

Energy Performance Contracting – Modernising Buildings with Guarantee

Results of the European Project EESI 2020

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Amtsgericht Charlottenburg, HRB 45313
USt.-Id.-Nr.: DE 157 533 924

Telephone: +49(0)30-293330-0

E-Mail: hermann@berliner-e-agentur.de

Internet: www.berliner-e-agentur.de

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Executive Summary

To achieve the European targets for energy efficiency and climate protection, massive investments into the European building stock will be required during the upcoming decades. It is therefore crucial to mobilize private capital with energy services for the modernization efforts needed.

Energy performance contracting (EPC) is to date the most developed energy service addressing demand-side energy savings in the building sector. But in spite of the meanwhile 20 years of experience with EPC, the demand for new projects remained below expectations during the last years.

The project “European Energy Service Initiative Towards the EU 2020 Energy Saving Targets” (EESI 2020), which was implemented between 2013 and 2016 by a consortium of European energy agencies or experts with support of the European Commission’s Intelligent Energy Europe Programme, has been addressing ways to improve the impact of EPC in nine European regions.

To improve the sustainability and the scaling up of the business model, EPC schemes were supported on the regional level by creating task forces, by including EPC in regional energy plans and by assisting pilot projects. In nine metropolitan regions, a total of 27 EPC pilot projects have been realised within EESI 2020, with overall investments in energy efficiency of more than 26 M€, leading to CO₂ emission reductions of 16.000 tons per year. The projects’ average energy cost savings are higher than 30%.

Additionally EESI 2020 promoted the role of EPC facilitators through dedicated capacity building measures: Facilitation materials in nine languages have been elaborated, including a project database with over 50 best practices, a detailed facilitator guideline and training modules. Furthermore, some 800 energy stakeholders have participated in EPC facilitator trainings within the project, broadening the available expertise to spark further growth in the EPC markets.

With the European Energy Service Award, successful projects, promoters and providers of energy services – many of them in the context of EPC – received public recognition within high-level awarding events in Brussels 2014 and 2015.

In the evaluation of the project activities and especially the pilot projects, barriers preventing the stronger uptake of EPC have been identified: High complexity of EPC, lack of trust, but also a cultural barrier persisting between public building owners and private ESCOs. Furthermore, EPC is currently focussed too much on public buildings, while for private building owners adapted business models still need to be developed.

The Eurostat Guidance Note on EPC published in 2015, which restricts off-balance accounting of EPC projects, is seen extremely counter-productive for EPC especially in less mature markets, as it increases the bureaucratic burden for starting new projects.

The EESI 2020 project also identified and further developed success factors for EPC. Through qualified EPC facilitation, many of the non-technical barriers can be tackled successfully. An experienced neutral facilitator will support EPC clients in identifying new EPC projects, provide his expertise in the complex procurement process and help bridging the cultural divide between the public and the private side. This will ultimately lead to increased experience, smoother management, lower transaction costs and thus a stronger market development on the demand side.

To reap in the future the full potential of EPC, the EESI 2020 consortium recommends to:

- Recognise and strengthen the role of project facilitators for the realisation of EPC projects and to train more facilitators at national or regional level,
- Encourage programmes aimed at improving national frameworks for EPC and financially supporting the EPC clients (e.g. as the National Energy Services Framework in Ireland and the BAFA programme for EPC facilitation in Germany),
- Create pragmatic ways to work within and around the recent Eurostat ruling which is having a negative impact on many EPC markets, and to
- Put more attention on expanding the private sector EPC market, which is not affected by the Eurostat ruling. While the EPC potential in the public building stock is still large, there is an even larger market potential outside the public building sector.

Energy Efficiency in Buildings

Energy efficiency is an issue that has been identified as a top priority at the highest level in the European Commission. It is key for productivity, energy security, job creation and lower carbon intensity, yet many Member States face challenges in meeting their EU 2020 target for energy efficiency.

While improving the energy efficiency of the building stock generally makes sense to political and technical experts, the building owners themselves and the financial lending institutions that can help fund the capital investments are not fully convinced that the future energy savings, and the returns on their investments, are reliable. It would also appear that the high expectations among some political institutions are not borne out in practice.

By way of background, many of the existing buildings across Europe were constructed before the first oil crisis in 1973, when energy was cheap and little consideration was given to energy efficiency. Today, when these building owners wish to improve the energy efficiency of their buildings they must replace the old inefficient boilers with modern highly efficient heating and cooling systems, upgrade the insulation in the building fabric and replace light fixtures and other electrical equipment.

These type of measures can be expensive and the building owners must evaluate the capital investments against the potential cost savings in energy bills over the longer term. Even if the contractors assure the building owners of the future energy and cost savings there exists a lack of trust that the promised savings will be realised in practice. Against this background, energy performance contracting (EPC) has introduced a new twin-track approach:

- a) The energy performance contract provides a hard guarantee to the building owner that the projected energy (kWh) and cost (€) savings will be delivered and maintained over time, through a binding long-term (5 to 15 year) contract with the supplier of plant and equipment – usually an energy services company (ESCO).
- b) In many contracts the ESCO also offers access to third party finance, allowing the facility owner the additional benefit of reducing the upfront capital investment, as the investments are repaid directly from the saved energy costs. In the event that the targets are not realised the ESCO must pay financial penalties.

This concept of energy performance contracting, as a means of delivering guaranteed energy efficiency in existing buildings, has gained considerable traction in some EU regions yet is quite unknown in other regions.

Promoting and facilitating the broader use of EPC is the overarching objective of the EESI 2020 project, the results of which are being presented within this publication.

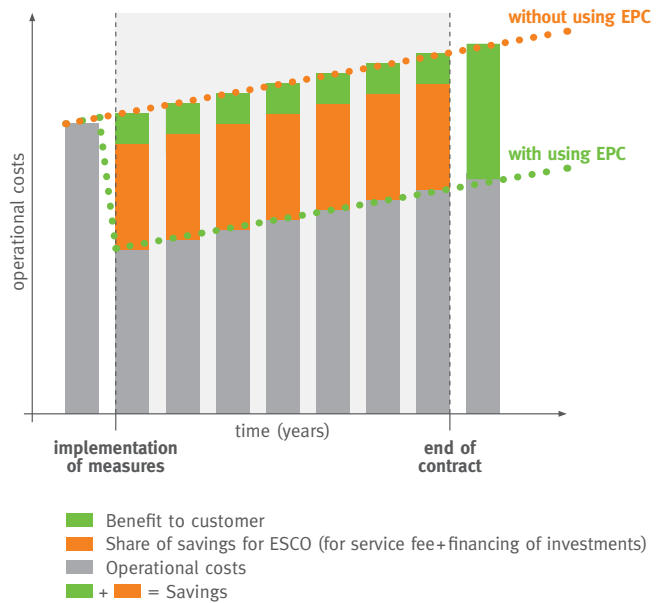


What is EPC?

Energy Performance Contracting (EPC) is an energy service model allowing to finance energy saving measures (ESM) in buildings from the achieved cost reductions. Under an EPC arrangement an Energy Service Company (ESCO) implements energy efficiency and optionally renewable energy (RE) measures, and uses the stream of income from the cost savings or the renewable energy produced to repay the costs of the project, including the costs of the investment.

The ESCO guarantees the cost savings to the building owner in the contract and takes over the financial and technical risks of implementation and operation for the entire project duration of usually 5 to 15 years. Typical ESCO services within an EPC are financing, planning and installation of ESM or RE generation in a building or pool of buildings. Operation and maintenance as well as training of the users are often included as well.

EPC is a means to deliver infrastructure improvements especially to facilities whose owners lack investment capital, engineering skills, manpower or know-how to implement the measures themselves. Thus, EPC delivers an integrated energy improvement and management package from one qualified service company, allowing the clients to focus on their core business.



A core feature of EPC is the guarantee of cost savings achieved through improved energy efficiency or renewable energies. The financing of the investments by the ESCO using a share of the achieved cost savings is the common practice, but not a condition in EPC, as sometimes the building owners prefer to finance the measures themselves.

The most important customer group for EPC in Europe is the public sector, followed by industry and hospitals.



The EESI 2020 Project

To achieve the European targets for energy efficiency and climate protection, massive investments into the European building stock will be required during the upcoming decades. It is therefore crucial to mobilize private capital with energy services for the modernization efforts needed.

Energy performance contracting (EPC) is to date the most developed energy service addressing demand-side energy savings in the buildings sector. But in spite of the meanwhile 20 years of experience with EPC, the demand for new projects remained below expectations during the last years. The main barriers identified were of a non-technological nature, such as the lack of systematic information, of trust, of procurement procedures, and the missing capacities of market and project facilitators.

The IEE project “European Energy Service Initiative Towards the EU 2020 Energy Saving Targets” (EESI 2020) has been promoting a significantly broader use of Energy Performance Contracting (EPC) by applying the following strategies:

Providing EPC information

- › Provision of market analyses and model contract documents for the participating countries as well as an online Best Practice Database for EPC

Promoting EPC facilitation

- › Development of an EPC facilitation package and delivery of facilitator trainings to enable and qualify energy consultants to provide support to EPC clients

Strengthening EPC on the regional level

- › Establishing EPC hot spots in nine metropolitan regions in Europe by creating EPC task forces and integrating long-lasting EPC schemes in regional energy or climate plans

EPC pilot projects

- › Supporting building owners in the target regions in the planning and implementation of EPC pilot projects through facilitators

Increasing visibility

- › Dedicated public relations activities for EPC with the European Energy Service Award (EESA) as the highlight

Within the project team, EPC experts from Germany, Austria, Norway and the Czech Republic supported the project partners in the emerging EPC markets of Ireland, Spain, Belgium, Croatia and Bulgaria.

Target Regions in EESI 2020

| | |
|-----------------------------|----------------|
| Berlin / Brandenburg | Germany |
| Prague | Czech Republic |
| Wiener Neustadt | Lower Austria |
| Region of Oslo | Norway |
| Dublin | Ireland |
| Region of Plovdiv | Bulgaria |
| Antwerp | Belgium |
| Barcelona | Spain |
| Karlovac County | Croatia |



Promoting EPC on the Regional Level

A major objective of EESI 2020 was to establish hot spots for EPC in the nine participating European regions. By bringing EPC on the agenda of relevant stakeholders (task forces), including EPC schemes in regional energy or climate plans and supporting EPC pilot projects in the region, additional momentum and self-sustaining structures to mainstream EPC regionally were created successfully.

Dublin | Ireland

Ireland is still a very young market for Energy Performance Contracting (EPC). After the first attempt to introduce public EPC in Dublin failed in 2008, a lot of effort had to be invested to thoroughly prepare the ground and implement the first projects, thus restoring trust and confidence among the market partners.

As part of the efforts, EPC programs have been embedded into the Dublin City Sustainable Energy Action Plan 2010-2020 (SEAP), which was prepared by the EESI 2020 project partner City of Dublin Energy Management Agency (Codema) in association with an interdepartmental Steering Committee set up by Dublin City Council in the year 2014. The document highlights the role EPC can play in facilitating Dublin reach its energy targets and recommends its broader application.

Within EESI 2020, the first public EPC pilot project in Dublin has been initiated and publicly tendered and will be implemented in 2016.

Karlovac County | Croatia

REGEA, the North-West Croatia Regional Energy Agency, has been preparing strategic and planning documents related to energy efficiency and renewable energy sources for its founders (four regional authorities in Croatia) and other local and regional authorities in Croatia and beyond since 2008. Within the framework of the EESI 2020 project, Karlovac County (target area in Croatia, one of REGEA's founders) established a task force for the implementation of EPC projects. According to the requirements of the Croatian Law on Energy Efficiency (O.B. 127/14), the following documents were prepared and officially adopted by the Karlovac County Prefect, Mr. Ivan Vučić:

- 1) Yearly Energy Plan for Karlovac County for 2016
- 2) Three Year Energy Plan for Karlovac County for 2015 - 2017

In the Three Year Energy Plan the EESI 2020 project is explicitly mentioned within Activity No.7 – energy retrofitting of public institutions based on the EPC model. In line with these plans and with support of REGEA, Karlovac County has started with the implementation of several EPC pilot projects, which are the first public EPC projects not only in Karlovac County but in entire Croatia.



Region of Plovdiv | Bulgaria

The European Labour Institute (ELI), Bulgarian partner in EESI 2020, provided trainings and information events on EPC in the towns of Plovdiv, Pazardjik and Kustendil. In the municipal development plans for 2014-2020 of all three towns, EPC is one of the recommended implementation schemes for ESCO projects in the chapter “Financing” of the respective documents.

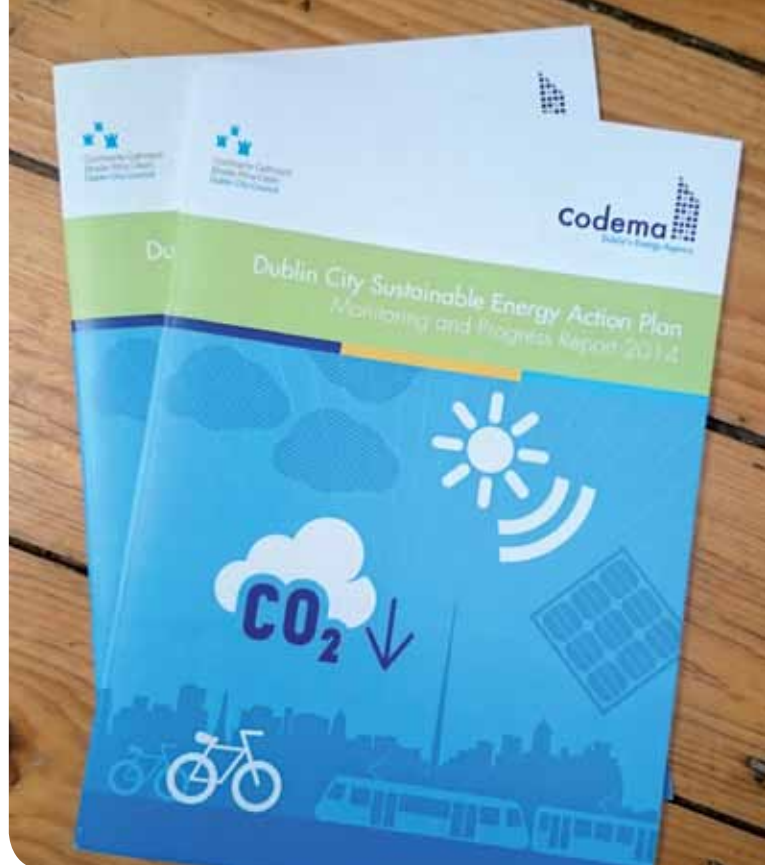
As another result of the trainings, a national data base with the contact information of 110 trained EPC facilitators was created. The data base was uploaded on the Bulgarian EESI 2020 webpage, distributed among the energy agencies and announced via the EcoEnergy network of the Convent of Mayors.

Region of Oslo | Norway

Akershus County is situated in the surrounding area of Norway’s capital Oslo. Within the EESI 2020 project, Akershus was one of the nine European target regions. EPC in Akershus is very effective as it is integral part of the county energy planning. The existing Climate and Energy plan for Akershus County specifically mentions EPC as a recommended method to save energy in buildings. “Energy efficiency is an important part of the existing Climate and Energy Plan for Akershus County Council, and EPC has proven to be the most efficient method for energy reduction in public buildings”, says Stig Hvoslef, scientific coordinator for climate and environment in the Akershus County Administration.

EESI 2020 partner Norsk Enøk og Energi AS (NEE) in cooperation with the facilitator Kjell Gurigard supported the county in their EPC activities and the initiation and implementation of no less than seven pilot projects. And yet another project is in the loop.

The good experiences from the first seven EPC projects will make it possible to set even stronger targets in the new County Climate and Energy Plan that will be developed in cooperation with the Akershus municipalities during 2016 and 2017.



Catalonia | Spain

The Institut Catala d’Energia (ICAEN), partner in EESI 2020, aims to save money for the Catalan Government by reducing the energy bills of public buildings.

In August 2011, a first local Energy Plan was adopted for Catalonia. Due to positive earlier experiences with EPC models, the energy plan puts a special focus on EPC. The plan demands for high investment projects the inclusion of guaranteed savings in the tendering process, with the minimum energy savings level at 20%. The application period of this first plan was 2011 to 2014.

In June 2015 an extension and revision of the energy plan for the period 2015 to 2017 was approved. It is part of the Catalan Climate change and Energy Plan 2012 to 2020 (known as PECAC2020) that implements the European Energy Efficiency Directive.

The 2015-2017 Catalan Energy Plan expects for public energy efficiency projects total investments of almost 110 M€, which have to come from the ESCO market. It furthermore specifies ICAEN as the facilitator to carry out the implementation of this strategy by initiating energy efficiency projects with guaranteed savings.

The Plan envisages energy savings of 25% for the whole building stock of the Catalan Government by the year 2020 based on 2007 figures. With 5 pilot projects initiated and supported in the context of the EESI 2020 project, the implementation of the Plan is on track.

Facilitating EPC

Although Energy Performance Contracting (EPC) is an established energy service model since many years, the significance of experienced facilitators for the success of EPC projects has long been underestimated.

A good EPC facilitator disposes of technical and economic expertise as well as a sound understanding of legal and financing issues. At the same time, a facilitator's most important role is communication and moderation. He or she has to explain well, listen to doubts, talk to stakeholders, and create confidence and mutual understanding. This is a key to making a project a win-win situation and a success.

By supporting a project's initial set-up, by assessing, its feasibility, and by communicating the concept towards decision makers, the facilitator is crucial for putting the train on track. Many EPC projects which never reached the phase of implementation, have failed in this initial phase due to a lack of knowledge about and arguments in favour of EPC.

Furthermore, facilitators guide their client through the procurement of the EPC-project, which requires sound knowledge of the process, the right handling of the tools, such as contract, baseline and tender documents, and the organisational requirements of EPC.



An important result of EESI 2020 was the development of a systematic guide for facilitators addressing the facilitator's responsibilities in the course of an EPC-project:

- STEP 1** How to identify potential EPC project opportunities
- STEP 2** How to Present EPC Projects to Customers
- STEP 3** Added Value of EPC compared to In-House Solutions
- STEP 4** Procurement of EPC: Tendering and Awarding of Contract
- STEP 5** The EPC Contract
- STEP 6** Financing of EPC-projects

With its modular structure, the guideline allows facilitators to support the client in the whole life cycle of the project or only in selected phases.

Within the EESI 2020 project, the consortium partners trained in more than 30 training events a total of almost 800 consultants facilitators on the application of the EPC facilitator guideline. The newly trained facilitators can now start supporting additional clients and become multipliers for EPC in Europe.



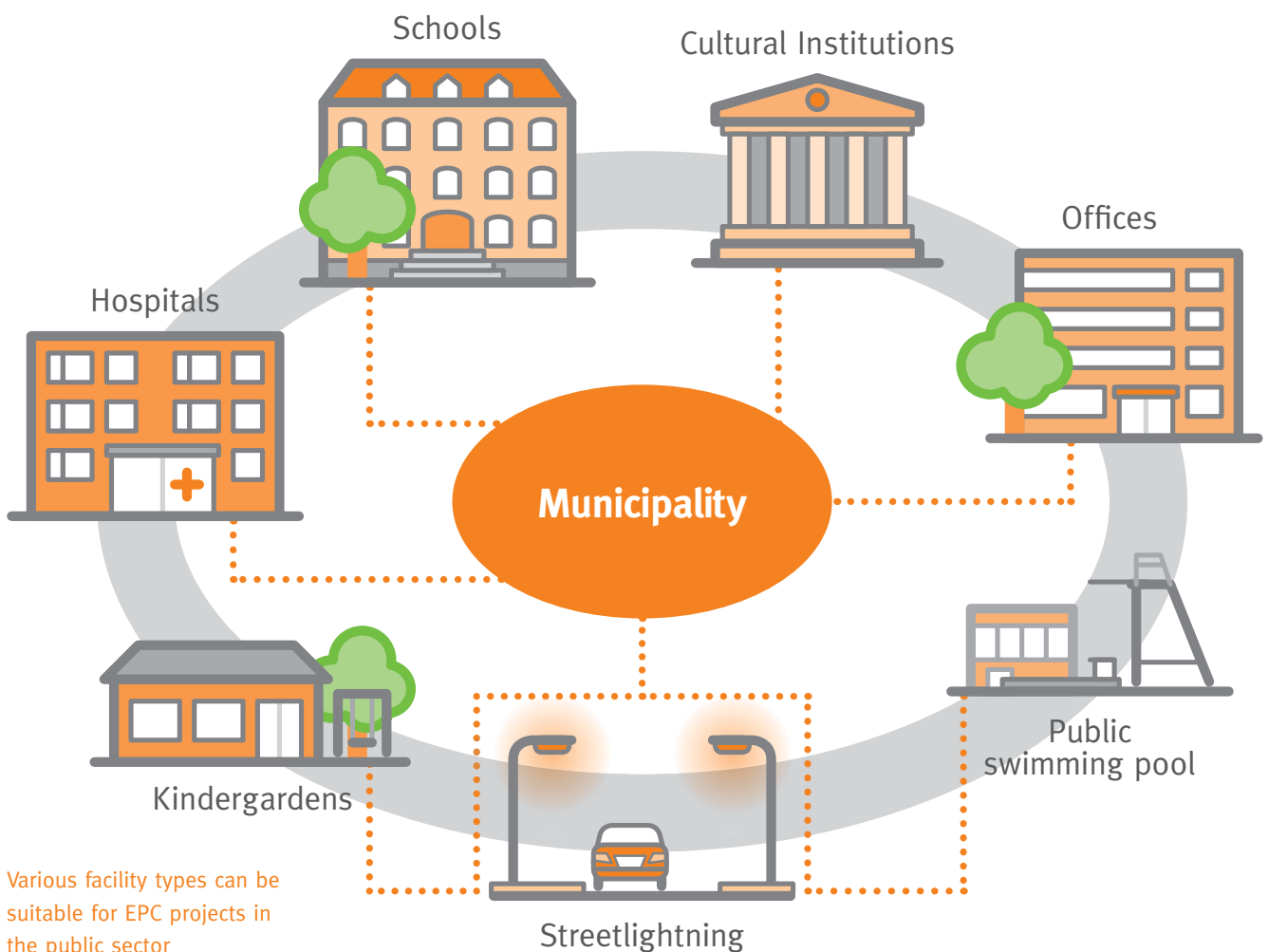
EPC facilitation in Austria

As the Austrian market potential for EPC is not as large as in other countries, there is currently only a limited demand for market actors in the field of facilitation of EPC-projects. At the same time, to achieve a market growth, a higher number of EPC facilitators will help in activating potential clients in order to maximize the number of EPC projects.

In Austria, the target group addressed with the EPC facilitator trainings in EESI 2020 were experts on energy efficiency (i.e. energy auditors) and energy managers within public and private organisations. The main objective was to empower them to take the initial steps in the development of an EPC project in order to detect feasible projects, communicate reasonable expectations towards EPC and eliminate improper project ideas and misleading expectations on EPC to avoid bad examples.

The facilitator guideline combined with the related trainings raised a lot of attention in Austria and led to a high number of project ideas. Especially with the perspective of bringing the results of energy audits one step further to the possible implementation through EPC. Not only in the public, but also in the private sector.

Within EESI 2020 Graz Energy Agency performed five trainings on EPC-facilitation in Austria, providing 160 experts the skills to initiate new EPC projects.



EPC Facilitation approach in Catalonia

ICAEN, the Catalan Energy Institute, has been focusing on creating awareness for the need to reduce energy consumption in Catalanian government buildings among public entities by consulting senior personnel and energy managers.

After the approval of the first Energy Plan in 2011, ICAEN started to develop a set of documents supporting stakeholders in the EPC tendering process and in the implementation of energy efficiency improvement projects with guaranteed results according to Spanish and Catalan public regulation. These tendering documents were developed with the consensus of the main ESCOs, of Energy Associations, Engineering companies and public entities.

The facilitation oriented tools developed within EESI 2020 perfectly complement the tendering documents.

Within EESI 2020, ICAEN conducted four training sessions in order to disseminate basic EPC concepts among important stakeholders. The attendees were engineering companies, ESCOs, public stakeholders responsible for energy management in different city halls, public consortia, representatives of public hospitals or buildings, and also some architects and freelance engineers. More than 100 people have been trained in total.

Tie Roefs, Deputy of Province of Flemish Brabant: “Via an innovative EPC coaching trajectory, the province successfully guided six municipalities towards the implementation of an EPC-project. Nine* new municipalities recently subscribed for our second trajectory.”

How a Market Facilitator Can Boost the Local EPC-Market – Belgium

Since 2010, the Belgian province Flemish Brabant supported the realization of energy savings by its municipalities via conventional energy audit programs. Confirming observations by many public authorities in other member states, the decision makers of the province concluded in 2013 that in reality this conventional approach generated almost no energy saving results. It was decided to take the role of an EPC market facilitator and to develop EPC projects.

Supported by the EPC- and change management experts of EY and Factor4, the province started with a careful analysis of the successes and failures of previous EPC-development tracks in Belgium and abroad. Based on this analysis, and making use of modern change management and communication techniques, the province launched an innovative EPC coaching trajectory composed out of four steps.

In the first step, municipalities could request an EPC-training. Before being allowed to the next step, they had to sign a Letter of Intent agreeing to actively participate in the rest of the process. If they would lack participation, or just drop out of the process, they were obliged to realize a concrete energy savings target without further support of the EPC market facilitator.



Next, experts of the province executed an EPC-pre-feasibility study for the municipal buildings, including collection of basic building data (e.g., technical condition of the building) and inventory of possible energy saving measures. All the necessary data were collected by the municipalities themselves, and transferred in data sheets provided by the province. After the data collection and pre-feasibility, the conclusions were discussed in an interactive workshop with the EPC-experts and municipal stakeholders. In parallel, in order to also convince the technical staff, the experts conducted three 'spot advices' (a walk-through audit with the building manager) to show the energy and non-energy saving potential that hasn't been taken care of. Confronted with potentials, most of the building managers admitted to be aware of the potentials, but regretted not having had enough time to handle all of these small and big projects. The combination of the pre-feasibility workshop and spot advices resulted in an EPC-pre-feasibility report approved by all the officials as well as by the politicians.

The major objective of this phase was neither 'technical' nor 'theoretical', but rather 'psychological', responding to 'what's in it for me?' for every stakeholder.

In the third step, all the stakeholders of at least three municipalities (i.e. the Mayor, Aldermen, technical and environmental team) participated in a 'JAM-session' where, after a short recapitulation of the basics of EPC, they were divided in three parallel workshops: financial, operational and juridical. This allowed everyone to ask more and more complex questions about their expertise to an expert specialized in this aspect of EPC. The workshop ended with a networking dinner enabling the politicians, officials and experts to connect more informally and to increase trust of all stakeholders furthermore.



During interactive 'JAM-sessions', EPC-experts answered the last remaining questions of the municipal officials

In the last step of the EPC coaching trajectory the municipalities procured an EPC-facilitator using procurement documents developed by the province in collaboration with EPC-experts.

The first EPC trajectory was a big success. Of the eight municipalities that started the program, six – thus 75% – decided to implement EPC and to effectively procure an external EPC-facilitator. This is a big success as previous experiences with local EPC-development programs based on a more conventional approach (e.g. classic workshops, informative meetings etc.) showed that only 10-20% of the municipalities would go for EPC.

The success of the first trajectory motivated several new municipalities to subscribe for the second trajectory which was recently launched.

Recommendations and Lessons Learned

In the evaluation of the project activities and especially the pilot projects (see p.18f), a number of barriers still preventing the stronger uptake of EPC have been identified: High complexity of EPC, lack of trust, but also a cultural barrier persisting between public building owners and private ESCOs. Furthermore, EPC is currently focussed too much on public buildings, while for private building owners adapted business models still need to be developed.

The Eurostat Guidance Note on EPC published in 2015 (see box on opposite page), which restricts off-balance accounting of EPC projects, is seen highly counter-productive for EPC especially in less mature markets, as it increases the bureaucratic burden for starting new projects.

While the Guidance Note will probably not be revised any time soon, the need to ease bureaucratic burdens for energy efficiency projects should be kept high on the agenda. As the potential contribution of EPC projects to public debt levels is statistically almost irrelevant, more flexibility in the application of the rule (e.g. via exceptions) could already help a lot to ease the market uncertainty, which has been created.

Looking at the barriers which are still being encountered in EPC, the vast majority is not on the technical level, but rather in the areas of complexity of the process, lack of trust, and very often on the level of communication. For all these non-technical barriers, qualified facilitation services can make a huge difference for the success of the projects. An experienced neutral facilitator can support EPC clients in identifying new EPC projects, provide his expertise in the complex procurement process and help bridging the cultural divide between the public and the private side. This will ultimately lead to increased experience, smoother management, lower transaction costs and thus a stronger market development on the demand side.

To reap in the future the full potential of EPC, the EESI 2020 consortium recommends to:

- › Recognise and strengthen the role of Project Facilitators for the realisation of EPC projects and to train more facilitators at national or regional level,
- › Encourage programmes aimed at improving national frameworks for EPC and financially supporting the EPC clients (e.g. as the National Energy Services Framework in Ireland and the BAFA programme for EPC facilitation in Germany),
- › Create pragmatic ways to work within and around the recent Eurostat ruling which is having a negative impact on many EPC markets, and to
- › Put more attention on expanding the private sector EPC market, which is not affected by the Eurostat ruling. While the EPC potential in the public building stock is still large, there is an even larger market potential outside the public building sector.





There are also some lessons learned from the EESI 2020 project:

- › **Facilitator Trainings:** When training EPC facilitators, it is advisable to focus first on empowering them to take the initial steps in the development of an EPC-project in order to detect feasible projects, communicate reasonable expectations towards EPC and eliminate improper project ideas and misleading expectations on EPC. For the procurement related tasks, new facilitators should seek the advice of experienced EPC consultants. Failed projects (for whatever reasons) can cause severe setbacks for EPC in a certain region and undermine trust.
- › **Developing new EPC markets:** In a regional or national market with (almost) no successful case studies of EPC, special attention should be placed on the development of the first project, as other building owners and ESCOs in the region will carefully observe the outcome of it. Having available extra funds to assist such projects is therefore a highly important asset for those paving the way in a specific market.
- › For many years, the focus of EPC projects was mainly on delivering energy savings on the level of the technical systems of a given facility. Meanwhile, the economics of specific renewable energies (e.g. PV) has become sufficiently competitive in some countries, that they can be interesting for EPC projects as well, especially if the facilities in question have a high electricity base load, which can partly be covered by self-produced RE power. Such “Green EPC” projects are becoming more and more attractive, as also documented with some of the EESI 2020 pilot projects.

Eurostat Guidance Note on EPC

Eurostat as the statistical office of the European Union is responsible for overseeing the levels of general government net borrowing/lending according to the European System of Accounts as defined through the Maastricht Treaty of 1992. In this context, Eurostat published in 2015 the Guidance Note “The Impact of Energy Performance Contracts on Government Accounts”.

The Note defines as to whom the investments in energy saving measures have to be attributed to: the public building owner (EPC client) or the ESCO (EPC supplier). Eurostat concludes that within EPCs the investments should generally be treated as government expenditure, even if financed through the ESCO. As the investments will then appear in the client’s balance sheet, they must count onto the public client’s investment budget, possibly increasing his debt level. Public debt levels, however, are limited through the Maastricht Treaty. Consequently, many local authorities will have great difficulties and much higher administrative burdens of getting permission from supervisory bodies to engage in EPC, if it is interpreted as public debt.

This ruling is not favourable for third party financing of EPC projects and is having a negative impact on many EPC markets, especially in the less mature markets.

European Energy Service Award

Since more than 10 years, the Berlin Energy Agency and the European Commission honour distinguished projects, enterprises and stakeholders active on the European energy service markets with the European Energy Service Award (EESA). The prize gives public recognition to exceptional efforts in the field of energy services such as energy performance contracting. Selected by a jury of experts from distinguished European institutions, up to six energy service projects, promoters or providers are being awarded each year.

EESA Jury (2015)

- › **Marie C. Donnelly**, European Commission, DG Energy
- › **Paolo Bertoldi**, European Commission, DG JRC
- › **Juan Alario**, Senior Energy Expert, former Associate Director at EIB
- › **Terry McCallion**, European Bank for Reconstruction and Development

1. Best European Energy Service Promoter

Open to companies, institutions or individuals having made a strong contribution the development of the energy service market, addressing existing barriers and implementing solutions to overcome these barriers.

2. Best European Energy Service Provider

Open to Energy Service Companies contributing to new market development with the readiness to take risks, showing innovativeness in technical implementation, exemplified in a successful milestone project.

3. Best European Energy Service Project

Projects can be from all sectors and should show excellent results in climate protection, application of innovative technologies, or customised solutions addressing specific customer needs.

In the context of the EESI 2020 project, the EESA competition and awarding ceremony was performed two times.



EU Commissioner Günter Oettinger at the EESA 2014 Ceremony



Winners and speakers of EESA 2015

Winners 2015

Best European Energy Service Promoter

- › Catalan Energy Institute (ICAEN)

Best European Energy Service Provider

- › Norsk Enøk og Energie AS (NEE)

Best European Energy Service Project

- › West London Alliance, England
- › City of Sosnowiec, Poland
- › Deutsche Postbank AG, Germany

Winners 2014

Best European Energy Service Provider

- › Cofely Deutschland GmbH

Best European Energy Service Promoter

- › CONSIP SpA, Public Joint Stock Company of the Italian Ministry of Economy and Finance
- › Ministry of Economics, Energy, Transport and Regional Development, State of Hessen

Best Energy Service Project

- › Gran Teatre del Liceu Barcelona, Spain
- › BIG Pool 4, Lower Austria
- › Jihlava, Czech Republic

EPC Pilot Projects

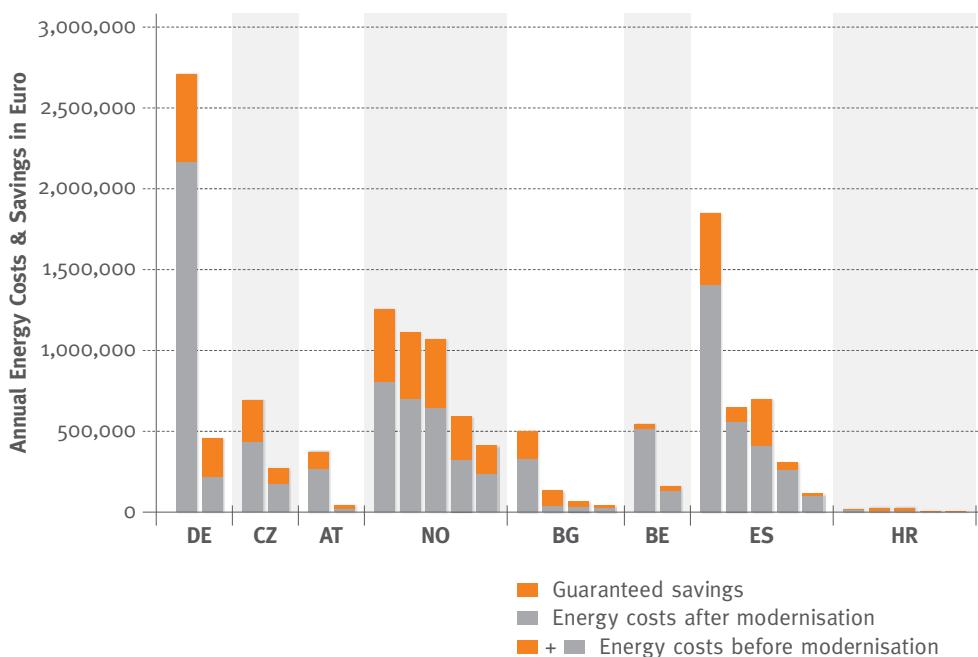
A major objective of the EESI 2020 project was to contribute to a broader use of Energy Performance Contracting (EPC) by initiating and supporting pilot projects.

The international consortium from nine European countries successfully supported 27 pilot projects in Germany, Czech Republic, Austria, Norway, Bulgaria, Belgium, Spain and Croatia to reach the milestone of a signed contract. In Dublin, the first public EPC project in Ireland has been tendered successfully, the contract is expected to be signed in April 2016.

Key results of the pilot projects

- The energy cost savings guaranteed by the ESCOs in the 27 pilot projects range from 5 to 70 percent with average savings of 30 percent.
- Resulting from the energy saving measures (ESM) and renewable energy (RE) generation, total CO₂ savings of more than 16,000 tons per year are being achieved.
- Over the 27 projects, more than 26 M€ were invested for the implementation of ESM and RE measures within EESI 2020.
- The project sizes correlate with the state of national EPC-market development. While the more advanced EPC markets tend to show higher project volumes, the investment sums in emerging markets are usually significantly smaller. Therefore the investment sums range from 40,000 € to 3,8 M€ per project.
- The pilot projects presented on the following pages are extracted from the EESI 2020 Best Practice Database with more than 50 examples. The Database is accessible on <http://eesi2020.eu/bestpractice/>.

Energy Costs and Savings of EESI 2020 EPC Pilot Projects



Pilot project | EPC in Police Department Potsdam-Eiche

› Berlin/Brandenburg | Germany

Facility and Initial Situation

Facility

- › Client: State of Brandenburg, BLB Property Management
- › 20 buildings with overall 18,836 m² net floor area
- › Administration buildings, workshops, training and seminar rooms between 224 and 1,833 m² net floor area

Initial Situation

- › Large facility with 20 buildings and small district heating system
- › Old substation and heating grids, not hydraulically balanced
- › Mostly poor insulation standards and high indoor temperatures
- › Some buildings with 24/7 operation
- › High electricity base load

Goals and Measures

Goals of building owner

- › Identification and implementation of significant measures to reduce energy consumption and costs.
- › Installation of a PV system for CO₂ free generation of electricity.

Measures

- › Measurement and verification of energy consumption and savings of each object;
- › Installation of a PV system (80 kW_p);
- › Modernization of heating systems and heat distribution;
- › Optimizing the measurement and control technology;
- › Increase energy efficiency through the use of CHP;
- › Insulation of the upper floor ceiling in 2 buildings.

Facts

| | |
|--|-------------|
| Duration of the contract | 10 years |
| Investment | 1.4 M€ |
| Energy costs 2012/2013 (Baseline) | 455,600 € |
| Guaranteed savings in Euro | 240,600 €/y |
| Guaranteed savings in % | 53% |
| Reduction of CO ₂ emissions | 1,075 t/y |

Innovations and Client's Advantages

- › The State of Brandenburg reduces 1,075 tons of CO₂ emissions annually, thus contributing to achieve the climate protection targets of Brandenburg.
- › The building owner now enjoys significantly lower electricity purchasing costs due to the decentralized power generation through PV and CHP.
- › Furthermore, the staff members of the public properties take part in trainings on energy efficiency and user motivation seminars.

BLB



Pilot project | EPC in Rudolfinum – Czech Philharmonic

› Prague | Czech Republic

Facility and Initial Situation

Facility

- › Large historical building with concert hall and offices of the Czech Philharmonic Orchestra
- › One building with a net floor area of 16,957 m²

Initial Situation

- › Obsolete technology 10 to 20 years old
- › Air conditioning
- › Cooling system
- › Heat delivery from gas boiler-house in neighbouring building

Goals and Measures

Goals of building owner

- › Reduce energy costs
- › Continue using renewable sources

Measures

- › Reconstruction of cooling system including heat pump using water from the Vltava River
- › Improvement of air conditioning system and efficient motors
- › Heating control system
- › Installation of efficient lighting

Facts

| | |
|--|------------|
| Duration of the contract | 9 years |
| Investment | 907,500 € |
| Energy costs (Baseline) | 269,000 € |
| Guaranteed savings in Euro | 93,300 €/y |
| Guaranteed savings in % | 35 % |
| Reduction of CO ₂ emissions | 656 t/y |

Innovations and Client's Advantages

- › Increased use of renewable sources – installation of new heat pump for cooling
- › Introduced energy management system



Czech Philharmonic

Pilot project | EPC in the Centre d'Alt Rendiment de Sant Cugat

› Barcelona | Spain

Facility and Initial Situation

Facility

The Centre d'Alt Rendiment de Sant Cugat (CAR) is a sport high performance centre with several swimming pools and facilities for various sports such as athletics, soccer, basketball, gymnastics, boxing and much more.

Initial Situation

The approach was to reduce the energy consumption of CAR facilities by switching from oil to natural gas and implementing best practices. Furthermore, investing in technology innovation, financed by generated and guaranteed savings (sustainable financing) was crucial.

Before EPC measures were implemented, heating production was performed by oil boilers, and lighting was mainly based on standard fluorescent tubes.

Goals and Measures

Goals of building owner

- › To reduce the buildings energy consumption
- › To improve the efficiency of facilities and its operation and management

Measures

- › Improvement of interior lighting technology, based on LED
- › Retrofit of heat production systems: replacement of oil boilers by gas boilers
- › Cooling tower replacement
- › New dehumidifier
- › Replacement of the outdoor swimming pool's gas boiler by a solar thermal facility
- › New monitoring and management system (with 45 field sensors) under responsibility of an energy manager who is CMVP qualified
- › Insulation improvements in pipings and swimming pools
- › Actions for water saving

| Facts | |
|--|-------------|
| Duration of the contract | 10 years |
| Investment | 1.3 M€ |
| Energy costs 2012/2013 (Baseline) | 700,000 € |
| Guaranteed savings in Euro | 287,000 €/y |
| Guaranteed savings in % | 39% |
| Reduction of CO ₂ emissions | 1,037 t/y |

Innovations and Client's Advantages

A continuous improvement cycle has been applied during the whole project process.

Furthermore, an energy monitoring system is in place and the more significant energy uses are defined as targets, energy baselines, and key performance indicators to assess the facility's energy profile.



Pilot project | EPC in Primary school Eugen Kvaternik, Rakovica

› Karlovac County | Croatia

Facility and Initial Situation

Facility

The building consists of three internally connected wings and has two floors as well as a sports hall.

Initial Situation

The school was built in 1970 and was reconstructed in 2010. Lighting was replaced in the school hall as well as in classrooms on the first floor. The heating system is based on a heating oil boiler and will be replaced by a biomass boiler. Concerning the current situation, the reconstruction of the exterior walls and the floor of the attic with the installation of adequate insulation is needed. It is also planned to replace T8 fluorescent lighting by T5 fluorescent lighting as well as incandescent light bulbs by compact fluorescent bulbs.

Goals and Measures

Goals of building owner

- › Energy reconstruction of the school building (heating system, lighting and outer shell)
- › Lowering energy costs
- › Improvement of working conditions for teachers and pupils

Measures

- › Reconstruction of heating system (boiler refurbishment) and fuel change (biomass)
- › Installation of inner efficient lighting
- › Refurbishment of outer building shell

Facts

| | |
|--|------------|
| Duration of the contract | 12 years |
| Investment | 309,200 € |
| Energy costs (Baseline) | 26,100 € |
| Guaranteed savings in Euro | 17,400 €/y |
| Guaranteed savings in % | 53% |
| Reduction of CO ₂ emissions | 93 t/y |

Innovations and Client's Advantages

- › Implementation of three energy efficiency (EE) measures
- › Primary school Eugen Kvaternik reduces 93 tons of CO₂ emissions annually,
- › The building owner will enjoy significantly lower energy costs due to implemented EE measures.
- › The quality of work and residence for the teachers and pupils will be significantly improved.



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Pilot project I Educational and Rehabilitation Facility of UNWE

› Ravda | Bulgaria

Facility and Initial Situation

Facility

- › Facility of UNWE Sofia (University of National and World Economy) for its students and professors for vacancies
- › Located in Ravda, district of Bourgas, for recreation, sports and conferences
- › 46 rooms, 3 apartments, conference halls, a sport hall, a canteen and a bar
- › 4 floors, around 4,500 m²

Initial Situation

Space heating and hot water was realized entirely with electric power, e.g. with radiators.

The annual electric power consumption was:

- 1) 516,916 kWh/a for heating and ventilation
- 2) 89,889 kWh/a for hot water supply
- 3) 117,448 kWh/a for lighting, computers, black devices etc.

Goals and Measures

Goals of building owner

- › Reduce the consumption of electrical energy
- › Improve the comfort for the students

Measures

- › Thermal insulation of external walls
- › Window replacement
- › Insulation of the roof
- › Insulation of the floor (jetties)
- › Installation of groundwater heat pumps for heating
- › Installation of solar collectors for hot water supply
- › Installation of hot water heating systems for some rooms



| Facts | |
|--|-------------|
| Installation of energy efficiency measures | 2014 - 2016 |
| Duration of the contract | 6 years |
| Investment | 260,500 € |
| Energy costs (Baseline) | 67,900 € |
| Guaranteed savings in Euro | 36,000 €/y |
| Guaranteed savings in % | 53% |
| Reduction of CO ₂ emissions | 314 t/y |

Innovations and Client's Advantages

Achieved electricity savings after the first year:

- 1) 84.4% for heating and ventilation (438,344 kWh)
- 2) 21.4% for hot water supply (19,236 kWh) and
- 3) 0% for lighting, computers, black devices etc.

The investment of 260,500 € was shared between the ESCO "Alumina consult" (25%) and the Bulgarian Energy Efficiency and Renewable Sources Fund (75%).



Pilot project | EPC in a ASVÖ sports centre

› Graz | Austria

Facility and Initial Situation

Facility

- › One building with about 2.500 m² net floor area (1.180 m² indoor sports area)
- › Sports centre of a sports association in Graz (ASVÖ)

Initial Situation

The ventilation system of the ASVÖ was at the end of its lifetime. With the help of the technical concepts resulting from the ideas competition within the tendering and negotiation process an ideal solution for the lifespan of the building services was found.

Goals and Measures

Goals of building owner

- › Optimized heating and ventilation system
- › Guaranteed investment costs
- › Guaranteed energy savings
- › Service and maintenance

Measures

- › Installation of centralized ventilation system
- › Installation of ceiling-spotlight-heating
- › Conversion from oil to natural gas heating
- › Installation of building-process control technique
- › Renewal of components of the existing heating distribution
- › Additional insulation of ceilings
- › Insulation of heating pipes
- › Renewal of window seals
- › Installation of energy-meters
- › Replacement of circulation pumps of warm water facility



| Facts | |
|--|------------|
| Installation of energy efficiency measures | 2015 |
| Duration of the contract | 12 years |
| Investment | 455,000 € |
| Energy costs (Baseline) | 40,700 € |
| Guaranteed savings in Euro | 19,000 €/y |
| Guaranteed savings in % | 47% |
| Reduction of CO ₂ emissions | 30 t/y |

Innovations and Client's Advantages

- › The ASVÖ received a cost-optimized package for the project duration that increased the value of the school.
- › Thanks to the energy efficiency measures, sportsmen of the ASVÖ can now enjoy a significantly higher level of comfort.



Pilot project I EPC in Enebakk Municipality

› Akershus County | Norway

Facility and Initial Situation

Facility

- › 23 buildings with overall 45,000 m² net floor area
- › Administration/office buildings, schools, healthcare facility, kindergarten and nursing homes

Initial Situation

- › Information/presentation about the EPC model for the property department
- › The goal was to create trust in EPC as a model for implementation of energy efficiency measures.

Goals and Measures

Goals of building owner

- › Guaranteed energy savings and return on investments
- › Long-term reduction of energy consumption and operational costs
- › Upgrade general standard of buildings and catch up with maintenance lags
- › Carry out a large number of energy efficiency (EE) measures in a short time period compared to in-house solutions
- › Outsourcing of risk by engaging an EPC provider

Measures

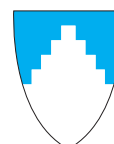
- › Energy monitoring systems
- › Heat pumps
- › Regulation systems for heating plants
- › Ventilation, heat and light control systems
- › Heating system
- › Renewable energy source
- › Thermal insulation building shell and reinforcement
- › User trainings
- › Lighting

Facts

| | |
|--|-------------|
| Duration of the contract | 10 years |
| Investment | 3,34 M€ |
| Energy costs (Baseline) | 591,750 € |
| Guaranteed savings in Euro | 269,200 €/y |
| Guaranteed savings in % | 46% |
| Reduction of CO ₂ emissions | 877 t/y |

Innovations and Client's Advantages

- › Responded to energy efficiency goals in climate and energy plans in Akershus County where EPC is mentioned as a good EE solution.
- › EE trainings for staff and hence the increased EE knowledge among staff/building users.



AKERSHUS
fylkeskommune

Voices for EPC



Ivo Slavotinek

ENESA a.s., Chairman of the Board and Director

I was active in the development and implementation of projects in the area of energy efficiency for over 20 years. I see Energy Performance Contracting in particular as an ideal way to achieve maximum energy efficiency in all types of buildings and production facilities. EPC provides a balance between investment costs and savings achieved. The EPC model also creates incentives for both parties – the customer and the ESCO – to continuously improve the operation of installed cost-cutting measures to increase project efficiency and create additional savings.



Marianne H. Dragsten

Lawyer and a public procurement expert

In April 2014, Norway adopted an official standard for energy savings contracts (EPC). This is the first official national standard for EPC in Europe, covering the entire process of an EPC project from the procurement phase through implementation of measures up to the measurement & verification of savings in the guarantee phase.

Both building owners, managers and energy entrepreneurs have tested and provided their input to the standard. It will facilitate an effective process on energy saving measures and we believe that the standard will now make it easier for building owners to start with energy conservation measures.



Volker Bargfrede

CEO of BLB, implementer of EPC project "Potsdam-Eiche" in Germany

What makes our EPC project Potsdam-Eiche special is the integration of renewable energies: A photovoltaic (PV) system for power generation has been included in the contract, making it a so called "Green EPC", a highly innovative model. The PV system also contributes to our project's biggest success: By means of different energy saving and power generation measures our electricity bill has been reduced by 58%.



Eng. Lidia Kostova

Chief expert "Control on the energy efficiency and EPC contracts", Department of control and information of AUER

Despite the existence of a large potential for energy savings in the building sector, the market of ESCO services in Bulgaria develops only slowly with currently only a small number of companies.

The Second National Action Plan on Energy Efficiency of Bulgaria highlights Energy Performance Contracts (EPC) as a financial instrument for the implementation of energy efficiency measures with significant energy saving effect. Additionally, a 2009 regulation provides significant support to the public sector when concluding EPCs. Also Energy service companies can receive funds from the State budget.

AUER, the Agency for Sustainable Energy Development participates in the examination and the approval of funds for the implementation of EPCs, however with only limited demand so far.

The experience so far still does not ensure an adequate level of confidence, which is considered to be one of the main barriers for marketing EPCs at national level. The promotion of EPCs and the training of consultants to assist the municipal administrations, as done within EESi2020, is a necessary and very useful initiative.

Consortium

Germany

BEA, Berliner Energieagentur GmbH (Co-ordinator)

www.berliner-e-agentur.de

› Laurenz Hermann



Austria

GEA, Grazer Energieagentur

www.grazer-ea.at

› Reinhard Ungerböck



Belgium

Faktor4

www.factor4.eu

› Johan Coolen



Bulgaria

ELI, European Labour Institute

www.eli-energy.com

› Irina Terziyska



EUROPEAN LABOUR INSTITUTE

Croatia

REGEA, North-West Croatia Regional Energy Agency

www.regea.org

› Velimir Šegon



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REGIONAL ENERGY AGENCY

Czech Republic

SEVEn, The Energy Efficiency Center

www.svn.cz/en

› Jana Szomolányiová



Ireland

Codema

www.codema.ie

› Joe Hayden



Norway

NEE, Norsk Enøk og Energi AS

www.nee.no

› Liv Randi Lindseth



Spain

ICAEN, Institut Català d'Energia

www.gencat.cat

› Josep M. Granollers



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www.eesi2020.eu

Berliner Energieagentur GmbH

Fon +49(0)30-293330-0
Fax +49(0)30-293330-93

Französische Straße 23
10117 Berlin, Germany

E-Mail office@berliner-e-agentur.de
Internet www.berliner-e-agentur.de



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