CONCERTED ACTION
ENERGY PERFORMANCE OF BUILDINGS

Training

Core Theme 3

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INTRODUCTION

Reducing energy consumption and eliminating wastage are among the main goals of the European Union (EU). They are embedded in Europe 2020 – the EU's strategy for smart, sustainable and inclusive growth. EU support for improving energy efficiency will prove decisive for competitiveness, security of supply and for meeting the commitments on climate change made under the Kyoto Protocol. There is significant potential for reducing consumption. With 40% of energy consumed in buildings, the EU has introduced legislation to ensure that they consume less energy.

A key part of this legislation is the **Energy Performance of Buildings Directive** (EPBD), which requires all EU Member States (MS) to tighten their building energy regulations and to introduce energy certification schemes for buildings. All MS are also required to have inspections of boilers and air conditioners.

The introduction of national laws that meet EU requirements is challenging, as the legislation has many advanced aspects. It is a great opportunity to further energy efficiency in EU buildings, but also a formidable and continuing challenge for many EU Member States.

To support them in this task, in 2005 the Concerted Action (CA) EPBD was launched by the European Commission to promote dialogue and exchange of best practice between them. An intensely active forum of national authorities from 29 countries, it focuses on finding common approaches to the most effective implementation of this EU legislation.

The multi-faceted format of the forum, with specialist workshops combined with high level discussions, allied to networking opportunities and web resources, has centred on sharing -and inspiring- smart solutions not only for the national legislation and regulations needed for implementation, but also for the professional tools, skills and systems in all fields addressed by it. These solutions are now being applied across the majority of EU Member States.

- **The Concerted Action EPBD** is carried out under the coordination of ADENE, the Portuguese National Energy Agency
- The consortium is composed of organisations appointed by all 27 EU Member States, plus Norway and Croatia

- The activities revolve around meetings, each with over 100 participants, held approximately twice a year
- Working groups and networking take place between meetings
- **Only national authorities implementing the Directive are involved, or those bodies appointed and entrusted by the national authorities to do so**
- Invited experts attend to give additional specialist viewpoints

The 100+ Members of the CA EPBD represent Europe's authoritative, collective knowledge on practical implementation and operational experience of energy performance certification of buildings and inspection and testing of boilers and air-conditioning systems.

When initiated in 2005, most MS were still at the planning stage, but are now well advanced. After stimulating advancement and convergence across the EU, the CA approach was further elaborated in 2007. The MS now share real operating experience and the Concerted Action provides ever increasing practical value and deeper learning to all participating authorities, playing its role in ensuring the success of this Directive as a vital instrument of EU energy-efficiency policy.

The CA EPBD 2 (2007 – 2010), the outcomes of which are presented in this book, is organised around 5 Core Themes (CTs):

- **Certification of Buildings**
- **Inspections of Boilers and Air-Conditioning systems**
- **Training of Experts**
- **Procedures for Characterisation of Energy Performance**
- **Information Campaigns**

Since its second phase was launched in December 2007, it has organised six major meetings between MS representatives, with intensive preparatory work in between. In addition to plenary sessions devoted to issues of general interest, it organised a total of 63 detailed technical sessions for discussing specific issues relating to one or more of the 5 CTs. Some sessions were organised in collaboration by two or more CTs, in topics that had impacts on various issues. The discussions built on the knowledge from the eight previous meetings, held during the period 2005-2007.

The initial plan for the CA EPBD 2 included a long list of topics related to the various Core Themes and additional topics have been identified by the participants since its launch. A brainstorming session at the first meeting in December 2007 was very useful in defining the topics of interest for the MS to discuss in the coming years. Furthermore, the recast of the EPBD was launched and adopted during this period, the CA being instrumental to that process.

The second part of this book contains extended summaries of the main outcomes of each of the 5 Core Themes, including conclusions and recommendations. The objective of the reports on the Core Theme activities is to present a snapshot of the concerns and deliberations of the teams dealing with practical implementation of legislation at national level. The synoptic information presented in these thematic reports is taken from dialogue during the period 2007 - 2010. Some topics may not have been revisited since the earlier part of that period and, as such, the results may be representative of that point in time. Nevertheless, the pros and cons of different approaches to implementation of the Directive remain relevant. For details on the present situation in all countries, i.e. in the final quarter of 2010, please see the Country Reports, part three of this book.

The CA EPBD is supported by Intelligent Energy-Europe under the European Union's Competitiveness and Innovation Programme.

1 General Information

Since its launching in December 2007, the Concerted Action (CA EPBD 2, 2007 – 2010) organised six major meetings among Member States representatives, with intensive preparatory work in between. In addition to plenary sessions devoted to issues of general interest to the 120+ participants in each meeting, it organised a total of **63 detailed technical sessions for discussing specific issues relating to one or more of the 5 Core Themes (CTs), 18 of which were devoted to topics related to "Training"**. Some Training sessions were organised in collaboration with other CTs.

The overall progression of this work has been towards ensuring the reputation of the EPBD as an effective policy instrument in the building construction marketplace through encouraging the establishment of suitable systems for regulating the **competence** and **conduct** of 'experts', comprising either assessors or inspectors[1]. It thus has a perspective beyond the technical confines of training alone, and in particular it seeks to advance the potential for harmonisation and mutual recognition of experts, and to highlight key operational procedures relevant to MS as training programmes mature.

Core Theme 3 Leader Kevin O'Rourke (Ireland) together with Paulo Santos (Portugal) were instrumental in the development of the Study Tours initiative, a new information exchange mechanism not only between CA delegates but also inclusive of a wider group of government and national agency personnel working on EPBD implementation.

Building on the experiences of the CA participants in the period 2005-2007, the initial plan of work included a long list of topics related to Training; additional topics have been identified since then by the participants. A brainstorming session at the first CA EPBD 2 meeting in December 2007 was very useful in defining the topics of interest for the MS to discuss, and their prioritisation. A high proportion of the in-depth work in delivering on these topics was carried out through a series of small working groups established over the course of the project.

This report summarises the main outcomes of these Training sessions, including conclusions and recommendations.

2 Programme of Work

2.1 Description of the action "Training" in CA EPBD 2

According to the EPBD (Art. 10), *certification of buildings, the drafting of the accompanying recommendations and the inspections of boilers and air-conditioning systems are carried out in an independent manner by qualified and/or accredited experts, whether operating as sole traders or employed by public or private enterprise bodies.*

How to accredit and recognise such experts is left to MS to decide. While approaches may therefore be highly variable between MS due to the specifics of the local labour markets, training and education of professionals is an issue of common interest.

In the course of the original EPBD Concerted Action, up to 2007, problem issues were identified and possible common solutions were explored but not yet finalised and implemented due to the prior need to focus on the methods and procedural aspects for energy performance characterisation. MS were able to present the systems and procedures that they are adopting or intending to adopt, and to exchange views to help them come to some degree of convergence on methods and qualifications. This would be highly desirable in itself as a visible reflection of a consistent strategic approach. In particular such convergence could lead to individual assessors or inspectors being allowed to work beyond national borders with little additional specific training (e.g., to know local regulations better) and ease local difficulties with shortages of such trained persons or improve the economic aspects of this type of activity.

[1] NOTE: Unless otherwise indicated, throughout this report the term 'expert' refers equally to a person qualified to carry out a building energy certification assessment ('assessor') or to a person qualified to carry out an inspection of a boiler/ heating system or air conditioning system ('inspector') under the terms of the EPBD.

It has also been appropriate and beneficial to explore and assess the approaches and experiences across MS, not only in terms of technical competences of assessors and inspectors, but also in terms of codes of conduct and behaviour. The latter is considered to be most important in the field to ensure the independence, reputation and ultimate effectiveness of the services provided to building owners by assessors and inspectors.

2.2 Activities on "Specification and Training requirements"

The approach to this body of work has been to build on the Volume/Quality/Quality Assurance paradigm developed in the first years of the CA work, 2005-2007. Energy certification of homes, non-residential buildings and public buildings, inspection of boilers and inspection of air conditioners have been addressed on a differentiated basis. In the period 2008-2010, the specifications and training issues have included assessment of operating experiences and development of guidelines in relation to:

- Specifications of fundamental and specific learning outcomes to be demonstrated by persons intending to be assessors or inspectors
- Specifications of inputs to be demonstrated by training providers by way of entry requirements, tutor qualifications, duration/ mode, materials and facilities, examination content/ process and external validation
- The content and transmission of practical advice material to building and system owners on energy efficiency opportunities
- Approaches and mechanisms for registration of assessors and inspectors, and associated registration and monitoring of service delivery
- Approaches and mechanisms for quality assurance in the field, plus continuing professional development (CPD) to maintain or improve service quality
- Approaches to codes of conduct governing matters such as service competence, diligence and ethical behaviour of assessors and inspectors
- Achieving synergies across the above differentiated tasks.

3 Actual work in the Training Core Theme

3.1 Overview of work plan

After the brainstorming session in December 2007, in order to identify the topics of most importance and relevance for participants, an initial 'shopping list' of potential topics for discussion was drawn up:

- Training specifications
- Quality assurance – interface with Core Theme 1: Certification
- Conduct
- Training delivery
- Boiler/ A/C inspections – interface with Core Theme 2: Inspections
- ISO 9001 as analytical framework
- Mutuality & recognition of assessors across MS

Quality assurance and harmonisation have been on-going issues. Several sessions have taken place around these and related topics and it is anticipated that further exploration will be pursued in the coming years.

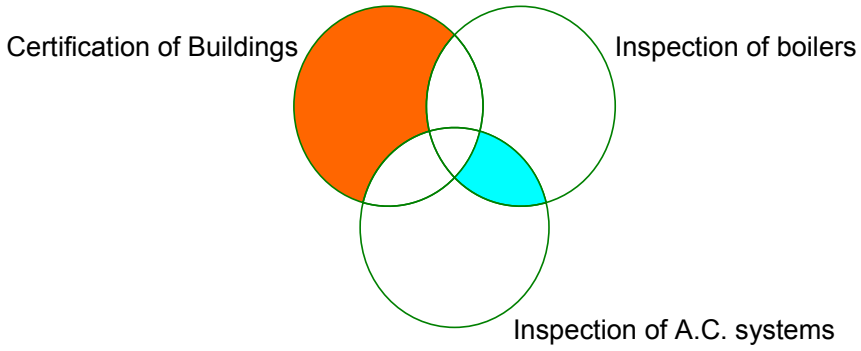
From mid-2008 to the end of 2010, effective data management and the practical establishment, operation and benefits of central registries for certificates and experts emerged as topics of increasing importance across several Core Themes, particularly CT 1 (i.e. not including inspectors as Core Theme 2 has led the examination of that topic). This was reflected in the two joint sessions between the 'Training' and 'Certification' Core Themes dedicated to these subjects, as well as the Study Tours initiative. The emphasis is not solely on data management; rather, the scope has extended to looking at the different models of central registries as enablers to the management and regulation of a quality service by experts, and of ancillary policy and planning benefits in relation to improving the energy performance of national or regional building stocks.

3.2 How many categories of experts?

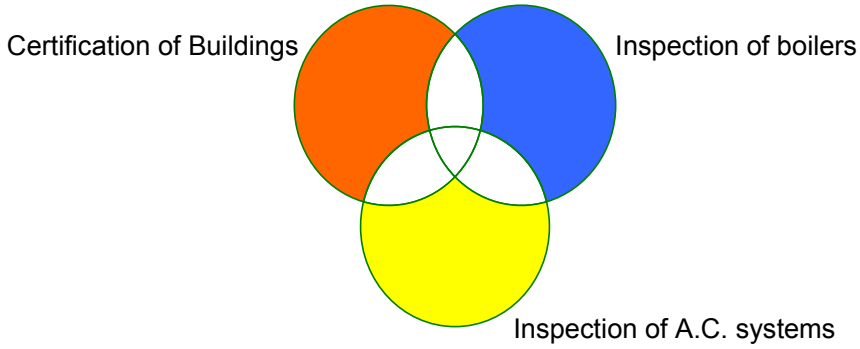
A questionnaire answered by representatives of 17 MS confirmed that the average differentiation across MS is four categories of experts, and the single most popular combination is three – building certification, boiler inspection and air conditioning inspection. One MS with seven defined categories of experts acknowledged that the distinction between mid-range and complex commercial buildings was a somewhat artificial divide which adds some further complexity in administration, as well as a possible lack of flexibility in responding to changing market conditions. At the other extreme, in a MS with just one defined category of expert, legislation is underway to create further distinctions, as a single category of expert accredited to certify all types of buildings (new/residential/commercial) was found to be negatively affecting the quality of certificates.

In general, if the approach to accreditation of experts is to automatically qualify existing professionals (engineers, architects, etc.), then it is likely that fewer categories will be defined. However, if a fully open market based approach is taken, then it is likely that more categories will be defined. The most common approach (10 out of 17 MS surveyed) was based on the following 3 generic categories: **Certification of buildings / Inspection of boilers / Inspection of air conditioning systems.** Two examples are illustrated below:

2 categories of expert: Certification / Inspection of boilers + A.C.

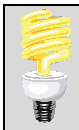


3 categories of expert: Certification / Inspection of boilers / Inspection of A.C.



The nature of skills required tends to relate closely to the methodology. However, even using a similar or identical calculation procedure, an obvious distinction may still be made between certification skills for new buildings (e.g. possibly desk based and not requiring a survey under national rules) and existing buildings (which will generally require a survey on site, in the likely absence of full drawings and specifications).

Another point to note is that most MS have not yet specified Continuous Professional Development (CPD) or on-going requirements for experts, probably due to the relatively early state of implementation. This is likely to become a challenging issue as feedback and practical experience emerges from the operation of building energy certification schemes.



Numbers of categories of experts varies between 1 and 7, with on average 4 different categories defined. The most common distinction is between building certification, boiler inspections and air conditioning inspections.

3.3 Training specifications and delivery

Training specifications and delivery can be considered respectively as being 'the rules of the game' and 'who plays it'. **Training Specifications** and **Training Delivery** sessions explored the diversities and commonalities of approaches in the design and implementation of training programmes to qualify experts in certification and energy assessment. (While the approaches and principles have generic validity, the focus of this work has been on skills for building energy certification rather than for boiler or air conditioning inspections.) The rules and players in the systems of acknowledging experts are defined by government, and thus training delivery and specification is to some degree defined by national legislation. The legislative approach to training delivery is a key issue when considering mutual recognition of experts and the scope and interaction of the Recognitions (2005/36/EC) and Services (2006/123/EC) Directives (see section 3.10, Codes of Conduct).

Routes to qualification as an expert/assessor vary between self-declaration of eligibility according to defined criteria, to training and/or examination. Some MS are reporting successful experiences with optional training, and in fewer cases the examination is waived if the candidate is deemed to be qualified via prior experience. An aspect of best practice must be to retain sufficient controls over the standard, quality and numbers undertaking training/examination. Too much dependency on commercial training providers has in some cases resulted in an oversupply of assessors, with mixed qualitative results. An increasing number of MS are directly administering a single national examination in order to ensure a controlled gateway to entry as a service provider and in some cases as a means of on-going maintenance of standards, usually in combination with a market based training approach. In other MS, the requirements of experts are defined legislatively and training providers are limited – usually to a small number of third level educational bodies. In some cases this has created somewhat of an initial bottleneck, where the experts are highly qualified but there are not enough in the short term to adequately service the market.

When considering the optimum approach to qualifying experts, it is interesting to note the experience of a MS with experience of energy certification of buildings prior to the implementation of the EPBD. In this instance, the approach has changed from acknowledging individual experts to acknowledging expert companies. This change in approach took place as a more efficient and more flexible scheme was sought, and it was found that there was no clear correlation between previous experience and ability to deliver a high quality certificate. There are tasks within the certification and inspection processes which are routine and can be delegated to a less-qualified individual than a building services professional with 5+ years of experience and a degree, and it was envisaged that a company accreditation approach would allow flexibility in this regard. At the end of 2010, it was too early to assess the relative merits of the new scheme in terms of certificate cost and quality. However, future developments will be tracked.

Generally, the majority of MS are delivering training through a combination of government and market actors. There is a high degree of reliance on existing professional bodies, and academic institutions to a lesser extent.

Government or nominated agency preparation of training materials has the effect of improving quality and consistency of training while simultaneously decreasing the costs of training. However it is more

commonplace for a government agency to issue a training specification rather than actually prepare a detailed curriculum.

Normally training duration for assessors is between 3 and 10 days. For success, the following factors must be balanced: number of experts, quality of experts (competence and behaviour), effective system of quality assurance, and adequately specified training requirements.

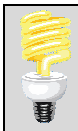
Training delivery for building energy certification is through a combination of government and market actors, with a high degree of reliance on existing professional bodies and academic institutions. Training providers prepare curricula according to government-issued specification. Training duration is generally between 3 and 10 days.

3.4 Training the trainers

At the opening meeting of December 2007, there was an invited presentation by Philip Fairey from the US voluntary/ NGO residential energy rating accreditation body RESNET[2] in relation to the features, conditions and experiences of its scheme. This applies solely to experts/ assessors for building energy certification. As implementation has progressed over the two year interim period, it was timely to re-examine the RESNET strategies for ensuring high standard training is delivered through a market-based accredited training provider model.

Although, according to the principle of subsidiarity, each MS may decide its own approach to implementation, the general recognition across Europe that the quality of experts must be improved indicates that there is an issue to be tackled. Directly administered, government/national agency training programmes tend to be costly without necessarily producing the required quality of expert (cf Danish experience and recent rethinking). Accreditation schemes tend towards bureaucracy (UK), market based training can result in a variable standard (Ireland, France), and the path of self-certification/automatically recognising experts (Germany, Poland, Norway) is perhaps even more challenged by lack of standardisation.

The scheme administered by RESNET is a market-based accredited training provider model. In order to be able to use the RESNET scheme, commercial training providers must submit curriculum and training materials to RESNET to demonstrate that training will ensure that candidates have the knowledge base needed to become a home energy rater, and also must employ RESNET-certified trainers that pass a stringent online national rater trainer examination. RESNET delivers and administrates the national examination for trainers. In addition, continuing professional development (CPD) for trainers is specified by RESNET, along with formal training on effective vocational education for adults. Key to this 'federal' model is harmonised methodology and language, which is far from the reality across the EU. This notwithstanding, the RESNET scheme provides an example of a relatively flexible model with light administrative cost overheads which may be of value in considering a pan-European qualification scheme or even a MS scheme within its own borders. In European countries which have set mandatory training as a pre-condition for experts, similar operational models with pre-qualifications for trainers, but with less intensive oversight of trainer quality assurance, are to be found – for example in Portugal and Ireland.



Mandatory trainer qualifications contribute towards standardised training. RESNET 'federal' scheme is dependent on harmonized methodology and language but provides a useful flexible lightweight model when considering a pan-European qualification scheme.

3.5 Guidance on high quality training materials

CA participants examined the applicability of different modes of training delivery according to the subject type. The primary mode across MS was found to be classroom based training. E-learning, as demonstrated through the RESNET model (see Training the Trainers, section 3.4) is considered to have significant

[2] Residential Energy Services Network www.resnet.us

potential as a medium of training delivery, both at national/regional level and in particular when considering the potential for pan-European harmonised materials and approaches.

Examples of the process of standardising training materials were examined:

- The Croatian UNDP (United Nations Development Programme) handbook;
- The Spanish approach, by defining learning outcomes and oversight of commercial/ market based training providers;
- The Irish experience of auditing commercial training providers.

Key issues identified were:

- Lack of national political will for harmonisation.
- A pan-European unitary database could at least enable the exchange of information and experience and help sharing the knowledge between MS. Access to the database should be free to all professionals that have interest in the field.
- A survey guide should be based on what to look for and where to look. The aim would be to offer a common tool describing basic needs and relevant stages of surveying work and to provide supporting materials for practice.

It was concluded that the development of such material may be worthwhile but is beyond the scope of the CA. However, the CA could provide for instance necessary and common boundary conditions and requirements, which could then be elaborated within a project from one of the EU programmes.

E-learning is currently under-utilised in training delivery, and has potential at both national and trans-European level. A survey guide has the potential to develop as a harmonised module within a suite of training materials.

3.6 Creating opportunities for shared learning

The need for on-going training or continuous learning coupled with the acknowledgement of experts either as individuals or as companies stimulated the discussion on shared learning. This focussed primarily on building energy certification, i.e. inspections are not included. The ENFORCE[3] project (European Network for the Energy Performance Certification of Buildings) has undertaken a comparative study on replicable best practice in the training of experts. ENFORCE includes seven partners from Italy, Portugal, Spain, Slovenia and Greece working closely with the relevant stakeholders at national and European level. The training approach in Austria is also addressed by the project. A workshop with the project representatives focused participants on identifying opportunities to create shared learning across the chain of actors responsible for service quality and quality assurance in training provision and qualification of experts.

The menu of topics and potential opportunities examined in this process included the following:

Shared learning between software developers:

- Provision of standardised software modules/ templates
- Cooperation in development of software modules
- Quality assessment/ rules
- E-learning courses
- Limiting the number of companies allowed to develop approved software.

Shared learning between training developers or providers:

[3] ENFORCE, Intelligent Energy Europe - IEE project number IEE/08/599 *www.enforce-een.eu/eng/*

- Stricter enforcement of EPBD stimulates better training provision
- Develop mutually recognised (across MS/ regionally) training provision or agreements between training bodies
- Single national examination promoting minimum training standards.

Shared learning between experts:

- Develop the online community – bulletin boards / discussion forums / networking
- Support initiatives by assessors and inspectors - professional associations, competitions / recognition of expertise / best practice
- Accreditation of minimum size (10+) companies of experts
- CPD seminars

Shared learning between different groups in the quality chain:

- Avoid one-way communication only
- Cooperation between home owners (residences associations) and municipalities / local authorities
- Enforcement on minimum quality standards
- Fixing price levels (not always legislatively possible)
- Expand the range of projects similar to ENFORCE.

Within the above menu, the topics identified as offering the most promising opportunities were software training through e-learning, feedback of areas of candidate weakness in national examinations, and active on-going interaction with professional associations. Collectively such initiatives can contribute to a progressive upskilling of persons offering and delivering building energy certification and inspection services.

As the core theme of training of experts is taken forward, it is anticipated that this discussion will continue and broaden to include a wider range of building industry workers. Future directions include the expansion of the quality chain to include building installers and construction industry professionals, the inclusion of more MS in projects similar to the ENFORCE project, and possible extension of support by government/national agency actors to enable the shared learning of building energy certification assessors and inspectors, training providers and agencies and software developers.

The ‘quality chain’ of actors should include building installers and construction industry professionals. Government and national agencies should enable shared learning of building energy certification assessors, training providers and software developers.

3.7 Requirements of experts and qualifying examinations

This topic probed more deeply into the specifications or requirements for experts set by the national authority in each MS. The diversity of requirements remains a barrier to harmonisation. In general, high entry requirements are a necessary but not sufficient condition to ensure high quality (although this is contradicted by the experience of one MS). High entry requirements do not lessen the dependency on a robust and effective quality assurance scheme. The recourse to market based training providers has resulted in a variance in the quality and standard of training in the marketplace, and therefore providing national examinations is a strategy for standardising the qualification. Acknowledging experts individually (as opposed to companies or accreditation schemes) may be a barrier to peer learning.

Some trends identified were:

- In most countries, a prior level of educational qualification is mandatory. For experts in energy certification of buildings, this is usually a university degree; for boiler and air conditioning inspectors a diploma is usually required.

- The dominant background of an assessor is engineering and architecture and as expected the background of inspectors of boilers/ air-conditioners is engineering or heating/ air-conditioning technician respectively. In the majority of cases experience is a prerequisite for experts.

- National examination and training are the most popular tools for qualifying experts.

Qualifying examinations are one of the least harmonised topics of the EPBD implementation in MS. Differentiated approaches reflect divergent starting points, past national practice, and variant structure of national legislation. Nevertheless, the majority have introduced a qualifying examination (or are planning to do so in the near future), with varying degrees of rigour. In the case of assessors, examination durations vary between 45 minutes and 4 hours with an additional practical/ case-study element.

Not all MS intend to keep the same system in the future, as some plans were undoubtedly 'last-minute'. Qualifying examinations represent a significant aspect of the quality assurance process, and as such are key to the reputation of certification and inspection programmes. The only two clear commonalities in qualifying examinations across MS are surveying and general EPBD information modules.

Many MS have introduced, or are planning, qualifying examinations to ensure quality of building energy certification assessors across varying standards of training provision. Examination durations vary between 45 minutes and 4 hours with an additional practical/case-study element.

3.8 Harmonised profile for boiler inspections

Although EU harmonisation will be difficult to achieve for the analysis and certification of buildings, there would seem to be a better prospect for such an approach in relation to plant inspection. Boilers, air-conditioning units, and other components of heating and cooling systems are often made by large manufacturers for international markets, so greater similarities between the installations in different countries might be expected.

In the Concerted Action, efforts have been made to identify similarities between the inspection schemes being set up by MS that have chosen option A of Article 8, and identified what moves towards harmonisation were feasible and desirable. Key issues to be considered in any movement towards harmonisation were discussed and are as follows:

- what advantages may be expected from harmonisation;
- are they worthwhile in relation to the effort;
- how should existing schemes be analysed to determine common characteristics;
- what are the critical features that should underlie a harmonised scheme;
- what plans, at national and European level, should be made for effective adoption.

It was concluded that, although there were no insuperable barriers, moves to harmonisation were unlikely to occur spontaneously except, perhaps, between pairs of neighbouring countries with similar systems and traditions. Language is a major barrier. MS would need to envisage powerful advantages to induce a commitment towards harmonisation. These might emerge in time, when more experience from inspection schemes had been gained and there was a greater consciousness of their costs and benefits. Otherwise, it appears unlikely that EU-wide harmonisation would evolve in the foreseeable future, unless a Directive were to require it.

A harmonised profile for boiler inspectors will probably be feasible over a certain period of time, but it is certainly premature at this stage of development.

3.9 Towards harmonisation for mutual recognition of experts

Mutual recognition of professional qualifications is a fundamental principle of the EU and this is clearly established in Directive 2005/36/EC on the recognition of professional qualifications with regard to mutual recognition of professional experts. Although the EPBD clearly allowed countries to define an independent technical methodology for the implementation of the Directive, a certain amount of convergence of principle can be identified. However, the procedure for the training and registration of an expert within a MS is not limited solely to the knowledge of the technical methodology, but generally includes prior technical education, skills in surveying, knowledge of the local building regulations, administrative procedures, and a code of ethics.

MS have developed their own systems for the training and registration of experts. The scope of work on this topic has been to identify possible approaches to harmonisation of the systems and procedures for the recognition of experts, specifically for MS to be in compliance with the Directive for the mutual recognition of professional qualifications. At the same time, in spite of the considerable diversity in types and levels of qualifications for experts across MS, and even across regions within the same MS, there are a number of MS with similar methodologies and/ or building practices. The identification of these commonalities could facilitate the mutual recognition of experts.

The topic was not one upon which a specific conclusion could be reached. However the main points arising from the discussion were:

- There is a strong tendency to focus on the differences between the MS rather than the similarities;
- The concept of mutual recognition of experts is one which is met by resistance from MS;
- It is not clear how mutual recognition would benefit the client or end user, although obviously it could be to the advantage of the expert;
- An additional point raised during the discussion was that this did not necessarily further the aims of the EPBD, i.e. introducing mutual recognition of experts would have no direct material effect upon energy savings in buildings. Whilst there might be an economic benefit arising from a wider market of experts, there was no discernible energy benefit;
- Although it might not be practical to harmonise the technical knowledge of the expert, the route to qualification, e.g. examination, etc., could be harmonised and an EU examination could be devised, with different content for the various MS.

Many participants did not feel that this was a topic which could be carried forward with a reasonable possibility of success. A number expressed the opinion that, to date, there had not been many issues with requests for mutual recognition. At the same time, it was noted that the EPBD recast is highlighting this issue: Member States should take account of **Directive 2005/36/EC on the recognition of professional qualifications with regard to mutual recognition of professional experts** which are addressed by this Directive, and the Commission should continue its activities under the Intelligent Energy Europe Programme on guidelines and recommendations for standards for the training of professional experts addressed by this Directive. Furthermore it is to be expected that as the number of experts increases in all MS, the potential for transfer of experts between MS will also increase.

Harmonisation remains a problematic issue; but remains on the agenda as emphasised in the EPBD Recast. It is anticipated that as the number of experts increases, the potential for transfer of experts between MS will also increase.

3.10 Codes of Conduct

This topic was identified during the discussion on Training Delivery, as it was observed that the way in which MS accredit/qualify experts has consequences for the implementation of the Services Directive (2006/123/EC) and the Recognitions Directive (2005/36/EC). These and other issues of independence and conduct need careful consideration in order to ensure effectiveness in implementing the EPBD.

The figures below give a 'snapshot' of what proportion of MS (out of 22 MS surveyed) have Codes of Conduct for experts, and whether experts qualified in other MS are recognised.

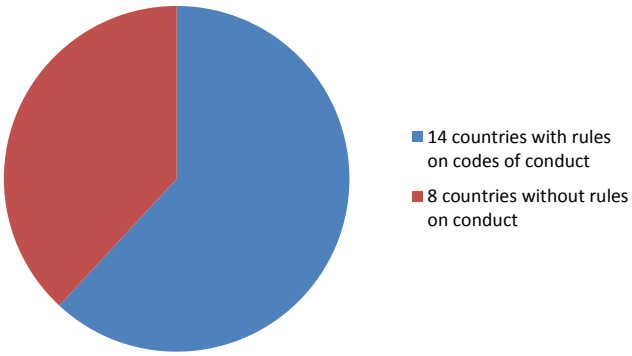


Figure 1: MS with defined rules on conduct

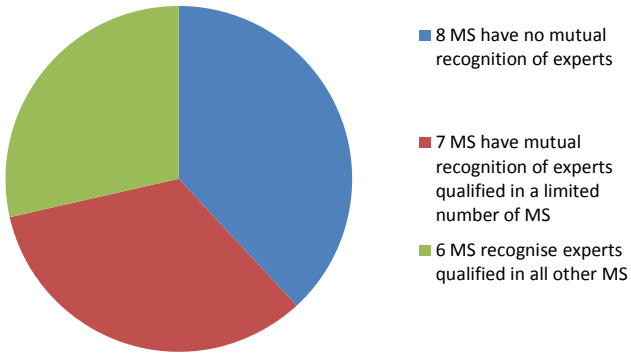


Figure 2: MS with mutual recognition of experts

In addition, the preparatory questionnaire asked participants to identify the most important issues covered by codes of conduct. The top priority issues were legal obligations and framework, insurance and professional liability, independence of conduct (conflict of interest), the relationship and obligations between experts and their clients and issues concerning costs/ fees, and guide pricing.

The following issues in defining codes of conduct for experts were considered:

Independence

Key questions addressed here are: What do rules on independence mean for the possibilities for recommending and carrying out energy savings? What barriers lie within rules on independence when it comes to promoting energy savings in buildings? How can rules on independence be set up to promote energy savings in buildings? And finally how can independence be combined with for instance ESCO activities?

Independence of experts is a major issue of the EPBD, especially in order to ensure the quality of certificates and the suitability and accuracy of the recommendations on accompanying advisory reports. Codes of conduct can address this issue by requiring that the expert makes a declaration of conflicts of interest. In addition, more stringent rules are in force in some MS, whereby estate agents are explicitly prohibited from certifying properties in which they have a financial interest, regardless of disclosure or a self-declaration on conflict of interest. It is also necessary to make clear that experts must not stand to gain financially as a consequence of the client implementing recommendations made in the advisory report. During the discussion it was concluded that enforcement of the independence rule was problematic, and that automatic acknowledgement of experts qualified in other MS may increase this challenge.

Intensity of rules on codes of conduct

There are three main ways of recognising experts. These are via government approval, accreditation/ certification, and no approval necessary. A national setup for recognising experts has consequences for which EU rules apply to codes of conduct, and therefore consequences on how intensely codes of conduct are regulated. What does intense or not very intense regulation mean for promoting energy savings in buildings? (Further discussion on Complaints and Disciplinary procedures are detailed in chapter 3.11).

Large or small companies

The national setup on recognition of experts also has consequences on whether the setup promotes small or large expert and inspector companies. Does this have an effect on the possibilities for promoting energy savings in buildings?

Complaint procedures

What level of quality may the building or system owner expect when receiving a certification for his/ her building or inspection of boiler or air-conditioning system? This is partly influenced by the national setup for recognising experts. What do differences in complaints procedures mean for the possibility of promoting energy savings in buildings?

Data security

Confidentiality vs. publicity of energy data is a theme with which every MS must engage. Obviously the more public certification and inspection data may be, then the easier they will be to use in promoting energy savings in buildings. But differing institutional arrangements across MS will lead to variable conclusions as to who should regulate data security and how does a country balance need for publicity vs. the consumer's need for privacy.

Key conclusions were:

- There should be rules ensuring that experts are independent (as required by the EPBD).
- Establish if and how the Directive on the recognition of professional qualifications (2005/36/EC) ('Recognitions Directive') applies to the scheme in question. This in turn decides the applicability of the Directive on services on the internal market (2006/123/EC) ('Services Directive') to the scheme.
- Ensure there is not a conflict between the national codes of conduct and the three Directives (services, recognitions, EPBD recast).
- Focus on rules on liability insurance, independence of conduct and prices on services. These are frequent topics within national regulations.
- MS will need to address any threat to quality that might arise if mutual recognition of qualifications were to be proposed on the basis of 'lowest common denominator' standards of competence – for example by requiring localisation training as a supplement.

The Recognitions and Services Directives should be taken into account when setting up rules of codes of conduct for EPBD experts. Ensuring independence of experts is a high priority across MS, although there are significant challenges in enforcing this rule.

3.11 Complaints & disciplinary procedures

This is analogous to the discussion on the Quality Assurance (QA) of certificates, in that the majority of MS have not yet adopted a definitive approach, and there is a lack of practical operational experience. Therefore, the focus was on providing MS with reference points and key issues for consideration in defining, designing and implementing procedures and processes for handling complaints and disciplinary cases. Two main types of complaints were defined:

- Complaints arising as a result of the QA process – issues with conduct/professional behaviour or technical error of experts;
- Complaints originating outside the QA process - complaints about the scheme from householders, building owners, experts, members of the public.

Complaints arising as a result of the QA process account for the majority of the complaints processed. Best practice identified to date is to assign a penalty points system to different categories of mistakes with de-registration or withdrawal of an expert's licence to practice as the ultimate penalty. This results in a transparent and fair system for dealing with errors. Another key finding is that the majority of errors picked up by the quality assurance seem to be 'minor' errors – typographical/clerical rather than deliberate falsification. Not many complaints are received from the public; perhaps at this early stage the consumer is not well informed enough to know what to expect from the assessor, and hence is not in a position to complain. In one country, the majority of complaints (arising from outside the QA process) was from assessors/ inspectors registered as complaining about the amount of paperwork required!

The MS participants, faced with given complaint scenarios, agreed with the idealised process by which the complaint should be dealt with. As can be seen from the table below, there was strong agreement on how the complaints & disciplinary procedures should be developed by MS.

Who receives complaint	What is the process	What are the outcomes	Possible sanctions	Consequences / communication
The organisation that manages the scheme - NGO/certification institute	If it is easily resolved the certification body deals with it, more complex than a consumer body	New certificate issued, warning to assessor, re-examination, additional training, check assessor's other certificates, no fines but assessor should bear cost of re-issuing certificate		Communicated to all parties involved
Acknowledgement body/ consumer organisation. Provider of advice on model contract between assessor and client.	Investigation, following a defined procedure	1. No action 2. Some action necessary 3. Serious action required	Accumulated points system, remains on assessor's record for some time	For severe complaints, suspension and lower tolerance of mistakes on re-registration
Agency/ acknowledgement body	Does the assessor admit the mistake? If not, agency appoints a competent, neutral expert	1. Assessor is wrong 2. Client is wrong 3. System is wrong/ bad guidelines	If assessor not satisfied with outcome then case must be resolved legislatively	1. New certificate issued 2. Certificate remains as valid 3. Procedure is corrected
Qualifying agency/ administration body	1. Check accuracy 2. Interview assessor 3. Identify source of error	Negligence, poor quality training, misinformation from building owner	Suspension/ re-issue of certificate, retraining, owner pays for new certificate	Client/owner notified if certificate incorrect
Issuing authority	Complaint is noted, complainant is interviewed, claims investigated, report	Complaint dismissed or upheld	No consequences, temporary or permanent suspension	Communicated to all parties involved

Sanctions are in place in most MS although in general these are used infrequently. There is clear convergence on the approach to resolving complaints and applying disciplinary procedures. An appeals process is necessary but can be time-consuming and costly.

3.12 Quality assurance of experts

Participants in this work topic tried to identify the most suitable approaches, common difficulties and obstacles, and directions for planning, implementation and further development of QA systems. A questionnaire was circulated to MS in order to update some facts and figures. The general conclusions about the role of QA systems in certification schemes were:

- Certification schemes are challenging to implement and must be well planned and managged from the financial and organisational point of view. The legitimacy of each national EPBD framework depends on their quality and reliability. Certificates serve not only as an evidence of actual state and conditions: if correct, they and their accompanying recommendations provide an explicit basis for planning of improvement measures, influence real-estate market value, offer indirect information about expected operational costs, and help build up comprehensive benchmarking databases, which are fundamental for shaping of strategies on the national level.

- Without instruments for evaluation of quality of certificates it is questionable if and to what extent the above tasks are fulfilled. Also, trust on the clients' side can be compromised if no safety mechanism exists, which would offer a 'value-for-money' guarantee.

- Quality assurance systems are thus a vital component of certification schemes. They must be introduced in a timely manner, be transparent and with clear rules, and perform not only

penalisation tasks but also educational and motivational ones, with the aim to constantly improve the scheme in general.

Quality assurance is a vital component for ensuring the reputation of the certification schemes. The next stage focus is providing feedback to trainers, coupled with readiness to impose penalties/ sanctions on experts who fail to deliver a consistent quality of service.

3.13 Experiences in managing central registries

Nearly all MS are running 'live' building energy certification schemes at this stage, and therefore registration and associated quality assurance systems for experts/ assessors, plus lodgement and management systems for the data on the performance of buildings and/ or heating/ cooling systems, is becoming a more central issue. An emerging issue is that minimum QA requirements specified by the EPBD recast also highlight the need for effective database management. This finding was echoed across other Core Themes (especially Certification and Inspections), and this topic will be further explored in the CA in the future.

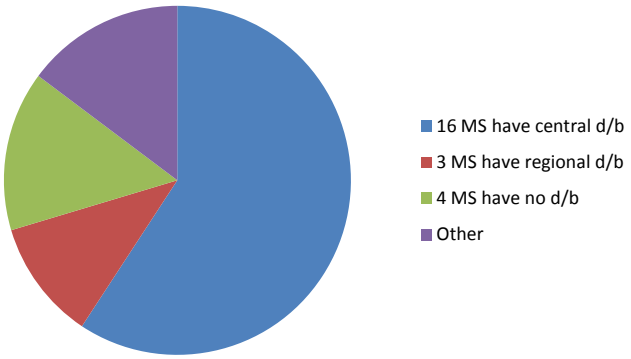


Fig 3: How many MS are opting for a central registry

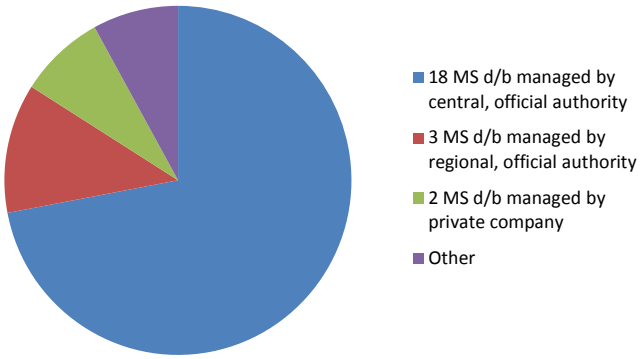


Fig 4: Responsibility for central registries

Although the majority of MS are convergent on the issue of a single central database (d/b) with oversight by the national authority, in many cases the functionality of the registry and the extent of the information gathered is very limited, which in turns limits the potential usefulness of the data arising from certification and inspection schemes.

Outcomes from this discussion included MS concerns about the set-up cost of a comprehensive IT system. Very few MS are operating a single integrated system with a range of functionalities (including billing, credit control, experts' forum and help desks/ communications centre) including direct interaction with the experts/ assessors. Although there is considerable design and financial overhead in the investment and set-up phase of such a system, there is more potential for the system to be self-financing as well as easing the administrative burden of implementation, verification of compliance, and achieving active follow-through and impact in conjunction with other national or regional policies, e.g. incentives. Identifying such self-financing or 'revenue neutral' models is likely to be a high priority topic in the coming discussions, and it is intended to explore this further, and provide MS with best practice models.

Very few MS are operating a single integrated system with a range of functionalities (including billing, credit control, experts' forum and help desks/ communications centre) including direct interaction with the experts/ assessors. Identifying a range of financing options for set-up and operation of single integrated systems is key to progressing this issue.

3.14 Design, operation & financing of central registries

Effective database set-up and management is an issue coming to the fore across all the Core Themes of the Concerted Action. There are several distinct operational areas – training, examination, registration, software, quality assurance, finance, administration etc. – that can be brought together in a single integrated administration system.

The focus for this topic has been on the MS which have the most developed and mature administration systems, with the goal of highlighting key successes in the form of best practice guidelines. Among the summary recommendations emerging from this work are as follows:

Design of central registers

- Specify/describe all business processes in detail
- Define all information relevant to the system, including technical aspects
- Plan the project according to available resources
- Define the requirement for software developer skills
- A key interface is the interaction of the certification methodology/ software and the central registry (databases)
- Validation of data
- Definition of data relevant for others topics relating to energy efficiency (e.g. EU Energy Services Directive)

Operation of central registers

- Management of the central register should be maintained within the energy agency but day to day operation should be outsourced. Energy agency should focus on development of energy policy.
- Deciding who has access to information and the level of information available in the central register is important. Take care of privacy issues.
- It is desirable to include all inputs as well as energy performance certificate results in the database (such that a certificate could be reproduced from the data).
- Quality assurance data is particularly important for meaningful analysis and recording of findings.
- Look to possibilities for synergies with other databases/ tools on the building stock in order to maximise use of data gathered for informing reporting/ policy requirements.
- Customer support can be resource intensive. Some countries do not offer phone support but only by email.
- Volume of data storage can be an issue as file sizes may be large e.g. photos of the building.
- Use register to gather information for other requirements e.g. reporting on the Energy Services Directive (Directive 2006/32/EC on energy end-use efficiency and energy services)

Financing of central registries

- The business model and budget for the central register should be defined beforehand, taking into account the business model of the scheme.
- Self–financing model vs. non-revenue model or somewhere in between.
- For which financial issues should the central register be used?
- Fee management + invoicing management

- Think beforehand about the costs related to consulting other non-free databases (fee/consulting). These costs have to be included in the global costs of the central register.
- Think beforehand about the costs of improvement of the central registers. These costs have to be included in the global costs of the central register.
- Some MS could retrieve money from selling information from the central register to third parties.

The nature of this topic is complex and extensive, so that the discussion is not actually concluded. As certification and inspection programmes continue to develop, the multi-functional central register will become key to EPBD implementation in a manner that maximises compliance and benefits. In this regard, the pilot Study Tours initiative, described next in more detail, focused on central registers/ national administration systems.

Strategic mapping and scoping of the design of central registries is vital from the outset. Demonstrations of functionality options, and discussion of detailed finance functions and budgetary items should continue to be shared e.g. during Study Tours.

3.15 Study tours

The study tours on the topic of central registries took place in May – June 2010. Host countries were Sweden, Ireland, Belgium and Portugal. Visitor MS were Austria, Croatia, Germany, Greece, Ireland, Portugal, Malta, Italy, Luxembourg, The Netherlands, Belgium and Slovenia. The areas of highest priority for investigation were (broadly categorised) database structure, quality assurance and finance models.

The concept of the study tours was born in 2009, as a group of Concerted Action members were informally discussing work practices. During the discussion, the group agreed that there was much value to be gained from 'hands-on' work shadowing – i.e. actually witnessing and working with the systems that different MS have developed in the course of EPBD implementation. During the CA meeting working sessions, it is often challenging to present a topic that is broad enough to interest a wider audience but also sufficiently detailed to provide value to those working closely with designing and operating administrative and technical systems supporting EPBD implementation.

In public administrations, it is a major challenge for civil servants to design fair, transparent, workable, efficient systems that are supported by legislation, accepted by and useful to the general public, and which can effect (in this case) energy savings and attitudinal shift towards a more energy-efficient built environment.

Key learning goals were declared in advance by participants, namely database structure and set-up, quality assurance procedures and financial models. Other topics of interest were certification software, data protection, sanctions, statistics, training, procedures, certification of public buildings and inspections.

The participants rated a high level of satisfaction average (4.2/5) indicative of how well these key learning goals were met by the host countries. Participants also scored each learning with respect to feasibility of implementation, that is, how realistic it would be to incorporate the measure into one's own national EPBD implementation programme. The average rating for such feasibility of implementation was 3.5/5. A specific example of a measure implemented as a consequence of the study tours information exchange was an innovative customer service technique, which resulted in a 30% time saving on the previous approach.

Participants also committed to a range of follow-through actions, the most popular of which were: meeting with decision-makers and/ or key players and reporting findings and suggestions; evaluating in more detail the feasibility of introducing opportunities identified; and reporting findings and suggestions to other authorities or entities involved in EPBD implementation in the participant's home country.

There is a saying **'The devil is in the details'** meaning that **the most difficult part of a task is in the many small details**. Study tours are designed to tackle the day-to-day details of implementation – enabling delegates to 'learn by doing', working alongside EPBD teams, clarifying procedures, identifying and replicating best-practice systems. On study tours, delegates focus on the 'mechanics' in the design

and operation of day-to-day programmes to enable national and EU-wide certification and inspection regimes.

Overall, there was a very high degree of satisfaction among participants regarding the quality, suitability and practical value of the direct 'hands-on' information, experiences and insights gained through the study tours.

4 Summary of Training topics discussed during the CA EPBD 2

Topic	Main discussions and outcomes	Conclusion of topic	Future directions
Categories of experts	Convergence of majority of MS on 4 categories. Less differentiation of building categories than previously anticipated.	**Too large a variety of experts/ assessors is a barrier to harmonisation**.	Informing mutual recognition schemes across MS
Training specifications	Wide variety of specifications, in many cases legislatively defined. Convergence on **single national examination** (per category of expert) **to ensure training standards**. Continued reliance on professional associations and academic bodies.	Forms starting point for discussion of related topics and advancing harmonisation.	Codifying the modules and detailed content of a model training specification. Mapping regional potential for recognition of experts.
Training delivery	Structural approach to implementing training / accreditation programs. Mix of public and private sector providers with accreditation oversight systems. Decreasing cost of training without deteriorating quality of training is a key issue of concern.	No, but most MS have selected their solutions among a limited set of options. Role of government in oversight and examinations.	Consideration of interaction with other Directives on **recognition of professional qualifications and provision of services is important** to design of training scheme.
Training the trainers	Majority of MS recognise the need for improving the quality of experts. Goal is to identify lightweight flexible administration model for qualification of experts. Presentation and discussion of the U.S. based RESNET approach - market-based accredited training provider model.	Pros and cons of different MS approaches to qualification of experts have been identified. Improving trainer quality is an effective strategy.	RESNET may be a useful model regarding **pan-European qualification of experts. Similar models exist in some MS.**
Guidance on high quality training materials	Training delivery mode was considered in relation to type of learning material. **Classroom training is the dominant mode of delivery in MS**. Proposal for pan-European online building survey guide/ process for identification of building typology.	Actual materials development was beyond scope of CA; harmonisation/ standardisation on-going development issue.	Cooperate with other projects aimed at elaboration of a common and open EU building surveying procedure. Potential for e-learning should be pursued.

Topic	Main discussions and outcomes	Conclusion of topic	Future directions
Requirements of experts	Requirements vary from building-related degree plus 3-5 years' experience to attendance at 2 week training with no prior experience. Some MS use company accreditation following ISO 9001 model. Very few MS have CPD requirements at this stage.	**National examination is a strategy for standardising the qualification of experts**.	**Boiler inspection is the most likely category of experts for harmonisation.**
Qualifying examinations for experts	Primarily a tool for standardisation and QA. Common modules among MS are surveying techniques and general EPBD information. Majority of MS convergent on solution of national qualifying examination.	Divergent starting points, past national practice, and variant structure of national legislation.	**There is very limited scope for harmonisation unless and until common certification and/ or inspection methodologies are established.**
Harmonised profile for boiler inspections	This category of persons shows the most potential for harmonisation, as recommended by HARMONAC[4]. Similarities identified. Lack of political will among MS to advance on this issue.	**Pre-inspection scheme should be linked to certification** and be adaptable to local conditions.	**Harmonisation possible but unlikely** unless required by legislation.
Towards harmonisation for mutual recognition	**Mutual recognition is a low priority for MS**; the potential benefits for increased energy savings must be identified.	CA participants are doubtful about prospects and feasibility of mutual recognitions for experts.	Future solutions to be found through common methodology and/or increased interaction between national qualification schemes.
Codes of conduct for experts	Key issues: independence, intensity of rules on codes of conduct, business configuration, data security and complaints procedures. Structural approach to training delivery defines scope of interaction between services, recognitions and EPBD recast Directives.	**Only a few MS have formal codes of conduct for inspectors/ assessors.**	Experiences in practice with procedures for disciplining, sanctions, managing complaints, appeals etc. merit detailed consideration.
Complaints & disciplinary procedures	Not yet underway in most MS. Participants confirmed clear consensus in how an idealised procedure should be defined. Most complaints/ mistakes arise as a consequence of the quality assurance process and can be classified as 'minor' in nature (but not necessarily minor in impact).	**Disciplinary procedures are an essential part of certification** that remains to be developed in most MS. However, legislative basis for sanctions is often in place.	Developed systems not in place in most MS. **Likely procedures to follow national consumer legislation & professional association codes**.
Quality assurance (experts)	**Cost of effective QA is an issue for many MS**; examples of intensive phases (at start-up/ early stage) and lighter but effective strategies identified.	QA is an on-going issue on which exchange of MS experiences will be important.	Next stage focus is providing **feedback to trainers and experts**.

[4] HARMONAC, Intelligent Energy Europe - IEE project number EIE/07/132 *www.harmonac.info*

Topic	Main discussions and outcomes	Conclusion of topic	Future directions
Quality assurance (certification)	Most MS at early stages of certification and therefore a lack of mature robust QA schemes in operation. Comprehensive documentation of developing QA schemes across MS	Scope to pursue further. **QA is a vital reputational/ public confidence issue**.	To be revisited when more developed systems in place
Design, operation & finance of central registers	Benefits, scope, functionality and financing of central administration system/ database set-up. Sufficient IT resources; different approaches to financing dependent on whether start-up capital is available. Possibilities for synergies with other databases/ tools and maximising use of data gathered for informing reporting/ policy requirements.	Functionality of central register becoming more challenged by QA requirements and monitoring compliance etc.	**Focus on strengthening the functionality of central registries** to enable effective interrogation of data to inform building energy upgrading actions.
Experiences in managing central registries	There is a large need for database management to improve certificate quality, enable cost-effective QA, enable compliance monitoring and provide input for national intervention programmes. Up-front cost outlay a leading issue for many MS.	Need to give MS clarity and confidence on value for money and policy benefit of strong central registry systems.	Need to continue sharing experiences and ideas, with a **focus on financial models and planning**.
Creating opportunities for shared learning	Discussion on on-going training/ continuous learning coupled with the acknowledgement of experts either as individuals or as companies. ENFORCE project informing overview of training; workshop focused on improving information exchange in quality chain of EPBD professionals.	Topic concluded for the time being; CA provided models and ideas for supporting peer learning opportunities	Expanding the quality chain of **EPBD professionals to include building installers and construction industry professionals**

5 Conclusions and recommendations

Two key objectives continue to inform the work of Core Theme Training. Firstly, to ensure the quality, reputation and effectiveness of EPBD implementation (building energy certification and inspection) in the construction and property marketplace, it is vital that Member States adopt robust arrangements whereby the service providers (experts in the form of assessors and inspectors) operate to high standards of competence and conduct. Secondly, while recognising the principle of subsidiarity, it is highly desirable that all possible opportunities are identified and appropriately pursued by Member States in respect of harmonisation of approaches and scope for mutual recognition of qualifications of experts.

Significant progress in identifying, mapping, analysing and reporting on a number of detailed priority constituent issues has been made during the course of the Concerted Action to date. The following are summary conclusions and recommendations:

- The role of experts under the EPBD should be seen as a “top up” to the qualifications of existing professionals rather than the creation of a new profession.
- Specifications and training requirements for experts are highly diverse across MS, even regionally within some MS. Requirements range from stringent (e.g. engineering degree + 5 years’ experience) to self-assessment. The task of harmonisation is challenged by the variety of delivery mechanisms and qualification routes.
- Nonetheless, there is clear potential for groups of MS (linked regionally/ linguistically/ common methodology) to engage in mutual recognition of experts, and it is strongly recommended that work towards formalising the mutual recognition process is commenced.
- In particular, examination as an entry condition is an effective mechanism towards enabling harmonisation, and can offer significant opportunity to advance the harmonisation agenda.

- A solely market-based solution to training has in some instances resulted in a wide variance in the quality of the training offered by commercial training providers. In principle, while a market based approach is appropriate, it is then essential that effective methods of carrying out quality assurance of training providers are established.
- The structural approach in MS to training delivery and qualifying of experts defines the scope of interaction between the Services Directive (2006/123/EC), the Recognitions Directive (2005/36/EC) and the EPBD recast. MS need to be aware of the requirements of these Directives as this has direct impact on the legislative basis for mutual recognition of experts from other MS.
- However, irrespective of progress on such mutual recognition, there is clear benefit to EPBD implementation and reputation from the comprehensive codification of codes of practice/ conduct. An important subset of this agenda is the codification of complaints, disciplinary and appeals procedures.
- Independence of experts is especially important towards ensuring the quality of certificates and the suitability and accuracy of the accompanying recommendations. Conflicts of interest can be addressed through a combination of mandatory prohibitions and transparent declarations within codes of conduct. Experts must not stand to gain financially as a consequence of the certificate or accompanying recommendations.
- Effective acquisition and management of the data generated by implementation (registers of assessors, certificates, training providers) is a particular current challenge facing many MS. Cost-effective/ self-financing models for central registries must be presented to MS, in order to encourage development of administrative/ ICT infrastructure sufficient to facilitate the quality assurance and other requirements of the recast EPBD.

Future directions are indicated in the EPBD recast, including ensuring that 'an adequate number of installers and builders should, through training and other measures, have the appropriate level of competence for the installation and integration of the energy efficient and renewable energy technology required', cognisant of the 'Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications with regard to the mutual recognition of professional experts'. Future directions for harmonisation of methodologies and experts include:

- Towards EU harmonisation – modularised training tools, examination
- Surveying skills
- Training assessors in extended fields of competence – and codification of qualifications in these fields
- Differential top up training for different foundational disciplines – architects, building engineers, HVAC engineers, building surveyors, renewable energy system installers
- Training the building workforce – installers, testers, technical HVAC systems, renewable energy systems, etc.
- Follow through/ CPD skills for assessors, inspectors, and building and equipment contractors
- Experiences in on-going management of QA
- Insurance/ legal liability risks – preventing, managing, costs
- Reconciliation with EU recognitions and professional services Directives.

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