D2.4 Country Report on Identified Barriers and Success Factors for EPC Project Implementation

Sweden

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Transparense project

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Abbreviations

BEEP: Buildings Energy Efficiency Programme
CEM: Contract Energy Management
CRC: Carbon Reduction Commitment
ECA: Enhanced Capital Allowance
EEEF: European Energy Efficiency Fund
EED: Energy Efficiency Directive
EESI: European Energy Service Initiative
EMA: Energy Managers Association
EPC: Energy Performance Contract
ESCO: Energy Service Company
ESTA: Energy Services and Technology Association
FM: Facilities Management
JRC-IE: Joint Research Centre – Institute for Energy
LEEF: London Energy Efficiency Fund
NHS: National Health Service
PFI: Private Finance Initiative
UK: United Kingdom

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1 Summary

The present report aims at providing an overview of the existing EPC market in Sweden. The report focuses on identified barriers and success factors for the implementation of EPC projects.

The report is building on the data and information gathered by two other similar projects, the European Energy Service Initiative[1] (EESI) and the ChangeBest project[2]. It further builds on the results of a previous survey and workshop with focus on success factors and barriers for EPC implementation in the Nordic countries

It is also intended as a continuation on the work of the European Commission's Joint Research Centre – Institute for Energy, and more particularly on its 2010 Status Report on Energy Service Companies Market in Europe[3].

2 Introduction

2.1 Methodology

The contents of this report are based on three main sources:

- the results of a nation-wide EPC survey which was sent to the country's main actors within the EPC market
- the results of a previous survey and workshop with focus on success factors and barriers for EPC implementation in the Nordic countries
- the market knowledge of the authors, as well as research from local / national literature (publications and studies, legislation documents, official statistics,

[1] http://www.european-energy-service-initiative.net/eu/toolbox/national-reports.html
[2] http://www.changebest.eu/index.php?option=com_content&view=article&id=43&Itemid=10&lang=en
[3] http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/15108/1/jrc59863%20real%20final%20esco%20report%202010.pdf

databases and personal communication with the Sweden Transparense steering committee)

The first step in collecting the data used in this document was to distribute a survey focused on Energy Performance Contracting (EPC) to the country's most relevant energy services companies, organisations and finance houses. The survey contained questions around four main areas: existing ESCOs and national EPC market; EPC models, financing models and policy initiatives. The answers were then analysed and the results are presented in this report in aggregated form.

The survey was sent and communicated to all the major ESCOs in the Sweden as well as some EPC facilitators and consultants. The survey was filled in by ten persons from five ESCO:s (seven persons), two business consultants and one independent specialist company.

A slightly different survey, modified for a different target audience (banks and finance houses) was also sent to the major financier of EPC projects in Sweden. However, only one response was obtained, which was incomplete and therefore not useful for the review.

Additional information has also been gathered by the authors in order to present an up-to-date picture of the state of the EPC market in Sweden.

2.2 What is Energy Performance Contracting

2.2.1 European definitions

Energy performance contracting (EPC) is when an energy service company (ESCO) is engaged to improve the energy efficiency of a facility, with the guaranteed energy savings paying for the capital investment required to implement improvements. Under a performance contract for energy saving, the ESCO examines a facility, evaluates the level of energy savings that could be achieved, and then offers to implement the project and guarantee those savings over an agreed term.

A typical EPC project is delivered by an Energy Service Company (ESCO) and consists of the following elements:

- **Turnkey Service** – The ESCO provides all of the services required to design and implement a comprehensive project at the customer facility, from the initial energy audit through long-term Monitoring and Verification (M&V) of project savings.
- **Comprehensive Measures** – The ESCO tailors a comprehensive set of measures to fit the needs of a particular facility, and can include energy efficiency, renewables, distributed generation, water conservation and sustainable materials and operations.

- **Project financing** – The ESCO arranges for long-term project financing that is provided by a third-party financing company, typically in the form of a bank loan.
- **Project Savings Guarantee** – The ESCO provides a guarantee that the savings produced by the project will be sufficient to cover the cost of project financing for the life of the project.

Energy Performance Contracting allows facility owners and managers to upgrade ageing and inefficient assets while recovering capital required for the upgrade directly from the energy savings guaranteed by the ESCO. The ESCO takes the technical risk and guarantees the savings.

The ESCO is usually paid a management fee out of these savings (if there are no savings, there is no payment) and is usually obligated to repay savings shortfalls over the life of the contract. At the end of the specific contract period the full benefits of the cost savings revert to the facility owner.

The methodology of Energy Performance Contracting differs from traditional contracting, which is invariably price-driven. Performance contracting is results-driven: ensuring quality of performance. ESCOs search for efficiencies and performance reliability to deliver contractual guarantees.

While there is a vast number of definitions of EPC within Europe, the Energy Efficiency Directive[4] (EED) finally provided EU wide definition as follows:

"energy performance contracting means a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, according to which the payment for the investment made by the provider is in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings".

While within the Transparense project we stick with the EU wide definition, the focus will be given to the EPC projects, where the above mentioned "agreed level of energy efficiency improvement" are **guaranteed** by the EPC provider.

2.2.2 Swedish definition

The Swedish Transparense steering committee has agreed on the following definition of EPC:

- **Guaranteed savings**: There is an agreement between the ESCO and the client about energy efficiency improvement measures with guaranteed savings

[4] Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC was approved on 25 October 2012.

- **Collaboration**: An energy efficiency improvement project is carried out in collaboration between an ESCO and a client on the basis of an agreement with implementation of measures and guaranteed energy savings
- **Three main phases**:
  - **Analysis**; the ESCO investigates and suggests energy efficiency improvement measures that are analysed in collaboration with the client. The ESCO reports the guaranteed savings on the basis of measures decided by the client.
  - **Implementation**; the contractor implements the agreed measures.
  - **Guarantee**; the savings are monitored and the ESCO assures that the agreed guaranteed savings have been achieved.

3 The EPC market in Sweden: an introduction

The EPC market in Sweden can be considered well developed, in the sense that EPC as a business model has been alive for decades. Despite its potential and several success stories, the model is regularly struggling with weak market demand, indicating both long-term barriers and occasional barriers dependent on specific occasional factors (such as financial crisis, removal of specific policy support etc.). This hinders the further development of EPC and customers are still reluctant see EPC as a win-win type of contract.

The survey respondents agreed that there are 5 companies offering EPC services in Sweden (one respondent stated there are 6 EPC providers), several of these are also active in other countries. Three of the ESCO:s are the main providers covering most of the Swedish market. Most of the ESCO:s are primarily active in the public and governmental sector.

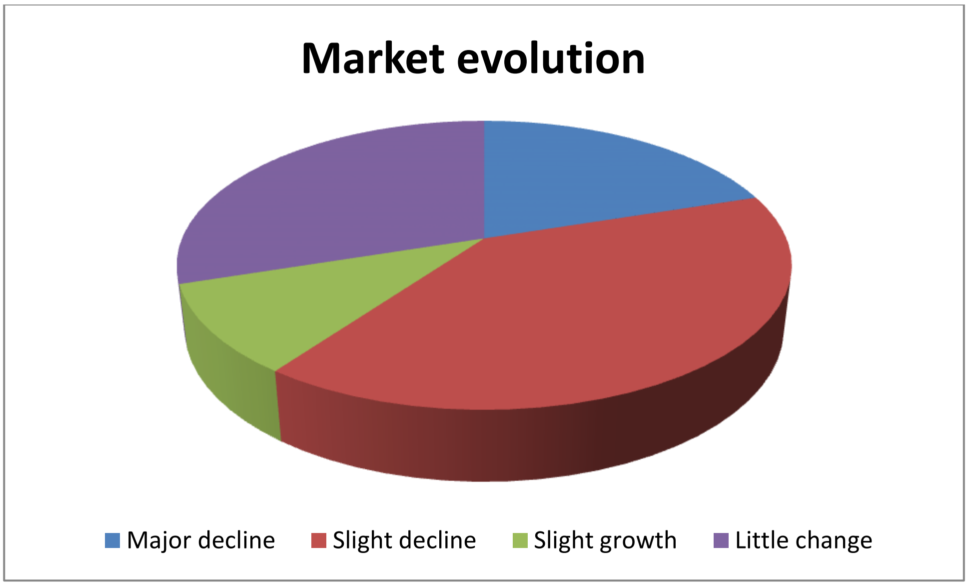

Figure 1. Evolution of the Swedish EPC market 2011-2013

The market has been fluctuating during the last ten years. In the early 00's, rising energy prices, renewed environmental concerns and focus on climate change generated growing interest in energy efficiency improvement and EPC. Since the NEEAP 2008, the EPC market in Sweden has grown considerably – but came to an abrupt halt in 2009/2010, followed by an up going trend. At present, the market is very weak again and very few or no new projects have been procured the last year. Data from the Transparense survey indicates that most of the ESCO respondents believe that the market for EPCs in Sweden had seen shown a slight or major decline over the last three years (see Figure 1).

The building types at which EPCs were being carried out vary. The most common buildings subject to EPC services are public buildings (90%) and offices (80%), see Figure 2. Only two ESCO:s offer EPC services for industries.

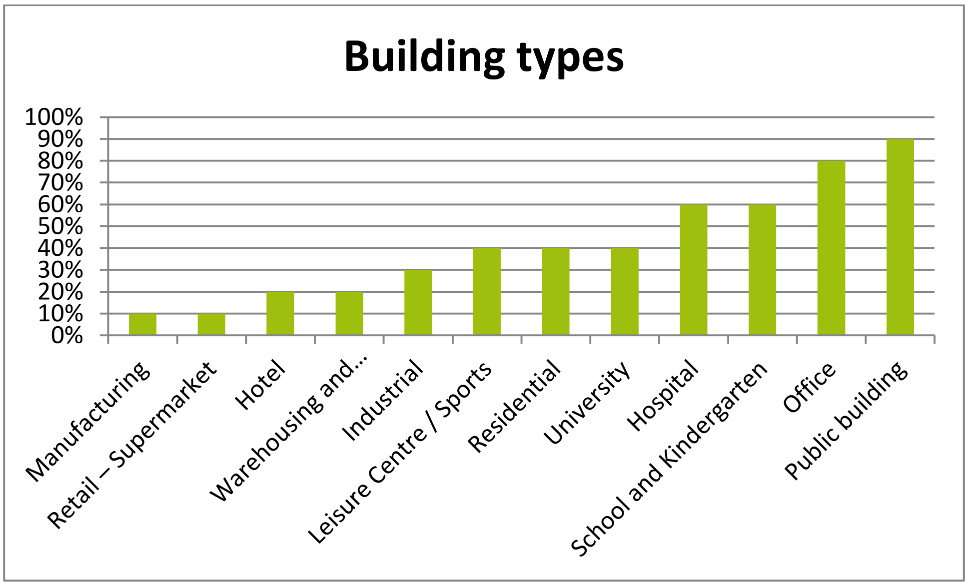

Figure 2. Distribution of EPCs by Building Type (October 2013)

Almost all respondents stated that a typical EPC addresses both energy efficiency and quality improvement measures, lasts between 5-10 years and results in a typical annual energy saving is between 16-30%. The most common investment outlay (value of the contract) is between 1 and 5M€.

An evaluation of 14 EPC projects undertaken in public premises in 2007, suggested an average of 22% savings for the EPC projects with variations between 17 % and 66%, indicating a substantial potential for energy savings by EPC projects.

At present there is no clearly defined ESCO association in Sweden, which make it difficult for ESCO:s to establish themselves as a unified EPC industry. There is a broader organisation, EEF (Energieffektiviseringsföretagen = Energy Efficiency Companies), with a much broader role on energy services in general and not only EPC. A discussion has just started between the ESCO:s and EEF (Energieffektiviseringsföretagen = Energy Efficiency Companies) about developing EEF as a Swedish ESCO association. Some of the ESCO:s are already members of EEF.

The measures most commonly included in Swedish EPC projects are building energy management systems, Heating Ventilation Air Conditioning (HVAC) and lighting efficiency and control (see Figure 3).

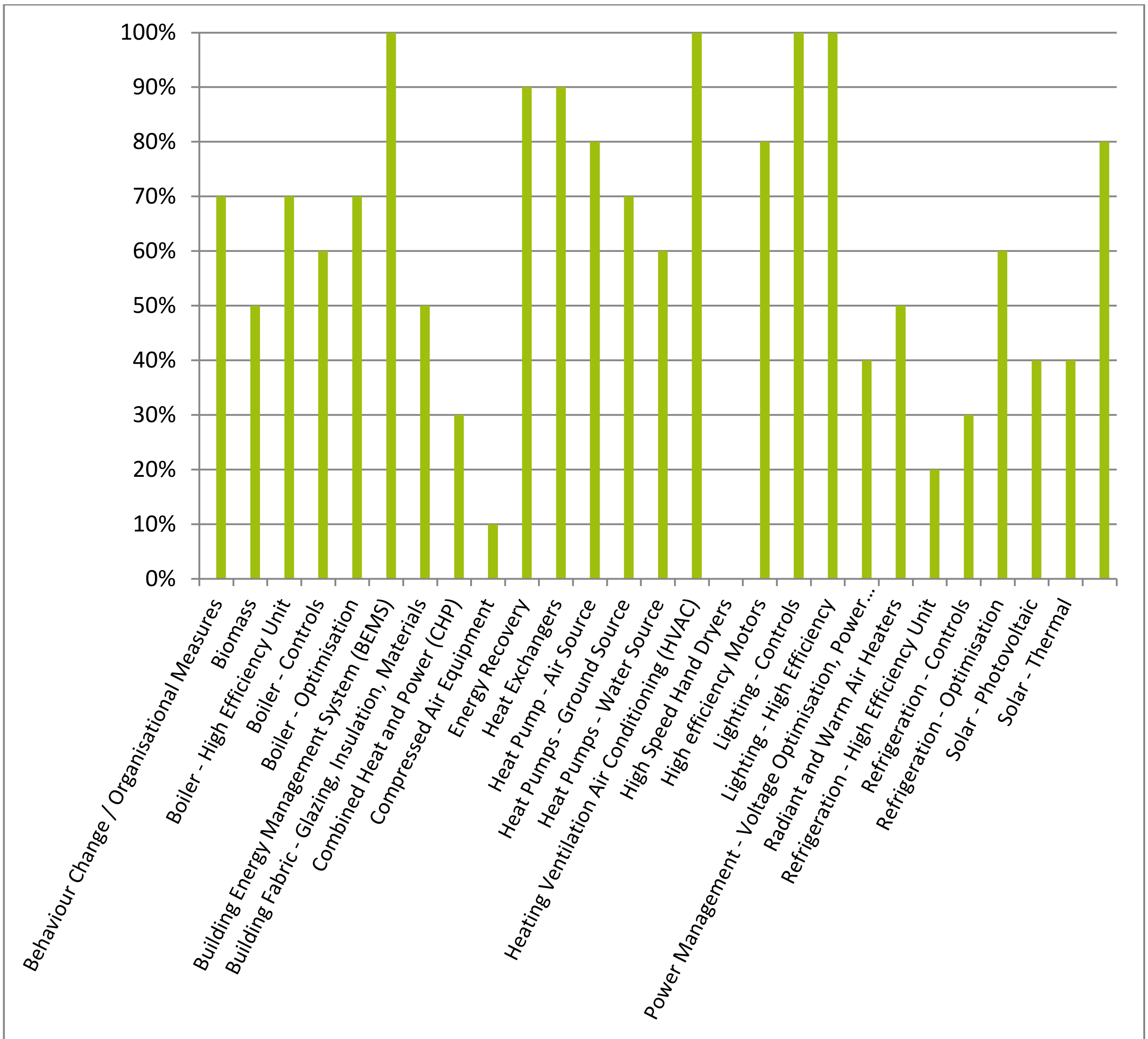

Figure 3. Summary of measures included in Swedish EPC projects according to Transparense survey.

4 Legislative framework

Generally, the legal and administrative requirements for an EPC project in Sweden are quite high, and suffer from a lack of standardisation (i.e. there is no “typical” type of contract, the ESCO:s offer slightly different models/contracts). The EPC industry has largely been left on its own and had to rely on its own initiative(s) to grow and become successful. The survey respondents find the Swedish existing policies ineffective to very ineffective in boosting the EPC market. Some even stated that there are actually no policies in place. They are slightly more positive regarding the effects on energy efficiency improvement in general (not specifically EPC).

The EU directives most relevant for energy services are (Swedish Energy Agency, 2013):

- The Energy Efficiency Directive[5] (EED)
- The Energy Performance of Buildings Directive (2010/31/EU)
- The Eco Design Directive (2009/125/EG)

Examples of Swedish adaptations to the above-mentioned directives or regulations/policy instruments that support energy efficiency improvement are described below (both current and recent).

Energy declarations are regulated in the EU Framework Directive on Energy Performance of Buildings (EPBD directive, 2010/31/EU) and imply that a systematization of the energy performance of buildings should be done. This enables comparisons between different buildings’ energy use. The directive may indirectly raise awareness of the potential for energy savings and thereby call for EPC projects in cases where the energy declaration shows poor performance.

The Energy Efficiency Directive aims at promoting cost-effective improvement of energy end-use in the EU, including by promoting the market for energy services such as EPC, by a range of measures. Based on the directive the Swedish government has proposed a new law demanding large companies to do energy audits and another law on voluntary certification of certain energy services (Swedish government, 2013).

Municipalities and local regions may apply for governmental support for energy efficiency improvement measures. The support started in 2010 and is administered by the Swedish Energy Agency (Swedish Energy Agency, 2013).

[5] Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC was approved on 25 October 2012.

There is a regulation requiring some authorities to make energy efficiency improvement actions (Regulation 2009:893). The measures are reported to the Swedish Energy Agency.

OFFROT was a previous support for energy efficiency improvement actions and conversion to renewable energy in public buildings, which ended in 2008. OFFROT grants have clearly contributed to increased demand for EPC and after the finalisation of the support the EPC market dropped remarkably. OFFROT proved to be effective in achieving energy savings, but the time limitation partially counteracts the realization of the full potential (Gode et al, 2007). If the contribution was made permanent, the conditions for energy efficiency measures in public buildings could significantly improve.

5 Identified Barriers

In February 2011, the following barriers to the progress of the EPC market were identified within the EESI project (Gottberg et al, 2011):

- Uncertainty about the Public Procurement Act
- Lack of knowledge, and knowledge asymmetries between clients and ESCOs
- Shortage of competent staff (difficult to recruit)
- Lacking continuity in information initiatives
- Limited number of ESCOs
- Discontinuation of public grants
- Coincidence in 2009 of the
    - financial crisis
    - end of grants for investments in energy efficiency measures in public properties
    - uncertainty and speculations about the Public Procurement Act due to the cancellation of a high profile EPC project on claims that it may be in conflict with the Public Procurement Act

The Transparense survey confirms that some of the same barriers still remain most problematic for the EPC industry in 2013. The barriers identified by most of the respondents of the survey are (see Figure 4):

- Regulation/Lack of support from the government
- Customer Demand
- Complexity of the concept/Lack of information

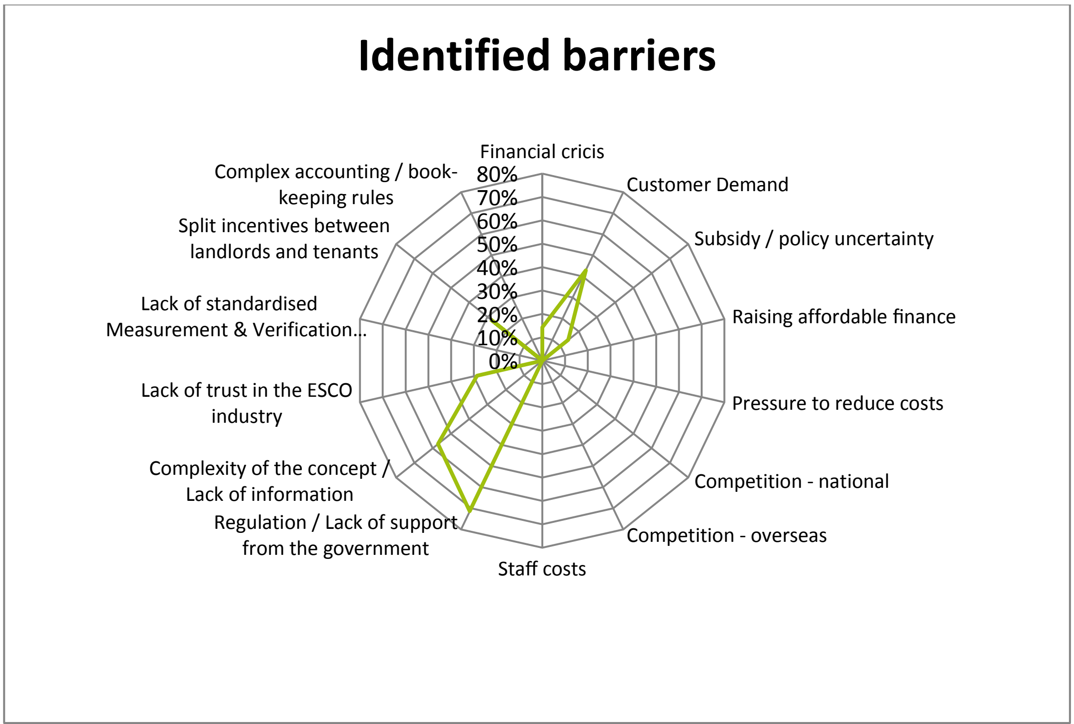

Figure 4. Identified barriers to EPC implementation.

5.1 Discussion on barriers

The EPC market has been driven by ESCOs and often clients have limited knowledge on EPC. ESCOs teach clients but this to some extent makes the clients dependent on ESCOs. This dependence may lead to a caution to embark on EPC projects. On the demand-side, there are a number of decision-makers including officials and politicians. Thus, many different actors in the demand-side need knowledge on EPC and a life cycle cost and profit approach to investment decisions.

A number of research initiatives and informal networks have been undertaken in recent years to build knowledge on EPC. The NEEAP 2008 proposed to support the Forum for Energy Services run by the Swedish Energy Agency. This forum has however, been dormant for some time due to staff turnover and limited resources. The lifespan for the present European Energy Services Initiative (EESI) website is limited to the duration of the project.

The Public Procurement Act seeks to make good use of public funds by taking advantage of competition in the relevant market and to ensure fair competition for suppliers. However, the Public Procurement legislation (originating in various EU directives) has become very extensive, detailed and unwieldy. There are many examples from the procurement of a variety of products and services that public procurement in accordance with the Public Procurement Act may be difficult. EPC is no exception. In the spring 2009 the Swedish quasigovernmental organisation the Swedish Environmental Management Council issued guidelines on the procurement of EPC, and published a report on experiences of public procurement of EPC. These guidelines addressed previous uncertainties about procurement of EPC. The discontinuation of an EPC project in the City of Stockholm in 2010 meant further uncertainties about how to procure EPC in accordance with the Public Procurement Act, which in effect deflate the efficacy of the guidelines by the Swedish Environmental Management Council.

In a draft from the Swedish Energy Agency on the market for energy services (in general, not only EPC) in Sweden, the following suggestions are presented to boost the market (Swedish Energy Agency, 2013):

- Information
- Increased competence
- Facilitators
- New business models
- ESCO association
- Co-operation between actors
- Methodology for monitoring the market

6 Success factors

Within the EESI project the following success factors were identified (Gottberg et al, 2011):

- Collaboration between ESCOs and clients
- Good energy statistics in the client organisation
- Commitment of both the client and ESCO
- Well prepared procurement process

Furthermore, during a Nordic workshop in 2009 about how to accelerate EPC implementation, a vision was elaborated illustrating successful EPC in the future (Gottberg et al, 2009):

- EPC is established and well-renowned in the Nordic countries and has a good reputation – more than 50 projects are in progress
- The procurement procedure is working smoothly and is not considered too complicated either by customers or providers
- The market is well-functioning with more actors and valuable competition and there is no longer a fear for unserious players

- Authorities understand that EPC may contribute to achieving great energy efficiency improvements and thereby fulfilling EU directives.
- Incentives have been introduced that stimulate the use of EPC.
- Networks and information channels are established and the knowledge level is high. The communication process is successful through the definition of terms that people do understand
- Competences and skills of both buyers and providers have increased and so have profits/savings
- Customers are comfortable with the concept and ask for EPC services
- The EPC concept has been developed;
    - Procedures for baseline definitions and comfort/saving guarantees have been established
    - EPC is not comprising too many issues to assure high competition and understanding

A slightly different picture on success factors is evolved from the Transparense survey (see Figure 5).

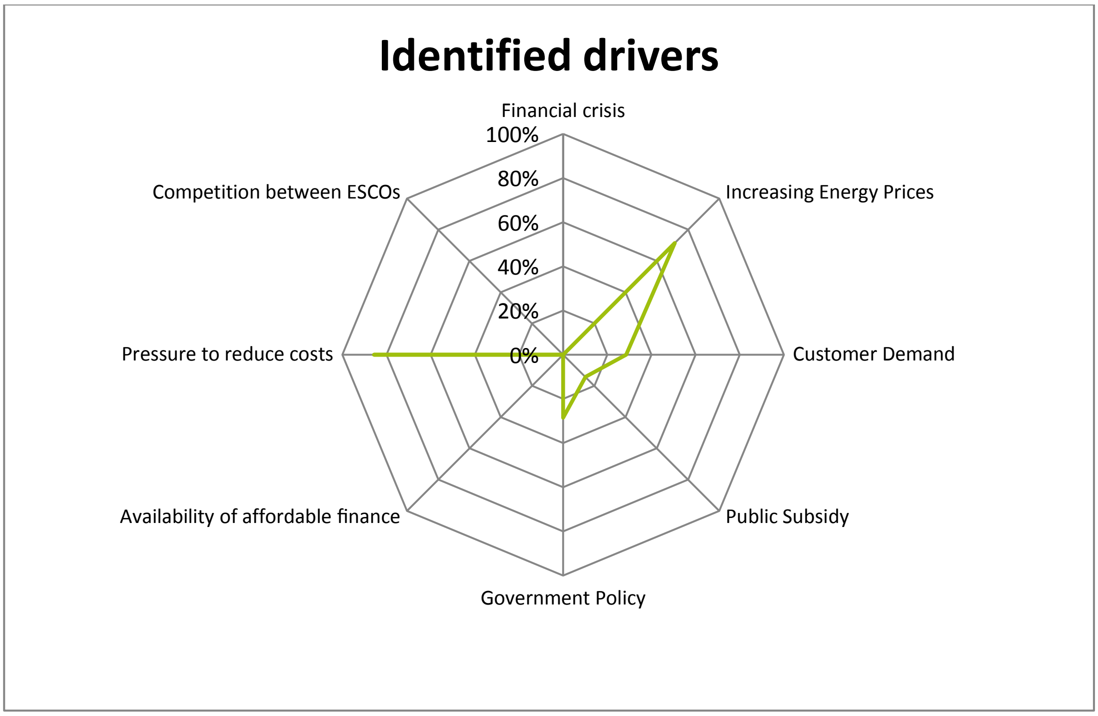

Figure 5. Identified drivers for EPC

References and other sources of information

Axelsson U., Gottberg A., Gode J., Särnholm E. ”Miljönytta med energieffektivisering – En studie av miljöaspektens roll i EPC-projekt”. IVL rapport B1923, maj 2010

Bratt, M., Farelius J., Petersen, C., & Bylund, S. (2007) Marknaden för energitjänster. Final Report for Näringsdepartementet, prepared by WSP Environmental.

Bratt, M., Persson, A., Sandgren, U. & Hagetoft, J.(2010) Det finns potential — Energieffektivisera offentliga fastigheter i högre takt. Sveriges Kommuner och Landsting, Stockholm.

Gode, J., Strömberg, A., Axelsson, U. & Särnholm, E. (2007) Energy Performance Contracting - en modell för minskad energianvändning och miljöpåverkan. ER2007:35. Energimyndigheten and Naturvårdsverket, Stockholm.

Gottberg A., Gode J., Axelsson U. “Accelerating energy efficiency improvement in the public sector, using Energy Performance Contracting - a workshop on Nordic experiences and needs for improvements”. IVL rapport B1866, 2009

Gottberg A., Gode J., Thörn P. Policy status – National report Sweden European Energy Service Initiative – EESI IEE/08/581/SI2.528408. February 2011

Lindgren, K. (2009) Transforming the efficiency gap into a viable business opportunity: an evaluation of the Swedish ESCO experience. Master Thesis, Department of Technology and Society, Environmental and Energy Systems Studies, LTH, Lund University

Lindgren Soroye, K. & Nilsson, L.J. (2010) Building a business to close the efficiency gap: the Swedish ESCO Experience. Energy Efficiency, 3:237–256

Miljöstyrningsrådet (2009a) Vägledning för miljöanpassad upphandling av EPC. http://www.msr.se/sv/Upphandling/Kriterier/Tjanster/Energitjanster-EPC/

Miljöstyrningsrådet (2009b) Upphandlande myndigheters erfarenheter av EPC. http://www.msr.se/sv/Upphandling/Kriterier/Tjanster/Energitjanster-EPC/

Regulation 2009:893. Förordning (2009:893) om energieffektiva åtgärder för myndigheter. Svensk Författningssamling. 2009

Pettersson, L. (2005) LOU. Den offentliga upphandlingens syfte och funktion. D-uppsats (2005:14), Institutionen för industriell ekonomi och samhällsvetenskap, Luleå Tekniska Universitet, Luleå

Swedish Energy Agency, Energitjänster i Sverige – Statusrapport för tjänster för energieffektivisering. Draft report, Dnr 2013-5652. 2013

Swedish Government. Förslag till genomförande av energieffektiviseringsdirektivet i Sverige. Downloaded from http://www.regeringen.se/sb/d/17078/a/218956, 2013-10-22