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Guidance on Energy Efficiency

in Public Buildings



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This publication has been prepared to contribute to and stimulate discussions on public-private partnerships (PPPs) as well as to foster the dissemination of best practices in this area.

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Abbreviations and Acronyms

COP	Certificate of Participation	GDP	Gross Domestic Product
DB	Design and Build	GHG	Greenhouse Gas
DB&M	Design, Build and Maintain	IGA	Investment Grade Audit
DBFOM	Design-Build-Finance-Operate-Maintain	IPMVP	International Performance Measurement and Verification Protocol
DBO	Design-Build-Operate	JESSICA	Joint European Support for Sustainable Investment in City Areas
DBOM	Design-Build-Operate-Maintain	M&V	Measurement and Verification
ECM	Energy Conservation Measure	O&M	Operation and Maintenance
EE	Energy Efficiency	O&MM	Operation, Maintenance and Management
EEEF	European Energy Efficiency Fund	PPP	Public-Private Partnership
ESCO	Energy Service Company	RES	Renewable Energy Sources
ESP	Energy Service Provider	RPA	Receivables Purchase Agreement
EPC	Energy Performance Contract	TA	Technical Assistance
EVO	Efficiency Valuation Organization	TELP	Tax-Exempt Lease Purchase Agreement
EIB	European Investment Bank	TPF	Third-Party Financing
G2G	EPEC PPP Guide to Guidance – A Sourcebook for PPPs		

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1. Introduction

1.1 Objective and background

Energy efficiency ("EE") is at the cornerstone of the European energy policy and one of the main targets of the Europe 2020 Strategy for smart, sustainable and inclusive growth adopted by the European Council in June 2010. This includes the objective for a 20% reduction in primary energy consumption by 2020. As energy related emissions account for almost 80% of total EU greenhouse gas ("GHG") emissions, the efficient use of energy can make an important contribution to achieving a low-carbon economy and combating climate change.

Buildings account for approximately 40% of final energy consumption. Investing in EE measures in buildings can yield substantial energy savings, while supporting economic growth, sustainable development and creating jobs. Greater use of energy-efficient appliances and technologies, combined with renewable energy, are cost effective ways of enhancing the security of energy supply.

Despite substantial progress towards meeting the 20% reduction target, a recent European Commission ("EC") study shows that, if no additional measures are taken, the EU will meet only half of its target. In 2011, the European Commission adopted a new EE Plan, and a proposal for a new EE Directive is currently under negotiation. The latter will require public authorities to refurbish at least 3% of their building stock by floor area each year.

Public and private sectors work in partnership to deliver public infrastructure projects such as roads, railways, airports, schools, hospitals and prisons. PPPs generally share the following features:

- a long-term contract between a public contracting authority and a private sector company based on the procurement of services;
- the transfer of certain project risks to the private sector;

- a focus on the specification of project outputs rather than project inputs;
- the application of private financing in most instances; and
- payments to the private sector which reflect the services delivered.

Experience over the past 30 years in the UK and North America has demonstrated that PPPs can be used to yield energy savings in the public sector; the main features of EE PPPs are similar to those of accommodation PPPs. They use Energy Performance Contracts ("EPCs") and the private partners in these arrangements are known as Energy Service Companies ("ESCOs"). ESCOs can also be set up by public entities. [\[Guidance 1\]](#)

There are different types of EPCs; including projects in which the private partner has the responsibility for delivering a service (i.e. providing final users with heat and/or electricity) through the construction and operation of a corresponding facility. The public entity repays the cost of the service.

This Guide focuses on works to existing buildings. In an EE PPP, the "design" normally refers to the optimisation of the EE of an existing public building or a pool of buildings. The "build" phase of the project normally refers to retrofitting and the implementation of EE measures in existing buildings rather than to new constructions. EE also plays an important role in PPP accommodation projects (e.g. hospitals and schools). In this case, EE forms part of the output specification, but it is not the primary focus.

The most innovative aspects of the EPC is the energy savings guarantee provided to the public partner and the payment of fees proportionate to the EE performance. This innovative approach, may lead to preparation, establishment and implementation processes that are different from infrastructure PPPs. This is mainly due to the fact that the expected output (energy savings) is

measured in terms of the reduction achieved. As a result, EPCs require a different approach to the management of the procurement phase. Correspondingly, an essential element will be to design the methodology for measuring and calculating the energy savings effectively at the outset, in order to properly allocate risk sharing between the various parties.

The aim of this Guide is to raise awareness and provide guidance for EE PPPs by providing the best information currently available from selected professional publications. This Guide provides information on the structuring of EPCs for public buildings and refers to additional sources of good practice. Furthermore, the Guide is designed to help readers address the challenges of reducing the energy consumption and GHG emissions of public buildings while transferring project risks to the private sector. This includes Design, Build and Finance ("DBF"), and in some cases, Operation and Maintenance ("O&M").

The EC and EU member states have developed policies to achieve ambitious goals in EE, promoting renewable

energy and curbing GHG emissions. Public buildings represent a considerable opportunity given the estimated large potential for savings of fossil fuel based energy. PPPs can play a key role in the development of EE through accelerating the pace of investment and mobilising private sector finance.

This Guide is based on the EPEC PPP Guide to Guidance, **[Guidance 2]** which readers may want to use as a general introduction to PPPs across all sectors.

For the purpose of this Guide, EE PPPs in public buildings are considered as such when:

- The main emphasis is on implementing EE investments aimed at reducing the energy consumption in physical terms as opposed to simply trying to decrease the energy bill in financial terms (e.g. through renegotiating the energy supply conditions). The integration of Renewable Energy Sources ("RES") often features in such investments; and

Box 1: Definitions

Energy Service Company ("ESCO"): A natural or legal entity that delivers energy services and/or other EE improvement measures in a user's facility or premises, and which accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of EE improvements and on the meeting of the other agreed performance criteria. **[Guidance 15]**

Energy Performance Contract ("EPC"): A contractual arrangement between the beneficiary and the provider (normally an ESCO) of an EE improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of EE improvement. **[Guidance 15]**

Energy audit: A systematic procedure to obtain adequate knowledge of the existing energy consumption profile of a building or group of buildings, of an industrial operation and/or installation or of a private or public service, identify and quantify cost effective energy savings opportunities, and report the findings. **[Guidance 15]**

Source: Directive on Energy End-use Efficiency and Energy Services, the European Parliament and the Council (April 2006) Article 3: Definitions

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:114:0064:0085:EN:PDF>

- Savings-based EE services are delivered. Performance risks are transferred to the private sector partner through adequate financing mechanisms that ensure a guaranteed level of energy savings.

Wherever possible, EE should be part of a holistic solution to providing services for a building or a group of buildings, thereby reducing not only energy costs, but also achieving economies of scale on other maintenance and management services, such as cleaning and catering.

1.2 Challenges for EE investments in public buildings

Four main challenges remain for the development of EE approaches in the public sector:

[Guidance 3,4]

Technical challenges: Public building owners or users often lack the technical background and expertise to understand EE methods and technologies for reducing energy consumption and/or replacing the consumption of fossil fuels with renewable energy sources. The first challenge is to ensure that public building managers are conscious that there is a gap between the level of energy consumption of the facility they are administering and the level which could be achieved if a specific energy conservation effort were to be employed and its financial value. This lack of awareness can usually be explained by the absence of methods for monitoring energy consumption and physical energy parameter regulations. A further technical challenge is to demonstrate that there are proven technologies, methods and services that can be used to substantially reduce energy consumption or substitute the energy consumed with other forms that could be less expensive and/or less polluting. ESCOs, when implementing EPCs, will install a measurement system with a twofold objective: it will help the energy manager of the building to reduce energy consumption and it will create the measurement and verification ("M&V") framework that the ESCO needs to estimate the level of savings achieved.

Economic challenges: Demonstrating the cost-effectiveness of EE projects is generally problematic. EE

projects have been subject to erratic variations in energy prices over the past 30 years. There is often no incentive to save when budgets are allocated on an annual basis. Similarly, if operating costs are matched by an operating budget then, particularly, public authorities owning or renting the building will have little incentive to reduce the costs. In addition, it may be difficult to convince managers to undertake projects which might become uneconomic when energy prices decline for a limited period. Guarantees regarding the profitability of such investments are key, both from a technical (physical savings) and economic (financial savings) standpoint.

Budget challenges: Public entities often encounter difficulties in raising finance for investments. They may not be able to finance their whole investment programme directly from public funding. This requires them to prioritise and, often, overlook EE investments. Additionally, the capacity of public entities to leverage debt is increasingly limited. In some cases, this may be the result of restrictions imposed by the regulatory framework or it may be due to their inability to increase the level of debt while still meeting prudent borrowing principles.

Legal and institutional challenges: The introduction of EE measures or the implementation of EE investments in public buildings may also be hampered by a series of issues relating to the legal, regulatory or institutional framework.

EPCs will be difficult to implement if some of the following conditions exist:

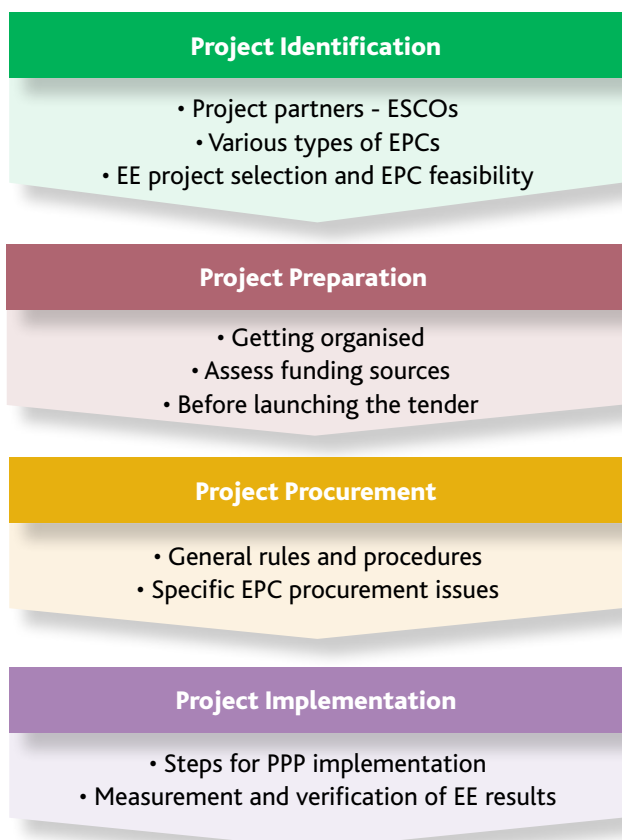
- staff concerns, regarding their working conditions and the possibility of outsourcing work carried out by public employees;
- a lack of expertise or awareness on the part of building energy managers;
- insufficient incentives to promote savings because energy tariffs are partly subsidised;
- conditions not conducive to investment in EE measures when operating budgets are lowered after one year;

- cumbersome procurement procedures associated with conducting energy audits leading to long delays;
- the challenge of involving several different public sector stakeholders, as the PPP approach is more comprehensive than conventional procurement; and
- the PPP requirement for organisational changes and adjusted processes and structures, which could slow down and complicate a project.

1.3 Structure and contents

The Guide follows key phases of a PPP project cycle and consists of four core chapters.

Figure 1: Key Phases of a PPP Project Cycle



Through the four core chapters, the case for EE PPPs is assessed for project suitability for EPCs. The Guide addresses the readiness of the procuring authority to engage in such a project, the establishment of an appropriate management structure, and the legal, contractual, technical and financial issues to be confronted in the course of procurement. Finally, it addresses the planning of a project measurement and evaluation framework to assess value for money ("VFM") and other potential benefits from the project.

1.4 How to use the Guide

The Guide can be used in a number of ways. For example as:

- a review of procurement and implementation issues with respect to EE PPPs;
- an introduction to the information to be requested from the EE PPP facilitator;
- a starting point to learn more about EE PPP characteristics; and
- a guide to promoting the concept of EE service contracting.

As the Guide has been designed as a good practice sourcebook, its value depends on the value of the information sources provided. These sources are noted in the guidance section and detail the title of the publication, its author(s), the date of publication and a brief paragraph explaining the topics covered.

All sources have a symbol **[Guidance n]** next to the reference number to direct the reader to further information about the issue discussed in the text. Most sources relate to existing documents that can be accessed via the internet. In these cases, the references include the web address. For publications such as printed books or other published material that cannot be accessed via the internet, the source description includes ISBN details.

Introduction: LINKS

Guidance 1

Energy-Efficient Buildings PPPs: Multi-Annual Roadmap for a Long Term Strategy , European Commission.
http://www.ectp.org/cws/params/ectp/download_files/36D1191v1_EeB_Roadmap.pdf

Guidance 2

The Guide to Guidance. How to prepare, Procure and Deliver PPP Projects.
www.eib.org/epec/g2g/index.htm

Guidance 3

Energy Efficiency in the Public Sector, Energy Charter Secretariat (April 2008)

Pages 23-26 present an international review of the barriers to energy efficiency in the public sector.

http://www.encharter.org/fileadmin/user_upload/document/Public_Sector_EE_2008_ENG.pdf

Guidance 4

L'apport du partenariat public-privé dans le financement des projets en efficacité énergétique, Institut de l'Énergie et de l'Environnement de la Francophonie (2008). ISBN: 978-2-89481-040-8.

Section 1.3 explains the barriers to EE projects and Section 2.2.2 focuses on the risk related to EE PPPs.

Guidance 15

Final Publishable Report, EUROCONTRACT IEE (February 2008)

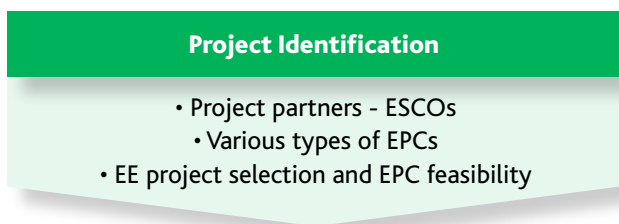
Presentation of adapted EPC models for refurbishment in the public sector (pages 49- 56).

http://ieea.erba.hu/ieea/fileshow.jsp?att_id=5828&place=pa&url=Eurocontract_Final_Report_Publishable.pdf&prid=1576

2. Project Identification

EE PPP investments in public buildings generally follow the same process as conventional PPPs. However, in the context of EE, the public partner has to consider a number of additional aspects. Private partners have to assume different liabilities and offer specialised skills, as the business model is based on the energy performance achieved rather than the standard DBO model.

Figure 2: Project Identification



2.1 Project partners - ESCOs

Public building managers are often not sufficiently aware of the EE opportunities in the premises that they administer. As a result, it can be difficult for a hospital director, an office building manager or a municipal building manager to define and implement the best means to reduce energy consumption. Therefore, a partnership between public building owners or managers and a qualified company with the necessary expertise (and possibly a large range of additional services such as maintenance, finance and/or guarantees) is an attractive solution.

The private partner of the public building manager provides EE services. The ESCO will receive payment for the energy savings guaranteed. Building maintenance, co-generation, new technologies and alternative power production may be included in the range of services provided by the ESCO and used to support guaranteed performance.

An EPC is a contractual arrangement between the public partner and the provider (normally an ESCO) of an EE improvement measure, where payments are made based on a contractually guaranteed level of EE improvement and energy cost savings. **[Guidance 5, Guidance 6]** The public partner contracts for a specific result (e.g. energy savings in kw/h) rather than for specific products or services. **[Guidance 7]**

Potential EPC benefits:

- the avoidance of upfront costs through third-party financing or on-bill repayment schemes;
- payment is on results allowing the transfer of technical risk from the public partners to the ESCO;
- a significant contribution to energy security, through the reduction of national energy demand;
- economic efficiency, through the installation of more energy efficient systems and controls, reducing utility bill costs and providing a funding source for building renewal projects;
- economic development through increased building and renovation activity than would normally be possible through traditional contracting methods;
- environmental stewardship due to significant reductions in energy use;
- improvements of indoor air quality which may not otherwise have been possible due to funding constraints;
- offer complete energy services (called "life-cycle approach" in PPP terms), including marketing, design capability, installation, financing, maintenance and measurement of energy management technologies; and

- offer shared-savings contracts (called “payment mechanisms” and “incentives” in PPP terms) where clients effectively pay for energy services from a portion of the actual energy bill savings.

2.1.1 Types of ESCO services provided

While none of the discrete skills that an ESCO employs are particularly unique, the added value from an ESCO is its ability to integrate a wide variety of skills and apply them efficiently to projects, irrespective of scale. [\[Guidance 8\]](#)

ESCOs package the following services: [\[Guidance 9,10,11\]](#)

- consulting engineering;
- general contracting;
- energy analysis;
- project management;
- project financing;
- training;
- performance guarantees;
- energy measurement;
- sustainable energy savings; and
- risk management.

Successful ESCOs are generally acknowledged to have the following strengths:

- energy system analysis and technology integration. ESCOs analyse energy systems in buildings and industrial processes as thermodynamic systems in order to select a comprehensive package of cost-saving options that offer sustainable savings;
- mobilisation and market penetration capability. ESCOs need to have proven ability to implement projects quickly and efficiently by drawing on the experience of the partners involved;
- financial, legal and contract capacity. ESCOs arrange for sophisticated credit analysis and enhancement, offer project financing expertise, accommodate both

simple and sophisticated contracts and are conversant with relevant legal issues;

- project and quality management. ESCOs have expertise in selecting subcontractors, managing projects and overseeing construction works. Furthermore, they have learned how to implement quality and risk management controls; and
- delivering sustainable energy savings. ESCOs have developed cost-effective techniques for measuring, monitoring and ensuring sustainable energy savings over time. These include client training and prompt exception reporting.

ESCOs may differ in terms of ownership, target market, technology focus/expertise and in-house capabilities. As a result, not all ESCOs can be considered as potential partners as far as EE PPPs are concerned.

Some of the key areas where ESCOs differ include the following: [\[Guidance 9\]](#)

- Ownership: ESCOs may be privately owned, utility subsidiaries, not-for-profit, joint ventures, manufacturers or manufacturers’ subsidiaries. There are also rare examples of state-owned or municipally-owned ESCOs;
- Target Market: ESCOs, focus on various market niches (hospitals, schools and municipally or state-owned buildings) and project sizes. [\[Guidance 12, 13\]](#) This has allowed them to develop specific skills in order to bundle several projects or replicate them easily while reducing transaction costs;
- Service Specialisation: Some ESCOs perform project installation using in-house expertise while others specialise in engineering design and analysis. Other ESCOs focus on measurement and evaluation. Public partners need to consider the nature of services delivered in order to ensure that a full service can be provided, possibly through subcontractors or a consortium;
- Technology: Many ESCOs display some level of technological bias (lighting, thermal storage, controls), which may be a constraint;

Table 1: Example of criteria for ESCO selection [Guidance 14]

	Hospital	Educational building	Office building
Ownership	Private company	Utility or manufacturer subsidiaries	Non-profit company
Targeted Market	Small/medium size project	Large project	
Service Specialisation	Engineering design and analysis	M&V	Installation and O&M
Technologies	Lighting	Heating, Ventilation and Air-Conditioning ("HVAC")	Regulation and control
Geographic Preference	Local/regional company	Country-based company	European-based company
Project Financing	Internal financing	Private third-party financing	Funding mechanism financing

- Geographic Preference: Some ESCOs focus their business in specific geographic regions; and
- Project Financing: Financing arrangements vary with the financial strength of the ESCO. Those with the financial capacity will be able to own and finance assets on behalf of the public sector. Some ESCOs have significant, well-established financing capabilities while others are limited. A number of ESCOs arrange financing through their lenders and/or through other ESCOs. It is important to note that all ESCOs rely to some extent on third-party financing. Even the larger ESCOs will have only limited internal financing capabilities but many have access to a variety of funding sources.

Table 1 shows various criteria that can help the public partner select an ESCO private partner that will match the EE project requirements.

2.1.2 Revenue streams

ESCOs will incur costs when implementing an energy retrofit project, which then produces energy savings. Regardless of the type of financing instrument used to fund a project, ESCOs effectively share in the resulting savings stream by guaranteeing a portion of the energy savings achieved for a contracted period of time. If the

present value of the ESCO's effective share of savings over the life of the contract is greater than the present value of all costs, the ESCO makes a profit. If not, it incurs a loss.

An ESCO's share of savings typically falls within a range from 50% to 90%, with 65% to 85% representing the most common range of values. EPCs generally last from 5 to 10 years but sometimes may last up to 15 years when they include long payback-period investments such as wall insulation or window replacements. Shorter terms are more common for private clients, while longer periods are usual for institutional and government projects (public buildings).

ESCOs can derive revenue and profit, if their estimates are correct, in three ways:

Cost plus: Most ESCOs derive revenue from the design and installation of cost-saving solutions at a client's facility. These costs are then marked-up to cover overheads and generate profit. ESCOs are required to limit costs so that they can be paid from savings over an agreed contract period. This motivates the ESCO to maximise the number and size of cost-effective measures in relation to the resulting savings stream.

Project financing: Some ESCOs derive income from the provision of project financing, although this is not generally the case. Acting as the source of project financing and using their engineering skills as a risk management tool for project investment decisions may be part of the total package.

Guaranteed savings: In the early days of performance contracting, ESCOs did not declare their costs since revenue was derived from sharing in a savings stream with the client. Thus, ESCOs were motivated to keep costs to a minimum and savings to a maximum. Some ESCOs also “share” savings that exceed original targets or estimates. However, this practice has evolved and should always be linked to a performance guarantee granted by the ESCO. This ensures that shared savings are limited to the amounts that exceed an established minimum guaranteed.

ESCOs usually refuse to take any risk related to energy prices as fluctuations over time have proved to be unpredictable. Instead, they measure the energy savings in physical terms, valued at the energy price current at the time of signature of the EPC or based on any other price commonly agreed upon with the public client. They take the risk of the degradation of performance due to aging equipment.

2.2 Various types of EPCs

The various criteria that characterise PPPs (financing by the private partner, partial or total risk transfer, output specification) also apply to EPCs, so that an EPC may be considered an EE PPP. However, from a contractual perspective, several variants of EPCs have been developed over the past 30 years. The purpose of this section is to describe the most common. **[Guidance 15, 16, 17, 18]**

There are four basic types of EPC contracts:

- a) Contracts in which the ESCO offers financing and provides a savings guarantee, meaning the ESCO bears both the financial and performance risk.
- b) Contracts in which the ESCO takes the performance risk and the customer is responsible for the financing.
- c) First out contracts, where all energy cost savings are

used to pay interest and amortise the debt until full repayment.

- d) Contracts for energy management in which the ESCO is paid to provide an energy service such as space heating or lighting “*chauffage*” (heating) contracts.

This section will focus on (a) and (d).

2.2.1 Guaranteed savings EPC

In a Guaranteed Savings EPC, the public partner obtains project funds directly from a third-party financier and takes on the financial risks. The ESCO is paid to provide all necessary support activities and facilitate the financial arrangement between the client and a financial institution. It provides a guarantee of a minimum level of energy savings, which allows for reimbursement of the loan. In the case of a shortfall in realised savings, the ESCO is obliged to make a reimbursement covering the difference between the expected savings and the amount to be paid back to the financial institution. If the actual energy savings exceed the ESCO’s guarantee, the public partner typically keeps the excess, unless further sharing arrangements have been made.

In a guaranteed savings project, the contractor will sign a traditional turnkey contract with its client and, in an additional agreement, commit to refunding any amounts received where the corresponding energy saving are not achieved.

The public partner must ensure that the ESCO has the financial capability to honour the guarantee.

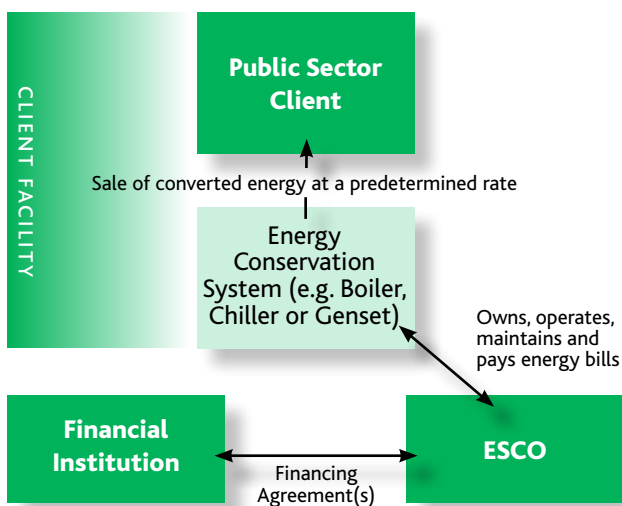
2.2.2 Rebate or *Chauffage* EPC

In a *chauffage* agreement, the ESCO guarantees that the public partner’s energy costs will be reduced by a certain percentage. During the contract period, the ESCO assumes responsibility for paying the owner’s utility bills and the owner agrees to pay the ESCO a percentage of its historical energy costs. Discounts of approximately 15% are typically applied. Contract periods range from 7 to 10 years and, from the payments received, the ESCO must recover its expenses and cover the owner’s utility bills. The ESCO generates a return by ensuring sufficient savings in order to compensate for the discount given to the client.

In a *chauffage* contract, an ESCO contractor becomes the owner of an energy conversion system located at its client’s premises. Cooling and hot water are energy flows

that have been converted, for example a chiller plant can be used to convert electricity into cooling or a boiler house to convert fuel into hot water. After the contract is signed, the contractor will operate and maintain the client's installations, pay the energy bills for the energy conversion system and invest to increase its efficiency. The contractor sells the "converted" energy at a predetermined "rebate" rate to its client, complying with a predetermined minimum quality level of "converted" energy supply during the term of the contract.

Figure 3: *Chauffage* EPC



The *chauffage* contract is not based on any project in particular. The ESCO does not need to present a detailed retrofit design to the client before the deal is closed. Instead, the ESCO will make the required system improvements. The more the ESCO achieves a reduction of the energy, maintenance and operating, the higher the profit. The public partner does not benefit from this as it is tied into the predetermined rate, unless it has negotiated an additional shared-savings clause.

Chauffage contracts should not be seen as "true" EE PPPs. However, many public sector clients prefer this type of deal because they do not want to take responsibility for their energy conversion system. They prefer to outsource the operation and maintenance component of this part of their facilities so that they can concentrate on their core activities.

2.3 EE project selection and EPC feasibility

The public partner rarely has the capacity to develop a detailed scope of the potential EE measures for their building pool. They should, however, take steps to develop a general scope of work based on their priorities, time constraints and other criteria. Wherever feasible, the public sector should conduct preliminary audits, either in all or in a representative sample of its project buildings, in order to collect preliminary information about savings potential.

The public partner and the ESCO need to negotiate a contract under which both parties will assume specific responsibilities at each stage of a project. In particular, the contract should describe the responsibilities of the ESCO and the facility owner for each phase of the project (i.e. audit and concept development, detailed design, construction and post-construction). Issues concerning the public procurement process are addressed in detail in Chapter 3. [\[Guidance 20, 21, 22, 23\]](#)

Step 1 Selection of buildings: The public partner selects one or more buildings for the implementation of EE measures. The preferred size of EE projects for ESCOs starts from about EUR 2 million, with the average being approximately EUR 5 million. The public partner should select a building, or a pool of buildings, that falls within this investment range. Larger building pools will limit the participation of smaller ESCOs.

Step 2 Preliminary assessment of energy savings potential: Having selected one or more buildings, the public partner undertakes a preliminary assessment of the energy savings potential in these buildings. This can be performed on the basis of a sample of buildings or on the basis of assessing each and every building in the pool. The level and detail of assessment depend on the internal capacity of the public partner to conduct this assessment and on its decision to outsource all or part of this assessment to specialised advisers. These preliminary estimates will help the public



partner in its negotiations with ESCOs. In many cases the cost of the audits will be borne by the ESCO.

- Step 3 **Initial meeting:** The initial meeting between the public partner and ESCO is usually carried out after the ESCO pre-qualification stage. The objective for the public partner is to clarify performance contracting issues with the ESCO and to agree on a procedure to collect the historical energy data and other operational information. This will serve as a basis for the calculation of the energy consumption baseline.
- Step 4 **Preliminary walk-through audit:** This step is essential for most ESCOs as, based on experience and technical skills, it will provide a rough estimate of the investment costs required to achieve the expected savings. At this step, these estimates will reassure the ESCO that the time and investment up to the signing of a contract is warranted. As a result, it may be essential that this preliminary walk-through audit be prepared with some of the pre-qualified ESCOs prior to launching the tender.
- Step 5 **Review of cost data:** Analytical software programs, often proprietary to the ESCO, are used to develop patterns of energy use and forecast probable areas for savings and efficiency improvements. Additionally, comparisons are made between the energy intensity of the building and that of comparable buildings.
- Step 6 **Estimation of savings potential:** Combining the analysis with the results of the initial walk-through audit, the ESCO can determine whether there is sufficient potential for cost savings. If this is the case, the ESCO will proceed but if the potential is too low, the ESCO may withdraw or ask for alternative facilities to be selected.
- Step 7 **Tendering process:** The ESCO will prepare a bid document based on the specifications

of the invitation to tender. The process for confirming the elements calculated by the ESCO during this feasibility phase must be included in the general approach through a detailed audit and inventory. This will allow the ESCO to submit a plan detailing the work to be performed and the savings to be achieved. The detailed audit phase is essential to obtain metrics stating the various ways through which energy is consumed, including the use of other commodities such as water. Similarly, the analysis must take into consideration the potential savings that could be generated through changes in the energy production system (e.g. co-generation when applicable or renewable energy sources). The ESCO must convince the public partner that it has the resources and skills to develop a successful business relationship. If the facility owner or manager elects not to proceed with a particular ESCO, the cost of the detailed audit will generally be reimbursed to the bidder (usually at a pre-determined cost). Otherwise, the cost of the study is rolled forward into the EPC. If the public partner and the ESCO proceed with the EPC, the feasibility study becomes a deliverable under the contract.

Project Identification: LINKS

Guidance 5

EPC Watch – Watching the World of Energy Performance Contracting, information website

The website contains a Q&A section regarding the basics of EPCs.

<http://energyperformancecontracting.org/>

Guidance 6

Joint Public-Private Approaches for Energy Efficiency Finance: Policies to Scale up Private Sector Investment, International Energy Agency (2011)

Pages 24 to 28 provide an introduction to ESPC (or EPC as referred to in this document), and illustrate various ESPC structures.

<http://www.iea.org/papers/pathways/finance.pdf>

Guidance 7

Introduction to Energy Performance Contracting, ICF International, National Association of Energy Service Companies (NAESCO) (October 2007). Prepared for the US Environmental Protection Agency – Energy Star Buildings.

Section 2 (pages 6-7) explains the basics of an EPC (or ESPC as referred to in the NAESCO document).

http://www.energystar.gov/ia/partners/spp_res/Introduction_to_Performance_Contracting.pdf

Guidance 8

Energy Service Companies Market in Europe – Status Report 2010, Angelica Marino, Paolo Bertoldi, Silvia Rezessy – JRC Institute for Energy (2010)

Section 2.1 presents the ESCO market and the types of ESCOs in each EU country.

<http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/15108/1/jrc59863%20real%20final%20esco%20report%202010.pdf>

Guidance 9

Energy Service Companies in Europe – Status Report 2005, Paolo Bertoldi, Silvia Rezessy – JRC Institute for Energy (2005)

Section 5 shows typical elements provided by ESCOs in a project.

<http://re.jrc.ec.europa.eu/energyefficiency/pdf/ESCO%20report%20final%20revised%20v2.pdf>

Guidance 10

Energy Service Companies in Europe – Status Report 2005, Paolo Bertoldi, Silvia Rezessy – JRC Institute for Energy (2005)

Section 2.3 defines components of an EE project carried out by ESCOs.

http://www.grazer-ea.at/eesi/upload/download/diskussionspapiere/091018_gea_energy_contracting_definitions-discussion_paper.pdf

Guidance 11

Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft

Section 5 introduces the services that an ESCO can provide.

Guidance 12

Energy Service Companies Market in Europe – Status Report 2010, JRC Scientific and Technical Reports, European Commission Joint Research Centre (2010)

Section 2 provides an overview of the European ESCO market in 2010, with detailed analysis for each Member State.

<http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/15108/1/jrc59863%20real%20final%20esco%20report%202010.pdf>

Guidance 13

Eurocontract Guaranteed Energy Performance, Publishable Report, Berliner Energieagentur GmbH (2008)

The report provides an overview of EPCs, and information about the market development in Germany, Austria, Finland, France, Greece, Italy, Norway and Sweden.

http://eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1576&side=downloadablefiles

Guidance 14

Client/ESCO SELECTION, IEE – BioSolESCO, TV Energy (2009)

The section on ESCO selection presents the criteria which a client should consider when choosing an ESCO.

http://www.biosolesco.org/guidance/uk/Biosolesco4_eng.pdf

Guidance 15

Final Publishable Report, EUROCONTRACT IEE (February 2008)

Presentation of adapted EPC models for refurbishment in the public sector (pages 49- 56).

http://ieea.erba.hu/ieea/fileshow.jsp?att_id=5828&place=pa&url=Eurocontract_Final_Report_Publishable.pdf&prid=1576

Guidance 16

Third Party Financing – Achieving its Potential, Energy Charter Secretariat (2003)

Section 2.2 provides a summary of the main financing approaches for an EPC.

http://www.encharter.org/fileadmin/user_upload/document/Energy_Efficiency_-_Third-Party_Financing_-_2003_-_ENG.pdf

Guidance 17

International Experiences with the Development of ESCO Markets, Berliner Energieagentur GmbH (December 2008)

Section 2.2 shows different kinds of EPC models.

<http://www.gtz.de/de/dokumente/en-International-Experience-Developing-ESCO-Markets.pdf>

Guidance 18

Standard EPC Documents – V. Energy Performance Contracts, EESI IEE, Prepared by SEVEN, Berliner Energieagentur (January 2011)

Short description of EPC articles.

http://www.european-energy-service-initiative.net/fileadmin/user_upload/gea/standard_documents/Standard5_Contracts.pdf

Guidance 19

Berliner Energie Agentur

<http://www.berliner-e-agentur.de/en>

Guidance 20

Models and Contracts, PRIME IEE, Author: Wuppertal Institute for Climate, Environment, Energy (July 2006).

Section 5: The appendix presents a model contract for EPCs (in German) (pages 5-20).

Guidance 21

Public Procurement of Energy Efficiency Services – Getting Started, Energy Sector Management Assistance Program, World Bank (November 2010)

Pages 17 to 23 expound the World Bank procurement guidelines dividing an EPC in two contract types: split design and construction and combined design and construction.

http://www.esmap.org/esmap/sites/esmap.org/files/BN009-10_EECI-Public-Procurement-Getting-Started.pdf

Guidance 22

Comprehension Refurbishment of Buildings with Energy Performance Contracting, EUROCONTRACT IEE, Reported by Graz Energy Agency Ltd (December 2007)

Section 6: Guidelines and Components for Implementation.

http://www.european-energy-service-initiative.net/fileadmin/user_upload/bea/Documents/Contractual_Issues/Comprehensive_Refurbishment-manual_main_part_071220.pdf

Guidance 23

Assessment of Policy Instruments for Reducing Greenhouse Gas Emissions from Buildings, UNEP SBCI Sustainable Buildings and Construction Initiative (2007)

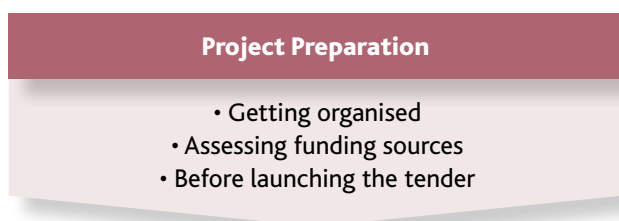
Table 14 on page 30 summarizes barriers to EPC in different sectors alongside possible solutions.

http://www.unep.org/themes/consumption/pdf/SBCI_CEU_Policy_Tool_Report.pdf

3. Project Preparation

Prior to launching a tender or entering into a procurement phase, it is important to carry out a market analysis at national level or European level. This will assess the presence of private partners likely to tender for EE PPPs.

Figure 4: Analysis of the various types of schemes



3.1 Getting organised

The public partner has to undertake a project preparation process prior to procurement and implementation. The public partner must define all project parameters, assess the potential involvement of private partners, evaluate the costs, risks and benefits of the different options available and prove that the PPP option is preferable to any alternative. There are two major stages in the preparation process.

Initially the public partner ensures that it has the resources and organisation to set the project in motion. [\[Guidance 24\]](#) Standard elements of the PPP preparation process are detailed in Section 3.1 of the Guide to Guidance ("G2G").

3.1.1 EE Financial expertise

In addition to the team members outlined in the G2G, the public partner needs to include an EE expert. [\[Guidance 25\]](#) The role of this expert is to help structure the project, define technical performance indicators and develop the technical part of the tender. The expert should have experience in implementing EE projects in buildings, be able to assess the technical proposals of bidders and show proficiency in identifying the best solution for the

public partner. The expert will also play a key part in the commercial negotiations, advising on what technical risks are to be transferred to the private partner and what levels of performance will be required.

The role of the EE financial expert includes a comprehensive understanding of financing through the PPP mechanism, financial risk assessment and risk allocation. This includes feasibility analyses as well as assessing the financial credibility of the prospective private partners. The financial expert should have an understanding of EE transactions, their related cash flows and budget implications.

In infrastructure PPPs, the private partner is required to implement the project in compliance with existing building standards only. In EE PPPs, there can be numerous technical solutions that fit these standards. Specialised EE assessment is therefore required to select the best value VFM solution. Finally, the expert should be able to perform technical checks and conduct analyses at different stages of the project development and implementation.

There can be many instances where public partners will not have sufficient internal capacity to assess or prepare aspects of the EE PPP and it will be necessary to retain the services of external advisers. This element is referred to in more detail in the G2G. [\[Guidance 2, Section 3.1.2, page 25\]](#)

3.1.2 Plan and schedule

With the team structure in place, the public partner can then develop a plan for procurement, contracting and implementation. The plan should involve the following:

- listing general tasks, activities and relevant documents throughout the entire process;
- consulting with the steering committee on the process;
- consulting with individual building management teams;

- allocating relevant experts/third-parties to the different tasks;
- establishing interdependencies;
- defining the timeline for each task;
- setting out any specific deadlines in the process (e.g. EE implementation can only be carried out between March and October or during holidays); and
- coordinating the plan and schedule with the steering committee and getting approval.

A more general plan is outlined in the G2G. [\[Guidance 2, Section 3.1.3, page 27\]](#)

3.2 Assessing funding sources and selecting method of financing

There are three sources of financing for PPPs: (i) the public sector through commercial banks, equipment suppliers or other sources of third-party finance (e.g. asset based leasing, investment from specially created EE funds), (ii) the private partner through commercial banks, specialised equity funds and/or securitisation structures or (iii) a combination of both. [\[Guidance 26, 27, 28, 29, 30, 31, 32\]](#)

The main reason for entering into an EE PPP is to receive a better quality of service and performance guarantees through the transfer of risk and to mobilise private sector financing. [\[Guidance 33\]](#) Private sector financing provides the ability to significantly scale-up EE operations in buildings. In addition, when public authorities face constraints on their borrowing capacity, PPPs may provide an attractive solution as private contractors can finance projects through mechanisms that are different from formal loans and can be tailored to the individual cash flows of each project.

A key obstacle for many EE projects is, however, the proportionally high transaction costs that are incurred when developing bespoke (i.e. customised, non-standard) EE financing. Since capital requirements are generally low, the costs associated with preparing technical feasibility studies and negotiating key agreements become

disproportionate unless an effort is made to maximise opportunities for standardisation and economies of scale. Transaction costs can therefore often be the decisive element on whether a particular project will be feasible and what financing method is to be employed. The EU makes grants available for technical assistance under European Local Energy Assistance (“ELENA”) [\[Guidance 34\]](#) as well as EEEF. [\[Guidance 35\]](#)

Example: The ELENA facility provided technical assistance to the city of Paris for the preparation and implementation of a refurbishment project regarding three bundles of schools (100 schools each). The project involves the improvement of the energy envelope of the building, specifically management systems with control and monitoring of the energy devices installed, EE lighting, and installation of photovoltaic panels on schools rooftops. The energy consumption and CO₂ emissions are expected to reduce by 30% compared to baseline levels. [\[Guidance 37\]](#)

Projects can be financed in a number of different ways. The preferred approach will often be through a combination of mechanisms and with finance sourced from various entities. In the case of a city authority that is seeking to upgrade its district heating system by replacing boilers and reducing heat loss, a combination of funding sources can be used. This can combine a soft loan from a designated special fund, plus bank financing via the ESCO. When selecting its financing options, the public partner should also consider taxation implications such as VAT and corporate income tax.

There are key trade-offs. If the EE project has the potential to generate significant value (i.e. the payback for investment is short and cash flows are high), then the focus will be on selecting a financing structure with the lowest cost debt or equity options. However, for the majority of EE projects, funding will often be the limiting factor and the primary emphasis will be on putting together finance that meets all the requirements and where restrictions such as the requirement for extra security or guarantees can be minimised.

3.2.1 Internal sources

Public partners with sufficient funds can self-finance EE projects. However, governments are currently under enormous spending pressures and typically set a limit on the amount of capital that a municipality can invest and more specifically the amount of money that it can borrow. There is also the potential issue that an authority funding an EE scheme directly may not be able to retain all financial savings due to various budgetary rules or controls.

In times of budgetary constraint and rationalisation, there is a need for innovative financial schemes that create synergies and attract investments by aligning the interests of both public and private partners. To be efficient and managed over the longer term, EE projects will require tailor-made financing. Complex project financing requires the involvement of commercial banks and private partners. EPCs and ESCOs are able to support an EE project when internal sources or on-balance sheet investments are limited.

Public authorities typically lack the necessary energy consumption data and information about best value technologies and project implementation required to lead EE projects. This means that self-financing by the public authority is significantly less attractive than using PPPs. When assessing self-financing compared to other means of financing, the public partner must consider the following questions:

- Does this project have higher priority compared to other public projects competing for the same funding?
- Will the benefits achieved by a particular project outweigh the benefits of alternative projects?
- Are alternative financing mechanisms more expensive than the returns on the project?
- Is the timing of the project critical? Can the public partner afford to wait until it can raise alternative financing?

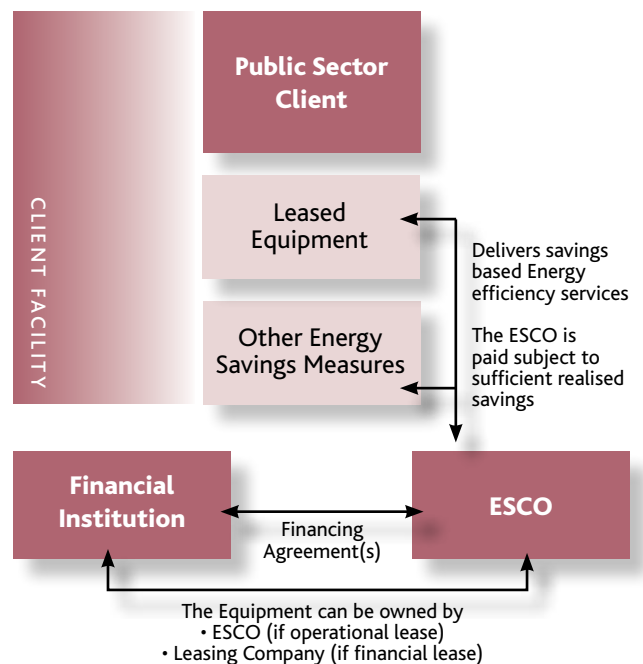
If the answer to all these questions is "yes," the public sector may finance the project with internal funds.

Asset-based finance

As an alternative to self-financing, leasing can be used to

finance the purchase of EE equipment and services. It is commonly used in vendor financing, ESCO projects and as part of utility programmes. Lease financing can also be applied to EE manufacturing ventures. Large numbers of similar transactions facilitate a statistical approach to managing end-user credit risk. Lease financing is possible only in countries that have well developed capital markets and a suitable regulatory framework.

Figure 5: Commercial leases



A lease agreement permits the use of equipment without purchasing it at the outset. It is particularly suitable for certain types of equipment used in EE projects, such as generating plant. Ideally, the equipment should be mobile (i.e. can be moved within a few hours) such as small CHP units which are fitted into a container. Mobile plant is much more likely to have a readily accessible second-hand market. Other less mobile plant (e.g. boilers) is also suitable.

Leasing can form an important element of the financing for an EE project, particularly if it can be combined with other soft-funding sources and when it forms part of an overall vendor sales package. For some time, sellers of heavy plant and equipment have recognised the value of

after-sales support to their business. In certain sectors such as aircraft engines, it is common practice to sell equipment on the basis of 'power by the hour', i.e. where finance and technical support are bundled and where the seller accepts the financial costs associated with the risk of equipment failure.

From a financial reporting perspective, commercial leases fall into two categories: an operating lease or a finance lease, each with different tax and legal treatments. In an operating lease, the lessor transfers the right to use the EE assets to the lessee. At the end of the lease period, the lessee returns the assets to the lessor. As the lessee does not assume the risk of ownership, the lease expense is treated as an operating expense in the income statement and the lease does not affect its balance sheet. Due to the fact that assets installed in an EE project rarely have any residual value, this type of lease is rarely applicable to EE in buildings.

In a finance lease, the lessee assumes some of the risks of ownership and enjoys some of the benefits. Consequently, the lease, when signed, is recognised both as an asset and as a liability (for the lease payments) on the balance sheet. The lessee claims depreciation on the asset and deducts the interest expense component of the lease payment each year. In general, finance leases recognise expenses sooner than equivalent operating leases. This type of lease is applicable to EE transactions, subject to the lessor being satisfied with the general financial standing of the lessee.

Most energy-saving measures involve civil works. However, some elements of an EE project can be financed through leasing. Usually, these elements include lighting, heating and cooling systems as well as renewable energy components such as solar panels. In a comprehensive EE project, leasing finance has to be combined with other sources of funding. This financing structure obliges the ESCO to pay the lessor while its revenues are subject to sufficient savings. In the context of a commercial lease, the financial risk is shifted to the balance sheet of the ESCO. In addition, the transaction does not impede the borrowing capacity of the public partner for other projects. However, in the event of the ESCO defaulting, the lessor will reclaim the equipment, which can disrupt the operations of the client building.

Vendor finance

Vendor financing typically involves major equipment suppliers (e.g. Philips, Siemens, Johnson Controls) using financial resources that permit them to offer "point of sale" financing for their equipment. The funding is typically facilitated or provided directly by a financial intermediary. Vendor financing is particularly suitable for standard equipment that can be used for EE within the residential and small commercial/industrial sectors. Vendor financing is similar to leasing in that it permits a statistical or portfolio risk approach for credit risk management. In some respects, leasing can be considered a sub-set of vendor financing.

There are typically two types of agreement under vendor financing schemes. One involves the vendor and a financial intermediary and the other is an agreement between the vendor and the end customer. The vendor/funder agreement includes the specific terms for the funding (e.g. interest rates, repayment period) while the vendor agreement defines who is responsible for default and non-payment by the end customer. Vendor agreements for EE related equipment are typically structured so that the amortisation schedule for the end customer is lower than the value of the energy savings achieved from the investment.

In the case of a municipality, the equipment manufacturer sells plant and equipment to the municipality under a loan with specified repayments. The terms for the loan are agreed between the municipality and the vendor and will generally be short-term. Vendor funding is usually at preferential rates. The borrower is typically the municipality that is purchasing the EE equipment.

3.2.2 External sources

ESCO financing

There are a number of ways in which an ESCO can be used to support the funding required for an EE project. The simplest option for funding EE is to obtain commercial debt supported by an energy savings guarantee agreement from the ESCO. The energy savings guarantee is key to the perception of risk but its value will be strongly influenced by the credit standing of the ESCO involved.

Some of the most effective EE schemes are where the ESCO (often through third-parties) has combined separate

EE schemes and established a portfolio of buildings undergoing EE. A widely quoted example and successful model for public buildings was developed between the Berlin Energy Agency and the Berlin Senate in the 1990s. The co-operation resulted in the "Berlin Energy Saving Partnership". It permitted the efficient refurbishment of public and private buildings over an extended period of time. A number of ESCOs bid competitively for individual projects and provided the financing and were responsible for implementation. Buildings requiring refurbishment were bundled together, increasing the potential energy savings as well as providing key synergies and thereby improving the overall viability of what was a major EE project.

In addition, an ESCO may partner with other investors to raise funding. An increasing number of special funds have become established that provide equity investment for EE. A good example is the recently established European EE Fund ("EEEF"). The EEEF aims to provide market-based financing for commercially viable public EE and renewable energy projects within the European Union ("EU"). It is supported by the European Commission, the European Investment Bank ("EIB"), the Cassa Depositi e Prestiti ("CDP") and the Deutsche Bank.

There are also a variety of other ways in which a contract with an ESCO can be used to obtain financing. Further details are covered in Section 4.

3.2.3 Innovative debt funding

There are a range of sources of debt financing for EE projects, however standard commercial bank financing is often difficult to obtain. In particular, it is difficult to achieve the requirement for clear delineation of a particular EE scheme that identifies sources of repayment and the underlying security supporting the financing. In theory, the financing of an EE project can be based on project finance principles as the investment cost should be reimbursed by cash flow savings generated by the project. However, commercial banks have typically been reluctant to simply rely on the economics of the project and require additional security in the form of collateral and guarantees.

Guarantees can be provided by third-parties to support commercial bank financing and provide additional credit

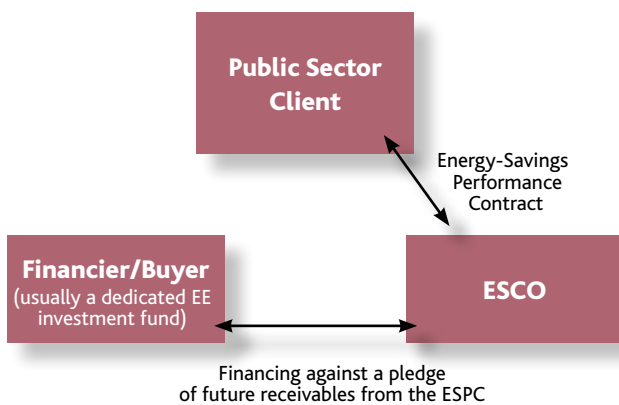
support. Guarantees can be made on part of a loan, debt service or to assure an investor's return on equity. Commercial banks can also issue guarantees as third-parties to support a particular project where other sources of funding are available. For example, if the credit rating of a municipality does not meet lender requirements, it may be possible to obtain credit guarantees from special facilities established by international donors and international financial institutions). Similarly, central government departments or the Ministry of Finance may provide suitable guarantees.

A substantial element of financing for municipal EE projects, particularly in the EU-12, over the past 15 years has come from Independent Financial Institutions ("IFIs"), such as European Bank for Reconstruction and Development ("EBRD"), EIB, the IFC and the Nordic Environment Finance Corporation. Given the priority placed on achieving GHG and carbon emission targets, there may be a variety of options available for utilising grant funding. Grants will typically be provided on a selective basis and will generally require some form of co-financing. In certain cases, grants are made available in the form of a Revolving Fund ("RF"), which is the main concept behind the JESSICA (Joint European Support for Sustainable Investment in City Areas) scheme. The RF is usually established for a specific purpose with the intention that it is repaid, at least in part (e.g. using soft loan), in order to release money from successfully operating projects, for investment in new initiatives. RF's can minimise the transaction costs associated with providing funding. A single entity manages the RF, and it can accumulate valuable local knowledge and expertise and apply this to standardising processes and procedures.

The RF becomes self-sustaining and provides on-going financing after the first capitalisation. As a fund, rather than a specific project, the initial investment can be raised from a combination of sources. However, one of the issues often facing RFs is that the public partner may be constrained by budgetary rules on the extent to which it can recycle grant monies, since savings achieved may simply reduce the overall budget.

A Receivables Purchase Agreement (“RPA”) is a less common yet effective mechanism for financing and has been used in the EU. RPA is mostly relevant for short-term contracts where the investment payback period is around three to four years. However, in Bulgaria, the publicly traded Fund for Energy and Energy Savings finances and operates the RPA scheme for local ESCOs purchasing receivables on ESCO contracts of up to seven years.

Figure 6: Receivables purchase agreements



The public partners pledges the projected future stream of energy savings to the ESCO. The ESCO then sells this pledge, minus annual costs earmarked for the O&M of the project, to a third-party financier.

The primary advantages of an RPA are speed of execution and transaction simplicity. Specific legal systems (e.g. France and Germany) also underpin the use of RPA by ensuring that the underlying obligations to pay by the public sector become irrevocable. The main disadvantage is that the valuation and discounting of the future cash flows created by the project depend on a third party (usually a commercial bank) providing the funding. It is generally more expensive compared with other forms of long-term debt provided on a project basis.

Under RPA, the public partner has an obligation to pay up to the amount of savings generated from the project. As this is an estimate, the ESCO bears the risk of the energy savings being insufficient to cover the payments on the financing at certain points throughout the life of the project.

3.3 Before launching the tender

Conduct additional preparatory work, if necessary

Often the public partner does not have all the information needed to carry out the preparation in the necessary level of detail. In such cases, additional preparatory work and studies can be performed, either in-house by the development team or outsourced to consultants with the relevant experience. This step is covered in Section 3.2.1 of the G2G. [\[Guidance 2, page 32\]](#)

Prepare detailed PPP design

The PPP design must consider the needs of all parties and the objectives of the project. Particular attention must be paid to the design of procurement procedures and contract management/monitoring systems. Issues to be considered include:

the completion of the project design relative to the PPP structure selected:

- technical performance standards;
- financial assessment to ensure viability; and
- assessment of future contract forms.

the selection and design of the tendering process:

- type of tender process;
- tender procedures;
- evaluation procedures;
- negotiation procedures; and
- contract award procedures.

the implementation conditions:

- monitoring and oversight conditions; and
- redress and renegotiation.

It is of crucial importance that the invitation to tender carefully defines the project while not being too prescriptive, to allow for innovative responses from the private sector.

For more information on preparing the detailed design of the PPP arrangement, see Section 3.2.2 of the G2G. [\[Guidance 2, page 36\]](#)

Select procurement method

In EE for public buildings, the public partner can choose from a number of procurement methods that are applicable to PPPs. [\[Guidance 30\]](#)

When the objective of the public sector is to use a performance-based PPP to implement EE in public buildings, the number of procurement approaches is much more limited:

Indefinite contracting – a procurement method that pre-selects one or more ESCOs on the basis of general qualifications. Government agencies are then allowed to negotiate directly with one of these pre-selected companies.

Project bundling – a government agency bundles together a pool of buildings to award a single contract to a large ESCO.

Quality and cost-based selection (two steps) – a process where bidders present short proposals and provide additional information. The proposals are then evaluated in accordance with a set of project-specific pre-qualification criteria. Bidders matching the criteria are then requested to submit detailed proposals.

More detailed information on procurement methods is available in the G2G. [\[Guidance 2, pages 40-41\]](#)

Define bid evaluation criteria

The evaluation of energy service projects is complex. Although the EE measures implemented in public buildings are fairly standard, proposals will still offer different solutions to achieve varying degrees of energy savings. They will also provide different M&V tools allowing for various degrees of precision following implementation.

The number of factors included in proposals will make them very difficult to evaluate on cost only. Balanced scoring criteria that weighs and assesses all the key elements in the EE project should be developed. [\[Guidance 38, 39, 40\]](#)

General aspects of the bid evaluation criteria are detailed in Section 3.2.4 of the G2G. [\[Guidance 2, page 44\]](#)

Prepare draft PPP contract

The contract must be structured to address the items already discussed in Sections 2.2 and 3.2. Usually the invitation to tender contains a draft contract but because the bidders can propose solutions that achieve the desired energy savings using different means, the final PPP contract can significantly differ from its draft version. [\[Guidance 18, 20, 39\]](#) The contract will also include all the elements of a standard PPP contract. [\[Guidance 2, page 23\]](#)

A key feature of the energy performance contracting scheme is that, very often, at the stage of awarding the contract, the precise costs of the project are yet to be determined (see Section 5.1). As a result, the public partner must have the ability to manage variations in EE proposals and solutions. To address this, the in-house procurement specialist can work under the guidance of an experienced EE procurement agent, an approach adopted in Austria, the Czech Republic, Germany and the Slovak Republic. A procurement agent may be another public agency, a utility, a PPP, an NGO or a private consulting firm often hired on a fee-for-service basis throughout the entire EPC procurement process, including negotiations and contract supervision.

3.4 Using technical assistance for project preparation

The development and supervision of the EPC is a crucial element in a project's success yet most of the public partners lack the necessary capability. To address this, there are a number of initiatives to provide Technical Assistance ("TA") funding for the preparatory phase:

EU Structural Funds: For the 2007-2013 programming period, TA is available to Member States or regions under the Structural Funds, with divergent application procedures across member-states.

National support schemes: TA funds for energy auditing or certification activities may be included in national support schemes, varying by country.

ELENA facility: European Local Energy Assistance is a TA facility created under the Intelligent Energy Europe II Programme. Launched in 2009, it provides TA grants to local and regional authorities for the development and launch of sustainable energy investments, covering up to 90% of eligible cost (see Section 5).

EEEF: The European EEEF Fund, launched in July 2011, aims at financing projects in EE, RES and clean urban transport through innovative instruments and, in particular, promoting the application of the EPC. A TA grant support (EUR 20 million) is available for technical and financial project development services (see Section 5).

MLEI: Mobilising Local Energy Investment is a scheme aiming at assisting the development of small scale projects (minimum EUR 6 million). It provides grants of up to 75% of the costs incurred by public authorities for TA to prepare, mobilise financing and launch investments in sustainable energy projects. **[Guidance 41, Guidance 42]** Proposing authorities may work together with financial institutions and/or ESCOs or other relevant stakeholders. Grants are awarded for up to three years, during which time the proposed investments must be launched and tenders issued for construction or implementation. (Section 5)

Project Preparation: LINKS

Guidance 2

The Guide to Guidance. How to prepare, Procure and Deliver PPP Projects.

www.eib.org/epec/g2g/index.htm

Guidance 18

Standard EPC Documents – V. Energy Performance Contracts, EESI IEE, Prepared by SEVEn, Berliner Energieagentur (January 2011)

Short description of EPC articles.

http://www.european-energy-service-initiative.net/fileadmin/user_upload/gea/standard_documents/Standard5_Contracts.pdf

Guidance 20

Models and Contracts, PRIME IEE, Author: Wuppertal Institute for Climate, Environment, Energy (July 2006).

Section 5: The appendix presents a model contract for EPCs (in German) (pages 5-20).

Guidance 25

Measuring Energy Efficiency. Indicators and Potential in Buildings, Communities and Energy Systems. VTT Research Notes 2581, 2011.

Chapter 5 illustrates methods for EE measurement in buildings.

<http://www.vtt.fi/inf/pdf/tiedotteet/2011/T2581.pdf>

Guidance 26

Comparison and Evaluation of Financing Options for Energy Performance Contracting Projects, EUROCONTRACT IEE, Reported by Graz Energy Agency Ltd (August 2010)

Chapters 4 to 6 show various financing options and their parameters: credit financing (Chapter 4), leasing financing (Chapter 5) and cession and forfeiting of contracting rates (Chapter 6).

[http://www.ieadsm.org/Files/Tasks/Task%20XVI%20-%20Competitive%20Energy%20Services%20\(Energy%20Contracting,%20ESCo%20Services\)/Publications/101126_GEA-T16_Finance%20Options%20for%20Energy-Contracting%20incl%20Examples.pdf](http://www.ieadsm.org/Files/Tasks/Task%20XVI%20-%20Competitive%20Energy%20Services%20(Energy%20Contracting,%20ESCo%20Services)/Publications/101126_GEA-T16_Finance%20Options%20for%20Energy-Contracting%20incl%20Examples.pdf)

Guidance 27

International Experiences with the Development of ESCO Markets, Berliner Energieagentur GmbH (December 2008)

Section 2.3 presents the three fundamental financing options: ESCO, energy-user or TP financing.

<http://www.gtz.de/de/dokumente/en-International-Experience-Developing-ESCO-Markets.pdf>

Guidance 28**Synthesis Report on ESCo Definition, Approaches, Drivers, Success Factors and Hurdles, A. Giakoumi & G. Markogiannakis (CRES) – BIOLESCO (January 2012)**

Section 3.1.3 describes the financial institutions and schemes used in several European countries.

<http://www.biolesco.org/download/Bio-SoleSCo%20D2.2.%20Synthesis%20report.pdf>

Guidance 29**Fund for Energy and Energy Savings, Bulgaria**

Websites with information on the Fund (in Bulgarian and English).

The Fund is listed on the Bulgarian Stock Exchange (Code: 6EE/FEEI).

<http://enemona.bg/english/index.php?97>

<http://www.investor.bg/companies/view/1122.html>

<http://www.eesf.biz/>

Guidance 30**Public Procurement of Energy Efficiency Services – Getting started, Energy Sector Management Assistance Program, World Bank (November 2010)**

Presentation of financing options (pages 25-30).

http://www.esmap.org/esmap/sites/esmap.org/files/BN009-10_EECI-Public-Procurement-Getting-Started.pdf

Guidance 31**Energy Efficiency Retrofit Fund, Guide for Applicants. Sustainable Energy Authority of Ireland, May 2010.**

This fact sheet describes the funding scheme available for EE retrofitting in Ireland.

http://www.seai.ie/Grants/Retrofit/EERF_Application_guide.pdf

Guidance 32**Working paper: current financial and fiscal incentive programmes for sustainable energy in buildings from across Europe, Association for the Conservation of Energy, London (September 2009)**

The document presents a country breakdown of the financial and fiscal incentives available in the European Economic Area (EEA).

http://www.euroace.org/PublicDocumentDownload.aspx?Command=3DCore_Download%26EntryId%3D205&ei=fXl7T7KsDcTG0QXAlKft&usg=AFQjCNGtQGPhVTtseXFubuaXO7fzjkGVw

Guidance 33**Joint Public-Private Approaches for Energy Efficiency Finance: Policies to Scale up Private Sector Investment, International Energy Agency (2011)**

Comprehensive report on the critical elements of joint public-private approaches to accelerating and scaling up private investment in EE with particular focus on lessons learned with regard to energy performance contracts, risk guarantees and dedicated credit lines.

<http://www.iea.org/papers/pathways/finance.pdf>

Guidance 34**European Local Energy Assistance (ELENA)**

The following link describes the main facts of the ELENA initiative.

<http://www.eib.org/epcc/resources/epcc-elena-factsheet.pdf>

Guidance 35

European Energy Efficiency Fund (EEEF) and its technical assistance

<http://www.eeef.eu/financing-terms.html>

Guidance 36

Berliner Energie Agentur

The following link describes the housing development project in Weissensee:

<http://www.berliner-e-agentur.de/en/services/contracting>

Guidance 37

European Local Energy Assistance (ELENA)

The following link contains a list of project for which ELENA provided technical assistance:

<http://www.eib.org/elena>

Guidance 38

Public Procurement of Energy Efficiency Services – Lessons from International Experience, World Bank (November 2010)

Chapter 4 (pages 43-55) details relevant procurement methods for EE.

Chapter 6 (pages 92-102) defines the bid evaluation process, lists evaluation criteria and provides project examples.

http://www.esmap.org/esmap/sites/esmap.org/files/P112187_GBL_Public%20Procurement%20of%20Energy%20Efficiency%20Services_Lessons%20from%20International%20Experience_Singh.pdf

Guidance 39

Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.

Section on Bid Evaluation, Table 6.3 (Page 94) displays a sample list of evaluation criteria and their scoring points and weight in the final evaluation.

Guidance 40

Guideline for Designing Energy Efficiency Services Contracts, PU-BENEFS IEE, Coordinator Crispin Webber, Thamesenergy LTD (September 2007)

Section 3 consists of a guideline for EPCs.

http://www.iee-library.eu/images/all_ieelibrary_docs/pubenefs_guidelineformodelcontract_en.pdf

Guidance 41

Call for Proposals 2012 for Actions under the Programme “Intelligent Energy – Europe,” Intelligent Energy Europe for a Sustainable Future (2012)

Pages 25-27 summarize the purpose and priorities of Mobilizing Local Energy Investments (MLEI).

http://ec.europa.eu/energy/intelligent/files/call_for_proposals/call_2012_en.pdf

Guidance 42

Mobilising Local Energy Investments (MLEI) Factsheet, Intelligent Energy Europe for a Sustainable Future (2011)

The factsheet contains information on how to apply for technical assistance funding under MLEI, and on the types of eligible investment projects and public authorities.

http://www.nks-energie.de/lw_resource/datapool/_pages/pdp_100/IEE_Loc_Invest.pdf

Guidance 43

Guidelines for the Provision of Infrastructure and Capital Investments through Public Private Partnerships: Procedures for the Assessment, Approval, Audit and Procurement of Projects. Compháirtíocht Phoiblí Phríomháideach (July 2006)

Section 2 (starting page 18) provides detailed guidelines on the steps involved in the PPP procurement process.

http://ppp.gov.ie/wp/files/documents/guidance/central_guidance/ppp-procurement-assessment.doc

Guidance 44

Competitive Dialogue in 2008, OGC/HMT Join Guide on Using the Procedure, Office of Government Commerce / Her Majesty's Treasury (UK)

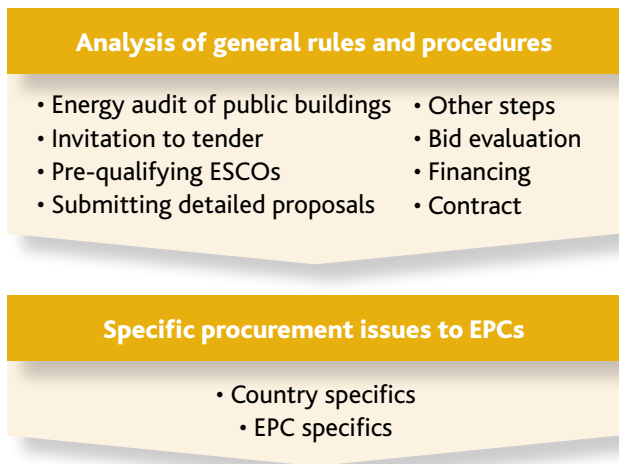
Section 2 (pages 11-12) describes key steps in a competitive dialogue procurement.

http://www.ogc.gov.uk/documents/OGC_HMT_2008_Guidance_on_Competitive_Dialogue.pdf

4. Project Procurement

This section focuses on the legal and contractual issues related to the analysis of the bids and the negotiation of the contractual arrangements with the selected bidder prior to the implementation of the EE investment. It details the generic competitive dialogue procedure, as it is important the public authority understands what specific aspects of the process require special attention when procuring a private partner for EE PPPs (see Figure 7). **[Guidance 43, 44]**

Figure 7: Project procurement



4.1 General rules and procedures

Figure 8: General rules and procedures



The major steps in the procurement process for an EPC are similar to most public procurement models. Procurement of PPPs is explained in detail in the G2G. [Guidance 2, page 53] However, there are some issues unique to EE projects. [Guidance 45]

The European regulations in public procurement of EE in the different Member States are described in *Energy Efficiency in Public Procurement – Member States' Experience, Barriers/Drivers and Recommendations*. [Guidance 6]

4.1.1 Preliminary assessment of energy savings

Initially, the client carries out a pre-feasibility assessment of its building(s) to assess the energy savings potential. This can be undertaken by the building energy manager or outsourced to a third-party consultant. Depending on the budget, size, specifications and number of buildings, the client may also conduct a walk-through audit or a full preliminary assessment of energy savings. This step can confirm that cost-effective energy-saving opportunities exist, help identify target systems to be retrofitted and allow project parameters to be defined. It is important to note that the information gathered in these documents will only serve the public sector client. While the ESCO may use it as a reference, it will conduct its own preliminary assessment of energy savings.

4.1.2 Invitation to tender

In general, the development of the bidding documents will involve the following steps:

- defining the project and services to be provided;
- preparing the invitation to tender;
- pre-qualifying ESCOs; and
- supplier conference with site visit.

Defining the project in the invitation to tender is a challenging and critical step in the process. Whereas the purpose of an EPC is to allow ESCOs to offer their best solutions for the current energy systems, some basic parameters need to be established and included in the invitation to tender. [Guidance 48] These parameters can include:

- target systems;
- minimum energy savings;
- sharing of savings; and
- services required (e.g. engineering and project design, procurement and installation, financing, M&V and O&M).

Essential components of an invitation to tender are as follows:

Background: Providing respondents with information on the public partner and the project or the facility under consideration, and a brief statement of the evaluation criteria.

Scope of work: Providing information on the types of services required, and the areas of competency that ESCOs must demonstrate.

Invitation to tender procedure: Covering instructions for preparing and submitting the proposals and sample documents for inclusion.

Selection criteria: Defining the criteria that will be used to judge and rank tenders. [Guidance 48, 49]

Qualifications, statement format, content and specific criteria: Specifying the format content and specific criteria for the invitation including examples of how the ESCO usually handles specific circumstances.

Appendices: Suggested appendices to the invitation to tender responses include:

- resumes of assigned personnel;
- sample contracts; sample preliminary assessment of energy savings; and
- proprietary information (optional).

4.1.3 Pre-qualifying ESCOs

The pre-qualification step screens interested bidders and ensures that those invited to submit detailed proposals have the capability and resource to undertake the work. Pre-qualification (as opposed to short-listing) requires that the applicants meet a minimum set of specific, objective criteria.

The criteria can be broadly divided in two sets – technical and financial. The former ensures that companies have a proven track record of projects with a similar or greater level of technical difficulty. The latter guarantees that the ESCO has the capacity to secure the financing for the project and will be able to fulfil its contractual obligations even if the savings are less than estimated.

Corporate history and experience

- How long has the ESCO been in business?
- Does this ESCO have a proven track record in performing energy services projects?
- Can it provide a list of satisfied clients?
- What has been its performance (savings) on past projects? How did the results compare with the original expectations?

Corporate capabilities

- Does the ESCO have strong core competencies in energy management and state-of-the-art technology?
- Does the ESCO have the organisational depth to implement the project in a cost-effective and timely manner?
- Does the ESCO have standard operating procedures? Are they documented? How much freedom does the ESCO staff have to vary from them?
- What is the expertise and experience of the project team (CVs and track record) that would be assigned to the project and of the support staff who would back them up?

Project implementation

- How experienced is the ESCO in minimizing the disruption to the workers in the public building(s) renovated?
- What training will be provided to the public building operations staff?
- What input will the public manager have regarding the design, construction and implementation of the project?
- What input will the public manager have regarding

the selection of equipment, suppliers and installers?

- Does the ESCO have any restriction or bias regarding equipment, suppliers and installers?

Project performance

- Will the ESCO guarantee the recovery of all project costs and interest costs through the savings that are to be achieved within a guaranteed period of time?
- Will the ESCO guarantee all savings or just a portion of savings?
- Will the ESCO be ultimately responsible for every element of the project?

Project financing

- How will the project be financed and at what interest rate?
- Will all project costs be disclosed?
- How will any additions or extras be charged?
- How can good value be ensured?
- Will fees be consistent through the entire project?

Project capabilities

- Typical improvement measures installed
- Design and project implementation procedures
- Software support systems

Project management process

- Selection, use and control of subcontractors

Project capacity

- Number of concurrent projects that can be comfortably performed
- Project managers and their respective project team

Scope of services

- Discrete services provided under energy performance contracting

Particular strengths of the ESCO

- Services contracted out including the following:
 - preliminary assessment of energy savings;

- retrofit design;
- project management;
- construction including provision of trades;
- commissioning;
- operator training;
- procedure documentation;
- mechanical and electrical maintenance;
- invoicing system and methods for calculating savings;
- remote measurement and savings performance evaluation;
- project financing; and
- energy services agreement negotiation.

Experience in energy performance contracting

- Description of EE and conservation projects during the last three years, where payment was not predicated on actual savings;
- Description of experience in training of building operators, provision of building mechanical and electrical maintenance services, and energy use measurement; and
- Description of EPC projects completed and in progress.

Financial stability

- Sufficient working capital and access to project financing;
- Demonstration of adequate skills in financial engineering at ESCO management level;
- Adequate and appropriate insurance; and
- Ability to comply with bonding requirements.

In general, companies are expected to:

- Demonstrate their capability to provide comprehensive energy management services, in the relevant market sector, for plant, processes or facilities, including but not limited to:
 - comprehensive preliminary assessment of energy savings and feasibility analyses; design, engineering, selection and installation of equipment, systems and modifications to improve energy (and other resources) efficiency without reducing the reliability or performance of such equipment;

- construction management;
- training of clients' operations and maintenance staff in energy-efficient practices;
- maintenance and service of installed measures;
- measurement and verification of energy (and other resources) savings; and
- financing for such projects.

- Guarantee that payments for EE improvements will be contingent on energy savings so that the client will not have any financial obligations that exceed the avoided utility costs.
- Outline their capability with respect to other related energy services including, but not limited to, technologies and applications of particular relevance to the client, e.g. boiler, compressed air, facility management and operations, (or other systems, power quality, HVAC, etc.).
- The public partner evaluates the qualification information against pre-specified evaluation criteria producing a list of pre-qualified firms, which are invited to submit detailed proposals. **[Guidance 45, 49]**

4.1.4 Submitting detailed proposals

All applicants that meet the pre-qualifying criteria are invited to bid. Short-listing, as the name implies, restricts the field of bidders to a fixed number (usually four to six). It is generally recommended that there should be a pre-qualification to ensure that unqualified firms are spared the high cost of preparing detailed bids and recommends short-listing only for consultant procurement. Some countries have sought to combine the two by developing a short list of qualified firms. Under typical schemes, a public agency issues an invitation for pre-qualification or a request for expression of interest ("ELI"), the latter for short-listing.

ESCO bidders are required to provide detailed technical proposals as set out in the Terms of Reference ("ToRs"). Bidders will already be familiar with the pre-feasibility study conducted by the client and, at this point, will conduct their own detailed preliminary assessment of energy savings, also called Investment Grade Audit ("IGA").

The preliminary assessment of energy savings [Guidance 47] is the technical and economic foundation of a successful EE project. It is a detailed document that validates all savings and costs for each EE measure along with savings calculations and methodologies. The audit provides the ESCO and the public partner with sufficient information to judge the technical and economic feasibility of the project.

The preliminary assessment of energy savings includes the following information:

- detailed baseline data (including all operational aspects of the facilities);
- a full analysis of consumption for each fuel and utility type with costs and operating conditions;
- detailed cost of each measure and the total cost;
- amount of expected savings during construction period;
- basis of savings and design/build cost for each measure;
- a full description of the analysis methods, calculations, data input and all assumptions for each measure;
- clarification of/dependencies between measures;
- final M&V plan;
- energy reconciliation and balance to historical actuals;
- schedule of work;
- carbon footprint for impact on CO₂ emissions; and
- risk analysis of the project.

The baseline is defined by the client, it is one of the most important elements in the preliminary assessment of energy savings. It contains the following details of all major pre-existing site conditions and costs impacted by project implementation:

Equipment: Inventory of all major energy-consuming items.

Energy Units:

- Electricity = demand (kW) and consumption (kWh);
- Fuel oil = units consumed (litres);
- Natural gas = units consumed as specified on utility bill;
- Water = units consumed as specified on utility bill;
- Energy rates: lists historical rates for each unit of energy ("base rates") that will be used to calculate savings payments;
- The preliminary assessment of energy savings in effect details the EE solution proposed by the ESCO. It is a major part of its technical proposal.

The full proposal will also include:

- the confirmed minimum level of guaranteed savings;
- the confirmed minimum net present value of the proposed project and the actual net present value of the proposed project;
- the final building capacity and awareness activities to be implemented; and
- the qualifications of the proposed experts.

4.1.5 Other steps

There are other optional steps that can be included, based on the needs of the public partner and the capabilities and experience of the pool of bidders. These include upstream consultations with potential bidders, a pre-bidding conference (to discuss the contents of the invitation to tender and respond to questions) and site visits (to allow bidding ESCOs to gather additional performance information on the target facilities).

4.1.6 Bid evaluation

The public partner must assess proposals based on the criteria specified in the invitation to tender. [Guidance 49, 50] EPC projects are very complex because the agency must assess a combination of technical, financial, project implementation and performance measurement requirements. Technical evaluation may be more straightforward because it is based on aspects that are contained in most service contracts, such as methodology, work plan and staffing. However, assessing the financial proposals can be complicated as there is no single price.

Proposals will include multiple indicators, including the investment amount, total energy and cost savings, share of savings to be allocated to the agency, duration of the contract and life of the equipment. The ESCO selected should provide the best value to the public partner. The value for money criteria have to be clearly defined. They would normally include an assessment of how risks are being transferred as well as the overall cost calculated after taking into account the time value of money. This includes:

- a detailed feasibility study is always required. Generally a sophisticated computer simulation tool capable of modeling all energy inflows and outflows is required in order to avoid “double counting” of energy savings or “savings overlap”;
- the engineering study, its source data and the associated assumptions and calculations should be documented for review by all parties;
- the project should include a detailed “scope of work” so that the public partner can have a simple yardstick for use in confirming completion of the work;
- detailed construction documentation to guide the contractor and help the public partner follow the progress of the installation. It also provides the public partner with a troubleshooting tool once the work has been completed and the term of the contract with the ESCO has expired; and
- the methodology used to calculate cost avoidance must be clearly stated in the contract. The energy-use data and other assumptions required for input to the methodology must be available to both parties.

Overall, the public partner needs to consider the following financial elements:

- the cash flow of the ESCO from other projects in its portfolio;
- the level of diversification of the ESCO’s revenue streams;
- the debt/equity ratio of the ESCO, compared to a market benchmark; and
- the credit rating of the ESCO.

4.1.7 Financing

In a typical EPC arrangement, the invitation to tender requires bidding ESCOs to provide a plan for financing the project. In underdeveloped markets, ESCOs may have trouble raising all the financing on their own. Therefore, some partial EU or government-sponsored financing programme may be necessary.

In the assessment of the financing proposal for the EPC, the public partner is interested in the following aspects:

- To which partners’ balance sheet is the equipment registered?
- Is the equipment used as collateral for financing and what happens if the ESCO defaults for whatever reason?
- Is the financing reliant on the the public partner?
- Are the cash flows from savings pledged against the financing?

4.1.8 Contract

With reference to 4.1.6, the ESP which best meets the value for money criteria that have been defined is then invited to negotiate the final contract. This process may be straightforward for many types of contracts, but it is more complicated for EPCs because of the many technical, financial and legal parameters and the possible lack of experience of the public partner. **[Guidance 49, 51]** The contract must also include an M&V plan. The M&V provisions are a very important part of the EPC process since they determine the payments made to the ESCO. The plan for the public procurement of EE services may be specified in the invitation to tender but it may also be proposed by bidding ESCOs. In either case, the ESCO must develop detailed M&V protocols through the completion of the IGA agreement with the public partner. This M&V plan is then incorporated into the final EPC. Many agencies and ESCOs use the M&V protocols set out in the International Performance Measurement and Verification Protocol (“IPMVP”) (EVO 2007). These protocols may be adjusted by mutual agreement for the specific EE measures being installed.

Apart from the contract items, termination arrangements are an important component of the ESCO agreement.

Both parties should be able to terminate the agreement if they have good reasons to do so. Common reasons for termination are:

- default by the ESCO to deliver a workable project (e.g. technological failure);
- bankruptcy of either party;
- irreconcilable differences where the parties cannot agree and arbitration proves impossible; and
- major changes in the building (sale of the facility, major changes in an industry that will affect the installed measures).

4.2 Specific EPC procurement issues

4.2.1 Country specific issues

EPCs have not been widely used in the public sectors of emerging economies, and especially the Member States that most recently joined the EU. In many countries, an initial focus on establishing local ESCO industries envisioned that the companies could then develop the EPC model in all sectors. However, they lacked the legal and financial infrastructure to support such complex business models. New ESCOs either lacked the technical and operational expertise to carry out all the functions typically associated with EPCs or lacked the balance sheets to mobilise the financing that such business models require. Local ESCOs often had no track record in the market to perform sophisticated projects while

international ESCOs with expertise and access to capital were not keen to invest in these emerging markets due to risk (e.g. small markets and projects, unclear legal and regulatory regimes, concerns about client creditworthiness, lack of access to appropriate local project financing). Emerging economies also face limited equity markets and a limited number of investors willing to create new companies and test new business types.

Rigid procurement and budgeting guidelines within the public sector often prevent public institutions from engaging ESCOs, particularly where full project costs and technical parameters have yet to be determined.

4.2.2 Specific energy performance contract issues

Procuring energy services and signing a performance contract differ from the traditional process of bid and specifications. A good "fit" between ESCO capabilities and public partnership is the foundation of a strong relationship and successful project implementation. It involves a clear understanding of the ESCO's capabilities and experience relevant to the particular needs of the client.

Box 2: Standardisation on Energy Management and Related Services

Two approaches can be used in the standardisation of energy services: the certification of the ESCO or the certification for provided services. In EU-27, there are no directives that oblige the implementation of a national certification system. Some countries such as Italy have developed their own certification standard. [\[Guidance 52\]](#)

The European Committee for Standardisation ("CEN") has been developing an EU-wide standard on definitions, requirements and qualification processes for ESCOs. However, the development of certification procedure and evaluation methods for ESCOs was removed from the CEN CLC/JTF 189 standard on energy management. The European standard on energy management will be redrafted. [\[Guidance 53, 54\]](#)

Project Procurement: LINKS

Guidance 6

Joint Public-Private Approaches for Energy Efficiency Finance: Policies to Scale up Private Sector Investment, International Energy Agency (2011)

Pages 24 to 28 provide an introduction to ESPC (or EPC as referred to in this document), and illustrate various ESPC structures.

<http://www.iea.org/papers/pathways/finance.pdf>

Guidance 45

Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft

Page 50 presents the phases of an EPC project.

Section 9 contains information on project preparation and development including preliminary assessment of energy savings.

Guidance 47

Etude d'Aide à la Décision - Audit Energétique dans les Bâtiments – Cahier des Charges, ADEME (April 2011)

This document shows how to develop an preliminary assessment of energy savings.

Guidance 48

Standard Procurement Document – Prequalification Document for Procurement of Works and User's Guide, The World Bank (2006)

Section III (pages 19-24) describes how to set up the general qualification criteria and requirements for contractors, which can also be applied to preparing bids for private partners for energy efficiency PPP.

<http://siteresources.worldbank.org/INTPROCUREMENT/Resources/Prequal-EN-09-sep-10.pdf>

Guidance 49

Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.

Section on Bid Evaluation, Table 6.3 (page 94) displays a sample list of evaluation criteria and their scoring points and weight in the final evaluation.

Guidance 50

Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.

This section (pages 93-102) gives issues on how evaluate a proposal and the criteria which can be used.

Guidance 52

Final Publishable Report, EUROCONTRACT IEE (February 2008)

Discussion on certifications in the context of energy services (pages 66-69).

http://ieea.erba.hu/ieea/fileshow.jsp?att_id=5828&place=pa&url=Eurocontract_Final_Report_Publishable.pdf&prid=1576

Guidance 53

Energy Performance Certification of Buildings: A Policy Tool to Improve Energy Efficiency, OECD/ International Energy Agency (2010)

Comprehensive discussion on energy performance certification of buildings

http://www.iea.org/papers/pathways/buildings_certification.pdf

Guidance 54

NORM APME, Making standards better for SMEs

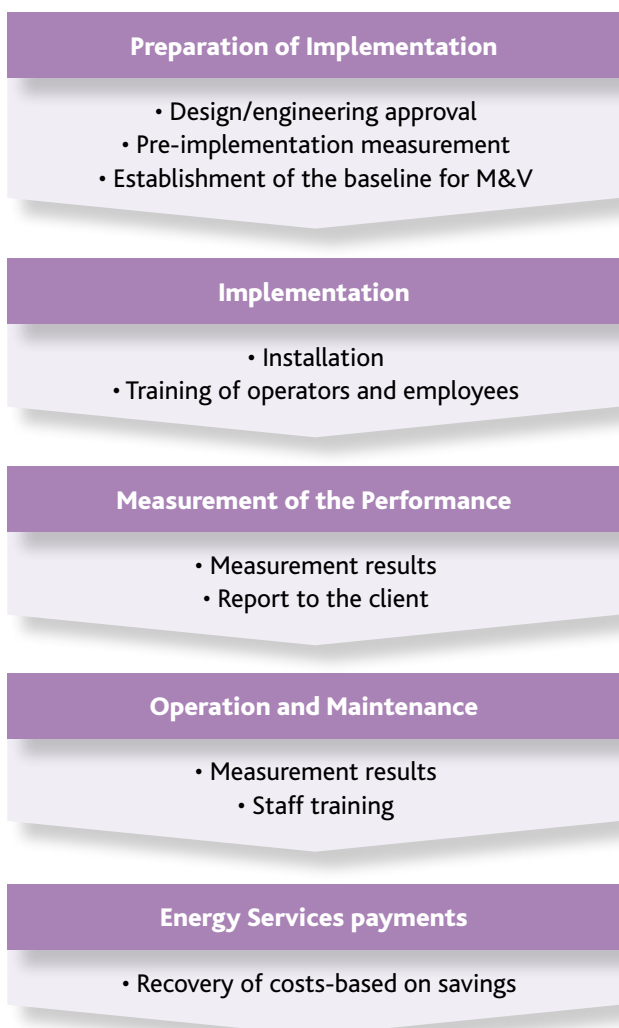
Energy Management: General requirements and qualification procedures webpage.

<http://extranet.normapme.com/en/technical-committees/cen-clc/jtf-189-energy-management-general-requirements-and-qualification-procedureCEN CLC/JTF 189 –>

5. Project Implementation

The management of an EE PPP raises specific issues in terms of construction, operation and maintenance of the installed equipment and the methodology for the M&V of energy savings, which serve as a basis for remuneration of the private sector partner. Chapter 5 of the G2G [\[Guidance 2, pages 78-105\]](#) defines the steps for PPP implementation.

Figure 9: Steps for PPP Implementation



5.1 Steps for PPP implementation

5.1.1 Preparation of implementation

The typical sequence of events subsequent to the signing of a performance contract includes finalisation of design, installation of equipment and maintenance of the energy services project. The initial design and construction phases are superficially similar to a conventional construction project. However, they include a number of design/construction iterations and, site conditions and the expectations of the building operating staff vary. [\[Guidance 55, 56\]](#)

Contract implementation starts once the ESCO wins the tender and is invited to negotiate the final contract. This step is more complicated than with other types of contracts because of the multi-sector parameters involved (technical, financial and legal) and the private partners' specific activities are neither well known nor defined.

During this phase, the ESCO finalises the design of the EE measures to be implemented. In a rehabilitation project, the time-planning of the installation and regulation measures are key because it must be in line with building use and occupation.

The baseline for M&V (see Section 5.2) has to be established before the implementation of the EE measures during the reference period.

5.1.2 Implementation

In addition to the construction phase and M&V, the private partner is also expected to adopt any measure that will optimise the use of energy including awareness campaigns for site occupants and training of operation and maintenance workers.

The aim of an awareness programme is to create a sense of ownership and provide information about the newly installed energy-efficient equipment as well as the measures to reduce energy consumption. The programme should build a greater understanding of energy usage and demonstrate how individuals can help reduce overall consumption.

The type and nature of training will vary based on the organisation and the EE measures involved. Programmes include operational and procedural training on energy management and newly installed technologies and transferring the required know-how to specific audiences, such as facility O&M staff.

5.1.3 Measurement of performance

The ESCO follows the M&V plan that is set out in the contract to measure and calculate the energy savings. If, during the reporting period the expected energy savings are not reached, the reporting period can be reduced to track the performance of the EE measures more closely. The plan contains the calculations and formulas used to determine the energy savings. This reduces misunderstandings and conflicts between the public organisation and the ESCO. [\[Guidance 55, 56\]](#)

5.1.4 Operation and maintenance

Public buildings being refurbished by an ESCO will usually have arrangements in place for works associated with the maintenance of the fabric of the building. Under EE PPP, the ESCO will have the task of ensuring that maintenance staff are properly instructed and managed in order that the planned energy savings can be realised.

5.1.5 Energy service payments

Payment is based on project performance. While adjustments can be made, they have to be provided for under the contract. Payment is based on the quantum of energy savings to which the ESCO is contractually committed. It is the responsibility of the ESCO to ensure that these efficiencies are actually achieved. The payment mechanism will typically include some form of penalty or reimbursement mechanism if the savings are not realised. However, ESCOs should not be exposed to energy price fluctuations since this is a risk that the ESCO cannot directly manage. Being exposed to energy price

fluctuations would distract the ESCO from achieving contracted levels of EE since short-term fluctuations in energy prices then take on a more important role than working on smaller, long-term savings.

The energy price is an issue that can affect project performance and benefits. The aim is to avoid speculation on energy prices by the ESCO and ensure that its focus is on energy services.

5.2 Measurement and verification of EE results

The M&V provisions generally determine the payments due to the private partner for its services. The private partner designs and implements the M&V plan, the public partner receives the deliverables and a third-party (optional) validates the results. [\[Guidance 57, 58, 59, 60\]](#)

While a retrofit project may reduce energy consumption, a thorough M&V process is essential for two reasons. First, M&V assesses resource savings against the performance guarantee. Second, M&V helps ensure that savings will persist over time.

The results of EE retrofits cannot be directly measured as they can only be defined by the absence of energy consumption. It is important to measure and verify savings generated by the project, without which it is not possible to value the results of an investment in EE.

The most widely used M&V procedure for EPC projects is called IPMVP. The protocols are written and periodically updated by the Efficiency Valuation Organization ("EVO") and are used in some European countries such as France and Spain. Other M&V protocols can be agreed upon between EPC stakeholders and while it is possible to build a specific M&V protocol on a case-by-case basis it is also possible to use other M&V procedures already developed like ASHRAE 14 or FEMP protocols. [\[Guidance 61\]](#) In this Guide, only the IPMVP is described because of its worldwide recognition.

According to EVO, "M&V is the process of using measurement to reliably determine actual savings created within an individual facility by an energy management, energy conservation or EE project or programme. As savings cannot be directly measured, the savings can be determined by comparing measured use before and after implementation of a project, making appropriate adjustments XE "adjustments" for changes in conditions."

The public partner and EE project investors use M&V techniques to mitigate the various risks that can arise after project completion. M&V is specifically used for the following purposes:

- improving engineering design and project costing;
- increasing energy savings through proactive adjustments in facility operations and maintenance;
- documenting financial transactions XE "verification";
- managing energy budgets;
- enhancing the value of emission reduction credits;
- supporting evaluation and development of broader efficiency programmes; and
- increasing public and marketplace understanding of energy management as a public policy tool.

5.2.1 IPMVP: the principles

The IPMVP consists of a library of documents that provides an overview of current best practice for measuring and verifying the results of EE, water efficiency, and renewable energy projects (both in the public and private sector). This library is available free of charge from <http://www.evo-world.org>, a not for profit organisation dedicated to providing key guidance in this area. IPMVP began in the 1990s as a voluntary initiative that came together under the auspices of a US Department of Energy initiative to develop an international M&V protocol that could be used to determine energy savings from EE projects in a consistent and reliable manner. It has since developed to provide a core set of M&V standards that are in use around the world and which are continually being refined. IPMVP publishes detailed documentation on M&V as well as providing a range of training materials and related services.

The IPMVP provides four different approaches for measuring and verifying savings, using the following formula:

$$\text{Savings} = (\text{Baseline Energy} - \text{Reporting Period Energy}) \pm \text{Routine Adjustments} \pm \text{Non-Routine Adjustments}$$

The four approaches are covered in summary form in Table 2. Considerably more information is available. **[Guidance 58]**

Box 3: Who Conducts the M&V?

M&V is now recognised as a fundamental tool for the success of EE projects and programmes. The question of who should develop and implement an M&V protocol for a specific project arises. Any of the parties involved in a project can design and implement an M&V protocol. The design will be more credible if it follows recognised concepts and best practice as provided by IPMVP definition? In the specific case of an EPC, the beneficiary (public partner), the ESCO, a combination of both of these parties, and/or a third-party, are all acceptable options for the creation and implementation of a solid M&V plan.

Table 2: Options for determining savings

IPMVP Option	How Savings Are Calculated	Typical Applications
<p>A. Retrofit isolation: key parameter measurement</p> <p>Savings are determined by field measurement of the key performance parameter(s) which define the energy use of the ECM XE "energy conservation measure" 's affected system(s) and/or the success of the project.</p> <p>Parameters not selected for field measurement are estimated.</p>	<p>Engineering calculation of baseline XE "baseline" and reporting period XE "reporting period" energy from:</p> <ul style="list-style-type: none"> - short-term or continuous measurements of key operating parameter(s); and - estimated values. 	<p>A lighting retrofit where power draw is the key performance parameter that is measured periodically. Estimate operating hours of the lights based on building schedules and occupant behaviour.</p>
<p>B. Retrofit isolation: all parameter measurement</p> <p>Savings are determined by field measurement of the energy use of the ECM XE "energy conservation measure" -affected system.</p> <p>Measurement frequency ranges from short-term to continuous, depending on the expected variations in the savings and the length of the reporting period XE "reporting period".</p>	<p>Short-term or continuous measurements of baseline XE "baseline" and reporting period energy, and/or engineering computations using measurements of proxies of energy use.</p>	<p>Application of a variable-speed drive and controls to a motor to adjust pump flow. Measure electric power with a kW meter installed on the electrical supply to the motor, which reads the power every minute. In the baseline XE "baseline" period, XE "baseline: baseline period" this meter is in place for a week to verify constant loading. The meter is in place throughout the reporting period XE "reporting period" to track variations in power use.</p>
<p>C. Whole facility</p> <p>Savings are determined by measuring energy use at the whole facility or sub-facility level.</p> <p>Continuous measurements of the entire facility's energy use are taken throughout the reporting period XE "reporting period".</p>	<p>Analysis of whole facility baseline XE "baseline" and reporting period XE "reporting period" (utility) meter data.</p>	<p>Multifaceted energy management programme affecting many systems in a facility. Measure energy use with the gas and electric utility meters for a twelve-month baseline XE "baseline" period XE "baseline: baseline period" and throughout the reporting period. XE "reporting period".</p>
<p>D. Calibrated simulation</p> <p>Savings are determined through simulation of the energy use of the whole facility, or of a sub-facility.</p> <p>Simulation routines are demonstrated to adequately model XE "model" actual energy performance measured in the facility.</p> <p>This option usually requires considerable skill in calibrated simulation.</p>	<p>Energy use simulation, calibrated with hourly or monthly utility billing data. (Energy end-use metering may be used to help refine input data.)</p>	<p>Multifaceted energy management programme affecting many systems in a facility but where no meter existed in the baseline XE "baseline" period XE "baseline: baseline period".</p> <p>Energy use measurements, after installation of gas and electric meters, are used to calibrate a simulation.</p> <p>Baseline energy use, determined using the calibrated simulation, is compared to a simulation of reporting period XE "reporting period" energy use.</p>

5.2.2 The costs of M&V

M&V costs will vary depending upon the IPMVP options used in a project.

A report sponsored by NAESCO and the USEPA suggests that each IPMVP option will cost the client the following percentages of total project costs:

Option A = 1-5%;

Option B = 3-10%;

Option C = 1-3% (if meters are already installed); or

Option D = 3-10%.

Project Implementation: LINKS

Guidance 55

Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.

This section (pages 93-102) gives issues on how evaluate a proposal and the criteria which can be used.

Guidance 56

Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft

Section 11 presents the implementation phase of an EPC project in state buildings.

Guidance 57

Guide de la Mesure et de la Vérification pour les Services d'Efficacité Énergétique, Club S2E (February 2009)

Guide for M&V in line with the IPMVP (in French).

<http://www.clubs2e.org/Content/Default.asp?PageID=137>

Guidance 58

International Performance Measurement and Verification Protocol, Volume 1, Efficiency Valuation Organization (September 2010)

M&V protocol available in different languages at www.evo-world.org. It contains all the information to build a valuable M&V plan.

http://www.evo-world.org/index.php?option=com_form&form_id=38&Itemid=535

In M&V FAQ, the differences between IPMVP and others M&V Guide are explained.

http://www.evo-world.org/index.php?option=com_content&task=view&id=123&Itemid=98

Guidance 59

Measurement and Verification and the IPMVP, Clinton Foundation, Clinton Climate Initiative, President Climate Commitment (April 2009)

Summary of the IPMVP.

http://www2.presidentsclimatecommitment.org/documents/ccitoolkit/Measurement_and_Verification_and_The_IPMVP.pdf

Guidance 60

Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft

Sections 13 and 14 contain information on how to develop and calculate a baseline.

Guidance 61

Climate Friendly Buildings and Offices – A Practical Guide, United Nations Environmental Programme (2010)

Section 3 contains information on baselining and benchmarking.

Section 6 contains three case-studies, including detailed energy analysis, on public buildings used by the United Nations and the African Development Bank.

<http://www.unep.fr/scp/publications/details.asp?id=DTI/1278/PA>

6. EU Energy Efficiency Initiatives

6.1 EU 2020 targets

The EU has adopted a framework for energy end-use efficiency and energy services. This includes an indicative energy saving target for Member States, obligations on national public authorities for energy savings and energy-efficient procurement, and measures to promote EE and energy services in the public sector. [\[Guidance 62\]](#)

EU countries transposed the Directive 2006/32/EC on EE and energy services in their national regulation framework. The Concerted Action for the Energy Services Directive ("CA ESD"), was implemented to provide a structured platform for exchange of information between the 27 Member States and Croatia. [\[Guidance 63\]](#)

Under the Europe 2020 Strategy, the EU has committed to reduce its energy consumption substantially. As buildings count for 40% of the energy consumption of the EU, huge efforts are required to improve EE in this sector. [\[Guidance 64\]](#)

There are two major challenges in the energy sector: (i) a lack of sufficient, reliable and affordable supplies; and (ii) environmental issues associated with energy production and consumption. Key objectives are to reduce the demand for fossil energy, diversify sources of supply geographically, foster alternative energies to allow for a wider distribution of energy resources and reduce GHG emissions. [\[Guidance 65\]](#)

At the current pace, known and proven oil and gas reserves can support production for approximately 41 and 63 years respectively. The overall level of the EU's reliance on imported energy was 52.3% in 2005 and is forecast to rise as domestic resources dwindle. The energy sector is responsible for most GHG emissions, and thus climate change. At the present time, fossil fuel consumption represents over 80% of GHG emissions, excluding land

use. Environmental problems associated with energy consumption are both of a local and global nature. Health and environmental impacts include air pollution, smog, climate change, degradation of ecosystems, water pollution and radioactive hazards. [\[Guidance 66\]](#)

EE is central to the EU's Europe 2020 Strategy for smart, sustainable and inclusive growth and the transition to a resource-efficient economy. It represents the equivalent of finding a new source of energy. The European Council of March 2007 emphasised the need to increase EE in order to achieve a reduction in energy consumption of 20% by 2020. It reaffirmed the commitment to the development of energy from renewable sources by endorsing a mandatory target of a 20% share of energy from renewable sources by 2020. [\[Guidance 64\]](#)

Substantial steps have been taken towards energy consumption reduction, namely in the appliance and building markets. Nonetheless, recent Commission estimates suggest that the EU is on course to achieve only half of the 20% objective. [\[Guidance 64\]](#)

The European Council of 4 February 2011 called for "determined action to tap the considerable potential for higher energy savings of buildings, transport and products and processes". The EC has developed the comprehensive new EE Plan 2011. It will be pursued alongside other policy actions under the Europe 2020 Strategy's Flagship Initiative for a Resource-Efficient Europe, including the 2050 roadmap for a low carbon economy. This will ensure policy coherence, assess trade-offs between policy areas and the benefit from potential synergies. The EE measures will be implemented as part of the EU's wider resource-efficiency target that encompasses efficient use of all natural resources and ensures high standards of environmental protection. [\[Guidance 64\]](#)

Buildings are responsible for 40% of energy consumption and 36% of EU CO₂ emissions. The energy performance

of buildings is key to achieving the EU Climate & Energy objectives and is a cost-effective way of fighting climate change and improving energy security while creating job opportunities. **[Guidance 64]**

Public sector spending accounts for 17% of EU GDP and publicly owned or occupied buildings represent about 12% by area of the EU building stock. A stronger emphasis on EE in the public sector is crucial, covering public purchasing, the refurbishment of public buildings and the encouragement of higher building standards in cities and communities. According to the EU Commission, the public sector can create new markets for energy-efficient technologies, services and business models. **[Guidance 65]**

The EU is seeking to set an example by showing that environmental and energy considerations are being taken into account in buildings occupied by public authorities and buildings frequented by the public. **[Guidance 64]**

The EU Commission strategy includes a focus on triggers to accelerate the refurbishment rate of public buildings: the Commission proposal for a new EE Directive (adopted in June 2011 and under negotiation) requires public authorities to refurbish at least 3% of their building stock by floor area each year. The Commission plans guidance to help overcome the obstacles that hamper the deployment of EPCs in various Member States, such as ambiguities in the legal framework and lack of availability of reliable consumption energy data to serve as baselines. In addition, the Commission will continue to support initiatives such as the Covenant of Mayors as a means to boost the implementation of EE measures on the ground.

6.2 EU funding for EE/renewable energy supply

Significant funding is available through EU programmes to accompany and help Member States implementing EU directives and support associated investments to fulfil the EE objectives.

In addition to national public programmes supporting EE projects (e.g. grants, soft loans, guarantees, subsidies, tax reduction), EU funding have been increasingly focused on

EE and renewable energy supply ("RES") investments in line with its Europe 2020 Strategy. Most of the EU funding co-finances projects with grants that are combined with national/local financing. However, Member States can use part of their structural fund's allocation in a JESSICA structure, enabling repayable investments (see below). There also exist financial instruments at EU-level (EEEF) and Technical Assistance Facilities (e.g. ELENA, MLEI).

Cohesion policy

Cohesion policy aims to reduce economic and social disparities among European regions. Three funds (the ERDF, the European Social Fund and the Cohesion Fund) are used to co-finance projects in the EU regions. Their management is shared between the European Commission and the Member States. In the current period, 2007-2013, every Member State has defined a national strategic reference framework, validated by the Commission, to be delivered through operational programmes at national or regional level. The operational programmes are implemented by the Member States and their regions. This involves selecting, monitoring and evaluating the individual projects. This work is organised by 'managing authorities' ("MAs") in each country and/or region.

The planned allocations of funding in the 2007-2013 Cohesion Policy programmes for sustainable energy investments amounts to approximately EUR 9.4 billion, of which RES (including wind, solar, biomass, hydroelectric, geothermal) is approximately EUR 4.8 billion, and EE (EE, co-generation, energy management) is approximately EUR 4.6 billion. Allocation of funds to RES and EE differ between Member States dependant upon the total volume of funds available, and the national needs and priorities set by each Member State.

Under the JESSICA initiative, MAs in the Member States are offered the possibility to invest some of their Structural Funds ("SF") in financial engineering instruments (revolving funds) supporting urban development and thereby recycle and leverage financial resources in order to enhance and accelerate investments in Europe's urban areas. These financial instruments are Urban Development Funds ("UDFs") investing in PPPs and other projects included in integrated plans for sustainable urban development. Alternatively, MAs can decide to channel funds to UDFs using Holding Funds

("HFs") which are set up to invest in several UDFs. This is not compulsory, but does offer the advantage of enabling MAs to delegate some of the tasks required to implement JESSICA to expert professionals.

For the period 2014-2020, the Commission has proposed to prioritise funding from the ERDF in order to increase spending on EE and renewable energy. According to the proposal, in more developed and transition regions 20% of the ERDF should be spent on EE and RES, in less developed regions 6%. This would result in a minimum allocation of EUR 17 billion from the ERDF for EE and RES in 2014-2020, based on the amounts proposed by the Commission in the multi-annual financial framework. In addition, allocations from the Cohesion Fund could also be made for EE and RES. A wider use of financial instruments is proposed, which would enable better leverage of private capital and renewed liquidity flow towards investments in EE and RES measures.

Research, development and innovation

Under the current EU Research & Development Framework Programme (FP7 2007-2013), approximately EUR 2.3 billion is dedicated to energy. Most of the budget is used to support research, technological development and demonstration projects resulting from the annual Calls for Proposals.

Under the proposal for the Future Horizon 2020 programme EUR 6.5 billion will be allocated to research and innovation in "secure, clean and efficient energy" in 2014-2020. A relevant share of this budget will be allocated to the "Market uptake of energy innovation" for projects facilitating the energy policy implementation, preparing the ground for rollout of investments, supporting capacity building and acting on public acceptance; and continue the Intelligent Energy Europe ("IEE II") Programme activities.

6.3 EU technical assistance, capacity building and policy implementation

Intelligent Energy – Europe Programme ("IEE") is an EU programme financing non-technological initiatives to

support EE and renewable energy policies.

Under the programming period 2007-2013, EUR 730 million is available to fund projects and put into place a range of European portals, facilities and initiatives. IEE helps to create favourable market conditions, shaping policy development and implementation, preparing the ground for investments, building capacity and skills, informing stakeholders and fostering commitment. This includes projects for financing EE in public buildings.

The initiatives support three main objectives - more EE, more renewables, and better transport and mobility. They are carried out by public, private or non-governmental organisations across Europe and include new training schemes, promotion campaigns, and the transfer of good practices.

ELENA Facility (Technical assistance facility created under the IEE II), launched in 2009, provides the technical assistance grants (of up to 90% of eligible costs) to local and regional authorities for development and launch of sustainable energy investments. The EU support must lead to investments with a minimum leverage of 1:20. It consists of 4 operational windows with the EIB, KfW (Kreditanstalt für Wiederaufbau), CEB and EBRD. To date, approximately EUR 31.5 million has been assigned to projects under ELENA and should trigger investments approaching EUR 1.5 billion, within the 3-year duration of ELENA contracts. About a third of these investments are addressing the buildings sector and EPC.

Complementing the ELENA Facility, grant support (up to 75% of eligible costs) for project development assistance is also provided through the 'Mobilising Local Energy Investments (MLEI)' Action of the IEE II, mostly aiming at small scale sustainable energy investment projects (minimum EUR 6 million).

Financial instruments

The EU has already some experience with financial instruments (1.3% of the EU budget has been allocated to such instruments during the current programming period) and wants to rationalise and develop them further in the next period (2014-2020).

Financial instruments provide equity/risk or debt financing (such as loans or guarantees) directly or via

financial intermediaries to final recipients who have difficulties with access to finance, or with sharing of the risk with financial institutions. Their primary role is to increase the volume of finance (or financing products range) available by leveraging the public funds with private capital. Financial instruments typically target investments that are economically viable (in terms of generated revenues) but which have difficulties attracting affordable commercial financing.

The EEEF was launched on 1 July 2011, providing different types of loans, guarantees and/or equity to local, regional and (if justified) national public authorities or public or private entities acting on their behalf. EEEF aims at financing projects in EE (70%), RES (20%) and clean urban transport (10%) through innovative instruments and in

particular promoting the application of the EPC. Technical assistance grant support (EUR 20 million) is available for project development services (technical, financial) linked to the investments financed by the Fund.

The European Commission's Communication on the next Multiannual Financial Framework, proposes to expand and harmonise the rules for financial instruments. The proposition contains a certain number of sector-specific initiatives, as well as the possibility for the Member States to use part of their structural funds allocation in financial instruments, either to be implemented at regional level (tailor-made or template instruments) or at EU level by ring-fencing their contribution for specific regions and priorities (joint instruments).

EU Energy Efficiency Initiatives LINKS

Guidance 62

Directive 2006/32/EC on energy end-use efficiency and energy services and repealing Council Directive 93/76/EC, European Parliament and European Council (April 2006)

The article 5 deals with energy end-use in the public sector. The article 9 presents the financial instruments for energy savings. The article 12 defines energy audits.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006L0032:EN:HTML>

Guidance 63

CA ESD webpage.

<http://www.esd-ca.eu/>

Guidance 64

Energy Efficiency Plan 2011, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (March 2011)

Section 2 (pages 4-5) explains why the public sector has to lead EE changes and Section 3 (pages 6-8) shows the importance of reducing building energy consumption at European level.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0109:FIN:EN:PDF>

Guidance 65

Directive on the Energy Performance of Buildings (recast), the European Parliament and the Council (May 2010)

The introduction of the directive traces the commitments of the European Commission concerning EE in buildings.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:EN:PDF>

Guidance 66

Booklet - Key Facts and Figures about Europe and the Europeans.

Pages 56-57 provide statistics about the energy independence of the European Union.

http://ec.europa.eu/publications/booklets/eu_glance/66/en.pdf

7. Conclusion

EU Member States face a difficult challenge with the energy consumption of their public buildings stock. Due to current budget constraints, both at national and local levels, the necessary investments have often been postponed and neglected even when the aim is to maintain or overhaul these buildings in order to reduce their energy consumption.

As a result, the energy costs represent a large proportion of public buildings' operating costs and the energy saving potential is substantial. The public building sector is also responsible for a significant part of GGEs. The issues that have prevented the public sector from investing in the refurbishment of its assets, continue to impede the launching of dedicated EE programmes. These programmes would benefit both the public budget and the environment.

The lack of investment combined with the lack of awareness of the availability and performance of EE technologies is the greatest challenge. As in many other areas in the field of infrastructure, one possible response to this is the use of PPPs. In the EE field, this is a concept that has been developed for more than 30 years. Specialised private entities known as ESCOs have accumulated experience in working with the public sector through agreements permitting the identification of technical investment needs and their financing. The ESCO is reimbursed through the savings realised.

During the 1980s and '90s in Europe, a number of public buildings (including high schools, colleges, hospitals, barracks, universities and municipal premises) engaged in such PPPs. They had a high rate of success in countries such as Spain, Portugal, France and Belgium, followed by countries such as Hungary, the Czech Republic, Poland, Romania and Bulgaria. Less attention has been paid since 2000 to the ESCO concept and the form of PPP it represents, in spite of its unquestionable advantages for the public sector, though a number of such ESCOs still exist and operate in most EU countries. The public sector now needs to capitalise on this experience and track record to start an ambitious EE refurbishment programme in public buildings.

Full Reference List

Guidance 1

Energy-Efficient Buildings PPPs: Multi-Annual Roadmap for a Long Term Strategy , European Commission.

http://www.ectp.org/cws/params/ectp/download_files/36D1191v1_EeB_Roadmap.pdf

Guidance 2

The Guide to Guidance. How to prepare, Procure and Deliver PPP Projects.

www.eib.org/epec/g2g/index.htm

Guidance 3

Energy Efficiency in the Public Sector, Energy Charter Secretariat (April 2008)

Pages 23-26 present an international review of the barriers to EE in the public sector.

http://www.encharter.org/fileadmin/user_upload/document/Public_Sector_EE_2008_ENG.pdf

Guidance 4

L'apport du partenariat public-privé dans le financement des projets en efficacité énergétique, Institut de l'Énergie et de l'Environnement de la Francophonie (2008). ISBN: 978-2-89481-040-8.

Section 1.3 explains the barriers to EE projects and Section 2.2.2 focuses on the risk related to EE PPP.

Guidance 5

EPC Watch – Watching the World of Energy Performance Contracting, information web-site, accessed 26.12.2011

The website contains a Q&A section regarding the basics of EPCs.

<http://energyperformancecontracting.org/>

Guidance 6

Joint Public-Private Approaches for Energy Efficiency Finance: Policies to Scale up Private Sector Investment, International Energy Agency (2011)

Pages 24 to 28 provide an introduction to ESPC (or EPC as referred to in this document), and illustrate various ESPC structures.

<http://www.iea.org/papers/pathways/finance.pdf>

Guidance 7

Introduction to Energy Performance Contracting, ICF International, National Association of Energy Service Companies (NAESCO) (October 2007). Prepared for the US Environmental Protection Agency – Energy Star Buildings.

Section 2 (pages 6-7) explains the basics of an EPC (or ESPC as referred to in the NAESCO document).

http://www.energystar.gov/ia/partners/spp_res/Introduction_to_Performance_Contracting.pdf

Guidance 8**Energy Service Companies Market in Europe – Status Report 2010, Angelica Marino, Paolo Bertoldi, Silvia Rezessy – JRC Institute for Energy (2010)**

Section 2.1 presents the ESCO market and the types of ESCOs in each EU country.

<http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/15108/1/jrc59863%20real%20final%20esco%20report%202010.pdf>

Guidance 9**Energy Service Companies in Europe – Status Report 2005, Paolo Bertoldi, Silvia Rezessy – JRC Institute for Energy (2005)**

Section 5 shows typical elements provided by ESCOs in a project.

<http://re.jrc.ec.europa.eu/energyefficiency/pdf/ESCO%20report%20final%20revised%20v2.pdf>

Guidance 10**Energy Service Companies in Europe – Status Report 2005, Paolo Bertoldi, Silvia Rezessy – JRC Institute for Energy (2005)**

Section 2.3 defines components of an EE project carried out by ESCOs.

http://www.grazer-ea.at/eesi/upload/download/diskussionspapiere/091018_gea_energy_contracting_definitions-discussion_paper.pdf

Guidance 11**Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft**

Section 5 introduces the services that an ESCO can provide.

Guidance 12**Energy Service Companies Market in Europe – Status Report 2010, JRC Scientific and Technical Reports, European Commission Joint Research Centre (2010)**

Section 2 provides an overview of the European ESCO market in 2010, with detailed analysis for each member-state.

<http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/15108/1/jrc59863%20real%20final%20esco%20report%202010.pdf>

Guidance 13**Eurocontract Guaranteed Energy Performance, Publishable Report, Berliner Energieagentur GmbH (2008)**

The report provides an overview of EPCs, and information about the market development in Germany, Austria, Finland, France, Greece, Italy, Norway and Sweden.

http://eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1576&side=downloadablefiles

Guidance 14**Client/ESCO SELECTION, IEE – BioSolESCO, TV Energy (2009)**

The section on ESCO selection presents the criteria which a client should consider when choosing an ESCO.

http://www.biosolesco.org/guidance/uk/Biosolesco4_eng.pdf

Guidance 15

Final Publishable Report, EUROCONTRACT IEE (February 2008)

Presentation of adapted EPC models for refurbishment in the public sector (pages 49- 56).

http://ieea.erba.hu/ieea/fileshow.jsp?att_id=5828&place=pa&url=Eurocontract_Final_Report_Publishable.pdf&prid=1576

Guidance 16

Third Party Financing – Achieving its Potential, Energy Charter Secretariat (2003)

Section 2.2 provides a summary of the main financing approaches for an EPC.

http://www.encharter.org/fileadmin/user_upload/document/Energy_Efficiency_-_Third-Party_Financing_-_2003_-_ENG.pdf

Guidance 17

International Experiences with the Development of ESCO Markets, Berliner Energiagentur GmbH (December 2008)

Section 2.2 shows different kinds of EPC models.

<http://www.gtz.de/de/dokumente/en-International-Experience-Developing-ESCO-Markets.pdf>

Guidance 18

Standard EPC Documents – V. Energy Performance Contracts, EESI IEE, Prepared by SEVEn, Berliner Energieagentur (January 2011)

Short description of EPC articles.

http://www.european-energy-service-initiative.net/fileadmin/user_upload/gea/standard_documents/Standard5_Contracts.pdf

Guidance 19

Berliner Energie Agentur

Website demonstrating the shared-savings model implemented by the municipality of Berlin.

<http://www.berliner-e-agentur.de/en>

Guidance 20

Models and Contracts, PRIME IEE, Author: Wuppertal Institute for Climate, Environment, Energy (July 2006).

Section 5: The appendix presents a model contract for EPCs (in German) (pages 5-20).

Guidance 21

Public Procurement of Energy Efficiency Services – Getting Started, Energy Sector Management Assistance Program, World Bank (November 2010)

Pages 17 to 23 expound the World Bank procurement guidelines dividing an EPC in two contract types: split design and construction and combined design and construction.

http://www.esmap.org/esmap/sites/esmap.org/files/BN009-10_EECI-Public-Procurement-Getting-Started.pdf

Guidance 22

Comprehension Refurbishment of Buildings with Energy Performance Contracting, EUROCONTRACT IEE, Reported by Graz Energy Agency Ltd (December 2007)

Section 6: Guidelines and Components for Implementation.

http://www.european-energy-service-initiative.net/fileadmin/user_upload/bea/Documents/Contractual_Issues/Comprehensive_Refurbishment-manual_main_part_071220.pdf

Guidance 23**Assessment of Policy Instruments for Reducing Greenhouse Gas Emissions from Buildings, UNEP SBCI Sustainable Buildings and Construction Initiative (2007)**

Table 14 on page 30 summarizes barriers to EPC in different sectors alongside possible solutions.

http://www.unep.org/themes/consumption/pdf/SBCI_CEU_Policy_Tool_Report.pdf

Guidance 24**Energy Efficiency Building Retrofit Toolkit, Building Owners and Managers Association International and Clinton Climate Initiative, March 2011**

This paper describes the main step of an EE retrofit project development.

http://clintonfoundation.org/files/cci/cci_toolkit_boma.pdf

Guidance 25**Measuring Energy Efficiency. Indicators and Potential in Buildings, Communities and Energy Systems. VTT Research Notes 2581, 2011.**

Chapter 5 illustrates methods for EE measurement in buildings.

<http://www.vtt.fi/inf/pdf/tiedotteet/2011/T2581.pdf>

Guidance 26**Comparison and Evaluation of Financing Options for Energy Performance Contracting Projects, EUROCONTRACT IEE, Reported by Graz Energy Agency Ltd (August 2010)**

Chapters 4 to 6 show various financing options and their parameters: credit financing (Chapter 4), leasing financing (Chapter 5) and cession and forfeiting of contracting rates (Chapter 6).

[http://www.ieadsm.org/Files/Tasks/Task%20XVI%20-%20Competitive%20Energy%20Services%20\(Energy%20Contracting,%20ESCo%20Services\)/Publications/101126_GEA-T16_Finance%20Options%20for%20Energy-Contracting%20incl%20Examples.pdf](http://www.ieadsm.org/Files/Tasks/Task%20XVI%20-%20Competitive%20Energy%20Services%20(Energy%20Contracting,%20ESCo%20Services)/Publications/101126_GEA-T16_Finance%20Options%20for%20Energy-Contracting%20incl%20Examples.pdf)

Guidance 27**International Experiences with the Development of ESCO Markets, Berliner Energiagentur GmbH (December 2008)**

Section 2.3 presents the three fundamental financing options: ESCO, energy-user or TP financing.

<http://www.gtz.de/de/dokumente/en-International-Experience-Developing-ESCO-Markets.pdf>

Guidance 28**Synthesis Report on ESCo Definition, Approaches, Drivers, Success Factors and Hurdles, A. Giakoumi & G. Markogiannakis (CRES) – BIOLESCO (January 2012)**

Section 3.1.3 describes the financial institutions and schemes used in several European countries.

<http://www.biosolesco.org/download/Bio-SoleSCo%20D2.2.%20Synthesis%20report.pdf>

Guidance 29**Fund for Energy and Energy Savings, Bulgaria**

Websites with information on the Fund (in Bulgarian and English).

The Fund is listed on the Bulgarian Stock Exchange (Code: 6EE/FEEI)

<http://enemona.bg/english/index.php?97>

<http://www.investor.bg/companies/view/1122.html>

<http://www.eesf.biz/>

Guidance 30

Public Procurement of Energy Efficiency Services – Getting started, Energy Sector Management Assistance Program, World Bank (November 2010)

Presentation of financing options (pages 25-30).

http://www.esmap.org/esmap/sites/esmap.org/files/BN009-10_EECI-Public-Procurement-Getting-Started.pdf

Guidance 31

Energy Efficiency Retrofit Fund, Guide for Applicants. Sustainable Energy Authority of Ireland, May 2010.

This fact sheet describes the funding scheme available for EE retrofitting in Ireland.

http://www.seai.ie/Grants/Retrofit/EERF_Application_guide.pdf

Guidance 32

Working paper: current financial and fiscal incentive programmes for sustainable energy in buildings from across Europe, Association for the Conservation of Energy, London (September 2009)

The document presents a country breakdown of the financial and fiscal incentives available in the European Economic Area (EEA).

http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCYQFjAA&url=http%3A%2F%2Fwww.euroace.org%2FPublicDocumentDownload.aspx%3FCommand%3DCore_Download%26EntryId%3D205&ei=fXI7T7KsDcTG0QXAIKft&usg=AFQjCNGtQGPhVTseXFubuaXO7_fzjkGVw

Guidance 33

Joint Public-Private Approaches for Energy Efficiency Finance: Policies to Scale up Private Sector Investment, International Energy Agency (2011)

Comprehensive report on the critical elements of joint public-private approaches to accelerating and scaling up private investment in EE with particular focus on lessons learned with regard to energy performance contracts, risk guarantees and dedicated credit lines.

<http://www.iea.org/papers/pathways/finance.pdf>

Guidance 34

European Local Energy Assistance (ELENA)

The following link describes the main facts of the ELENA initiative.

<http://www.eib.org/eppec/resources/eppec-elena-factsheet.pdf>

Guidance 35

European Energy Efficiency Fund (EEE F) and its technical assistance

<http://www.eeef.eu/financing-terms.html>

Guidance 36

Berliner Energie Agentur

The following link describes the housing development project in Weissensee:

<http://www.berliner-e-agentur.de/en/services/contracting>

Guidance 37

European Local Energy Assistance (ELENA)

The following link contains a list of project for which ELENA provided technical assistance

<http://www.eib.org/elena>

Guidance 38**Public Procurement of Energy Efficiency Services – Lessons from International Experience, World Bank (November 2010)**

Chapter 4 (pages 43-55) details relevant procurement methods for EE.

Chapter 6 (pages 92-102) defines the bid evaluation process, lists evaluation criteria and provides project examples.

http://www.esmap.org/esmap/sites/esmap.org/files/P112187_GBL_Public%20Procurement%20of%20Energy%20Efficiency%20Services_Lessons%20from%20International%20Experience_Singh.pdf

Guidance 39**Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.**

Section on Bid Evaluation, Table 6.3 (Page 94) displays a sample list of evaluation criteria and their scoring points and weight in the final evaluation.

Guidance 40**Guideline for Designing Energy Efficiency Services Contracts, PU-BENEFS IEE, Coordinator Crispin Webber, Thamesenergy LTD (September 2007)**

Section 3 consists of a guideline for EPCs.

http://www.iee-library.eu//images/all_ieelibrary_docs/pubenefs_guidelineformodelcontract_en.pdf

Guidance 41**Call for Proposals 2012 for Actions under the Programme "Intelligent Energy – Europe," Intelligent Energy Europe for a Sustainable Future (2012)**

Pages 25-27 summarize the purpose and priorities of Mobilizing Local Energy Investments (MLEI).

http://ec.europa.eu/energy/intelligent/files/call_for_proposals/call_2012_en.pdf

Guidance 42**Mobilising Local Energy Investments (MLEI) Factsheet, Intelligent Energy Europe for a Sustainable Future (2011)**

The factsheet contains information on how to apply for technical assistance funding under MLEI, and on the types of eligible investment projects and public authorities.

http://www.nks-energie.de/lw_resource/datapool/_pages/pdp_100/IEE_Loc_Invest.pdf

Guidance 43**Guidelines for the Provision of Infrastructure and Capital Investments through Public Private Partnerships: Procedures for the Assessment, Approval, Audit and Procurement of Projects. Compháirtíocht Phoiblí Phríomháideach (July 2006)**

Section 2 (starting page 18) provides detailed guidelines on the steps involved in the PPP procurement process.

http://ppp.gov.ie/wp/files/documents/guidance/central_guidance/ppp-procurement-assessment.doc

Guidance 44**Competitive Dialogue in 2008, OGC/HMT Joint Guide on Using the Procedure, Office of Government Commerce / Her Majesty's Treasury (UK)**

Section 2 (pages 11-12) describes key steps in a competitive dialogue procurement.

http://www.ogc.gov.uk/documents/OGC_HMT_2008_Guidance_on_Competitive_Dialogue.pdf

Guidance 45

Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft

Page 50 presents the phases of an EPC project.

Section 9 contains information on project preparation and development including energy audits.

Guidance 46

Energy Efficiency in Public Procurement – Member States' Experience, Barriers/Drivers and Recommendations, Joint Research Centre, European Commission (May 2010)

Section 1.2 (starting page 13) provides an overview of the EU legislative framework.

Section 2 (starting page 18) provides a review and an assessment of the legislative framework policy and of the practical implementation of EE procurement for each EU member state.

http://ec.europa.eu/energy/efficiency/studies/doc/2010_05_jrc_ee_public_procurement.pdf

Guidance 47

Etude d'Aide à la Décision - Audit Energétique dans les Bâtiments – Cahier des Charges, ADEME (April 2011)

This document shows how to develop an energy audit.

Guidance 48

Standard Procurement Document – Prequalification Document for Procurement of Works and User's Guide, The World Bank (2006)

Section III (pages 19-24) describes how to set up the general qualification criteria and requirements for contractors, which can also be applied to preparing bids for private partners for EE PPP.

<http://siteresources.worldbank.org/INTPROCUREMENT/Resources/Prequal-EN-09-sep-10.pdf>

Guidance 49

Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.

Section on Bid Evaluation, Table 6.3 (page 94) displays a sample list of evaluation criteria and their scoring points and weight in the final evaluation.

Guidance 50

Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development/The World Bank. ISBN: 978-0-8213-8102-1.

This section (pages 93-102) gives issues on how evaluate a proposal and the criteria which can be used.

Guidance 51

Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.

Section overview (pages 4-5), Table 2 provides a list of different types of contracts being used for EE.

Guidance 52**Final Publishable Report, EUROCONTRACT IEE (February 2008)**

Discussion on certifications in the context of energy services (pages 66-69).

http://ieea.erba.hu/ieea/fileshow.jsp?att_id=5828&place=pa&url=Eurocontract_Final_Report_Publishable.pdf&prid=1576

Guidance 53**Energy Performance Certification of Buildings: A Policy Tool to Improve Energy Efficiency, OECD/ International Energy Agency (2010)**

Comprehensive discussion on energy performance certification of buildings.

http://www.iea.org/papers/pathways/buildings_certification.pdf

Guidance 54**NORM APME, Making standards better for SMEs**

Energy Management: General requirements and qualification procedures webpage.

<http://extranet.normapme.com/en/technical-committees/cen-clcjt-189-energy-management-general-requirements-and-qualification-procedureCEN CLC/JTF 189 –>

Guidance 55**Public Procurement of Energy Efficiency Services – Lessons from International Experience, J. Singh, D. R. Limaye, B. Henderson, X. Shi (2010). The International Bank for Reconstruction and Development / The World Bank. ISBN: 978-0-8213-8102-1.**

This section (pages 93-102) gives issues on how evaluate a proposal and the criteria which can be used.

Guidance 56**Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft**

Section 11 presents the implementation phase of an EPC project in state buildings.

Guidance 57**Guide de la Mesure et de la Vérification pour les Services d'Efficacité Energétique, Club S2E (February 2009)**

Guide for M&V in line with the IPMVP (in French).

<http://www.clubs2e.org/Content/Default.asp?PageID=137>

Guidance 58**International Performance Measurement and Verification Protocol, Volume 1, Efficiency Valuation Organization (September 2010)**

M&V protocol available in different languages at: www.evo-world.org. It contains all the information to build a valuable M&V plan.

http://www.evo-world.org/index.php?option=com_form&form_id=38&Itemid=535

In M&V FAQ, the differences between IPMVP and others M&V Guide are explained.

http://www.evo-world.org/index.php?option=com_content&task=view&id=123&Itemid=98

Guidance 59

Measurement and Verification and the IPMVP, Clinton Foundation, Clinton Climate Initiative, President Climate Commitment (April 2009)

Summary of the IPMVP.

http://www2.presidentsclimatecommitment.org/documents/ccitoolkit/Measurement_and_Verification_and_The_IPMVP.pdf

Guidance 60

Guidelines for Performance Contracting in State Building, F. Seefeldt, V. Kuhn, W. Trautner, J-H. Wetter (April 2003). Berliner Energieagentur GmbH Anwaltskanzlei Schawien Naab Partnerschaft

Sections 13 and 14 contain information on how to develop and calculate a baseline.

Guidance 61

Climate Friendly Buildings and Offices – A Practical Guide, United Nations Environmental Programme (2010)

Section 3 contains information on baselining and benchmarking.

Section 6 contains three case-studies, including detailed energy analysis, on public buildings used by the United Nations and the African Development Bank.

<http://www.unep.fr/scp/publications/details.asp?id=DTI/1278/PA>

Guidance 62

Directive 2006/32/EC on energy end-use efficiency and energy services and repealing Council Directive 93/76/EC, European Parliament and European Council (April 2006)

The article 5 deals with energy end-use in the public sector. The article 9 presents the financial instruments for energy savings. The article 12 defines energy audits.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006L0032:EN:HTML>

Guidance 63

<http://www.esd-ca.eu/>

CA ESD webpage.

Guidance 64

Energy Efficiency Plan 2011, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (March 2011)

Section 2 (pages 4-5) explains why the public sector has to lead EE changes and Section 3 (pages 6-8) shows the importance of reducing building energy consumption at European level.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0109:FIN:EN:PDF>

Guidance 65

Directive on the Energy Performance of Buildings (recast), the European Parliament and the Council (May 2010)

The introduction of the directive traces the commitments of the European Commission concerning EE in buildings.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:EN:PDF>

Guidance 66

Booklet - Key Facts and Figures about Europe and the Europeans.

Pages 56-57 provide statistics about the energy independence of the European Union.

http://ec.europa.eu/publications/booklets/eu_glance/66/en.pdf



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