transparense
INCREASING TRANSPARENCY OF ENERGY SERVICE MARKETS

Country Report on EPC Pilot Projects Evaluation and use of Code of Conduct

Sweden

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Transparense project

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1 Introduction

Within the framework of the project TRANSPARENSE, which receives support from the program IEE (Intelligent Energy Europe) of the European Union, European EPC Code of Conduct has been developed (hereinafter Code) for energy service providers (ESCOs) implementing EPC projects. The objective of the Code is to increase the transparency of the EPC markets and ensure the high quality of the energy services provided by the ESCO. By adhering to the EPC core values and code of conduct, the ESCOs and customers develop a solid foundation for a working partnerships based on trust and confidence. They are expected to utilise the Code in order to further develop energy efficiency services to meet their goals and expectations which shall be evaluated at a later stage.

In addition, the developed EPC Code of Conduct will be tested and evaluated in at least 25 EPC pilot projects. This will also provide feedback on the Code. The outcome and results of the evaluation will be used in all country reports by the Transparense project partners in this work package.

This report presents the evaluation of the Code application in the pilot projects in *country name*. The major stakeholders (both client and ESCO side) in the pilot projects of the country have been interviewed / asked to supply relevant information. For this, detailed questionnaires have been used (see Annex), which were the main data source for the analyses included in this report.

The main objective of this evaluation is to assess whether the application of the Code in *country name* manages to ensure the defined quality criteria in practice, what the success factors are and which barriers might still exist, which should be further addressed.

2 Barriers and success factors for the pilot projects (1-3 pages)

2.1 Barriers

- Very difficult to identify pilot projects (IVL has been in close contact with all ESCOs, EPC faciliators, client associations, and potential clients, but without success) mainly due to very few new EPC projects.

- The difficulty to find pilot projects is closely linked to the current 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.).

- The most important barriers identified by the Transparense survey are regulation issues, lack of support from the government, weak customer demand and the fact that the EPC model is complex and that there is a lack of information about the concept among many potential customers
- Our strategy is to identify and focus on later stage pilot projects (i.e. EPC projects which are in the implementation phase). Lessons learned from these projects are essential for understanding the clients' needs and can hopefully provide vital information on how to stimulate the market and initiate new projects.

2.2 Success factors

Unfortunately, no new projects started during the timeframe of the project, focus has therefore been on later stage pilot projects. From the later stage pilot projects two success factors have been identified: the positive relationship between IVL and Ludvika Municipality and between IVL and Caverion.

3 Pilot projects implementation (1-2 pages)

Table 1 List of pilot projects and phases included

Project name	Project phases that already STARTED			
	Phase I - Project Preparation and development	Phase II - Procurement Procedure (after client announces call for tenders by publication of contract notice)	Phase III - Implementation and operation phase (after signing of the EPC contract)	Phase IV - Measurement and Verification (based on the first consumption measurement)
Ludvika Municipality	X	X	X	X

Table 2 Overview of the Code of Conduct implementation

Project name	Code of conduct implementation			
	ESCO signed Code	Code included in tender dossier	Code included in contract	Other (please specify)
Ludvika Municipality	X	0	0	

3.1 Pilot project

The Project is a later stage pilot project in which the Municipality of Ludvika aims to improve the energy efficiency of 48 buildings. The project is financed by the customer, and co-financed by County administrative board Dalarna, 20 % saving of heat consumption is guaranteed.

- The main implemented measures concerned: Ventilation, Energy management system and Measurement and control.
- The procurement procedure was in 2007.
- The organisational structure consisted of Ludvika municipality and Caverion.
- Birgitta Parling Andersson and Stefan Andersson of Municipality of Ludvika and Anders Fagerkrantz and Håkan Olsson at Caverion.
- Since this is a later Stage project, the Code of Conduct has not been implemented.

In the later stage pilot project No 2, the Municipality of Ludvika aims to improve the energy efficiency of 35 buildings. The project is solely financed by the customer and 20 % saving of heat consumption is guaranteed.

- The main implemented measures concerned: Ventilation, Energy management system and Measurement and control.
- The procurement procedure was in April 2011.
- The organisational structure consisted of Ludvika municipality and Caverion.

4 Code of Conduct application and evaluation

This is a later stage project, thus Code of Conduct was not implemented. Therefore, there is not much experience to share. The EPC provider of the pilot project agrees that all principles of the code of conduct were fully or almost fully implemented within the project. This is in line with the overall viewpoints of the Swedish ESCO market, that the principles of the code of conduct have been important parts of WPC projects for a long time.

Overall, after doing all interviews and work with the Swedish later stage pilot project, we believe the Swedish EPC market finds the code of conduct useful although it has not been tested in tendering yet.

Annex: EPC Project Evaluation

Methodology

Basis of the evaluation template and questionnaire is the European EPC Code of Conduct (JSI and SEVEn 2014) conducted in the framework of Transparense. The set of principles and values which are described in the Code of Conduct have been taken over for evaluation:

- Values: Efficiency, Professionalism, Transparency
- Principles: Cost Effectiveness, Sustainability, Relationship, Transparency, Comprehensiveness, Financing, Interest in success, Quality

For each pilot project, relevant information is compiled in 3 parts:

- Basic information on the project will be given in **Part A** - this may be filled in by the **Transparense partner**.
- In **Part B** the pilot project **customers** are enquired about the project with a clear focus also on ESCO (and facilitators) evaluation.
- **Part C** collects information from **ESCO**s how/if they consider the Code useful and appropriate

The templates for parts A, B and C are prepared as **seperate documents** so the partners can have them separate when sending out to different persons.

The evaluation template request feed-back information during different phases of an EPC project on how effective and practical the EPC Code of Conduct was and also on how the pilot projects were carried out.

The four phases have been outlined in the Code of Conduct document as:

Phase I: **Project preparation and development**

Phase II: **Procurement procedure**

Phase III: **Implementation and operation phase of EPC/Code pilot projects**

Phase IV: **Measurement and Verification**

These phases form the structure of the Part B questionnaire - whereas the above mentioned values and principles will form the criteria and indicators. Each phase has its role in providing

the feedback on the proposed EU Code and the pilot projects. The user of this evaluation template will have to decide if all phases are applicable for his/her procedure.

In all four phases a *quantitative evaluation* is foreseen in which data information will be collected – giving also a technical overview of the project. The data will be derived from the selected building(s). As the most important criteria for the selection of a suitable EPC projects are various effective measures and the subsequent calculation of savings these are included as well in the questionnaire. In addition, it also focuses on the amount of investments as well as the method through which the project is financed.

More evaluative and subjective question (*qualitative evaluation*) are also part of the evaluation. The goal of this qualitative evaluation is to select those parameters which have the most significant impact on the quality. At the same time, qualitative evaluation should reflect the satisfaction of the client in respect of the taken actions, technical solutions and the results achieved.

All three questionnaires of each project form the basis for the evaluation in the context of the country reports.

For each pilot project in a country, the filled in parts A, B and C are attached as Annex to this country report in the following.

Pilot Project Evaluation *Municipality of Ludvika*

PART A: Basic information on the project

Questionnaire filled in by

Name of the person	Birgitta Parling Andersson and Stefan Andersson
Organisation name	Municipality of Ludvika

Project description	
Pilot project name i.e. facility name	EPC project (2 projects)
Location (city, region)	Municipality of Ludvika, Dalarna, Sweden
Country code	SE
Type of customer	• Municipality
Sector	• Schools • Other public organisations (culture, sport, etc.)
Number of buildings of each type *(e.g. 25 schools, 11 healthcare facilities, etc.)*	• 50 buildings (project no 1: 48 buildings and project no 2: 35 buildings)
Goals of the project (e.g. comprehensive reconstruction of the energy system during six months by implementing measures saving heat, electricity and water)	• Energy efficiency improvement of buildings
Measures (short description – max. 5 points)	• Ventilation • Energy management system • Measurement and control
If there are other important aspects of the project, innovations and client´s advantages, not mentioned above, please, describe here*	A key component is a solid training for operating personnel. Even the maintenance debt has decreased significantly

Timing of the project	From	Till
Project identification	2006 (project no 1) April 2011 (project no 2)	2006 (project no 1) April 2011 (project no 2)
Procurement procedure	2007 (project no 1) April 2011 (project no 2)	2007 (project no 1) April 2011 (project no 2)
Installation of energy efficiency measures	2007 (project no 1) 2011 (project no 2)	December 2008 (project no 1) 2014 (project no 2)
Contract duration (guarantee duration)	2009 (project no 1) 2014 (project no 2)	2020 (project no 1) 2020 (project no 2)
Period of repayment *(if the same, do not fill in)*		
Contract duration [years]	14 years (project no 1) 6 years project no 2)	

Financing	
Total investment [EUR] *(if not available estimate)*	App. 11 million Euro (project no 1 and 2)
Co-financing *(if project is co-financed by the customer or public funds explain and provide real or estimated volumes in EUR)*	Fully financed by customer (project no 1 co-financedwith app. 1,5 million euro)
Guarantee of savings *(explain how it is defined)*	20 % saving of heat consumption 535 k€ (only heating, not electricity)

Quantitative evaluation		Baseline *(initially before the project)*	Annual savings	
			Guaranteed	Achieved *(yearly average of available data for 2014-15)*
Final consumption of heat	[MWh/a]	26 923	5 221	6 386
Final consumption of power	[MWh/a]	10 857	862	791

Primary energy	[MWh/a]	58 560	8 658	10 018
GHG emissions	[tCO2e/a]	5 528	562	580
Total operational costs *(energy costs, water costs, maintenance etc. – fill in what is available)*	[EUR/a]	2 700 000	535 000	870 000

Part B: Questionnaire for Clients

Within the framework of the project TRANSPARENSE, which receives support from the program IEE (Intelligent Energy Europe) of the European Union, European EPC Code of Conduct has been developed (hereinafter Code) for energy service providers (ESCOs) implementing EPC projects. The objective of the Code is to increase the transparency of the EPC markets and ensure the high quality of the energy services provided by the ESCO. By adhering to the EPC core values and code of conduct, the ESCOs and customers develop a solid foundation for a working partnerships based on trust and confidence. They are expected to utilise the Code in order to further develop energy efficiency services to meet their goals and expectations which shall be evaluated at a later stage.

In addition, the developed EPC Code of Conduct will be tested and evaluated in EPC pilot projects. The outcome and results of this questionnaire will provide feedback on the Code and its usefulness.

Questionnaire filled in by

Name of the person	Birgitta Parling Andersson and Stefan Andersson
Organisation name	Municipality of Ludvika
Role in the project (client, facilitator etc.)	Client
Pilot project name i.e. facility name	Ludvika Municipality
Location (city, region)	Ludvika, Dalarna
Country code	SE

4.1 Phase I: Project preparation and development

1	How was the first information on the EPC project obtained?	*Presentation by EPC provider.*	
2	Were the above mentioned information sufficient and clear?	Yes ☐	No ✓ *If no, please comment why not: Interesting, but considered complex and more information was needed (Ludvika required additional information from the*

			municipality of Nyköping, which had already implemented a EPC project. Would have been good to obtain information from a neutral partner, e.g. Swedish Energy Agency)
3	Did you have assistance for the energy efficiency project preparation?	Yes ✓ *If yes, please specify who assisted:* *External consulting company TAC*	No ☐
4	Who prepared the preliminary analyses of suitability for using the EPC method for implementing the energy efficiency project?	*Internal work group (i.e. civil servants at the municipality) prepared the preliminary analyses, which were complemented by analyses performed by TAC.*	
5	Was the planned time schedule of the project preparation kept - or were there any delays?	Yes ☐ *If yes, how long was the major delay?……..*	No ✓
6	When it comes to the project preparation: were the customer expectations met?	on 1 to 5 scale: 1 = no 2 = almost not 3 = partly 4 = almost fully 5 = yes, fully	 1 ☐ 2 ☐ 3 ☐ 4 ✓ 5 ☐
7	What was the value of expected energy saving potential?	20 % of baseline/original consumption Refers only heat savings	
8	What was the (approx.) volume of investment costs for implementing energy efficiency measures?	11 million € (project no 1 and project no 2)	
9	What were the biggest barriers in the phase of project preparation?	1 = complexity of EPC concept 2 = lack of information 3 = lack of trust 4 = quantify energy baseline 5 = raising finance 6 = other	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ✓ please specify: Public Procurement Act (difficult to make use of “soft” qualification criteria)
	How were the above chosen barriers overcome?	*Internal project team handled the public procurement process successfully (in retrospect the municipality think it would have been a good idea to involve external expertise in the public procurement process)*	

4.2 Phase II – Procurement Procedure

1	How did the customer obtain information for preparation of the EPC project procurement?	*Internal project team handled the public procurement process successfully (the public procurement process of the municipality of Nyköping provided inspiration – Nyköping provided Ludvika with the documentation from their public procurement process).*	
2	Were the above mentioned information sufficient and clear?	Yes ☐	No ✓ *If no, please comment why not:* *Internal project team handled the public procurement process successfully (in retrospect the municipality think it would have been a good idea to use external expertise in the public procurement process)*
3	Did you have preparation assistance for the EPC procurement?	Yes ✓ *If yes, please specify who assisted:* *External consultant assisted in evaluation of the tenders.*	No ☐
4	Was the planned time schedule of the procurement process kept - or were there any delays?	Yes ☐ *If yes, how long was the major delay?* …… ……	No ✓
5	How long did it take to sign the contract between ESCO and customer (after the first publication of a contract notice)?	……..	App. 4 months
6	How many ESCOs expressed their interest in the EPC procurement? How many ESCOs submitted their tenders (i.e. offers)?	*5 EPC providers submitted tenders.*	
7	Were ESCOs required to fulfil any qualification criteria?	Yes ✓ *If yes, which ones?* - *Criteria regarding*	No ☐

		annual turnover (threshold value) - *Criteria regarding credit worthiness* - *Criteria regarding previous experience of energy services.*	
8	Did the customer negotiate with the ESCOs the conditions of their tenders during the procurement process?	Yes ✓	No ☐
9	What was the volume of savings provided by the winning tenderer (ESCO)?	*Not qualification criteria (not presented until completion of phase 1). Ludvika had the opportunity to cancel the project (project no 1) after completion of phase 1.*	
10	How guarantees the winning tenderer the expected volume of savings?	*Guaranteed in contract*	
11	What was the volume of the investment costs proposed in the winning tender?	*Approximately 11 million € (project no 1: 5,5 million € and project no 2: 5,5 million €*	
12	Who decided that the procurement procedure will be implemented?	*City council (civil servants prepared and presented)*	
	Was there an official approval required (e.g. by the City council etc.)?	Yes ✓ *If yes, by whom?* *City council*	No ☐
13	Who decided on the final choice of the winning tenderer?	*City council (civil servants prepared and presented)*	
	Was there an official approval required (e.g. by the City council etc.) and if yes, by whom?	Yes ☐ *If yes, by whom?* *City council*	No ☐
14	What were the biggest barriers during the procurement process?	*Public procurement complex (e.g. difficult using "soft" qualification criteria).*	
	How were the above mentioned barriers overcome?	*Internal project team handled the procurement process successfully. External consultant was used for evaluation of the tenders.*	
15	Were the expectations of the customer met within the procurement process?	on 1 to 5 scale: 1 = no 2 = almost not 3 = partly 4 = almost fully 5 = yes, fully	 1 ☐ 2 ☐ 3 ☐ 4 ✓ 5 ☐

4.3 Phase III – Implementation and Operation

1	Did the ESCO introduce and	Yes ✓	No ☐

	explain the process of energy efficiency measures implementation to the customer sufficiently?		
2	Did the ESCO verify the up to date statuses of energy systems in the building within the contract?	Yes ✓	No ☐
3	Did the customer find any differences in comparison with the tender, which was necessary to solve?	Yes ✓ *If yes, how was it solved?* *The client and the EPC provider established a project steering committee. The energy service provider and the client agreed on that possible deviations, requests for changes in the project plan or similar should be handled by the steering committee. All matters were solved in dialogue between the provider and the client.*	No ☐
4	Did the ESCO prepare a design/concept of project documentation for the implementation phase?	Yes ☐ *If yes, how was the quality (on 1 to 3 scale):* 1 ☐ good, comprehensive 2 ✓ substantial 3 ☐ not substantial/unclear	No ☐
5	Was the project documentation for implementation of EE measures checked by an external expert company?	Yes ☐	No ✓
6	If the ESCO had any sub-suppliers, how was the quality of those?	on 1 to 3 scale: 1 = good 2 = moderate 3 = poor	 1 ☐ 2 ✓ 3 ☐
	Was it necessary to negotiate directly with the sub-suppliers?	Yes ☐	No ✓
7	How long lasted the EE measures implementation phase?	*2007-2008 (project no 1)* *2011-2014 (project no 2)*	
8	Time schedule of the EE measures implementation was kept or were there any delays?	Yes ☐ *If yes, what was the lengths of major delay?* …… ……	No ✓

9	Was the implementation of EE measures checked by an external expert company?	Yes ☐	No ✓
10	Were there any supervisor meetings between the ESCO and customer during implementation phase?	Yes ✓ *If yes, how many?* *Steering committee meetings 3 times per year* ……	No ☐
11	Were there any significant problem(s) in relation to the EE measures implementation?	Yes ✓ *If yes, what kind of problem and how was it solved?* *Problems with the installation of geothermal installation at the kindergarten Junibacken (i.e. ground conditions turned out to be more difficult that anticipated). The problem was solved in dialogue between the provider and the client.*	No ☐
12	Were installed EE measures transmitted into property of customer? If yes, when?	Yes ✓ *After installation (agreement between provider and client)*	No ☐
13	Had the client any comments to the EE measures implementation after its finalisation and after the equipment ownership had been transferred? If yes, what were the comments and how these were reflected by ESCO?	Yes ✓ *If yes, what were kind of comments? Comments regarding operation of the installations. The provider and the client handled these comments in dialogue.*	No ☐
14	Were the actual investment costs different from than volume stipulated in the contract?	Yes ☐ *If yes, what was the difference and the reason of it?* …… …… …… *How was the inconsistency solved?* …… …… ……	No ✓
15	Did the ESCO provide trainings for the operational personnel of the implemented EE measures sufficiently?	on 1 to 5 scale: 1 = no 2 = almost not 3 = partly 4 = almost fully 5 = yes	1 ☐ 2 ☐ 3 ☐ 4 ✓ 5 ☐
16	Were the overall expectations of the customer met – especially during the process of the EE	on 1 to 5 scale: 1 = no 2 = almost not 3 = partly	1 ☐ 2 ☐ 3 ☐

	measures implementation?	4 = almost fully 5 = yes	4 ✓ 5 ☐

4.4 Phase IV - Measurement and Verification

1	Did the ESCO introduce and explain the process of measurement and verification to customer sufficiently?	on 1 to 5 scale: 1 = no 2 = almost not 3 = partly 4 = sufficient 5 = very sufficient	 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
2	Did the ESCO specifies rules and obligations - in relation to measurement of energy consumption - clearly to the involved personnel?	Yes ✓	No ☐
3	Who is providing measurement of the operation of the installed equipment?	1 ✓ ESCO (via data-transmission) 2 ☐ ESCO (directly on site) 3 ✓ Customer / caretaker of building	
4	Who is providing verification of energy consumption and savings?	*(free text)* *The client provides verification (raw data) every month to provider. Provider refines the data and provides the client with detailed report every month.*	
5	Is verification of consumption and savings provided according to guidelines stipulated in the tender?	Yes ☐	No ✓ *If no, how was a change in the guidelines approved? Dialogue between provider and client.*
6	Is verification provided in relation to the IPMVP (International Performance Measurement and Verification Protocol) or another standard form?	1 ☐ IPMVP 2 ☐ ASHRAE Guideline 3 ☐ FEMP Guideline 4 ☐ National M&V Protocol 5 ☐ Other 6 ✓ Don't know	
7	How often is the verification of consumption and savings provided?	*The client provides verification (raw data) every month to provider. Provider refines the data and provides the client with detailed report every month*	
8	How often is the customer informed on the energy savings achieved?	*The client provides verification (raw data) every month to provider. Provider refines the data and provides the client with detailed report every month*	
9	Has the ESCO submitted to the customer a report on the achieved energy savings? If yes, how often?	*The client provides verification (raw data) every month to provider. Provider refines the data and provides the client with detailed report every month*	
10	What was the value of the achieved	24 % of baseline/original	

	energy savings?	consumption Refers only heat savings	
11	Was the volume of energy savings reached <u>higher</u> than the guaranteed level of savings stipulated in the contract?	Yes ✓ *If yes, how were the access savings shared between ESCO and the customer? 50/50 between provider and client (for 2 years higher than guaranteed savings – app. 10 000 euro to each partner)*	No ☐
12	Was the volume of savings reached <u>below</u> the guaranteed level of savings stipulated in the contract?	Yes ✓ *If yes, was the difference compensated by ESCO and how? 1 year below the stipulated level – app. 25 000 euro in compensation, i.e. in the form of extra installations)*	No ☐
13	Which main problems appeared during the measurement and verification phase?	*Procedure for error report/malfunction reporting was not efficient.*	
	How were these issues solved by the ESCO?	*This is currently being handled in dialogue between provider and client.*	
14	Were the overall expectations of the customer met with respect to the actions taken by ESCO during the measurement and verification phase?	on 1 to 5 scale: 1 = no 2 = almost not 3 = partly 4 = almost fully 5 = yes	 1 ☐ 2 ☐ 3 ☐ 4 ✓ 5 ☐

Part C: Questionnaire for ESCO

Within the framework of the project TRANSPARENSE, which receives support from the program IEE (Intelligent Energy Europe) of the European Union, European EPC Code of Conduct has been developed (hereinafter Code) for energy service providers (ESCOs) implementing EPC projects. The objective of the Code is to increase the transparency of the EPC markets and ensure the high quality of the energy services provided by the ESCO. By adhering to the EPC core values and code of conduct, the ESCOs and customers develop a solid foundation for a working partnerships based on trust and confidence. They are expected to utilise the Code in order to further develop energy efficiency services to meet their goals and expectations which shall be evaluated at a later stage.

In addition, the developed EPC Code of Conduct will be tested and evaluated in EPC pilot projects. The outcome and results of this questionnaire will provide feedback on the Code and its usefulness.

Questionnaire filled in by

Name of the person	Anders Fagerkrantz and Håkan Olsson
Organisation name	Caverion

Below are listed the principles of the Code of Conduct for EPC. Please answer the questions for each principle:

1. EPC projects are economically efficient

The EPC provider aims at economically efficient combination of the energy efficiency improvement measures. Such combination of the measures maximizes the net present value of an EPC project for the client (defined as sum of all the discounted incoming cash flows (operational cost savings) and all outgoing cash flows associated with implementing the project over the term of the contract).

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

It is an interesting question, however I feel the question is strangely formulated. EPC is not about maximizing NPV. This is not an economic project, it is not about accomplishing the largest profitability, in that case we would just switch lightbulbs. EPC concerns more than just the economy, it concerns refurbishment and environmental issues. It is not about maximizing

NPV. We focus on the impact of the results, i.e. to have a balanced budget. The project should not cost the municipality or the customer more after than before, despite all the investments. Therefore we do not focus on maximizing NPV, instead our concern is impact of the results.

This is a simplified approach to EPC, it is important to see one step further than that described in question. They way in which the question is formulated now, it can be interpreted that EPC only focuses on profitability. It is important to discuss the triple bottom line, which not only includes the economy but also environmental and social issues. I feel it is important to maximize all three not just the Economy.

2. EPC provider takes over the performance risks

The EPC provider assumes the performance risks of the project during the whole duration of the contract. Such risks include, inter alia, risk of incorrect estimates of savings, design risks, implementation risks and operational risks.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

Of course we as an ESCO assume the performance risks of the project during the whole duration of the contract. In terms of operational risk, we as an ESCO do not take over the operations and as such we do not carry all operational risk. However, we carry the operational risks which are within our commitment.

3. Savings are guaranteed by EPC provider

The EPC provider guarantees the achievement of the contractually agreed level of energy savings and/or related costs. In case an EPC project fails to achieve performance specified in the contract, the EPC provider is obligated by the contract to repay savings shortfalls over the life of the contract. The contractually agreed quantified energy savings should be defined in a fair and transparent manner based on realistic assumptions and appropriate methodology defined in the contract. At the end of the specific contract period the full benefits of savings revert to the facility owner.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

B) What kind of problems/barriers have you encountered when implementing the pilot project and what is your recommendation to overcome them?

This if one of the cornerstones of EPC, if energy savings cannot be guaranteed, then it is not an EPC project.

In terms of transparence, it has worked very well with Ludvika Municipality.

4. EPC provider supports long-term use of energy management

The EPC provider actively involves the client in the implementation of an energy management programme during the contract period and eventually after the contract period by agreement. This supports the benefits from the project to sustain also after the contract period.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

B) What kind of problems/barriers have you encountered when implementing the pilot project and what is your recommendation to overcome them?

The International Performance Measurement and Verification Protocol is used as guidance.

5. The relationship between the EPC provider and client is long-term, fair and transparent

The EPC provider and the client work together very closely and as partners with the common objective to achieve contractually agreed level of savings. They strive to keep their relationship long-term, fair and transparent. They both provide access to their information which is relevant to the project in a non-distortive manner. They do not hide such information to the other party. Both EPC provider and client fulfil their obligations according to the contract terms. For instance, the client is committed to inform the EPC provider about any changes in the operation of its facilities during the contract duration that could affect the energy demand. The establishment of such relationship between the EPC provider and the client supports achieving their common interest to achieve the contractually agreed level of energy savings and to preserve long-term co-operative relationship.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

B) What kind of problems/barriers have you encountered when implementing the pilot project and what is your recommendation to overcome them?

A) EPC projects are like a marriage; it is a long term commitment. Transparence concerning *energy savings* has been working well for a long time; while the *economy* has not been transparent. However, over the past five years it has become much better. Mainly because customers have demanded increased transparence regarding the investment costs and not only transparency regarding energy savings as before. In this project the transparence between us (Caverion) and Ludvika Municipality has worked very well.

B) In terms of:" the client is committed to inform the EPC provider about any changes in the operation". I know this is a huge issue for many ESCOs, but for us it has never been a challenge. I think it is because we have had a good relationship with our clients. If the relation is poor, then this type of business model would not work. I think this is why the project with Ludvika Municipality has worked very well.

6. All steps in the process of EPC projects are transparent

The EPC provider and client comply with all laws and regulations that apply to the EPC project in the country in which the project is implemented. The EPC provider and the client avoid conflict of interests and apply a zero tolerance policy against corruption and self-dealing.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

B) What kind of problems/barriers have you encountered when implementing the pilot project and what is your recommendation to overcome them?

Free text box

7. Support in financing of EPC projects

The EPC provider supports the EPC client in finding the most suitable solution providing for project financing taking into account the credit risk of both parties. The capital to finance the EPC project can either be supplied out of the client's own fund, by the EPC provider or by a third party. Provision of financing by the EPC provider is an option, not a necessary part of the EPC project.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

B) What kind of problems/barriers have you encountered when implementing the pilot project and what is your recommendation to overcome them?

This is an interesting question. The basic idea is that the future savings will finance the project and it's obvious that we support this.

In Sweden the clients themselves finance the project by taking a loan or using own capital then, we as an ESCO provides a savings guarantee equivalent to the cost of this capital.

8. EPC projects require qualified staff

The EPC provider maintains a qualified staff in order to provide the right technical, commercial, legal and financial abilities. EPC provider ensures that the experts working for them have the adequate qualifications and capacities related to the implementation of the EPC projects in order to ensure e.g. sound engineering evaluation, design, project management, risk management and implementation of energy efficiency improvement measures. The client can use a specialized advisory company (EPC facilitator) that will steer the correct implementation and procurement of the EPC project on his side.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① fully ② **almost fully** ③ partly ④ almost not ⑤ not at all*

B) What kind of problems/barriers have you encountered when implementing the pilot project and what is your recommendation to overcome them?

This is a huge challenge, it is difficult to find qualified resources for EPC projects. We initially had problems with finding the right personnel for the later stage project in

Ludvika municipality. It is also difficult to find project managers that can handle these types of projects.

9. The EPC provider focuses on high quality and care in all steps of project implementation

The EPC provider uses certified procedures, high-quality and reliable equipments and products, and cooperates with reliable sub-suppliers. It adheres to the principles of ethical business conduct, meets its obligations towards sub-suppliers and conducts itself responsibly with respect to client and its representatives.

A) Have you implemented the principle within the pilot project /Scale Fully 1-5 Not at all

*① **fully** ② almost fully ③ partly ④ almost not ⑤ not at all*

B) What kind of problems/barriers have you encountered when implementing the pilot project and what is your recommendation to overcome them?

EPC projects include a lot of data and in order to provide high quality we at Caverion have developed a tool database that can handle large amount of data.