

## SUMMARY REPORT

### on status quo of EPC markets

# Inventory of EPC Essentials

European Energy Service Initiative 2020 – EESI 2020  
IEE/12/686/SI2.644738

September 2013

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Co-funded by the Intelligent Energy Europe  
Programme of the European Union

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## Conditions of EPC implementation

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### *Potential of EPC implementation in respective city/region*

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This potential very depends on the state of the buildings. If an important number of Buildings have low efficiency (equipment, operation, control, etc.), then the potential will be great.

#### **Austria**

As EPC – and especially the Integrated Energy Contracting (IEC) – is quite well known and established in the region of Styria the low hanging fruits regarding projects and potential clients have already been covered by EPC. Still there is potential

- for EPC plus comprehensive refurbishment (including all it's barriers: financing, lifetimes, guarantees,...),
- for the repeated tendering of already established EPC-projects and
- for IEC.

#### **Belgium**

The potential for energy savings occur in both - the municipal building and public domain, and in non-municipal services included organisations and companies located on the Antwerp area. The using of EPC as a tool for reducing energy consumption is necessary to realize EPC pilot project that would enhance the credibility of the EPC method. At present, awareness and information about EPC method spreads and pilot projects are approved. After their realization is expected an increase interest about the EPC method.

#### **Bulgaria**

The most part of the existing buildings in Bulgaria are very old i.e with low energy efficiency performance, the potential for EPC and ESCO activities is high. A significant EPC market growth is expected in the public sector in short term.

In the territory of Sofia there are more than 3000 state owned and private buildings: administrative buildings, hospitals, schools and universities, hotels, shopping and sport centers and others.

As the Bulgarian economy is considered as very energy intensive with 2,5 times more energy consumption per GDP compared to the EU average values, the city and the region has a high potential for energy saving measures in SMEs and big industrial and service enterprises.

The ESCO market in the country is in its initial stage of development. It started its development around year 2000 when the first EPCs with some Bulgarian municipalities were stipulated. Before that, only a couple of demonstration projects were financed by EU.

## Croatia

The City of Zagreb has become a signatory of the Covenant of Mayors in 2008 and has adopted its Sustainable Energy Action Plan (SEAP) in 2010. There is a rather high potential in the City of Zagreb for public buildings (over 1.700) retrofitting and certainly a large part of these could be realised through the energy performance contracting model.

Looking at the national level, the number of public buildings owned by various ministries of the Croatian Government as well as other Croatian cities and counties which are suitable for EPC model implementation is estimated at 400 with a total heated area of approximately 1.000.000 m<sup>2</sup>.

## Czech Republic

The EPC method has been known in the Czech Republic since 1992 and implemented from 1993, when the first two projects were prepared in hospitals. Since then several projects have been implemented in Prague, the largest of which was the project at the Faculty Hospital Motol, the best known project being in the National Theatre and the greatest number of school buildings being in the Prague 13 district (31 schools in all).

## Germany

Germany has a growing market for Energy Services and is one of the pioneers for developing the European market for Energy Performance Contracting (EPC). There are already high market standards and consistent market volume and growth for both primary types of contracting – Energy Performance Contracting and Energy Supply Contracting. There is an immense economic usable potential with about 1.4 million buildings or objects for Contracting.

The share of EPC contracts is about 15 % of all Contracting contracts. There were more than 300 EPC agreements reached since the mid-90s – with high-tech and complex individual buildings like hospitals, as well as building pools of up to 100 separate buildings mostly within the public building sector which remains the most favourable customer group for EPC.

It is expected that the EPC market grows +7 % annually on average. An increase in projects in Germany will first and foremost take place in the regional hot-spots i.e. Baden-Wuerttemberg, Bavaria, Berlin, Bremen and Hesse. This will have a role model effect on surrounding regions.

## Ireland

Energy Performance Contracting is currently very high on the Irish political agenda. It has developed a National Energy Services Framework to help develop the energy efficiency market in the non-domestic sector throughout Ireland. Following the commitment in the National Energy Efficiency Action Plan (NEEAP) and the Program for Government 2011-2016, this National Energy Services Framework sets out the current roadmap through which energy efficiency projects and an Energy Performance Contracting process will be developed. To support the development of the market the Department of Communications, Energy and Natural Resources (DCENR) recently announced the Energy Efficiency Fund and the Energy Performance Contracting (EPC) Framework. It is envisaged that the Fund, when established, will finance two main types of energy efficiency projects in public

and commercial sectors, Energy Performance Contracts (EPCs) where funding is lent to an Energy Services Company (“ESCO”) and direct lending to the client company.

Historically the EPC market in Ireland has been relatively small and underdeveloped with two organizations classifying themselves as ESCOs. The cost effective potential market size for ESCOs in Ireland was estimated by SEAI to be €49 - €110 million per annum by 2020.

### Norway

The potential of EPC implementation in the city of Oslo, is considerable. There are a large amount of older buildings, some owned by public sector and some by private sector. Many buildings are in need of maintenance and energy efficiency.

### Spain

Due to current economic situation in Catalonia, the EPC model is viewed as a main way to implement energy efficiency improvements in buildings and the industry in order to obtain savings and improve and update facilities.

Projecting those numbers to the city or regional level, the EPC potential for Catalonia can be considered as a 60% for the whole public buildings (including councils, city halls and others).

The EPC market in Catalonia for 2014 to 2020 period could be estimated as a minimum of 200 million euros in performance projects investments, for public sector.

### Existing Energy Efficiency Documents for the city/region

Existing energy efficiency documents are usually generally applicable at the national level. In some regions are taken and adapted to the local level.

Most of the documents were created in response to the EU directive on the reduction of energy consumption by 20% by 2020.

### Austria

As a legislative document to rely on in the implementation of EPC in the federal regions there is an agreement between the national government and the regional governments, the 15 A-B agreement. This agreement services as legal foundation for federal states to enable EPC as a tool for the implementation of energy efficiency measures.

*Agreement between state and federal state according Art. 15a B-VG for measures in the building sector for reduction of emission of greenhouse gases.*

Art. 13: (6) The activities on energy services in public buildings have to be expanded, especially for giving sufficient incentives for realization of comprehensive refurbishment. Therefore payback periods of maximum 15 years are the decision criterion.

## Belgium/Antwerp

Developing of documents currently depends on political situation. For this time The climate plan of the previous City Council still has some value.

## Bulgaria/Sofia

At national level- Action plans for EE and RES have been developed in which EPCs are considered as a “highly efficient tool for achieving planned activities”.

The Ministry of economics and energy issued a special Ordinance No РД-16-347 (2009), for the terms and the order defining the budget and the payment for EPC.

- A decision of the Sofia Municipal Council No315/05.26.2011  
An “Action Plan for sustainable energy development for the period 2012-2020” of the Sofia municipality was worked out by the Sofia Energy Agency – Sofena in which the EPCs are considered as an highly efficient tool for achieving the planned objectives

## Croatia

The City Assembly of the City of Zagreb has officially adopted the following documents related to energy efficiency:

- Sustainable Energy Action Plan (SEAP) for the City of Zagreb (2010);
- Programme of Energy Efficiency in Final Energy Consumption for the City of Zagreb for 2010 to 2012;
- Plan of Energy Efficiency in Final Energy Consumption for the City of Zagreb for 2011;

## Czech Republic

An important general document, which should support the development of the EPC method throughout the republic, was the Government Resolution (2011), which requires its use in state administration buildings. In response to this resolution was ensured the processing of new text to the standard contract for the provision of energy services with a guaranteed result, including a description of the content of the annexes.

For the given locality a specific document is valid in the form of a regional energy concept for Prague, which is to be amended in the foreseeable future.

## Germany

In Germany several guidelines for EPC exist, e.g.:

- Guidelines for energy performance contracting in public buildings (2012)
- Energy Performance Contracting as a contribution to climate protection and cost reduction - Guide to Energy Performance Contracting in public buildings (2000)
- Contracting pilot for municipalities (2008)
- Contracting Guidebook "Contracting for local authorities - and it works!" (2001)

## Ireland/Dublin

The main national document in relation to energy efficiency is The National Energy Efficiency Action Plan (NEEAP). It is in response to this plan that the Energy Efficiency Fund and the Energy Performance Contracting (EPC) Framework has been established.

On a local level two of the four Dublin Local Authorities have produced energy efficiency action plans. Dublin City Council developed the Dublin City Sustainable Energy Action Plan 2010 to 2020, South Dublin County Council recently adopted the South Dublin Sustainable Energy Action Plan. Both documents are aligned and supportive of the national plan.

## Norway/Oslo

The municipality of Oslo has a large number of Documents where environmental issues and Energy Efficiency are some of the topics, but EPC is not mentioned in any of these documents. There are specific goals for energy savings, but nothing about the process to achieve the savings.

## Spain/Catalonia

The only documents which are about EPC are the Technical & Administrative Clauses which were developed for tendering process in two pilot public project (buildings of Catalan Government).

Other documents in relation to energy efficiency are:

- Catalan Public Buildings Energy Efficiency Plan. Approved on August 30<sup>th</sup>, 2011. Scope: only for buildings of Catalan Government (Generalitat), not for council or municipal buildings.
- Directive 2012/27/UE (25 October) of European Commission, on energy efficiency.
- 2010 Catalan version of the EVO's IPMVP (International Performance Measurement and Verification Protocol).
- A Best Practice Guide to Measurement and Verification of Energy Savings (Australasian Energy Performance Contracting Association, 2004)
- Administrative clauses tender for the P1 – P5 Energy Supply model (ESC).

### Potential target groups and buildings for EPC implementation

#### **Public sector**

The EPC focus is mainly on public buildings, which can be explained by suitable conditions in public buildings regarding constant energy use and possibilities for central energy management installations. Increasing financing problems for own investments by public budget.

Suitable buildings for using this business model are:

Administrative and social buildings, street lightening, hospitals, kinder gardens, schools and universities, cultural buildings, sport facilities.

## Austria

The demand in cities and rural communes still exists. Main barriers for further development of this market are the high transaction costs of contracting in relation of the typical project sizes in this sector and lack of knowledge, because most decision makers judge EPC only as a financing instrument and not for enhanced and improved energy efficiency and as an outsourcing tool.

## Belgium

The potential target groups in the public sector in **Antwerp** are controlled by the City. This is mainly the municipal buildings (sports buildings, culture, administration,...), public domain (mainly public lighting, traffic lights), the buildings of the care sector, the Autonomous Company for Municipal Education (AGSO), the social housing company Woonhaven, the Port of Antwerp.

## Bulgaria

The public sector is the target group which dispose of greater financial support for EE renovation as well as with some experience in implementing the EPC defining it as a promising EPC customer. **Sofia** municipality owns almost 1000 buildings: administrative buildings, schools and kindergartens, healthcare centres, cultural institutions and others. To this amount, there is more than 1000 state own buildings to be added, which are part of the activities of different ministries.

## Croatia

Potential buildings for reconstruction through EPC model in the public sector within the **City of Zagreb** include all public buildings owned and operated by the City of Zagreb. An Energy Efficiency project including 87 buildings and a large part of public lighting is coordinated by the City of Zagreb (Zagreb – Energy Efficient City). A second target group could be public buildings owned and operated by the Government of Croatia.

## Czech Republic

The environment of the public sector is relatively stable and the buildings offer relatively large potential savings. At the same time, it faces a lack of financial resources and qualified personnel. Potential suitable customers in **Prague** are:

- The City of Prague (secondary schools, social buildings and administrative buildings),
- Individual city districts (primary and nursery schools, administrative buildings, etc.)
- Ministerial buildings and other government organisations such as faculty hospitals, theatres and other cultural facilities and administrative buildings, etc.

## Germany

Around 75 % of EPC projects have been implemented in the public sector. For the implementation of EPC a minimum energy cost baseline of approximately about € 200,000 is required. Small buildings are in general not suited for EPC. However, they can be part of a building pool together with larger



buildings. About 60% of the energy consumption in public buildings can be attributed to buildings owned by municipalities. These buildings are mainly for administration, education (schools, Kindergartens) and sports activities (sports centers). In total, the general education schools are responsible for almost 50% of the energy consumption in municipalities.

### Ireland

The EPC market is still very much underdeveloped, so therefore medium to large building owners are a potential target. The public sector is particularly suited to EPC for a number of reasons, primarily due to a lack of funds, local expertise and a mix of aging building with poor fabric insulation and poorly performing modern buildings.

The initial target group in **Dublin** project will be the Dublin Local Authorities whose main buildings consist of leisure centers, swimming pools, public offices, fresh and waste water treatment plants and fire stations.

### Norway

The target groups will be three major public building owners. Through these groups we will gain access to the majority of public buildings in **Oslo**. Potential buildings consist of older buildings with high energy consumption.

### Spain

In **Catalonia**, awareness of target groups in the public sector is developed. During this year two public buildings of the Catalan Government were tendered in the EPC format: a huge Sports Center and the Catalan National Archive. Before the end of this year, will be tendered one more public property: a prison. For the next year is expected a tendering for at least 10 public buildings of different sizes and of different departments as culture, Justice, public hospitals, police department among others.

### Private sector

In all countries, there is a big potential in the private sector, but the use of the EPC method is controversial because of legal and ownership relations. Its implementation depends on diffusion by main ESCo's and knowledge and expertise of these ones. More market pressure with an effort by ESCo's should result in a considerable increase of EPC in the private sector.

### Austria

In this area buildings built between 1950 and 1980 from 10 apartments onward are considered to be interesting for EPC. But there is also problem with legal and ownership relations.

For small and medium enterprises and industry there are possible barriers for EPC like financial barriers and operational barriers. Far better than EPC energy supply works in the field of process heat and combine heat and power.



## Belgium

On the long term, there is a very high EPC-potential in the non-municipal. On the short and medium term, this potential will be more difficult to access as there are now good EPC-contracts available for the private sector that meets the specific requirements of this sector (e.g. sufficient flexible, taking into account the faster occupancy and operational changes in private companies, etc.).

## Bulgaria

The private sector lacks of information and financial resources.

In Bulgaria high potential for energy savings is in residential buildings stock, but they are privately owned which makes it difficult to implement large scale EPC in this sector. In case of good legal and financial conditions, projects for renovation of privately owned block of flats by EPC are feasible.

In 2012 the Ministry of regional development started a Program for energy renovation of the residential building stock covering up to 75% of the investments for energy efficient measures of the households.

EPC can be applied also for industrial buildings (production buildings, energy buildings, ware-houses, etc.). There is a big variety of commercial buildings as shopping centers and malls, including retail centers of big chains and hotels.

## Croatia

The consumption of the private sector buildings (households, commercial sector) in the City of Zagreb is over 12 times higher than the public sector. As such the potential for EPC implementation within this target group is considerably higher than the public sector.

## Czech Republic

In the private sector the EPC method is used to a lesser extent. The reason for this is usually the greater risk during financing and the more stringent rules regarding the specification of the requirements when selecting the ESCO. Despite this, it is possible to use EPC, for example in the area of production, in administrative buildings, hotel industry, etc.

It is not suitable to use the EPC method in the area of housing due to legal and ownership relations.

## Germany

The industry sector is characterized by different production processes and equipments resulting in varying demand on usable energy supply. Some ESCOs satisfy this demand by combining energy supply contracting with additional saving elements, which are implemented as full services. Information on the use of EPC related products in the industry sector is typically not published. In general, industrial companies try to achieve a reduction of the contract duration by providing own financial resources to the EPC projects.

Buildings of the commercial and trade sector are comparable to large residential buildings. The units are rented by different clients with the impact, that user changes might appear very often. The technical saving potentials are significant.

The general legal framework for realization of EPC in residential buildings is currently not very supportive. ESCO needs an agreement of each tenant to implement measures. To reach the minimum size to implement EPC economically the number of necessary agreements is high.

### Norway

There are a large amount of buildings in private sector suitable for EPC implementation, but the owners are smaller to be the main target.

### Ireland

EPC in the private sector in Ireland is underdeveloped but there is also considerable potential. The support of establishing the EPC market in Ireland is the task of National Energy Services Framework. Through this framework SEAI (Sustainable Energy Authority of Ireland) are providing best practice guidance on engaging the services of ESCOs and have also developed a handbook on EPC and EPRP which outlines a five-stage development process for developing and procuring projects for the public and private sectors.

In order to “road test” this five stage process and the accompany documents that have been developed (such as a sample EPC contract) 22 exemplar projects have been selected, 11 from the public sector and 11 from the private sector. These projects come from a range of sectors such as food production and sales, the construction industry, the hotel industry and the education sector.

### Spain

EPC model has been introduced and recently applied in some private companies (geriatrics, in an office building of enterprise association, some industries,...).

### *Attitude of the local/regional authorities to EPC*

The attitude of the local/regional public authorities to EPC is different and the level of implementation is at a various levels of development. It depends on the awareness, interest and will of the authorities to deal with, but in most localities/regions the EPC method is received in a positive way.

Where some projects solved by EPC method have been implemented, often depends on the rate of further development depend just on their success.

## Austria

EPC and IEC are well established with a number of potential clients, so the authorities have already gained experience with the concept. The main barrier for future EPC implementation has been cancelling of an application for an ELENA-project after facing difficulties with the Off-Balance-Financing-issue and increasing the debts through EPC-projects.

## Belgium

On the level of the **City of Antwerp**, key-persons tend to support the idea of the EPC approach. It is supposed that the new political decision makers will also support it.

## Bulgaria

The EPC method is not very popular among the public administration neither in **Sofia**, nor in the other regions of the country. It is caused mainly because of bad experience in the past. Since then, the attitude of authorities has been rather sceptic. There is a need of awareness rising and educational activities more than in other regions.

## Croatia

The attitude of the city **Zagreb** authorities is generally positive and supportive. But they need a wider support at the national level.

## Czech Republic

The implementation of EPC projects is supported in the territory of **Prague**. Success in preparing specific projects depends on willing to promote EPC method and further on not always stable political situation. Generally, however, the endeavours to use the EPC method are growing. Various EPC seminars are organised in Prague to raise awareness about EPC.

## Germany

A general assessment of local and regional authorities' attitude towards the implementation of EPC projects can't be given as there is a strong dependence on personal awareness, competence, knowhow and interest within the level of decision makers.

There are some success projects, which are regional hot-spots for the implementation of EPC, e.g. **Berlin**. Supporting factors can be a regionally active facilitator or effectively running EPC projects which have been successfully implemented in the past. Especially the last factor often provides the impulse for other mayors or high level decision makers to follow the example.

## Ireland

**Dublin** and other local level in Ireland have still the EPC market very much under development. However EPC is very high on the Irish national political agenda, as demonstrated by the creation of the Efficiency Fund and the Energy Performance Contracting Framework.

## Norway

In **Oslo**, the attitude has changed in favour of EPC implementation in last year. Nowadays, after an initial meeting with authorities, they seem positive towards EPC.

## Spain

Local and regional authorities in **Catalonia** see the EPC method as an opportunity for refurbishment with no investment. For those public bodies who buy energy through aggregated purchase, as they get best prize of primary energy, they see EPC as the best tool to accomplish big savings. Other public authorities who still don't have aggregated purchase for energy, have no clear idea in using EPC model.

### *Barriers in EPC implementation*

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A number of barriers hamper the development of the EPC market. Barriers in implementation of EPC method are similar in most of countries. It could be divided to several parts:

#### **Awareness and knowledge barriers**

Lack of a sufficient level of understanding the energy saving potentials and the EPC concept and its financial benefits is immanent to policy decision makers, resulting in the perception that energy efficiency and renewable energy investments are complicated and risky.

The most frequent barrier is primarily distrust or ignorance on the part of customers - lack of knowledge about EPC, both among municipalities and ESCOs, as well as lack of documented experiences and success stories. There is still a lack of knowledge about EPC concerning the other advantages except outsourced financing – outsourcing of risks, duties, involvement of experts and guarantees – and how they can be integrated into the contracts to the favour of the client.

Reluctance from organisations to enter into long term contracts

#### **Legislative and administrative barriers**

Energy performance contracting projects in the public sector are subject to public procurement and therefore need to follow public procurement rules. There is the barrier of the strenuousness of relatively complicated preparations for the process that the projects require. The process leading up

to an EPC contract can be seen as complicated and expensive. The reason of being the extensive amounts of information, that has to be collected in order to develop tendering documents. The lack of legal clarity has led to a high perception of risk among public decision makers, financing institutions and ESCOs.

### **Financial barriers**

Financial barriers can be at the demand side (customer side), the supply side (provider/ESCO side), financial institution side as well as policy maker side.

- Customers often face the lack of internal capital and have constrained operational budgets.<sup>3</sup>
- Lack of credit potential/equity of companies interested in providing energy services.
- Smaller ESCOs without support of a larger parent company and without appropriate credit ratings are especially vulnerable, being not in position to attract third-party financing.
- Mistrust of the banking system in this new EPC model.

Finally the financial crisis and economic downturn has made access to finance more difficult in the large majority of countries.

### **Market barriers**

Energy savings are not a priority due to a lack of targets regarding energy reduction/efficiency.

Many energy efficiency projects and ventures are too small to attract the attention of large financial institutions. This creates a perceived small market size by the banking industry and lack of interest on their part to invest the time and resources to learn how to finance energy efficiency projects.

Some examples of specific barriers in individual countries:

#### **Bulgaria**

Besides barriers mentioned above, in Bulgaria there is problem with socialist heritage in energy.

#### **Croatia**

One of the most important barriers for EPC implementation in public buildings owned by municipalities, cities and counties prior to the adoption of the mentioned regulation was the treatment of investments made by ESCOs as public debt. This meant that even in the case that the total project investment in a public building was covered by an ESCO, for municipalities, cities and counties this still counted as public debt which is limited according to a special law.

#### **Norway**

Low energy prices in Norway leads to longer payback time and less interest in energy saving measures.

## Spain

Service contracts in Spain are limited to a maximum period of 4 + 2 years, and normally EPC projects need an average period of 10 years to recover investments of the energy conservation measures. Further specific problem is that Spanish and Catalan tender documents don't consider the EPC model, and it's difficult to be incorporated in the current state of tender documents, as savings are not considered by Catalan or Spanish Administration as a service.

## Position of the EPC implementation

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### *Existence of basic instruments for EPC*

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In countries that participated in the previous project EESI, created some documents in its output. The existence of basic documents depends mainly on the degree of development of the EPC method.

### Austria/Styria

As the regional government has already performed a number of EPC-projects by themselves in the early 2000's years and as they have proceeded with the implementation of IEC-contracts around 2006 there are all necessary basic instruments for EPC available. Also within the EESI-project numerous documents have been promoted to the public.

There are available basic instruments like EPC contracts, tender documentation, guidelines for a M&V-plan, manual for financing, etc.

### Belgium

The basic instruments are available.

- EPC contract and EPC procurement documents
- EPC procurement documents
- A set of contracts that fix the agreements and remunerations in case of different building user, owner-tenant problems, etc.

### Bulgaria

The only document focused especially on EPC is the Ordinance № ПД-16-347/2009 regulating the payments up to EPC in state and/or public buildings. There are as well provisions on EPCs in the Energy Efficiency Act /2013/.

## Croatia

No publicly available documents in Croatian.

## Czech Republic

- The standard contract for the provision of energy services by EPC including a description of the annexes' content for concluding contractual relationships with providers of energy services with a guarantee.
- The process of preparing a selection process for public procurement of EPC.
- A methodology for preparing and implementing of energy efficiency projects on EPC.
- A code of conduct on EPC (a description of standard behaviour by the ESCOs and also by the customers).

## Germany

In addition to the documents listed below, during the EESI project are provided for download a set of EPC instruments and standards, guidelines for the procurement of energy supply contracting, a guideline for EPC in public buildings, relevant quality standards etc. have been provided by the EESI project for download.

- Guidelines of energy efficiency services (03/2009)
- Requirements of energy management systems (08/2009)
- Terms and services of Energy Performance Contracting, explains the stages of project development and gives criteria for the assessment of EPC services (2000)
- Definition of different types of contracting (11/2003)
- Energy Services with guaranteed Energy Saving Contracts (EPC) - RAL-UZ 170, January 2012

## Ireland

Documents have been produced as a part of the National Energy Services Framework. But they are still under development. Draft EPC template documents are Project Development Brief Stage, EPC Contract, EPC Assessment, EPC Payment Mechanism, EPC Technical File and Baseline Data Template and other

## Norway

Model documents were incorporated in the "Green Municipalities" project run by the Norwegian Association of Local and Regional Authorities (KS), where the legal aspects were developed further and they were used as a basis for developing a Norwegian standard for EPC contracts. This work is still ongoing.

## Spain/Catalonia

Spain has no documentation strictly for EPC projects. During 2012 it was developed a tender documentation for an EPC tendering process, which consists in an administrative tender document



and a technical document, with different annexes which describes savings assessment and payments in relation to a M&V plan integrated into the procurement documents.. Standard EPC contract will be based on the former document. At the end of 2013 will be signed first EPC contract.

### Existence of ESCO (Energy Services Companies)

#### Survey of existing ESCOs

In each region, there is a number of companies that provide energy services of various kinds. However, it is important to point out that almost all of these projects are not pure EPC type projects in the sense that payment is based on a fixed level of energy savings which was defined at the time of contract signature based on project documentation. In other words, energy savings are not verified and monitored during the term of the contract and there are no savings guarantee offered. So only a few ESCOs have experiences with EPC.

The provision of EPC services, however, is not usually limited to the company's place of business and ESCOs are able to carry out energy-saving projects throughout the countries.

#### Austria/Graz

Number of ESCOs specialized on EPC: 7 (cover 70-80% of all EPC contracts)  
 Other players can only infrequently engage in EPC projects.

#### Belgium/Antwerp

Main ESCOs: more than 10 (TPF Utilities, Sophia group, Axima Services, Cofely Services, Dalkia, Cegelec, Siemens, Johnsons Controls, Honeywell, Schneider, ABB, ...)  
 Local companies focused to private sector: 2 (REUS, Factor 4)

#### Bulgaria/Sofia

Number of ESCOs, which want to offering EPC: quite high  
 In reality 3-4 of them have performed kind of EPCs (named "ESCO contracts"). The leading one is ENEMONA Company with 45 ESCO contracts all over the country. In Sofia, there have been only very few EPC projects implemented yet.

#### Croatia/Zagreb

Main ESCO: HEP ESCO Ltd.  
 Smaller companies offering EPC services: at least 7 (VERITAS TRADE, Eltec Petrol Hrvatska, Circom Inženjering, Rudan, Eko ESCO, Planetaris, Media Verba)

### Czech Republic/Prague

Approximate number of ESCOs specialized on EPC: 10  
ESCOs located directly in Prague: 5  
Main ESCOs: ENESA, AB Facility, Siemens, MVV Energie CZ, Dalkia CZ

### Germany

Approximate number of ESCOs: 500  
Number of ESCOs specialized on EPC: 10-20  
Main ESCOs for EPC throughout Germany are e.g.: Siemens, Hochtief, MVV, Johnson Controls, Cofely etc.  
Main ESCOs with regional project implementation and new EPC market players are e.g.: Honeywell, Dalkia, Sauter, Imtech Contracting, etc.

### Ireland/Dublin

Number of ESCOs: at least 4 (Longship, Candelas Ltd, Aramark, Dalkia)

### Norway/Oslo

Number of ESCOs: 5-7 (both types - local and large national or international actors)

### Spain/Catalonia

Main ESCOs: 4 (Honeywell, Schneider, Johnsons Controls, Siemens)  
At least 20 other companies can operate or operate as an ESCO (Comsa-Emte, Dalkia, Imtech, Cofely, etc.).

### Scope of ESCO experiences

#### Austria

The above mentioned ESCOs can refer to a number of reference projects to prove their experience. As the market size for EPC has been varying in the last years it seems difficult for new market actors to enter the market.

#### Belgium

The Belgian EPC market for buildings in the public sector is still a beginners market, with no EPC-projects procured until now. EPC is in Belgium a rather unproven approach and the procurement of EPC-projects is rather complex and new and can be perceived as risky. The first tangible results of the few existing Belgian EPC-projects - that are still in the phase of procurement - can only be expected after some years.

## Bulgaria

In Sofia there was 3 ESCO project implemented in the period 2002-2009 and since then there are no initiatives for EPC in public buildings. There is no information for the implementation of EPC in private buildings or industrial enterprises.

## Croatia

Main Croatian ESCO (HEP ESCO) has a reference list that includes projects on reconstruction of public lighting, public buildings, industry facilities and energy supply systems. However, these cannot be categorised as EPC type of projects due to lack of savings guarantee.

Other mentioned companies providing ESCO type of services are relatively small and with limited experience. Conclusion from these tenders is that in more cases ESCOs are not interested in such projects.

## Czech Republic

Virtually all of the ESCOs operating on the Czech market have a long-term focus on the business of providing energy services via the EPC method, they have experience from a number successful projects and regularly enter into other EPC projects.

## Germany

The market for Energy Services in Germany is a competitive market with around 500 ESCOs. The market includes some 10-20 of the most important large ESCOs, normally operation on the international level, which are also the most important players for EPC. Furthermore, a lot of medium-size and small ESCOs and other vendors are operating in the German energy services market. ESCOs in Germany have different business background, e.g. utilities, energy service companies, energy agencies, heating installers, plant engineering and regional supply companies.

## Ireland

ESCO market is currently both small and underdeveloped. But with recent developments a number of case study examples of ESCO projects have emerged.

## Norway

Approximately five ESCOs can refer to a number of reference projects during the last 5 years.

## Spain

Some of the mentioned companies have had experiences in Spain on improving energy efficiency through guarantying energy savings.

## Ability to compete

### Austria

In general, no big external barriers for EPC can be perceived. There is a relatively good information level among the stake holders. There is a well-developed provider structure with a number of credible and experienced companies. There is also some support from the financial sector, with banks themselves engaging in low level EES to market their special EEI credit products. There are also various public subsidies available for EE measures and consultancy. On the other hand there is no regulation that would directly stimulate the market for EES.

### Belgium

As for EPC projects in Belgium, the Negotiation procedure with publication is used, as it concerns complex projects with budget that are difficult to estimate in advance.

### Bulgaria

Bulgaria has a Public procurement Act, which amended version will enter in force at the beginning of 2014. This law lays down the principles, the conditions and the procedures for assignment of public contracts in order to ensure the efficiency of spending the budget, as well as the funds, related to fulfillment of defined by the law activities of social significance. Theoretically, ESCOs are subject to tenders as well.

### Croatia

According to the Law on public procurement EPC type projects have to follow public procurement procedures. Negotiation procedure is not a good option, because of the very underdeveloped EPC/ESCO market in Croatia, lack of experience from both ESCOs and clients as well as a lack of trust.

### Czech Republic

The Act on Public Procurement has been in force since 1995, pursuant to this it is essential to enter projects solved by the EPC method in the public sector. Since roughly 2005 the notification used for public procurement for EPC projects is the form of negotiated procedure of the EPC with publication, which, as has been confirmed in many selection procedures, is most appropriate for the projects concerned.

### Germany

As for all ESCOs applicable, in Germany the public procurement is regulated by the procurement law. The concrete refinement of procedures is given in the so-called "Verdingungsordnungen" VOB (Contract procedures for building works) and resp. VOL (official contract terms for the awarding of construction contracts).

The award of public contracts is currently being

- a) the “open method” in public procurement above the EU thresholds\* at which all interested entities may submit a tender notice of which the contracting authority then selects the most economical offer (the corresponding method in public procurement below the EU thresholds, the public tender).
- b) The “restricted procedure” above the EU thresholds\*, in which (after a Europe-wide notice) interested companies are requested to express their interest of participation (with a limited number of at least 5), the contracting authority then will chooses among the companies to tender form.

### Ireland

There are currently only a small number of ESCOs currently active in the Irish market and these are almost all international, non-indigenous companies. With recent market developments and the development of the Energy Efficiency Fund more established companies, particularly from the construction sector, are becoming interested in the ESCO model. However it will take some time before these companies are in a position to compete with the more established ESCO companies.

### Norway

According to the law of public procurement, EPC projects (in public buildings) have to follow public procurement procedures. For EPC projects procedure of negotiation is mainly used.

### Spain

Within an open tender procedure, In general all companies say they are able to compete in an EPC procedure, but the reality is than only few real ESCO companies have the expertise to compete and to develop and implement energy efficiency measures with savings guaranteed.

Negotiation procedure would be an instrument to select real ESCOs, but in Spain is only up to 100.000 Euros (VAT excluded), and this would only be applicable in a too small project to be performed as an EPC.

### ESCO associations or other institutions

There are no ESCO associations or institutions in Norway, Ireland, Bulgaria and Croatia.

In other countries exists associations or institutions, whose activities are focused on EPC projects in a different level - mainly or in a limited degree. In Czech Republic, there is the only association, which is focused only on EPC projects.

Country	Name of the association or institution	
<b>Austria</b>	DECA	Dienstleister Energieeffizienz und Contracting Austria
<b>Belgium</b>	Belesco	
	AGBP	Agoria Green Building Platform
<b>Czech Republic</b>	APES	Association of Providers of Energy Services
<b>Germany</b>	ZVEI	Zentralverband Elektrotechnik- und Elektronikindustrie e. V.
	AGFW	Energieeffizienzverband für Wärme, Kälte und KWK e. V.
	ASEW	Arbeitsgemeinschaft für sparsame Energie- und Wasserverwendung
	B.KWK	Bundesverband Kraft-Wärme-Kopplung e. V.
	VfW	Verband für Wärmelieferung e. V.
<b>Spain</b>	ANESE	National Association of ESCOs
	ACTECIR	Catalan Association of Technicians in Energy, Air Conditioning and Refrigeration

### *Financing and banking sector in relation to EPC projects*

The most common method of financing is through bank loans. However, although commercial banks have the EPC awareness and they are interested in the business that can be generated in the field of energy services but there is still caution and barriers. Where is the EPC developed, often is used of funding in the form of sale of receivables, which among others allows repeatability of obtaining funds for the ESCO.

#### **Austria**

Most common type of financing is “third party” financing. Also customer financing and EES provider financing are sometimes used.

#### **Belgium**

In Belgium is common type of financing by banks. One of the biggest bank showed interest in financing EPC-projects, but after it was hit sovereign debt crisis, so EPC is not on the agenda now. Other banks are interested in EPC, but our impression is that they wait with financing activities until the first EPC-projects will be tendered.

#### **Bulgaria**

EPC could hardly be self-financing. Potential funding sources are primarily grant programs, the Fund for Energy efficiency and Renewable energy as well as some new financial initiatives.

## Croatia

Loan programmes for ESCO and EPC projects are available through Croatian Bank for Reconstruction and Development (HBOR), which has introduced several credit lines designed specifically for supporting projects of renewable energy sources and energy efficiency, two of which are currently active. In 2012 a new programme under the European Commission initiative was developed and is currently being implemented in co-operation with the EIB. These loan programmes are also available through commercial banks. They have developed their own portfolio of green loans for sustainable energy projects. However, no tailor made EPC loan programmes are currently available.

## Czech Republic

As a general rule, financing of the project is provided by the ESCO, rather than the contracting entity, and by obtaining investment funds through a bank loan, which is paid back from the savings achieved.

In the last few years ESCOs have resolved financing EPC projects in the form of purchasing the receivables for the contracting authority with regards to the bank, i.e. factoring. Thus the contracting authority pays the loan “directly” to the bank (of course without the need to conclude a credit agreement) and the ESCO guarantees achieving the agreed-upon amount of energy savings and reduction in operating costs. Factoring is now the most frequent manner of financing these projects.

## Germany

The commonly used instrument today for re-financing by the ESCO is factoring (in Europe: forfeiting). Forfeiting is the in case of EPC long-term sale of (future) receivables: when a bank loans money through a forfeiting mechanism, the bank wires euros to the ESCO at the time of completion of the project set-up, i.e. when the equipment has been installed. The customer makes periodic fixed payments to the bank. For this, the customer signs an agreement on the amounts to be paid directly to the bank or financial institution. For the ESCO this may mean that the amount of security that it has to provide to the customer is increased. **Since forfeiting is an instrument to refinance the ESCOs hardware costs fast, it is today commonly used.** But also full or partial financing by clients are preferred by ESCOs.

## Ireland

The government has established the Energy Efficiency Fund. Its aim is to kick start the EPC market in Ireland and generate competition and raise awareness of the EPC market within the financial sector, with the intention of winding down the fund within a number of years as it becomes redundant.

## Norway

Financing and banking sector has got very limited knowledge about EPC projects and show very little interest in such projects. **Most common way is financing by customer.**



## Spain

There are knowledge of the existence of EPC projects model by the majority of banks and local finance entities, but this knowledge is superficial, but under current conditions it is very difficult to get bank loans and with this new model to the banking system situation is even further compounded to get loans. One Catalan bank is pioneering on financing EPC projects in Catalonia.

### *Existence of programs for support of EPC*

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It is generally true, that projects resolved by the EPC method does not need subsidies, but they do need support in terms of information support and in the form of examples from the state.

Except of Ireland, there are currently no specific programs in other countries which support directly the development of EPC projects.

In **Ireland/Dublin**, the key program of support for the development of EPC is the National Energy Services Framework. The aim of this Framework is to develop robust projects which are investment-ready for financing entities. This will in turn stimulate the development of an Energy Services Company (ESCO) market. The Framework also aims to provide best-practice guidance to public and private sector client organization when procuring energy services and engaging ESCOs. The Framework will focus initially on providing guidance and tools to support developing projects suitable for Energy Performance Contracting (EPC) and Energy Performance-Related Payments (EPRP).

In some other countries there are programs and subsidies suitable for the use in EPC.

Country/region/city	Name of the program	Focus/description
<b>Austria/Styria</b>	KPC - Kommunalkredit Public Consulting	Subsidy program for public customers, if energy efficiency measures are implemented through contracting concepts
<b>Czech Republic/Prague</b>	EFEKT	subsidy provided only for the preparatory stage of EPC projects, specifically for processing the preliminary analysis as to whether the buildings selected are suitable for the EPC method
<b>Germany/Berlin</b>	Combined Heat and Power Act	priority for feeding-in electricity from CHP-plants into the grid, guaranteed bonuses for generated CHP electricity
	The Market incentive Program for Renewable Energy Sources	investment incentives for biomass heating systems, heating pumps, geothermal installations, solar thermal installations, local heating grids



	KfW Building Restoration Program	reduced interest rates for building modernisation, support of different measures: insulation, modernisation of heating distribution, installation of renewable energy facilities
	EEG - Renewable Energy Sources Act	priority for feeding-in electricity from renewable sources into the grid; guaranteed feed-in tariffs over a duration between 15 and 20 years
Norway/Oslo	Enova SF - The national energy agency	general energy efficiency grants for measures

## EPC projects

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### *Realized projects*

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#### Austria

The region of Styria (formerly known as LIG) has performed a number of EPC- and IEC-projects. In the last 7 years 3 pools of projects have been performed, awarding 10 separate projects to 7 different ESCOs.

Name of the Project:	
Objects:	conference hotel, schools, home for the elderly, office buildings
Investor:	Landesimmobiliengesellschaft Steiermark (LIG)
Measures realized:	<ul style="list-style-type: none"> <li>- Efficient heat boilers (majority on biomass)</li> <li>- Or connection to district heats system (instead of oil boilers)</li> <li>- control system,</li> <li>- thermostatic valves,</li> <li>- insulation of uppermost ceiling</li> <li>- solar thermal collectors</li> <li>- new and isolated heat distribution systems</li> <li>- efficient lights</li> </ul>
Baseline (€):	€ 350.000
Contractual relationship:	15 years
Installation period:	Between 2006-2012
Amount invested:	€ 790.000
Savings (%):	17% - 31% heat, 5% - 12% electricity

#### Belgium

No project until now.

## Bulgaria

Name of the Project:	
Object:	Pirin Tex LTD – town Gotze Delchev
Investor:	ENEMONA PLC
Measures realized:	<ol style="list-style-type: none"> <li>1. Re-construction of the heating system</li> <li>2. Optimization of the lightening system</li> <li>3. Implementation of devices for energy saving – controllers for the electrical installations’ work etc,</li> <li>4. Implementation of a monitoring and management system of the energy consumption</li> </ol>
Baseline (€):	
Contractual relationship:	ESCO contract
Installation period:	2.3 years
Amount invested:	540 000 Euro
Savings (%):	675 MWh/y.
Savings (€):	250 000

## Czech Republic

So far approximately 200 EPC projects have been implemented in the CR with investment funds exceeding CZK 3 billion, while it can be estimated that Prague accounted for about a third of the projects. The largest number of energy-saving projects in the form of EPC was implemented in the public sector, in particular in primary and secondary school buildings, another frequent area is health care followed by the area of culture.

Name of the Project:	<b>The Institute for the Care of Mother and Child in Podolí, Prague</b>
Object:	Grounds of health facility buildings built in 1914 located in the Vyšehrad protected heritage area.
Investor:	The Institute for the Care of Mother and Child (contributory organization of the Ministry of Health of the CR)
Measures realized:	rebuilding steam boilers for hot water, building local pressure-independent transfer stations with hot water heating in the building’s four pavilions, complete reconstruction of the heating system, installation of a new measurement and regulation system with a central control room, energy management and service for the measurement and regulation system (M&R) for the entire
Baseline (€):	252.000



Contractual relationship:	7,5 years
Installation period:	2004
Amount invested:	684.000
Savings (%):	42
Savings (€):	104.000

### Croatia

Name of the Project:	
Object:	3 objects: Main administrative building, Virology building, Auxiliary building
Investor:	Croatian National Institute of Public Health
Measures realized:	Overall reconstruction including: <ol style="list-style-type: none"> <li>1) Reconstruction of heating system, replacement of boiler, installation of thermostatic valves</li> <li>2) Indoor lighting modernization</li> <li>3) Wall Insulation</li> <li>4) Roof insulation</li> <li>5) Change of windows and doors</li> </ol>
Baseline (€):	783.252 HRK (103.000 EUR)
Contractual relationship:	8-10 years
Installation period:	Planned in 2014
Amount invested:	Estimated at 3.136.000 HRK (412.600 EUR)
Savings (%):	35
Savings (€):	256.160 HRK (33.700 EUR)

### Germany

There were more than 300 EPC agreements (estimation BEA) concluded since the mid 90's in Germany – with high-tech and complex individual buildings like hospitals, as well as building pools of up to 100 separate buildings. In the framework of the Energy Partnership in Berlin 27 pools are realized – one of these pools - with 4 separate buildings of the University of Applied Science – is shown below:

Name of the Project:	<b>Pool 10</b>
Object:	Beuth Hochschule Technik, Berlin

Investor:	Contractor: Evonik New Energy
Measures realized:	Optimized heating control, replacement of pumps, optimization of HVAC, use of frequency converter, building automation
Baseline (€):	928.200 €
Contractual relationship:	EPC
Installation period:	10 years (2002-2012), 2013: follow up contract (10 a) out for tender (with additional savings of 19%)
Amount invested:	552.200 €
Savings (%):	22.50%
Savings (€):	208.900 €

### Ireland

At this time, there are case study examples, but no realized project until now.

### Norway

No EPC project has been realized by public sector in Oslo. There might have been some smaller EPC-projects in private sector, consisting of mainly single buildings.

### Spain

Name of the Project:	<b>Improving energy efficiency in Fundación Colección Thyssen Bornemisza</b>
Object:	Efficiency Improvements on the AC systems of a Museum of 15.000 m <sup>2</sup> , performed by Honeywell.
Investor:	Private company: Thyssen Foundation (Museum in Madrid)
Measures realized:	Retrofit of 3 Chillers, 3 cooling towers, 3 air handler units (fans with better efficiency & VSD), VSD on primary and secondary pumping circuits, VSD in condensation pumps and a new control and management system
Baseline (€):	1.864.591 kWh/year. 149.944 €/year
Contractual relationship:	2 years
Installation period:	First 4 months of 2012. Project ends December 2013.
Amount invested:	600.000 €
Savings (%):	29% guaranteed by Honeywell
Savings (€):	42.000 €/year





### *Prospective projects*

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In the near future the situation is mainly dependent on the attitudes formed by prior experience with EPC projects. It is expected that the project EESI 2020 may help develop.

#### **Austria**

Due to the cancellation of the ELENA-application and the restructuring process within the regional government of Styria, there are no concrete project developments at the time of the report.

In the framework of EESI2020 there is an agreement between Graz EnergyAgency and relevant project facilitators within the regional government body to aim for a relaunch of EPC project development.

#### **Belgium**

Several new EPC projects are expected to be tendered during the following few years in the Flemish and Brussels region. They will be procured via a smart EPC contract of Fedesco.

#### **Bulgaria**

As per the Agency for sustainable energy development 630 public buildings are suitable for ESCO contracts.

#### **Croatia**

At the level of City of Zagreb, prospective EPC projects are mostly the buildings and public lighting included in the IEE MLEI ZagEE project (87 buildings in total), for which the project documentation for retrofitting will be prepared within the following year, after which tenders for retrofitting should be launched. However, the decision on the modalities and sources of financing (which could include EPC model) is still to be made by representatives of the City of Zagreb.

#### **Czech Republic**

This year several projects are being prepared in Prague in the public sector with an approximate value of CZK 120 million. It primarily concerns buildings in the sectors of education, health care and culture. It is assumed that the projects will be guaranteed for the contracting entities by the ESCO that is selected, including financing, while the basic condition will be achieving the contractually agreed-upon energy savings.

## Germany

Although the number of public EPC tenders has been decreasing in the past 7 years, there are expectations among ESCOs and other market experts that a yearly growth rate of approximately 10% is achievable. With this assumption the EPC market volume might rise to € 120 resp. 290 million in 2020 in Germany. The development is foreseen to be driven mainly through the public and the hospital sector.

## Ireland

As part of the framework process 22 organizations have been selected to complete EPC projects in 2013/2014 (e.g. Dublin City Council, Dublin City University, GE Healthcare, Four Seasons Hotel, Irish Prison Service, St. John of God Hospital, Tesco, etc.)

## Norway

During a project called RENERGI/ESPARR supported by The Norwegian board of research two tools for energy saving will be tested. One of them is EPC. During this project, one EPC-project will be implemented, namely, Nedre Silkestrå Borettslag (Oslo Housing association). This project consists of 14 buildings from early 1980's.

## Spain/Catalonia

There are two prospective project facilitated by ICAEN in an Archive Building and in a Sports Centre, both property of the government of Catalonia. Within the frame of the energy efficiency & savings Plan for the public buildings of the government of Catalonia is planned to carry out one more project at the end of 2013 and at least 5 more EPC projects during 2014.