwellings (about 50%) in analysed EU accession countries have an average useful floor area only up to 60 m² while in EU member states (Austria, the Netherlands) it is only 1/3.

An average number of rooms occupied by a single household is 3 to 4.

Table 5: Structure of dwellings by number rooms, in %

	A	BG	CR	GR	LV	NL	SK
1 room	7.9	7.0	6.6	1,5	23	1.2	1.4
2 rooms	22.8	30.5	27.4	8,0	45	8.4	9.8
3 rooms	29.6	34.3	37.1	22,4	22	20.4	25.4
4 rooms	19.4	17.3	17.0	36,9	10	33.7	38.3
5 rooms	11.0	6.3	7.4	21,7		23.8	25.1
6 rooms and more	9.3	4.6	4.6	9,5		12.5	.
Total	100	100	100	100	100	100	100

Despite the fact that EU accession countries are well known for massive construction of housing using concrete panel technology, the share of such houses on the total number of houses is not that high, e.g. 19% in the Czech Republic.

Table 6: Structure of materials used for housing construction

Material	A	BG	CR	GR	LV	NL	SK
Baked matter bricks, profilated bricks	N/A	55.1	52,5	N/A	N/A	N/A	46,4
Stones, baked matter bricks		2.8	23,1				1,3
Concrete panels		33.9	19,0				37,1
Other materials		8.2	5,5				15,2
Total		100	100				100

2.1.2.2 Basic forms of housing

A large variety of housing stock ownership exists in both EU member and EU accession countries of concern. The review is given in the following table according to the following types: privately-owned housing, municipal/state rental housing, private rental housing, co-operative rental housing, and other. The largest share of privately-owned housing occupied by owners can be found in Bulgaria (92%). High share is also in Greece (77%), Austria (73%) and Latvia (70%), in other countries this figure is 50-60%. The highest share of municipal rental housing is in the Czech Republic (23%) but this figure is becoming less and less due to ongoing housing privatisation process. The co-operative (rental) housing plays a rather important role in Austria, the Czech Republic, the Netherlands and Slovakia despite the fact that their origin and current role differs country by country.

Table 7: Structure of housing stock according to way of ownership, in %

Sector	A	BG	CR	GR	LV	NL	SK
Privately-owned housing	73	92	47	77	70	53	73
Municipal/state rental housing	11	3	23	0	30	37**	9
Private rental housing	.	5	7	23		5	.
Co-operative rental housing	12	0	17	0		0	15
Other	4	0	6	0		5	3*
Total	100	100	100	100	100	100	100

* mostly combined ownership; ** municipal and housing association rental housing

2.1.2.3 Housing stock age

In all analysed countries, except Slovakia and Greece, about ¼ of housing stock was built by the year 1945. In Slovakia and Greece it was only 12%. The housing construction boom was recorded in all countries after the World War II when during 25 years (in the period 1946-1970) there was built more than ¼ of the current housing stock, except for Greece and Bulgaria where nearly ½ of the housing stock was built and Slovakia with more than 1/3 of housing stock built in period 1946-1970. In the following 2 decades (1971-1980 and 1981-1990) about 30-45% of housing stock was built except for Bulgaria with 25%. Major difference among current EU member and EU accession countries can be seen after 1990 when in all EU accession countries the construction of new housing dropped due to lack of financing and also due to legislative and economical changes.

Table 8: Structure of housing stock by period of construction

Construction period	A	BG	CR	GR	LV	NL	SK
Until 1919	18	5	11	3,1	11	9	3
1920 – 1945	8	19	15	7,3	14	12	7
1946 – 1970	28	48	26	31,7	28	27	35
1971 – 1980	16	15	23	24,5	22	19	26
1981 – 1990	13	9	16	19,1	21	18	21
1991 – 2001	17	5	8	14,2	4	15	7
Unknown			1	0,2			1
Total	100	100	100	100	100	100	100

2.1.2.4 Housing completed after 1990

In the period after 1990 all EU accession countries recorded a big change in the construction of housing. First of all there was a drop in annually completed housing in all EU accession countries after 1990.

Table 9: Number of dwelling completed in 1991, 1996, 1999, 2000 and 2001, per 1,000 inhabitant

Year	A	BG	CR	GR	LV	NL	SK
1991	5.18	2.16	4.09	9.78	2.71	5.77	3.94
1996	7.19	0.97	1.44	8.28	0.60	6.12	1.16
1999	7.34	1.20	2.32	8.43	0.44	5.24	2.00
2000	6.60	1.10	2.50	9.26	0.40	4.70	2.39
2001	6.80	0.70	2.40	8.40	0.34	4.50	1.90

Nearly all of completed dwellings in Bulgaria were in urban areas while in other countries it was usually less than 70%.

Table 10: Dwellings completed in urban areas in 1999, 2000, in %

Year	A	BG	CR	GR	LV	NL	SK
1999	56.4	96.9	83.1	55	45.3	67.4	82,1
2000	68.4	97.7	72.8	58	55.6	66.8	85,3

Besides drop in the number of completed dwellings there was also a change in the quality of housing in the EU accession countries. This was reflected by an increase of an average useful and living floor space per dwelling completed after 1990 that means the newly completed dwellings were not in the category of social housing but were built for higher income part of the population. However it should be kept in mind that building an expensive house may cause “a chain of removals” which means that more than one family are helped. For the occupier of a new and more expensive house leaves a middle class house which is occupied by a family who leaves a social rental house, etc.

Table 11: Average number of rooms, average useful and living floor space per dwelling completed in 1991, 1996, 1999, 2000 and 2001

Year	Average figures	A	BG	CR	GR	LV	NL	SK
1991	Number of rooms	4.5	2.6	3.9	3.4	2.5	3.7	4.0
	Useful area, m ²	99.0	70.9	79.2	79.6	63.7		89.8
	Living area, m ²	99.0	53.4	55.6	79.6	.		55.1
1996	Number of rooms	4.1	2.7	3.95	3.25	3.9	3.5	4.1
	Useful area, m ²	92.9	82.4	94.0	124.5	145.4		109.1
	Living area, m ²	92.9	61.7	59.6	124.5	72.0		65.1
1999	Number of rooms	4.1	2.6	3.5	3.18	4.1	3.9	3.6
	Useful area, m ²	94.3	84.6	107.1	126.4	100.9	.	132.8
	Living area, m ²	94.3	62.5	69.2	126.4	85.7	.	79.8
2000	Number of rooms	4.3	2.6	3.9	3.15	4.2	3.8	3.7
	Useful area, m ²	96.0	86.3	106.4	126.4	212.6	.	135.0
	Living area, m ²	.	65.2	68.2	126.4	92.4	.	82.5
2001	Useful area, m ²		91	107	.	236	.	129

2.1.2.5 Energy consumption by housing stock

Energy demand of housing stock depends very much on period of construction as can be seen in the following table for Austria and the Czech Republic. An active policy for reduction of energy demand was introduced in current EU countries after the first world energy crises and it was further promoted after the second oil crisis. In analysed EU accession countries the impact of the first oil crises on energy demand of housing stock was practically negligible. Only in 1980s new stricter building standards were introduced which reduced the specific energy demand for heating through implementation of better thermal insulation of mostly built concrete panel block of flats.

Table 12: Energy demand of housing stock by period of construction, kWh/(m²*year)

Construction period	A	BG	CR	GR	LV	NL	SK
Until 1919	300	170	280	N/A	N/A	200	304
1920 – 1945	280		240				295
1946 – 1960	320		250			160	259
1961 – 1970	310	200	220			160	224
1971 – 1980	250		260			120	194
1981 – 1990	200		240			98	224
1991 – 2001	150		180				

- Austria – consumption per m² of living area, Czech Republic - consumption per m² of useful area
- In Bulgaria there is no available data concerning the energy demand of housing stock by period of construction. The demand for dwellings with external brick walls 38 cm. thick erected before 1956 is around 160-180 kWh/m², for these erected after 1956 with external brick walls 25 cm. thick 180-200 kWh/m², and the energy demand for concrete panel dwelling buildings is around 220 kWh/m².

Energy demand of housing stock also very much depends on type of heating. In general, it is higher in housing connected to district heating which was mostly developed in Central and Eastern European countries and resulted in higher specific energy consumption in these countries as compared to EU countries.

Table 13: Structure of energy consumption by energy carrier, in %

Energy carrier	A	BG	CR	GR	LV	NL	SK
Local heating	26.3	0.01	15,0	0,41	N/A	15	10,6
Coal, other solid	1.4	38.1	3,9	0,51			5
Gas	8.6	2.6	7,0	0,19			3,5
Oil	3.9	0.3	-	47,78			1
Electricity	9.6	38.8	4,0	36,72			1
Renewables	2.8	0.01	1,5	10,25			0,1
Single storey heating	21.0	0.00	8,1	35		-	6,5
Central heating	24.0	0.00	37,0	60	80	37,9	
District heating	28.7	20.2	36,6	0,5	5	45	

2.1.3 Costs of housing and living

2.1.3.1 Cost of housing

Acquisition of new dwelling is usually a very costly. This can explain such big drop in new housing construction in EU accession countries after 1990 – public budgets were limited to build new municipal rental housing and population had not always substantial finances to buy new dwellings. There were many reasons for that, e.g. due to high inflation rate in early 1990s most of people lost their savings, the interest rate on loans and mortgage were unaffordable. In this situation, government or municipalities offered to population a privatisation of existing housing stock, which was sold for much lower price than new dwellings. Unfortunately the low price of old dwellings mostly reflected a low quality of dwellings as they were usually sold without making any refurbishment. Large

investments will be necessary to improve the quality of privatised housing stock to reach an average standard of new housing.³

Table 14: Average acquisition price of completed dwellings in 2001, in Euro/m²

	A ¹	BG	CR ²	GR ⁴	LV ³	NL	SK
Single family house	1371	200	850	2500	900	1251	870
Dwelling in multi-family house	1449	167	550	1600	580	1930	543

- ¹Austria: data from 2000 (Data from 2001 is not available)
- ²Czech Republic – acquisition price is higher than 1,000 Euro/m² in capital city of Prague in case of new dwelling and 400 Euro/m² in case of older privately owned housing.
- ³These prices for dwellings in multi-family house and single-family house are average for Riga (third part of all population is living there). Outside Riga – the prices are much lower.
- ⁴Greece: For the Attica prefecture (which covers the Athens area)

2.1.3.2 Housing-related expenditures

Housing-related expenditures make a large portion of the family budgets as can be seen in the following table. An average figure for EU accession countries are below 20% while in analysed EU member states are well above 20% (except for Greece). The major reason for the difference between EU member and EU accession countries are subsidised prices of energy carriers and rents in EU accession countries. In case of low- income households, the housing-related expenditures consume about 30% of family income both in EU member and EU accession countries. But this figure may substantially differs country by country and also city by city.⁴ It can be expected that costs of livings including housing-related expenditures will grow in EU accession countries in coming years due to phasing out subsidies and introduction of cost based pricing of services related to housing.

Table 15: Housing-related expenditures in percentage of family income 2001, in %

	A	BG	CR	GR	LV	NL	SK
Average figure	22.8	15****	16	17	18,6	26**	15,5 ¹⁾
Low income families	30.4	(60)	27*	N/A	22,7	34***	26,7 ²⁾

- *Low income households of pensioners; ** owner-occupied housing; *** Rental housing average **** It must be underlined that this figure is due to the fact that many households can't afford the prices for heating, in many cases only one room is heated during the winter season, sometimes two or three families live together during the heating season to share the expenditures for heating. Many households can't afford to give more money for heating or maintenance as the food is more important than the heat! An investigation conducted by the Ministry of Energy and Energy sources shown that only for a normal heating (without expenditures for water, maintenance, etc.) the average expenditure would be 60% of the family income.*
- 1) Data source - Statistical office of the Slovak Republic
- 2) Considering social income of pensioners according to the Ministry of Labour, Social Affairs and Family of the Slovak Republic. For average low income family it is about 24,6%

³ For example, in the Czech Republic the double room dwelling with kitchen and all amenities of 45 m² useful floor area in concrete panel house built in early 1960s was sold to tenant for Euro 2,000. The costs for refurbishment of the dwelling and the house are estimated as high as Euro 20,000. Thus the total price of the dwelling would be 400 Euro/m², which is about half price of new dwelling but roughly the same as the price of refurbished dwellings on the market.

⁴ For example, housing-related expenditures in Prague, capital of the Czech Republic consume about half of the income of an average pensioner living alone in municipal rental flat with 2 rooms. The rest of the income is usually used for other basic needs (food, local transport).

When energy price subsidies in EU accession countries are phased out energy costs make more than 50% of housing-related expenditures as can be seen in the following table for the Czech Republic.

Housing-related expenditures are considerably differentiated based on the type of housing (privately-owned, cooperative, rental), the dwelling size, rural or urban area and the size of the municipality where the dwelling is located. The average proportion of housing-related costs per household rises slightly as the municipality size increases. The differences are mainly due to different level of rent - the larger the municipality, the higher the proportion of rent in housing expenditures. In addition, some differences stem from the technologies used for space heating, hot tap water heating, and cooking. In general, costs of heating are higher in case of dwellings connected to district heating as compared to those ones using local heating.

3. POLICY FRAMEWORK FOR HOUSING

3.1 Energy Policy and the position of energy efficiency

In all analysed countries, both EU member states and EU accession countries, energy policy exists and contains a part dealing with energy efficiency. In the field of energy efficiency in buildings in EU member states many national programmes have already been carried out in past leading to substantial improvement of energy efficiency in buildings including introduction of strict building standards. The major issue in EU accession countries now is an implementation of the EU Directive on Energy Performance of Buildings.

In EU accession countries the energy efficiency in buildings was given much lower interest in past as compared to EU member states. Subsidies to energy prices reduced the burden on population from growth of energy prices and thus there were no incentives to energy savings. The process of phasing out energy price subsidies which has recently been done in most of EU accession countries increased housing-related expenditures. Due to very negative impact on low-income population, these countries introduced social aid programmes for vulnerable part of population. Nevertheless a comprehensive energy efficiency program for residential sector is usually missing in these countries due to lack of financing available from public funds. Also an implementation of EU Directive on Energy Performance of Buildings is still a big issue and a progress should be done soon to meet requirements and deadlines.

3.2 Environmental Policy and the position of energy efficiency and climate change

Similar like in case of energy policy, in all analysed countries, both EU member states and EU accession countries, environmental policy exists. In some countries the climate change issue is treated in a climate change mitigation policy of the government.⁵

3.3 Housing policy and the position of social housing

3.3.1 Bulgaria

3.3.1.1 Housing policy

In Bulgaria there are no special laws, norms or other requirements concerning state or municipality owned dwellings as 97 % of the dwelling stock is privately owned.

The main laws concern the dwellings in blocks of flats. In the end of the year 2002, the dwellings in blocks of flats represented 33.5% of the dwelling stock, for the towns this figure is 53.2%. About 60% of the dwellings in blocks of flats are located in complexes and are erected with industrial methods.

The management and the maintenance of blocks of flats is realized in accordance with:

⁵ For example, in May 1999, the Czech Government approved a Strategy of Protection of the Climate System of the Earth in the Czech Republic (Resolution of the Government of CR No. 480/1999), which placed protection of the climate amongst top-priority environmental issues and set out the main tasks for the individual sectors, which should lead to fulfilling of the quantitative tasks of the Kyoto Protocol.

- ◆ The “Law for ownership”; and
- ◆ The “Rules for management, order and control in the blocks of flats”.

The owners have the obligation to maintain and to refurbish their individual parts of the building.

In case when different parts of the building are owned by different persons, common are: land over which is erected the building, foundations, external walls, internal walls that separate the different parts of the building, roofs, main lines of all installations, etc.

Each owner has the obligation to share the costs needed for the maintenance and the refurbishment of the building according to his part.

In Bulgaria there is no preferential credit policy and state subsidy for the dwelling sector.

Nine banks grant dwelling’s credits at 8 to 15% interest. In 2001 the interests were between 14 and 18%. For some banks the term for paying off the credit reach 20 years. The candidates for credit should co-finance about 30% of the value of the new dwelling.⁶ Mortgage is compulsory. To get a credit for dwelling that costs 30 000 Leva, you must have at least 10 000Leva in cash or in bank account and mortgage an estate property for at least 20 000 Leva.

3.3.1.2 Social housing policy

The social policy is conducted by the Ministry of Labour and Social Policy and is carried out mainly by the municipalities. The main law that regulates the social policy is the “Law for social assistance”.

The whole social policy is oriented mainly to people with low income, the integration of ethnic groups and the problems with the unemployment. The policy deals both with housing and financial help, but as the municipalities prefer to sell their dwellings instead to rent them at low prices, the only available social housings in the country are some very old dwellings that nobody want to buy.

3.3.2 Czech Republic

3.3.2.1 Housing policy

The Housing Policy Concept of 1999 was updated in 2001. The major goal of the housing policy is general improvement and mainly financial affordability of housing for all parts of population.

The new housing policy includes new priorities as follows:

- ◆ Support should be provided not only to construction of a new housing but also to purchase of existing housing as existing housing is cheaper than new one.

⁶ To get a credit for dwelling that costs 30 000 Leva, you must have at least 10 000Leva in cash or in bank account and mortgage an estate property for at least 20 000 Leva.

The new policy measures are proposed to break the current interest of population in getting new housing and to promote interest in purchase and rehabilitation of elder housing.

- ◆ Support should be provided to selected groups of population that face difficulties in their access to adequate housing not only due to their low income level but also due to their health conditions, age, etc. The new policy measures are proposed that would help these specific groups of population (e.g. young people, handicapped people, or people with urgent needs in housing) to get adequate housing. Such policy measures could be soft loans, grants, etc.
- ◆ Due to current limited financial sources of population, an expected development of the housing sector by individual type of housing **in the short term** is based mainly on promotion of **rental housing** mostly based on non-profit co-operative housing. Due to expected improvement in financial situation of population and also continuation of privatisation of housing stock **in the medium-term and long-term**, in this period it is assumed the priority to be given to the **privately-owned housing sector**.

3.3.2.2 *Social housing policy*

There is no comprehensive social housing strategy in the Czech Republic and there is even no definition of social housing. Nevertheless the new housing policy (as mentioned above) calls for support measures for specific groups of population (e.g. young people, handicapped people, or people with urgent need in housing) to get adequate housing. In practice, the following support policy is available:

- ◆ *Support for Construction of Municipal Rental Apartments and Technical Infrastructure* - Investment subsidies for construction of rental apartments and the related infrastructure. The amount of this grant totals a maximum of Euro 10,000 per dwelling and a maximum of Euro 26,000 per dwelling in case of related infrastructure. The subsidy purposely covers only a part of the costs of construction and needs to be combined with municipal or private funds.
- ◆ *Support for Construction of Rented Housing with Community Care Services built by municipalities* - The maximum amount of the subsidy is Euro 25,000 per unit intended for persons with reduced self-sufficiency, i.e. disabled and retired individuals.
- ◆ *Interest-Free Government Loan for Municipalities for rehabilitation of housing stock* - interest-free and repayable within up to ten years is intended for municipalities and through them also to private property owners (at least 20% of the allocated subsidy) for repair and maintenance of neglected housing fund.
- ◆ *Subsidies for Repair of the Housing Stock* - subsidies for all owners of buildings constructed with the prefabricated panel technology not exceeding 50% of costs. The subsidy is intended for repair of very serious defects and emergencies.

3.3.3 **Greece**

3.3.3.1 *Housing policy*

The Ministry of the Environment, Physical Planning and Public Works has the responsibility for shaping and implementing national policy for the building sector.

Other aspects of the building sector policy are formulated in collaboration with other Ministries. For example the Ministry of Development is responsible for the overall energy policy whereas the Ministry of Finance and National Economy is responsible for the development and implementation of incentives, financial programs and specific development laws.

3.3.3.2 *Social housing policy*

Practically, Greece does not have a social accommodation policy comparable to the ones adopted in most European countries. The housing market is traditionally focused on private ownership and the Greek State or the different municipalities do not own or provide housing stock. However, the Workers' Housing Organisation (OEK), which is supervised by the Greek Ministry of Labour and Social Services, is an organization that deals with social housing in a way.

OEK⁷ is the main state housing policy instrument in Greece, which aims at supporting the low-income families to purchase or to construct their own home. The funds allocated by the Ministry of Labour and Social Services are used by the beneficiaries/members of the Organisation for low cost houses or loans, on the basis of social-economic criteria. The main target groups for supported accommodation are workers, employees and pensioners with low-incomes or households with more than 4 children, who also respond to other eligibility standards. Ready-made dwellings are distributed to beneficiaries via a lottery system or by other programmes such as beneficial loan systems and rent benefits. Though not a typical case for a social housing organisation, OEK constitutes the main instrument for exercising social housing and subsidised accommodation policy while remaining at the same time the largest Greek organization in the housing construction field.

OEK offers a variety of social accommodation programmes, including:

1. *Grants of finished house in settlements*, where OEK designs and constructs houses. The houses are granted with full ownership and are paid off interest-free in 20 years, at their construction cost. The houses are ceded using the transparent system of drawing lots, in which the interested beneficiaries participate after having been classified in four main categories, depending on three objective criteria: the number of members in their families, their income and the number of working days completed by each beneficiary. These four categories have different possibility rates in the drawing lots, in order to favor the protectors of big families and the low income.
2. *Loans for purchase or construction of a new house* through banking funds, with a double interest-rate subsidy provided by the Greek State and the OEK. The amount of the loan depends on the annual income of each family, while the final interest rates vary according to the number of family members and range, subsequent to the subsidies, related to conditions from 3% for the unmarried beneficiary to 0% for beneficiaries with 4 or more children.

⁷ OEK was founded in 1954 with the aim to provide housing to the homeless workers and employees. It is a Legal Entity of Public Law, operating under the auspices of the Ministry of Labor and Social Security, and a financially independent organization. It is financed both by Greek enterprises and workers. Contributions are provided both by workers (1% of their wage) and employers (0.75% of their employees' wages). The revenues will amount to approximately €555 million in 2003. Operating cost take 7% of the total budget. The remaining budget, i.e., 93% of the total, is distributed to the various forms of housing contributions provided to beneficiaries. OEK, in its almost fifty-years of operation, has covered the housing needs of a total of about 366,500 families

3. *Loans for repair, enlargement or completion of existing house* from OEK funds. These loans are interest-free and paid off in 15 years.
4. *Rent subsidy to pensioners, low-income families and newly wed couples.*
5. *Special permanent programmes for the housing coverage of families with many children and of persons with special needs* (e.g. kinetic disability).
6. *Special programmes for beneficiaries who reside in frontier regions or regions that have suffered natural disasters.*
7. *Rent support programmes* on a limited scale and in states of emergency.
8. *Rehabilitation and refurbishment programmes* for old built-up settlements.
9. *Operation of a Special Solidarity Fund* to cover due debts to the OEK, by the beneficiaries facing urgent needs (illness, death, long unemployment) and acute financial.
10. *Special settlements for the payment of due debts from housing assistance* with favorable terms.
11. *Pilot programme for accommodation of sensitive social groups* (e.g. gypsies) in cooperation with the government and other bodies of the State and the Local Administration

Each year OEK builds between 1,000 and 3,000 dwellings, which represents 1-2% of the total construction of dwellings nationwide.

It should be noted that neither OEK's Board of Directors nor the overseeing Ministry has prepared any Action Plan or long term development Plan setting key priorities, targets and objectives for the social housing policy in Greece. Instead, each year OEK calls for applications for its renewed programmes asking from beneficiaries to express their interest. Dissemination is rather limited and restricted to OEK's local business offices.

OEK estimates that building costs including landscaping works do not exceed 450 €/m². The low construction cost is basically achieved due to the negligible cost of land since most land is either originally owned by OEK or is generously provided by local administrations and municipalities.

OEK offers an integrated programme for housing intervention in space, by building housing developments that blend harmonically into the broader environment, which it respects and upgrades. Within this environment, homes are designed with high standards for sunlight, lighting, and ventilation, with comfortable and functional interiors, adapted to the particular morphology of the terrain, but also to the local character and tradition of the region in which the settlements are built.

An on-going effort is being made to improve existing plans and to design new ones trying to meet modern criteria. Lately OEK's design team started a collaboration with CRES in order to implement some of the latest energy efficiency techniques to its designs.

3.3.4 Latvia

3.3.4.1 Housing policy

Development of housing policy was initiated in 1996 when on 30th of July 1996 Cabinet of Ministers approved the Housing Policy Framework Document prepared by the Ministry of Environmental Protection and Regional Development. This paper is the main document which regulates housing policy and determines the development objectives, main tasks and principles.

As in 2002 new parliament was elected, new reforms started due to which Ministry of the Environmental Protection and Regional Development was restructured and a 2 ministries were established - Ministry of Environment and Ministry of Regional Development and Local Governments. Due to the reform, the Ministry of Regional Development and Local Governments (established in February 2003) is responsible for development of housing sector but the Ministry of Economy, the Building department is in charge of the building sector.

The main guidelines of the state housing policy stated by the new ministry are as following:

- ◆ Approximation of quality of living conditions to the average level in EU countries;
- ◆ Energy saving and efficient use;
- ◆ Use of old existing buildings and long-standing constructions for new needs;
- ◆ Providing inhabitants with good, healthy and safe housing.

One of the planned political activities of the ministry is preparation of Framework Document on Development of Social Housing Fund.

The Cabinet of Ministers in 1997 approved a new conception called Housing Construction, Renovation and Modernization Long-Term Lending Conception according to the Housing Policy Conception where one of the main tasks is stated as follows – development of mortgaging program and establishment of mechanism for reconstruction, renovation, construction, and purchase by applying for long term lower interest rate loans. In the document there are determined the main principles of housing loans, prior tasks for establishment of lending system for mortgaged housing and promotion activities of these loans.

3.3.4.2 Social housing policy

In 1997 Latvian Parliament adopted Law on Social Apartments and Social Dwelling houses. This law has been the first legislative act that defined social house and social apartment. The law also defined how these houses should be financed and who had the rights to live in these social houses and apartments. Law states that municipalities are responsible for implementation of the law.

The main social policies concerning housing are regulated by the Law on Social Utilities and Social Assistance (2002), the Law on Municipal Assistance to Residents in Housing Matters (2001) and the Law on Social Apartments and Social Houses (1997) and different Cabinet of Ministers regulations. Under this legislation, social assistance is delegated entirely to the local governments.

According to these laws, municipalities have the responsibility of providing housing for all vulnerable and socially disadvantaged groups, defined as families with children, invalids, or pensioners who are not under the care of a family member.

According to the legislation, at the moment low-income people receive social assistance regarding housing in two ways: either they obtain social flat (separate or in social house), or receive monthly apartment benefits to cover rent and public utilities payments.

Decision about establishment of social houses is done by each municipality independently according to their possibilities and demand for social housing and number of low-income people in the municipality. The status of social apartment and social house is assigned by official decision of municipality council. The Law on Social Apartments and Social Houses states that the status of social house can be given to those houses that have been built or remade for such needs and are not rented and are owned by the municipality. The status of social apartment can be given to those apartments that are:

- ◆ Owned by municipality and are not rented; or
- ◆ Owned by municipality and rented to social low-income persons (families) who have submitted application letter that they would like to rent social apartment and the flat area is not bigger than the assigned size in the regulations of the Cabinet of Ministers.

In addition, municipality can give a status of social apartment to those rented apartments the tenant of which submits letter that states that he would like to close the existing hire contract and sign a new – social apartment rent agreement.

According to the Law, social apartments and social houses cannot be privatised.

Each municipality assigns the renting fee separately. Law says that it shall be at least 3 times lower than that renting fee, which is allocated to the same category of municipal flats. Municipally can also partly cover expenses related to public utilities.

Loans for social houses

At the moment in the framework of the Housing Development Lending Program, Latvian Mortgage Bank gives loans to municipalities or other legal entity (non-governmental organisation, public organisation etc.) for equipping and reconstruction of social apartments or construction of social house, including finishing those buildings under construction and establishing social houses. Maximum loan is Euro 480,000. One of the important requirements is that co-funding should be at least 30% of all the project costs. The interest rate for these kinds of projects varies for different currencies but for Euro interest rate varies from 4-6% plus 6 month EURIBOR.

3.3.5 The Netherlands

3.3.5.1 Housing policy

The Dutch Housing Law dates back to 1901. This law gives permission to local private non profit organisations to build and manage dwellings for low and mid income groups, until 1993 fully financed by the state budget. The non profit organisations must work entirely for the benefit of social housing. In the first years after the Housing Law came into force, many of those housing associations have

been established, mainly by specific interest groups, such as employees of the State Railways, teachers, and factory workers. If there was no housing association to fulfil the social housing task, the municipality was obliged to provide social rental houses. In particular after the World War II, the share of the municipalities in the social housing stock increased enormously. In 1990 the majority of the municipal housing companies were privatised and got the status of housing association. Since the early nineties, a lot of housing associations merged to large bodies, owning 50.000 houses and more.

3.3.5.2 Social housing policy

As a consequence of the emphasis on rental houses in the social sector, about 37 percent of the Dutch housing stock is made by social rental houses. 5% of the housing stock is owned by institutional investors, such as insurance companies, 5% by private investors and the remaining 53% is owned by the occupier.

The high share of social rental houses made it easy to get existing houses improved, both in technical aspects and in thermal aspects. A large quality scan of the Dutch housing stock in 1989 showed, that the social rented houses were the best maintained.

3.3.6 Slovakia⁸

3.3.6.1 Housing policy

The available data on the income structure of the households in the Slovak Republic indicate that the real costs for housing in both existing and newly built dwellings exceed the affordability limits of many households and housing is becoming financially inaccessible for some households. Existing policy documents:

- ◆ Slovak Parliament act no. 124/1996. – State housing development fund
- ◆ Directive of The Ministry of Reconstruction and Regional Development of Slovak Republic no. 2/2003 where the rules for grant providing for tenement flats acquisition are stated.
- ◆ Regulation of Slovak government no. 137/2000 – Housing development programmes
- ◆ Directive of The Ministry of Reconstruction and Regional Development of the Slovak Republic no. 3/2003 which contains the rules for grant providing intended for area preparation and technical equipment reconstruction.

3.3.6.2 Social housing policy

The available data on the income structure of the households in the Slovak Republic indicate that the real costs for housing in both existing and newly built dwellings exceed the affordability limits of many households and housing is becoming financially inaccessible for some households.

⁸ Based on paper: *An attempt to revitalize social rental housing in Slovakia* by Elena Szolgayová, Ministry of Construction and Regional Development of the Slovak Republic Bratislava Slovak Republic

To improve this development, and to increase a share of public rental housing for low-income households, new programmes have been introduced in 1999-2000:

- ◆ *State subsidy programme for municipal rental housing construction* - provides grants to municipalities in amount of 30-50% of construction costs, it is possible to combine them with the long term low interest loan from the State housing development fund;
- ◆ *Subsidy programme for technical infrastructure* necessary for housing construction; and
- ◆ *Programme of the state guarantees for the market bank loans for municipalities.*

Results of these programmes are positive. In the period 1999 - mid 2002 they initiated a start of construction of some 8.000 municipal rental dwellings in the situation when total yearly construction was around 10,000 – 12,000 dwellings. In the Principles of State Housing Policy up to the year 2005 with an outlook up to 2010, a framework document providing a wider comprehensive overview of co-ordinated objectives of the State in partial areas concerning housing for a period of 10 years, one of the objectives is to gradually increase the construction of new rental dwellings, so that their share would be approximately 50 % of the new construction around 2010. Low average income of the population and a high unemployment rate constitute the most significant barrier for the access to the housing market. Because of that, it is considered necessary that the State and municipalities in a long run create suitable conditions and adopt efficient measures to provide for the affordability of housing for the inhabitants. In order to develop a reasonable type of social housing, effective institutional solution should be found. Recent trend toward more market oriented approach is visible in different types of not for profit housing organisations, which are important players on the housing market in several European countries. Slovakia is keen to follow those best practices. An amendment to the Act on not for profit organisations adopted in 2001 has created legal framework for more active role of these organisations in revival of the public rental sector in the Slovak Republic.

3.4 Technical standards in housing construction and operation

Technical standards in housing construction and operation can highly influence energy consumption. This chapter provides a brief review of technical standards in individual countries. In general, there are rather big differences in valid standards among individual countries.

3.4.1 Austria

In Austria a unitary standard for housing does not exist. Instead, nine different building codes for each province region create the legal framework of the building sector, where all relevant clauses are constituted. Regarding the energy efficiency requirements primarily the provided U-values of components are of interest. The following table gives a compilation of the U-values, found in the federal constitution and in the building codes of the regions. As it is shown in the table below, the U-values of the regional building codes are lower than the values of federal constitution in some cases. In order to implement the new European Directive for Energy Performance of Buildings, a unification of the building codes is foreseen.

Table 16: U-values in the building codes – Austria

Building codes of	Federal	B	K	NÖ	OÖ	S	St	T	V	W
building codes valid since	1995	1998	1997	1996	1999	1991	1997	1998	1996	1996
Exterior wall 1) and freestanding firewalls	0,70	0,45	0,40	0,40	0,50	0,47	0,40	0,35	0,35	0,50
Walls to attic rooms	0,70	0,45	0,40	0,40	0,50	0,47	0,40	0,35	0,35	0,50
Firewalls to other buildings	0,90	0,70	0,70	0,70	0,70	0,70	0,70	0,50	0,50	0,70
Windows and french doors	2,50	1,70	1,80	1,80	1,90	2,50	1,90	1,70	1,80	1,90
windows to unheated rooms	-	-	-	-	-	-	2,50	-	2,50	-
entrance doors without glas	1,70	1,70	1,80	1,80	1,90	2,50	1,70	1,70	1,90	1,70
Entrance doors or doors to unheated rooms	-	-	-	-	-	-	2,50	-	2,50	-
Partition walls to unheated rooms	0,90	0,70	0,70	0,70	0,70	0,70	0,70	0,50	0,50	0,50
Partition walls between flats	0,90	1,20	1,60	1,60	1,60	1,56	1,60	0,90	1,60	0,90
Partition ceils between flats	0,90	0,90	0,90	0,90	0,90	1,03	0,90	0,70	0,90	0,90
Ceils to ambient	0,30	0,25	0,25	0,22	0,25	0,26	0,20	0,20	0,25	0,20
Ceils to attic	0,30	0,25	0,25	0,22	0,25	0,26	0,20	0,20	0,25	0,20
Ceils to heated or unheated rooms	0,60	0,40	0,40	0,40	0,45	0,37	0,40	0,40	0,40	0,40
Walls between ground and heated rooms	0,80	0,40	0,50	0,50	0,50	0,55	0,50	0,40	0,50	0,50
Floors between ground and heated rooms	0,80	0,40	0,50	0,50	0,50	0,39	0,50	0,40	0,50	0,40

Federal...values given in the federal constitution law

B...Burgenland; K...Carinthia; NÖ...Lower Austria; OÖ...Upper Austria; S...Salzburg; St...Styria; T...Tirol; V...Vorarlberg; W...Vienna

3.4.2 Bulgaria

In Bulgaria, the country-wide maximum values of the coefficient of heat transition of external enclosure building elements **K_{max}** ($W/m^2\text{°C}$) are set as given in the following table.

Table 17: U_{max} -values in the building codes – Bulgaria

N°	Type of enclosing building elements	Maximum values for U_{max} ($W/m^2\text{°C}$)
1.	External walls in new buildings and in cases of reconstruction of façades with external thermal insulation	0.50
2.	Windows and balcony doors a) in dwellings and public buildings	2.65
	b) in industrial buildings and in heated premises in industrial buildings with double glazed windows and/or ceiling windows	3.57
3.	Roofs, attic's slabs in cases of unheated attics, floors over passages and other open spaces bordering on external air	0.30
4.	Floors over unheated basements	0.50

3.4.3 Czech Republic

Two figures for U-values in the building codes are published in the Czech Republic – desired value and recommended value. The recommended value, which is by 1/3 stricter than the desired one, is mandatory for all projects financed from the public

budgets while desired value is applicable in projects with private financing. In addition, there are also desired U-values for low energy buildings that are about ½ level of desired U-values for standard buildings.

Table 18: U-values in the building codes – Czech Republic

Building constructions	Heat passage coefficient - U-value [W/m ² .K]			
		Desired value	Recommended value	Desired value for Low Energy Buildings
Platform roof	light	0.24	0.16	0.12
Slanting roof < 45°	heavy	0.30	0.20	
Outside wall	light	0.30	0.20	0.15
Slanting roof > 45°	heavy	0.38*	0.25	
Windows	new	1.80**	1.20	1.2 - 0.8
	older	2.00	1.35	

*0,46 for single layer masonry until 31.12.2004, **2,0 until 31.12.200

3.4.4 Greece

The Presidential Decree entitled *Thermal Insulation Regulation* was issued in 1979. It is the first Regulation on thermal requirements of buildings, covering all types of building use, which renders mandatory the application of thermal insulation in all new buildings. The Thermal Insulation Regulation introduces upper limits for the thermal transmittance coefficients, U-values, of various building elements such as external walls, roofs and floors for the three climatic zones¹ of Greece. Moreover the Regulation sets upper limits for aggregate thermal transmittance coefficients referring to the whole building and to the envelope including the openings. The regulation does not cover cooling loads because in the late 70s when it was first introduced, most buildings lacked mechanical cooling systems. The Insulation Code does not make any recommendation on the type of building materials and on the building design. There is not any suggestion for bio-climatic design while it does not make any account of solar gains or any other source of heat gains. The Thermal Insulation Code is currently under revision, in the framework of the new integrated energy study as foreseen in the new Regulation of Rational Use of Energy and Energy Savings.

¹ in the Insulation Code, Greece is divided into three zones A, B and C according to prevailing climatic conditions. Zone C is the coldest while A the warmest. Different upper limits U-values are applied for each zone

Table 19: U-values in the building codes – Greece

Maximum thermal transmittance coefficient (W.m⁻².K⁻¹)	Zone A	Zone B	Zone C
External walls	0.7		
External horizontal surface	0.5		
Floors above non heated areas	3	1.9	0.7
Internal/separating walls next to non heated areas	3	1.5	0.6
Glass surfaces and doors	2-5 (depending on frame and window type)		
Each floor (including windows and doors)	1.9		

Maximum Permissible value of the average thermal Transmittance coefficient (U_m)			
F/V (m-1)	Zone A	Zone B	Zone C
<=0.2	1.553	1.18	0.938
0.3	1.448	1.111	0.884
0.4	1.349	1.043	0.831
0.5	1.270	0.983	0.785
0.6	1.198	0.924	0.738
0.7	1.145	0.872	0.698
0.8	1.101	0.834	0.669
0.9	1.078	0.808	0.640
1	1.07	0.791	0.616

3.4.5 Latvia

Table 20: U-values in the building codes – Latvia

U W/(m².K) normative values

Elements	Dwelling houses, pension, hospitals and kindergartens	Public buildings, except pension, hospitals and kindergartens	Production buildings
Roofs	0.2 k	0.25 k	0.35 k
Floor on the ground	0.25 k	0.35 k	0.5 k
Walls			
with the weight smaller than 100 kg/m ²	0.25 k	0.35 k	0.45 k
with the weight 100 kg/m ² and more	0.3 k	0.4 k	0.5 k
Windows, doors and walls with glass	1.8 k	2.2 k	2.4 k

Note. k – factor of temperature

U W/(m².K) maximum values

Elements	Dwelling houses, pension, hospitals and kindergartens	Public buildings, except pension, hospitals and kindergartens	Production buildings
Roofs	0.25 k	0.35 k	0.5 k
Floor on the ground	0.35 k	0.5 k	0.7 k
Walls			
with the weight smaller than 100 kg/m ²	0.30 k	0.4 k	0.5 k
with the weight 100 kg/m ² and more	0.40 k	0.5 k	0.6 k
Windows, doors and walls with glass	2.7 k	2.9 k	2.9 k

Note. k – factor of temperature

3.4.6 Netherlands

In the Netherlands, the energy performance is calculated according to the so called Energy performance Standard, and expressed in a figure without dimensions: the Energy Performance Coefficient EPC. (A description of the methodology is beyond the scope of this report.) The Building Code requires an energy performance that meets the actual EPC. This EPC is politically defined, and was lowered from 1,6 when it came into force in 1996, to 1,0 nowadays. Discussions are ongoing about lowering the EPC to 0,8, which means that the consumption of fossil fuels and fossil fuel generated electricity of houses that meet this EPC is twice as low compared with houses built according to the 1996 standard.

Table 21: Apart from the EPC, buildings must meet a number of minimum R_c values, being:

Outer wall and roof constructions of living spaces, bathrooms and toilets	$R_c = 2,5 \text{ m}^2\text{K/W}$
Ground floors	$R_c = 2,5 \text{ m}^2\text{K/W}$
Windows, window frames and doors in outer wall and roof constructions	$U = 4,2 \text{ W/m}^2\text{K}$
Total Reconstruction	idem
Reconstruction partially	idem, minus $1,2 \text{ m}^2\text{K/W}$

3.4.7 Slovakia

The regulations are applied in all fields of construction process. It is provided by the system: building code - technical requirements on structures – relevant standards.

Current Slovak standard related to the thermal quality of indoor climate and thermal performance of buildings with part 1-4 is:

STN 73 0540 Thermal performance of buildings and components. Thermal protection of buildings

Part 1: Terminology

Part 2: Functional requirements

Part 3: Properties of environments and building products

Part 4: Methods of calculation

The validity of this standard is from October 2002.

The EN and ISO standards are implemented into Slovak standard system.

The functional requirements on performance of the structures and buildings according to current standard are:

- ◆ the criterion of lowest thermal-technical properties (max. U-values)
- ◆ the hygienic criterion of minimum internal surface temperature
- ◆ the criterion of the minimum air change rate
- ◆ energy criterion.

These criterions are mandatory for all new and upgraded (refurbished) buildings dedicated for long term stay of people. The criterion of lowest thermal-technical properties - max. U-values are recommended for new buildings

provided that all others criterions are fulfilled. Mandatory is the requirement for U-value given for refurbished buildings.

Energy criterion is different for new and refurbished buildings and depends on the form factor.

Table 22: U-values in the building codes - Slovakia

Building construction	Transmission heat loss coefficient UN - value W/(m ² .K)	
	Upgraded (refurbished) buildings maximum value	New buildings recommended value
Outside walls and pitched roofs with slope > 45°	0,46	0,32
Flat roof and pitched roofs with slope ≤ 45°	0,30	0,20
Ceilings over exterior	0,30	0,20
Ceilings under unheated rooms	0,35	0,25
Walls between ground and heated rooms - depth under ground :		
- up to 0,5 m	0,60	0,45
- above 0,5 m to 2,0 m	0,90	0,60
- above 2,0 m	1,20	0,75
Floors between ground and heated rooms :		
- up to 0,5 m under ground and 2,0 m distant from internal surface of external wall	0,60	0,40
- others	0,85	0,60
Windows and doors to living rooms	2,0	1,7
Entrance doors to heated rooms without unheated anteroom	4,3	3,0
Entrance doors to unheated anteroom	5,5	4,0

Explanatory notes:

Useful area – is the sum of floor area of all rooms including kitchen, hall, lobby, bathroom, lavatory, excepting area of balcony and loggia.

Living area – is the sum of floor area of living rooms with floor area of more than 8 m² excludes the floor area of kitchen. Only if the floor area of the kitchen is more than 12 m² this part above 12 m² is included to the living area.

3.4.8 Conclusions

In general, there are rather big differences in valid standards among individual countries. Nevertheless the future trend standardisation of energy consumption in buildings is related to implementation of requirements of the EU Directive on Energy Performance in Buildings.

4. IDENTIFICATION OF BARRIERS TO LOW ENERGY LOW COST SOCIAL HOUSING

The idea of the LOCOSOC project is to assist accession countries to remove the barriers for low cost low energy social housing, learning from the experience in EU countries. In this chapter, barriers to low energy and low cost social housing in the analysed accession countries are identified. The identification is partially the result of analysis of the above information, partially based on experience of the partners in the project with energy conservation projects in CEE countries, and the result of discussions between the partners. Furthermore, the background country reports are a source of information.

The following types of barriers were identified and discussed in the background country reports:

- ◆ Legal barriers
- ◆ Technical barriers
- ◆ Institutional barriers
- ◆ Fiscal/Financing barriers
- ◆ Other barriers.

4.1 Legal barriers

The following major legal barriers were identified in the analysed EU accession countries:

- ◆ The clear definition of low energy and low cost social housing and its implementation in the legal/standardisation system is still missing. Due to that low energy housing is not mandatory even if construction is done using public funds.
- ◆ The clear legal framework for refurbishment of existing housing stock including its change to low energy and low cost social housing is not in place.

4.2 Institutional barriers

The following major institutional barriers were identified in EU accession countries:

- ◆ There is currently no special programme for promotion of low energy and low cost (social) housing in any of analysed countries. In some countries there are programmes for social housing (e.g. Latvia) and/or special institutions dealing with social housing (e.g. Czech Republic – State Housing Fund). Also programmes for low energy housing exist in some countries (e.g. Czech Republic). Nevertheless a comprehensive programme for promotion of low energy and low cost social housing is still missing in analysed countries.
- ◆ Currently there is no institution dealing with promotion of low energy and low cost social housing despite the fact that there are various institutions and groups of experts who are involved in policy development of housing and also implementation of RUE and RES. Nevertheless there is lack of co-ordination of their activities.

- ◆ There are various experts in practical design of low energy housing. They should cooperate in all phases of the project. This could lead to improved designs, implementing of RES and RUE solutions at the same time.
- ◆ Low energy housing is not sufficiently promoted as a part of professional training of architects and civil engineers both in gradual and post gradual training except few individuals. It would be necessary that low energy housing would become a regular part of the training. This is also true for many EU member states. (Does not apply to NL, it is already going on in this country)

4.3 Technical barriers

Despite the fact that that materials and technologies needed for low energy house construction are available on the market, there are still some technical barriers:

- ◆ The spatial planning in some countries still does not take into account low energy housing concept when designing the infrastructure. Due to that some advantages of low energy housing can be lost (e.g. utilisation of passive solar heating cannot be fully utilised if the road planning does not take into account optimal utilisation of passive solar heating in new buildings).
- ◆ Some construction companies are still not able to meet necessary requirements in quality of construction and thus to reach parameters for low energy housing in practice. In addition, a fierce price competition gives them a strong incentive to maximise their margins by using lower quality materials or by changing the design with an adverse effect on energy performance of the building.

4.4 Lack of awareness

One of the barriers is lack on awareness on low energy and low cost social housing among the various stakeholders in EU accession countries, and mainly:

- ◆ Municipalities in many countries are still not aware of the possibilities to build low energy and low cost social housing and there is also a resistance to penetration of new ideas which may create difficulties and risks during implementation and operation of low energy housing concept.
- ◆ Municipalities give priority to construction of standard low investment cost housing which leads to higher operational costs.
- ◆ Despite the fact that there exist some financial sources exist to support construction of social housing it may happen that potential investors are not aware of availability of these funds and the way how to apply for getting financing from them.
- ◆ In Central European countries there is a long-term experience in the use of typical building materials like solid bricks or light concrete blocks. It is a historical fact. Wooden constructions of buildings typical in many Scandinavian and Baltic countries, Australia and Canada are not usually applied in new housing. Thus wooden construction can be one solution for cheaper buildings, faster construction, recycle of waste materials. But it is difficult to disseminate this idea among people. The Central European countries have a lot of forest areas, the wood is different and not such good as in Scandinavia, but it is possible to found or re-open factories for wood conversion. It would provide not only cheap housing but also provide a place for employees and decrease

unemployment in the countryside. Nevertheless norms and standards should be set and knowledge for this type of buildings should be disseminated.

- ◆ Lack of awareness of low energy housing occupiers about the impact of their behaviour on energy consumption can result in much higher consumption of energy than expected in the design (up to 200%).
- ◆ Utilisation of renewable energy sources in buildings is not a common practice as people are not aware about their potential use. This is mostly the case of EU accession countries.
- ◆ Procurement criteria do not usually take into account energy performance of the building and thus prefer cheaper technical solution with higher operational (energy) costs to low energy and low cost solution.

4.5 Financial barriers

Raising financing for low energy and low cost social housing is one of the key barriers in EU accession countries, and mainly:

- ◆ In some of the analysed countries there are financing programmes supporting construction of social housing available. But currently there is no specialised financing programme that would deal with financing new low energy and low cost social housing.
- ◆ Most RUE and RES investments are still non attractive from an investor's point of view because of their long payback period and non-competitive pricing compared to other types of energy.
- ◆ A number of criteria are used to select project for public co-financing and mostly it is difficult to meet these criteria and/or to write an application to receive financing from public funds. The system should be either simplified or assistance to applicants in drafting the application should be available.
- ◆ In EU accession countries a large part of housing was built using the concrete panel technology with high thermal losses. As some case studies show, these houses can also be converted to low energy and low cost social housing. Limited funding for rehabilitation of housing stock exists in some countries but more attention should be given to this issue.
- ◆ Commercial banks are not much interested in financing rehabilitation of existing housing stock if no other co-financing is available (grants, soft loans) as they assess it as a risky business. Blending of financing from various sources can help to overcome this barrier and to reduce interest rates of loans that are still rather high in some EU accession countries.
- ◆ Energy Service Companies are still not active in rehabilitation of old housing stock due to long-term payback period.

5. IDENTIFICATION OF INCENTIVES TO LOW ENERGY LOW COSTS SOCIAL HOUSING

To overcome barriers to low energy and low costs social housing incentives were identified in individual countries and they are presented below in the following fields:

- ◆ Legal incentives
- ◆ Institutional incentives
- ◆ Technical incentives
- ◆ Fiscal/Financing incentives
- ◆ Other incentives.

5.1 Legal incentives

Promotion of low energy and low costs social housing needs an implementation of new regulation which would define/specify low energy and low costs social housing and set basic characteristics which would be binding for those who would like to apply for financial/fiscal incentives. Such regulation could be developed and implemented within the process of implementation of the EU Directive on Energy Performance of Buildings.

5.2 Institutional incentives

Housing policy would include low energy and low costs social housing among the priority areas for public interest in housing.

National and municipal programmes dealing with promotion of low energy and low costs social housing would be developed being a part of the housing policy implementation.

National and regional programmes for promotion of RES and RUE can be used as a good background for their implementation in built environment. EU member states participating in the project (Austria, Greece, and the Netherlands) have extensive experiences in this field.⁹

Training of architects, engineers, designers in design and construction of low energy and low costs social housing could be a part of their graduating and post-graduating training.

5.3 Technical incentives

Programme for research and development of new progressive materials and technologies to be applied in low energy and low costs social.

⁹ For example, Austria has excellent national and municipal programmes to subsidize ideas in alternative energy. These government programmes have proved themselves effective in the building branch, enabling the implementation of these concepts. As an example, Austria has the largest number of warm water collectors per citizen in middle Europe.

Stricter technical standards for housing construction will promote development and implementation of advanced technologies.

Through procurement of advanced technologies to be applied in low energy and low costs social housing the market would be promoted which would further reduce costs of new technologies.

5.4 Awareness

Dissemination of information on successful projects is the best way to increase awareness.

Low energy housing should be connected with increase of awareness on the use of renewables.¹⁰

Free basic consultancy should be available in regions for those who would like to build new or refurbish an existing house.¹¹

Demonstration – awareness campaign

Publications – informational material

Architectural competition

Student competition.

5.5 Fiscal Incentives

Income Tax Exemptions

Property Tax Exemption

Energy/carbon tax

5.6 Financial incentives

Low operating and maintenance costs are naturally the greatest incentive. With construction costs of low-energy housing compatible with those of normal housing, the low operating costs present an enormous advantage. If one were to compare the savings between the two forms, the occupant in the low-energy housing would save up to one half the costs over the occupant in the conventional housing.

¹⁰ Research polls in several low-energy housing projects indicate that by living within such housing the occupants have become increasingly aware of the advantages for the environment, and what their personal impact can be. Further, living in a low-energy housing project fulfils a desire on the part of the consumer to make a personal effort to reduce waste and protect the environment.

¹¹ For example, the Ministry of Environment in Greece has organized regional offices throughout the country in order to provide free consultancy, technical assistance and information to local engineering offices and individuals. CRES and a number of private consultancy companies have the know-how to consult and provide solutions for the implementation of RUE and RES in the housing stock.

The improvement of living quality and comfort. In the last few years the interest on the part of consumers is made evident by a marked increase in low-energy building within the housing industry. With comparative costs, the occupant feels more comfort at home. For example a passive energy housing unit shows the occupant how pleasant it can be to have continuous natural air circulation. The market share in housing incorporating this technology has doubled in the past few years.

Support for Mortgage Loans

Support for Construction of Municipal Rental Apartments and Technical Infrastructure

Support for Construction of Rented Housing with Community Care Services

Interest-Free Government Loan for Municipalities

Subsidies for Repair of the Housing Stock

6. CONCLUSIONS AND RECOMMENDATIONS FOR NATIONAL POLICY AND FOR THE PROJECT

6.1 Conclusions

6.1.1 Aim of low energy and low cost social housing

The aim of low cost low energy social housing is to:

- ◆ Meet housing needs of a vulnerable part of population at reasonable quality and costs;
- ◆ Reduce the burden on public budgets (both government and municipal) through reduction of both housing costs and living costs of a vulnerable part of population which receives social aid;
- ◆ Promote new technologies, utilisation of RES and RUE in housing sector; and
- ◆ Reduce emissions of pollutants and greenhouse gases.

6.1.2 Definitions

There is no uniform definition for both low energy housing and social housing. Thus, there is also no official definition of low energy and low cost social housing. Thus, within the current project we set the definitions presented below.

6.1.2.1 Energy consumption of low energy housing

Annual energy consumption for space heating per unit of heated useful floor area would not be higher than the following figures:¹²

- ◆ Low energy block of flats: 50 kWh/m²
- ◆ Low energy family house: 40 kWh/m².

In addition to energy consumption for space heating there is also consumption for tap water heating, cooking and electrical appliances. In case of low energy block of flats total energy consumption is assumed to be up to 65 kWh/m² and in case of low energy family house the total energy consumption is assumed to be up to 55 kWh/m².

In addition, there are passive houses with energy consumption up to 15 kWh/m² but they are not taken into account in this study.

6.1.2.2 Quality of low energy and low cost social housing

All housing, including low energy and low cost social housing, must meet requirements of national building regulation as the quality and standards of housing regards.

¹² The figures depend on the climate and thus may slightly differ country by country.

6.1.2.3 Target groups for low energy and low costs social housing

The following groups of population are assumed to be potential target groups for low energy and low costs social housing:

- ◆ Young families with more children (e.g. 3-4);
- ◆ Low income families during their productive age (based on a criteria on minimal income);
- ◆ Pensioners and disabled people with low income; and
- ◆ Children without parents.

6.1.2.4 Type of low energy and low cost social housing

Low energy and low cost social housing can be built using the following types of housing:

Rehabilitation of current social housing

We can assume that block of flats built using prefabricated concrete panels in EU accession countries in 1960s and 1970s can be included in the category of social housing due to their low quality and the way the flats were rented to tenants based on the criteria of social aid. Most of such type of housing required urgent rehabilitation. Experiences show that such housing can be converted to low energy and low cost social housing using much lower costs than in case of building new housing.

Construction of new social housing

Primarily social housing is assumed in block of flats in which flats would be rented to tenants from the groups listed above. But in rural areas also family houses can be assumed to be social housing.

Construction of boarding houses for pensioners and disabled people

Many elder and disabled people mostly in EU accession countries become a part of vulnerable population which cannot effort current housing. They also need regular health care. In this case construction of boarding houses for pensioners and disabled people can be an option for their lighter future. As these houses are mostly built from public funds, their construction as low energy and low cost social housing would be promoted.

Construction of boarding houses for children without parents

Children without parents that cannot find a new family need a special care. One option is building boarding housing for them. As these houses are mostly built from public funds, their construction as low energy and low cost social housing would also be promoted.

Only combination of implementation of all above listed measures can bring substantial reduction of energy consumption in the housing sector.

6.1.2.5 Costs of low energy and low cost social housing

The combination of low cost housing and low energy housing is sometime crucial to reach with the requirements for social housing. To make this type of housing acceptable for target groups of population the maximal costs should not overpass the cost of standard housing by more than 10%.¹³

6.2 Recommendations

Future efforts within the project would be targeted on the following issues:

- ◆ Formulate recommendation for overcoming the barriers to low energy and low cost social housing;
- ◆ Increase awareness on low energy low cost social housing among various groups (investors, municipalities, officers, architects, students, general public and home owners associations); and
- ◆ Develop a feasibility study of construction of low energy and low cost social houses in selected participating countries, mainly EU accession countries.

¹³ The costs may differ country by country due to different price of building materials and labour costs. That is why the actual costs are not presented.