

Securing the take-off of
Building Energy Certification

STABLE

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Project acronym: STABLE

**Securing The Take-off of
Building Energy Certification:
Improving Market
Attractiveness through
Building Owner Involvement**

Publishable summary report

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1 The project

1.1 Objectives of the action

The objective of this project has been to secure the genuine market-driven take-off of building energy certification in the participating countries. In the beginning the project realisation focused on the following objectives:

1. Improve market attractiveness of energy certification through developing and disseminating customer quality requirements, related quality recommendations to programme managers and approaches for linking high energy performance with financial market incentives;
2. Increase the awareness and interest of European building owners by delivering a targeted information campaign towards major building owner sectors in participating and developing a generic structure and basic elements of a European energy certification campaign for further dissemination;
3. Increase the certification related competence and knowledge level of qualified energy auditors; and
4. Transfer best practices on energy certification and building energy auditing between Member States (current, new and candidate)

1.2 Achieved results and lessons learnt during the action

In four of the seven participating countries the objectives of the action as well as the performance indicator were well met. In three countries only the data collection work could be done and the dissemination part of the action was not possible.

Some of the highlights of the action were:

- The questionnaire made for building owners and energy auditors and the results of the questionnaire were well used when communicating with the people involved in legislation and regulation in participating countries
- In Sweden the project ended with a well planned and structured set of events for building owners and energy auditors. The feedback was collected also from the events.
- In Austria, Sweden, Belgium and Bulgaria the discussion between the financial institutions and technical implementation of the regulations could be started.

1.3 Project consortium

The project has been coordinated by Motiva Oy. The project consortium consisted of xx partners. The partners and contact persons are listed in the following table:

Participant N°	Participant Short name	Address of Participant	Family name, first name	E-mail
1	Motiva	PL 489, 00101 Helsinki, Finland	Nojonen, Osmo	osmo.nojonen@motiva.fi
2	FREF	Annankatu 24, 00100 Helsinki, Finland	Rantama, Markku	markku.rantama@kiinteistoliitto.fi
3	AEA	Otto-Bauer-Gasse 6, 1060 Wien, Austria	Höfer, Gerhard	gerhard.hofer@energyagency.at
4	VITO	Boeretang 200, BE-2400 MOL, Belgium	Vekemans, Guy	guy.vekemans@vito.be
5	Senter-Novem	Postbus 8242, 3503 RE Utrecht, The Netherlands	Hoogelander, Kees Jan	k.hoogelander@senternovem.nl
6	STEM	Box 310, 63104 Eskilstuna, Sweden	Lopes, Carlos	carlos.lopes@energimyndigheten.se
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2 The Questionnaire

2.1 Objective

In the EU project Stable (Securing the Take-off of Building Energy Certification: improving the market attractiveness through Building Owner Involvement) seven countries are researching which aspects influence the attractiveness of the energy certificate. This report presents the results for all the countries.

2.2 Method

- 1) A questionnaire has been designed and sent out to professional parties in the building sector by the STABLE project team. This was done in 2005. Response was returned by April 2006. The questionnaire is attached as an annex.
- 2) This report is produced based upon the English questions. For the data collection these were translated into the national language. Possible nuance differences in translation are not taken into account, nor are the additional comments in national language.

The questionnaire for professional organisations has been used in Finland, Sweden, The Netherlands, Greece, Bulgaria, Belgium and Austria. Country reports of the results in those countries are available (except for Belgium).

- 3) A questionnaire has been designed and sent out to consumers (both house owners and tenants). The questionnaire is attached as an annex.

This questionnaire for consumers has been used in Belgium, Sweden, The Netherlands and Austria. Separate reports of the results in those countries are available.

No analysis is performed on the differences / agreements between professionals and consumers. The amount and distribution over various countries and types of respondents does not warrant a useful comparison.

2.3 Status of Energy Performance Certificates

From 4 (Belgium, Netherlands, Finland, Austria) of the 7 countries, information was received on the status of the implementation of EPBD and certificates and Bulgaria already has implemented all of the issues. Twenty different issues need to be arranged. Belgium, Netherlands, Finland and Austria plan to be ready before half of 2008, see Table.

	Netherlands	Belgium	Finland	Austria	Bulgaria
Number of measures already implemented for (number of segments from existing residential, new residential, existing non-residential, new non-residential)					
methodology for calculation energy performance	4	4	1	2	4
set energy performance requirements	2	2	1	2	4
issue an energy certificate	0	4	1	2	4
arrange qualified and or accredited experts	2	2	1	2	4
generating advice	2	3	0	0	4
Status	Ongoing	Advanced	Starting	Ongoing	Complete
Schedule for implementing EPBD					
Planning to be ready	1 st half 2007	2008	1st half 2008	1st half 2008	done
Responsible	National government	Regional Government	National Government	Regional Government	National Government

3 Questionnaire results; professional parties

The results of the questionnaire with professional parties will be described and analysed according to the following structure:

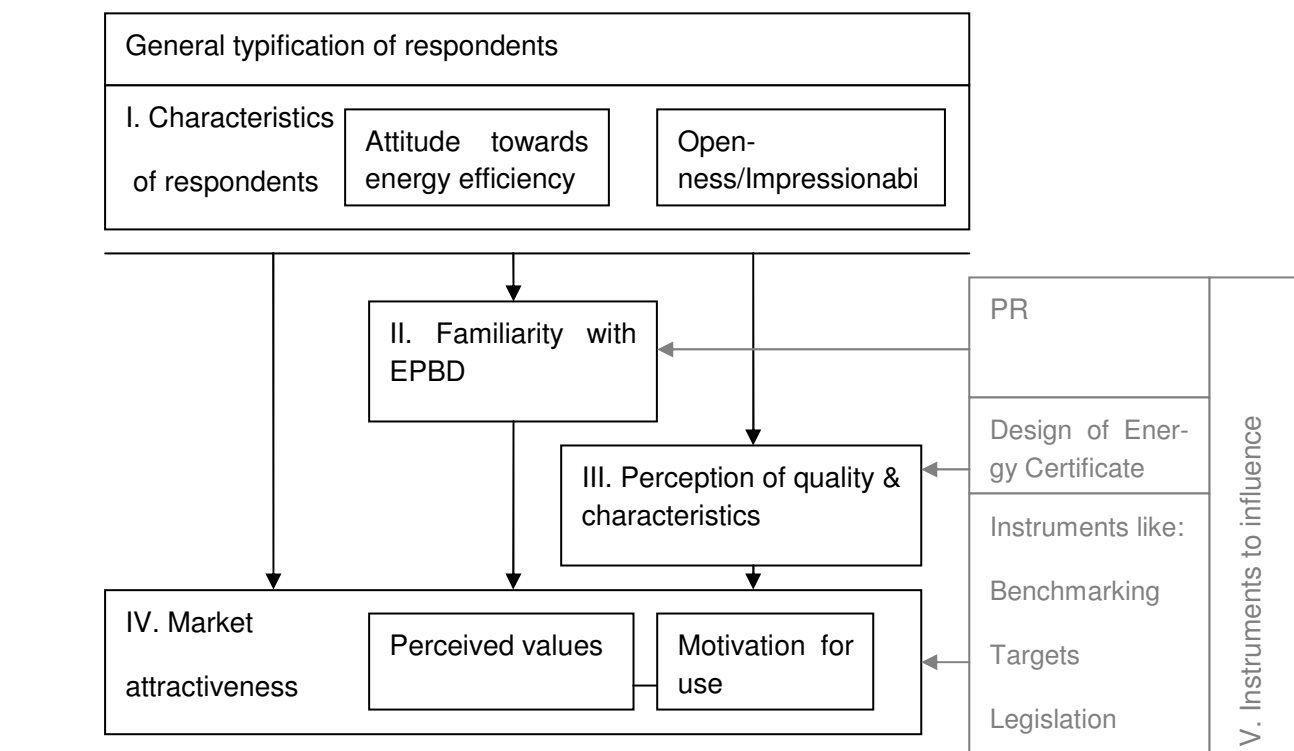


Figure 1.

First, a description of the response to the questionnaire is given. Second, we will describe the results for the different elements, see Figure 1.

- I. Characteristics of respondents
- II. Perception of quality & relevant characteristics of an energy certificate
- III. Market Attractiveness
- IV. Instruments of Influence

In each section, the results will be described per country, but when interesting we will take a cross section and relate the results to the characteristics of the respondents being:

- Type of organisation (Owner, Supplier, User)
- Level of priority one assigns to improving energy efficiency (Very high, High or Low/very low)

- Type of buildings one mainly works with (Residential or Non-residential)

This chapter will conclude with a summary of the main aspects that relate to the market attractiveness of Energy Performance certificates as observed from the data as gathered with the questionnaires amongst professional parties, in order to be used for recommendations to improve successful implementation.

**Please note that standard deviation in the graphs can be quite large, for instance, the results for Belgium are based upon only 6 returned questionnaires in the professional market.*

3.1 Response

Number of responses

In total 466 questionnaires were returned from the seven countries that participate in the STABLE project. The number of respondents differs a lot between the countries.

The useful responses from Belgium, Bulgaria and Greece were relatively low. In Belgium, this is because the specific market situation makes this questionnaire less relevant. Also the distribution of the response over the type of organisations per country is different.

General distribution over the professional parties

The organisation types which responded are distributed over three categories as follows, see also Table 1 for details:

- *Owners of buildings*: defined as the sum of condominium/housing cooperative, housing company/association and building owner/investor (68% of all returned questionnaire, 81% of defined response)
- *Supplier to owners*: defined as building management, building maintenance and property developer (15% of all returned questionnaires, 18% of defined response)
- *Users*: defined as building user / tenant organisation (2% of all returned questionnaires, 2% of defined response)

		Austria		Belgium		Bulgaria		Finland		Greece		Sweden		Netherlands		Total	
Total number of returned questionnaires		93		6		61		123		24		90		69		466	
Owner of building(s)	building owner or investor	6		2		21		31		5		22		4		91	
	housing com-	59	67	0	2	0	24	29	71	1	8	58	81	59	63	206	316
	condominium, cooperative etc	2		0		3		11		2		1		0		19	
Supplier to owners of building(s)	property	2		0		1		6		0		1		0		10	
	building management	19	21	1	4	2	3	17	29	1	3	2	9	0	0	42	69
	maintenance	0		3		0		6		2		6		0		17	

User of building	user/tenant organisation	0	0	0	0	0	0	6	6	1	1	0	0	0	0	7	7
Other or not answered	other	1	5	0	0	10	34	14	17	3	12	0	0	3	6	31	74
	not answered	4		0		24		3		9		0		3		43	

Table 1. Distribution of response over countries and organisation

Type of buildings one mainly works with.

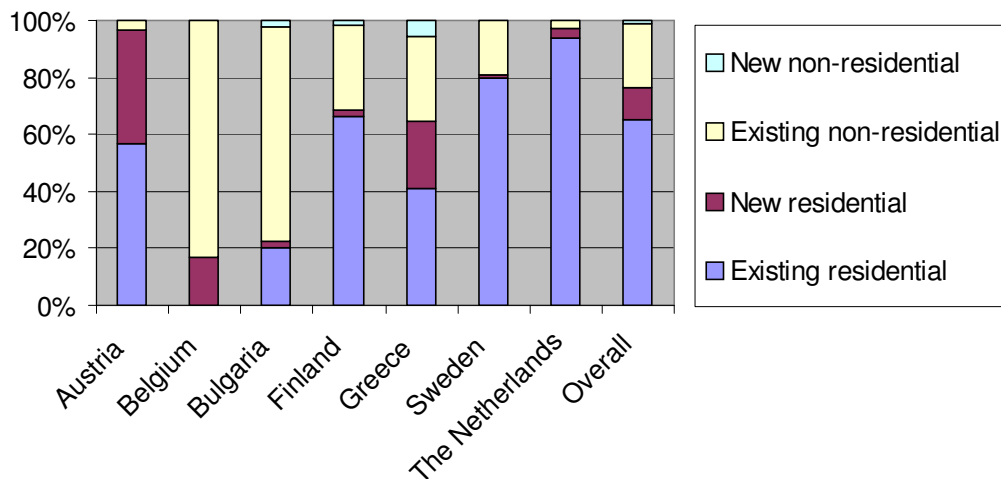


Figure 2. Type of buildings being worked with by the respondents

The majority of respondents mainly work with residential buildings (325), but a significant part mainly works with non-residential buildings (101), Figure 2. Therefore a comparison between the preferences between these two respondent groups might be useful.

The vast majority of respondents mainly work with existing buildings (88%). In the analysis of the response differences between parties that work with new or existing buildings are not specified.

Interpreting differences between countries should be done with care, keeping in mind the differences in number and type of respondents per country.

3.2 Characteristics of respondents

Attitude towards energy efficiency

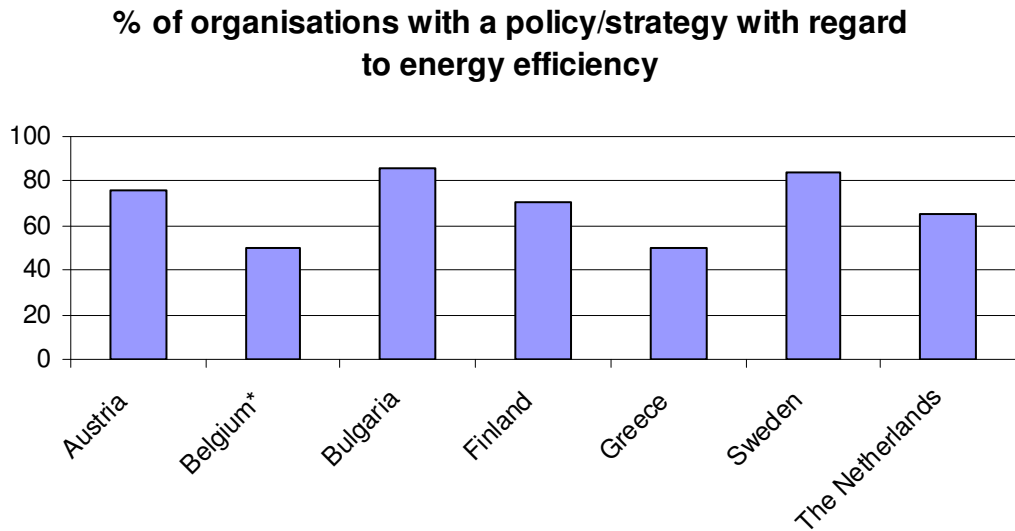


Figure 3.

In all countries at least half 50% of the organisations do have a policy/strategy with regard to energy efficiency, Figure 3. In Bulgaria and Sweden most organisations have such a policy/strategy (>80%).

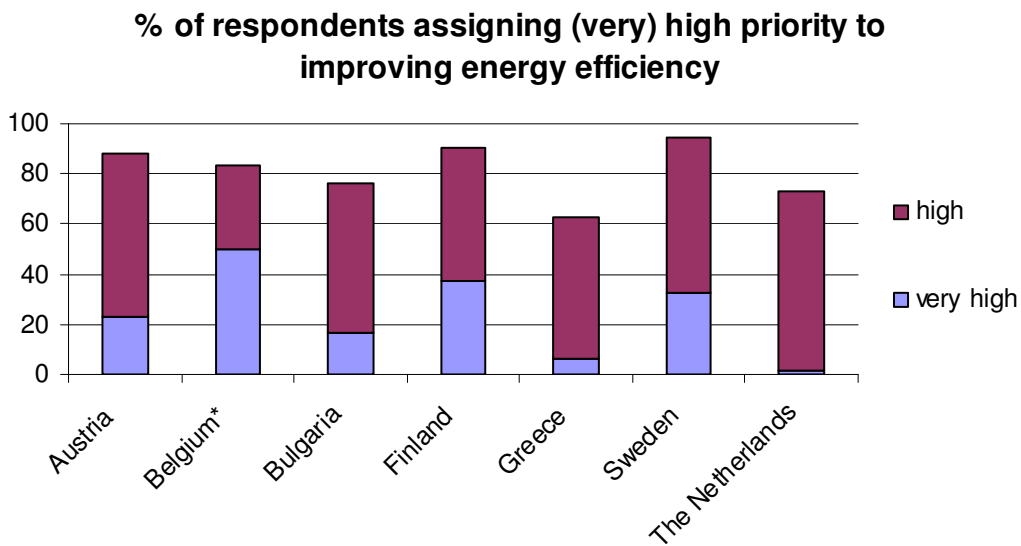


Figure 4.

In Finland and Sweden the percentage of the organisations assigning a (very) high priority to improving energy efficiency is more than the overall percentage for all respondents, Figure 4.

The respondents can be clustered into three groups according to the priority level they assign to improving energy-efficiency:

group 1: very high priority level (25%),

group 2: high priority level (61 %),

group 3: low/very low priority level (14%).

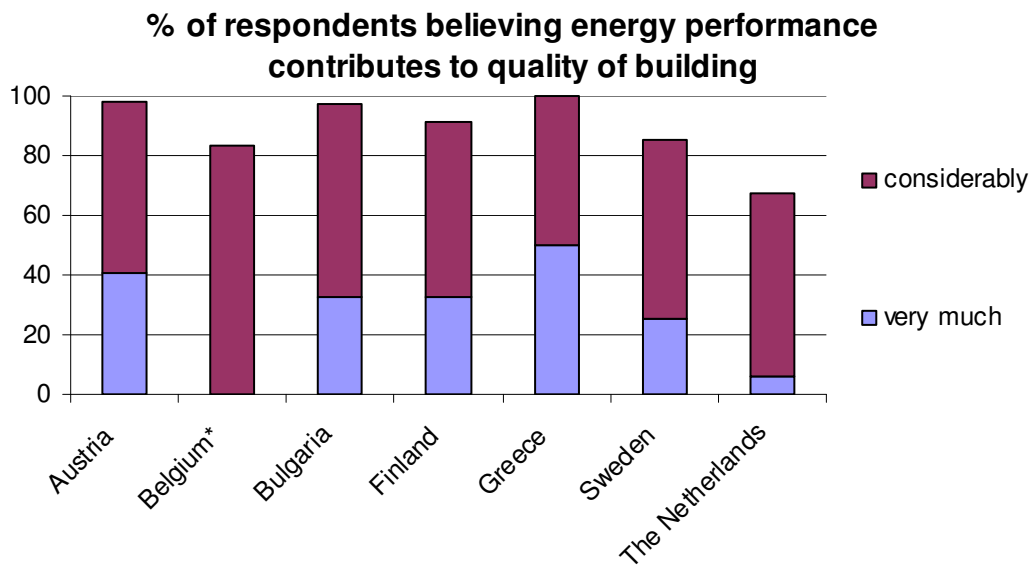


Figure 5.

In The Netherlands relatively little respondents believe energy performance contributes to the quality of a building. In Austria, Bulgaria, Finland and Greece this believe is just over average, Figure 5.

Positive attitude towards energy efficiency

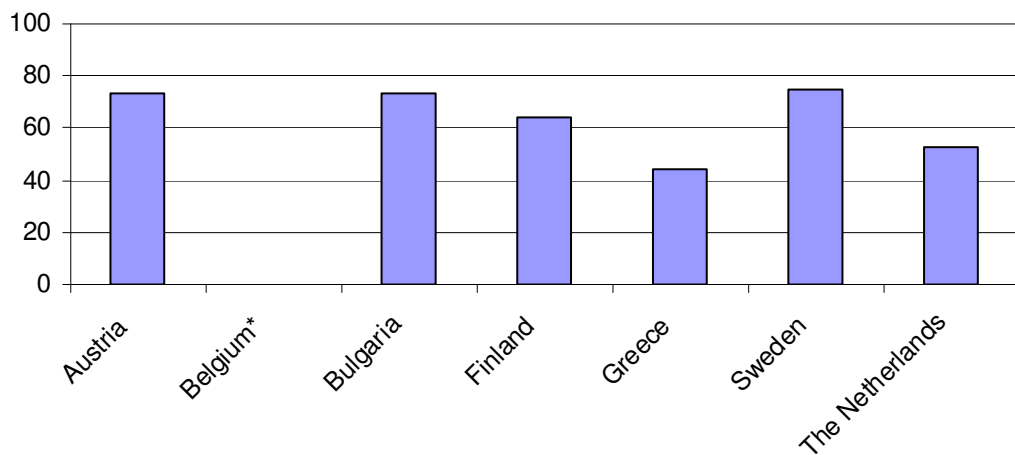


Figure 6.

What is now the general picture with regard to the attitude in countries? A clearly positive attitude towards energy efficiency can be defined as having a positive opinion with respect to all three above mentioned subjects (Figure 3, 4, 5). In Sweden, Bulgaria and Finland a more than average number of organisations do have a positive attitude towards energy efficiency, Figure 6. In Greece and The Netherlands less organisations, but still almost half, have a positive attitude towards energy efficiency.

Openness/Impressionability

% of respondents that think an instrument could influence their decision making proces with respect to energy efficiency

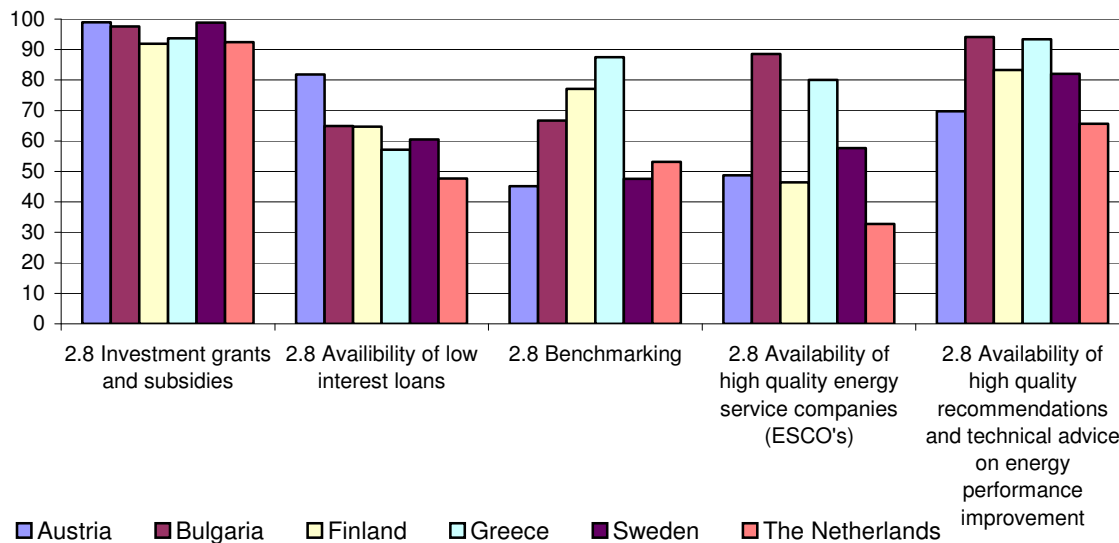


Figure 7.

Investment grants and subsidies influence decision making processes in all countries and to almost all respondents, Figure 7. The influence of benchmarking differs though. In Greece, Finland and Bulgaria this instrument could influence more organisations than in the other countries. In Bulgaria and Greece the availability of high quality ESCO's is considered more influencing than in the other countries. This could be caused by the fact that respondents from those countries work more often mainly with non residential buildings.

The influence of high quality energy services is much larger for organisations active in the non-residential market than in the residential market (70% versus 47%). The influence of the availability of low interest loans is smaller in the non-residential market compared to the residential market (53% versus 68%).

% of respondents influenced by other parties

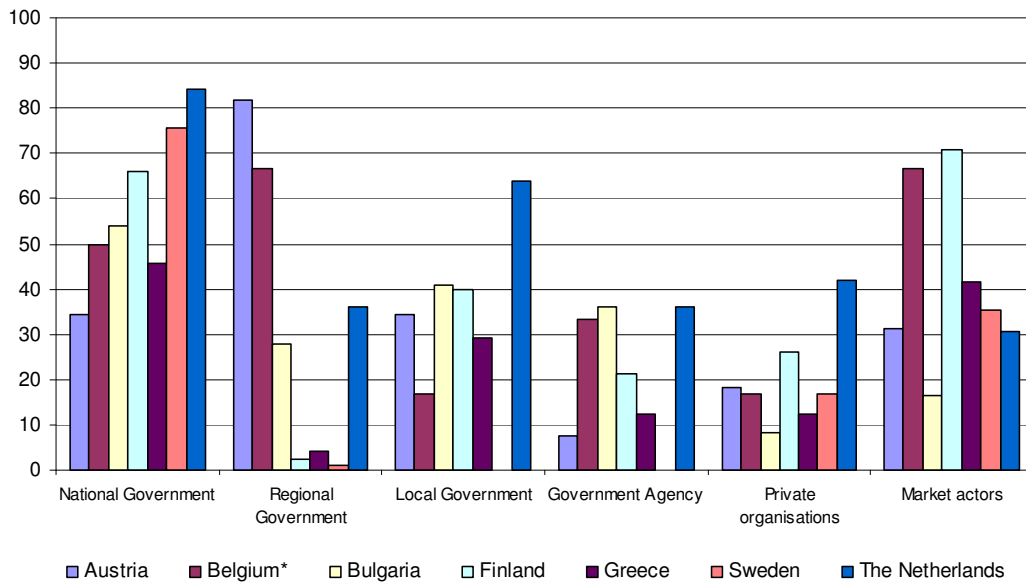


Figure 8.

When comparing the types of external parties that influence the respondents with respect to improving energy efficiency, it seems that in The Netherlands, Sweden and Finland the National Government are important influencers, Figure 8. In Austria (and Belgium) the Regional Government are very influential. Furthermore, Finnish (and Belgian) respondents are influenced a lot by market actors. Dutch respondents are influenced considerably by Local Government.

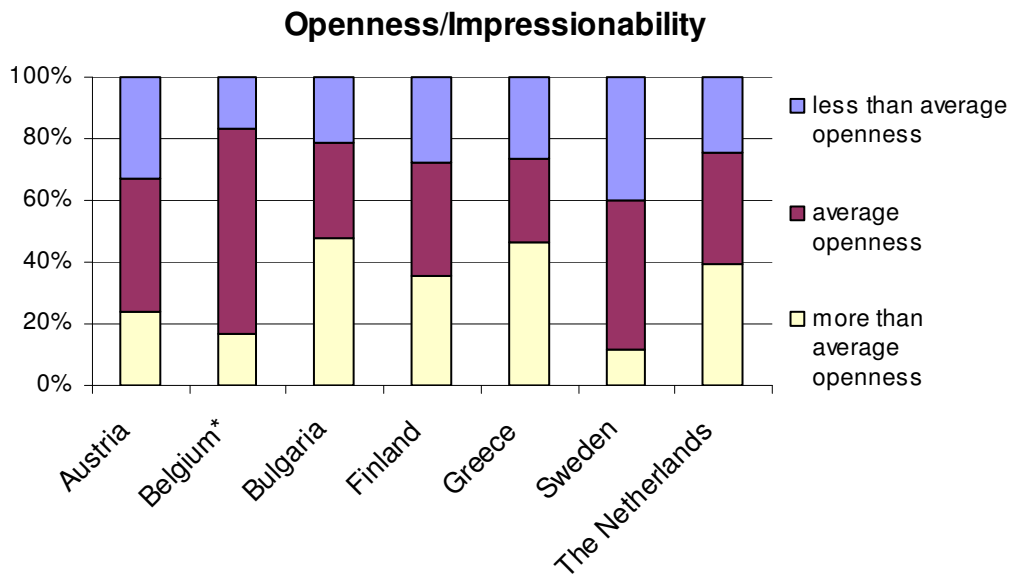


Figure 9.

The Openness / Impressionability is measured by counting the number of instruments and organisations which respondents think they are influenced by. Respondents in Sweden seem less impressionable while organisations in Bulgaria and Greece seem more impressionable.

3.3. Familiarity with EPBD and information gathering preferences

The majority of respondents know about the EPBD, but most are not familiar with the contents and requirements of all aspects, Figure 10. In general the energy certification of buildings and the inspections of boilers and air conditioning installations are best known. However, Bulgarian respondents are relatively good informed about the different aspects of the EPBD with the exception of this regular inspection of boilers and air conditioning installations.

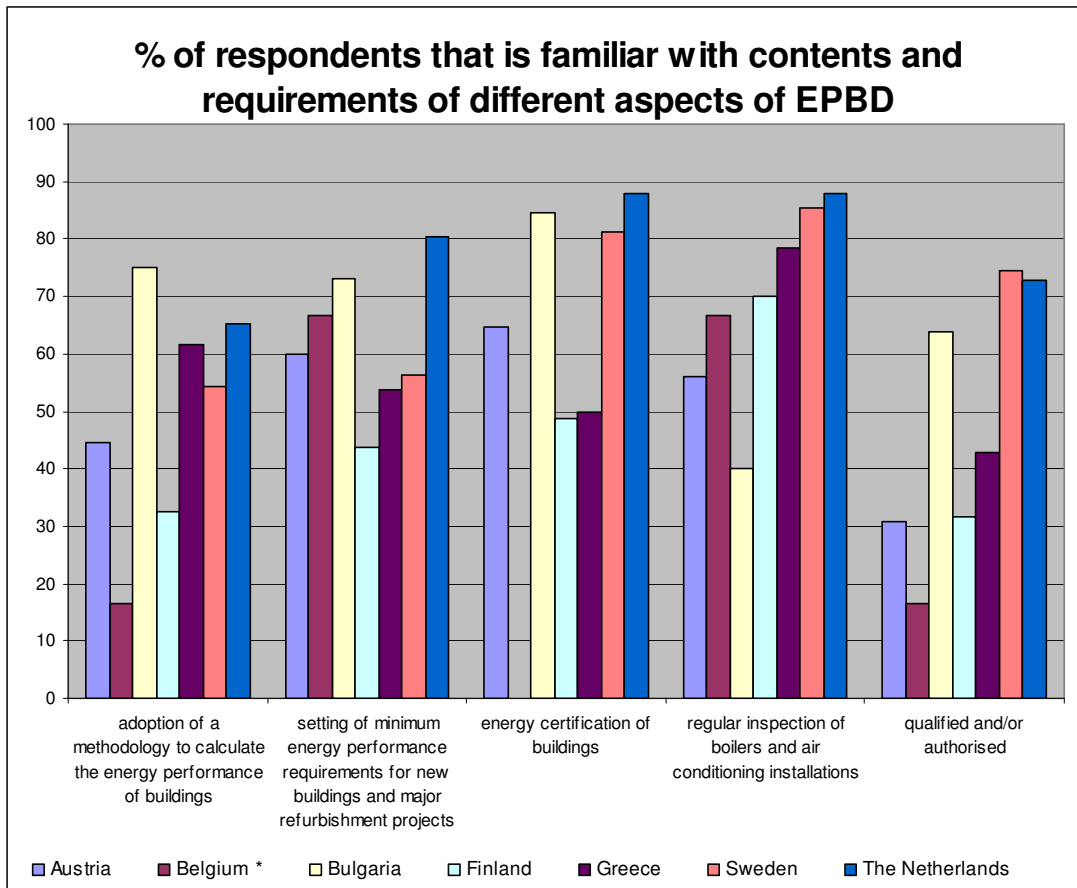


Figure 10.

In the questionnaire one was asked about his familiarity with 5 different aspects of the EPBD. It appears that Dutch and Swedish respondents are most informed about those aspects.

As the table below shows there is no correlation between the aspects of the EPBD that are already in effect and the familiarity and preparations of the EPBD.

	Austria	Netherlands	Finland
Aspects of EPBD in effect (max. 5 items x 4 sectors)	4	10	15
% of respondents familiar with at least 3 aspects of EPBD	55 %	87 %	40 %
% of respondents that have made preparations	53 %	62 %	34 %

Figure 11.

Also Owners of buildings are familiar with more aspects than Suppliers to owners.

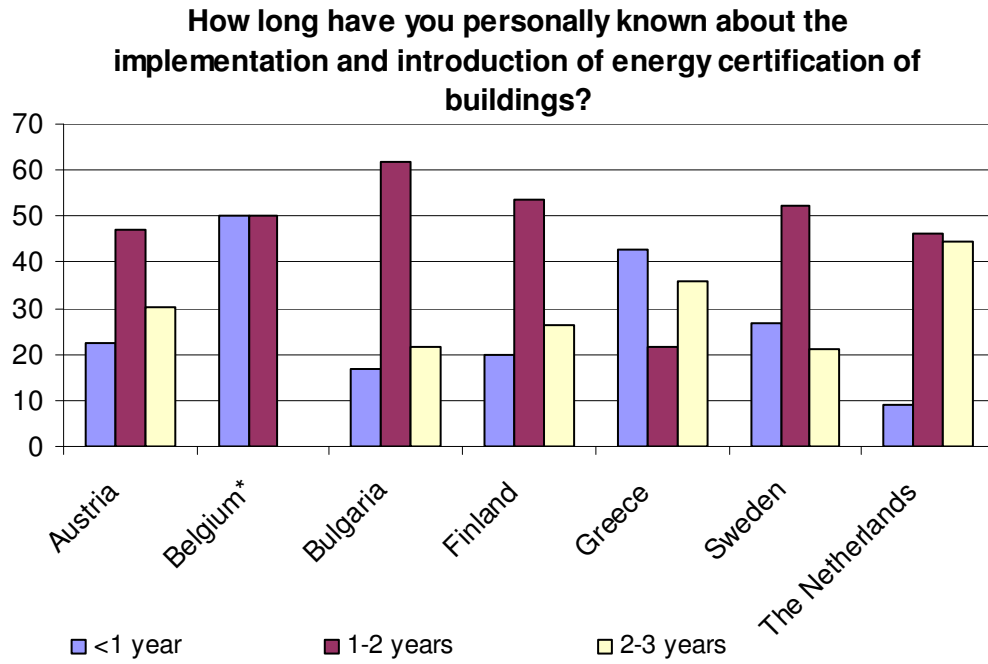


Figure 12.

In most countries the majority of respondents know of the EPBD since 1-2 years, Figure 12.

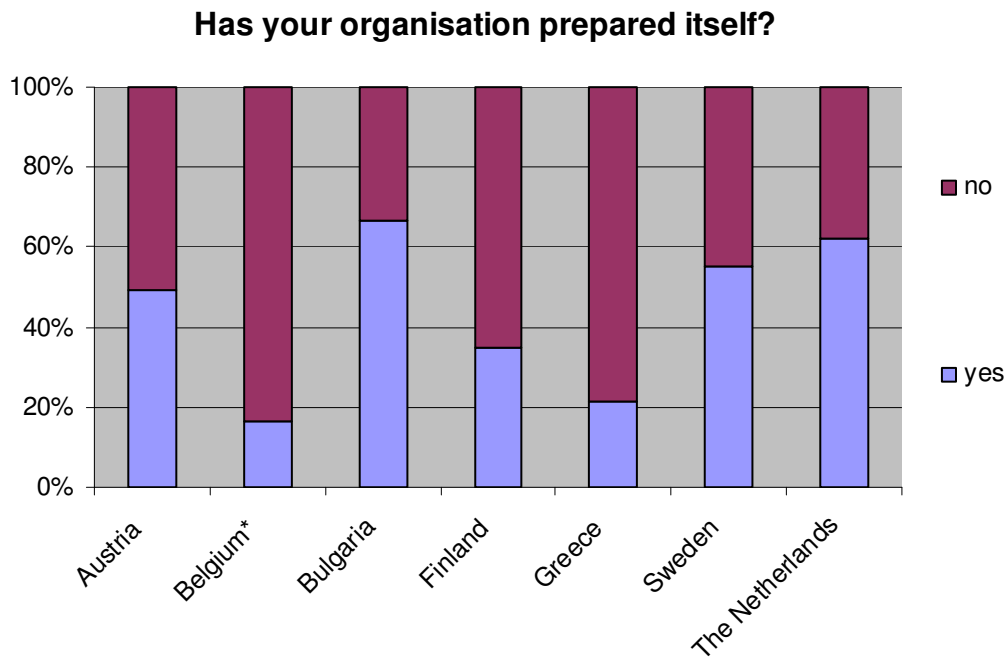


Figure 13.

In Greece and Finland (and Belgium) the lowest number of respondents state to have prepared themselves, Figure 13. In Bulgaria, The Netherlands and Bulgaria more respondents say they have prepared themselves. In Bulgaria this is probably related to the fact that the EPBD is already implemented.

Owners have taken much more preparations than Suppliers to owners (52% versus 29%). More organisations with very high priority to improving energy efficiency have taken preparations (60% versus 47% and 38% for high and low/very low priority).

Assuming that this questionnaire might be filled in by people that are more inclined to improve energy efficiency than average, this could indicate that a large share of the market that does know of the EPBD, and has not made preparations yet.

Also there is a (logical) connection between the period of time the organisation knows of the EPBD and the preparations they have made (see table 2).

	Preparations taken in any way?	
	yes	no

know of EPBD < 1 year	20 %	80%
know of EPBD 1-2 years	48 %	52%
All	47 %	53 %

Table 2. Preparations made in relation to the time that respondents know about the EPBD

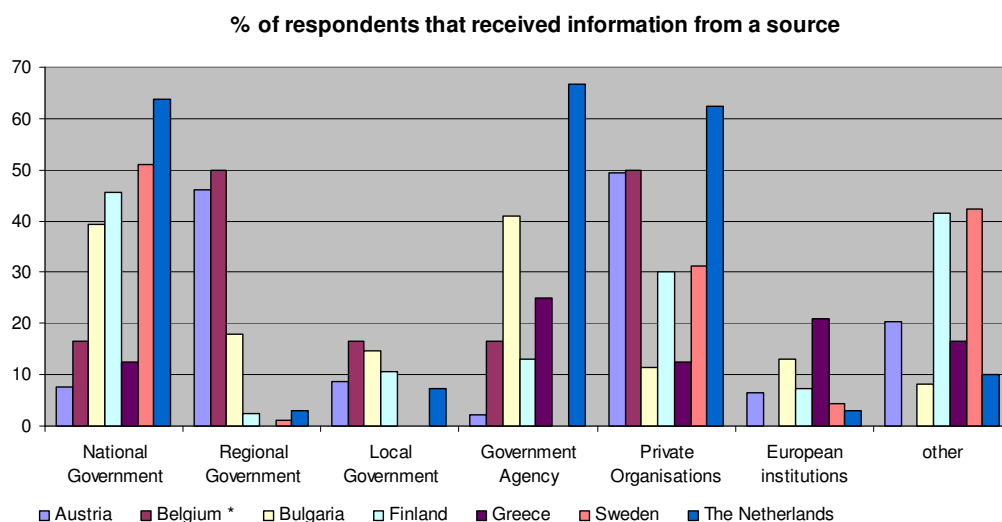


Figure 14.

Compared to the other countries, many respondents from The Netherlands say to have received information from National Government, Government Agency and Private Organisations, Figure 14. In Austria the Regional Government has provided most information, together with Private Organisations. In Finland and Sweden other (non specified) information sources played a role.

	Daily newspapers		professional		radio		television		internet		other channels	
	<i>received</i>	<i>desired</i>	<i>received</i>	<i>desired</i>	<i>received</i>	<i>desired</i>	<i>received</i>	<i>desired</i>	<i>received</i>	<i>desired</i>	<i>received</i>	<i>desired</i>
Austria	43%	<u>24%</u>	55%	58%	4%	3%	11%	7%	21%	52%	3%	2%
Belgium	17%	17%	17%	17%	17%	17%		33%	33%	67%		
Bulgaria	40%	<u>20%</u>	50%	65%	13%	15%	33%	<u>20%</u>	33%	73%	10%	10%

Finland	47%	38%	82%	78%	13%	10%	38%	33%	47%	68%	9%	15%
Greece		19%	19%	44%			6%	19%	38%	81%	6%	6%
Sweden	14%	10%	63%	<u>41%</u>	1%	7%	13%	8%	33%	29%		6%
The Netherlands	33%	<u>12%</u>	74%	<u>61%</u>	6%	8%	9%	12%	29%	52%	5%	3%

	branch organisations		partner organisations		government communication	
	<i>received</i>	<i>desired</i>	<i>received</i>	<i>desired</i>	<i>received</i>	<i>desired</i>
Austria	75%	75%	15%	22%	13%	18%
Belgium*	50%	67%	17%	17%		17%
Bulgaria	30%	30%	38%	33%	45%	43%
Finland	12%	18%	43%	<u>36%</u>	33%	53%
Greece	13%	25%	38%	44%	31%	25%
Sweden	73%	84%	22%	<u>10%</u>	41%	67%
The Netherlands	79%	73%	24%	20%	44%	67%

Table 3. Type of dissemination channels through respondents received information about energy certification of buildings and the channels through which they desire to receive information. Numbers in **bold** indicate more respondents would like to receive more information through this channel, *italic* numbers indicates respondents would like less information through this channel.

Looking at the channels through which one likes to receive information,

respondents from all countries desire more information through the internet. Thus the availability and/or accessibility of information through the internet should be increased, Table 3. In Finland, Sweden en The Netherlands respondents would like to receive more information through direct government communications.

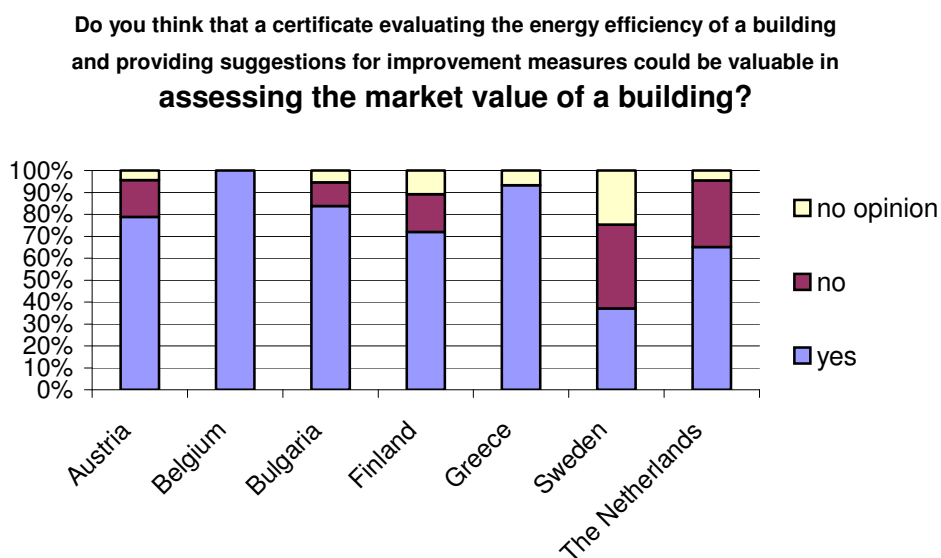
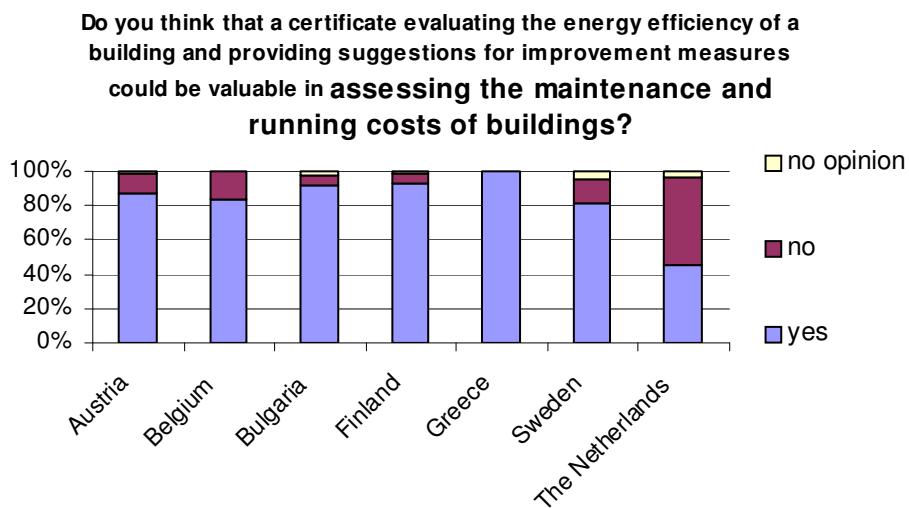
3.4 Market attractiveness: Perceived values and motivation for use

Perceived values

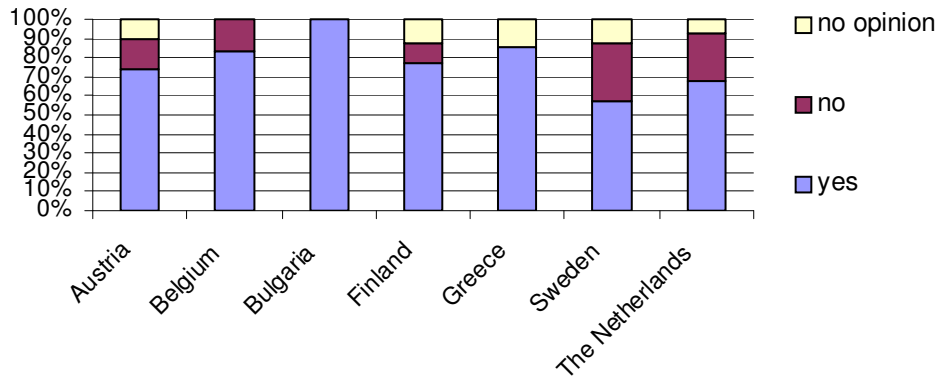
The graphs below (Figure 15-19) indicate that the EPBD-certificate is considered valuable by the majority of the respondents for (descending in value):

- assessing maintenance and running costs (overall 82%)
- planning maintenance and/or renovation (overall 80%)
- developing renovation, reconstruction and maintenance strategies (overall 74%)
- making investment / acquisition decisions (overall 73%)
- development environmental and energy management (overall 68%)
- marketing (overall 67%)
- assessing market value of a building (overall 67%)

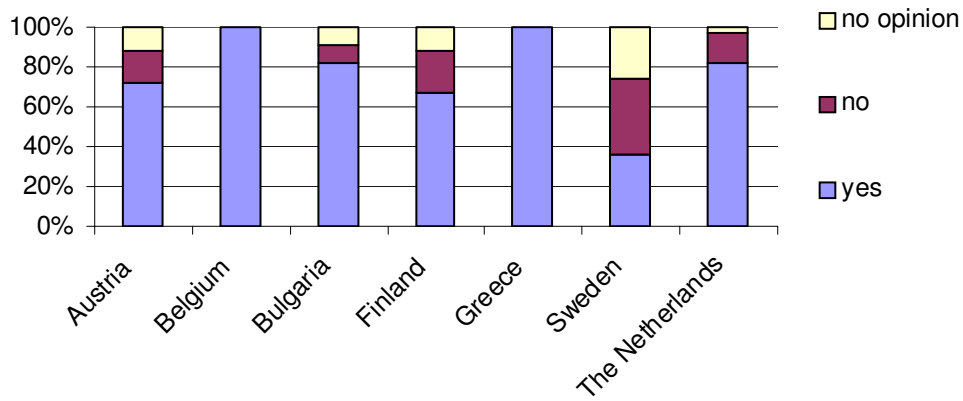
In the various countries, there are some differences between the perceived values. These can largely be explained the type and characteristics of the respondents per country.



Do you think that a certificate evaluating the energy efficiency of a building and providing suggestions for improvement measures could be valuable in **developing environmental and energy management in your building stock?**



Do you think that a certificate evaluating the energy efficiency of a building and providing suggestions for improvement measures could be valuable **in marketing buildings for potential investors or tenants?**



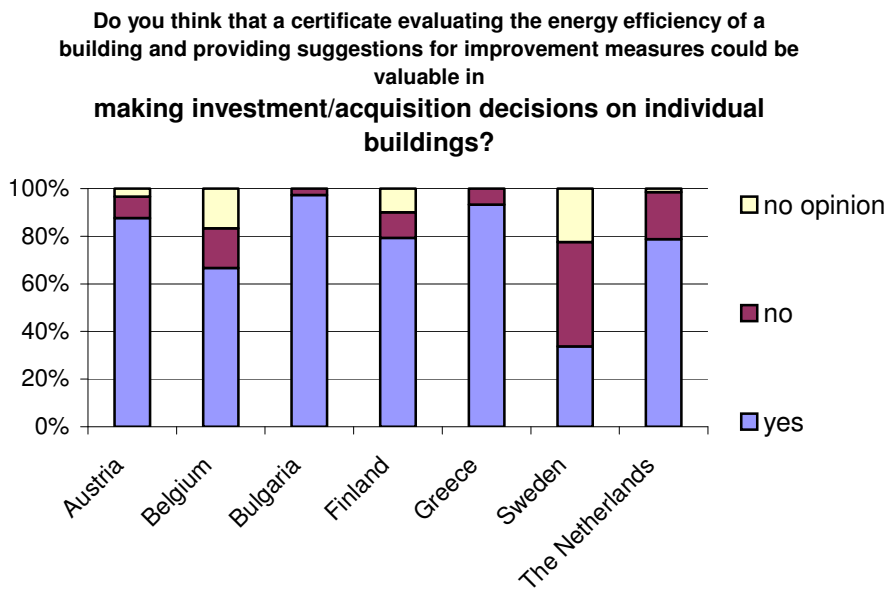


Figure 15-19. Value of energy certificates.

The respondents that assign the lowest priority to improving energy efficiency see the biggest value of the energy certificate in investment/acquisition decisions (79%) and marketing (73%). The respondents that assign higher priority to improving energy efficiency, see the biggest value in assessing maintenance and running costs (86%) and planning maintenance and renovation (83 %).

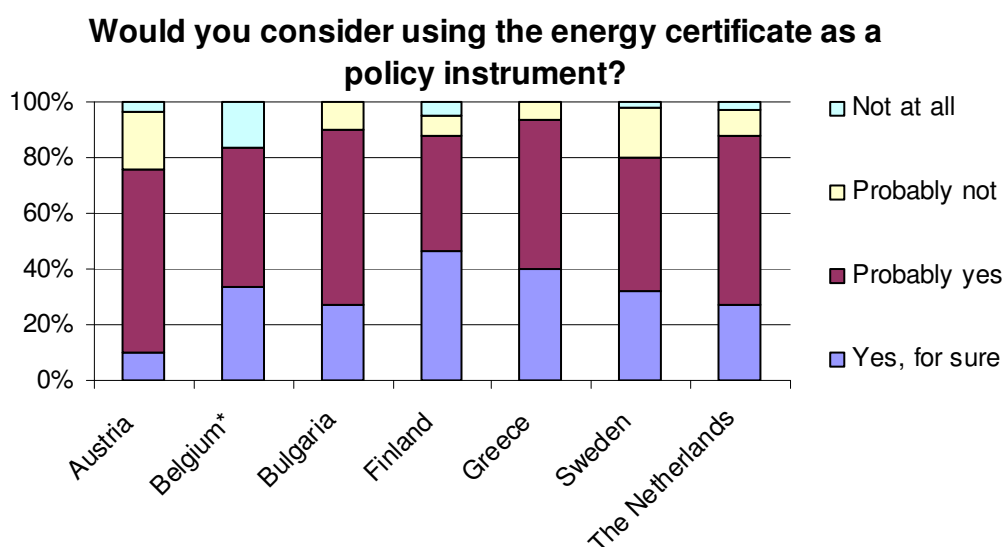


Figure 20.

As the certificate is considered valuable by the majority of respondents. Also the majority (overall 84%) consider using the certificate as a policy instrument, see table 4.

	% considering to use the certificate as a policy instrument
Owner	85%
Supplier	79%
Residential	83%
Non-Residential	87%
(Very) high priority to improving energy efficiency	85-87%
Low/very low priority to improving energy efficiency	70%

Motivation for use

Many respondents believe promoting a certain level of ranking will stimulate property owners to take measures to improve the energy quality of a building, Figure 21. Especially in Bulgaria and Greece many are of this opinion, in Sweden and The Netherlands this believe is less strong.

The respondents working with non-residential buildings almost all (84%) agree (yes or probably yes) while the respondents working with residential buildings for a large part (74%) agree. This may be correlated to the country of origin (most respondents that work with non-residential buildings come from Bulgaria and Greece, which are also the countries with a higher believe in the effect of ranking).

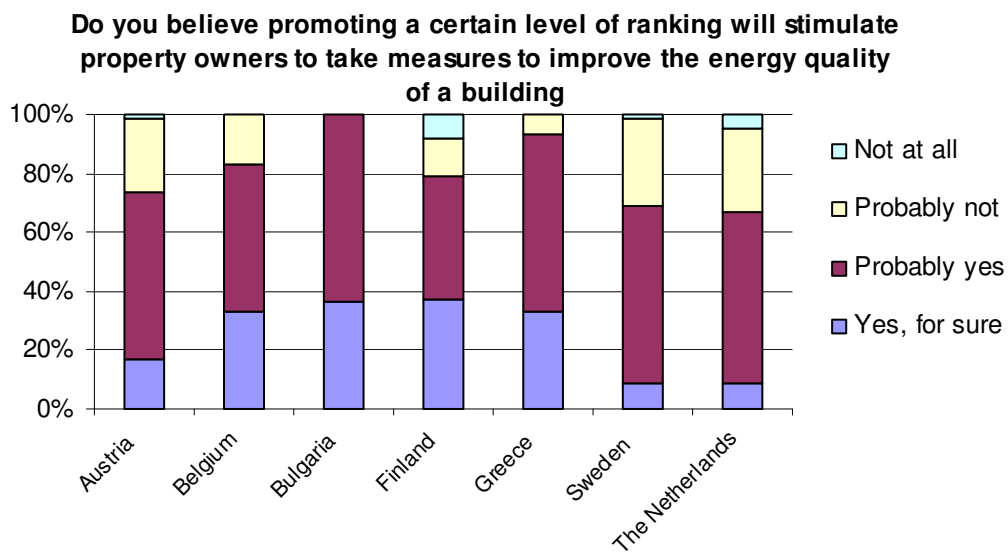


Figure 21.

Respondents that believe ranking certificates will stimulate property owners to take measures to improve the energy quality of a building, will (probably) use the certificate more often as a policy instrument than respondents that do not believe ranking will stimulate taking measures (93% versus 55%).

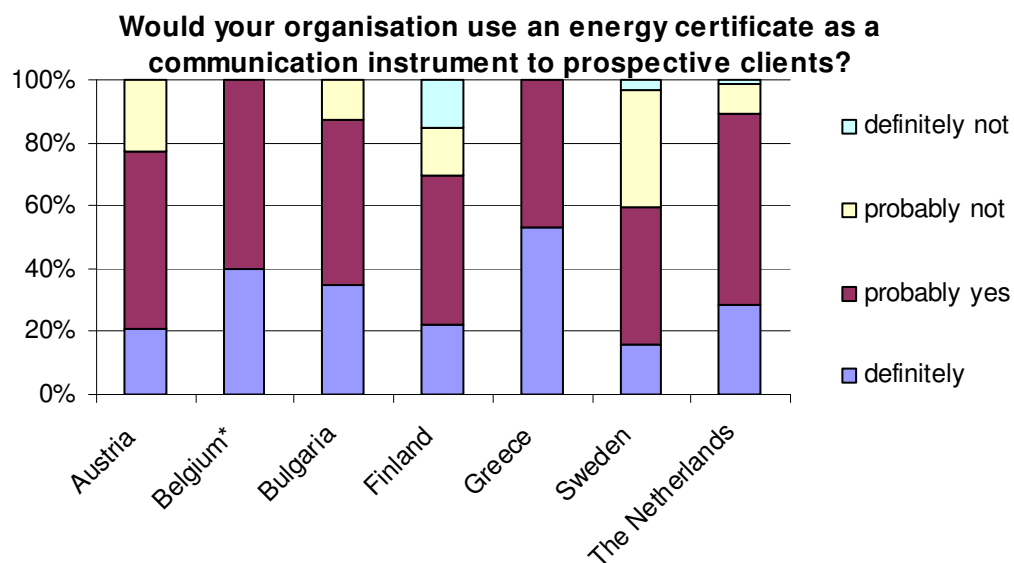


Figure 22.

Regarding the use of the energy certificate as a communication instrument to prospective clients, the respondents in Finland and Sweden score relatively low, Figure 22. Respondents that believe the certificate could be valuable in marketing buildings for potential investors or tenants, will use the certificate more as a communication instrument to prospective clients than respondents that do not believe the certificate is valuable in marketing (86% versus 48%, and respondents that do not have an opinion on this score 65%).

Other aspects investigated are:

- No significant differences were found in motivation between the different types and characteristics of respondents, although respondents that assign a very high priority level to improving energy efficiency are more definite in their answer.
- More than half (58%) of the respondents say energy certification would increase their investments to energy efficiency if the implementation of the energy saving measures recommended in the certificate was totally voluntary. This percentage is related to the priority level one assigns to improving energy efficiency. Respondents with a low/very low priority level will voluntarily increase their investments in 43% of the cases, while respondents with a very high priority level will do so in 62% of the cases. There is no difference between different typifications of respondents.
- If implementation would be mandatory, a majority (64%) of the respondents would increase their investments in energy efficiency. There is no difference between the different priority levels or type of respondents.
- In case implementation would be supported by financial mechanisms, almost all (93%) of the respondents would increase their investments in energy efficiency. There is no difference between the different priority levels or type of respondents.

3.5 Perception of quality and characteristics of a certificate

Perceived quality

The importance of several factors in the quality of energy certification has been investigated. The results are given below:

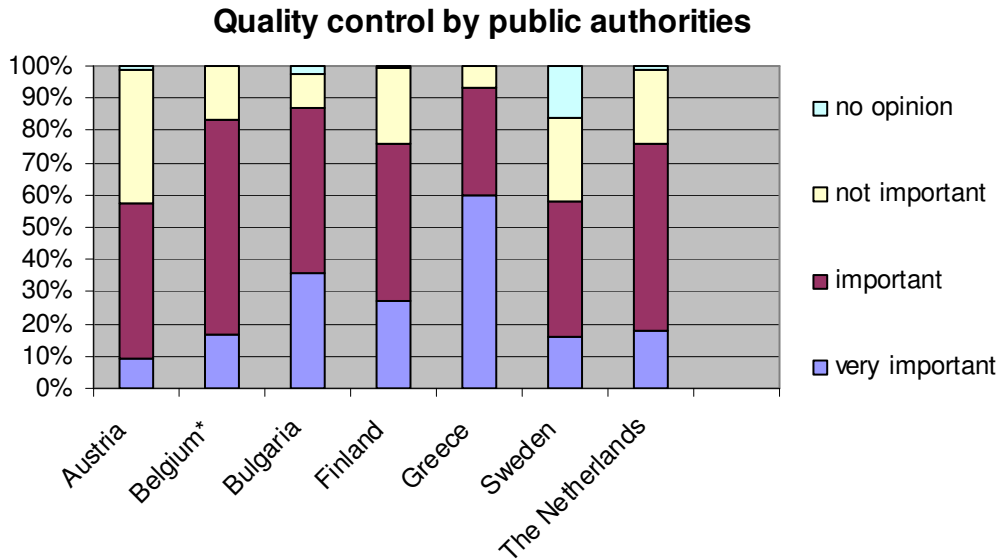


Figure 23.

In general quality control is regarded less important, Figure 23. Especially respondents from Austria and Sweden find quality control by public authorities least important,

Other aspects investigated are:

- In general the competence of consultants is regarded important to the quality of energy certification. Finnish respondents tend to find the competence of consultants less important compared to the other countries.
- The comprehensiveness of the building inspection is regarded less important than the quality of consultants. But especially respondents from Bulgaria and to a lesser extent Finland and Greece find the comprehensiveness of the building inspection/audit (very) important.
- The contents of the certificate is regarded quite important in all countries.
- A reliable and common calculation methodology is regarded (very) important in all countries, with the exception of respondents from The Netherlands who seem to find this less important than respondents from other countries.
- Except for Greece, authorisation of individual experts is regarded less important.
- Authorisation of organisations is very often regarded as not important, Figure 24.

- Technical standards set by public authorities are quite important to the quality of energy certification. Swedish respondents and to a lesser extent Finnish respondents find this less important.
- Except for Sweden, feasibility and comprehensiveness and reliability of the recommendations made on the energy certificate are important to the quality.
- The opinion on the independence of consultant differs. Many find it very important but also some respondents find it not important.
- Owners of buildings find the Competence of consultants and the Technical standards set by authorities more important than their Suppliers do.
- But the Suppliers find Quality control by public authorities and a Reliable and common calculation methodology more important.
- Respondents assigning a very high priority to improving energy efficiency, find the Comprehensiveness of audit/inspection, the Contents of the certificate and a Reliable and common calculation methodology relatively more important to the quality of energy certification.

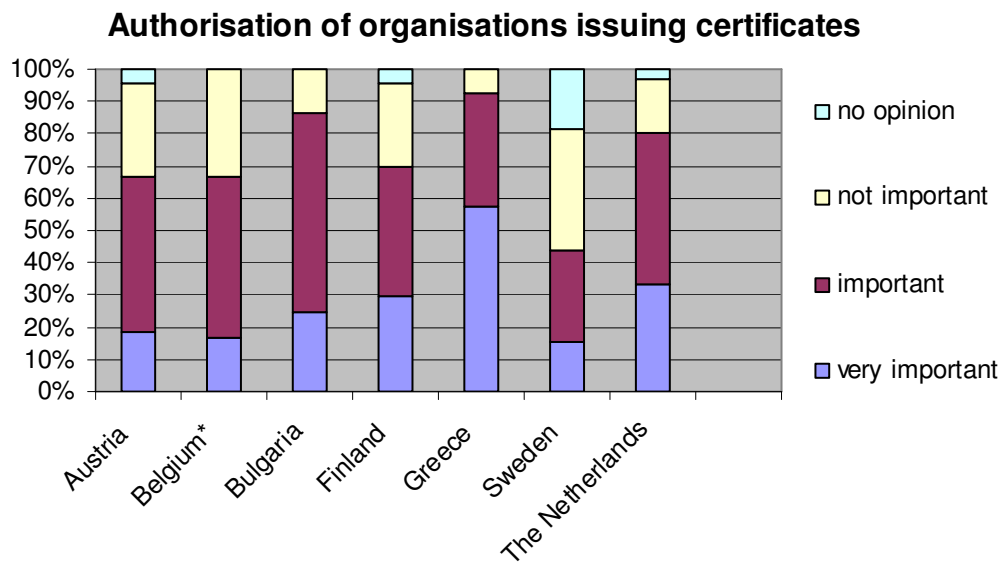


Figure 24.

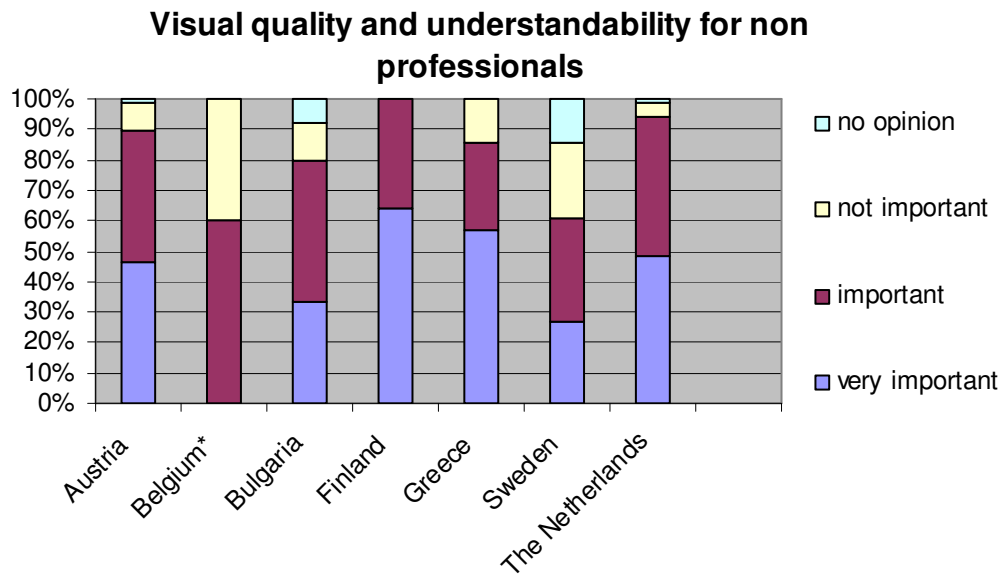


Figure 25.

The opinion on the visual quality and comprehensiveness differs over the countries, Figure 25. Overall, many find it very important.

Relevant characteristics

Energy certification should be based on...

It is not clear whether energy certification should be preferably based on a simplified walk through of the building or on a full energy audit of the building.

In The Netherlands, Austria, (Belgium) and Sweden majority is of the opinion it should be based on a simplified walk through of the building. In Bulgaria, Finland and Greece majority is of the opinion that it should be based on a full energy audit of the building.

There is no significant difference in opinions between Owners and Suppliers nor between the priority levels one assigns to improving energy efficiency. Respondents that work with residential buildings though, feel more for a simplified walk through as opposed to a full energy audit (45% versus 33%) while respondent working with non-residential buildings feel slightly more for full energy audits as opposed to simplified walk throughs (50% versus 41%). Respondents working with Residential buildings are also more often of the opinion that no on-site inspection is needed (16% versus 5% for non-residential).

The estimated reasonable price correlates to the expected intensity of the audit (see table below).

	full audit	walk-through	off-site	total
residential	840	525	442	619
non residential	616	814	750	691
total	780	564	468	632

Table: expected reasonable price (euros) versus the type of audit that respondents think is suitable

Energy certification should be carried out at the level of...

Respondents that work with non-residential buildings have a preference for carrying energy certification out on the level of individual buildings (65%) instead of groups of buildings with common heating systems (33%). Respondents working with residential buildings are indifferent whether the certification should be carried out on the level of groups of buildings or individual buildings(44% versus 42%), but compared to non-residential respondents they are more into basing it on individual apartments/spaces (14% versus 2%).

Exact the same distribution of preferences goes for Suppliers versus Owners of buildings, with Suppliers having the preference for certification based on individual buildings.

The respondents that assign low/very low priority to improving energy efficiency are less often of the opinion that energy certification should be carried out at the level of groups of buildings (27% versus 40-50% for respondents with higher priority level for energy efficiency) and more often at the level of individual apartments/spaces (22% versus 12-2% for respondents with higher priority level for energy efficiency).

Quality control should include...

In Austria, (Belgium), Sweden and The Netherlands, quality control should include checking and assessing the final documentation that is produced by the energy consultant. But in Finland and Greece preferably the quality of field work should be assessed. In Bulgaria assessing the final documentation

that is produced by the energy consultant and assessing the quality of field work are felt equally important. In Sweden and The Netherlands quite some respondents (23% and 36%) say it is enough to check that consultants comply with formal authorisation requirements.

Non residential respondents are more often of the opinion that quality control should include checking the quality of field work. Although not significantly proven, respondents assigning a very high priority to improving energy efficiency seem to be more often of the opinion that quality control should include checking the quality of field work (42% versus 31 and 27% for respondents assigning high and low/very low priority), but still it is indifferent to them whether it should include checking and assessing the quality of final documentation (41%) or checking the quality of field work (42%).

In nearly all countries majority of respondents think quality control should be done on a random basis, with only a small impact on the costs. In Bulgaria they are indifferent though and in Greece they feel it should be regularly and comprehensively, even if this raises the costs.

Qualifications for energy consultants

The basic level of education of consultants carrying out energy certification should be other technical education, except for Greece and Bulgaria where they are of the opinion the consultant should have a university degree.

The consultant should have at least 3-5 years professional experience, except for in Sweden where more respondents feel the consultant should have 5-9 years experience. In Finland about the same amount of respondents are in favour of 3-5 years experience as 5-9 years experience.

Authorisation of consultants should be the responsibility of public authorities (The Netherlands, Sweden, Greece, Finland (and Belgium)) or technical institutes (Bulgaria, Austria). This should be done every 2-3 years (Bulgaria, Greece and The Netherlands)) or 5-10 years (Austria, Finland and Sweden).

In nearly all countries majority of respondents think training of consultants should be performed by technical education institutes. Only Finnish respondents feel it should be performed by public authorities.

3.6 Summarising conclusions - professional organisations

This chapter contains a summary of the main aspects that relate to the market attractiveness according to professional organisations of Energy Performance certificates in order to be used for recommendations to improve successful implementation. It is based on the responses to the questionnaires amongst professional parties from seven European countries. It is possible that respondents are not representative for the European market. *The results of this research are indicative and have to be interpreted with care.*

Some general remarks:

The interest and attitude towards energy efficiency are very positive.

The response to the questionnaires in the seven countries differed a lot in:

- type of organisations that responded (Owners of building(s), Suppliers to owners of buildings and Users) - both share in total response as share per country
- type of market the respondents work in (residential or non-residential)
- amount of response per country

Taking this into account, general comparisons between countries are difficult to make and should be interpreted with care, as it will not be a comparison between “Finland” versus “The Netherlands” but between “Finnish Owners and Suppliers of residential and non residential buildings” versus “Dutch Owners of residential buildings”. Furthermore, as the number of questionnaires per country is limited and differs a lot (from 6 to 123), extreme differences are needed to find significant differences between countries.

With respect to what is stated above and since hardly any major significant differences have been found between countries, the conclusions will focus on overall observations, ignoring the level of individual countries.

1. Instruments that influence the decision making process towards energy efficiency improvements

The most expensive types of instruments are considered the most influential by respondents:

- Instruments that most influence decision making on improving energy efficiency are Investment grants and subsidies

- Availability of high quality energy service companies and high quality recommendations is the second most influential. The influence of these instruments is especially high in Bulgaria and Greece.
- Organisations that assign a very high level of priority to improving energy efficiency are more impressionable by all the measures. This is especially the case for benchmarking (78% versus 52%)
- Organisations that assign a low or high level of priority to improving energy efficiency are less impressionable than those who assign very high level of priority (roughly 10-20 % below), *however their decision making process is similarly influenced by Investment grants and subsidies.*

The influence of high quality energy services according to professionals is much higher in the non-residential market than in the residential market (70% versus 47%). The influence of the availability of low interest loans is lower though in the non residential market compared to the residential market (53% vs 68%)

2. Parties that influence the decision making process towards energy efficiency improvements

The National Government influence respondents the most, followed by Market actors, Regional and Local government. In general the influence of Government agencies and Private organisations is less. But of course this observation could be coloured by the administrative situation in a country and the number of respondents from that country.

3. Familiarity with EPBD

Most (80%) of the Owners of building(s) know about the implementation and introduction of energy certification for more than one year, only 20% of the Owners know about this since less than one year. As stated above, these results might very well not be representative for the European market.

If one knows about the implementation and introduction of energy certification, one is not necessarily familiar with the contents and requirements of all aspects of the EPBD. In general the number of aspects one is familiar with, differs a lot (39% are familiar with 0-2 aspects, 33% with 3-4 aspects and 28% with all 5 aspects). Owners of buildings seem to know a bit more than Suppliers of owners.

There is a clear relation between how long organisations know and what their attitude is on improving energy efficiency vs. the preparations that they have taken and the number of aspects they are familiar with.

Not proven significantly, it seems that respondents that are less familiar with the EPBD received slightly less information from National Government and Private Organisations. No differences are found in desired information channels between respondents that are more familiar with the EPBD or less familiar. Therefore no pan-European recommendations can be done on through which channels should be used to improve familiarity with EPBD.

4. Usefulness of certificate

The EPBD-certificate is considered useful by the majority of the respondents in (descending):

- assessing maintenance and running costs (overall 82%)
- planning maintenance and/or renovation (overall 80%)
- developing renovation, reconstruction and maintenance strategies (overall 74%)
- making investment / acquisition decisions (overall 73%)
- development environmental and energy management (overall 68%)
- marketing (overall 67%)
- assessing market value of a building (overall 67%)

The organisations that assign the lowest priority to improving energy efficiency see the biggest value of the energy certificate in investment/acquisition decisions (79%) and marketing (73%). The respondents that assign higher priority to improving energy efficiency, see the biggest value in assessing maintenance and running costs (86%) and planning maintenance and renovation (83 %).

5. Potential effect of benchmarking on increasing investments

Respondents that will voluntarily increase their investment in improving energy efficiency are more influenced by benchmarking instruments than respondents that will not voluntarily increase their investments (64% versus 51%).

Respondents that will increase their investments if implementation is partly mandatory or not, are equally influenced by benchmarking instruments.

Respondents that will increase their investments when supporting financial mechanisms are established, are more influenced by benchmarking instruments than respondents that will not increase their investments when financial mechanisms are established (60% versus 40%).

Respondents that are influenced by benchmarking instruments are more inclined to increase investments voluntary (62% versus 49%) or when financial support is established (95% versus 89%), compared to respondents that are not influenced by benchmarking.

It is concluded that convincing professional organisations of the usefulness of benchmarking and making them more open to this instrument might increase voluntary investments and investments supported by financial mechanisms.

4 Questionnaire results; consumers

The results of the questionnaire with consumers will be described and analysed according to the following structure, see Figure 26.

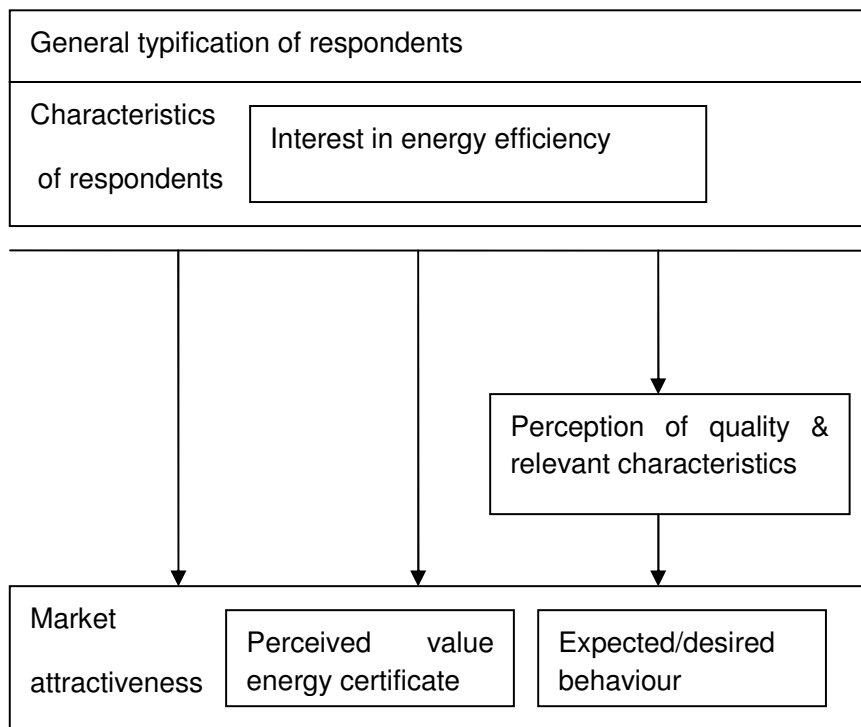


Figure 26.

First we will describe the responses for the different blocks. Where necessary/possible related to the different types of the respondents:

- characteristics regarding interest in energy efficiency
- perceived values of energy certificates and the expected/desired behaviour
- perception of quality & relevant characteristics of an energy certificate

Second, some relations between the blocks will be explored and analysed.

This chapter will conclude with a summary of the main aspects that correlate to the market attractiveness of Energy Performance certificates as observed from the data as gathered with the questionnaires, in order to be used for recommendations to improve successful implementation.

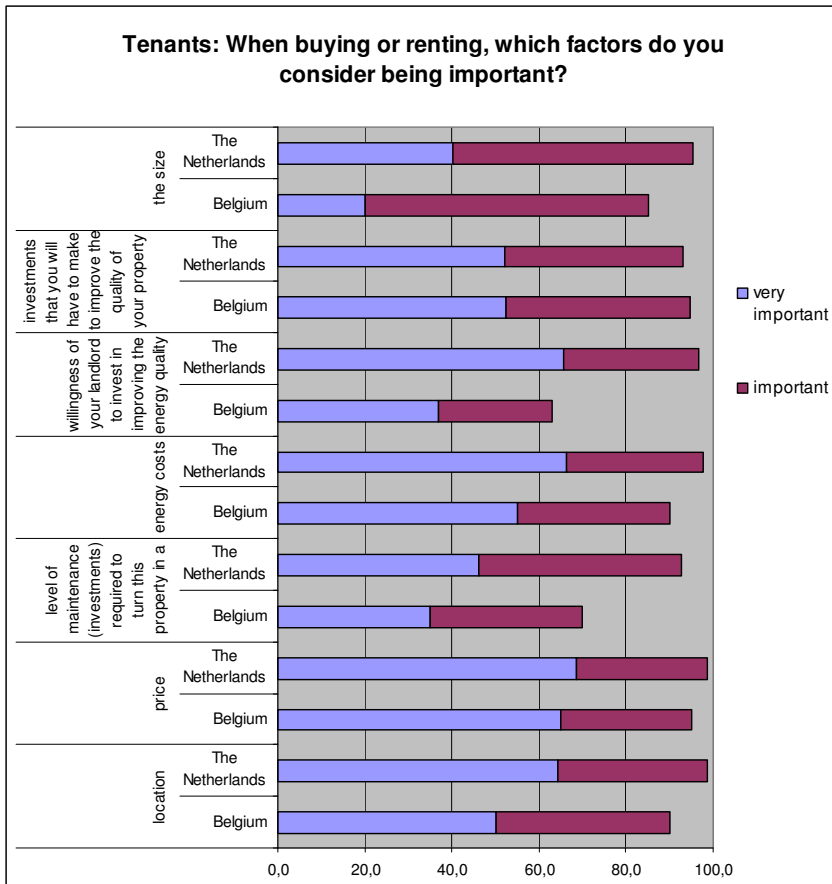
In total 979 questionnaires were returned from 4 countries that participate in the STABLE project. The number and types of respondents to this questionnaire varies a lot between the countries, see table below:

	private homeowners	tenants	landlord	other parties	professional	Total
Austria	1	1	1		5	8
Belgium	282	20	38		51	391
Sweden	19	3	4		2	28
The Netherlands	92	455	3		2	552
Total	394	479	46		60	979

Table: overview of respons

As this part of the analysis deals with consumer parties, only the response of private home owners and tenants will be analysed. The amount of response makes it possible to look into results of private home owners and tenants in Belgium and The Netherlands and private home owners in Sweden.

4.1 Characteristics of respondents



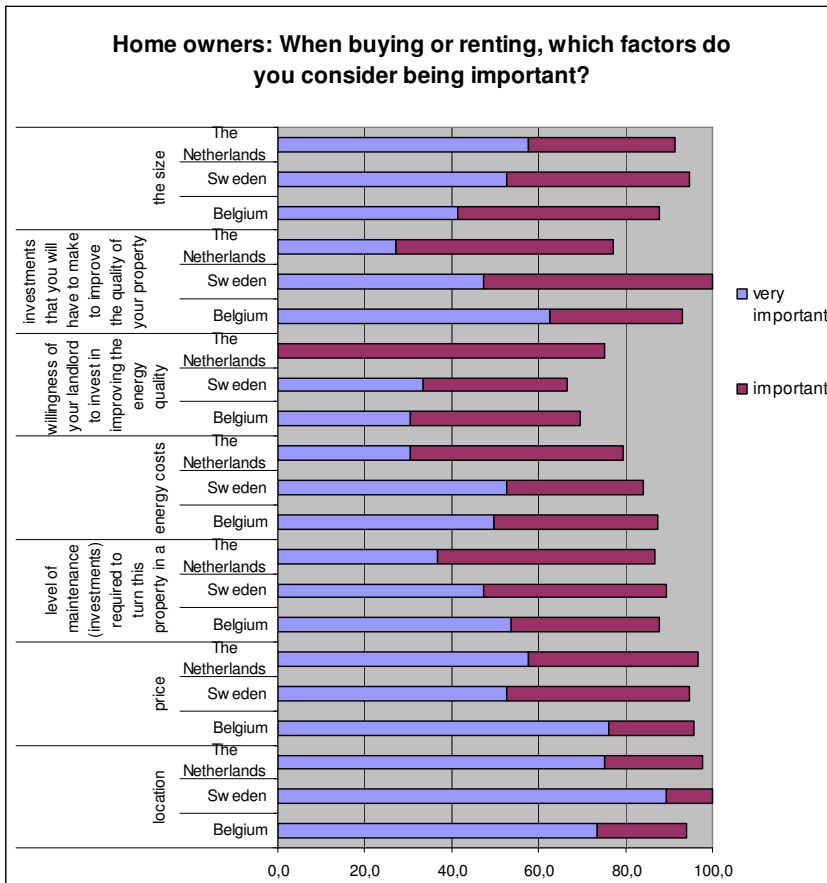


Figure 27 and 28: factors considered (very) important when buying or renting a property.

All factors investigated are important for tenants and home owners when renting or buying a house / apartment, with some exceptions, Figure 27 and 28. Belgian tenants assign a smaller importance to the maintenance level required to make the home comfortable and the willingness of the landlord to invest. Home owners especially consider location very important.

4.2 Market attractiveness: Perceived value energy certificate & expected/desired behaviour

Perceived values

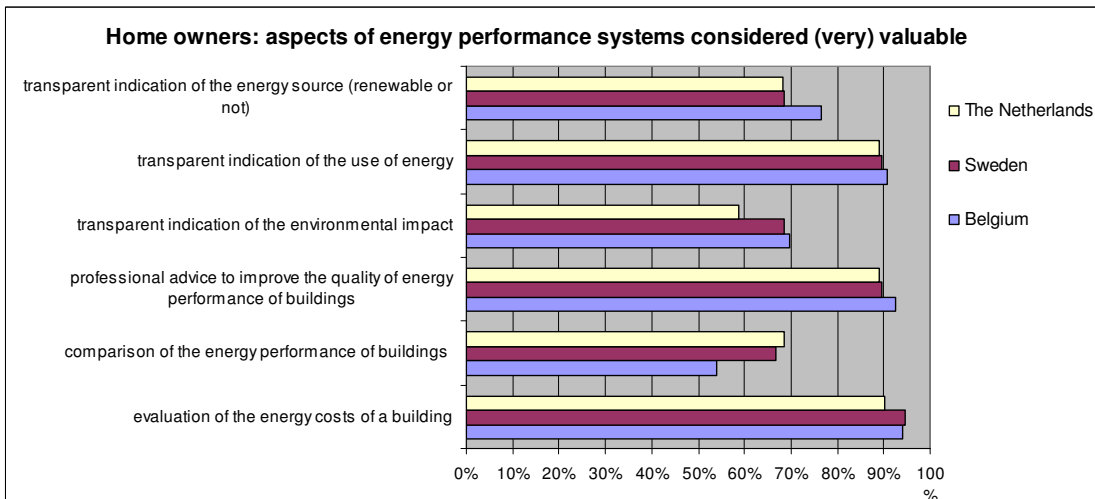
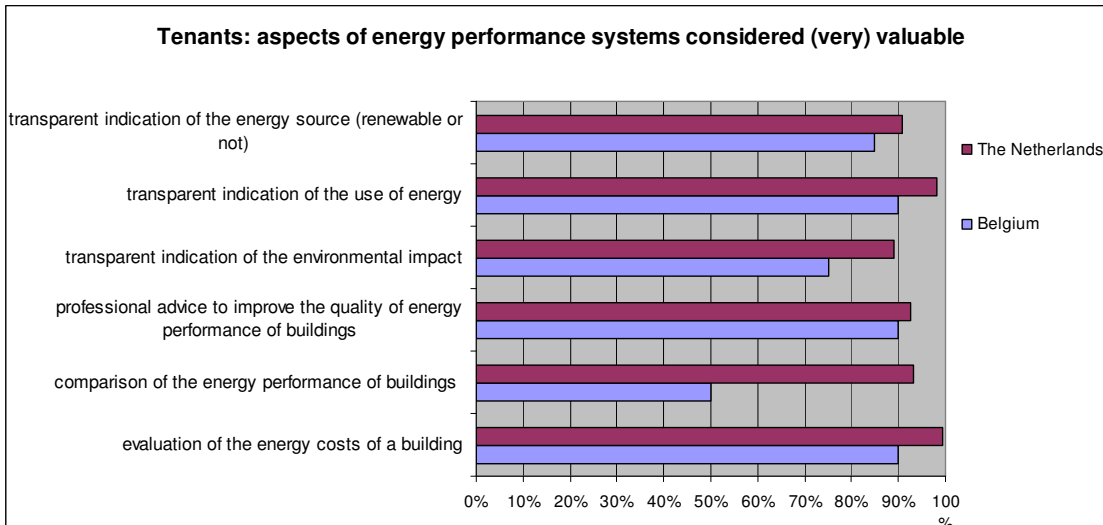
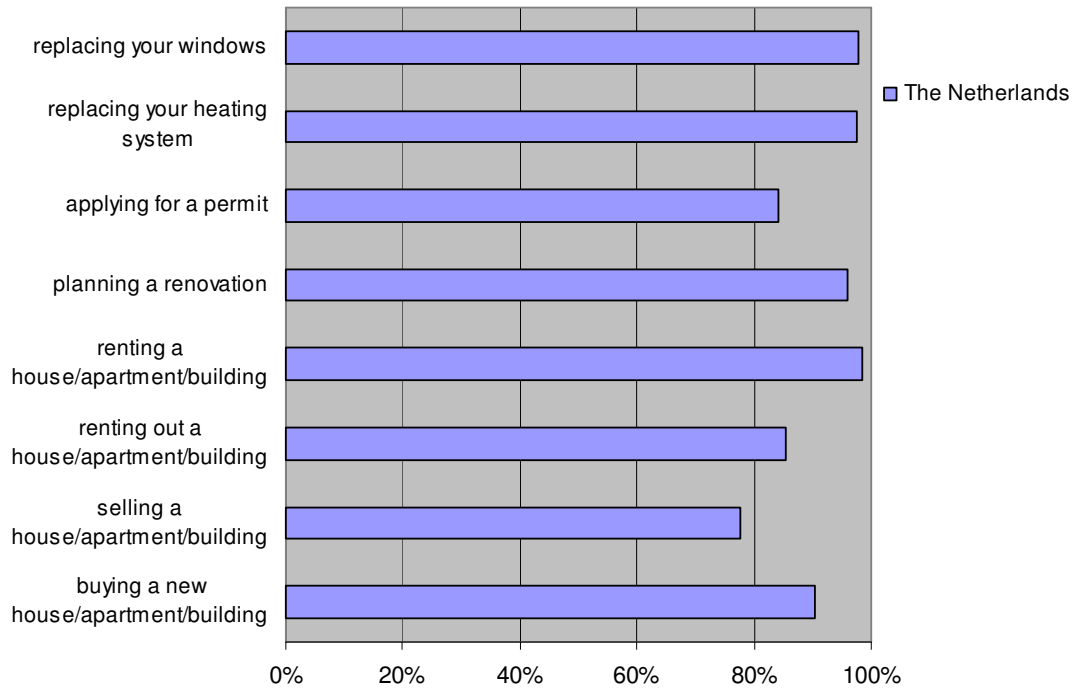


Figure 29 and 30: (very) valuable aspects of energy performance systems

In general tenants regard more value than owners to the factors investigated, Figure 29 and 30. Tenants consider the evaluation of energy costs and a transparent indication of energy the most valuable aspects. Belgium tenants assign smaller value to the comparison of energy performance between buildings.

Owners especially consider the evaluation of energy costs, a transparent indication of energy use and professional advice to improve the quality of energy performance of buildings (very) valuable aspects of an energy certificate.

tenants: moments information is (very) valuable



Home owners: moments information is (very) valuable

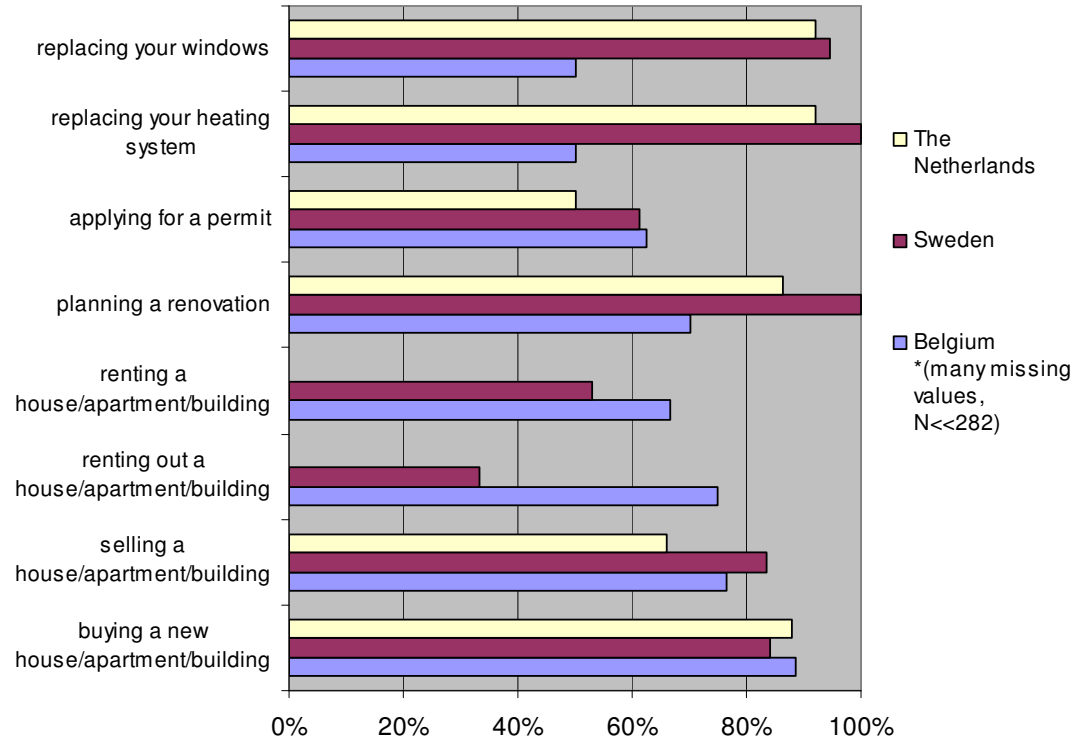


Figure 31 and 32: Moments information is (very) valuable (Belgian tenants have not answered this question, and only few (between 8 and 26) Belgian home owners have answered)

In general the information on the energy certificate is considered valuable on three moments, Figure 31 and 32:

- when working on/improving the property (renovation, replacement windows/heating system)
- when buying a house
- when renting a house

Expected/desired behaviour

Asked for the influence of the energy performance certificate and instruments, it appears that the majority of respondents:

- sees positive effect of such a certificate on willingness to pay, pricing and investments (Figure 33 and 34, 70- 80% yes or probably yes)
- will pay more attention to energy quality in negotiations with landlords, Dutch tenants more than Belgian tenants (Figure 36)

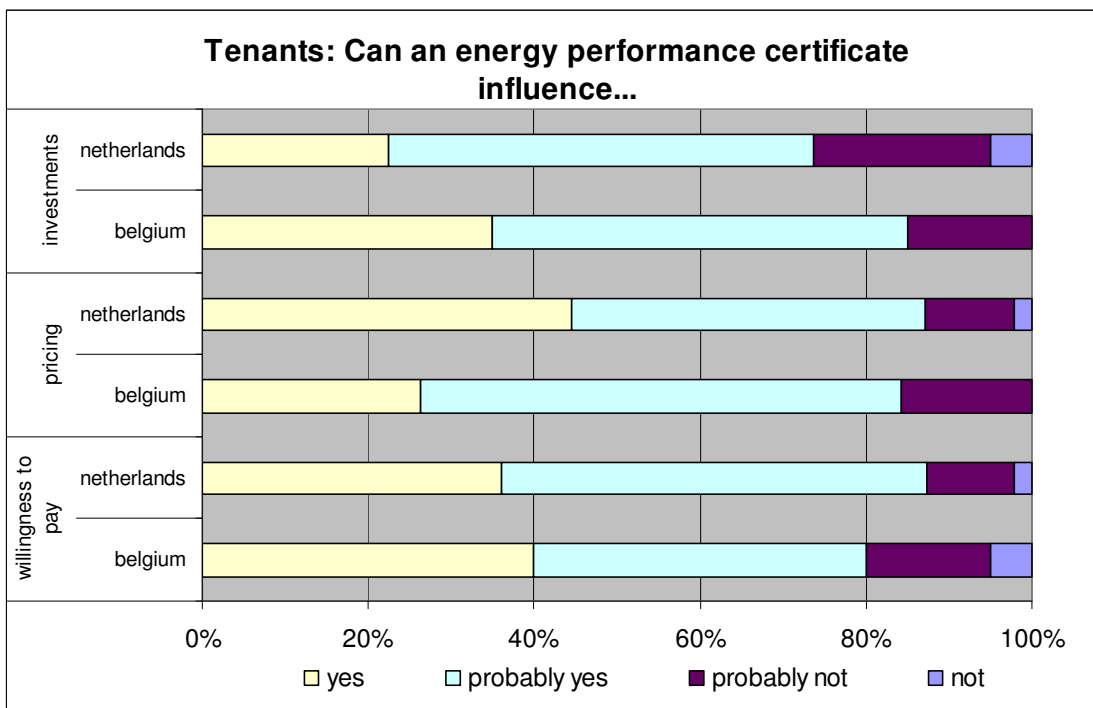


Figure 33

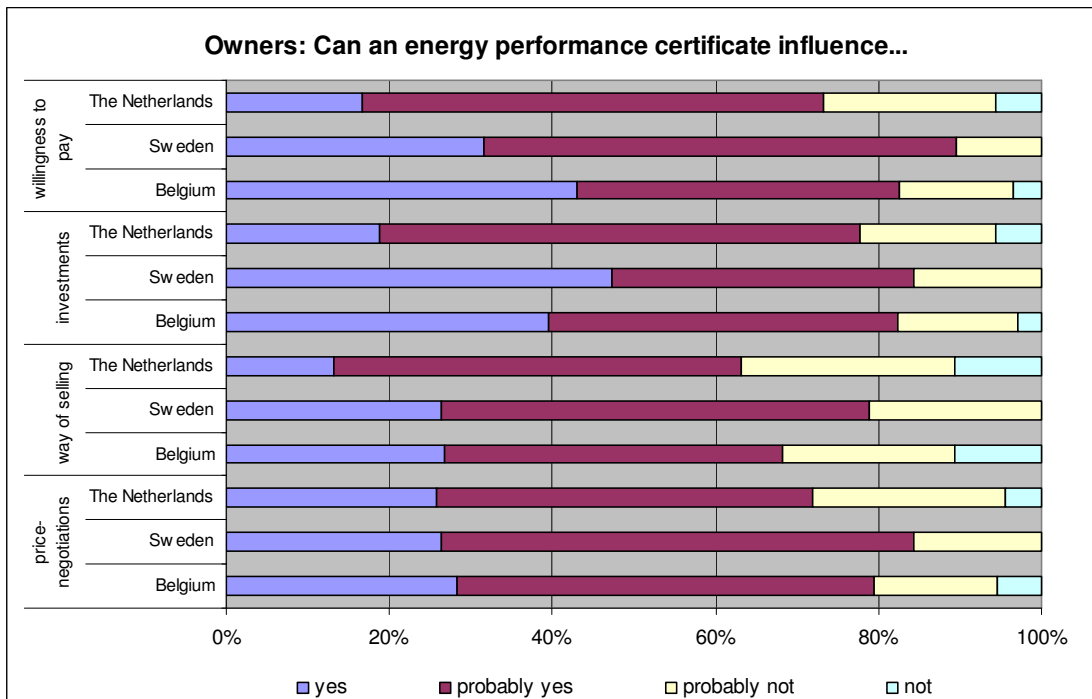


Figure 34

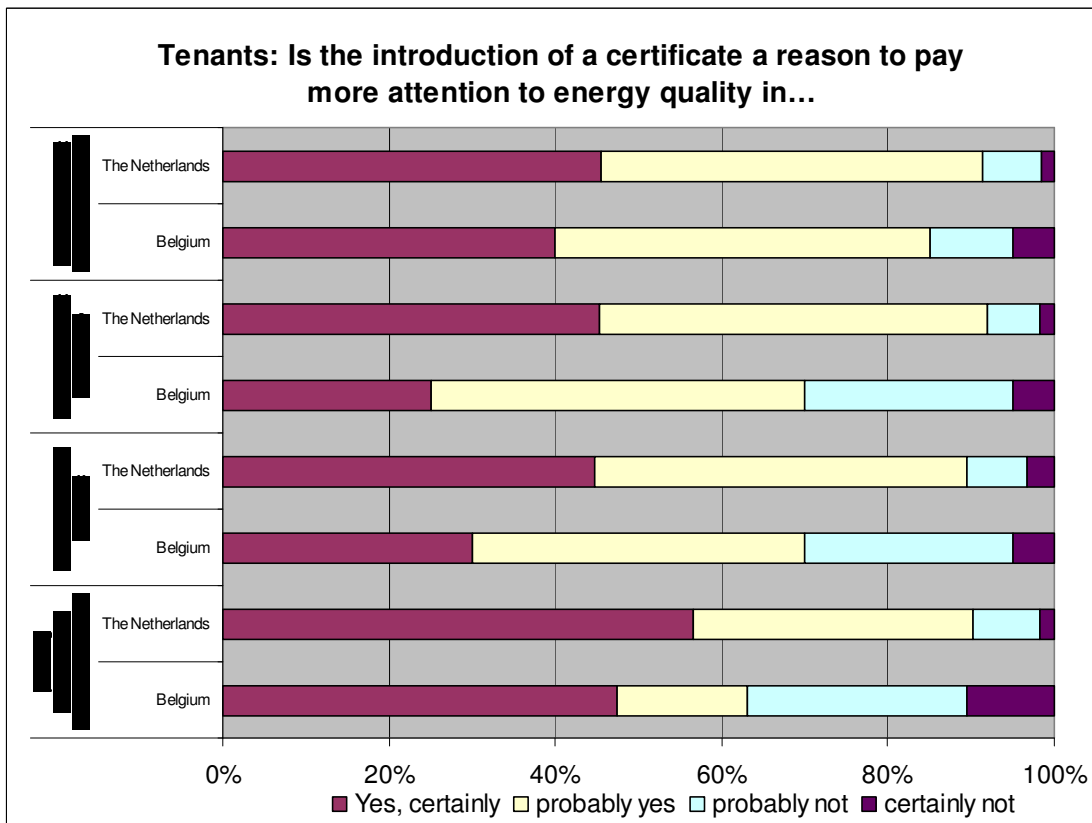


Figure 36

4.3 Perception of quality & relevant characteristics

House-owners ascribe great importance to a balance in quality of especially indoor air quality and living comfort (Figure 39)

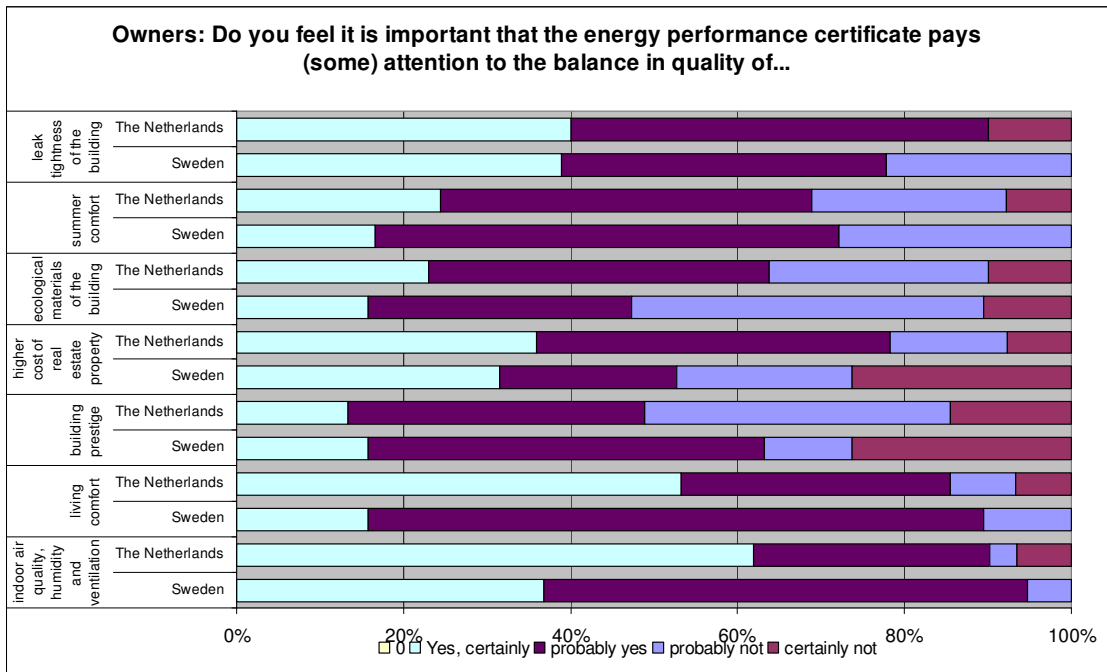


Figure 39 (no response from Belgian owners)

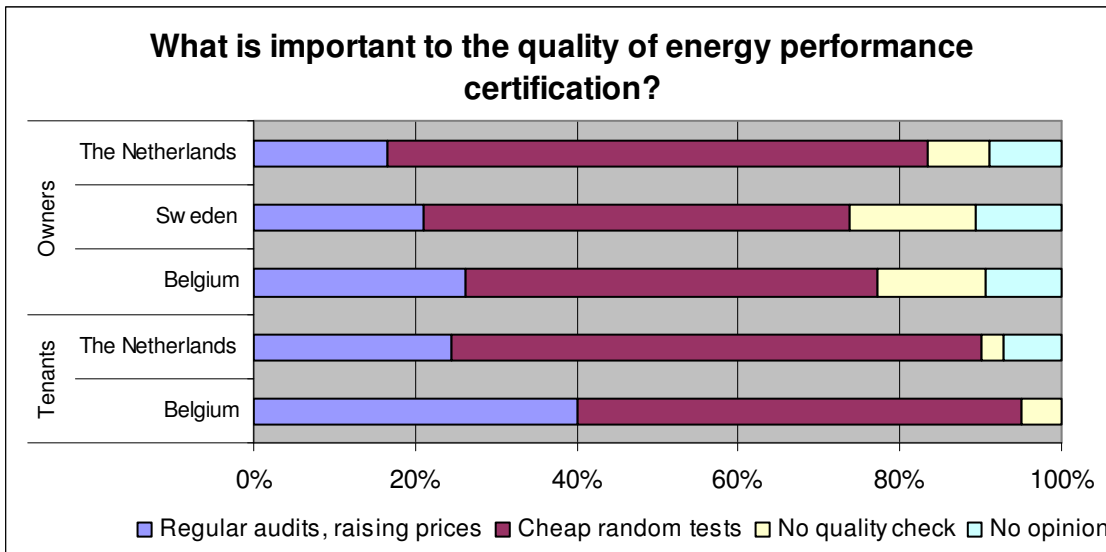


Figure 40

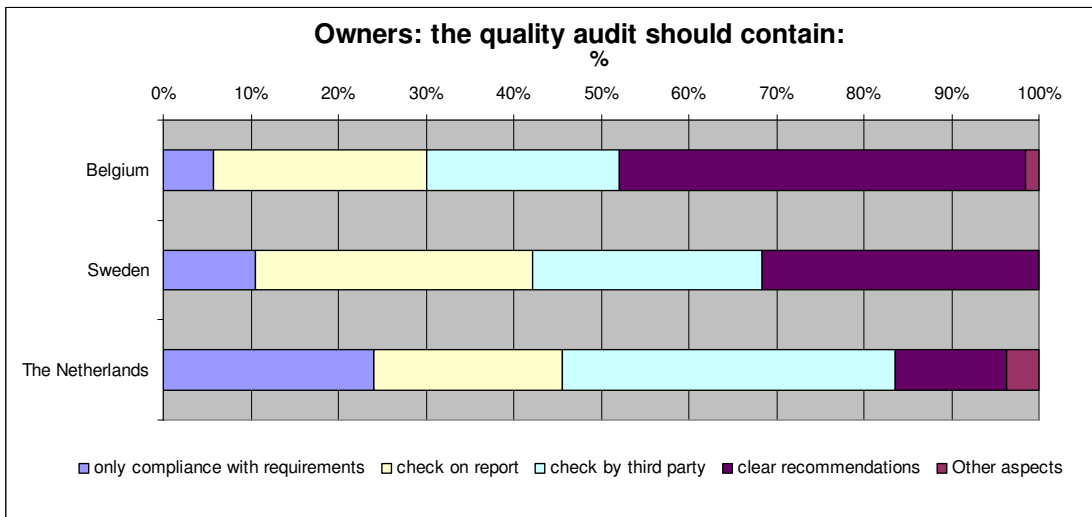


Figure 41

The factors seen as important in the quality of energy performance certification (see Figure 40) are different for tenants and owners: Owners ascribe a larger importance to cheap random tests or no quality check at all, whereas tenants appreciate regular audits more.

Figure 43 shows that most house-owners think an on site inspection is needed, preferably a full energy audit.

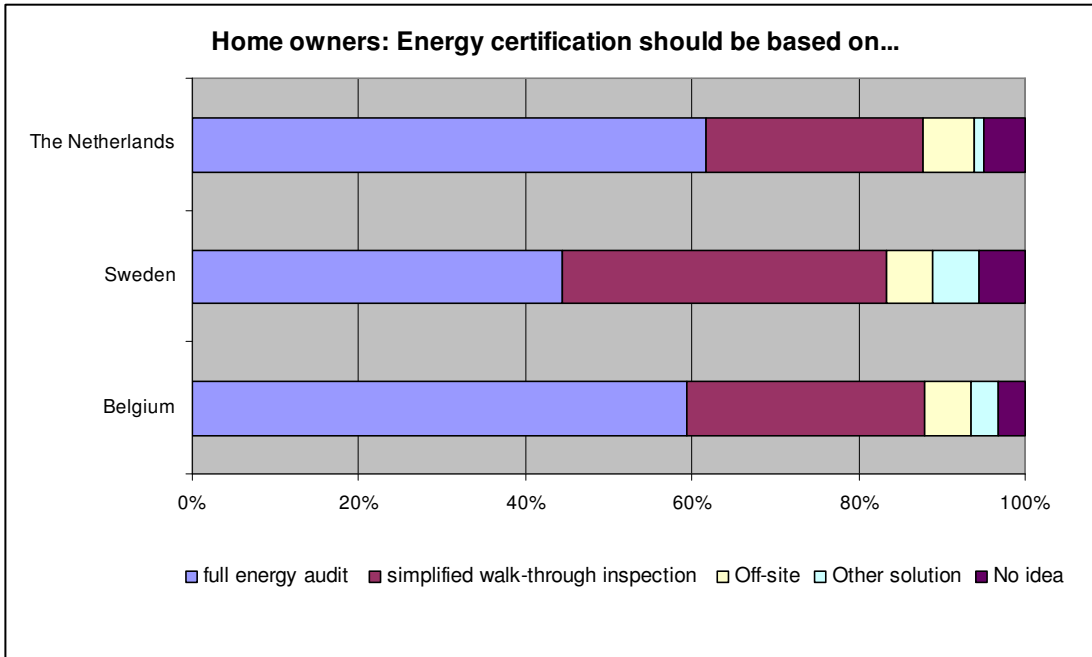


Figure 43

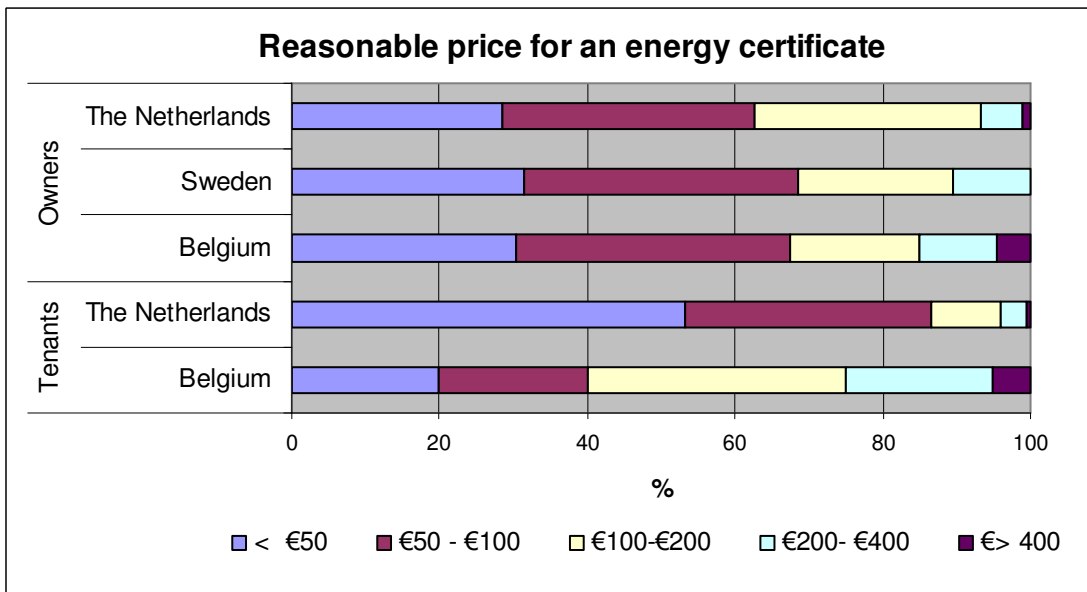


Figure 45

The distribution of acceptable price levels is given in Figure 45. Although there are differences between the countries, the median value is quite similar. A reasonable price for the energy performance certificate is 130 to 150 euro.

The reasonable price corresponds with the intensity of the inventarisation (tenants that want a full inspection think 170 euro is reasonable while tenants that want an off-site-inspection think 75 euro is reasonable).

4.4 Summarising conclusions - consumers

A summary of the main aspects that correlate to the market attractiveness of Energy Performance certificates as observed from the data as gathered with the questionnaires in the consumer market is as follows. These can be used for recommendations to improve successful implementation.

For the Netherlands, Sweden and Belgium results can be presented. Where necessary/possible related to the different types of the respondents:

- characteristics regarding interest in energy efficiency
- perceived values of energy certificates and the expected/desired behaviour
- perception of quality & relevant characteristics of an energy certificate

Renting and buying decisions

All factors investigated are important for tenants and home owners when renting or buying a house / apartment, with some exceptions. Belgian tenants assign a smaller importance to the maintenance level required to make the home comfortable and the willingness of the landlord to invest. The response to the latter by home owners seems irrelevant and is discarded.

Perceived values

In general tenants regard more value than owners to the factors investigated, Figure 29 and 30. Tenants consider the evaluation of energy costs and a transparent indication of energy the most valuable aspects. Belgium tenants assign smaller value to the comparison of energy performance between buildings.

Owners especially consider the evaluation of energy costs, a transparent indication of energy use and professional advice to improve the quality of energy performance of buildings (very) valuable aspects of an energy certificate.

The information on the energy certificate is considered valuable on three moments:

- when working on/improving the property (renovation, replacement windows/heating system)

- when buying a house
- when renting a house

Expected/desired behaviour

Asked for the influence of the energy performance certificate and instruments, it appears that the majority of respondents:

- see positive effect of such a certificate on willingness to pay, pricing and investments (Figure 33 and 34, 70- 80% yes or probably yes)
- will pay more attention to energy quality in negotiations with landlords, Dutch tenants more than Belgian tenants (Figure 36)

House-owners ascribe great importance to a balance in quality of especially indoor air quality and living comfort (Figure 39).

Quality

The factors seen as important in the quality of energy performance certification (see Figure 40) are different for tenants and owners: Owners ascribe a larger importance to cheap random tests or no quality check at all, whereas tenants appreciate regular audits more.

Most house-owners think an on site inspection is needed, preferably a full energy audit.

Acceptable price levels

The distribution of acceptable price levels is given in Figure 45. Although there are differences between the countries, The median value is quite similar. A reasonable price for the energy performance certificate is 130-150 Euro, according to consumers. This is lower than the estimated price by professional parties.

- **Annex: Overview table**

(This table supports findings in executive conclusion)

Country	B G	GR	N L	FI	SE	B E	AT
part in Europe	se	se	w	n	n	w	center
EPBD regulation in effect	+	-	-	-	-	-	-
0. Response							
1. response in professional market higher then 100	-	-	-	+	-	-	-
1.1 response professional enough for differentiation							
1.1a owner/supplier/user	+	-	+	+	-	-	+
1.1b residential / non-residential market	+	-	+	+	-	-	+
1.1c existing / new building	-	-	+	-	-	-	+
2. response in non-professional market higher then 100	n	n	+	n	-	+	-
2.1 response enough for differentiation owner / tenant	-	-	+	-	-	+	-
A. Typification of respondents							
3. priority to improving energy efficiency (professional market) > 70 % high & very high	+	-	+	+	+	n	+
4. interest in energy efficiency and importance of energy costs when renting/buying (consumers)> 70 % high & very high	n	n	+	n	+	+	n
B. Familiarity with EPBD							
More than 50 % know EPBD less then 2 years	+	+	+	+	+	n	+
clear correlation between time of knowledge and preparations	-	+	+	+	+	n	+
C. Perception of quality and characteristics							

majority thinks no full inspection is needed (walkthrough or off-site)	-	-	+	+	+	n	+
majority of private owners think total review is needed	n	n	+	n	-	+	n
price 100-150 is most answered by professional parties	more	more	less	more	more	n	more
random check is enough for majority of prof. respondents	intensive	intensive	+	+	+	n	+
tenants think higher price is reasonable then owners	n	n	-	n	n	+	n
= yes, - is no, n = no data							
D. Market attractiveness prof. parties							
perceived value of certificate in investments > 75 %	+	+	+	+	-	n	+
perceived value in marketing > 75 %	+	+	+	-	-	n	-
perceived value in maintenance and renovation > 75 %	+	+	-	+	-	n	+
(probably) used as policy instrument > 75 %	+	+	+	+	+	n	+
(probably) used as communications instrument > 75 %	+	+	+	-	-	n	+

Table A: Summary of conclusions for market attractiveness test of energy performance certificate in BG (Bulgaria), Greece (GR), Netherlands (NL), Finland (FI), Sweden (SE), Belgium (BE), Austria (AT). Legend: + = yes , - = no, n = not available

Country	B U	GR	N L	FI	SW	B E	AT
part in Europe	SE	SE	W	N	N	W	Ce nte r
EPBD regulation in effect	+	-	-	-	-	-	-
Media best used are for owners the internet, for tenants papers/tv	n	n	+	n	+	+	n
Policy 3. Influence of instruments							
Grants and subsidies are the best working policy	+	+	+	+	+	n	+
High quality advice is 2nd important	+	+	+	+	+	+	+
Making implementation of recommendations partly mandatory will work on approximately 25 % extra	+	+	+	+	+	n	+

Table B: Conclusions on policy on Energy Performance Certificates for BG (Bulgaria), Greece (GR), Netherlands (NL), Finland (FI), Sweden (SE), Belgium (BE), Austria (AT). + = yes , - = no, n = not available

5 Programmes and expectations versus the questionnaire results

The objective of work package 4 was a comparison between the proposed scheme of energy performance certificates (EPC) according to the implementation of the Energy Performance of Buildings Directive (EPBD), which were described in national reports of work package 2, and the building owners' requirements, which were identified by results of questionnaires in work package 3. Furthermore, an analysis was carried out regarding the strength and weaknesses of each scheme in terms of technical level, quality assurance, cost and other characteristics identified in the classification framework.

The questionnaire in work package 3 was separated in two target groups:

- building owners of multi-family houses (large buildings) and
- individual homeowners of detached or semi-detached houses (small buildings).

Belgium concentrated on the target group small houses, Greece and The Netherlands could reach both target groups, while all other STABLE partners focused on building owners for multi-family houses.

Hereafter, the number of country specific answers to the questionnaires, which were carried out in work package 3 of the STABLE project, are listed. In total, 1414 building owners filled in the questionnaire.

STABLE partner country	Number of answers	
	large buildings	small buildings
Austrian Energy Agency/Austria	93	11
VITO/Belgium	-	402
Energy Efficiency Agency/Bulgaria	61	-
Motiva Oy/Finland	121	-
CRES/Greece	33	22
SenterNovem/The Netherlands	67	486
STEM/Sweden	90	28
Total	465	949

6 General attitude towards energy efficiency of buildings

Hereafter, some relevant attitudes of building owners towards energy efficiency of buildings are mentioned. Detailed information can be found in the final report of work package 3.

The questionnaire for owners of large multi-family residential buildings was answered mainly by housing companies and associations (47%), to a lesser extent by building owners and investors (21%) (Figure 1).

Figure 1: Kind of organisation which respondents represent

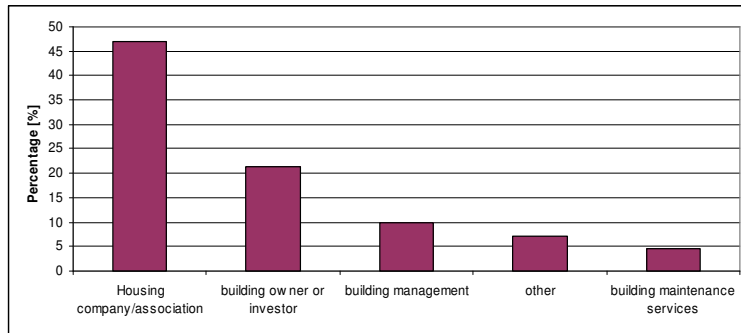
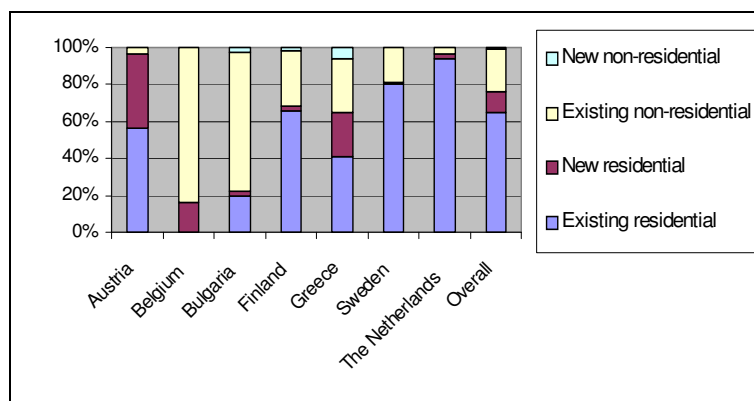
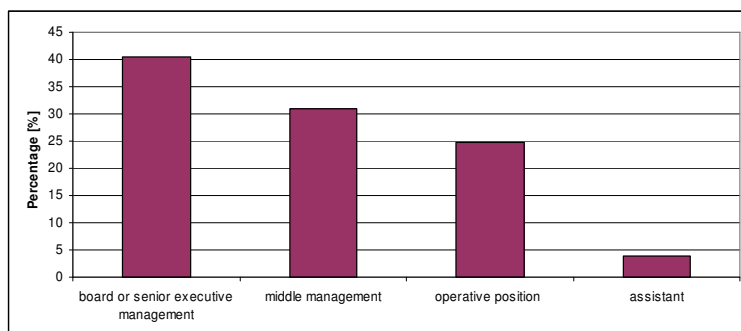


Figure 2: Type of buildings being worked with by the respondents



Most persons, who answered the questionnaire, are working for companies with focus on existing residential (64%) or non-residential buildings (23%); more than half of them are working for organisation in the private sector (54,5%), less than a half in the public sector (45,5%). Referring to this point, the countries were quite different: while Greece, Finland and Austria have a majority in the private sector, Bulgaria, Sweden and The Netherlands have more answers in the public sector. The answers were mainly carried out by persons in the board or senior executive management (40%) or middle management (31%) (Figure 3).

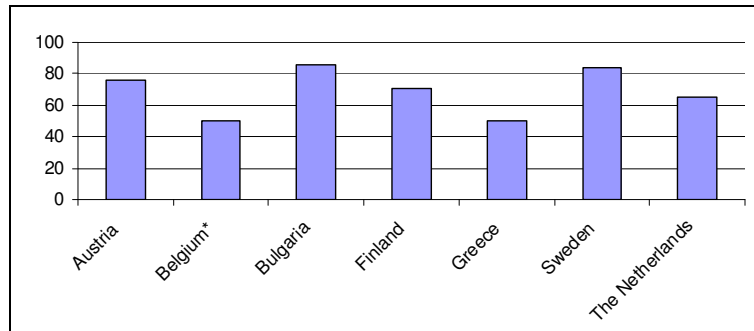
Figure 3: Position in the organisation of responses



On the contrary, the questionnaire, which focused on small buildings, was answered mainly by private homeowners (33%), tenants of a social property owner (25%) and tenants of a private property owner (12%).

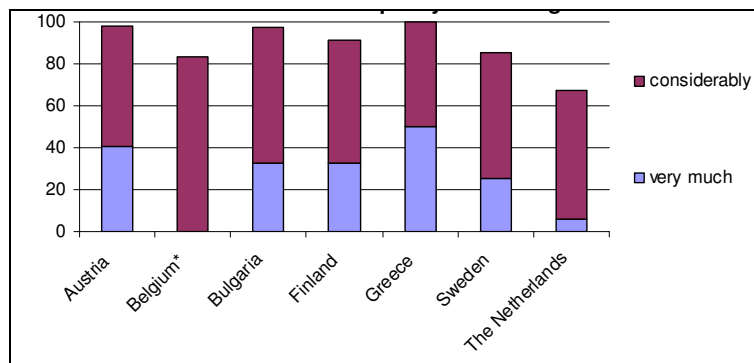
The results of the questionnaire outlines that **owners of large residential buildings are quite aware of the topics maintenance, renovation and energy efficiency in buildings**. Over 65 % of them have a strategy for long term maintenance, over 70% for short term maintenance and renovation. **More than 73% of building owners have a policy regarding the energy efficiency of buildings** (Figure 4), for more than 85% the improvement of energy efficiency of buildings is important (60%) or very important (17%).

Figure 4: % of organisations with a policy/strategy with regard to energy efficiency



For owners of multi-family houses, the **energy efficiency of a building is a very important issue for the overall quality of a building**. Nearly 100% think that energy performance of a building contributes considerably (65%) or very much (33%) to the overall quality of buildings. Furthermore, **for 83% good energy performance contributes considerably (67%) or very much (17%) to a positive image of an organisation and their housing stock** (Figure 5). The main reasons for improving energy efficiency of buildings are mainly reducing running costs and to a lesser extend by improvements during a comprehensive renovation of a building. For all building owners, the **reduction of energy use is important** (38%) or very important (62%).

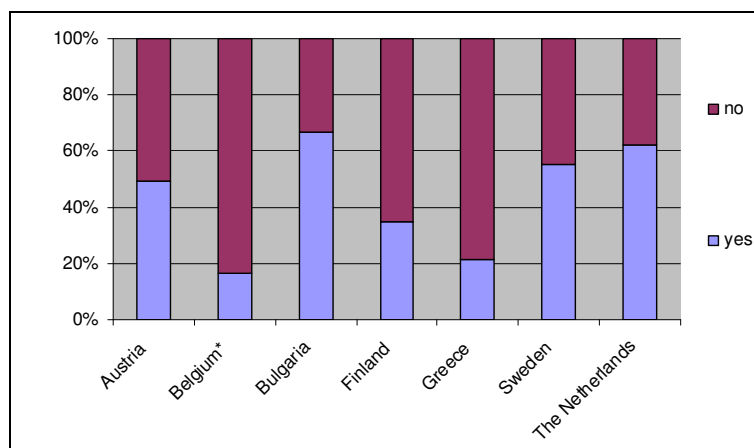
Figure 5: % of respondents believing energy performance contributes to quality of building



Professional building owners would like to have an added value as result of issuing EPC for their buildings. For nearly 80% of all responses think that the **availability of high quality recommendations** and technical advice on energy performance improvement could influence the decision making process towards energy efficiency improvements. After all, approximately 80% of building owners would like to **use the EPC for planning maintenance and/or renovation**. Furthermore, the certificate **should be used as communication instrument** to prospective clients. About 25% of buildings owners say, that they would use the EPC for this objective definitely, about 50% probably.

Many of **owners of large residential buildings are already prepared for the implementation of the energy performance certificate** according to the EPBD (Figure 6). About 85% are familiar with the contents and requirements of the EPBD with regard to EPC. Most of them already know about the EPC implementation more than a year (85%). More than half of all owners are somehow prepared for the implementation of the EPBD (67%).

Figure 6: Percentage organisation which are prepared for the EPBD



For small houses, energy efficiency plays a very important role. More than 82% of all persons are very interested in the energy efficiency of their house, but just 14 % know exactly about the current situation regarding energy efficiency of their house. About 40% of them have a glue, but nearly half of all persons don't know about the energy performance of their buildings. When buying a house, after the location of the property and the price, the energy costs that have to be paid to live in this property are most important (for 58% of responses). Above all, information about the evaluation of energy costs of a building, transparent indication of the use of energy and professional advice to improve the quality of energy performance of buildings are very valuable.

However, it has to be noted that the respondents of the questionnaires most likely do not include representatives of the most negatively inclined organisations and individuals.

7 Comparison of requirements of building owners with proposed EPC

In this chapter, the building owner requirements (results of questionnaires in work package 3) are compared in detail with country reports on energy performance certificate (result of work package 2); general or country specific statements are drawn, respectively.

The following analysis takes into account the national reports in work package 4 of Austria, Belgium, Bulgaria, Finland [and Sweden](#).

7.1 Generic Work Process

The field assessment-audit work objective and the adopted approach tailored to this objective and to the characteristics of the target building sites

This category describes the type of energy audit which should be carried out for issuing an EPC.

The results of the comparison are very diverse: In Belgium and Bulgaria the building owner requirements corresponds with the specific national EPBD regulation: a full energy audit of a building, with complete on-site audit of performance of building systems and indoor quality, will be carried out for individual buildings. On the contrary, in Austria and Finland the requirements don't correspond with the proposed type of audit: Finnish building owners would prefer comprehensive energy audit but a simplified walk through will be implemented; Austrian building owners would prefer a simplified walk through but there is no agreement on a simplified scheme, a comprehensive one may be implemented. Furthermore, Austrian building owner say EPC should be carried out for individual buildings; Finnish ones would prefer issuing EPC for groups of buildings with common heating systems which means fewer EPCs. In Sweden, building owner would prefer an energy audit based on an on-site inspection. However, there is regulation concerning the type of audit (it's up to the expert to assess the need for an on-site inspection)

This category is very diverse throughout Europe, both in terms of building owner requirements and EPBD regulations.

The work documentation depth and quality *and* contents

In this category, the comprehensiveness and elements of the building audit is described.

All countries implemented the elements required by the EPBD; in detail, these elements are final or primary energy demand, assessment and analysis of the final or primary energy demand in a label, recommendation for improving energy efficiency of the building. These elements are also required by building owners. In none of the proposed certificates, energy costs are integrated, while more than 70% of building owners would like to have this information in the EPC and for more than 90% reduction of energy costs is important. Furthermore, estimations on the energy performance and energy classes of buildings, after carrying out renovations mentioned in the EPC, are integrated in the regulations of Bulgaria and Finland, about 73% of owners of multi-family house would require this information. In addition information about estimation on the investment cost and payback time of the recommended measures is essential for more than 70% of building owners; just in Bulgaria this information should be an element of the EPC. This is very important, taking into account that 79% of building owners think that the availability of high quality recommendations and technical advice on energy performance improvements could influence the decision making process towards energy efficiency improvements.

Throughout Europe, all countries integrated elements of EPC which were required by the EPBD. However, building owner would require more information like energy costs, investment costs combined with payback time, which is included just in a few countries. However, these requirements have to be put together with maximum costs for an EPC.

The identification of energy performance indicators and profile *and* the rating of performance and the verification of as-built specifications or as-operated buildings

Building owners require information of a classification of energy performance (e.g. on a scale from A to G) as well as an assessment of heating energy consumption. This means, an assessment of final or primary energy demand on a label is needed. In all countries, some kind of labelling of final or primary energy demand is include, while not in all of them an indicator including the losses of the HVAC system is the main energy efficiency indicator. However, there are differences in labelling the indicator: some are using the scale between A (or even A++) to G, others are using the energy tachometer or similar figures (Sweden).

All building owners have strong demand for a reliable and common calculation method, which is proposed or already implemented in most of the mentioned countries. As well, technical standards set by public authorities regarding the calculation method are important. However, calculation method and software can be freely selected in Finland, although building owners have different requirements. [In Sweden there is a list of obligated data to be collected, but there is no common calculation method.](#) In all other countries, the calculation method is specified.

Most of building owners would like to have both, information on energy demand and consumption, in the EPC. The proposed EPCs use calculated values; just in Finland [and Sweden](#) measured energy consumption will be used for existing buildings.

The schematics of the issued energy certificate

Independence and reliability of consultants as well as visual quality and understandability of certificate for non-professionals are important for building owners. All countries integrated an energy efficiency label in their EPC scheme in order to have easy understandable information for non-professionals. Details about the consultants/auditors – see below.

7.2 Elements

Promotion and marketing

The requirements of building owners are different, depending on the respective target group: while owners of multi-family house would like to receive information on energy certification of buildings by the channels professional journals, branch organisation, internet and newspaper, the individual homeowners prefer to receive that information by daily newspaper, internet, television or government communication. At the moment, just a few individual activities like articles in newspapers or journals or workshops and seminar were carried out. No concerted action to inform about these new regulations using several channels took place.

However, information regarding new regulation based on the EPBD is required by building owners. Especially, taking into account the high value of EPC for building owners: more than 70% would like to develop renovation, reconstruction or maintenance strategies based on the EPC. About 68 % think that an EPC could be valuable in assessing the market value of a building.

Cost and financial support policy

The building owners' opinion about a reasonable cost for certification per building is very diverse: there is a range between 100 EUR to 3.000 EUR for a price of one certificate. For new buildings there should be hardly any extra costs for an EPC (max. 50 – 150 EUR) because this effort should be part of planning costs and a result of the planning stage. Current estimations say that the price of issuing an EPC will be between 250 and 600 EUR; for complex buildings up to 1.500 EUR. [In Sweden, first offers for energy certification services show that the certificate for multi-family residential cost between 1.300 and 3.000 EUR, for non-residential buildings more than 2.200 EUR.](#) This corresponds quite well with the requirements of building owners.

None of the countries have proposed a subsidy schemes for EPC for existing buildings without any refurbishment activities. Though, there are existing or new subsidy schemes for energy efficiency investments. Nearly all of the respondents think that energy certification would increase their investment in energy efficiency if subsidies for the investments would be available.

Administrative structure and key parties, and structure of administration

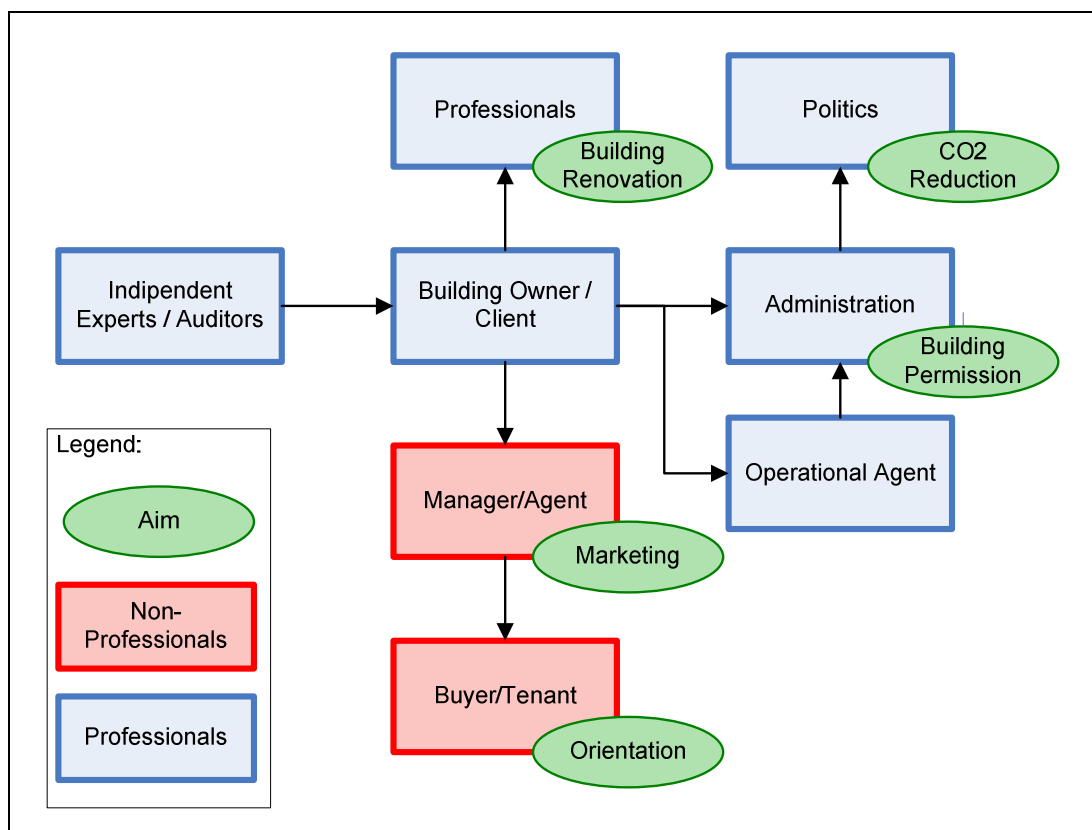
There are four main parties within the certification process: administrator with legal responsibility; operational agent, who is responsible for the everyday business; experts or auditors, who will certify buildings and the client, who will receive the EPC. In all countries the first three parties are different or not even defined yet. In the questionnaire, administrative structures were not addressed directly. However, according to the results at least the following elements of administrative responsibility should be clearly defined:

- Authorisation and training of experts
- Quality control by an independent third party
- Development of models and tools for energy certification experts

These elements were already or will be addressed in specific categories of this report, respectively.

Figure 7 shows the interaction between the already mentioned players which are members of the core certification process; in addition, there are players beyond the core process like building manager or agent, buyers and tenants or politicians. Furthermore, the figure should illustrate the interaction between professionals, who are experts in the field of buildings or energy certification, and non-professionals.

Figure 7: Players and aims in energy performance certification process



Monitoring and evaluation system

The customer survey did not explicitly address the issue of monitoring and evaluation. However, building owners are willing to use a certificate evaluating the energy efficiency of a building for assessing the maintenance and running costs of a building, developing environmental and energy management in the building stock and developing renovation, reconstruction and maintenance strategies for the building stock. That means certain types of monitoring and evaluation systems, at least at the level of building owners, have to be implemented.

Furthermore, taking into account other monitoring and evaluation requirements, for instance looking at the European Directive on energy end-use efficiency and energy services, the installation of such tools would be valuable not only for building owners but also for national authorities. At the moment, hardly any country has implemented or even developed a proposal for installing a monitoring and evaluation system, based on the information gathered by the EPC.

Energy assessment – audit models; and tools for assessor – auditors.

In this category, the national implementation is very diverse: in Belgium and Bulgaria the energy assessment and audit models, even tools for assessors are defined. On the contrary, in Finland [and Sweden](#) these regulations are deliberately loose and simple in terms of the description on on-site audit work. In Austria, however, there are regulations concerning the calculation method, but there is still no definition how to carry out the building audit and if simplified calculation methods could be used.

For building owners, the comprehensiveness of the on-site inspection/audit is a very important (33 %) or an important (50 %) element in the quality of energy certification. Furthermore, the contents of laws and regulations regarding energy certification (calculation methods, definitions of energy audit contents, necessary measurements, etc) are very important (42 %) or important (51 %) elements in the quality of energy certification.

Authorisation and training of energy assessors-auditors

In this category, there are some similarities but also discrepancies of building owners between different countries:

In all countries, authorisation of energy certification experts is a very important (32 %) or an important (43 %) element in the quality of energy certification. The independence and reliability of energy certification experts is a very important (51 %) or an important (38 %) element in the quality of energy certification. Energy certification experts should be re-authorised every 2-10 years (37% every 5 – 10 years, 35% every 2 – 10 years). 3 -5 years of professional experience in certification is sufficient for buildings owners.

But there are also discrepancies, especially in the responsibilities, according to the responses of the building owners: In Finland [and Sweden](#), authorisation and training of energy certification experts should be carried out by public authorities; on the contrary, in Austria and Bulgaria these tasks should rather be carried out by technical institutions.

In this field, the implementation authorities of mentioned STABLE countries rarely made any decisions made by now.

Services quality control

Building owner think that quality control performed by public authorities is a very important (23%) or an important (49%) element in the quality of energy certification. Quality control should be established on a

random check basis (57 %) or on an even stricter basis even it has an impact on the costs of energy certification (24 %). There are differences in the approach what the quality control should cover: In Finland the quality control should rather cover the auditors' field work (50 %), in Austria rather the contents of the issued energy certificate and its eventual annexes (33 %), in Bulgaria both approaches have nearly the same number of responses.

In none of the STABLE countries the proposed legislation does include a defined procedure or responsibilities for quality control. However, in Sweden experts will be certified by a certification body. Furthermore, experts need a basic technical education complemented by five years of practical experience and a theoretical test.

8 Synopsis

Based on first contacts with relevant players in the EPBD implementation process during the STABLE project, several general remarks to the European EPBD implementation could be drawn (more general remarks will be developed in work package 8):

- There is a partial or complete lack (or difficult to reach) of building overall and energy documentation. This is the basis of any audit and certification activity. Furthermore, this problem rises expenditures very high, if new sets of documentation are to be elaborated and/or prepared. Therefore, all municipalities and energy providers are asked to offer reliable documentation easily.
- Common basic EPC issues and procedures should be unified and recognised by all EU Member States in connection with the basis for the EU free movement of (energy) services.
- In prolongation with Article 5 EPBD, old buildings should also have alternative systems to be included in EPC recommendations, just as for new buildings.

The comparison between the national EPBD implementation details and the questionnaire for building owners shows, that national regulations according to the EPBD implementation correspond with the requirements of building owners in several issues, but not in all. The following recommendations should be taken into account in the national implementation process in order to customise these regulations with the target group which is very much affected by the EPBD: the building owners.

- In general, the contents of proposed EPC corresponds with building owner requirements; the visual quality for non-professionals is available. But **more information** - like energy costs, estimation of investment cost combined with payback time, energy savings if recommendations for improvements are carried out - should be included in the EPC
- Building owners require the availability of **high quality recommendations and technical advice** on energy performance improvements in order to use this for their strategies regarding maintenance and renovation.
- **One main energy efficiency indicator** representing both, net energy demand and losses of the HVAC system (that means at least the level of final energy demand) should be presented on an energy efficiency scale.
- There should be common and **reliable calculation method**. This is available in the proposed regulation in many countries, but not in all of them. There should be a clear definition of energy assessment method and audit scheme.

- In the EPC there should be information about both, **energy demand and consumption** of the building.
- Promotion and marketing is very important: National concerted action using different channels, separated for professional owners for multi-family houses and individual homeowners, to inform about national implementation of EPBD should be carried out. It is very important to use the most appropriate information channels for the respective target groups.
- There should be a clarification of administrative structure, at least in the fields authorisation and training of experts, quality control by an independent third party and development of models and tools for energy certification experts
- Monitoring and evaluation system, most suitable in combination with a common monitoring and verification method for the European Directive on energy end-use efficiency and energy services, should be established.
- Regulations of authorisation and training of energy assessors should be set in force. Relevant target group – the building auditors - should be informed.
- The procedure or responsibilities for quality control should be established. There is a strong demand by the building owners.

9 Recommendations to audit and certification programme managers

This report presents the result of work package 8 within the EU-project STABLE (Securing the Take-off of Building Energy Certification: improving the market attractiveness through Building Owner Involvement). In this work package the project members have searched for recommendations to audit and programme managers and good practices replicable transnationally. The outcome of WP8 is energy certification and audit programme managers better informed and aware of market requirements for certification services. WP8 is in partly based on results from earlier work packages. Regarding the recommendations at national level, four participating member countries contributed with recommendations: Austria, Belgium, Bulgaria and Sweden. It was not possible to gather the recommendations from the other participating member countries i.e. Finland, Greece and The Netherlands. This report presents the results from the responding countries, as well as recommendations for the EU as a whole.

9.1 Background

In the majority of the EU- Member States the implementation of the Energy Performance of Buildings Directive (EPBD) has passed the transposition to national legislation phase. Thus the recommendations do not address “how the transposition should be” or “should have been”. The recommendations and good practices address the practical implementation of the national legislation and regulation adopted, i.e. how to achieve the most given the existing legislation framework.

It should be said that in most of the MS the legislation and regulation still leaves a large freedom regarding its interpretation and how the market will apply them. Furthermore, legislations and instructions are not carved into stone and are likely to be revised in the future, particularly since the implementation of the EPBD is a learning process and the European Commission has already stated that the revision of the directive would start in 2007 ¹.

Thus the recommendations formulated in this report address mainly the following areas: compliance; monitoring; trade-off between cost and quality of information including identification of energy performance improvement measures; and mechanisms and measures to stimulate building owners to implement the energy performance improvement measures.

9.2 Objective

The objective of this survey is to describe national recommendations for the participating countries, recommendations replicable transnationally, and recommendations at EU level.

The recommendations here drafted address the further development of energy certification and audit programmes from the points of view of:

- building owners as customers to certification and auditing;

¹ Energy Efficiency Action Plan, European Commission, 2007

- audit professionals as the central delivery vehicle;
- authorities responsible for the actual implementation of the EPBD, namely monitoring its compliance and results;
- other bodies such as certifying and accreditation bodies, NGOs, professional associations etc.

The recommendations should, among other things, lead to measures that will encourage building owners to carry out energy efficiency measures and facilitate the introduction of Energy Performance Certification (EPC). Furthermore, a list of good practices replicable in other contexts is given, e.g. voluntary initiatives where property owners carry out energy saving measures on a level with the certification of buildings or beyond, or special conditions for energy efficiency investments provided by financial institutions.

9.3 Method

To formulate the recommendations, the following method has been followed:

- recommendations have been compiled based on the conclusions from previous work packages namely Classification framework for audit and certification schemes (WP 2), Customer requirements for energy certification and auditing (WP 3), Analysis and classification of adopted mechanisms (WP 4), and Linking energy certification to market financing mechanisms (WP 5);
- interviews have been held with key persons/organisations at the national level as well as at European level;
- feedback from the campaigns for building owners energy auditors (WP 6 and 7), in which recommendations were tested and new ideas from discussions were picked up;
- as for the national recommendations, STABLE-partners formulated their country specific recommendations due to their better knowledge of the national situation.

Concerning interviews with key persons/organisations, a questionnaire (Appendix 1) was generated to facilitate the interviews. In order to gather recommendations representing the different perspectives, the key persons included: building owners and their associations; energy auditors and their associations; representatives from authorities involved in the implementation of the EPBD; other experts.

10 Recommendations from building owners (WP3)

A recommendation is a policy instrument or a measure aiming at improving the national introduction of energy performance building certification. Earlier work within the STABLE project, namely within work package 3 - Customer requirements for energy certification and auditing, aimed at gathering how building owners would respond to conditions influencing the decision making process towards energy efficiency improvements. For the purpose an extensive questionnaire was designed, which was translated to national language and implemented in a web-platform was answered from representative building owners. These answers can be regarded as general descriptions of national recommendations but in some cases can be replicable transnationally. However, it should be kept in mind that the questionnaire was held during the process of transposition, so they did not know how the final national legislation would look like at that time. A summary of their general recommendations is listed below.

Information from building owners constitutes one of three bases for recommendations to audit and certification programme managers with regard to current national legislation.

10.1 Recommendations from building owners in Austria

- Building owners in Austria require the availability of high quality recommendations and technical advice on energy performance improvements in order to use this for their strategies regarding maintenance and renovation;
- Energy certification of buildings would increase investments in energy efficiency of Austrian building owners if financial mechanisms were established providing support for the implementation of the energy saving measures recommended in the certificate; Austrian building owners show a strong demand for a simplified approach to calculate energy performance for existing buildings in order to have enough energy auditors and an acceptable price for the certificate;
- For building owners the two most important factors for the quality of the energy performance certificate are (1) the competence of consultants and (2) reliable and common calculation method;
- For Austrian building owners, there are mainly three very important items the energy performance certificate should include, these are:
 - a classification of energy performance (e.g. on a scale from A to G);
 - an assessment of heating energy consumption;
 - an estimation on the energy performance and energy class of the building if all recommendations are carried out.
- The procedure or responsibilities for quality control should be established. A vast majority of the building owners prefer to have a quality control concept on a random check basis, with only a small impact on the cost of certification.

10.2 Recommendations from building owners in Belgium

Building owners in Belgium are rather individual and not very strongly organised. Therefore a uniform point of view is not easy to establish. Nevertheless the information gathered in the STABLE project showed some major interests:

- Building owners are interested in a certification with high added value, delivered by technically experienced experts and with a guaranteed quality. This however is in contradiction with the price they mostly are willing to pay;
- Building owners find the current proposal of the energy certificate for new dwellings positive, although they think it lacks specific information on the energy costs;
- The current financial support possibilities are not fully explored. Loans and mortgages can be a motivation, but at the moment very few specific formulas are available to stimulate energy efficiency renovations.

10.3 Recommendations from building owners in Bulgaria

A crucial recommendation from Bulgarian building owners is that energy performance certificates must generate building specific energy saving measures. A summary of other recommendations from large building owners (Ministries and Municipalities) in Bulgaria is listed below, based on answers from the questionnaire in WP3.

- Numerous different proposals for certification, audit prices and financing were received – there is a need for common approach at EU and National level;
- Building energy certification decisive quality – of consultants/auditors, of ESCOs and of grants/subsidies;
- Leading significance of State bodies and national legislation for the success of the energy efficiency policy implementation;
- Leading importance of information available on the internet and professional newsletters for EPBD information dissemination;
- Accent on the building energy expenditures in the certificate display;
- The energy audit has to have guaranteed quality, be detailed and cover the entire building;
- Crucial importance of suitable financial tools to carry out energy saving recommendations.

10.4 Recommendations from building owners in Sweden

According to Swedish building owners asked in WP3, there are two main financial instruments that would stimulate the implementation energy saving measures of: (1) investment subsidies and (2) low interest loans.

Answers from WP3 questionnaire also clearly point out that Swedish building owners appreciate access to qualified energy service companies and carefully prepared specific energy saving recommendations. This makes them more willing to carry out the energy saving recommendations given. Furthermore, they want information about energy certification to come from building owners' trade associations and/or from government authorities.

The results from the WP3 questionnaire also points out organisations as important trendsetters. If, for instance, a well-known building owner trade association announce max limits for energy use, it would most likely inspire building owners to go below that limit.

Other recommendations are:

- **Quality control.** Mechanisms for ensuring quality control of experts are needed, for example by randomly checking certificates;
- **Independency of experts.** Guiding principles should be adopted to guarantee that accredited companies/organisations, for example HVAC and other equipment companies do not work on provision;
- **Implementation of the energy performance improvement measures.** Economic incentives should be created in order to kick-start the implementation of EPBD and in particular the implementation of the energy efficiency recommendations. Incentives, e.g. loans with low interest rates, tax reductions and subsidies, are preferred when compared to enforcement measures, e.g. obligations imposed on building owners, to implement the recommended energy efficiency measures;
- **Auditing process.**
 - Guidelines are needed to allow accurate energy measurement namely by installing dedicated meters, as operational rating has been chosen for all buildings;

- Incentives should be established to support initiatives taken by professional organisations (experts, building owners, HVAC professionals, etc) or groups of associations aiming at developing criteria for auditing and certification. This is due to the fact that no audit method is specified. And that audit methods are therefore to be developed by the market;
- **Information.** Information activities about EPBD implementation should be continued both by professional organisations and by authorities.

11 Good practices

In this chapter, existing national good practices that can be replicated in other contexts are reported. Implementation of the EPBD has, at the time when this report is being compiled, passed the legislation phase in a majority of the EU-Member States. Consequently, the definition of good practices here are methods and processes that represent public or market initiatives that, among other things, encourage building owners to carry out energy efficiency measures to improve the energy performance of buildings.

11.1 Good practices from Austria

IG PassiveHouse

The IG Passivhaus is a platform for all information, quality and training around the topic "low energy house". The platform aims at quick spread of all issues concerning the low energy house and its high comfort of living. The platform also contains a database of passive houses in Austria. The platform gives information to building developers to plan and build passive houses, which fulfil the requirements of the regional building codes and, furthermore, have the A++ label in the Austrian energy performance certificate.

Klima:aktiv - comprehensive modernisation

Klima:aktiv – comprehensive modernisation is a set of there are three programmes for the thermal-energetic renovation of large apartment buildings, service buildings and state-owned buildings. These programmes, which are listed below, aim not only at contributing to cost savings, but also at increasing the quality of living and the property value.

- Wohnmodern is a programme for the modernisation of large apartment buildings and cooperates with the federal provinces and associations of the housing and real estate industry;
- Ecofacility supports private property managers in developing tailored solutions for technical and financial renovation problems. This programme aims at increasing both the quantity and the quality of renovations in private service buildings and, as a consequence, permanently reducing operating expenses;

- Bundesgebäudecontracting supports the modernisation of buildings used by public authorities. Energy consumption in approximately 300 properties, the majority of them owned by the federal buildings management company Bundesimmobiliengesellschaft (BIG), is to be optimised by means of energy performance contracting. The results so far: stimulation of the economy through net investments by the contractors amounting to 15 million euro, guaranteed savings of 3.4 million euro annually (of the planned total of 11.4 million) and a reduction in carbon dioxide emissions by 16,500 tonnes annually (goal: approx. 60,000 tonnes p.a.).

Ecofacility and wohnmodern give amongst others direct support to building planners and owners (building audit) in order to make energy savings in renovation and how to fulfil the requirements of the building codes after transposition of the EPBD. Furthermore, issuing an energy performance certificate can be part of these supporting activities.

Klima:aktiv Houses – energy efficient new buildings

The programme klima:aktiv houses contributes to significantly increasing the market shares of energy efficient and environmentally friendly new buildings complying with the klima:aktiv houses standards. By means of a catalogue of 1,000 criteria – based largely on the research results of the Federal Ministry of Transport, Innovation and Technology (BMVIT) programme “Building of Tomorrow” (cf. p. 16) – parameters such as planning, energy efficiency, building materials/construction and health/comfort can be documented and evaluated. Strong emphasis is placed on a further training initiative for experts in the planning and construction industry.

Within the Klima:aktiv houses programme, direct support activities are carried out for building owners of private service buildings in order to plan energy efficient buildings. A result of the report is to give information how the building fulfils the requirements of the building code.

For residential buildings, the building has to fulfil the catalogue of 1,000 criteria. If a building is indicated as klima:aktiv houses it also fulfils the requirements of the building code.

11.2 Good practices from Belgium

In Belgium the currently developed software tools for energy certification are being based on a web based tool with direct connection for the energy experts. This means that only one software (proposed by the government) is being used by all experts, and all certificates are requested to be sent to the administration. This has several advantages, especially with respect to data mining of the building data from the certification:

- It is possible for the government to check the quality of the data coming in to their central server. A simple check up, compared to similar buildings, could in the future lead to a quality check on the performance of the auditors, and efficient on-site checks;
- A direct follow-up and reporting of the implementation of the EPBD could be a possibility in the future;
- The definition of building typology, default values and revision of defined energy classes can be based on the available data of energy characteristics in the central database.

The implementation of this kind of on-line data mining of course requires quite some efforts (people working on the data processing and interpretation), but offers a wide variety of opportunities for improvement of the applied energy policy.

11.3 Good practices from Bulgaria

EPBD Legislation

Bulgaria have enforced a National legislation in accordance with the EPBD one year before the EPBD “D” day, January 4th 2006, which practically secures all needed procedures in order to reach the EPBD final goal – the building energy certification and improvement and the main STABLE target as well - to secure the take-off of the building certification within the time frame of this Project. What is good practice here is the practical transposition of the EPBD requirements in specific National conditions.

The EPBD requirements implementation is grounded in the Energy Efficiency Act (EEAct) of March 2004 and in its four Regulations:

- Regulation №18/12.11.2004 for energy performance of facilities
- Regulation №19/12.11.2004 for building certification for energy efficiency
- Regulation № 21/12.11.2004 for investigation for energy efficiency
- Regulation №20/12.11 2004 on order and conditions for entering of persons to perform building certification and investigation for energy efficiency and obtaining information.

Bulgarian implementation of the Norwegian method ENSI Key Numbers

With the EEAct adoption, the EN 832 standard becomes Bulgarian standard as well. The Norwegian methodology “ENSI Key Numbers Software” - “Key values” software products are based on EN 832, so they could serve as a basis for the education and accreditation of building energy audit and certification experts in Bulgaria, in compliance with the EPBD. The Government of Norway granted officially 3 000 licenses for “Key values” method software usage, together with the “ENSI Key Number Software” and “ENSI Economy Software. The Bulgarian side already allocates this software and secures the education and registration of experts that already perform energy audits and certification of buildings in the country, using this unified National methodology. The respective software is grounded within academically developed educational programs, adopted by the EEA, for the operation of educational training courses in six University centres in the country; educated/trained energy assessors-auditors are than accredited and registered in EEA official Public Registers, prior to be able to legally perform their professional duties. Till 25.04.2007, 107 companies to perform building certification, trained following this methodology have been entered in the respective EEA Public Register.

EBRD foster implementation of EPBD

The Government adopted a National Programme for renovation of residential buildings, including financing the insulation of public and private (mainly panel dwellings) buildings. Specific National structure for energy certification of buildings monitoring and control is created. An Energy Efficiency Fund has been created, which imposes specific requirements for eligibility such as auditing, certification, and monitoring.. In addition, a credit line provided by the EBRD – European Bank for Reconstruction and Development targeting households is operational through 4 National Banks since 2005 to support investments in energy efficiency. There are good perspectives for this approach to be used in other New Member States.

11.4 Good practices from Sweden

The web based database *eNyckeln* (the *eKey*)

The web based database *eNyckeln* was developed by the Swedish Energy Agency in 2005 as a future help for owners of multifamily and non-residential buildings. The purposes of *eNyckeln* are to help the building owners:

- To make their own database of their buildings and their annual energy use;
- To compare a single building's annual energy use with benchmarks made up of all buildings entered into the *eNyckeln* database;
- To provide, via an energy expert, all data to Boverket's database (The National Board of Housing, Building and Planning), which is required for the ongoing energy certification of buildings. This possibility is currently being investigated.

In addition a future goal is to facilitate easier production of statistics on the detailed energy use in multifamily and non-residential buildings. The data for the buildings entered into the web based database can to a great extent be exported from all the main softwares used in Sweden for energy management of buildings.

The *eNyckeln* database opened in April 2006. All data is based on single buildings and includes: delivered energy, energy use and water use that are entered on a monthly basis and that can be divided into several energy end-uses. The database normalizes entered heating energy to a standard year for the four main climate zones in Sweden.

The database is slowly getting filled with more buildings, mainly due to a promotion initiative started in spring 2007 when the final parts of the Swedish legislation of the energy declarations came into force.

The property owners' buyer group - BELOK

The Swedish Energy Agency formed in 2001 a property owners' buyer group, which is a network consisting of the 14 largest Real Estate companies in Sweden focusing on commercial buildings and non-residential premises. This group, called BELOK, is a co-operation between the Swedish Energy Agency and the largest building owners, both public and private. The main purpose is to formulate and carry out research and development projects directed towards energy and environmental efficiency.

The goal is to introduce energy efficient technology options that have not yet reached the marketplace in order to demonstrate and test the procedure developed. The development projects aim towards making the energy use more efficient and at the same time fulfil the requirements on function and comfort or even increase them.

BELOK's vision is to become the leading Swedish group of real estate owners through realization of different projects "showing the way forward" towards considerably reduced energy use in non-residential buildings. The energy use should to a high extent be based on renewable energy sources.

BELOK's mission is to support promising energy efficient products, systems and methods and create the necessary conditions for their implementation. Projects should be realized through the member companies. An example is technology procurement projects that stimulating the development of products, systems and methods, in new or existing buildings. Examples of projects and other initiatives are available at www.belok.se.

The BELOK group constitutes a powerful network for developing, testing and adopting new approaches for example in different aspects of the EPBD implementation.

11.5 Good practice from EU

In 2004, the European Commission initiated the GreenBuilding Programme. This programme aims at improving the energy efficiency and expanding the integration of renewable energies in non-residential buildings in Europe on a voluntary basis. The programme addresses owners of non-residential buildings to realise cost-effective measures, which enhance the energy efficiency of their buildings in one or more technical disciplines.

In a pilot phase in the years 2005-2006, the GreenBuilding infrastructure was set up in ten European countries. In each participating country, a so-called National Contact Point was established for aiding organisations, who consider participation in GreenBuilding. The GreenBuilding pilot phase is a project supported by the European Commission's Intelligent Energy Europe Programme. (Source: www.eu-greenbuilding.org). The GreenBuilding logo is a marketing tool for advertising good energy performance of an organisation or a company.

12 Recommendations from key-persons

In order to gather recommendations representing the different perspectives, key-persons were interviewed. These included: building owners and their associations; energy auditors and their associations; representatives from authorities involved in the implementation of the EPBD; other experts.

12.1 Method

National key-persons/organisations were interviewed following a questionnaire. The interviews were carried out mostly via telephone, or via email complemented by a telephone interview. The key-persons were encouraged to freely come up with national and international recommendations. The questionnaire was meant to form a basis for the interviews, rather than being answered as strict questionnaires, and is available in Appendix 1.

12.2 Recommendations from key-persons in Austria ²

The Austrian Energy Agency did not carry out interviews based on the questionnaire developed within STABLE because of ongoing contacts to key-persons regarding EPBD transposition in Austria. The following recommendations are based on regular contacts with building owners, building owner associations, national property owner federations, involved authorities of the federal regions, the federal ministries of justice and of economy and labour as well as representative and key persons of the Austrian Standards Organisations. The recommendations below address mainly the transposition rather than aspects related to the “practical implementation” of the legislation.

- The energy performance certificate should have one energy efficiency classification on the first side of the certificate, which represents a global indicator of the energy performance of a building. This could be either final energy demand or primary energy demand or CO₂ emissions;
- The energy performance certificate should include recommendations for improving the energy performance of a building. These recommendations should be compiled in groups: one group of measures should secure that the global indicator on the first page is at least one class better than before. The second group of measures should decrease the energy performance a building in order to fulfil the energy performance requirements of the regional building code for new buildings;
- Besides the first two pages and the technical annex, the energy performance certificate should also contain an information sheet for non-experts, which describes the purpose and the technical expression of the certificate;
- The borders between the energy efficient classes on the label on the first page should be indicated in the label itself;
- Throughout Austria, the energy performance certificates should be calculated with a common, reliable calculation method. This method should also include a simplified approach in order to keep the cost for certificates for existing buildings low;
- The data of energy performance certificate (input and output data) should be uploaded in a national or regional database in order to use them for quality control and statistical reasons.

² Formulated by the Austrian Energy Agency

12.3 Recommendations from key-persons in Belgium ³

The following recommendations result from discussions with the Belgian governmental administrations, the energy experts and some building owners. The information was gathered both via direct meetings, general conferences and workshops, and finally via personal contacts. In general the following issues need further development in the future:

- Training needs further development. The quality of different training centres may vary a lot. Training of trainers is an issue;
- The software and technical procedure is sufficiently extended and also includes aspects as indoor comfort. But here also improvement can be made towards the easiness of use. There are still some faults in the software. This however has been dealt with by a website with FAQ, where experts can go to with their questions and where the questions are answered, and where actions for improvement of the software are being defined;
- For existing buildings the voluntary (preparatory) scheme is being supported by tax reduction both on the audit as on the measures. It is however for the moment not yet clear to which extent this will lead to significantly increased number of applied measures. As mentioned previously, further investigation on other possibilities for tax reduction and loans/mortgages is necessary;
- The audit cost for the voluntary (preparatory) scheme for energy certification of existing dwellings is experienced to be too high (400-600 €). Nevertheless one has to take into account the building complexity and variety in Belgium. Therefore a new action towards a simplified procedure (objective 200 €?) has been launched with specific attention for the balance between cost and accuracy on one hand, and reproducibility of the results on the other hand;
- As already mentioned before a system (web based data gathering) by the government is being initiated for central data processing. For the moment it is too early to come up with specific results. Issues to be dealt with are of course privacy of data, efficient data processing and reporting.

12.4 Recommendations from key-persons in Bulgaria ⁴

National key-persons were interviewed based on an “own” questionnaire, relating the national energy situation, distributed in the framework of the WP8 National Seminar. In total 26 key-persons were interviewed: 10 from registered audit companies, 4 from real-estate organisations, 2 from regional Energy Efficiency Agencies, 2 from National NGOs, 1 from finance institutions, the Executive Director of the National EE Fund, 1 from energy generating utilities, 3 from key Ministries, 1 Mass Media - TV EUEropa, 1 from Technical Universities – the National key-person on energy building Certification and energy audit of industrial facilities software and educational programs. Their written answers-recommendations are kept in the EEA STABLE WP8 record - herewith is the summary of the recommendations:

- Compulsory part and evaluation of energy efficiency for all new and renovated building;
- Grouping in more scaled lots different municipal buildings;
- More effective management of State owned buildings;
- Integrated approach towards the building and its adjacent area;
- Financial incentives for building owners;
- Adoption of a Unified National building Standard;

³ Formulated by VITO

⁴ Formulated by the Bulgarian Energy Efficiency Agency

- Application of Energy Performance Contracting, TPF and similar ESCO activities;
- Better coordination and interaction between different players;
- Integration of energy efficiency in architectural education, design & practice;
- Increased awareness of energy performance of buildings;
- Cooling loads to be included in the software for calculation of the building energy performance;
- Better knowledge of legislation related to energy certification.

12.5 Recommendations from key-persons in Sweden

The following persons and organisations were interviewed:

- Boverket (The National Board of Housing, Building and Planning), Hans Olof Karlsson Hjort;
- Sifu – Education of energy experts, Per C. Persson;
- CIT Energy Management AB – Consultant to the Government Independent Inquiry for the EPBD implementation, and coordinator of Belok (see Section 3.4), Per-Erik Nilsson;
- Swedish Property Federation, Bengt Wånggren;
- National Property Board, Lars Pellmark;
- Diligentia, Per Widén, member of Belok;
- Energiteamet (energy audit company), Börje Filmberg;
- Swedish Association of Energy Advisors, Lotta Bångens.

Competence, independency and control of energy experts

- Competence of the energy experts is considered to be of utmost importance. A preoccupation that is mentioned by some key-persons is that experts, apart from ensuring that energy saving measures do not influence the indoor climate negatively, should ensure that their suggestions do not damage architectural aspects of buildings with cultural or historical value. The compilation of national education literature, in which this is described, together with national examination, is recommended to handle this;
- As no audit method is recommended, it is important to establish a quality control mechanism. This could be done by checking randomly a small percentage of certificates issued by experts, for example to check if the most important energy performance improvement measures are identified;
- A way to ensure that accredited companies/organisations, such as HVAC companies, do not work on provision is necessary, and therefore, it is suggested that guiding principles for tackling this aspect are formulated. Another aspect mentioned is the independency for energy utilities that want to issue certificates.

Assessing the building energy performance and energy auditing

- Operational rating is recommended to start only after waiting three, four or even five years after a building is taken in operation, since that is about the time it takes before a building is working and “tuned in” as it should, not to mention stabilisation of activities. Another aspect mentioned is related to measuring namely by installing separate meters. In Sweden, it is not legal or possible to get information from utilities about tenants specific energy use. It is recommended to create a general permission form to handle this;
- It is recommended to use questionnaires together with actual metering to estimate the indoor climate. Questionnaires should however not be used more than necessary since some tenants are already tired of them;

- It is difficult to estimate the depth of an audit in advance. A dialogue between the energy expert and the building owner is recommended to find out the necessity of an audit and its depth. In buildings where the price of an audit is not fixed, it is important that the energy expert does not decide alone the range of the audit, since he/she has a commercial interest in “going deeper” than what may be necessary. A clause that permits the building owner to change energy expert, if they do not agree, is recommended;
- Building owners want to make a wide use of the possibility that the regulation gives according to which a certificate can be issued without an in-situ energy audit. Building owners suggest that only the worse c.a. 25% of the buildings should be audited. Most energy experts and even authorities reject the idea of establishing a threshold (share or other criteria) for the buildings to audit as the responsibility for not performing the energy audit as it up to the expert to judge if the audit is necessary. Furthermore most energy experts claim that it is always possible to identify cost-effective measures in most of the buildings.

Recommendations for cost-effective energy performance improvement measures

- Information and awareness creation is necessary for building owners to implement the recommendations. For this purpose it is recommended to adapt the information campaign which is held all over the country to cover this aspect of the building energy certification. The campaign is organised by The Swedish Energy Agency, The National Board of Housing, Building and Planning, The Swedish Environment Protection Agency and The Swedish Consumer Agency;
- Taking advantage of the great attention given to environmental problems and climate change in particular, it is recommended to use indicators based on CO₂ emissions when agreed factors exists;
- A potentially powerful instrument for households is the network of municipal energy advisors that are supposed to work as multipliers advising households and small companies in taking the most energy efficient decisions, namely based on the results of the building energy certificate;
- Some concern has been mentioned regarding a possible influence on the indoor climate of implementing the recommended energy saving. If such an effect is foreseen, this effect has to be mentioned.

Economic and enforcement instruments

- Subsidies and other financial incentives (“carrot”) seem to get the preference when compared to forcing building owners to carry out energy saving measures (“stick”). Reduced taxes, tax credits, loans with lower interest rates are examples of benefits that most likely would help implementing the recommended energy saving measures;
- Finally, effective sanctions are recommended towards building owners who repeatedly do not comply with the obligation of energy certification.

Register and monitoring

- It is recommended to collect and save all data in a national database in accordance with a standardised procedure, which must be followed by all energy experts. Collected information from certificates gives good information on energy statistics and eventually on the penetration of energy saving measures carried out. This information can be used as support when taking decisions about policy instruments;
- Data can be used for research purposes. An example is to make it possible to follow the effect of subsidies for different environmental technologies. It will make it possible to follow the

development of the energy performance in the building stock, far more detailed than ever before.

13 Feedback from national targeted campaigns to building owners and to auditors

This chapter presents the feedback from the National campaigns conducted in the framework of WP6 targeted campaigns to building owners and WP7 targeted campaigns to energy auditors. Recommendations have been gathered or formulated at the events composing the national campaigns and are presented below.

13.1 Feedback from national targeted campaigns in Austria

- Energy performance certificate: The Austrian energy efficient label on the first side of the certificate, representing the energy performance of the building, is a misleading report. This label classifies the net heating demand of the building. That means the energy losses of the heating system are not included. In non-residential building this approach is even worse: Neither net cooling demand nor energy demand for the HVAC system and lighting is included. This may lead to a wrong interpretation of the total energy performance of a building;
- All persons at presentations and workshops strongly ask for a common calculation method and a common energy performance certificate in Austria;
- The regulation about who will be authorised to carry out energy audits or calculated energy performance certificates is very uncertain: Administrations in the federal regions as well as the Federal Ministry of Economy and Labour and the Chamber for Economy argue to be the right body to set regulations. By now, no common regulation was set. This leads to uncertainty and dissatisfaction to people who would like to issue certificates. This topic should be clarified as soon as possible;
- Building owners have an information deficit regarding different methods to issue an energy performance certificate. In Austria, it is possible to make a detailed calculation including a building energy audit, as well as it is allowed to use a simplified method not including an audit. The range of prices for a certificate is between 3000 EUR for a detailed one, and 300 EUR for a simplified certificate. Building owners are not able to see the differences of the simplified method and the extended method in the offers of different certificate providers.

13.2 Feedback from national targeted campaigns in Belgium

The recommendations on the road shows or alternative actions largely correspond to the recommendations as described in chapter 4. Since the implementation of the energy certification for existing buildings in Belgium is still in a preliminary phase, the feedback of the end-users was especially given by an action via property owners with input from the owners on the current proposal for energy certification and corresponding procedure. The general conclusions on this were:

- The general concept of energy certification is perceived to be useful/necessary and not to be “an extra measure imposed by Europe”;
- End-users want to have qualified experts, the quality of the expert is important;

- End-users want more information via general media on the topic of certification, because they are generally interested to receive more information on energy efficiency. This is normal since the introduction is only in a preliminary phase (started for new dwellings, first initiatives for audits/labelling for existing dwellings). A general request is also to have a more coherent information from different actors (local, regional, federal government, energy service companies, etc);
- In addition, several road show actions were organised with no direct feedback from owners as for instance a presentation on regional television targeted at home owners.

13.3 Feedback from national targeted campaigns in Bulgaria

Different building owners / organisations were presented at all main EEA Road Show Public events, which included eleven events between November 2005 and June 2006, three of which with financial institutions. Their main recommendations are:

- More information at the local level on the Energy Certification of Buildings (ECB)
- Better quality of experts (proposed EE measures) and ESCO activities
- Crucial significance of financial incentives for building owners
- Normalization and effective representation of the real estate co-property in the country
- More transparency and information on the ECB different benefits

13.4 Feedback from national targeted campaigns on road shows in Sweden

The campaign carried out within STABLE was organised by the Swedish Property Federation and the Swedish Energy Agency, as well as the Swedish Association of Energy Advisors (Energirådgivarna) in order to cover the energy experts/auditors (target for WP7). The location for the seminars was chosen so that it would cover the regions not covered by other events. The locations chosen were Luleå, Jönköping, Kalmar and Norrköping, and the seminars were held in May 2007.

The seminars gained a significant success with approximately 400 persons in total, a mixture of mid-size building owners and (future) energy auditors. In the beginning many of the building owners were anxious, rather negative and poorly informed before about the EPBD implementation. In contrast the future energy auditors were generally positive to start of the EPBD and good perspectives for a new market. Not surprisingly, more questions than recommendations came up from the audience. However, it has been possible to identify some ideas and recommendations, especially from the speakers and the panellists, which are listed below:

- The most important conclusion is perhaps that building owners and energy experts have shown different positions, namely regarding the need for in-situ energy audits. Building owners want to make a wide use of the possibility that the regulation gives according to which a certificate can be issued without an in-situ energy audit. Building owners suggest that only the worse 25% of the buildings should be audited. Most energy experts and even authorities reject the idea of establishing a threshold (share or other criteria) for the buildings to audit. In fact, only the expert

can judge if the audit is necessary since he/she will be responsible for the accuracy of the certificate. Furthermore most energy experts claim that it is always possible to identify cost-effective measures in most of the buildings;

- Both building owners and energy experts are very concerned about the short period available – 15 months - for certifying all multifamily residential buildings and all non-residential buildings. Both claim that there will not be enough qualified experts, and that after the peak in demand for certification, the market will fall during a number of years. This instability is considered to be very prejudicial for the whole process;
- Building owners are very concerned over the cost of certification and their cost-effectiveness. This is one reason why building owners prefer to focus on the worse energy performing buildings where energy performance is in principle higher;
- Sanctions are proposed to be applied to building owners who do not carry out energy certification;
- The creation of incentives, such as investment subsidies and low interest loans, is proposed in order to kick-start the implementation of EPBD;
- The reinforcement of information activities about EPBD implementation is proposed. Germany is mentioned as a good example of how the information could have been managed, namely with full-page advertisements in major daily papers;
- Building owners support the idea that guiding principles are needed to ensure that energy experts do not search for making too much money with unjustified overdetailed energy certification processes;
- Both building owners and energy experts are very concerned with the independence of some accredited companies/organisations, such as HVAC companies that might work on provision; guiding principles are also proposed to tackle this potential problem;
- Incentives should be established to support initiatives taken by professional organisations (experts, building owners, HVAC professionals, etc) or groups of associations aiming at developing criteria for auditing and certification;
- As regulations do not give guidelines regarding audit methods and calculations, mechanisms for ensuring quality control of experts are needed, for example by randomly checking certificates;
- Accredited certifying organisations do not necessary have to be companies, they could also be associations.

Following the STABLE seminars, two articles have been published in “Energi och Miljö”, the journal of the association of HVAC professionals. The articles were written by Bengt Wånggren, from the Swedish Property Federation, representing the building owners’ perspective, and Eje Sandberg, From the Swedish Association of Energy Advisors, representing the energy experts. In both articles the authors summarise the discussions from the seminars from their respective perspectives.

14 Final recommendations

A summary of national recommendations and recommendations is given below.

14.1 Final recommendations for Austria

- The energy performance certificate should have one energy efficiency classification on the first side of the certificate, which represents a global indicator of the energy performance of a building. This could be either final energy demand or primary energy demand or CO₂ emissions;
- The energy performance certificate should include recommendations for improving the energy performance of a building. These recommendations should be compiled in groups: one group of

measures should secure that the global indicator on the first page is at least one class better than before. The second group of measures should decrease the energy performance a building in order to fulfil the energy performance requirements of the regional building code for new buildings;

- Besides the first two pages and the technical annex, the energy performance certificate should also contain an information sheet for non-experts, which describes the purpose and the technical expression of the certificate;
- Throughout Austria, the energy performance certificates should be calculated with a common, reliable calculation method. This method should also include a simplified approach in order to keep the cost for certificates for existing buildings low;
- The data of energy performance certificate (input and output data) should be uploaded in a national or regional database in order to use them for quality control and statistical reasons.

During the whole implementation process, the part with energy saving recommendations was not treated. It is possible that there will never be any regulations about energy saving measures. After intervention of The Austrian Energy Agency, the federal regions committed themselves to set target values for recommendations. A target value is the minimum requirements for new buildings, meaning that recommendations have to be described in order to fulfil the minimum requirements for new building according to the regional building codes.

AEA regularly talked to representatives of the federal regions concerning collecting data out of the energy performance certificates. At the end, a national wide database is planned and several activities on regional level are already carried out in order to establish databases for energy performance certificates.

14.2 Final recommendations for Belgium

The final recommendations for Belgium are summarized as follows:

Technical procedure and software

- Improve the user friendliness of the software (including some small technical errors);
- For existing dwellings a simplified (meaning less costly) procedure needs to be developed with focus on the balance accuracy/cost and reproducibility.
- Information about energy costs should be added to the certificate or audit results.

Training and experts

- End-users require experts with a technically added value and working according to quality requirements, nevertheless this is not easy to combine with the expectations towards lower cost;
- Random check ups show that quality of the experts can be improved. Checking the quality of the training centres may be one of the possible solutions for this.

Financial support

- Explore the possibilities of fiscal measures and specific energy efficient or green loans/mortgages.

Using the database of energy certificates

- Using data mining perform automatic quality checks of energy experts;
- Define more accurate default values for building energy characteristics and building typology;
- Follow up the implementation of the EPBD and namely the of executed policy measures.
- Further experience with large number of data has to be built up in order to evaluate the full capacities of this data mining.

14.3 Final recommendations for Bulgaria

The final recommendations for the Government and the Parliament are:

- Complete the harmonization of the EPBD related legislation with the final EU EPBD common method and CEN Standards;
- Stimulate the long-term involvement of central and local government within all energy certification of buildings applications, mainly on recommended measures implementation;
- Stimulate the creation of effective financial schemes for encouraging building energy certification and the creation of the national building energy certification steering committee;
- Support the practical and large-scale application of ESCO activities, offering Energy Performance Contracting (EPC) possibly with third party financing;
- Reinforce information activities regarding energy certification targeted at building owners.

14.4 Final recommendations for Sweden

Since the legislation and the regulation give a relatively large freedom for the implementation, e.g. regulations do not require the building to be audited (it is up to the expert to decide) and do not specify which audit and calculation methods to use, a number of initiatives are needed to ensure quality and efficiency in the certification process. Recommendations regarding this and other aspects are presented below.

Quality and independency of experts

- Measures to ensure the availability of qualified energy experts should be taken. This includes measures to level the demand for energy certificates so that a stable market is created, in order to avoid the peak in demand until end of 2008, followed by a long period with low demand;
- Mechanisms for ensuring quality control of experts are needed, for example by randomly checking certificates;
- Guiding principles should be adopted to guarantee that accredited companies/organisations, for example HVAC and other equipment companies do not work on provision;

Auditing process

- Guidelines are needed to allow accurate energy measurement namely by installing dedicated meters, as operational rating has been chosen for all buildings;
- Incentives should be established to support initiatives taken by professional organisations (experts, building owners, HVAC professionals, etc) or groups of associations aiming at developing criteria for auditing and certification;
- Indoor air quality is an important part of the EPBD implementation. It is recommended to use questionnaires, together with technical metering, to estimate the indoor climate;

Implementation of the energy performance improvement measures

- Economic incentives should be created in order to kick-start the implementation of EPBD and in particular the implementation of the energy efficiency recommendations. Incentives, e.g. loans with low interest rates, tax reductions and subsidies, are preferred when compared to

enforcement measures, e.g. obligations imposed on building owners, to implement the recommended energy efficiency measures;

- Innovative financial mechanisms like energy performance contracting and third party financing are considered to be an important financial instrument for implementing the recommendations. Despite the fact that this market is developing rapidly, it is recommended to continue promoting its further development specially in the field of building refurbishment and for private building owners;

Information activities

- A potentially powerful instrument for stimulating the implementation of the recommended energy efficiency measures is the network of municipal energy advisors that can work as multipliers advising households and small companies based on the results of the building energy certificate. Their role should be clearly formulated and support should be provided to them in order to facilitate their task;
- Information activities about EPBD implementation should be reinforced. Germany is mentioned as a good example of how the information could have been managed, namely with full-page advertisements in major daily papers;

Ensuring compliance and monitoring

- Sanctions should be applied to building owners who do not carry out energy certification;
- It is recommended to collect all data from energy certificates in a national database in accordance with a standardised procedure. This information can be used as support to follow the development of the energy performance in the building stock, in a far more detailed than ever before. It can also be used for monitoring or taking decisions about policy instruments.

14.5 Final EU-level recommendations

The recommendations presented below have been compiled with the contribution from participants in STABLE (VITO, AEA, STEM, BEEA), complemented with contributions from persons working at EU-level, namely involved in the Concerted Action for the implementation of the EPBD, the Buildings Platform, and the European Council for an Energy-Efficient Economy. Some recommendations formulated here are addressed to the EU-Commission while others address the Member States.

Recommendations to the EU-Commission

- The Commission should be very precise in notifying national transposition of the EPBD. As an example concerning Austria, several parts of the transposition do not or hardly fulfil the European directive. This could be crucial if these parts lead to a negative opinion for the whole EPBD;
- The Commission should continue to support and reinforce activities supporting the implementation of the EPBD such as the Buildings Platform, and the Concerted Action as a forum for implementers. These initiatives should be given the necessary means for producing regular thematic reports. Themes related to the practical implementation of the directive should be included such as financial incentives or obligations for implementing highly cost effective measures;
- The Commission should undertake a review of MS buildings strategies to assess the complementary measures (e.g. financial incentives) able to improve the overall effectiveness of the EPBD, including studying good practice;
- The Commission should ensure that Member States have effective enforcement systems in place and assess regularly and independently whether enforcement is effective.

Recommendations to Member States:

- Member States should ensure that the EPBD implementation targets in priority existing buildings which more cost effective energy savings potential;
- Member States should ensure that there are effective enforcement systems in place and assess whether enforcement is effective. They should implement a monitoring system based on the information included in the building certificate;
- Member States should adopt a set of complementary measures to ensure the take-off of building energy certification by: information and training campaigns targeted at all market agents;
- Member States should adopt instruments for ensuring that the energy efficiency recommendations are implemented. Examples of such instruments are: financial incentives e.g. soft loans, tax credits; connecting the recommendations to existing instruments like white certificates systems; stimulate that ESCOs implement the recommendations; or, if accepted, obligations to carry out the most cost effective energy efficiency recommendations.

15 Conclusions

The recommendations have been formulated based on the conclusions from previous work packages in the project, on interviews with key persons/organisations at the national level as well as at European level, on the feedback from the campaigns for building owners energy auditors, in which recommendations were tested and new ideas from discussions were picked up. As for the national recommendations, STABLE partners from Austria, Belgium, Bulgaria and Sweden formulated their country specific recommendations due to their better knowledge of the national situation.

In the majority of the EU-Member States the implementation of the Energy Performance of Buildings Directive (EPBD) has passed the transposition to national legislation phase. Thus the recommendations and good practices address the practical implementation of the national legislation and regulation adopted, i.e. how to achieve the most given the existing legislation framework. However, in most of the MS the legislation and regulation still leaves a large freedom regarding its interpretation and how the market will apply them. Thus the recommendations formulated in this report address mainly: compliance; monitoring; trade-off between cost and quality of information including identification of energy performance improvement measures; and mechanisms and measures to stimulate building owners to implement the energy performance improvement measures.

The common recommendation in the participating Member States is the availability of high quality recommendations and technical advice (high added value) on energy performance improvements, so that building owner can include them in their strategies regarding maintenance and renovation. The country specific recommendations are included in the report.

Other general recommendations to Member States:

- Member States should ensure that the EPBD implementation targets in priority existing buildings which more cost effective energy savings potential;

- Member States should ensure that there are effective enforcement systems in place and assess whether enforcement is effective. They should implement a monitoring system based on the information included in the building certificate;
- Member States should adopt a set of complementary measures to ensure the take-off of building energy certification by: information and training campaigns targeted at all market agents;
- Member States should adopt instruments for ensuring that the energy efficiency recommendations are implemented. Examples of such instruments are: financial incentives e.g. soft loans, tax credits; connecting the recommendations to existing instruments like white certificates systems; stimulate that ESCOs implement the recommendations; or, if accepted, obligations to carry out the most cost effective energy efficiency recommendations.
- In case asset rating is used, the energy performance certificates should be calculated with a common calculation method;
- Energy performance certificates must generate building or type specific energy saving measures, especially for buildings with poor energy performance;

Recommendations to the EU-Commission

- The Commission should be very precise in notifying national transposition of the EPBD. As an example concerning Austria, several parts of the transposition do not or hardly fulfil the European directive. This could be crucial if these parts lead to a negative opinion for the whole EPBD;
- The Commission should continue to support and reinforce activities supporting the implementation of the EPBD such as the Buildings Platform, and the Concerted Action as a forum for implementers. These initiatives should be given the necessary means for producing regular thematic reports. Themes related to the practical implementation of the directive should be included such as financial incentives or obligations for implementing highly cost effective measures;
- The Commission should undertake a review of MS buildings strategies to assess the complementary measures (e.g. financial incentives) able to improve the overall effectiveness of the EPBD, including studying good practice;
- The Commission should ensure that Member States have effective enforcement systems in place and assess regularly and independently whether enforcement is effective.

Good practices

In this report, good practice are considered to be methods and processes that represent market or public initiatives that, among other things, encourage building owners to carry out energy efficiency measures to improve the energy performance of buildings. The “good practices” described are meant to be replicable in other contexts, and can be national or international.

The good practices selected include: the platform on low energy houses “IG passive houses”, the programmes for building renovation and for new buildings under the initiative “Klima:aktiv”, from Austria; the web based software tool for energy certification from Belgium; the funding by the European Bank for Reconstruction and Development of energy efficiency measures in the household sector in Bulgaria; the web based database “eNyckeln” for building owners and the property owners’ buyer group – Belok, from Sweden; the GreenBuilding programme at EU level.