

Market Report on the Czech Republic EPC Market

Deliverable D2.2

Horizon 2020

Grant Agreement No. 696040



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 696040.

Imprint

Published by:

ENVIROS, s.r.o.

Dykova 53/10

101 00 Praha 10

Telephone: +420 274 007 487

E-mail: vladimira.henelova@enviros.cz

Internet: www.guarantee-project.eu

Author(s): Vladimira Henelova
Michael ten Donkelaar

Disclaimer:

The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EASME nor the European Commission are responsible for any use that may be made of the information contained herein.

Structure Market Assessment Report

1 Content

1	Executive Summary	4
2	Political framework	5
2.1	Relevant national legislation	5
2.2	Relevant regulation	6
2.3	Relevant support schemes	8
2.4	Critical assessment	10
3	Economic Framework.....	10
3.1	Availability of public and private financing for energy services / ESCOs	10
3.2	Development of energy prices in the Czech Republic.....	12
3.3	Critical assessment	13
4	Key Actors.....	13
4.1	Description of key actors.....	13
4.2	Critical assessment	15
5	Market Volume.....	16
5.1	Critical assessment	17
6	Market Assessment of EPC sectors	18
6.1	Public sector	18
6.2	Private Sector: Industry.....	20
6.3	Private Sector: SMEs.....	20
6.4	Private Sector: Residential.....	21
7	Results from stakeholder survey.....	23
7.1	Basis of survey	23
7.2	Experiences with EPC	24
7.3	Problems and potential solutions	29
7.4	Highlights of qualitative answers	32
	Annex: Development of energy prices in the Czech Republic.....	33
	References.....	35

1 Executive Summary

Political Framework:

Important driver for EPC is supportive EPC framework with published model contract and guidelines for EPC projects development and procurement. Energy services promotion has been approved by the Government in 2012 and is also stated in the Energy Policy of the Czech Republic.

Most important barrier for EPC are lack of energy management and planning in the public property, preference to tradition way of implementation energy efficiency measures, available subsidies for deep renovation projects (construction works). Subsidies do not include energy measures in technical systems of the buildings, but these are not priority with the exception of boiler houses. Currently low energy prices prevent some of energy efficiency measures from being implemented in EPC contracts because of low energy prices and long repayment terms (despite low interest rates).

Most relevant support schemes

Support programme exists within the State programme for support of energy efficiency and renewables (managed by the Ministry of Industry and Trade) for public clients to perform initial analysis of EPC project feasibility (analysis of both technical and economic potential in the public property).

Model contract, guidelines for procurement, existence of facilitators and of the Association of Energy Service Providers present significant support to the market. Ministry of Industry and Trade has been actively supported energy services extension.

EPC existing market consists mainly from public sector, other sectors present minority in the number of project implemented. Yet potential still exists in buildings to be modernised, combined with exemplary role of public sector.

Key players

Key players in the market are ESCOs themselves and Facilitators, both of these two groups being members of the Association of energy service providers.

2 Political framework

2.1 Relevant national legislation

With its State Energy Policy, the government of the Czech Republic has formulated strategic energy objectives and strategic priorities and also political, legislative and administrative framework for reliable, sustainable and reasonably priced supplies of energy up to 2040.

State Energy Policy – as revised and adopted in May 2015 – includes in the sector of energy efficiency also actions to be implemented in the field of legislation aiming at simplified and streamline administration and regulations related to control of energy savings. The Policy also includes measures to support extended use of energy services with a guaranteed result (EPC) in the non-residential sector, and the implementation of the National Energy Efficiency Action Plan, developed according to the Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency.

Czech Republic’s Fourth report on progress in energy efficiency was completed in April 2016 and informed about the update (based on Eurostat methodology) of the national indicative target, which was set at 50.67 PJ (14.08 TWh) of savings in final energy consumption by 2020. The report presented in detail the progress in fulfilling the obligation of art. 7. Savings as high as 2,704 TJ in final energy consumption were achieved in 2015, which is more than 400 % increase in comparison to savings of 665.5 TJ in 2014. Update of the National Energy Efficiency Action Plan (NEEAP—IV) was approved by the government in March 2016 and the Public Buildings Renovation Plan in December 2015.

The National Energy Efficiency Action Plans (NEEAP) covers significant energy efficiency improvement measures and expected or achieved energy savings, including those in the supply, transmission and distribution of energy as well as energy end—use. The 4th Action Plan also reports on the alternative scheme according to Article 5, and specifies the role of energy services. It also reports on state support to EPC implementation in municipal and regional sectors and contributory governmental organisation. This support consists in providing subsidies for initial analysis of the potential for EPC in the clearly specified buildings and facilities in the property of the public applicant. In the Article 5 the process includes setting the target for energy savings in governmental buildings, implementation of low-cost and no-cost measures and also implementation of energy saving measures with repayment terms less than 10 years.

Legislation / regulation	Effect on energy services / EPC
Directive 2012/27/EU and National Energy Efficiency Action Plans (NEEAP) – Czech NEEAP includes also improved evidence and promotion of energy services with guaranteed results (EPC). According to the guidelines for energy savings calculation the Ministry adopted measures to calculate savings from EPC into the national target (voluntary agreement with the Association of energy service providers). The Ministry has developed a Methodology on reporting energy savings from alternative political measures – these will be used for reporting energy savings achieved by energy services with guaranteed results.	+
Act no. 458/2000 Coll., on business conditions and public administration in the energy sectors	0

<p>Act no. 406/2000 Coll., on energy management</p> <p>The Czech Republic has adopted law on energy efficiency (Energy Management Act) already in 2000. This Act is regularly updated and harmonised with the European Energy Efficiency directive and its revisions. This Act being under the responsibility of the Ministry of Industry and Trade also steadily incorporates additional provisions related to support of energy services and requirements which the EED (especially Article 18) imposes on Member states with regard to energy services promotion and extension.</p> <p>One of the Articles of the Act (Article 10e) defines the mandatory provisions which any contract which relate to energy services in the public sector must consist.</p> <p>Article 10f of the Act stipulates the requirement on establishment of a list of energy service providers and facilitators.</p>	+
<p>Act no. 165/2012 Coll., on subsidized energy sources – includes support to cogeneration – green bonuses – which helps to include small cogeneration in the proposals</p>	+
<p>Act no. 137/2006 Coll. on Procurement as amended by Act no. 139/2006 Coll. on Concessional Contracts and Concessional proceedings (the Concessional Act)</p> <p>Current procurement guidelines for EPC projects in public sector fully comply with the above Act. The procedure used is negotiated procedure with prior announcement (two-stage procedure).</p>	+

2.2 Relevant regulation

Major regulation on energy services and support required by the Directive has been stipulated by the Article 18 of the EED.

Status of the Article 18 implementation in the Czech Republic was analysed in 2014 and so was the Annex XIII of the EED and its obligatory items of the EPC contract.

According to the Directive, energy service' means the physical benefit, utility or good derived from a combination of energy with energy-efficient technology or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to result in verifiable and measurable or estimable energy efficiency improvement or primary energy savings.

This definition has been in full transposed to the Czech law by the Act on Energy management. As to the paragraph 1 of the Article Member states are obliged to disseminate clear and easily accessible information on available energy service contracts and items that should be included in such contracts to guarantee energy savings. That is why the Article 10e) of the Act on Energy Management defines compulsory provisions which must be included in the energy service contract in case such a contract is concluded in the public sector. These provisions reflect the - Minimum items to be included in energy performance contracts with the public sector or in the associated tender specifications **are defined in the Annex XIII to the Directive.**

Item of the Annex XIII	Czech EPC Model contract
1. Clear and transparent list of the efficiency measures to be implemented or the efficiency results to be obtained.	List of technical measures must be included in Annex 2 to the contract, describing energy saving measures, its quantified benefits in technical units and cost reductions of heat/fuel, electricity, water, other operational costs. Also investment costs have to be specified related to each of the measure.
2. Guaranteed savings to be achieved by implementing the measures of the contract.	<p>Guaranteed savings expressed either in annual fixed amounts, or cumulated savings for the period of the contract, or both. The guaranteed savings are calculated using either fixed tariffs of the reference period, or floating tariffs.</p> <p>Way of calculating sanctions for non-achievement of the guaranteed level of savings and remuneration for savings achieved above the guaranteed level (usually share on the extra-savings) has to be included.</p> <p>The figures and procedures are stated in the main contract and in the Annexes.</p>
3. Duration and milestones of the contract, terms and period of notice.	<p>All Included.</p> <p>The contract defines and describes 3 periods of the contract implementation:</p> <ul style="list-style-type: none"> – Preliminary activities (verification of the reference status) – Construction period (implementation of agreed energy saving measures), – Guarantee period, during which savings are measured, calculated and verified, reported to the Client.
4. Clear and transparent list of the obligations of each contracting party.	Included – in all 3 periods of the contract implementation, in general clauses and in the Annex, describing activities related to energy management
5. Reference date(s) to establish achieved savings.	Described in detail in Annex 1 of the Contract and also all reference data available.
6. Clear and transparent list of steps to be performed to implement a measure or package of measures and, where relevant, associated costs.	The above mentioned 3 periods of contract include details on activities to be performed, the way these are reported and supervised by the Client and agreed with the Client.
7. Obligation to fully implement the measures in the contract and documentation of all changes made during the project.	There are several clauses in the model contract which define the way activities are performed by the ESCO. Also procedure is available in case alterations must be made or additional measures, clauses on information duty etc..
8. Regulations specifying the inclusion of equivalent requirements in any subcontracting with third parties.	It is the ESCO who takes full responsibility for achievement of all standards and norms related to the efficiency of equipment, of the final operation, installation rules, hygiene norms etc.

<p>9. Clear and transparent display of financial implications of the project and distribution of the share of both parties in the monetary savings achieved (i.e. remuneration of the service provider).</p>	<p>In the Czech Republic and in the model contract and in procedural guidelines for public sector, guaranteed savings model has been applied. Shared benefits exist, though, in case of extra savings achieved above the guaranteed level (share of the provider is considered as remuneration for the quality of service). In addition, energy management is invoiced as a separate price item – services provided during the guarantee period. The guaranteed level of savings usually must be equal or higher than the repayment of the loan (both collateral and debt service).</p>
<p>10. Clear and transparent provisions on measurement and verification of the guaranteed savings achieved, quality checks and guarantees.</p>	<p>The annexes to the model Contract also contain information and data, needed for preparation of measurement and verification plan (M&V plan). This plan and the procedure of savings measurement and verification form a compulsory attachment to the Contract and are agreed with the Client. The content of the plan is set by the International measurement and verification Protocol (IPMVP), which is referred to in the model contract for public sector.</p>
<p>11. Provisions clarifying the procedure to deal with changing framework conditions that affect the content and the outcome of the contract (i.e. changing energy prices, use intensity of an installation).</p>	<p>Included.</p>
<p>12. Detailed information on the obligations of each of the contracting party and of the penalties for their breach.</p>	<p>Included.</p>

2.3 Relevant support schemes

According to the European Directive, Article 18, Member States shall promote the energy services market and access for SME by disseminating clear information on financial instruments, incentives, grants and loans to support energy efficiency service projects. Following financial instruments are available to EPC support in the Czech Republic, which are advertised and promoted:

financial instruments, incentives, grants and loans to support energy efficiency service projects (Paragraph 1, point a II) of the EED, Article XVIII)	Open to client and/or ESCO	Effect on energy services / EPC
<p>State programme for support of energy efficiency and renewables (EFEKT): Support to project developers in energy performance contracting (started 2012) – Initial analysis of the energy saving potential in municipal/regional/governmental buildings and facilities has been financed up to 90% of the cost. Value of the support is</p>	<p>Client</p>	<p>++</p>

financial instruments, incentives, grants and loans to support energy efficiency service projects (Paragraph 1, point a II) of the EED, Article XVIII)	Open to client and/or ESCO	Effect on energy services / EPC
limited. Eligible applicants: municipalities, regions and their 100% owned organisations, governmental contributory organisations.		
State programme for support of energy efficiency and renewables (EFEKT): Support to project developers in energy performance contracting (started 2012) – contribution to energy efficiency measures with longer than 10 years pay-back times in case there exist an EPC contract and the measures improve complexity of the EPC project. Value and the share of support is limited. Eligible applicants: municipalities, regions and their 100% owned organisations, governmental contributory organisations.	Client	+
Operational programme Environment – in its specific goal No 5 the programme is open to combination of supported measures (long-term measures for energy efficiency increase in public buildings) with an EPC project (the EPC project helps the insulated buildings to have also technical systems in the buildings refurbished and energy management systems implemented)	clients	+
<p>Partial grants and soft loans are available at the Operational programme for Industry and Investments into Competitiveness</p> <ul style="list-style-type: none"> • Steam pipes insulation in municipal DH schemes and industrial sites • highly efficient cogeneration and cooling systems • introduction of energy management systems 	Industries & ESCOs	+
<p>State programme for support of energy efficiency and renewables (EFEKT)</p> <p>Since 2000 a model EPC contract has been developing, updated and improved regularly - initially by the working group for energy efficiency at the Chamber of Commerce, since 2011 by the Association of Energy Service providers of the Czech Republic.</p> <p>In 2012, The Government resolution required the Ministry of Industry and Trade to prepare a model contract for energy services with guaranteed results between contributory organisations of municipalities, regions and the Government and ESCOs. The model contract has been regularly updated with the financial assistance of the Ministry of Industry and Trade (Programme EFEKT). Since then the Model Contract has been published on the website of the Ministry.</p> <p>http://www.mpo.cz/dokument105425.html</p>	Clients (public sector, SMEs, consulting companies)	+

financial instruments, incentives, grants and loans to support energy efficiency service projects (Paragraph 1, point a II) of the EED, Article XVIII)	Open to client and/or ESCO	Effect on energy services / EPC
State programme for support of energy efficiency and renewables (EFEKT) - Seminars and Education The Programme EFEKT also gives support to organisation of seminars for public administration, SMEs,, governmental sector – promoting Energy services with guaranteed results, model contract, guidelines for procurement, Measurement and Verification of savings, financing the projects, Code of Conduct, European projects	Clients (public sector, SMEs, consulting companies)	+

2.4 Critical assessment

Energy Services have a long tradition in the Czech Republic. Initially energy services in DH systems started to be provided, but although initially they were based on energy supply contracting, recently no guarantees are provided. In 1992 first contracts based on U.S. experience in performance contracting started to be implemented in the Czech Republic. Since then EPC has been developing and most advantageous model sought. It is the concept of Energy Performance Contracting with guaranteed results which has developed and since 2015 has been also legally supported by the Czech Act on Energy Management in the public sector. No legal barriers exist currently in municipal and regional sector and in facilities and organisations in their ownership. No legal barriers exist also in contributory organisations of the Government. This is not the case for organisations financed directly and solely from the state budget. Efforts are being made by the responsible Ministry to resolve existing barrier.

Support to EPC implementation is provided to public clients who think about EPC implementation in the buildings and facilities they own. Initial analysis has been subsidized by 90 %, because these funds were difficult to get approved due to uncertainty of the result and also due to lack of interest in EPC projects. Only after the analysis shows the existing potential and its economic terms, public clients trust more the feasibility of EPC project. Long experience of ESCOs, reference projects, availability of model contract, standardised procedures for procurement and also assistance of facilitators are important for the market growth.

3 Economic Framework

3.1 Availability of public and private financing for energy services / ESCOs

Energy Performance Contracting (EPC)

Similarly to the standardisation of contracting issues and procurement process also financing of energy service contracts has stabilised. Since 2000 majority of EPC projects in the Czech Republic are based on guaranteed savings contracts in which the ESCO finances the investments. For doing so, the instrument of forfeiting (see annex for explanation) is the preferred financing practice of the ESCOs and is usually also accepted by the clients (though there are exceptions).

In recent years, there has been a growing number of EPC projects in which the client took over (parts of) the financing of the investments (it is enabled by the guaranteed savings approach), thus reducing the ESCO's financing obligations. This is being done especially in situations in which the client is interested in including deep renovation measures in an EPC project. As the payback period of deep renovation measures is usually higher than the duration of an EPC project, a construction subsidy from the client is usually the only way to achieve this goal. Combination of the two financing resources is possible due to the fact, that the client becomes the owner of all installed technologies immediately after these are installed and depreciation is applied by the client.

Deep renovation measures in public buildings are subsidised from EU funds. In case EPC project starts early after the deep renovation, savings achieved by the deep renovation can be used as revenue of the Client which can be invested in the EPC contract. This can be regarded as financial contribution by the client as well.

Financing of EPC projects - summary	Open to client and/or ESCO	Effect on energy services / EPC
Forfeiting – ESCO is selling receivables after proper hand-over of the installed measures – it submits an invoice to the client in which the instalments are at a fixed level (lower than the guaranteed savings) for the length of the contract, payments are made by the client directly to the bank.	ESCO	++
Co-financing by the client – directly from the annual budget	Client	++
Co-financing by the client from energy savings achieved in parallel or foregoing investments (deep renovations – thermal insulation of building envelope, windows replacement – financed by the client with substantial subsidy from EU funds – separately tendered)	Client	+
Financing by the ESCO (rare) - a loan directly to the ESCO, no forfeiting	ESCO	-
Paid immediately by the client after hand-over, guaranteed savings contract still in place (SMEs, industries, state budget organisations, municipalities and regions) Source of finance – client’s own budget or On-Balance sheet (Debt Financing) – discussed often before the interest rates of loans to ESCOs became fairly low (most recently 1,5 to 3%).	Client	+

Energy (Supply) Contracts

Efficient supply of useful energy such as heat, steam or compressed air is contracted and measured in GJ (MWh) delivered. The business model usually includes purchasing of fuels and is comparable to district heating or cogeneration supply contracts. The scope of energy end-use efficiency measures is

usually limited to the energy supply side of the building or enterprise, i.e. the boiler room. Such contracts can also be applied to energy supply from renewable sources.

These contracts have been widely used in the Czech Republic already since 2000 or even earlier, but due to the fact that energy efficiency increase is rarely expressed in the contract and the efficiency is only visible in the tariff structure (reduction of operational costs for energy), no guarantee is provided (exceptionally price guarantee for heat delivered is included), these services rarely comply with the new definition of energy services and thus are not included in the figures of energy savings achieved by energy services. Due to the fact that energy savings achieved (reduced purchase of fuel/heat) are rarely reported or expressed in the contract they cannot be followed either.

Usually such contracts consist of following two agreements:

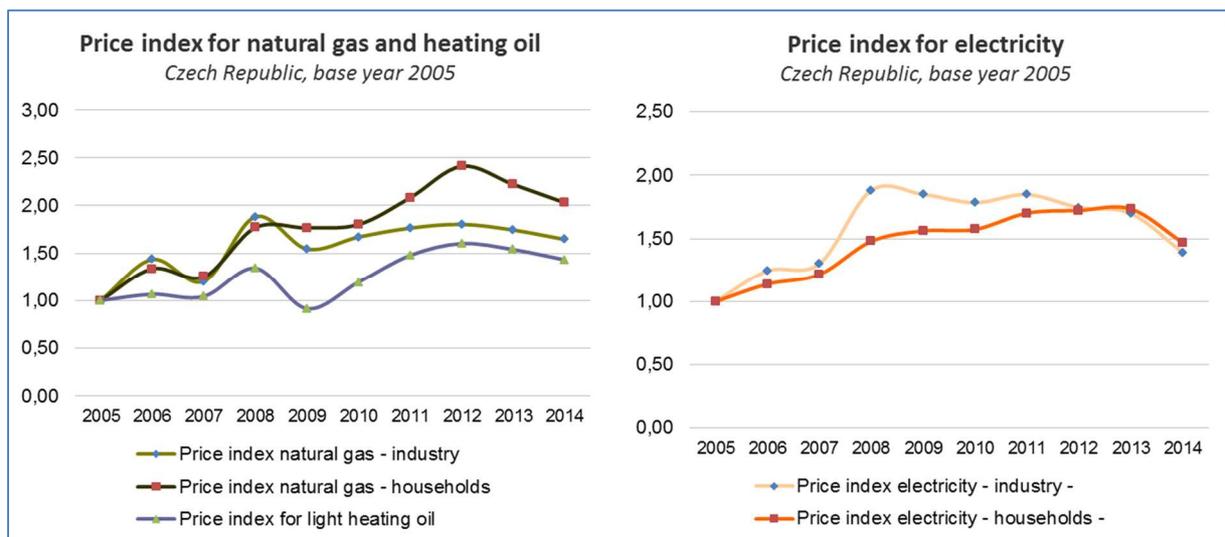
- Agreement on operation of the boiler house (rent agreement)
- Agreement on heat delivery and on price for heat reflecting:

Investments are made by ESCO, depreciation is reported by ESCO, ownership of installed technology is also of the ESCO for the length of the contract (usually 15 years).

Procurement process is different, no model contract exists (heat delivery agreement has been standardised, but without the inclusion of reported energy efficiency increase.

3.2 Development of energy prices in the Czech Republic

Energy prices and price relations strongly influence the attractiveness of energy efficiency investments and might have dramatic influence on the economic viability of energy services unless the EPC contract eliminates the risk. European energy prices (based on Eurostat) have been published in the 2016 “Energy Data” publication of the German Federal Ministry for Economic Affairs and Energy. The following graphs illustrate the price development for gas (industry and households), electricity (industry and households) and light heating oil (index year 2005) in the Czech Republic.



Source of data: EUROSTAT

3.3 Critical assessment

In the Czech Republic, most ESCO find workable finance for a good/viable project easy and they are able to obtain commercially viable terms and low rates of interest from funders. Therefore, ESCOs do not consider finance needed for EPC projects as an obstacle. EPC contracts as off-balance sheet financing does not increase municipal debts. During several last years, the ESCOs in the Czech Republic use sale of receivables to finance their EPC projects. The preparatory phase of the project (after contract signature) as well as installation of the measures is financed by the ESCOs. Once the technologies and energy efficiency measures are handed over to the customer, the cost of installation is assigned to a third party – the bank. This allows ESCOs to enter other EPC projects. No changes are made to the EPC contract and guarantee of savings by the ESCO remain unchanged.

Low energy prices increase substantially repayment terms of many energy efficiency measures and present certain barrier – energy performance contracts being extended to 9-12 years.

4 Key Actors

4.1 Description of key actors

ESCOs

Energy Performance Contracting

A list of companies providing energy services with guaranteed results has been most recently established in the Czech Republic by the Ministry of Industry and Trade in line with the Act on Energy Management and its Article 10f. The List contains both ESCOs and facilitators. Currently there are 29 companies which asked for inclusion to this list, no restrictions and requirements have been applied at this stage. The Ministry is considering certification of ESCOs, possibly also of facilitators – to provide guarantee that the companies registered provide for the public sector energy services according to EPC contract as defined by the Act.

Most active companies in EPC in the Czech Republic include (in alphabetical order):

AB Facility a.s.
AKTÉ spol. s. r. o.
Amper Savings, a.s.
D-energy s.r.o.
ENESA a.s.
ENGIE Services a.s. (former COFELY)
EVČ s. r. o.
MVV Energie CZ a.s.
Siemens, s.r.o., division of Building Technologies

The above companies regularly participate at EPC tenders announced. Other significant companies have registered despite the fact that they are not able to provide a portfolio of implemented EPC project. Submission of reference projects may be required as part of certification. Other significant companies

whose intensions are to develop EPC projects include: Veolia Energie CR, Philips Lighting Czech Republic s.r.o., ČEZ Energetické služby, s.r.o., etc. All of the companies are members of the Association of ESCOs.

Energy Supply Contractors

Some of the ESCOs providing services in EPC also offer and provide energy supply contracting or just heat supply. In addition to those companies numerous (70) companies offer operation of boiler houses incl. investments into modernization (BOT), operation of boiler houses, operation of small district heating systems, external operation of large heating plants and systems. These companies do not provide any longer-term guarantee of energy cost savings or efficiency increase, most of them are members of the Association for the District Heating of the Czech Republic (ADH CR), which is an interest group of legal entities, entrepreneurs in the field of heat supply. The mission of the Association is to protect the interests of its members and to promote development of district heating systems and combined heat and power generation.

EPC Facilitators

There are currently 7 facilitators most active in the analysis and procurement of EPC projects, nearly exclusively in the public sector. All of them are members of the Association of ESCOs and also some other consultancies, also registered at the List of Facilitators on the website of the Ministry of Industry and Trade. Most recently the Association of ESCOs was approached by 7 new potential members. This would enlarge the family of facilitators to about 15 members. Facilitators currently most active (in alphabetical order) are:

C.E.I.S.CZ, s.r.o.
ENVIROS, s.r.o.
LOYDGROUP s.r.o.
MT Legal s.r.o.
PORSENNA o.p.s.
SEVEn, o.p.s.
KEA MSK o.p.s.

Association of ESCOs in the Czech Republic

Association of Energy Service Providers (APES) is an interest group of legal entities, entrepreneurs in the field of energy services It was established and registered in October 2010 by several ESCOs (ENESA, AB Facility, Siemens, SUE, Dalkia CR, MARTIA) and 2 consulting companies (SEVEn, ENVIROS). In May 2015 the Association brought together already 24 members (May 2016) and the number is still increasing – 9 companies – both potential or existing providers and facilitators- asked for membership in June 2016 at General Assembly meeting. Website of the association is: <http://www.apes.cz>.

All members of the Association voted for adoption of the European Code of Conduct, all members are required to sign the Code of Conduct also separately.

Priorities of APES include from the beginning promotion of EPC, represent and protect interests of the EPC providers, actively contribute to the market development, define, promote and harmonise quality

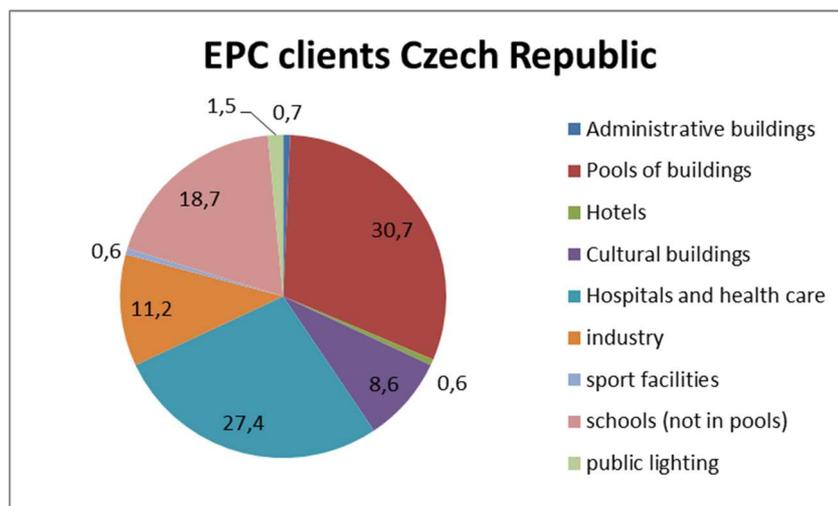
standards of the services on the Czech market. Since 2011 APES assists to the Ministry of Industry and Trade in:

- Model EPC contract improvements and harmonisation with legal acts revisions
- Guidelines improvement for EPC projects development and procurement
- EPC and its instruments (e.g. Code of Conduct) promotion, etc.

APES also organises competitions for EPC projects, annual conferences on EPC, supports European projects dealing with EPC, shares new information with its members. APES is also a member of several organisations (CZGBC – Green building Council, Chamber of Commerce, etc.).

EPC clients

Energy Performance Contracting has been promoted in the Czech Republic since 1992. Since then the number of projects has been slowly increasing and EPC was used by number of towns, regions, individual big hospitals, leisure centres, hotels, etc. During the past 2-3 years, the number of projects has stabilised, although the investments are growing. Most active in the projects development in the Czech Republic are regions (who own substantial property – schools, hospitals, cultural, sport and social facilities), cities and also smaller towns. In addition, lots of projects have been implemented in individual large hospitals, colleges, theatres, sport facilities, also in hotels. The structure of reported projects corresponds to the below stated diagram:



Source of data: Database of individual EPC projects developed by APES (Association of ESCOs) members in 2015.

4.2 Critical assessment

Number of clients to EPC in the Czech Republic increase and so is the number of ESCOs and facilitators. This can have very positive influence on growth rate of the future EPC market.

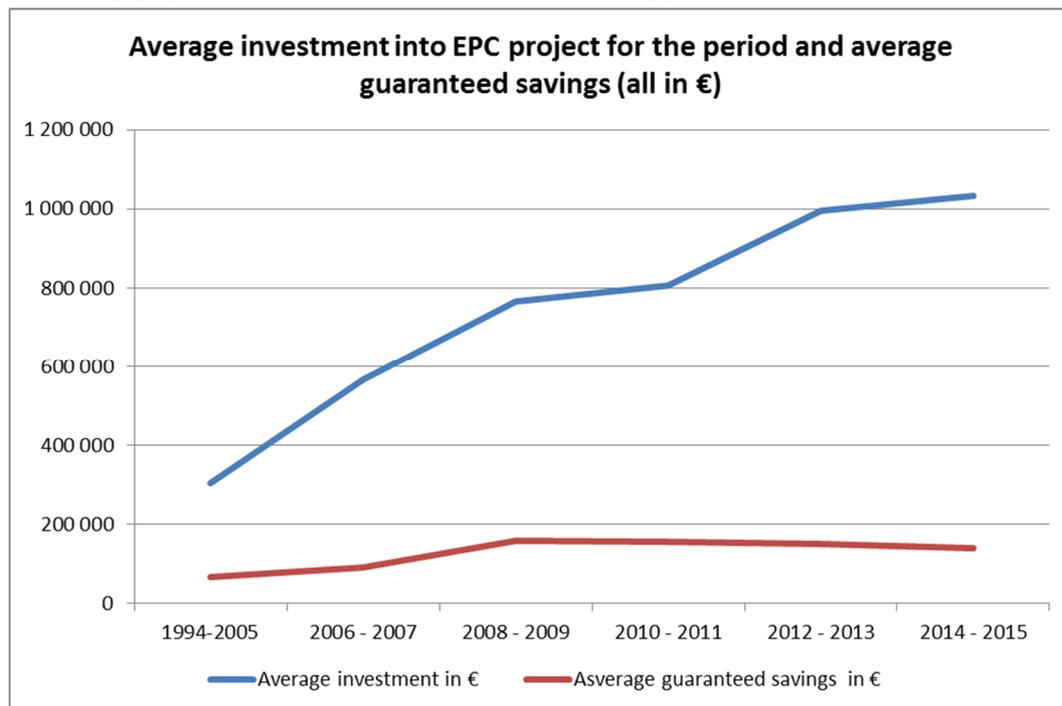
5 Market Volume

As to the number of EPC projects implemented deep differences exist between regions, between sectors. The number of projects has increase after 2012, the total investment is increasing – the investment over past two years was as high as the investment for the whole decade between 1994 – 2005.

Item	1994-2005	2006-2007	2008-2009	2010-2011	2012-2013	2014-2015
Number of EPC projects with public clients*	55	22	17	12	20	20
Number of EPC projects with private clients	12	2	4	0	0	0
Investment in total (€)	20 295 153	13 559 738	16 067 885	9 658 126	19 919 240	20 653 433
Guaranteed savings in total (€)	4 483 578	2 175 681	3 336 914	1 879 930	3 017 732	2 772 559

Source of data: Database of individual EPC projects developed by APES (Association of ESCOs) members in 2015, amended by data from initial database of EPC and EC projects developed by ENVIROS in 2003 and maintained later on by SEVEN – up to 2007. No official database exists yet, but is under preparation. The data of investments and savings are fairly reliable, reported by ESCOs. The database may not include absolutely all EPC projects.

Following graph shows the investments in 1 € of energy saved.



The graph shows that the unit investment has been increasing – mainly due to the fact that the measures implemented are more sophisticated and also because the “cheap” inefficiencies had already been removed. Typical length of EPC contracts are extended to about 10 years, longer contracts exist, though.

No systematic evaluations of EPC projects in the private sector are available. Contract durations in private sector EPC projects will normally be in the range of 3-6 years.

Other important energy services

In addition to EPC energy supply contracts are widely used, in which, though, no efficiency improvements are reported and repayment of the investment and the service is included in the price of sold heat. DH systems being operated in all Czech towns, also number of DH operators is high. The contracts also include operation of separate boiler houses at houses and block boiler houses for several blocks of flats or in tertiary sector.

Price of heat sold to “third parties” is subjected to the decision of the Regulatory office and can include only eligible cost. Investment (in case of energy supply contracts depreciation is applied by the operators and not by the owner of the facility) is included in the eligible items of the price calculation and also fees and other fixed and operational cost of DH operation. Instructions are obligatory and information exist to holders of licences for thermal energy generation or thermal energy distribution, on the essentials and structure of regulatory reports, including model forms, and the rules for compiling regulatory reports. The reports must be delivered to the Energy Regulatory Office with financial and technical data. An overview of thermal energy prices applied at the various levels of transfer are then available, and also data on installed capacity, types of fuel, and the quantity of thermal energy supplied at the respective price location.

These contracts are not in the Czech Republic considered as “performance based contracts” and are not included in the above EPC statistics. Following companies are on the large list of operators of DH systems and boiler houses, in many other operators of the HD systems these companies are co-owners.

- ČEZ Energo, s.r.o.
- ČEZ Teplárenská, a.s.
- Veolia Energie ČR, a.s.
- ACTHERM, spol. s r.o. 48024091
- Bohemia Energie s.r.o.
- TEDOM a.s.
- KOMTERM Čechy, s.r.o.

5.1 Critical assessment

Provide a critical assessment and outlook of EPC market developments for energy services in your country.

6 Market Assessment of EPC sectors

In this part the various sectors are analysed. For each sector, the points below have to be described. If you want, the public sector can be specified into further segments, too (e.g. buildings and streetlight). Write around 6-8 pages in total.

6.1 Public sector

Strengths	Weaknesses
<ul style="list-style-type: none"> - The way services are provided is legally supported (definition of EPC and the contract compulsory items are since 2015 included in the Law on energy management) - No legal barriers exist for municipal and regional sectors and for governmental contributory organisations - Model contract exists, available at the web page of the Ministry and also Guidelines for EPC project development - Subsidy for initial analysis of EPC project feasibility has been provided by the Ministry of Industry and Trade within the State programme of support to energy efficiency and renewables - EPC contained in NAPEE, steps are taken to report the savings - Procurement procedure is stable and promoted by a guideline - Experienced facilitators assist public authorities in the initial analysis and administration of the tenders - ESCOs are experienced in the public sector, using recommended procedures and respecting the guaranteed savings scheme and the model contract - Financing is available due to guaranteed savings scheme, banks buy receivables - Lots of promotional actions aimed at public sector are organised – also within European projects on EPC promotion - Bundling of buildings and facilities in an EPC project is common, and this way also smaller schools, social facilities etc. can be included - ESCOs have access to initial loan for construction of energy efficiency measures - Projects are presented, database exists at the web page of APES with contacts and basic data 	<ul style="list-style-type: none"> - Barriers in the Governmental budgetary sector exist – no debts can be raised in the sector - High transaction costs due to public procurement rules - Professional abilities of ESCOs not fully understood - EPC model not applicable for very small projects (e.g. in smaller towns with only a few public buildings) - Trust is still difficult to achieve due to complexity of the EPC projects - Split interests exist and preferences of local companies - Low interest on verified and guaranteed results – low financial awareness and economic understanding - Traditional ways preferred (energy audit, project documentation, tender for lowest price). - Availability of EU funding for thermo-modernisation of public buildings leads to underestimation of potential in technical systems in the buildings

<ul style="list-style-type: none"> - ESCOs are active in contacting clients as well as the facilitators - Cross-selling made during energy audits development - Association of ESCOs exist, thus public sector has access to the number of companies which provide the service and believe that the tender can be successful - Initial analysis of EPC feasibility being subsidized less obstacles exist in approving the cost of the analysis by the public sector, once the analysis is positive, the public client should continue with procurement and selection of an ESCO - IPMVP has been used for energy savings measurement and verification in the EPC contract results, right way of savings reporting is discussed during the negotiated procedure. 	
Opportunities	Threats
<ul style="list-style-type: none"> - Despite the efforts taken large potential still exists at both regional and municipal property. Many big towns have yet not started any EPC project implementation. - No of buildings which were included in the EPC project is about 1000, while the total number of buildings is about 15 times higher. Even though not in all the buildings sufficient potential for renovation exists, the market is large. - In addition efforts have been made in performing pilot projects in budgetary state organisations, at which underinvestment can be huge and repairs of their heating, hydraulic and ventilation systems is needed. - EPC plus (combination of EPC contracts and deep renovation contracts) has started already, but the potential has not been fully used. - Price for heat delivery in DH systems is not that low as the price for gas. 	<ul style="list-style-type: none"> - EPC models of implementing energy saving measures is strongly dependent on political support - Tendency to reduce outsourcing and to build up own technical capacities exist in many administrations - Long-term and mid-term planning in property management as well as energy management is still rare. - Resistance of the governmental sector is huge, although the potential for energy efficiency improvements can be huge as well. - Prioritizing grants and subsidies for buildings insulation influences view on energy savings, modernisation of technical systems is being done only after the technologies become close to the end of operation

Financing

All types of financing can be combined with the guaranteed savings EPC model. Financing stopped to be a barrier at the public sector, and financing can be most often adjusted to the needs of the EPC client (customer /third party/ EES provider financing). Most common case – sale of receivables is used, conditions of which the service provider knows before the tender. After selection of ESCOs no changes are made in the contract as far as financing costs and conditions are concerned.

Best Practice

More than 150 projects are available and their short description at the website of the Association of energy service providers of the Czech Republic (www.apes.cz). It is available, though, only in Czech. Typical project can be described in municipal property:

Town of Klatovy - ESCO selected in 2013 for a pool of buildings ((educational and social facilities), number of buildings 18. The length of the contract is 8 years, investment amount to 671 thousand EURO, guaranteed savings of 1 082 thousand EUR in total, annual fixed savings 135 thousand EUR/year. Total price of the contract (incl. interest and management) is 874 thousand EURO.

6.2 Private Sector: Industry

Strengths	Weaknesses
<ul style="list-style-type: none"> - High cost-consciousness in industry - Openness to outsourcing in industry - Public tendering not necessary - Facilitators rare, cost of tendering low 	<ul style="list-style-type: none"> - Short project duration priority, EPC contracts rarely accepted - EE measures usually concentrates on measures in supporting processes - EE in production technologies difficult - Measures rather proposed by in-house professionals at large industries
Opportunities	Threats
<ul style="list-style-type: none"> - ESCOs/manufacturers/utilities can use their strong ties to industry - Possibility to develop/offer integrated energy services - Process heat utilisation offers opportunities for CHP and other modern applications - Step-by-step approach without the need to find complex solutions in the beginning 	<ul style="list-style-type: none"> - Energy cost decrease and with decreasing price motivation of owners for energy efficiency projects implementation decrease (economic terms of EE projects are getting worst) - Ties to already proven external companies do not allow to bring new possibilities - Lack of confidence in external advice is a threat and also focus on supply side

Financing - Customer financing prevail in industry, forfeiting could be complicated – while banks have full trust in the municipal and regional sector, based on way liabilities are treated in public budgets, it is not the case for industry, in which long-term liabilities are not that safe.

Best Practice – several published projects exist with data on investments, guaranteed savings, results.

6.3 Private Sector: SMEs

Strengths	Weaknesses
<ul style="list-style-type: none"> - Concept of guaranteed savings has been applied in many private projects – and also at 3 hotels. 	<ul style="list-style-type: none"> - Increased building value not a priority - Energy cost is not a priority - split incentives dilemma in case of rented facilities

<ul style="list-style-type: none"> - Possibility to invest money into other needs could make the EPC projects attractive, only for short-midterm solutions. 	<ul style="list-style-type: none"> - Only short project duration is being accepted, barriers exist in long-term guarantee for receivables - Low awareness may exist on EE improvements in SMEs - Facility managers prefer low cost/cheapest investment solutions, financing through ESCOs seem to be more costly - Data on energy cost often not followed and also information on the potential for savings
Opportunities	Threats
<ul style="list-style-type: none"> - Potential still exists (due to number of hotels, SMEs, administration buildings) - Complexity of processes that could be optimised should increase the demand for complex solutions - Interest (of tenants) in energy cost savings - Combination of FM with energy services - Energy management introduction 	<ul style="list-style-type: none"> - Resistance against outsourcing energy related services and operations to third parties - Low energy prices do not motivate for savings

Financing - Customer or EES provider financing are used for EPC in this sector. Selling receivables only for shorter period due to higher risk in long-term operation perceived by banks.

6.4 Private Sector: Residentials

Strengths	Weaknesses
<ul style="list-style-type: none"> - Several projects implemented in residential buildings – mainly boiler houses reconstruction, in which savings in purchased fuel or heat are measureable. - Compulsory metering in every household brings motivation in savings - In case energy supply contracts are included in this analysis, the number of contract residential houses have with energy supplier (DH company) is enormous (50 % of Czech households). Other contracts are not possible under this occasion. 	<ul style="list-style-type: none"> - Resistance against outsourcing property management and operations to third parties - Modern gas boilers do not necessitate external operation - The split incentives dilemma exist in case external building owner - Complex contractual requirements (also with tenants) - Existing legislation dealing with heating cost allocation to tenants
Opportunities	Threats
<ul style="list-style-type: none"> - Potential exist in many boiler houses, mainly at older building. - Significant saving potentials exist - Energy cost are high in expenditures of households - Combination of FM with energy services - DH suppliers motivation for improved services - Improved legislation motivating to energy efficient behaviour 	<ul style="list-style-type: none"> - Non-supportive legal frameworks - Increased cost for heating thanks to payment for services compared to own operation of a boiler house - Price of heat are increasing (VAT increase for heat from DH systems, tendency for disconnections, causing additional price increase –

	<ul style="list-style-type: none"> - Investments into HD systems under threat – not protected, DH systems in full competition to separate boiler houses. - M&V problems in metering the results at households - No influence on consumers’ behaviour in case of guaranteed savings.
--	--

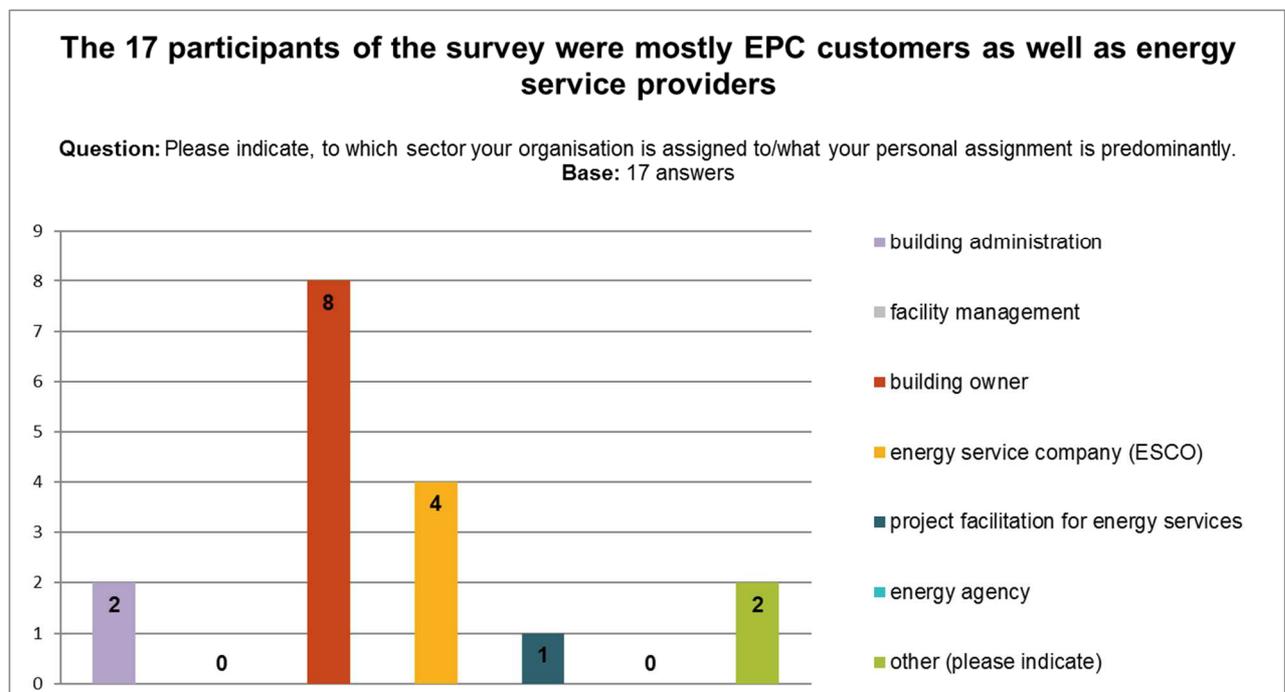
Financing - *EES provider financing or third party financing are most suitable for the sector, guarantee for EPC in this sector rare, usually BOT contracts used. Price is usually influenced by energy efficiency increase through reduced operational (fuel) cost, but the unit price is influenced by many other factor, i.e. climate conditions, changes in occupancy, etc.*

7 Results from stakeholder survey

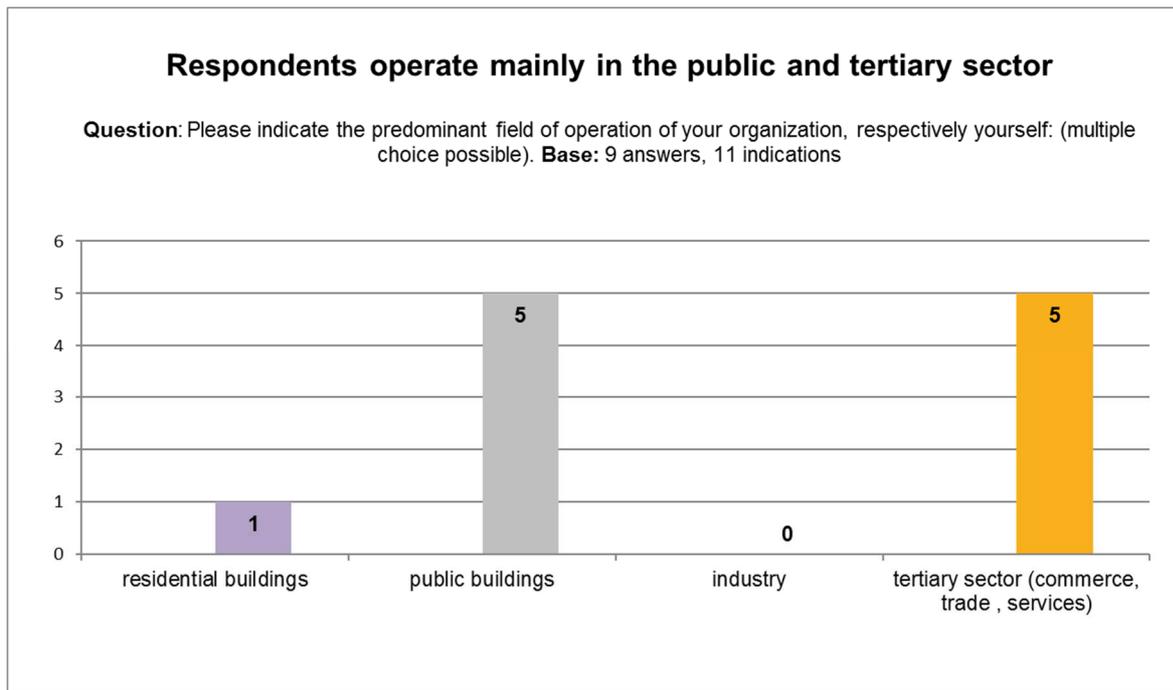
From July until August 2016 an online stakeholder survey was conducted in order to address EPC-market stakeholders. The questionnaire included a mixture out of quantitative as well as qualitative questions concerning the usage of energy efficiency services in the Czech Republic. The main results are summarized in this chapter.

7.1 Basis of survey

The questionnaire for the Czech Republic was completed by 17 participants. Most of them were EPC customers and energy service providers.

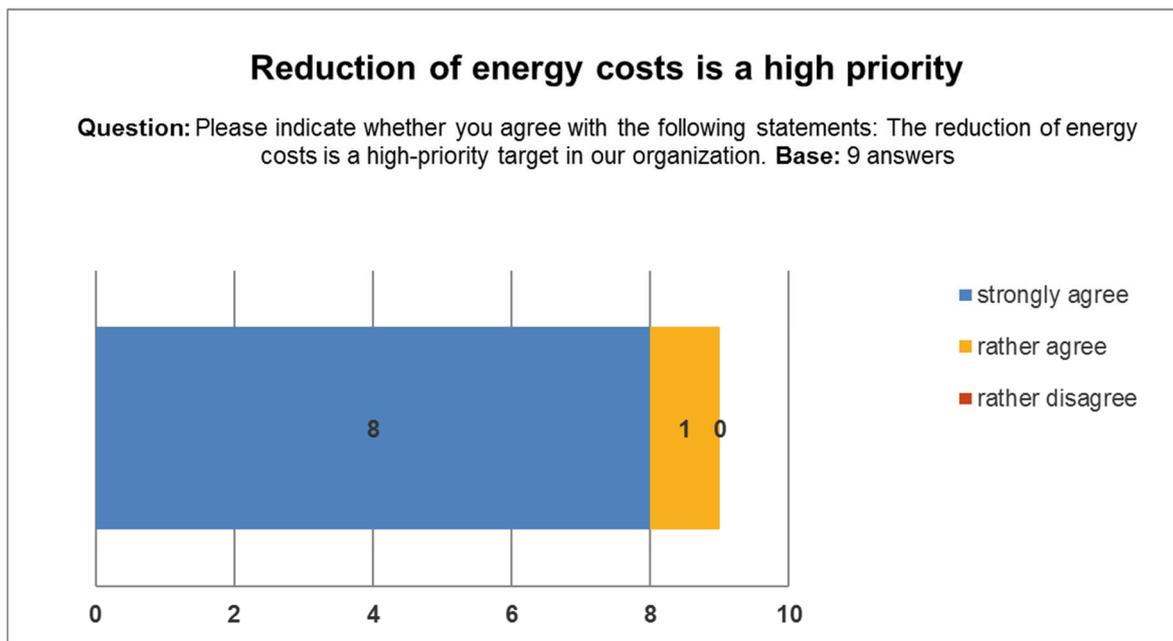


Most respondents operate in the public and tertiary sector.



7.2 Experiences with EPC

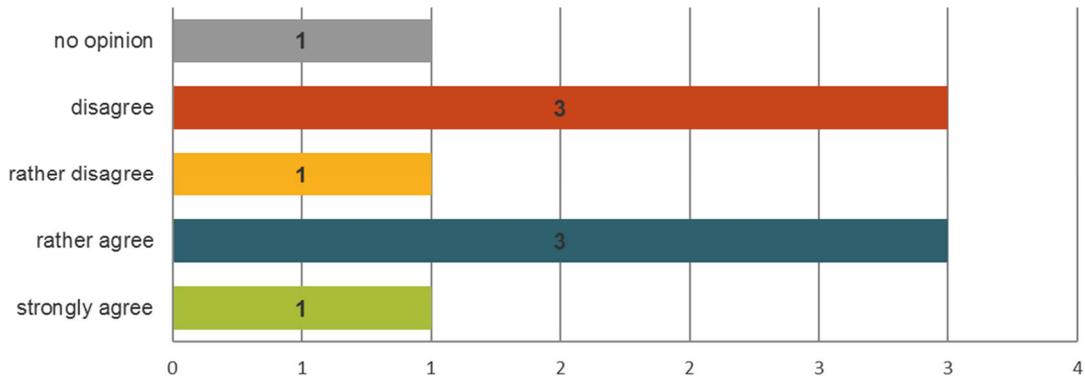
When asking about the reduction of energy costs, 8 out of 9 respondents indicate that the reduction of energy cost has high priority in their organization.



Around 40% of respondents have already experiences with energy service providers; a similar percentage of respondents evaluated the experiences as positive.

Experience with the involvement of ESCOs is only partially available

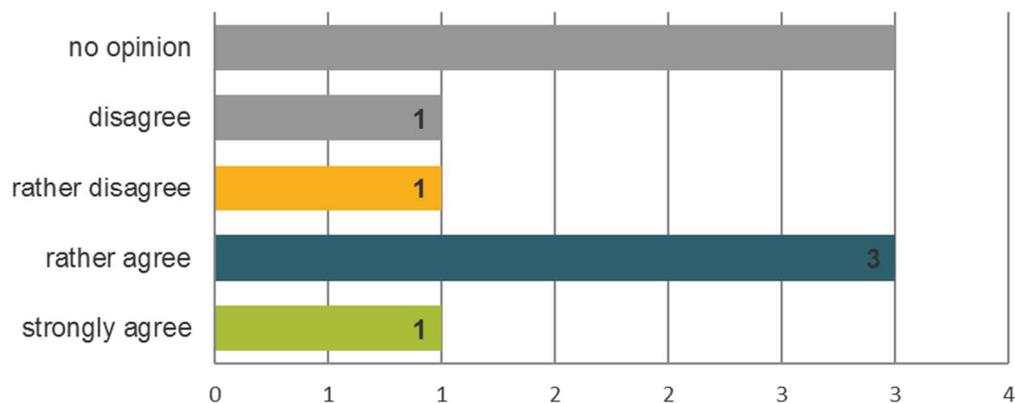
Question: Please indicate whether you agree with the following statements: We have experience with the involvement of energy service companies (ESCOs). **Base:** 9 answers



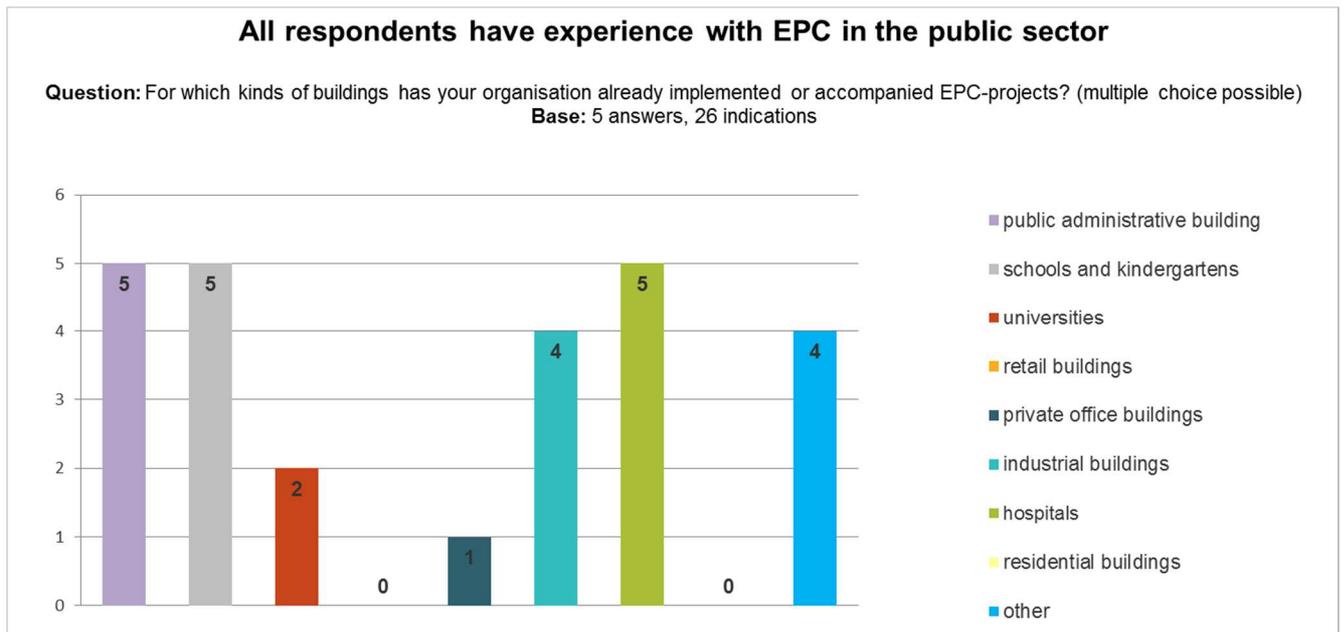
Wherever EPC is available, the experience is mostly positive (the “disagree”-answers are dedicated to interviewees).

If available, experience with Contracting is mostly positive

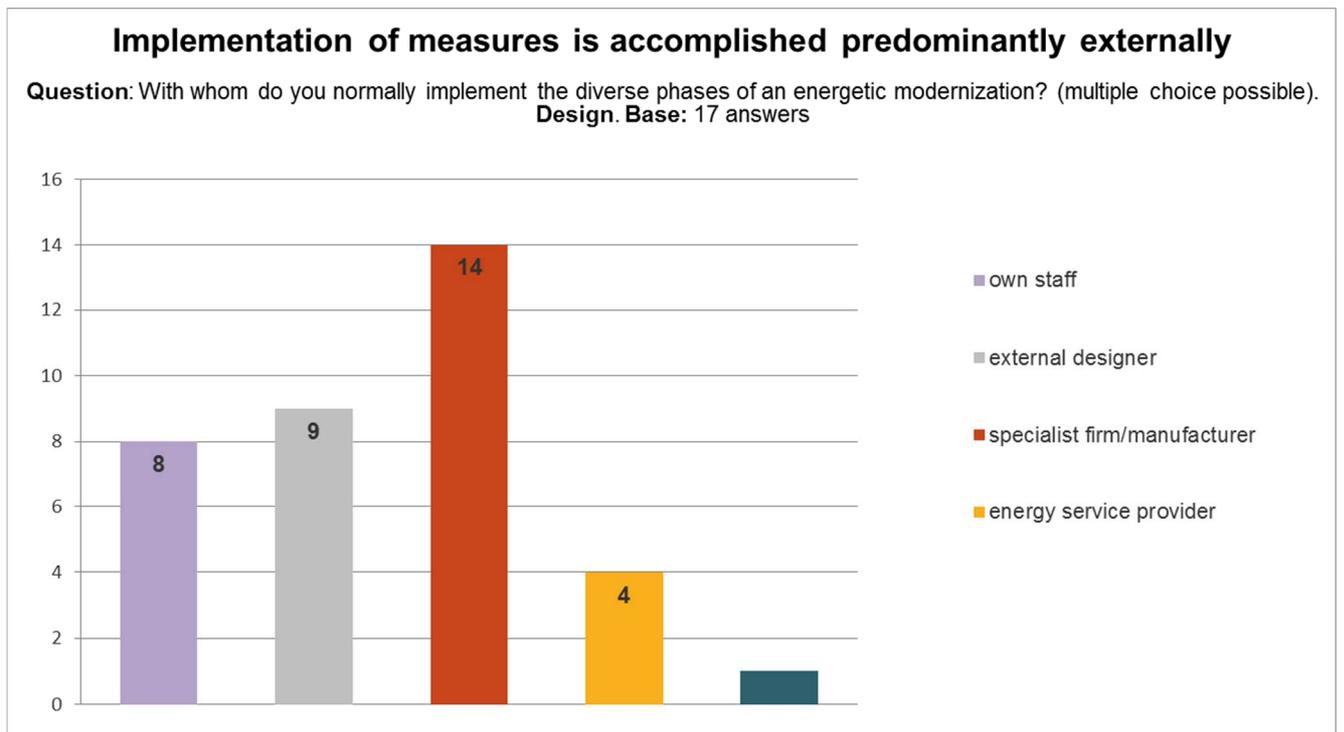
Question: Please indicate whether you agree with the following statements: Our experience with ESCOs was predominantly positive. **Base:** 9 answers



The respondents with experience in EPC mentioned that their experience is mainly in buildings of the public sector: administrative buildings, schools & kindergartens and hospitals.

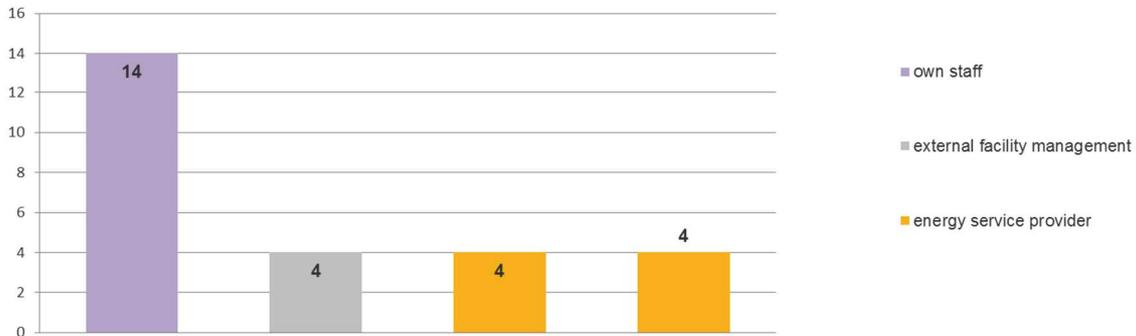


The following two graphs give evidence, that mostly measures are implemented by external companies and afterwards maintained and operated by in-house-staff. This might lead to risks on the side of the building owner that can be addressed/solved through EPC.



Operation of facilities after implementation of measures is accomplished predominantly internally

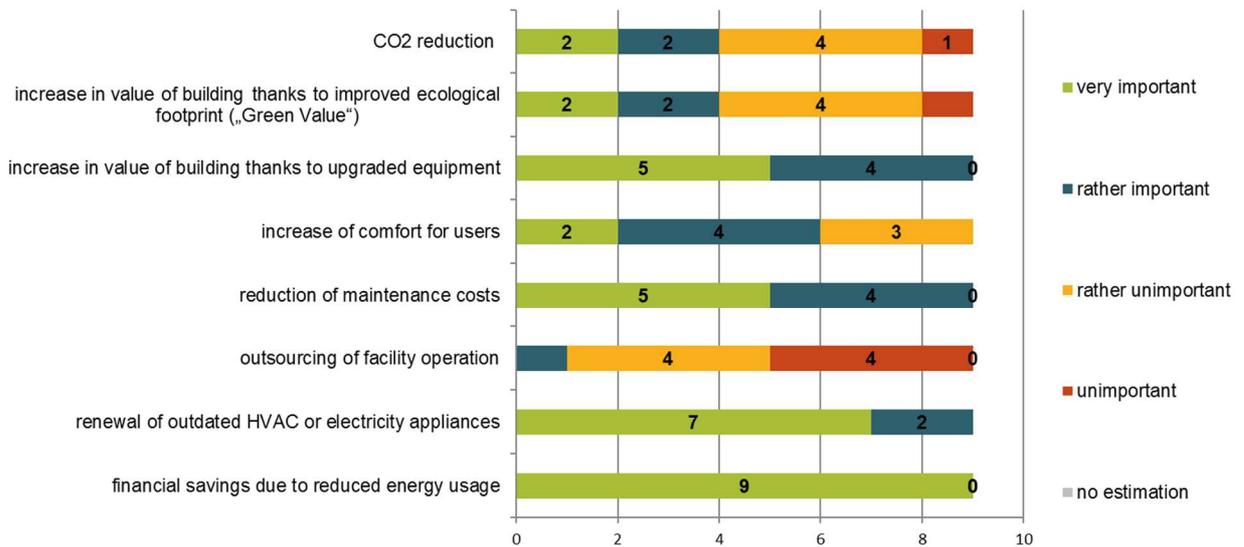
Question: With whom do you normally implement the diverse phases of an energetic modernization? (multiple choice possible). **Operation of facilities after implementation of measures. Base: 17 answers**



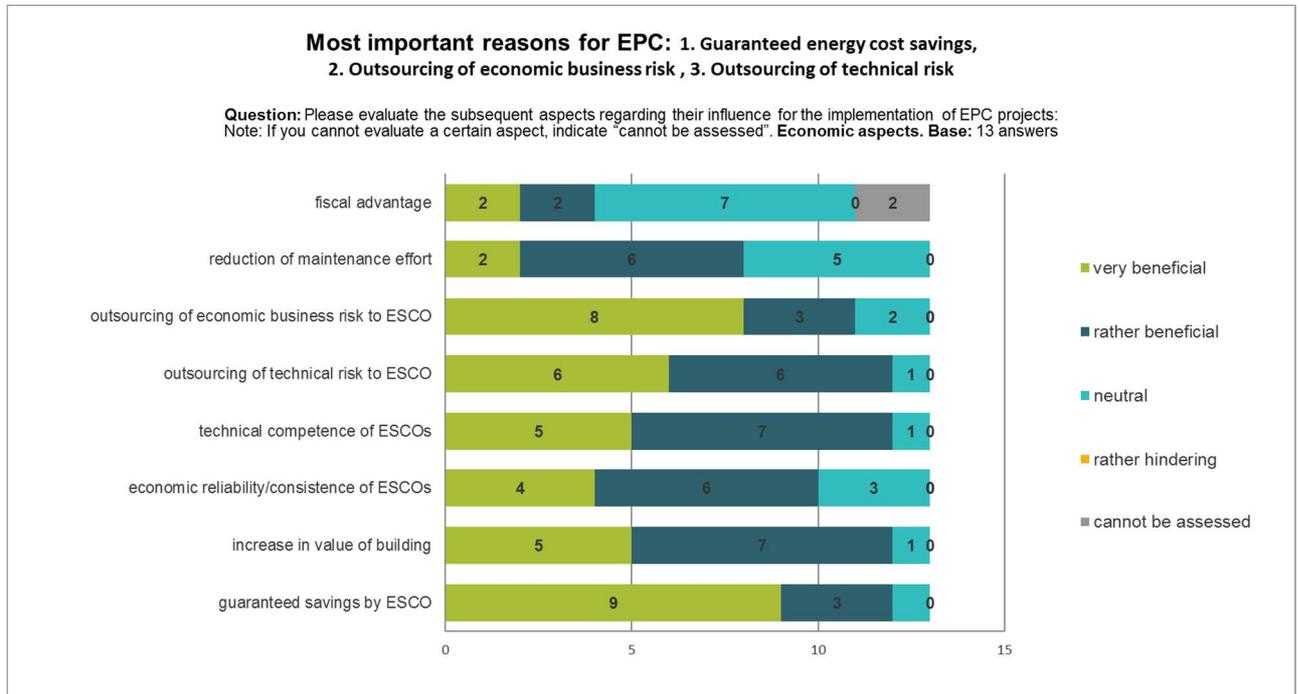
The main driving forces of modernisation are financial savings and renewable of outdated HVAC or electric appliances. Reduction of CO2 or increase in comfort for users are less important driving forces.

Financial savings and renewal of outdated HVAC and electric appliances are most important reasons for modernization

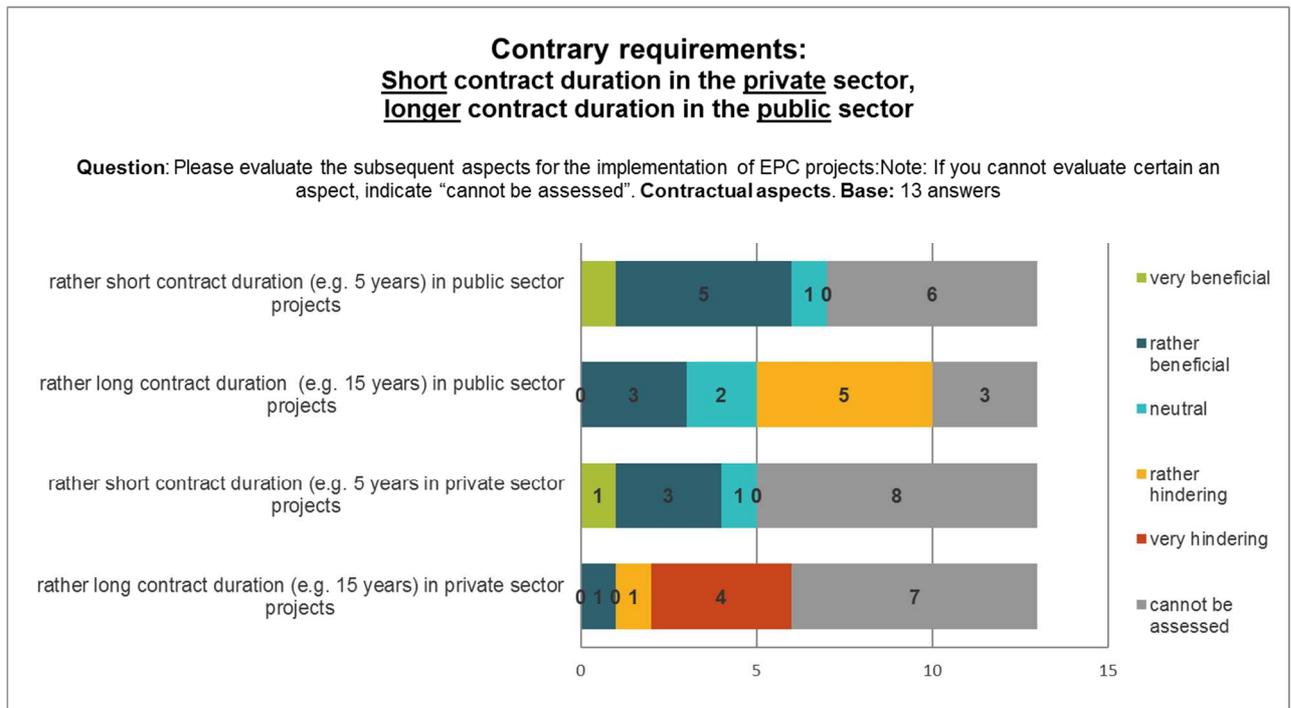
Question: There are several reasons for an energy efficient refurbishment. How do you evaluate the importance of the following aspects: **Base: 9 answers**



For the follow-up step towards an EPC-project the reasons for it are as expected:



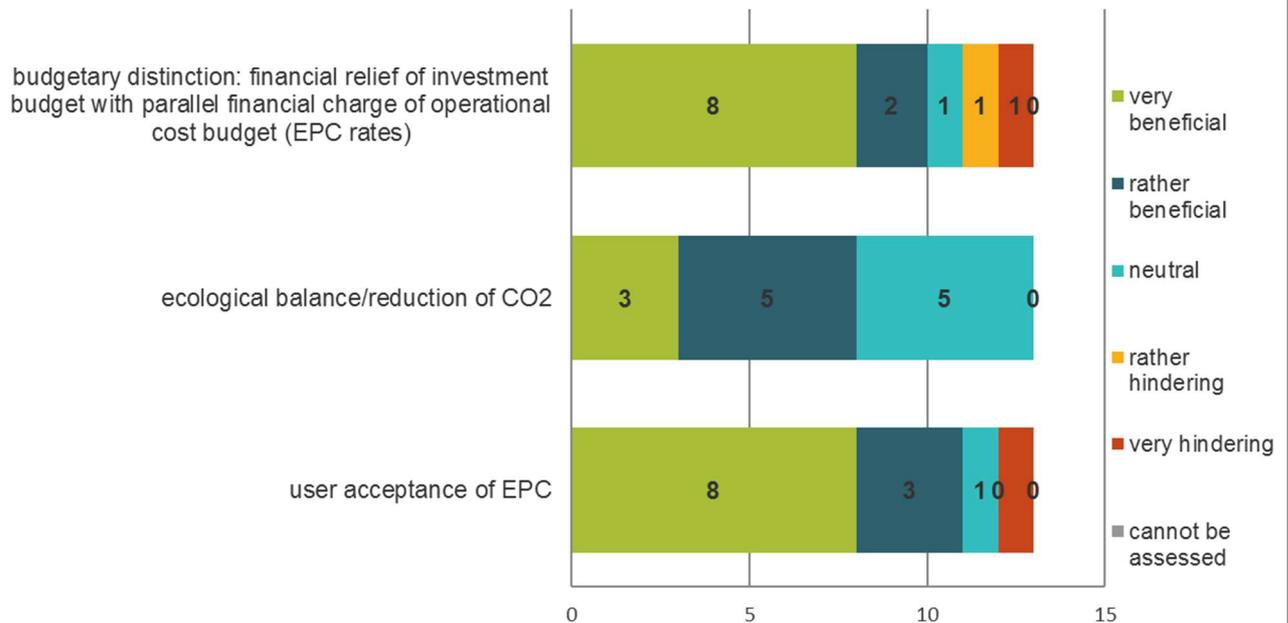
An interesting – although not surprising – finding related to the contractual requirements between public and private sector. The private sector prefers short to long contract duration. This preference is also seen in the public sector, but the public sector does not see longer contract durations as hindering to EPC.



When asking about the success factors for EPC, user acceptance is an essential aspect for the implementation of EPC projects. The possibility for budgetary distinction is another important aspect.

User acceptance is an essential aspect for the implementation of EPC projects

Question: Please evaluate the subsequent aspects for the implementation of EPC projects: Note: If you cannot evaluate certain an aspect, indicate "cannot be assessed". **Other aspects. Base: 13 answers**

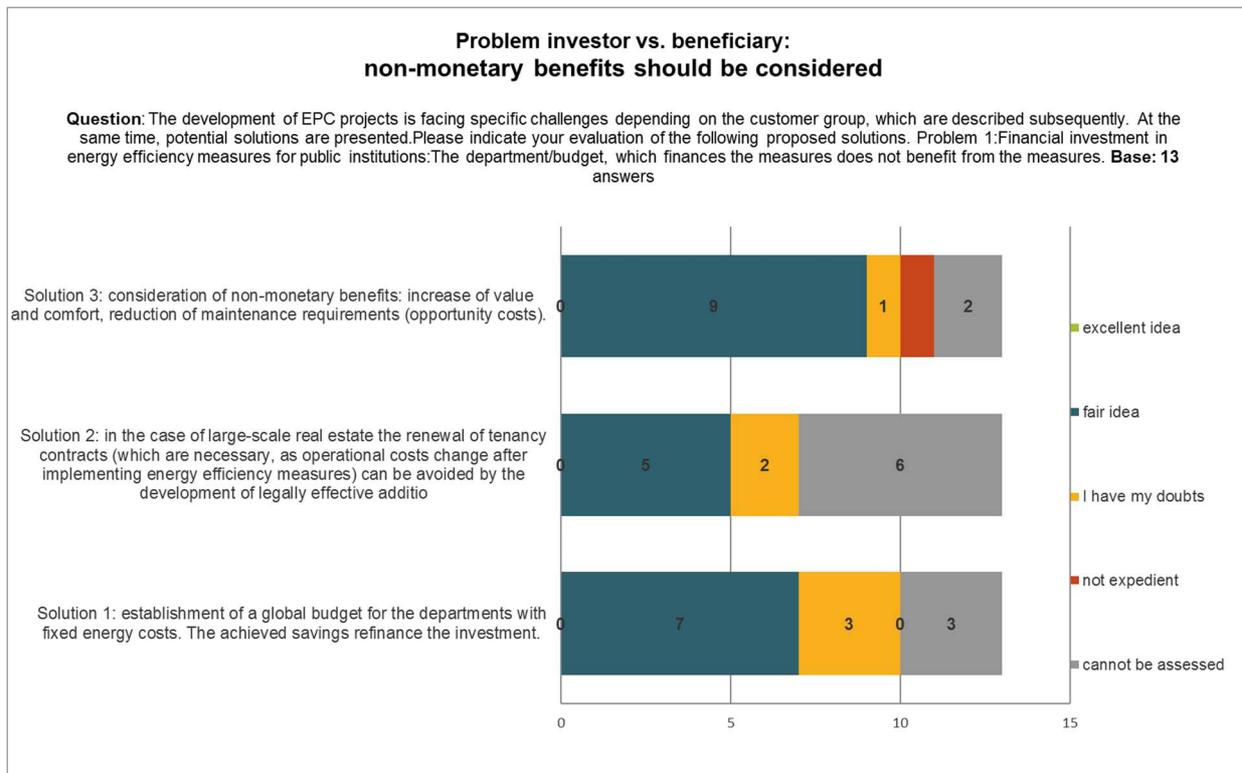


7.3 Problems and potential solutions

The development of EPC projects is facing specific challenges depending on the customer group. Those problems were presented and potential solutions offered, which were assessed by the respondents.

Respondents were asked to choose a solution for Problem 1 - *Financial investment in energy efficiency measures for public institutions: The department/budget, which finances the measures does not benefit from the measures.*

- The preferred solution was the consideration of non-monetary benefits: increase of value and comfort, reduction of maintenance requirements (opportunity costs).
- The least preferred solution was: in the case of large-scale real estate the renewal of tenancy contracts (which are necessary, as operational costs change after implementing energy efficiency measures) can be avoided by the development of legally effective additional agreements.

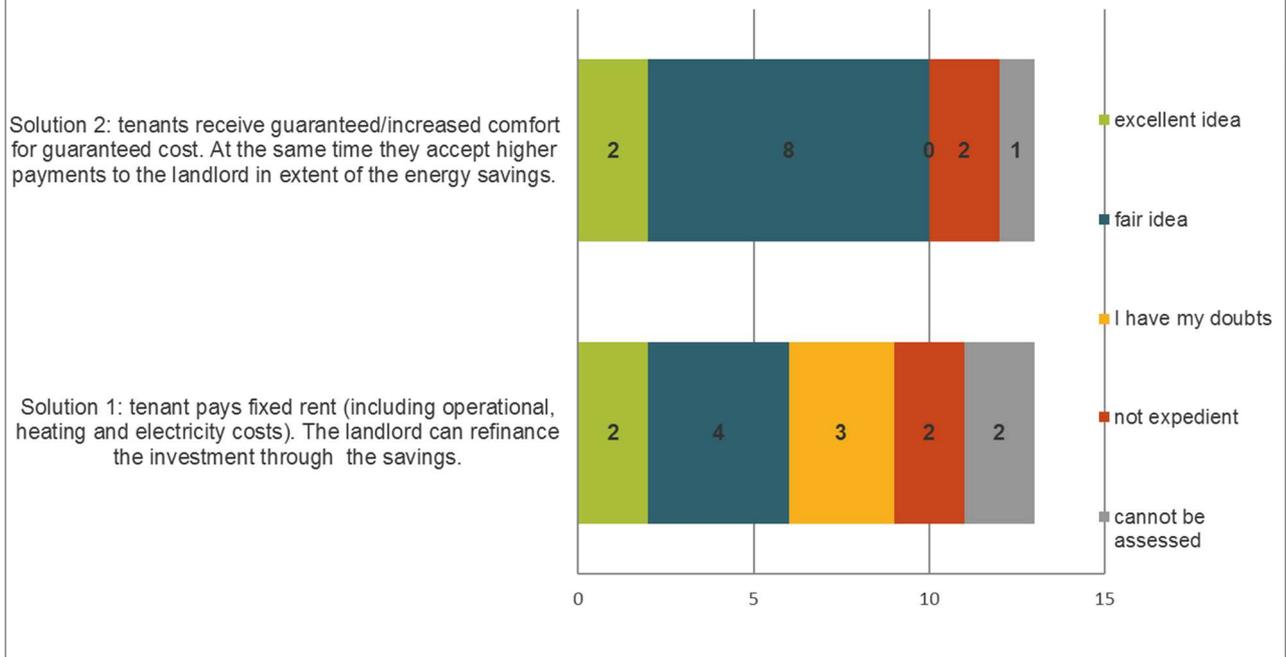


Problem 2: Tenancy in commercial properties: The landlord invests in energy efficiency measures but cannot refinance those by reduced energy cost, as only the tenant benefits from energy cost savings.

- The preferred solution: tenants receive guaranteed/increased comfort for guaranteed cost. At the same time, they accept higher payments to the landlord in extent of the energy savings.
- The least preferred solution: tenant pays fixed rent (including operational, heating and electricity costs). The landlord can refinance the investment through the savings.

Problem financing efficiency measures in rented commercial properties: fixed rent (including operational, heating and electricity costs) for financing

Question: Please indicate your evaluation of the following proposed solutions. Problem 2: Tenancy in commercial properties: The landlord invests in energy efficiency measures but cannot refinance those by reduced energy cost, as only the tenant benefits from energy cost savings. **Base:** 20 answers



Problem 3 – efficiency measures and behaviour of users in rented properties: the difficulty of “profit sharing” by users/tenants.

The behaviour of users in buildings influences the energy demand drastically. However, the change of behaviour of the user can turn out to be difficult. Both solutions were seen as a fair idea with a slight preference for:

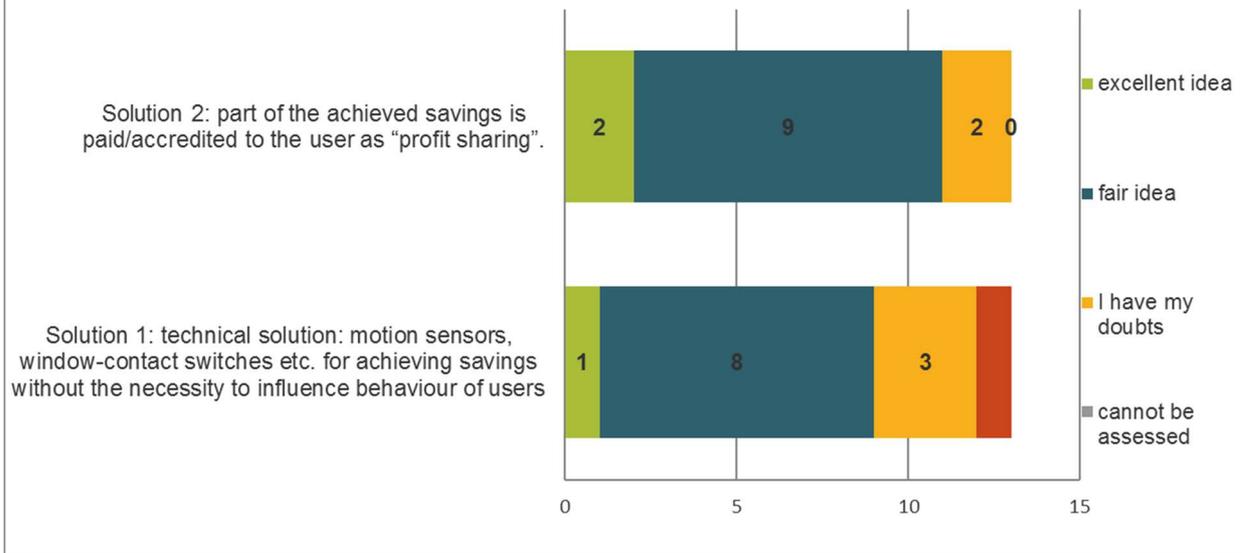
- Part of the achieved savings is paid/accredited to the user as “profit sharing”.

But also accepted was:

- Technical solution: installation of motion sensors, window-contact switches etc. for achieving savings without the necessity to influence behaviour of users.

Problem efficiency measures and behaviour of users in rented properties: "profit sharing" of user/tenants

Question: Please indicate your evaluation of the following proposed solutions. Problem 4: The behaviour of users in buildings influences the energy demand drastically. However, the change of behaviour of the user can turn out to be difficult. **Base:** 13 answers



7.4 Highlights of qualitative answers

The respondents of the questionnaire were from both ESCOs and their potential clients (mainly municipalities or public organisations owned by municipalities).

Public sector representatives mention the following issues

- complex tendering procedure as one of the main barriers to EPC. It also remains difficult to understand the concept on guaranteed savings. Public organisations mention that they are in a disadvantaged position when negotiating with ESCOs about guaranteed savings.
- It also was mentioned that the selection of an ESCO provider is often more time consuming than the implementation of energy saving measures itself.

Some other highlighted issues, mainly by ESCOs were:

- installation of motion sensors, window-contact switches etc. for achieving savings without the necessity to influence behaviour of users was seen as a necessity by ESCOs
- ESCOs believe that there is always the possibility to cancel EPC contracts (so that "problem 5 – rigid duration of EPC contracts" from the questionnaire is not viewed as a real problem).

Another, more general, comment made was related to the use of EPC as a service. Sometimes services are offered as EPC, while they do not include guaranteed savings. This gives EPC a bad name.

Annex: Development of energy prices in the Czech Republic

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015 ⁵
Price natural gas - industry¹	€-ct/kWh	1,76	2,53	2,12	3,32	2,73	2,95	3,11	3,18	3,08	2,90	
Price index natural gas - industry	-	1,0	1,4	1,2	1,9	1,5	1,7	1,8	1,8	1,7	1,6	
Price natural gas - households²	€-ct/kWh	2,73	3,65	3,42	4,84	4,84	4,93	5,70	6,60	6,08	5,56	
Price index natural gas - households	-	1,0	1,3	1,3	1,8	1,8	1,8	2,1	2,4	2,2	2,0	
Price for electricity - industry³	€-ct/kWh	5,92	7,37	7,71	11,14	10,96	10,57	10,95	10,34	10,07	8,24	
Price index electricity - industry	-	1,0	1,2	1,3	1,9	1,9	1,8	1,8	1,7	1,7	1,4	
Price for electricity - households⁴	€-ct/kWh	8,70	9,90	10,57	12,87	13,59	13,69	14,81	14,99	15,09	12,79	
Price index electricity - households	-	1,0	1,1	1,2	1,5	1,6	1,6	1,7	1,7	1,7	1,5	
Price for light heating oil	€ / 1000 l	601,03	640,17	626,94	806,28	549,36	717,19	888,02	963,49	925,34	860,25	681,76
Price index for light heating oil	-	1,0	1,1	1,0	1,3	0,9	1,2	1,5	1,6	1,5	1,4	1,1

¹ Database 2005 - 2007: Consumers with about 116 Mio. kWh (≈417.600 GJ), 330 d/a of use, 8.000 h/a of use. From 2008 on: All consumers with a consumption of 100.000 to

² Database 2005 - 2007: Annual consumption of households: around 23.000 kWh (prices inclusive all taxes). From 2008 on: All consumers with a consumption of 20 to 200 GJ/a.

³ Database 2005 - 2007: Consumers with about 2 Mio. kWh; maximum power consumption: 500 kW; annual use: 4.000 h/a. From 2008 on: All consumers with a consumption of

⁴ Database 2005 - 2007: Annual consumption of households: around 1.200 kWh. From 2008 on: All consumers with a consumption of 1.000 to 2.500 kWh/a. Price inclusive taxes

⁵ Preliminary

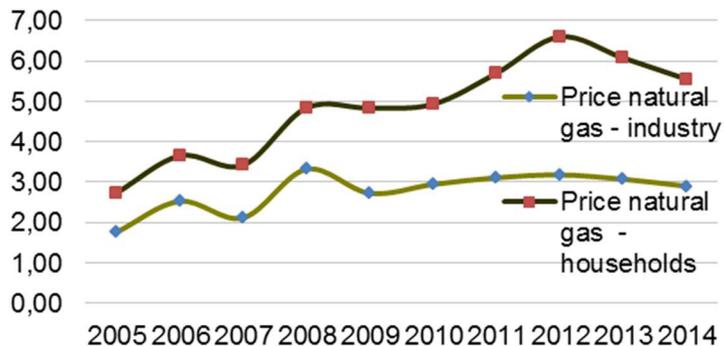
Resource: BMWi, 2016: Energiedaten: Gesamtausgabe

(Energy statistics see URL: <http://bmwi.de/DE/Themen/Energie/Energiedaten-und-analysen/Energiedaten/gesamtausgabe,did=476134.html>)

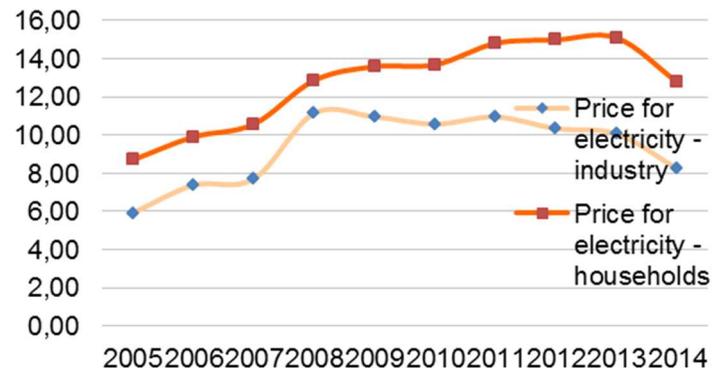
Data source: EUROSTAT



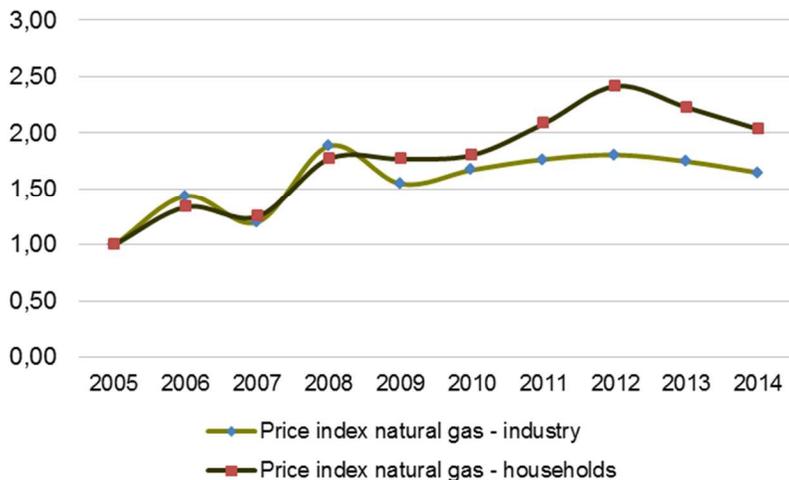
**Prices for natural gas (ct/kWh),
Czech Republic**



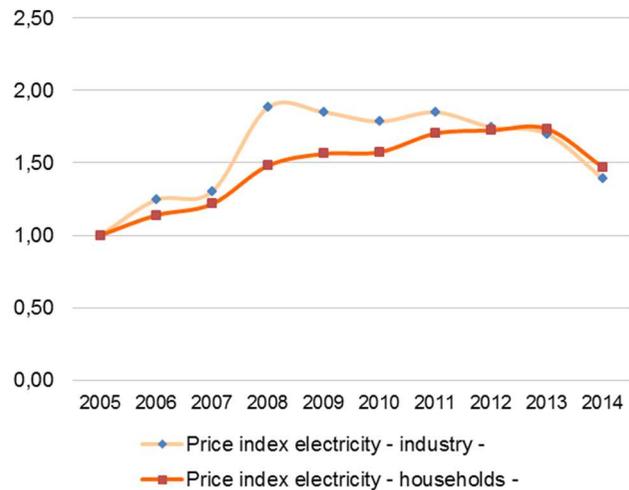
**Prices for electricity (ct/kWh),
Czech Republic**



**Price index for natural gas
Czech Republic, base year 2005**



**Price index for electricity
Czech Republic, base year 2005**



References

BMWi (ed.), 2016. *Energiedaten: Gesamtausgabe.* (Energy data: Complete edition) URL: <http://bmwi.de/DE/Themen/Energie/Energiedaten-und-analysen/Energiedaten/gesamtausgabe,did=476134.html>.

EESI 2020: EPC Market in the Czech Republic and potential for its Growth, SEVEn, (5.1_CZ_Questionnaire_SEVEn_cs)

APES: Publication for the Ministry of Industry and Trade: Implementace článku 18 o energetických službách směrnice evropského parlamentu a rady 2012/27/EU o energetické účinnosti (EED) v českých podmínkách (Implementation of the Article 18 on energy services of the European Directive No 2012/27/EU on Energy Efficiency, 2013)

APES: Database of EPC Projects, 2015

MPO (Ministry of Industry and Trade): 4th Progress report on NEPEE Achievements, 2016