Energy Performance Contracting in the Form of Public-Private Partnerships in Slovenian Municipalities

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Abstract
Aware of the importance of energy efficiency, the EU encourages investments that seek to reduce energy consumption, among others, in the energy renovation of public facilities. One mechanism for this is a Public-Private Partnership, which, in the area under consideration, is known as Energy Performance Contracting (EPC). Various stakeholders complain about the Slovenian EPC market's poor state, which was a trigger for a survey as we wished to determine the truth of these opinions, find the key reasons for this situation and ways to bring about an improvement. In addition to statutory barriers, a major finding of the survey is the lack of interest among private partners despite the market's great potential.

Keywords: energy efficiency, public buildings, energy renovation, Public-Private Partnership, Energy Performance Contracting

JEL classifications: H00

Introduction

Energy efficiency reduces energy consumption while helping to cut greenhouse gas emissions and thus mitigate climate change. In order to increase energy efficiency, in 2007 the EU set itself the goal of achieving a 20% reduction in overall energy consumption by 2020 (2012/27/EU Energy Efficiency Directive). The Conclusions of the European Council in 2011 acknowledged the EU energy efficiency target was not on track and that determined action was needed to tap the considerable potential for higher energy savings in buildings, transport, products and processes. It was stressed that buildings account for 40% of the EU's final energy consumption, and buildings owned by public bodies make up a considerable share of the building stock. The EU required member states to every year renovate 3% of the total floor area of buildings owned and occupied by central government.

Due to insufficient public budget funds for investments, a limited public sector, poor energy planning qualifications, and the inefficient monitoring and management of energy costs, it was necessary to find alternative methods for introducing energy efficiency measures. The most appropriate proved to be Energy Performance Contracting (EPC) in the form of a public-private partnership (PPP), especially in the fields of the energy renovation of buildings and public lighting. EPC occurs in projects where the investor is a public institution; the contractor (an energy service company, ESCO) comes from the private sector, while the public interest is at the forefront. ESCO services are usually paid off via energy cost savings, according to the terms of the contract.

EPC in PPP form is relatively well established around the world: researchers state that PPP is the most suitable model for successful energy management in India (Thapar, 2015). PPP is also a useful instrument for implementing environmental projects in Russia (the areas of waste and wastewater, energy efficiency and renewable energy; Sedash, 2015) and in Italy (building energy performance measures; Copiello, 2016), while in Romania and Portugal the development of renewable energy sources is encouraged (Martins et al., 2011, Babonea & Gherman, 2014). One of the authors writes about PPP on the field of energy in emerging market economies, where the emphasis is on cross border investments – case of Iceland.(Hilmarsson, 2012). Al-Rashed & Abdel-Jawad (2009) explored the use of PPP for seawater desalination projects in arid regions; in China for establishing incinerators for municipal solid waste as renewable energy sources (Song et al., 2013). In the United States (Foley et al., 2015), the Greater Philadelphia Innovation Cluster (GPIC), a consortium of both public and private sectors and academics, was established with the goal to increase energy efficiency, create jobs and encourage private investments. PPP is increasingly used in the area of electricity supply (Chaurey et al., 2012; Koliba et al., 2014) and can also be used as an effective tool for reducing carbon dioxide emissions (Kuronen et al., 2011; Buso et al., 2018).

Directive 2012/27/EC on energy efficiency gave a leading role to the public sector in the energy renovation of buildings. In the Strategic Implementation Document, the Operational Programme for the Implementation of the EU Cohesion Policy 2014–2020, Slovenia commits itself to supporting projects for the energy renovation of public sector buildings to be implemented in the EPC framework. The total volume of investments in the energy renovation of public sector buildings in the period 2016–2023 is estimated at €415 million (€52 million/year; MI & MJU, 2015).

Despite its great potential, EPC in Slovenia is not developing as planned, with this jeopardising the state's ability to achieve the above-mentioned commitments. The number of projects grew from an average of two new projects a year to more than 15 in 2013, continuing in a similar way in 2016 (Boza-Kiss et al., 2017). However, in 2013 the size of the ESCO market was estimated at €3 million/year (Staničić, 2013) as opposed to an estimate of €3–5 million in 2016 (Boza-Kiss et al., 2017)

There were 2–3 ESCOs in 2010, 4–6 in 2013 and the trend of acceleration was expected to at least continue (Bertoldi et al., 2014). However, in 2016 an EPC provider register was introduced and it is concluded there are between 4 and 6 EPC providers in the country. An ESCO association has yet to be established (Staničić (2015) and Boza-Kiss et al., 2017).

The purpose of the article is to promote the development of EPC and the market of ESCOs by identifying all the benefits of EPC, the difficulties encountered by both the public sector and ESCOs in making EPC a reality, and by describing ways to avoid problems.
The main research question focused on the key reasons for EPC's relatively poor development in Slovenia. We also wished to determine: a) what is the primary contractual basis for applying measures to enhance the energy efficiency: public procurement or PPP; b) which problems do municipalities have while implementing energy renovation

investments through PPP; and c) were the EPC projects engaged in by selected Slovenian municipalities successful?

The first part of the article summarises the characteristics of the PPP, considers the definition of EPC and overviews the situation in selected EU countries. The core part presents a survey of EPC in Slovenian municipalities which includes an overview of the state of EPC in urban municipalities, a survey of representatives of Slovenian municipalities, ESCOs, local energy agencies and the opinion of the Centre for Energy Efficiency (Jožef Stefan Institute). The conclusion summarises the research findings and answers the research questions raised.

Theoretical Background

Public-Private Partnerships (PPPs)

No single definition of public-private partnership (PPP; World Bank Group, 2017) is widely accepted, there is no generally accepted and consistent definition in each jurisdiction (HM Treasury, 2013) and it is not defined at the Community level (EU Green Paper 2004).

"In general, the term refers to forms of cooperation between public authorities and the business world that aim to ensure the funding, construction, renovation, management or maintenance of infrastructure or the provision of a service." (EU Green Paper 2004) "It is often defined as a long-term contract between a private party and a government entity for providing a public asset or service in which the private party bears significant risk and management responsibility and the remuneration is linked to performance. "(World Bank, 2017)

According to a PPP contract, the public partner makes a performance-based payment to the private partner for the service (e.g. depending on a road becoming available) or gives the private partner the right to generate revenue by providing a service (e.g. from bridge user tolls). The private partner's payment is thus uncertain or depends on availability, which can impose excess risk on the private partner and potentially impede the development of PPPs.

An alternative to the PPP is the public procurement procedure. However, this is not the case with energy contracting as the public partner prepares the project and investment documentation, defines the technical specifications, provides funds for accomplishing the project, and ultimately benefits from energy savings. The private partner is responsible for providing the energy renovation according to the project and investment documentation and does not assume the risk of providing energy savings. It only takes on the risks associated with implementing the energy renovation (ZJN-3, 2015). ZJN-3 regulates public tender procedures, which lead to relatively rigid and detailed legal agreements between the public purchaser and private supplier. The procedures are quite demanding, long and entail high costs. The reasons for such regulation are to retain competitiveness while ensuring the equal treatment of providers, transparency and the prevention of corruption.

Sadka (2006) and Martins et al. (2011) argue that a PPP allows the state to make large investments without public expenditure. The benefits of PPP are a reduction of public sector costs, thereby easing the problem of budgetary constraints, while a PPP also allows the

sharing of risks and economic benefits, permits greater private partner mobility, and enables projects to be funded (Ngoma et al., 2014). Al-Rashed & Abdel-Jawad (2009) emphasise that cutting costs is the result of the tough competition between prequalified competitors and a transparent pre-qualification and auction process.

Infrastructure funding is seen by investors as an opportunity for relatively high yields and safe investments, which often conflicts with financial models that maintain long-term social benefits (Sclar, 2015). Accuracy in forecasting costs and thus cost efficiency is significantly higher in PPP than with the traditional financing of public procurement procedures (Makovšek, 2007). A financier which risks its own capital is more motivated for applying greater diligence in ensuring its own interests are met, such as cost optimisation and profit-making. The reason for the greater diligence and responsibility of suppliers of a PPP is that most of the capital is contributed alone without the public partner's guarantee. Its interest is to increase revenue by cutting costs, and should therefore be more innovative. There is no such incentive with a traditional public procurement, and the level of innovation is lower. The problem of cost overruns and delays typical of traditional financing through public procurement does not occur so often in PPPs: data from the NAO (2003) study show that 76% of all PPP projects are completed on time or even pre-deadline, while 78% of all PPP projects are completed within budget. Among the benefits of PPP, Ross and Yan (2011) also rank a lower probability of changes while implementing the project (and thus a rise in costs), and a smaller chance of implementing wrong projects.

The constraints on PPPs are particularly the lack of adequate legislation, the length of contracts, the excessive rates of return for private investors, the non-use of revenue-sharing formulas, and the poor risk sharing between public and private partners (Ngoma et al., 2014). According to Opara and Rouse (2018), much evidence also shows that PPPs do not always provide better value for money, which is the biggest argument for involving private industrial partners. The main reasons for this are that costs and risks are kept off the balance sheet. Also cost calculations are incomplete; alternative options are not examined on an equivalent basis; and the government still bears an excess proportion of the risks involved and hence all too often ends up footing too much of the bill (Glaister & Travers, 2007; Sheikh, Asher, & Ramakrishnan, 2015). It is difficult to compare value for money between PPP and traditional financing due to the contract duration. It is easy to demonstrate that PPP delivers better value for money by adjusting or manipulating the discount rate by a small amount, such as by 1%, to 'prove' the traditional model is more expensive than the PPP (Pollock, Shaoul, & Vickers, 2002). Välilä (2005) points out that PPPs offer benefits over traditional public tenders in terms of economic efficiency, but that such benefits come with costs, which may or may not outweigh the benefits. If PPP can deliver a combination of allocative efficiency and productive efficiency, at non-prohibitive transaction costs, then PPP is the optimal instrument for public sector investments.

PPP must fulfil several conditions to achieve benefits. Most researchers stress the importance of legislation; Hsueh & Chang (2017) mention a favourable investment environment, the selection of a suitable PPP and public support; Xu et al. (2014) stress the relevance of providing adequate guarantees to the private sector.

The most critical criteria considered by stakeholders is effective risk management (Osei-Kyei and Chan, 2018). Risks associated with PPP projects may be political (with government intervention and maturity), financial (macroeconomic, economic viability), construction, operation and maintenance, market and revenue, and legal (Kwak et al., 2009, Xu et al., 2010; Regan et al., 2011). Both the public purchaser and the ESCO should identify any possible risk associated with the proposed project and ensure these risks are allocated to the best party. In addition, parties should avoid the incomplete transfer and mistreatment of risks as this will not help with achievement of this criterion. The public purchaser must provide comprehensive specifications to make it easier for the ESCO to meet the expected results. Engel et al. (2014) state that risk in PPPs must be allocated in a way that maximises the project value; controllable risks should be borne, at least in part, by the party best equipped to control them. In their opinion, concessionaires should bear construction and operation risks as well as policy risks that have no direct relationship to the project, whilst demand risk should be borne by the public partner.

Energy Performance Contracting (EPC)

Directive 2012/27/EC on energy efficiency defines "energy performance contracting" as a contractual arrangement between the beneficiary and the provider of an energy efficiency. Improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings.

The goal of EPC is the continuous optimisation of energy use which enables the efficient use of energy, contributes to lowering energy costs and reducing the burden on the environment. The basis for EPC is a set of services (turnkey implementation) that includes the optimal choice and proper installation of energy equipment, maintenance of this equipment over the life cycle, and the monitoring of the effects. An energy service company (ESCO) provides the procurer with funding for measures to reduce energy use or to provide new energy sources. ESCO services are usually paid off via energy cost savings, according to the terms of the contract. The targeted energy savings are contractually bound as the ESCO's payment for the return of the investment and the services provided depends on the savings achieved. The ESCO thus bears the technical risk and provides savings.

The advantages of EPC (Staničić, 2013) are:

- reducing or eliminating a public partner's investment costs due to a private partner's input;
- payment conditional on achieving contractually agreed savings;
- the transfer of the technical risk to a private partner;
- a significant contribution to energy safety or sustainability due to a wider (national) reduction of energy consumption;
- increased economic efficiency – reflecting the energy efficiency measures applied, lower costs and the provision of funding to renovate public buildings;
- stimulation of economic development – entailing the increased economic activity due to completing projects that would not have been implemented without EPC models (due to the lack of funds);

- reducing the environmental – as a result of cutting energy consumption and restructuring energy sources;
- improving air quality (inside and outside the building); and
- the integrity of the private partner's services allows synergetic effects.

Garnier (2013) analysed EPC in EU countries in 2013; he classified Slovenia in the medium-sized market group, in which he also included Spain, Portugal, Denmark, Norway and Italy. The group of developed markets includes the Czech Republic, Great Britain, Germany, Sweden and Austria. Below, we summarise the situation in some of the most developed countries.

The EPC market in Germany has 500 operating energy service companies (6.2 ESCOs per million citizens) and is thus the largest ESCO market in Europe. Energy agencies and other market moderators hold greater importance; their purpose is to assist local communities in implementing EPC projects. The ESCO association is also crucial; among other things, the ESCO association promotes the exchange and transfer of knowledge in the field of EPC (Busch, 2013). Over the past 20 years, more than 300 EPC projects have been carried out. The biggest user of ESCO services is the public sector. The potential for investment in measures to increase energy efficiency ranges between EUR 1.5 and EUR 3 billion, and the annual potential for energy savings is over EUR 200 million.

The financing of EPC projects goes through the forfeiting and investment of the ESCO's own funds. The public sector uses the EPC model because it does not have its own resources available to implement energy efficiency measures (Busch, 2013). Forfeiting is used in the case of the purchase of long-term receivables of financed investments. The financial institution lends money through forfeiting. After performing all the investments, the financial institution transfers money to the ESCO and repays the money with periodic fixed payments of the client. The financial institution and the client also sign an agreement on the payment of amounts to the financial institution. This can also mean a greater range of security for the ESCO since, in the case of using forfeiting, the proportion of total guaranteed savings supported by a bank guarantee rises (e.g. from 5% to 10%).

The UK's EPC market is non-standardised; its potential is estimated at EUR 1 billion (Bertoldi et al., 2014). Some associations in the market have significantly influenced its development. The London Development Agency has created a programme that aims to achieve financial savings, improve energy efficiency and reduce carbon dioxide (CO2) emissions in the public sector. The programme is used for various measures to lower CO2 emissions: replacement of insulation, replacement or upgrading of hardware and electrical equipment, and the installation of custom-designed measures. The programme seeks to rationalise the process of implementing energy services by providing an appropriate contract in line with applicable legislation and can be used for pre-qualified ESCOs. The programme is funded by the London Development Agency and the European Commission (European Local Energy Assistance Program, hereinafter: ELENA).
The International Performance Measurement and Verification Protocol (hereinafter: IPMVP) has greatly helped develop the ESCO market. IPMVP enables building owners, ESCO and project funders to calculate savings arising from the implemented measures. Financial aspects also hold

considerable importance since 89% of surveyed ESCOs always or mostly acquire commercially satisfactory conditions and interest rates to finance energy efficiency measures.

The liberalisation of the energy market has not yet been successful, hampering ESCO services, with electricity prices being subsidised in some sectors. The construction sector was intended to serve as a means for developing the ESCO, but local construction companies were not ready and are not financially viable and involved in projects where they must wait years to recover their investments (Bertoldi et al., 2014).

The latest report from 2017 (Boza-Kiss et al., 2017) states that Slovenia is a steadily growing ESCO market. The biggest driver is the established legal framework, clear legally binding renovations, standards, and guidelines. The market has overcome a few critical barriers, but many problems remain, including the market's financial capacity (in particular, that of small ESCOs), and the high transaction costs (Staničić (2015) and Boza-Kiss et al., 2017).

The total ESCO market status is assessed as modest (6–8 ESCOs), the total ESCO market size is €15 million, of which the size of the EPC-only market is €3–5 million per year. In addition to the small number of EPC providers, general barriers to be removed include the low energy prices and lack of available information and expertise. Other obstacles mentioned are the ESA 2010 definition of public debt related to EPC, the lack of in-house expert training coupled with reluctance to use facilitators, and a lack of trust and fear of the actual applicability and effectiveness of the EPC mechanism (Boza-Kiss et al., 2017.

Public authorities are also limited by their existing indebtedness or caps on new public debt. The assets underlying an EPC contract to provide energy efficiency services on the basis of dedicated assets are often considered to be on the public sector balance sheet and not on the private sector balance sheet (Staničić (2015) and Boza-Kiss et al., 2017). In effect, ESCO projects contribute to the level of public debt, according to Eurostat's interpretation, and therefore there is a limit to the size of projects that are run.

The supply side of the ESCO market is still very small and this limits the size of the market. The economic and technical risk are still too high in relation to the determination, monitoring and verification of energy performance guarantees in public buildings for both the ESCO and public building owner, and this is a major barrier to the broader expansion of ESCO model uptake (Boza-Kiss et al., 2017).

Reporters also mentioned opportunity for further development: the financial basis from the dedicated streams of the Structural Funds were expected to boost the market, in line with the obligatory renovation rates of the central government.

A Survey of EPC in Slovenian Municipalities

In order to determine the current development of EPC in Slovenia and find any obstacles to its development, we conducted a survey of Slovenian municipalities, ESCOs operating in the Slovenian market, and Local Energy Agencies (LEAs). By analysing the ways in which energy efficiency measures were implemented and financed, we searched for

reasons why PPP are not more widely used in municipalities. At the same time, we explored the development of the ESCO market in Slovenia. We surveyed all seven Slovenian LEAs and six ESCOs. In order to improve understanding of the research results, we also interviewed a representative of the Jožef Stefan Institute – the Centre for Energy Efficiency (CEU), which conducts research and consults in the energy field in Slovenia.

The survey was based on questionnaires partially adapted to the individual groups of participants. The research was conducted from August to October 2017. We sought answers to the following research questions:

• RQ1: What is the main contractual basis for implementing measures to enhance the energy efficiency in practice of Slovenian municipalities: public procurement or PPP?

• RQ2: What are the key reasons for the relatively poor development of EPC in Slovenia?

• RQ3: Which problems do municipalities have while implementing (or wishing to implement) energy renovation investments through PPP and why is PPP not used in municipalities that have the potential or need for the energy renovation of buildings?

• RQ4: Were the EPC projects implemented by selected Slovenian municipalities successful? (benchmarks of success: deviation in the achieved and contractual (planned) energy savings; delay of implementation of the project, imposed contractual penalties, cancellations of the contracts).

The survey questionnaire for the municipal representatives included issues on the current implementation of energy projects and EPC and ways of implementing and financing measures to improve energy efficiency.

The survey of the ESCOs' representatives allowed us to understand energy contracting from their point of view, where they see the advantages and disadvantages, and which problems arise while using the PPP facility. The survey of local energy agencies highlighted the local professional aspects of energy contracting.

We developed the questionnaires based on the examined theoretical backgrounds. We considered other studies on a similar subject for the purpose of obtaining new ideas. The questionnaires were not too long and contained understandable and simple questions of open and closed types.

The questionnaire was sent by electronic and regular mail to all 212 Slovenian municipalities. The survey was answered by 62 municipalities, representing 30% of all Slovenian municipalities in which 53% of all Slovenian citizens live; 39.3% of the municipalities participating in the analysis have more than 10,000 citizens, 26.2% are municipalities with between 5,000 and 10,000 citizens and 34.4% have less than 5,000 citizens. In 46% of cases, the survey was completed by the director or secretary of the municipal administration; in other cases, the head, senior advisor, consultant, expert associate, referent etc. was involved. The average survey respondent had worked for the municipality for 8.9 years (ranging from 10 months to 22 years). Eight of the 11 "Urban" municipalities in Slovenia answered, while 3 did not. The latter have on average 19,931 citizens, whilst the "urban municipalities" that answered on average have 80,080 citizens.

Most of the municipalities (60 %) that did not answer are very small (with less than 5,000 citizens) and probably have not encountered a PPP yet. 12% of the municipalities that did not answer have more than 20,000 citizens. Nineteen municipalities in Slovenia were newly

established (after 2000) and 15 of those municipalities did not answer.
We sent the survey to all local energy agencies in Slovenia and all seven responded (100%); in all cases, the survey was completed by the director. We sent the survey to 10 ESCO companies listed by local energy agencies, with 6 responding. The ESCOs have 11 to 130 employees, and an average of 61.
In order to add to the research results, we included the opinion of the Centre for Energy Efficiency (Jožef Stefan Institute) which researches and consults in the fields of energy, efficient energy use (EEU) and renewable energy sources (RES) in Slovenia. The questionnaire was answered by a person employed by the CEE for 12 years. This enabled us to compare the answers of the four actors for the same or similar questions.

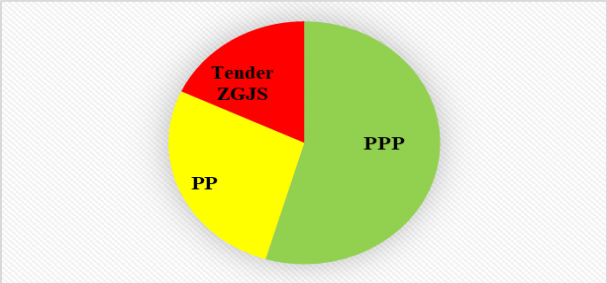
The state of EPC in Slovenian municipalities

In order to determine the current state of EPC in Slovenian municipalities, we reviewed current documents of the municipalities that indicate the measures they plan for reducing energy consumption. We also reviewed delivered public contracts and PPPs in the field of the energy renovation of facilities and also investments in modernising the public lighting of individual municipalities (using information obtained from the public procurement portal and the Official Gazette of the Republic of Slovenia). The Energy Act obliges the local community to adopt a Local Energy Concept (hereinafter: LEC) every 10 years as an energy management programme for the local community, which includes, inter alia, specific goals and measures for energy savings to increase the energy efficiency of buildings owned by local communities and housing funds. In 2014, 209 municipalities had adopted an LEC, thus covering 99.9% of the population of the Republic of Slovenia. In addition, representing 36.5% of the total population of Slovenia 28 Slovenian municipalities have committed to cutting greenhouse gas emissions under the Covenant of Mayors, of which 11 participating municipalities have already adopted action plans for sustainable energy. All Slovenian urban municipalities have also adopted environmental protection programmes that contain measures aimed at reducing the impact on the environment from the use and supply of energy. These measures aim in particular to lower emissions of substances into the air to improve air quality, reduce greenhouse gas emissions and the transporting of long-range pollutants.

The Energy Efficiency Action Plan reveals that 11 municipalities possess a Sustainable Energy Action Plan, of which 3 are urban municipalities; 17 municipalities are preparing a plan, of which 4 are urban municipalities. Eight municipalities have adopted an Environmental Protection Programme, of which 6 are urban municipalities. Energy management systems in public buildings or energy accounting are established in 30 municipalities, of which 3 are urban municipalities. The number of projects for the energy rehabilitation of buildings that are in the implementation phase in Slovenian municipalities was 109 (79 municipalities), of which 8 are urban municipalities (Ministry of Infrastructure, 2015).
The LECs of all the urban municipalities list investments planned for the fields of public lighting and the energy renovation of buildings. The planned savings and investment value are on average higher for the energy renovations of buildings. Six urban municipalities (55%) implemented or are still implementing the EPC model for energy-efficient buildings or public lighting. Only three urban

municipalities are performing the energy-efficient renovation of buildings or public lighting exclusively in classical form (public procurement), while two have concluded a tender to grant a concession for building energy rehabilitation or public lighting in line with the provisions of the Act on Commercial Public Services (ZGJS). Also important is the data showing the number of offers received in individual procedures, where up to six offers are registered in public procurement procedures, and only one, two or at most three offers in PPP procedures. At the public procurement portal, we also found that some PPP procedures were unsuccessful due to a lack of interest in the PPP among private partners.

Figure 1: Types of energy rehabilitation contracts in urban municipalities

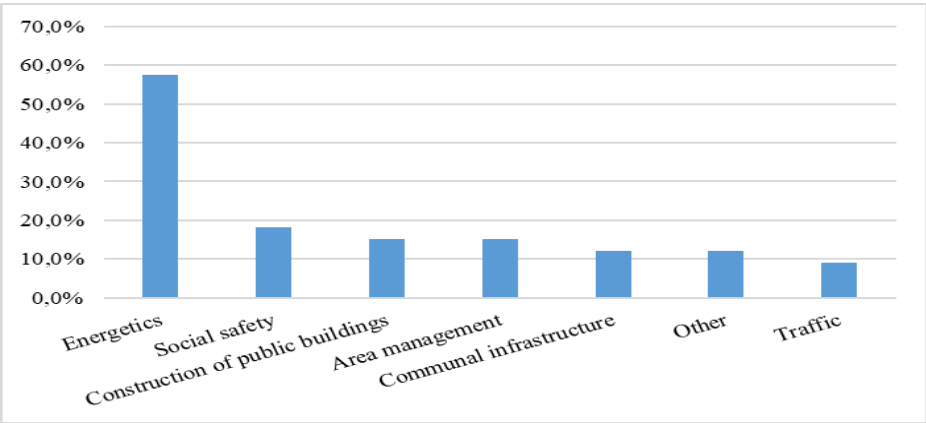


3.2 Answering the research questions

RQ1: What is the main contractual basis for implementing EPC projects in Slovenian practice: public procurement or PPP??

For the question "Have you already implemented the PPP procedure in the field of energy efficiency?", 38% of municipalities responded in the affirmative. Almost half (49%) of municipalities did not have a valid PPP contract at the time of the survey, 26% of municipalities had one, and 25% municipalities had several valid PPP contracts. The highest number of currently valid PPP contracts held by a municipality was 12. The municipalities have entered into PPP contracts in various fields, mostly in the energy sector (58%), the least in the transport field (9%; Figure 2).

Figure 2: Fields of PPPs



Almost 90 % of municipalities have performed the energy rehabilitation of buildings after the year 2007 and 75 % of municipalities have modernized public lighting. 21 % of municipalities used PPP in the

case of energy rehabilitation of buildings and 13 % of municipalities used PPP in the case of modernization of public lighting.

For the period 2017–2020, 62% of municipalities are planning the energy recovery of buildings, 37% of them are planning to use a PPP, and 53% will use a classical public procurement procedure. Further, 41% of municipalities are planning to update public lighting in this period (2017–2020), one-third of them intend to use a PPP, while the remaining 64% will use a traditional public procurement procedure.

ESCO companies were asked if they apply more frequently to PPP or classical public procurement procedures. Two (of six) companies responded that they more often apply for public procurements procedures due to the faster procedures, simpler preparation of the offer and the fact that fewer risks are transferred to the private sector. Three companies responded they more often apply for PPP tenders because of the long-term nature of the contracts, which has a positive impact on the company's operations and for the purpose of transferring risks to the private sector as a possibility to use the know-how and experience of the private partner. One company selected both options.

All companies had already submitted applications showing an interest in implementing a PPP for energy rehabilitation projects for buildings or for projects to modernise public lighting, ranging from two to ten times; on average, on six occasions. In 83% of cases, the PPP procedure was actually initiated on the basis of the applications submitted. Five companies still have an interest in collaborating in a PPP.

We find the traditional way of financing investments in energy efficiency (by way of public procurement) is still dominant, except in urban municipalities where slightly more PPP procedures are used.

RQ2: What are the key reasons for the relatively poor development of EPC by using PPP in Slovenia?

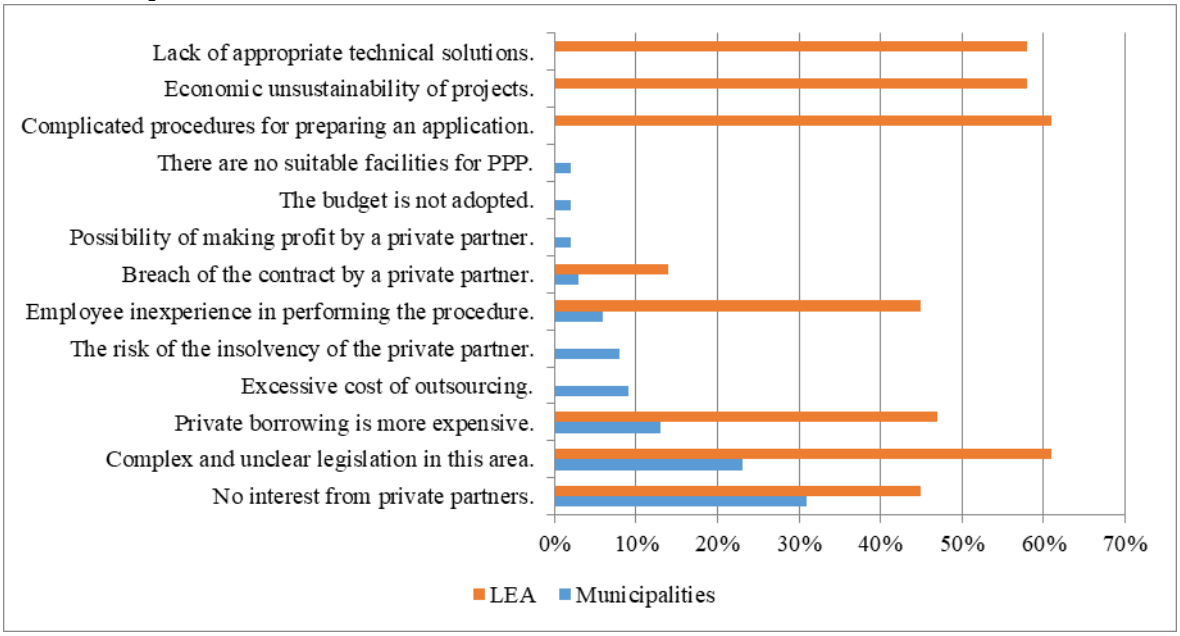
Only one-third (28%) of the municipalities think PPP is the best way to finance projects in the field of energy efficiency, with more than half of them (57%) holding the opposite opinion. As a main advantage, the respondents indicated the relief and allocation of public funds to other sources (24%). On the other hand, four of six LEAs think that PPP is more appropriate. They see advantages in transferring risks to the private sector, the ability to exploit the know-how and experience of the private partner, and accelerating the development of public infrastructure. The ESCOs also highlighted the same advantages. On the other hand, the ESCOs emphasise the public procurement procedure is faster, it is simpler to prepare an offer and the private partner bears fewer risks. The Centre for Energy Efficiency (CEU) thinks that PPP is a more appropriate way of financing for the public sector, but not for companies. The CEU believes the benefits of PPP are being able to accelerate the development of public infrastructure and the cheaper and/or better implementation of activities. They consider that, from the public sector perspective, it is important that energy savings are guaranteed.

Concerning the reasons for not using PPP in the field of energy efficiency, the opinions of the municipalities and the LEAs are very close: both put in first place the lack of private partners' interest, and for important reasons also the complex and unclear legislation, more expensive borrowing to private partners and excess outsourcing

costs (Figure 2). For the ESCOs, the primary reasons for not using a PPP are the complex and long procedures for preparing the application and (similar to the municipalities) the complex and unclear legislation (Figure 3).

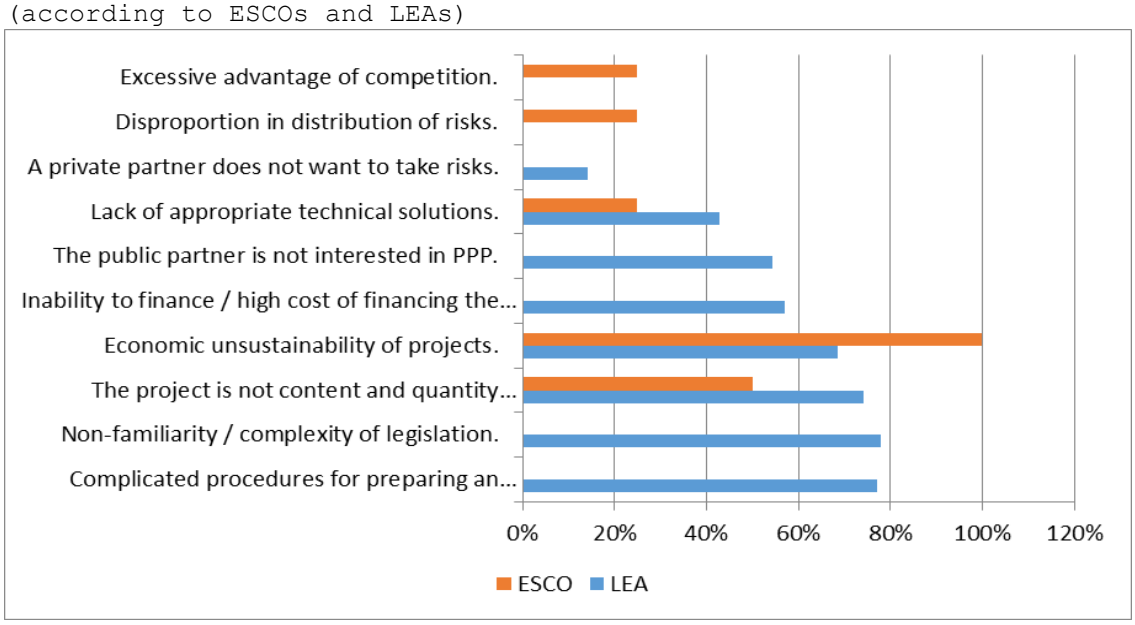
In addition, accounting is a major problem (EPEC, 2016) since in the case of a PPP the recording on the public partner's balance sheet affects municipalities' public borrowing, thereby constituting an obstacle to implementing the PPP. Juricic (2015) states that indebted countries, including Croatia, are intensively trying to find models for the delivery of public projects, as well as energy savings projects that will not increase public debt. According to the rules of Eurostat, a risk assessment is necessary. Assets can be classified outside the balance sheet of the public partner only if it is demonstrated with a sufficient degree of certainty that the private partner carries the majority of risks associated with the asset and the specific PPP and is also entitled to the majority of benefits from the PPP. In limiting the risks, the indirect transfer of risk to the public partner must also be taken into account (e.g. guarantees, guarantee financing, contractual penalties etc.). The public partner can bear the risk of uninsurable risks; the risk of a rise or a drop in the insurance premium should be borne by the private partner and not transferred to the public partner, possibly by adapting the availability or demand fee (Eurostat, 2016).

Figure 3: Reasons for the low PPP use in the public sector (according to municipalities and LEAs)



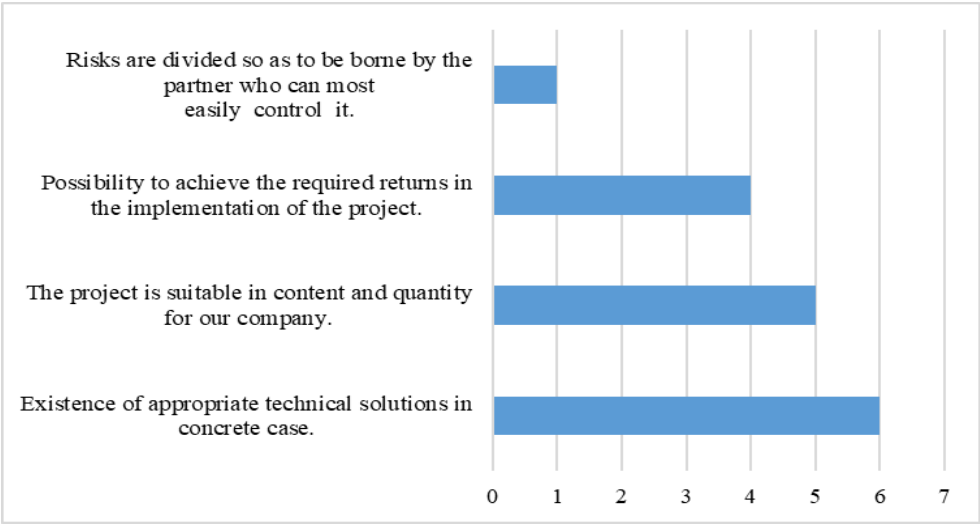
The CEU contends the reasons public partners do not decide on PPP include the inexperience of employees to implement a PPP procedure, excess outsourcing costs, the lack of interest among private partners, and non-compliance with or breach of the treaty obligations by a private partner. The situation in which only one ESCO applied for a public tender was also mentioned which, as a 'monopolist', can set its conditions for completing the project.

Figure 4: Reasons for the low response of companies to PPP tenders (according to ESCOs and LEAs)



Among the conditions that had to be fulfilled to apply for PPP calls, all the ESCOs indicated the existence of appropriate technical solutions. Five (of six) ESCOs required that the project is suitable in both its content and quantity for the company. The possibility of achieving the required returns in implementing the project is important for the four companies. One company stated that another condition is appropriate risk-sharing (borne by the partner that best manages them), while one ESCO stated that a condition is to have a competitive advantage (Figure 5).

Figure 5: ESCOs: Conditions for applying for a PPP tender



Therefore, the most of survey participants believe that the lack of interest among private partners is the biggest reason for not using a PPP. Other obstacles are the complex and unclear legislation in this area; the fact that borrowing to private individuals is more expensive than borrowing by the state or the local community, and the overwhelming cost of needing to hire in external experts.

RQ3: What are the problems encountered by municipalities in implementing energy rehabilitation through PPP?
Problems have occurred in 70% of municipalities, where 70% of the problems involved a violation of the agreement by the concessionaire (delays in implementing the investment, inadequate or delayed reporting, failure to achieve the planned savings, difficulties with controlling the performance of the concession contract due to non-participation of the concessionaire etc.).

Other problems are insolvency of the concessionaire and problems controlling the performance of the concession contract due to a lack of staff on the public partner side.
27 % of municipalities had sanctioned a private partner (contractual penalties, cancellation) and 64 % of municipalities had not sanctioned a private partner regardless of a contract violation. Other municipalities had only issued warnings to their private partners.
Further, 17% of municipalities stated they had encountered violations of the concession agreement relating to savings, and 17% of municipalities indicated problems with controlling the performance of the concession agreement due to non-cooperation of the concessionaire.

An important problem in PPP EPC projects is the failure to achieve the targeted savings. In the municipalities' opinion, the reasons for this lie in an incorrectly or inaccurately prepared tender, errors in implementation, errors in operation and maintenance and also due to a reduction of the subsidy for electricity generation.
Municipalities therefore encounter most problems with contract violations with the concessionaire (delays, reporting problems, failure to achieve savings, control problems etc.). Other problems arising while implementing a contract are the concessionaire's insolvency and difficulties controlling the performance of the concession contract due to a lack of staff in the public sector.
The results of the municipal surveys also point to two problems, namely non-sanctioning of the concessionaire: notwithstanding a contractual violation, 64% of the municipalities did not sanction the private partner, while 9% only provided an official warning. Another problem is that 13% of municipalities find it difficult to control the performance of the concession contract due to a lack of staff in the public sector; such problems are not negligible since they are also encountered by larger municipalities.

Conclusion and Policy Implications

In order to promote EPC which contributes in the long run to cutting energy use and thus to tackling climate change, we decided to write this article on the state of EPC in Slovenian municipalities, the reasons for not using EPC, and the difficulties encountered by municipalities and ESCOs.

We believe EPC is a perfect option for implementing investments in energy efficiency measures affecting public infrastructure, even when a problem of insufficient public budget funding exists. We believe

that EPC is a better option for the public sector and for society as a whole than any option that is without investment and thus retains the energy-wasting state and the unjustified higher energy use.

We found there is unused potential in Slovenian municipalities for achieving energy savings, and that the traditional way of financing energy efficiency investments (via public procurement procedures) is dominant, except in urban municipalities where a few more EPC through PPP procedures are implemented. Municipalities already implementing EPC projects have found problems with contract violations by the concessionaire (delays, reporting problems, failure to achieve savings, control problems etc.), but the majority of private partners involved have gone without any sanction. There were also problems in controlling implementation of the concession contract due to a lack of staff in the public sector. However, these problems do not discourage the use of EPC, with the key reasons for this being the lack of interest among ESCOs and the complex and unclear legislation.

The ESCO's lack of interest – in addition to the long procedures needed to prepare an application as well as the complex and unclear legislation – is likely to be associated with a small number of them as they only apply for those projects that appear to be the most profitable. A primary reason for the weaker implementation of PPPs (EPC) is therefore the small number of ESCOs willing to participate in PPP procedures in the Slovenian market. The ESCOs in the survey attribute this to a lack of knowledge about the PPP model, the lack of staff in business, the insufficient equity available for investments, banks' weak support in borrowing, the absence of knowledge of this specific field and lack of trust in systemic sustainability (legislation, state control institutions etc.). ESCOs would rather respond to public procurement calls because those procedures are faster, preparing an offer is simpler, and they bear fewer risks.

The CEU believes that major problems are the monopoly position held by some of the larger ESCOs, the knowledge concentration within them, the high risks of entering market competition, the capital inadequacy of companies wishing to enter the ESCO market, the lack of standardised solutions and the high administrative costs.

The state government encourages the development of EPC (with the aim of fulfilling its own commitments) in various ways: by allocating some financial incentives for EPC implementation, applying measures to optimise the functioning of energy systems within energy contracting etc. The Action Plan envisages the establishment of a legal, professional and technical support office for running EPC projects at the national and local levels together with the provision of financial support: in 2020, 80% of all financial support for the energy rehabilitation of public buildings will be targeted at promoting EPC (Ministry of Infrastructure, 2015). Financial support is also tendered for ESCOs in the form of reversible funds and loans, ESCOs are also justified to use consultancy services.

We believe that establishing an ESCO association would importantly assist the development of EPC in Slovenia. It also follows from the practice of other countries that it is vital to ensure the easy acquisition of funds for the financing of EPC and interest rates that support the economic viability of projects (for example, forfeiting).

Given that the biggest problem is the lack of interest among private partners, there are several ways to attract private partners. At the time of implementing a contract, it is crucial to establish an appropriate measurement and verification mechanism (e.g. the IPMVP Protocol) so that the public partner can successfully identify the private partner's performance and ensure the risk is not actually transferred to the public partner.

Regarding the further development of EPC, we found that incentives and support exist at the state and EU levels. According to the municipalities' planning, we can expect the increased use of PPPs for the past period (2007–2017): in implementing the energy rehabilitation of facilities (a 15% increase) and for updating public lighting (an 18% increase).

However, effective models and a standardised contract should primarily be developed to ensure fair and effective contractual relations and to thereby attract private partners to EPC. Municipalities should adequately train staff or assist themselves by relying on experts from the LEAs. In the end, we must unfortunately conclude that, despite the wide and written declarations made about saving the planet, the decisive role is still played by money. If both municipalities and ESCOs are able to see satisfactory financial benefits from energy renovation projects, they will opt for EPC, and otherwise will avoid them.

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