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5

Energy services and ESCOs, energy auditing, solving administrative barriers

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1 Introduction and context

The Concerted Action for the Energy Efficiency Directive (CA EED) supports the effective implementation of the 2012/27/EU Energy Efficiency Directive (EED). By providing a trusted forum for exchange of experiences and collaboration, the CA EED helps Member States plus Norway to learn from each other, avoid pitfalls and build on successful approaches.

The role of energy audits was already important in the Energy Services Directive. The EED reinforced the provisions on the availability and quality of energy audits, with further measures aiming to overcome barriers limiting the widespread use of energy audits and the implementation of energy audit recommendations. The EED includes provisions for every stage of the energy audit chain: from the qualification/certification of providers; to the characteristics of the audit; to information, support or obligations – depending on the type of user – to undergo an energy audit; to support for implementation of the recommendations arising from the energy audit. The EED encourages the diffusion – among small to large enterprises, and also in public bodies – of energy audits and also of management systems dedicated to energy, capable of enhancing energy efficiency, maintaining and (usually) increasing the results over time. This report summarises the work carried out between January 2013 and March 2015 on energy services, ESCOs, energy auditing and overcoming administrative barriers.

Among the other measures to promote energy efficiency, the EED requires the removal of regulatory and non-regulatory barriers deterring energy efficiency investments due to the 'split incentives' between owner and the tenant, or among owners. It also requires the removal of barriers deterring public bodies from energy performance contracting (EPC) and third party financing (TPF). The public sector should be supported by providing model contracts for EPC and diffusing information on EPC best practices.

In this context, the CA EED resulted in the sharing and discussion of relevant experiences gained in some Member States (MS) as regards split incentives, model contracts for the public sector, energy audits and transposition of the EED. It also included discussion of other interesting international practice in these fields that can be beneficial for the transposition and implementation of the EED.

The information and good practices gathered from participants to the CA EED through a web-based questionnaire, NEEAPs and international papers on the topic, were shared and discussed during the parallel sessions.

2 Energy audits: obligations and minimum criteria

Minimum criteria for a high quality energy audit

As part of the transposition of Article 8 of the EED, Member States have to establish minimum criteria for energy audits based on Annex VI; they may also require assessment of connection to a heating/cooling network. The presence of these provisions in the existing energy audit framework was investigated via a web-based questionnaire and the results are presented in Table 1.

The questionnaire also addressed the economic evaluation of energy efficiency measures and found that life cycle cost analysis was the least used of the requirements of Annex VI. A further investigation during the parallel session confirmed that life cycle cost analysis is not widely used, while the most common evaluation method is simple payback, followed by discounted payback. This was in some way surprising and was debated, since simple payback is an index that cannot be accepted when talking about financing.

A presentation from a representative of Deutsche Bank introduced the topic of the evaluation of savings in energy audits. A study of over 200 building retrofits in New York showed, on average, an over-evaluation of the savings.

An interesting tool from the USA is the building performance database¹, developed by the Department of Energy to collect data from across the country on different buildings and energy efficiency upgrades. Thanks to its huge data set, this tool creates the opportunity to evaluate the typical return on investment of different efficiency measures, for different buildings, activity type, climate zones, etc.

In the subsequent discussion, it was noted that, to increase the chances that measures suggested by the energy audit will be implemented, the audit report, or at least a part of it, should 'speak the same language' as decision makers (e.g. Chief Financial Officers) or of the financiers. It should thus contain economic indicators like discounted payback, internal rate of return, return on investment, etc.

Different tools for energy audits were discussed and prioritised; these were derived from questionnaire results, the Audit II² project and other sources. The most important ones are:

- Audit guidelines/handbook.
- Templates for reports, designed to be uploaded to a database.
- Collection of reports in a database.
- Existence of benchmarks / target values.

Recommendations

More finance-friendly indicators should be suggested for the evaluation/prioritisation of measures highlighted by energy audits. These indicators are not complex to calculate; however, the provision of appropriate spreadsheets, software tools, etc. should be evaluated.

Audit tools should be considered. This should include not only the traditional ones (guidelines, checklists, report templates, etc.), which in many cases already exist, but also a wider use of information technology (e.g. electronic report templates that can be uploaded into databases, structured databases, etc.). This could be placed under the control of an independent authority to ensure the non-disclosure of sensitive data.

Good practice example



Finland gave a presentation on their ongoing energy audit framework and how it deals with the minimum requirements of Annex VI. The guiding principle is that the energy audit must be attractive for clients, and cost effective for both the client (thanks in part to subsidies) and to the government (cost effectiveness of the energy audit framework). There are three guidance levels: guidelines, models for client groups and handbooks. More stringent minimum requirements are set for buildings, while other sectors are left to bilateral negotiation. The audit model contains requirements for a comprehensive audit and its results, including a spreadsheet template to be filled with data, delivered to the national energy agency and uploaded to a database. This database is used to calculate the average saving potential for different measures, to evaluate the audit programme, to inform users, etc.

Table 1: Criteria for energy audits of Annex VI and Article 8.7 already present in guidelines/standards (26 answers)

Based on up-to-date, measured, traceable operational data on energy consumption and (for electricity) load profiles.	88%
Be proportionate, and sufficiently representative to permit the drawing of a reliable picture of overall energy performance and the reliable identification of the most significant opportunities for improvement.	84%
Allow detailed and validated calculations for the proposed measures so as to provide clear information on potential savings.	84%
Comprise a detailed review of the energy consumption profile.	80%
The data used in energy audits shall be storable for historical analysis and tracking performance.	68%
Build, whenever possible, on life cycle cost analysis (LCCA) instead of Simple Payback Periods.	40%
Feasibility of connection to an existing or planned district heating/cooling network (where applicable).	20%

¹ bpd.lbl.gov

² www.motiva.fi/en/areas_of_operation/projects_and_campaigns/save_ii_projects/audit_ii

Energy audit obligation for large enterprises

Five existing energy audit obligation schemes were identified through the web questionnaire and four were presented. All of these schemes have some requirement for the qualification of auditors, and in many cases periodic re-qualification is required. A monitoring system is always present, and the audit report has to be sent to the national body in charge.

In 4 of the 5 schemes, there was a threshold for the obligation. In general, the threshold was annual energy consumption, while in one case it was the power of the heating system or the total surface area of the building. The energy audit periodicity varied from 1 to 10 years. The first obligation started in 2001, the last in 2010. Beyond this, each obligation has its own characteristics. Looking at some of the obligations in more detail:

- **Czech Republic:** This is one of the older energy audit obligations, having started in 2001. Each year, the national energy agency receives over 1500 energy audits. There are over 350 certified energy auditors. Auditors from other Member States are also recognised. The State Energy Inspectorate may order the public sector to implement measures identified through the energy audit. One of the lessons learned is that the energy audit is a professional, but costly document; an easier approach was proposed (known as 'energy expert opinion') and this was defined in the new Energy Management Act (2012).
- **Croatia:** Energy audits and energy performance of building certificates are two separate and different things, but, by law, a building certificate cannot be issued without a prior energy audit.
- **Portugal:** Energy audits are compulsory every six years. After the audit has been carried out, an energy rationalisation plan, including a target and efficiency measures, has to be submitted to the General Directorate of Energy and Geology to be validated. An agreement can then be signed to obtain discounted excise duties on fuels. Every second year, an execution and progress report has to be presented. Another noticeable feature of the scheme is the web platform, which is used to send the audit and progress reports and which gives the managing body the opportunity to easily extract useful information.
- **Slovakia:** The audit obligation explicitly covers the agriculture sector. Energy audits are also established by law for other sectors (e.g. district heating systems, buildings, public lighting, etc.), but on a voluntary basis.

In the discussion after the presentations, some suggestions arose as to what could be added to these audit obligation schemes (e.g. following up non-compliance before inflicting a fine). The fundamental pillars of setting up and managing an energy audit obligation were discussed.

Schemes from the Czech Republic and Portugal are also described in good practice fact sheets, downloadable from the following web addresses:

CZ: www.ca-eed.eu/good-practices/good-practice-factsheets/energy-services/energy-services-energy-audits-czech-republic

PT: www.ca-eed.eu/good-practices/good-practice-factsheets/energy-services/energy-services-energy-audits-portugal

Conclusions

Setting up a sound and cost-effective audit obligation scheme is not a simple task. Of the obligation schemes presented, the ones with higher responses have at some point offered incentives for audits and/or for implementing the measures.

Additional requirements, like planning and periodic reporting in connection with incentives, can enhance the energy/economic saving results of the obligation.

A dedicated web application, to allow upload audits and other required material, and which offers other tools and information, is considered very important, not only to inform and help users but also to manage the scheme and provide aggregated data on measures, savings etc.

A list of obligated organisations seems to be very important in order to involve a high proportion of users. Another approach is to check the fulfilment of the obligation through other existing procedures/authorisations.

3 After the audit: encourage the implementation of the identified measures

The energy audit assesses the energy use of a building, organisation, service or system and identifies opportunities to improve energy efficiency. The energy audit itself is only a first step: if none of the identified opportunities are taken, the audit turns out to be just a cost, without any positive effect on energy consumption and expenditure. Different approaches to encouraging implementation of the opportunities were identified through a questionnaire to the CA EED participants and in international good practice.

The EED recognises the importance of implementing audit recommendations as the subsequent step after the energy audit; this may be supported by Member States for SMEs (Article 8(2)) and large enterprises (Article 8(7)).

Other provisions considered in this context are the absence of clauses preventing the findings of the audit from being transferred to any qualified/accredited energy service provider, on condition that the customer does not object (Article 8(1)); and the requirement for energy audits to assess the technical and economic feasibility of connection to an existing or planned district heating or cooling network (Article 8(7)).

A questionnaire was sent to the CA EED participants to investigate the existence of support schemes for the implementation of energy audit recommendations, and also to identify if energy audit data and real data on savings generated are collected, and for what purpose. In over 2/3 of the Member States, the energy audit reports are collected by an appointed organisation. Data is collected in a similar number of Member States on the real savings generated by the implemented measures.

Data from energy audits is used to evaluate the quality of the audits and the effectiveness of the scheme; to create reports based on aggregated data; to create a database of energy saving measures; to report at international level; and for policy planning, management and assessment. Some of these uses of data can also be linked to benefits arising from the implementation of audit recommendations, and a database of energy saving measures with statistical data on the savings can help build trust from customers and banks.

In around 2/3 of Member States, there are ongoing schemes to support the implementation of opportunities highlighted by energy audits. In many of these support schemes, the energy audit is part of a broader framework involving, for example, voluntary agreements, energy management systems and eventually some kind of obligation (energy audit obligation, obligation to implement the measures, etc.).

It is quite common to subsidise energy audits, though it is less common to link the subsidy to the implementation of recommendations. Requiring an energy audit in order to apply for a grant is more common, but it was noted in the discussion that, in this case, the energy audit may become a mere justification for implementing a measure that was already planned.

Energy audits are compulsory for large entities/those over certain thresholds in around 1/5 of the Member States; in a small number of cases, there is also an obligation to implement the audit recommendations.

A number of different schemes/practices from within and outside Europe were discussed:

- Support schemes for implementation of opportunities identified by energy audits, for example, voluntary agreements, and the TREND project. Some schemes also exploit the exchange of information among neighbours (energy efficiency networks³ for SMEs) or among brand associations (cooperation within an industrial sector, as in the paper industry in NL).
- Other use of data: compulsory data disclosure (e.g. Australian Energy Efficiency Opportunities⁴) or voluntary data disclosure (e.g. Energie Atlas Bavaria).
- The role of technical standards/guidelines in encouraging the implementation of measures (e.g. The Australian technical standard on energy audit).

According to the CA EED discussions, the barriers to encouraging the implementation of audit recommendations were often linked to energy being a low business priority; scarce economic and/or human resources; and low trust in the quality of the energy audit. The identified solutions can be clustered as information/organisation; finance/funding and qualification/certification of audit; services and technology providers.

The use of data from energy audits was also debated. The data can be useful for internal uses (planning, management, evaluation of results, etc.) and external purposes (sharing within networks or among branch associations, creation of sectorial benchmark and guidelines, data disclosure, etc.).

Almost all of these data uses are more or less widespread in various countries and sectors. The public reporting of energy saving opportunities is one of the characteristics of the Australian Energy Efficiency Opportunities programme, and has also been considered as an option in the UK public consultation for the transposition of the energy audit obligation of the EED.

At the moment, there does not seem to be any mechanism in place to facilitate the transfer of the findings of the energy audit to (qualified/accredited) energy service providers that can offer technical and financial support (e.g. third party financing) for the implementation of measures.

However, there are some attempts to create a public database of waste heat (e.g. Energie Atlas Bayern and other heat mapping initiatives linked to the transposition of Article 14 of the EED), which can help to connect users with surplus heat to providers of technologies and energy services, and/or with neighbouring needs for heating or cooling.

Good practice examples

✓ TREND programme – Regione Lombardia – Italy

The TREND project, financed by the European Regional Development Fund, was aimed at promoting awareness, competencies and tools for energy efficiency in SMEs in Regione Lombardia.

It was carried out in three steps:

- Matching demand/supply of experts in energy management to carry out energy audits in 500 SMEs.
- Analysing the energy efficiency measures for improving the energy performance of SMEs by sector and size in terms of energy savings and cost effectiveness.
- Matching demand/supply of clean technologies and energy efficiency services and funding, in 100 of the audited SMEs, the implementation of the most effective measures in terms of innovation, energy saving, environmental benefits, competitiveness and repeatability. The estimated energy saving for the funded measures is 4000 toe. Data showing the results of the efficiency measures is required one and two years post-implementation.

The data from the energy audits (collected via specific electronic templates) are used also for the industrial section of the regional energy balance and for regional energy planning.

More information can be downloaded from the following webpage: www.ca-eed.eu/good-practices/good-practice-factsheets/energy-services/energy-services-trend-programme-italy

✓ Energie-Atlas – Bavaria – Germany

Energie-Atlas is a web platform supporting citizens, municipalities and companies with information on how to realise energy savings and increase energy efficiency, and on the use of renewable energy technologies. The core content is an interactive map integrating and showing, on-demand, different layers of geo-referenced information such as installed energy plants, potential for new capacity, infrastructure, tools for project delivery, information on efficient techniques, etc.

There is also a stock exchange for surplus heat, and an integrated tool to visualise potential surplus heat and demand for additional heat. The database was populated using information from the emission authorisation procedure. Each company can decide whether to authorise the publication of its data by signing an agreement. At present, nearly 300 sources of surplus heat are identified, alongside the additional sources of heat from municipal wastewater and waste incineration.

Further development is based on presenting good practice examples combined with public relations to motivate industrial and municipal bodies, as well as plant operators, to integrate additional data and to foster networking, to make contact and create projects for the exchange of surplus heat. The platform is visited on average by 1000 users per day from different groups: citizens, municipalities, politicians, plant installers and operators, energy suppliers, industry etc. The feedback is extremely positive and the users support the improvement and expansion of the platform.

More information can be downloaded from the following webpage: www.ca-eed.eu/good-practices/good-practice-factsheets/energy-services/energy-services-energie-atlas-bayern-germany

³ See also the presentation 'ENIG=Network for Energy Efficiency' by Filip Ekander in Copenhagen, March 2012, WG 5.2 www.ca-eed.eu/good-practices/member-state-presentations/consumer-information/how-to-customise-knowledge-transfer/network-for-energy-efficiency

⁴ www.energyefficiencyopportunities.gov.au

4 Encouraging SMEs to undergo energy audits and the subsequent implementation of the recommendations from these energy audits

✓ 'Friendly energy audit' – The Netherlands

The Dutch Paper Makers started an energy transition programme in 2004. The paper sector as a whole decided to work together to survive in the highly competitive international environment. Their 2020 vision is to become a 'world champion', halving their consumption. Many paper mills were eager to implement an energy management structure and ISO 50001 was chosen to become the standard for the paper industry. However, no experienced consultants were available or trained for the paper industry. To ensure that ISO 50001 would not become red tape, but would really raise awareness, a working group was formed. One of the activities was the organisation of friendly energy audits. Eight companies participated in this pilot. The eight mills were each visited for one day. A presentation/report was made at the end of each visit and shared in the working group meeting afterwards. This included, for example, the vision (target) of every mill. Many ideas on ways of communicating with mill personnel were also shared. After this first experience, the mills asked to repeat the friendly audit again next year.

More information can be downloaded from the following webpage: www.ca-eed.eu/good-practices/good-practice-factsheets/energy-services/energy-services-friendly-audit-netherlands

Conclusions

More or less structured frameworks for energy audits exist in most of the Member States. The presentations showed examples of qualification and accreditation/certification of auditors, audit tools such as guidelines, handbooks and energy audit templates (in some cases, in electronic format to enable upload to a database and the extraction of useful anonymous information such as sectorial consumptions, savings, benchmarks, etc.). The weakest element of ongoing energy audit frameworks, compared to the provisions of Annex VI, seems to be economic evaluation.

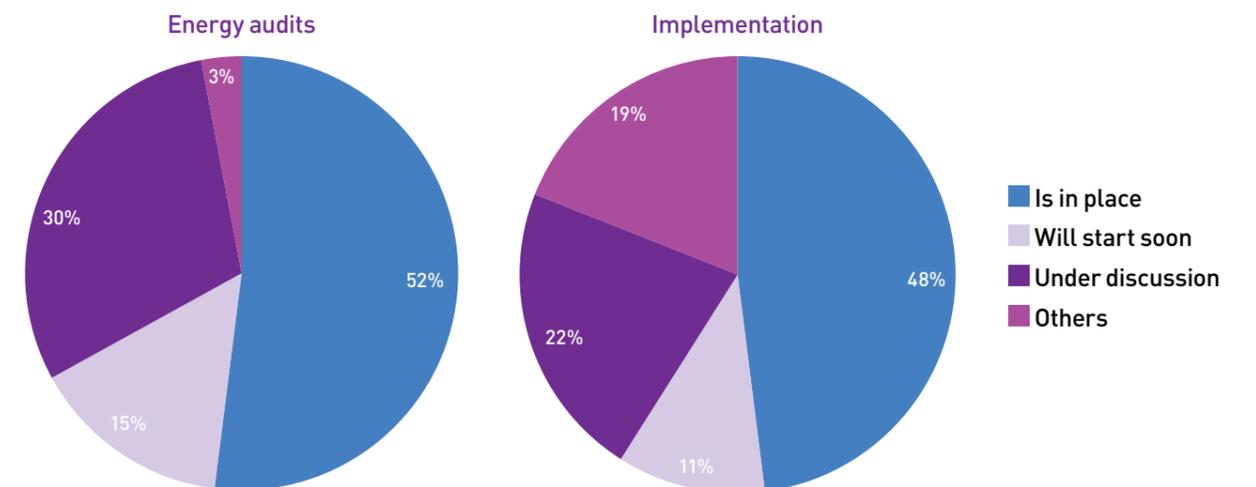
Five Member States already have an energy audit obligation. There are also obligations to implement the measures highlighted by the energy audit: for public authorities in the Czech Republic, on decision of the State Energy Inspectorate; and for non-residential buildings in the Brussels Capital Region, if payback is under five years.

In many cases, energy audits are part of other measures (e.g. incentives, voluntary agreements, etc.). Controls on implementation, and the savings of the opportunities highlighted only exist in some cases. Few frameworks are comprehensive. More structured frameworks can be beneficial but require more resources and the cost/benefit ratio has to be carefully evaluated. For a small number of Member States, energy audits are something completely new. Audits are, however, used in different ways and harmonisation of their contents according to the EED could be beneficial.

Energy audits and implementation of audit recommendations in SMEs

Schemes to encourage SMEs to undergo energy audits (Figure 1) are already in place in half of the MSs, while in most of the others they are under discussion or will start soon. Also schemes to foster the implementation of the audits' recommendations are already in place in almost half of the MSs, but only a part of the others will start or is discussing about them.

Figure 1: Schemes to encourage SMEs to undergo energy audits, and encourage implementation of recommendations



Considering past and present schemes, and those currently under discussion, the majority of the initiatives are at national level, probably due to the more limited human and financial resources of the local administrations. The initiatives to be started soon are almost the same number at national and local level. This could indicate a redistribution of roles and responsibilities and/or that a local actor may be considered more effective to involve entities such as SMEs, which are usually smaller and more linked to a specific territory.

As for non-SMEs, there are already some obligations to undergo energy audits, but in most cases only for those meeting specific criteria. There are different support mechanisms for energy audits in SMEs: ad hoc guidelines/templates (in DK there is also a technical standard for energy audits in SMEs), registration/qualification of audit providers, free advice/mentoring and subsidies covering 40%–75% of the audit costs.

In some cases those mechanisms are linked to voluntary agreements. The implementation of energy audit recommendations is supported by tax credits, low interest loans and guarantee funds. In many cases those schemes are part of a more general framework, e.g. subsidies (in this case often an energy audit is not prerequisite) and local energy efficiency networks. Figures on the results of some schemes in terms of savings are in the range of 7–15% (average), up to 60%.

The positive experiences reported regard mainly energy audits involving facilitator, sector organisation or local assistance. The challenges are linked to the differences among SMEs, making them difficult to reach, and the scarce resources SMEs can devote to energy efficiency, suggesting a need to simplify as much as possible the reporting obligation and bureaucracy to enable access to the sustaining framework.

Energy management systems for SMEs

Currently the most common management systems for SMEs in MS are ISO50001, ISO14001 and EMAS. Simplified management systems for SMEs are in use, were in use in the past, or will start soon, in almost one third of the MS, (not taking into account the initiatives in European projects such as Ex-Bess).

The presented experiences (e.g. Energy Management System Light in SE) also show that simplifying SMEs' energy/environmental management systems by using tools (for example web-based tools) is possible and seems promising.

There is already implementation support of management systems in one third of the MS, and in most of the rest MS support is under discussion or will start soon. It seems that acquiring financial incentives (support, subsidies etc.) or technical support for SMEs' to adopt an energy/environmental management system has been one of the key challenges. Energy or environmental management systems are usually considered too laborious and expensive for SMEs' requirements. The EED requires that there should be public examples of the benefits of management systems for SMEs, but so far only a very few Member States have them.

Conclusions

SMEs are very diverse and fragmented and it is difficult even to find the right way to segment them: not only does size matter, but also sector and energy use. Regarding size, it is probably better to subdivide them at least into medium (<250 employees) and small (<50 employees), and also consider micro (<10 employees), since the way to reach and involve them can be different. Various approaches emerged, from general media communication (e.g. newspapers, magazines, websites) to direct phone calls or even direct personal contact by energy experts/auditors trying to sell their service. The latter can be very effective and can be undertaken

as an autonomous initiative, but requires interesting opportunities in the SMEs and the availability of a certain number of auditors/experts on the market.

One issue for SMEs is resources, and particularly for the smaller ones, the main resources lacking can be time and expertise. It is clear that subsidies, tax credits and low interest loans are welcome and are one of the main triggers to act, but there is also need for assistance and facilitation, usually through sector organisation, local agencies, chambers⁵, and engineers' networks.

The examples presented of simplified management systems and energy networks seem to perform well, resulting in up to 50–100% higher energy efficiency implementation rates, but these tools don't seem right for the ones with lower energy use or lower energy efficiency potential (usually the smaller enterprises, but the absolute dimension depends on the sector).

There is not a fixed minimum size of the SMEs for these activities, but it is clear that they can't be too small (or at least there must be an interesting energy saving potential), unless other benefits (e.g. public image) are also considered. Certification is another appealing reason to implement energy/environment management systems, thus when setting up a simplified management system, it is important to structure it in a way that can lead to certification with the lowest additional efforts.

Member States combine a variety of measures to reach and support SMEs, from subsidies for audits and implementation, simplified guidelines for audits, voluntary agreements, qualification/certification for experts, to simplified energy/environmental management systems and energy networks. This seems to indicate that due to the particular nature of SMEs it is not possible to set up a one-size-fit-all measure. Discussing good practices it seems that it would not be so easy to replicate them in other Member States (due to cultural diversity), but even scaling up in the same territory to cover a higher share of SMEs is difficult. There is no extensive data, but the impression is that with various initiatives it is possible to involve only a certain amount of SMEs, probably those who were already heading in the right direction or ready to implement the measures anyway.

Practical examples

✓ **Following are two examples of energy efficiency networks, also linked to the implementation of energy management systems, and the first specific for SMEs.**

SE: The Energy Management System Light within the ENIG energy efficiency network, managed by the iron sectorial association. 5 stages inspired by ISO 50001 but simplified for SMEs: an energy audit first, targets, an action plan, an energy policy, investment methods, and finally improvement methods. In two pilot projects the average saving was 15% (against the 10% for energy audit only) of savings (in the general support scheme for energy audits alone, presented in the first session, the average saving was 10%).

DE: Learning Energy Efficiency Networks (LEEN). The scheme is not purely for SMEs, but works well with SMEs. In DE it has been quite successful, and to replicate it LEEN 100 plus was launched at the end of 2014. The model should work without public support, but at the moment there are subsidies. There is the need for a local host (e.g. a city, chamber of commerce, energy distributor), a moderator and an engineer counsel.

Participants get an audit according to EN 16247 and the work covers the most important parts of the ISO 50001. On average the enterprises in the network invested two times more. This is also due to lower transaction costs as a result of the fact that it is possible to check directly how the measure works on other members of the network that already implemented it.

⁵ For example the European project STEEP, www.steep.eu involving regional and local Chambers of Commerce and Industry of 10 MSs.

5 Transposition of energy audit obligation for large enterprises

All Member States have to introduce new provisions in their legislation to transpose Article 8 and Annex VI of the EED. There are similarities with the Energy Performance of Buildings Directive and many elements (e.g. energy management systems, voluntary agreements) are already widely diffused across MS. This meant that, in the early stages, the transposition of Article 8 was underestimated in some cases.

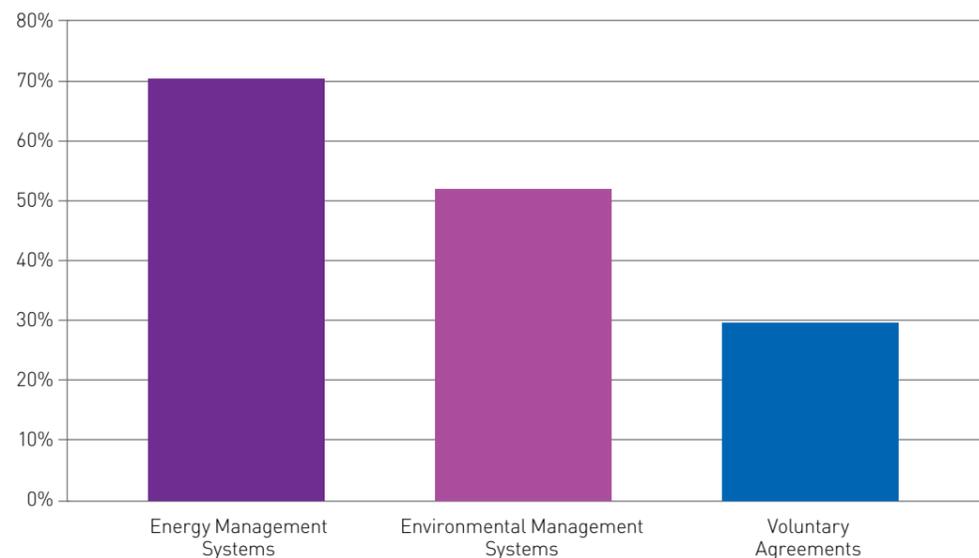
At the beginning of 2014, a questionnaire circulated to the CA EED participants investigated the state of the play of the transposition of the energy audit obligation, the accompanying measures and the interactions with existing supporting schemes and obligations.

The MS were working on implementation of Article 8 and some had published consultation or draft transposition documents. Analysis of these documents indicates that a range of different approaches are proposed, reflecting national circumstances.

The majority of MS (Figure 2) intend to allow large enterprises to comply via certified energy management systems. Around half of MS intend to allow environmental management systems as a route to compliance, while less than one third will consider voluntary agreements.

Figure 2: Options alternative to energy audit, but which comply with the obligation for large enterprises

Which options are considered to transpose audit obligation



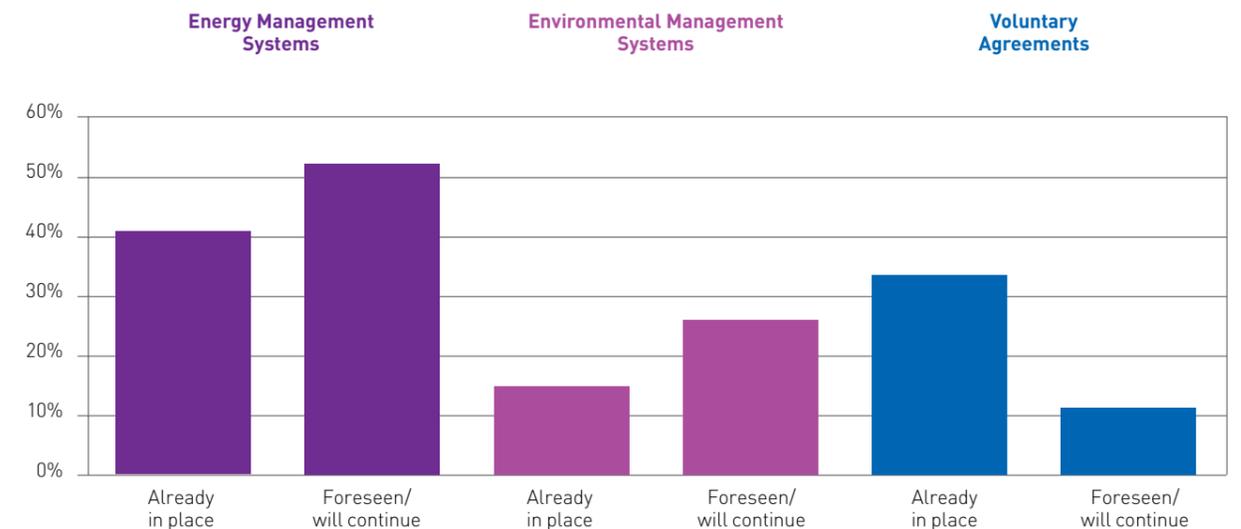
There is a similar trend when looking at incentives (Figure 3), with energy management systems currently supported by incentive schemes in around half of the MS. With the transposition, this number will increase. The pattern is similar, but with a lower share of MS for environmental management systems; while it is the opposite for the voluntary agreements, probably due to higher complexity and state aid issue.

Some participants observed that environmental management systems would not always be implemented in a way that meets the minimum requirements of Annex VI to the Directive.

It is worth remembering that it will not be possible to subsidise large enterprises for mandatory energy audits.

Figure 3: Incentives for energy or environmental management systems or voluntary agreements

Incentives for:



Consumption data and the results of energy audits are, at the moment, considered sensitive in most of the MS, but there are some proposals to disclose them partially for specific subjects or for management of the energy audit framework. In some schemes, e.g. in the UK, this would be linked to the involvement of the management and the diffusion of information to stakeholders.

The creation of a comprehensive list of companies that will be required to comply with the energy audits obligation is a challenging task, but over 90% of respondents considered that this list is useful or necessary, and a number of respondents had identified ways in which such a list could be created. Statistical data is useful to evaluate the number of obliged subjects, but in many cases it is not possible to access other essential information for creation of the list such as names and addresses of the enterprises.

To ensure that large enterprises carry out energy audits on a regular basis, the majority of MS considered that penalties are a necessary backstop. Some MS indicated that they would check compliance with the obligation through other processes – such as voluntary agreements, incentives, permissions, etc.

As regards the minimum criteria for high quality energy audits, the majority of MS set out that they do not intend to go beyond the requirements of Annex VI, but some MS indicated their intention to include in legislative acts or audit guidelines more details of the requirements set in Annex VI, and to outline good practice in energy auditing.⁶

Several MS intend to require energy audits to meet the standard set by EN 16247 – 1, the European standard for energy auditing. There are some uncertainties regarding other parts of the standard, in part due to the ongoing work on the international standard for energy audits (ISO 50002). An example of a concrete approach to Annex VI is the Austrian draft document on minimum requirements.

A suitable qualification for audit providers is fundamental to ensuring high quality energy audits, but there is also a concern about the availability of a sufficient number of skilled providers to meet the need of obliged enterprises. There are different approaches: authorisation/certification (see Romanian presentation) vs. market.

Multinational enterprises express their concerns on the possible difficulties if internal energy auditors have to be recognised/certified in different MS. Some MS (e.g. Czech Republic) already have mutual recognition of audit providers, but it seems difficult to extend to all MS, since in some cases audit providers can be only a physical person, whilst in others they can be companies. Moreover, the qualification criteria are different, so it would be difficult to ensure mutual recognition and safeguard audit quality.

In some of the draft transpositions or draft guidelines, there are specific provisions for energy audits in transport. During the discussion, Finland shared some information on air, ship and rail transport, where there are already international reporting schemes in place, some of them compulsory requirements, in line with the provisions of the Directive.

The boundaries of energy audits were also discussed. An identified minimum threshold of consumption is considered beneficial to help focus energy audits on the most significant aspects of energy consumption, but a fixed threshold or fixed share limits the field of action of the energy auditor. In the latter case, the auditor has more freedom, though this creates the risk of poor quality audits; therefore, a thorough quality check must be in place.

Good practice examples

✓ Document on minimum requirements for energy audits – Austria

The document on quality criteria for energy audits (Qualitätskriterien für Energieaudits) was prepared by the Austrian energy agency and contains concrete details on how to fulfil the requirements of Annex VI. The document is still a draft, thus the specific details are indicative at the moment.

Key points include:

- Using latest available real data (from energy bills or consumption records), referring to the same period, for all the fuels used by the organisation.
- For the first audit, data of a minimum period (e.g. the latest 3 years) are required. With regard to proportionality and representativeness, there is a minimum consumption (e.g. 10%) for the essential energy uses to be identified.
- For large enterprises, there are specific requirements additional to EN 16247-1 for buildings, industrial processes and transport.
- Evaluation of investments has to consider the interest rate, and a justification is required if it is not possible to use life cycle costing. The suggested reference is the national technical standard ÖNORM M7140.
- Regarding data storage, the data of the last two energy audits has to be available.

The most detailed part of the document is the energy consumption profile (point b of Annex VI). There are two different sections, one for large enterprises and a shorter one for SMEs.

Conclusions

There is huge diversity between MS in the transposition of the energy audit obligation. On one hand this means that trying to ensure that enterprises face similar conditions throughout the MS is challenging; on the other hand, this diversity offers MS the opportunity to see what works and to learn from each other.

In the current transposition phase, curiosity is accentuated and everyone wants to know more about what other MS are doing. Various examples and studies on the topic are already available and it is now important to make progress in a way that is as simple and as concrete as possible.

Nevertheless, although MS show different approaches and requirements to the energy audit chain, the provisions of the Directive and the European and international technical standards go in the direction of creating a common, level playing field for energy audit providers, users, obliged enterprises and energy services providers. Greater sharing among MS of aspects such as requirements for the qualification of audit providers was discussed and is considered beneficial, but due to the different situations of the MS this would require additional efforts and time.

⁶ www.ca-eed.eu/good-practices/member-state-presentations/energy-services/transposition-of-energy-audit-obligation-for-large-industries/minimum-criteria-for-energy-audits-according-to-art.-8-austria

6 Split incentives

Split incentives in the building sector, between the different parties bound by the terms of a contract, is the split of motivations prompting the parties engaged in a contract to pursue different objectives.

The issue has many names: split incentives, agency dilemma, principal – agent, landlord – tenant, misaligned financial incentives, and it is a market failure that usually arises when one party is responsible for the investment costs while the other party takes advantage of the cost savings during operation. In the building sector the issue is present between owner and tenant where the tenant pays the rent and also the energy bill, so the owner has no interest in investing in efficiency measures. It is also present among owners or among tenants – typically when it is not possible to measure the usage of energy or services inside the same organisation, when owner and tenant are different offices or departments with different goals. There is also the case, sometimes called ‘reverse split incentive’ when the owner pays the energy/services thus the tenant has little/no motivation to limit their usage (e.g. hotels, but also schools).

Some of the solutions applied to tackle this issue in one sector can fit also for other sectors. For instance life cycle costing – utilised to optimise the planning, design and construction of state buildings in the US since the seventies – is among the minimum requirements for the evaluation of energy audit opportunities in Annex VI of the EED.

Around 60% of the Member States gave some information regarding split incentives in the 2014 National Energy Efficiency Action Plan (NEEAP), underlining the fact that it is considered and perceived as a barrier, at least in some circumstances. NEEAPs contain more or less detailed analysis of the issue and in around half of the cases the on-going measures to address it; while in the other cases mainly or only proposals, more or less precise and articulated, to modify or introduce new legal provisions are outlined.

Split incentives are reported to be a barrier to energy efficiency, which is often present between owners and tenants in residential and private buildings and among owners in residential buildings, while they are less common among owners in non-residential buildings and between real estate developers and the incoming owner in residential and non residential buildings. The situation is different in different Member States, and in different sectors, due to the particular conditions (building property, building typology, weather, etc.).

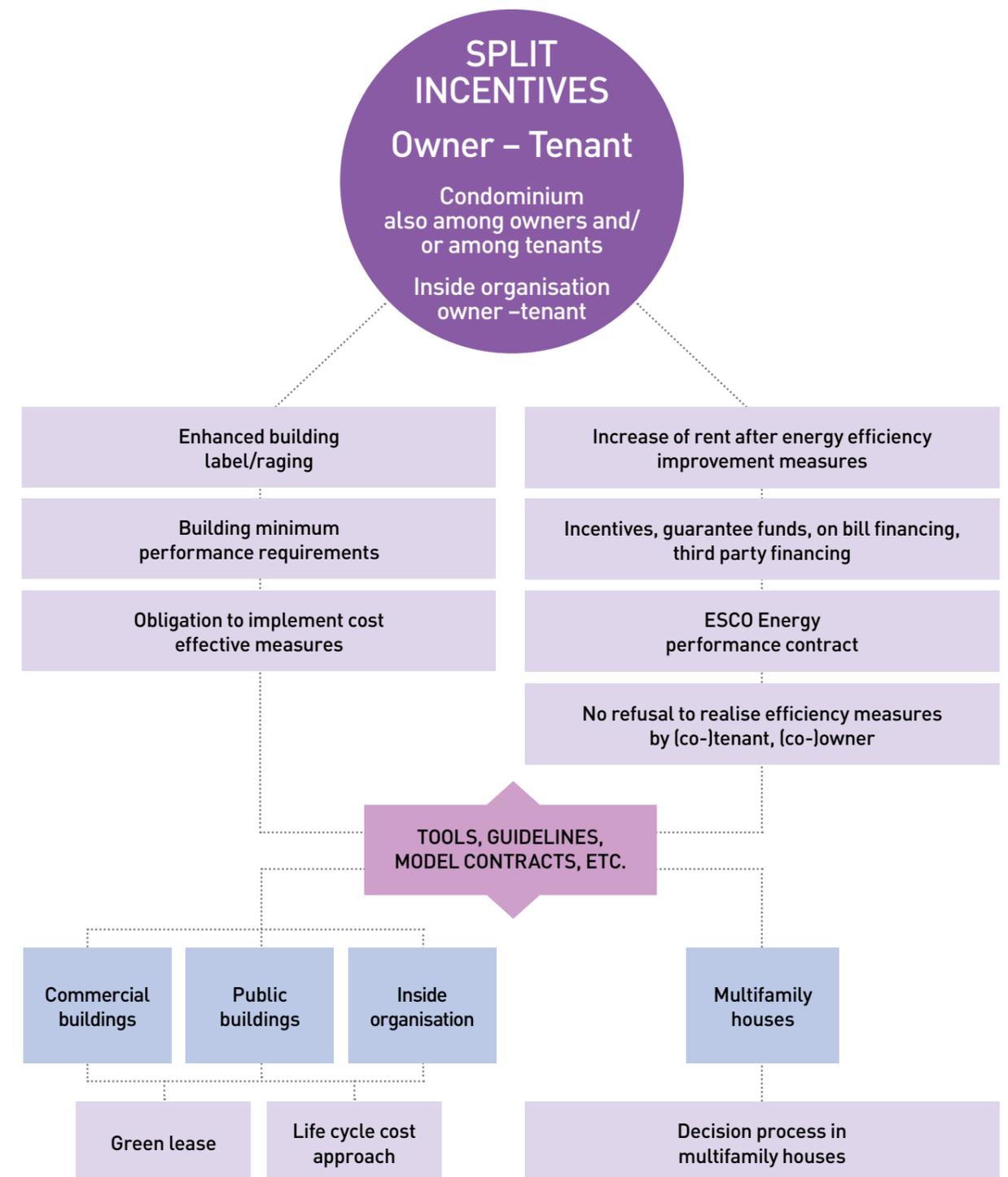
Measures to tackle the split incentive issue

In the non residential buildings the split incentives are less of a barrier, this is probably due to the fact that there is a lower information gap and that for the private sector (at least in some Member States), the contract duration is shorter, thus it is easier to renegotiate the contract conditions or find another solution on the market. From the energy efficiency perspective, with shorter contracts, there is lower stimulus for the owner to invest, mainly in longer payback time measures, due to the higher uncertainties.

Measures to tackle split incentives are already in place in over 60% of the Member States and there are plans to introduce measures in around half of them. Some of those measures specifically address split incentives, while others also address or are mainly addressed at other issues.

The measures described in the answers to the questionnaire and in the NEEAPs can be divided into regulatory/legislative (also comprehending guarantee funds, incentives and partially ESCO and energy performance contracting) and other support measures such as tools, model contracts, etc.

Figure 4: Measures to tackle the split incentive issue



In Figure 4 there is an attempt to group the measures: on the left are those more related to the building, on the right are those more related to financing and at the bottom the tools, etc. divided by sectors.

Practical examples

✓ **The green lease (a collaborative owner-tenant approach to save resources and money) for the non-residential sector has so far seen little implementation in various Member States, but is considered a promising instrument.**

It doesn't seem to be complex and the benefits are for both parties, not only in terms of energy and economic savings, but also for public image. The main support mechanisms available for this practice are model contracts or an interactive web platform (see NL presentation).

Among the other measures, an enhanced building rating/certificate targeted at split incentives is probably the most replicable, since the instrument is in place in all Member States. It seems, from the example in the Dutch retail sector, that with relatively limited additional efforts it could be possible to achieve much higher results compared to the standard rating/certificate. Moreover this would also be an opportunity to enhance the effect of the rating/certificate on the market.

In the UK regulations have been introduced to set a minimum energy efficiency standard for all categories of domestic private rented property. The minimum energy efficiency standard will be set at an E Energy Performance Certificate (EPC) rating. The regulations will apply from 1st April 2018 upon the granting of a new tenancy to a new tenant, and a new tenancy to an existing tenant, then from 1st April 2020, the regulations will apply to all privately rented property in scope of the regulations. The regulations provide for a number of exemptions to the E-rating requirement including where all cost-effective improvements capable of being installed within the Green Deal's Golden Rule have been undertaken and the property remains below an E-rating.

Conclusions

The presence and the importance of the split incentives issue depends on many different factors such as weather, ownership, contract type (covering or not energy/services), contract duration, presence of meters/cost allocators, energy prices, and the measures in place to tackle the issue. In the same MS the issue can be almost non-existent in one sector and, under certain circumstances, be more diffused and important in another.

The issue is quite complex and involves a large number of subjects, thus it seems that it cannot be addressed via one measure alone, but through a combination of measures. Measures are in many cases linked, or require others as prerequisite. For instance, to use energy performance contracts in third party financing there must be the possibility of increasing the rent, taking into account the lower energy/services bills of the tenants⁷. A solution to make this process smoother could be a voluntary agreement between associations of owners and tenants, with a guarantee that the total expenditure will not rise; or an amendment to the regulatory framework. A regulatory framework is also a prerequisite for energy services, third party financing, and preventing the refusal of a tenant (or landlord) to implement energy efficiency measures.

In multi-family houses the decision process is critical, and can also preclude the implementation of measures if incentives, funds and/or performance contracts are present. This issue is not only a matter of obtaining a majority decision, it has to be addressed with communication and decision making support and tools, model conventions for common installation on private parts, and tailored financing/revolving funds for multi-family houses.

For the non residential public sector, and to tackle split incentives inside organisations, an all-inclusive rent and life cycle costing approach should be considered. If compatible with legislation and accounting rules, the creation of an internal revolving fund, fed by revenue streams from savings resulting from the implementation of energy efficiency measures, should also be evaluated.

The problem of split incentives can clearly not be dealt with via a one-size-fits-all solution. Measures must be tailored to Member States' specific conditions (e.g. taking into account typical contract type and duration).

7 Model contract and guidelines for energy performance contracts in the public sector

Article 18 and 19 of the EED refer to either the taking up of energy services, indicating ways to support the public sector, and the removal of regulatory and non-regulatory barriers deterring the public bodies from energy performance contracting (EPC) and third party financing (TPF).

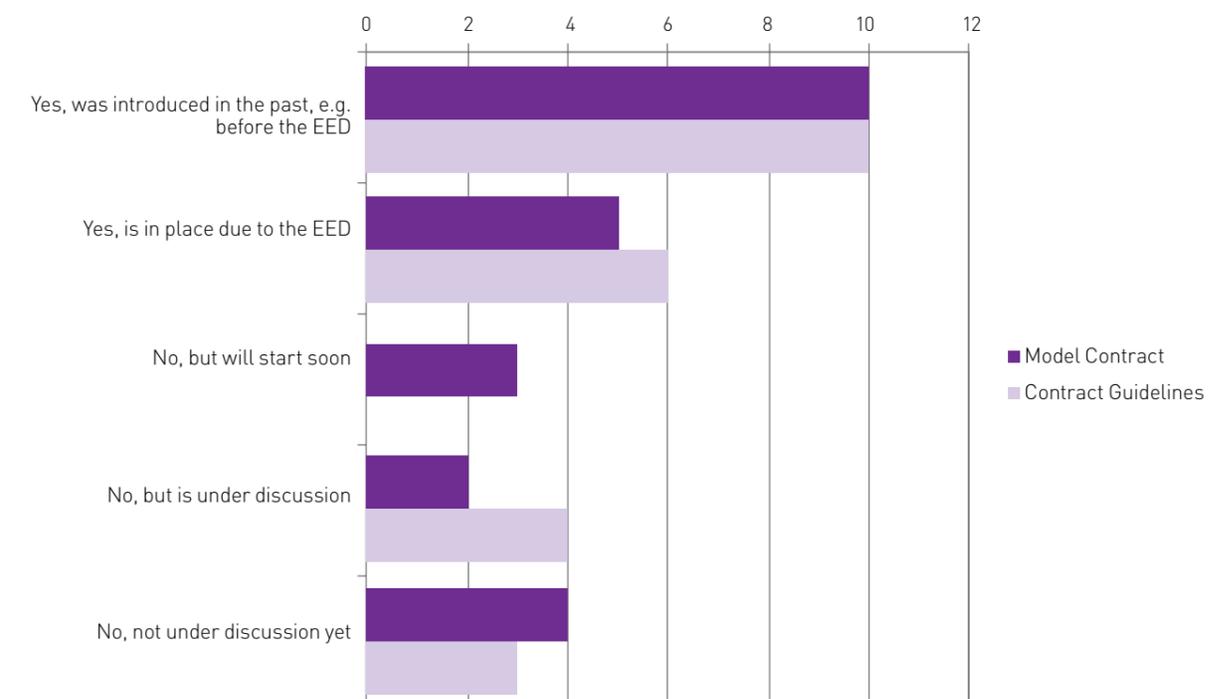
A questionnaire was circulated among the CA EED participants to investigate the way Member States have approached the provisions of Article 18 and Article 19 to foster energy performance contracting and third party financing within the public sector.

The establishment of a model contract at national level (Figure 5) for energy performance contracting in the public sector has been initiated in half of MS, of which two thirds were initiated before the obligation in the framework of the EED was introduced. However, at regional/local level it has been much less developed.

The same is true of the establishment of contract guidelines at national level for energy performance contracting, which 10 MS established before the EED came into force, and 5 established under its compulsion.

Both model contracts and contract guidelines are present in 13 MS, in 9 of them they were introduced before the EED came into force.

Figure 5: The availability of model contracts and contract guidelines for energy performance contracting in the public sector, at national and regional/local level.



⁷ See for example: Overcoming the split incentive barrier in the building sector, Marco Corradi, presentation at JRC workshop in Namour 19th March 2014 iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/files/documents/events/03_corradi_13.03.14.pdf

The main reasons for the development of model contracts and contract guidelines have been: the growing EPC market and the need for standardised guidelines or minimum criteria to be covered by the ESCO contracts; encouragement of utilizing ESCO and EPC concepts in large building situations, where procurement rules and competition makes ESCO tendering more challenging.

Where established, the contracts are either part of regulations or published independently without obligation for use.

The most common options for the development of model contracts are:

- Collecting contracts and information from the existing national market.
- Taking experience from abroad.
- Involving a limited number of experts.

Regarding the items that should be included in an energy performance contract, (as listed in EED Annex XIII), around 1/3 of the MSs have fulfilled all minimum requirements (some of these following the publication of the EED), while some have only partially fulfilled these requirements due to particular constraints. For instance, in some markets, clear and transparent measurement and verification (transparency) seems to be an issue; and non-disclosure of consumption/savings data is considered a competitive factor (e.g. for subsequent tendering) and a security margin in case of issues (e.g. underperformance).

Information on best practices for energy performance contracting in the public sector is mostly provided in the frame of wider information on energy efficiency, to be used in both the public sector and private sector. Successful ESCO/ EPC projects have been disseminated and valorised through journals, seminars, and websites.

Information on best practices in the public sector with cost-benefit analysis using a life cycle approach has not been developed so much (only 1/6 of the MSs), and is under evaluation in another third. The question is: if ESCO/ EPC projects are long term contracts in nature, and it is appropriate to include long term cost analysis into the contracts, why is such a practice still difficult?

A wide range of prerequisites or accompanying measures that may foster the diffusion of energy performance contracts can be gathered under the following categories: information and awareness of all the parties and stakeholders involved; training and communication to a sectorial target; consultancy support by facilitator agencies to applicants and to public administrations in developing regulatory frameworks; bundling of building sets in a single contract, or of smaller similar contracts (e.g. of small municipalities) in a bigger framework tender to reduce risk for ESCOs; and online systems. Centralised contracting can simplify EPC for the public sector and scale it down to a single small building.

Conclusions

The diffusion of EPC is still far from its potential, even in developed markets. To foster its use in the public sector a crucial point is the clarification of balance/off balance sheet treatment, and a simplification of accounting and tender procedures; also, in more mature markets, the main barriers are legislative. As in any market, when dealing with financial issues a more standardised approach can help in growing the market, simplifying transactions and lowering their costs. Most of the tools/approaches presented and/or discussed take this direction (guidelines/support for tendering and contracting, contracts/contract guidelines, qualification/code of conduct, measurement and verification, etc.). Since every case (or building) is different there must be enough flexibility to adapt to each situation.

Facilitators are crucial to the market at all stages, but sometimes their availability or qualification is not enough to meet the market needs. Qualification/certification of facilitators (and energy experts) should be considered.

The transaction costs are high: support/subsidies for preparation of EPC (e.g. covering a part of the costs of facilitators) and guarantee funds are quite diffused among MS, including those with a more mature market.

The first step is to understand the needs and the situation, starting with data gathering and an energy audit. Then it will be possible to evaluate what the best solution is; this is not always a performance contract.

Practical examples

✓ The following tools/approaches can foster EPC in different ways:

- In all markets, regardless of the different stage they are at, facilitators for EPC have an important role to play in the public sector (and not only). Energy agencies (e.g. IE) and associations of energy services providers (e.g. CZ) also have an important role to play in fostering EPC through guidelines and websites.
- NL: A web tool has been established for EPC for commercial buildings, but can also be used for public buildings. It can be used for HVAC systems, energy management and maintenance, or for the entire building. It is more flexible than a traditional model contract. It is also available in English.
- Transparence project: European Code of Conduct for Energy Performance Contracting. The barriers to EPC are mainly trust, complexity and lack of regulation. A code of conduct shared with stakeholders at national and European level can orient and give more guarantee to the client (points can be added to the contract), and at the same time is a way to diffuse information on EPC and can be used as a marketing tool for the ESCO.

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For further information please visit www.eed-ca.eu or email caeed@ca-eed.eu



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