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Authors and contributors

The PROMINENT-MED Consortium consists of the following institutions:

Partner Name	Country	Acronym	Authors and contributors
BAIXO ALENTEJO INTERMUNICIPAL COMMUNITY	Portugal	CIMBAL	Pedro Pacheco, Beatriz Maio
CITY OF KOPRIVNICA	Croatia	KOP	Maja Balaško Kiš, Manuela Licul Martinčić (external procurement expert)
CONSORCI DE LA RIBERA	Spain	RIBERA	Plàcid Madramany Sanchis, Mª Isabel Serrano Cantó
CSTB	France	CSTB	Frédéric Bougrain (coordinator of the deliverable and main author)
IRRADIARE	Portugal	IRR	Elsa Nunes, Sofia Martins
MUNICIPALITY OF NARNI	Italy	NARNI	Pietro Flori
POLYTECHNIC UNIVERSITY OF VALENCIA	Spain	UPV	José Badia, Amparo Ribes, José Manuel Navarro and Víctor Cloquell
REA NORTH	Croatia	REAN	Denis Premec, Ivan Šimić, assist. prof. dr. sc. Bojan Milovanović (external technical expert)
SVILUPPUMBRIA	Italy	SVIL	Diego Mattioli

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Why PPI for energy efficiency in small municipalities?

Energy consumptions in municipal buildings

In Europe the built environment accounts for the largest share of greenhouse gas emissions in terms of energy end usage. It represents about 36% of Europe's national emissions. Its share in the total energy consumption is also the highest with 40%. To deal with this environmental challenge, various policies have been launched by European governments. Under the impulse of the European Union, new directives have been proposed to reduce energy consumption in buildings. On the demand side, regulation and public procurement are complementary policy tools. While regulation has been used for many years to improve energy efficiency, public procurement still appears under-used.

For municipalities, buildings and public lighting usually account for a large share of energy consumptions (e.g. respectively 76 and 18% in French municipalities in 2012– ADEME, 2014). Public procurement and the way procurement processes are shaped provide local authorities with significant opportunities to modernise and improve the energy efficiency of their aging infrastructure.

By orienting their procurement strategies toward new solutions that improve the energy efficiency of buildings / public lighting, local and regional authorities can reduce CO_2 emissions and contribute to sustainable development. Public Procurement of Innovation is one solution for small municipalities to address the challenge of climate change by purchasing products, services, and works with high environmental performance.

PPI can help overcoming the bottlenecks for reducing energy consumption in buildings owned by small municipalities. With PPI, a public authority acts "*as an early adopter and buys a product, service or process that is new to the market and contains substantially novel characteristics*" (European Commission, 2018b: 8). In a sector such as construction where public authorities are frequently the first users, it is also important to show to innovative firms that the public demand for innovation exists.

The challenge: making small municipalities credible

The credibility of small municipalities regarding the efficiency of public procurement is hindered by at least three barriers:

- **The capability gap**: it is recognised that small public authorities lack expertise and experience with complex purchases. There is frequently a gap between the capabilities held by these public authorities and the skills required for procuring innovative solutions. There is frequently nobody at municipal level with enough knowledge to assess, propose and decide on actions in the energy field. Consequently, small municipalities are mainly risk-averse and tend to secure reliable procurement outcome. Criteria such as delivery period and price become priority when awarding contracts for equipment or renovating public buildings. "The economically most advantageous tender" is seldom promoted.
- **The difficulty to attract external consultants:** the lack of internal competences could be overcome by hiring external expertise. However, small municipalities seldom buy immaterial services and private consultants prefer to work with large municipalities that have larger resources. Moreover, their offers are frequently standardised and not adapted to actors with limited resources.
- **The difficulty to attract large market players**: small municipalities have limited resources and are overlooked by most suppliers and contractors who focus on large markets. Consequently, call for tenders tend to attract less candidates. However, this element is not systematically a disadvantage if small municipalities are able to demonstrate that there are opened to

innovative solutions and do not favour contracts with established and large firms that provide them with more technical and financial guarantees.

SMEs/start-ups can bring new ideas and provide opportunities in terms of innovation, competitiveness, environmental impact and local employment (Clement et al., 2016). They usually lack references. Thus, there are not systematically for the big market. They just want to increase the marketability of their new product(s)/service(s). They have also less experience with public procurement but are looking for credibility. PPI launched by small municipalities could represent this opportunity. Moreover, the bureaucratic process that scare SMEs is also lighter within small municipalities.

Thus, small municipalities can have advantages over larger city councils when it comes to innovation. Their size means that they are more agile. It is easier to take decisions and to respond to innovation opportunities. Organizational 'silos' that characterize large organisation and prevent communication and cooperation between departments, do not exist in small municipalities.

Dividing *"contracts into smaller lots to make contract requirements more achievable to SMEs (and less attractive to bigger companies)"* (Clement et al, 2016:50) is also an approach encouraged by the European directive.

Why this guidance?

Researchers, practitioners and policy makers have shown a great interest on PPI. Several guidelines presenting different but complementary approaches have been issued over the last five years:

- some focus on market engagement (Watt, 2017);
- sectoral approaches (water, transport and health) have also been developed: WaterPiPP (2015) focused on the water sector, TRANSFORM (2015) on transport and Nordic Healthcare Group (2016) on the health sector;
- most guidelines are general (Semple, 2014; Clement et al., 2016; EAFIP, 2016). The EAFIP toolkit with three modules offers the most detailed and achieved guidelines in this field. The European Commission (2018b) emphasises on the necessity to build a step-by-step learning process and to start with simple and practical problems.

These guidelines which provide a comprehensive overview of the key steps to follow to implement an innovation procurement process, are not made for small municipalities. The objectives of this guidance developed during PROMINENT MED is not to reinvent the wheel but to offer practical assistance to procurement officers working for small municipalities and dealing with building projects. It is recognised that small authorities frequently lack expertise and experience with complex purchases. There is a gap between the capabilities held by small municipalities and the skills required for procuring innovative solutions. Due to this lack of knowledge, aspects such as delivery period and price becomes priority when awarding contracts for equipment or renovating public buildings. The concept of "the economically most advantageous tender" is seldom at the agenda. The use of external expertise could be one solution to overcome this capability gap. However, small municipalities seldom buy immaterial services. Similarly, private consultants prefer to work with large municipalities that have larger resources. Consequently, their offers are seldom adapted to actors with limited resources.

This guidance aims at reducing the capability gap by providing small public authorities guidelines to ease the adoption of innovative procurement practices. The pilot projects will serve as case studies. The presentation of the cases will be instrumental (Baxter and Jack, 2008). It will provide insight into

PPI and play a supportive role to any future contracting authorities by facilitating their understanding of the process to follow and the pitfalls to avoid. Each case will not be presented in detail. The goal is twofold:

1. to illustrate each step of the PPI by an exemplary approach followed by one of the municipalities involved in Prominent MED;
2. to provide a good framework for public procurers who lack experience and intend to develop decision making skills.

The focus on small public authorities is not the single specificity of this guidance. The second originality is the emphasis on the built environment which represents a huge part of the economy. The construction activity consists of much more than merely on-site production. It encompasses other value-adding activities such as: "1*/ Upstream - manufacturing, mining and quarrying, architectural and technical consultancy, business services. 2/ Parallel - architectural and technical consultancy. 3/ Downstream - real estate activities.*" (Barrett et al., 2007: 3).

If the site activities linked to construction and renovation are considered, then construction represents about 6% of GDP. But it goes up to "*10% if parallel and upstream activities are added in, or 20% if downstream activities are included*" (Barrett et al., 2007: 4).

The total value of public procurement in the EU representing about 19% of European GDP. The improvement of public infrastructures (such as buildings and roads) represent a large percentage of this value. Indeed, managing public buildings represents a core task among municipalities and other local authorities.

Definitions

The last version of the Oslo Manual which is the reference for analysis dealing with innovation, proposes a general definition of innovation that is applicable to all institutional units or entities: "*An **innovation** is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)* – OECD and Eurostat, 2019: 60*).*

If the focus is on the Business enterprise sector, "*a **business innovation** is a new or improved product or business process (or combination thereof) that differs significantly from the firm's previous products or business processes and that has been introduced on the market or brought into use by the firm"* (OECD and Eurostat, 2019: 68)

"*The **minimum requirement for an innovation** is that the product or business process must have one or more characteristics that are significantly different from those contained in the products or business processes previously offered by or used by the firm. These characteristics must be relevant to the firm or to external users. For example, the firm may expect the new or improved characteristics of a product (or business process) to increase utility for users or to enhance its own competitive position in the market. Relevant characteristics are described below for product innovations and business process innovations*" (OECD and Eurostat, 2019: 69).

Innovation procurement concerns either **Pre-Commercial Procurement** (PCP) or **Public Procurement of innovation** (PPI). "*PCP means procurement of research and development services involving risk-benefit sharing under market conditions, and competitive development in phases, where there is a separation of the research and development phase from the deployment of commercial volumes of end-products*" (European Commission, 2014: 12). *"PPI is procurement where contracting authorities act as a launch customer for innovative goods or services which are not yet available on a large-scale commercial basis, and may include conformance testing"* (European Commission, 2014: 12).

Structure of the guidance

To be a good source of inspiration, this guidance will follow a step-by-step approach that goes from preparation and planning to the selection and evaluation of the tenders. Each step is closely inter-connected with the others. For example, the selection of the procedure depends on the results of the market engagement which is linked to the needs identification. The contract implementation stage which is considered as the last stage of a procurement procedure will not be examined since the stages that precedes the execution of the works are at the core of PPI. The aim is to propose a step-by-step approach focusing on:

- Preparation and planning
- Market engagement
- Selection and implementation of the procedure
- Selection, evaluation and notification of the tenders

The key issues associated to each of these stages will be presented (table 1).

Table 1: The four public procurement of innovation stages

	Preparation and planning	**Market engagement**	**Selection and implementation of the procurement procedure**	**Selection and evaluation**
Key issues	Needs identification	Market analysis	Analysis of the procedures	Award criteria
	Creation of the project team	Preliminary market consultation	Dialogue with the economic operators	
	Definition of specification			

The case studies will serve as a common thread to explain public procurers how to address each step of the innovation procurement process.

As a prelude, a focus will be given to the context and the history of each pilot project and to the organisation and governance of the small municipalities involved in PROMINENT MED. The aim is to help future decision makers and practitioners and to provide them with contextual elements to benchmark their situation with PROMINENT MED projects.

To conclude this guidance, the main lessons learned during the public procurement innovation implementation in MED countries, are exposed.

The context: the municipalities and the pilot projects in a nutshell

Croatia – The renovation of a kindergarten at the city of Koprivnica

The city of Koprivnica has 33 000 inhabitants on 90 km². 66 civil servants work for the municipality which has an annual budget of €29 800 000 (2018). It owns 46 public buildings amounting to 53 000 m². The annual energy consumptions due to municipal buildings is 2 330 000 kWh and the budget dedicated to energy consumption per year is €270 000.

The city of Koprivnica is setting new standards for the energy efficiency of its building stock. A new development policy adopted in 2011 requires that all new public buildings be constructed to low-energy or passive building standards.

The pilot project concerned the extensive transformation of a prefabricated kindergarten (net area: 820 m²) built in 1982 (prefabricated wooden ground floor building with solid foundation - 75 % of gross area) and expanded in 1995 (masonry ground floor building annex with solid foundations). The building was never renovated, had high energy consumption and was approaching the lifetime end. Moreover, this pilot project could serve as a proof of concept and become a reference for future similar building renovations.

Italy – The renovation of a school the municipality of Narni

The municipality of Narni has 19 252 inhabitants (2017) on 197 km².

The identified building was the school "Gianni Rodari" located in Narni. It hosts about 200 people (pupils, teachers and assistants). The school has a net floor area of 1248.83 m² and was built with a structure in reinforced concrete. The slab is in brick blocks combined with reinforced concrete.

Portugal – The renovation of the historical city hall at the municipality of Mértola

The municipality of Mértola has 7274 inhabitants (2011) and 269 civil servants. It owns manages 94 public buildings amounting to a total estimate surface of 18 819m²[1]. Mértola is a town with a very important past where archaeology and heritage issues are very important.

The building is operated as a service building with work areas, meeting rooms and support areas. It presents an occupation of 8 hours daily for 5 days a week. The building has an area of 685.40m² and energy consumptions of 80.712,00 KWh/year, representing 31,5 tCO_2/year. The building has no air conditioning. The roof is inclined in tile however it has a zone in simple glass. Moreover, in its basement the building has a Roman museum. This museum was created in 2004 and belongs to a group of museums mainly located in Mértola's historical centre.

The selection of this specific building was due to the energy efficiency regulation concerning heritage buildings. Most traditional technologies cannot be implemented. Consequently, PPI appeared as a solution to answer to the technical challenge and to meet the heritage buildings requirements.

Spain – The transformation of a old factory in the municipality of Alzira

The municipality of Alzira has 44,488 (2016) inhabitants. It is a member of Consorci de la Ribera (CRIB) formed by la Ribera Alta and la Ribera Baixa which are associations of 47 municipalities gathering more

[1] Based on the municipality records. It must be considered that around 10 % of area data is missing.

than 300,000 inhabitants. Consorci de la Ribera is used to deal with joint procurement purchases such as electricity or natural gas for several municipalities.

341 civil servants work for the municipality which has an annual budget of €37.000.000. It owns 55 buildings (municipal offices and warehouses, primary schools, winter/summer pools, sports centres, a house of Culture...) covering an area of 110 km². The annual energy consumptions due to municipal buildings is 4.676.988 kWh (2016) and the budget dedicated to energy consumption per year is €612.723,00 (2016).

The old orange storage building is located in Alzira. The existing construction dates from 1891 and has a constructed area of 992 m² in a single diaphanous plant. The main body of the building is formed by a single floor. The gabled roof (height of 10.05 m) was recently rehabilitated by removing the fiber cement plates and replacing them with insulating and fire-resistant panels.

Step 1: Preparation and planning

Needs identification

"*The need comes from a gap in the ability of the public sector to perform one of its tasks; public authorities cannot fulfil them with their internal resources and that is why they need to purchase external support*" (European Commission, 2018a: 17).

Needs identification (the problem to solve) constitutes the base of PPI. This stage offers the opportunity to public buyers to reconsider their approach. Instead of replacing their outdated equipment with the most up to date one and renewing their expired service contract, they must identify the function which is missing to carry out their activity.

Needs identification has an impact on the procurement procedure since needs may be satisfied without launching a procurement procedure. Once the needs are identified, the question is whether the potential solution is available on the market.

Identifying the needs starts with a discussion with end-users who are best placed to pinpoint the inefficiencies of the service/process that is delivered. Involving the end-user is important for the future implementation and acceptation of the future solution. The end-users and people working for the contracting authority contribute to define the scope of the project and avoid purchasing needless equipment or services.

Involving the end-users is also of paramount importance in building renovation aiming at improving energy efficiency. Indeed, the users' understanding of the building and their active involvement in the operation is of high importance to achieve energy goals. However, involving them is quite complex since they have seldom any technical competences.

Discussion with the end-users was systematically encouraged and adopted in the different pilot projects:

- In **the city of Koprivnica** two separated focus groups of end users were involved: one group gathering kindergarten personnel and another interested parents. Each group had to give answers based on previously prepared questions. Then, end-users were free to propose their ideas. All answers were documented and compiled.
- At **the municipality of Mertola**, two separated focus groups of end users were involved in needs identification: the municipality staff and the building users. Each group had to give answers based on previously prepared questions.
- At **the municipality of Narni**, the final users of the buildings (teachers, assistants, pupils, parents) were interviewed.

However, the focus groups were not always reactive. Most of the needs were determined by the project team instead of end-users.

The approach used at **the municipality of Alzira** was different since the factory was going to be completely refurbished and the service provided by the building would be new. Consequently, the citizens of the municipality of Alzira were consulted to declare their expectations. They chose that the future use should be a youth social building. This turned into the necessity of having a bright diaphanous open area for multiple uses, with an energy efficient mind-set and a high acoustical insulation.

All municipalities indicated that needs identification required time, but the discussions strengthen the links between the stakeholders of the projects.

Creation of the project team

Among the stakeholders, t is crucial to identify the actors who will compose the project team. The efficiency of this managerial approach relies on:

- The appointment of a project manager who will bypass traditional hierarchies and services with different targets. For example, the renovation of a school may involve several departments (education, building construction, maintenance and operation, urban, financial, public procurement, etc.) who pursue frequently contradictory objectives. Consequently, the project manager must belong to the contracting public authority and be recognised for its experience and expertise.
- The gathering of experts with complementary competencies: According to Georghiou et al. (2014), those who commission procurement are either the most important enabler or barrier of innovation procurement. Difficulties are due to a lack of expertise and experience with complex purchases. There is frequently a gap between the capabilities held by public authorities and the skills required for procuring innovative solutions. There is no need to gather specific competence when procuring off-the-shelf goods while greater competences are required when procuring innovative solutions (Yeow et al., 2015). To overcome this barrier, it is central to enrol experts specialised in the subjects connected with the procurement. In the field of PPI, subjects are frequently new. Consequently, relying exclusively on internal employees may hamper the success of the preparation phase. External experts are usually better placed to deal with the complexity attached to PPI. They usually act as facilitators and intermediaries between public bodies and innovative SMEs which often do not work together. This issue is particularly central for small municipalities who have limited human resources.
- The definition of the roles and responsibilities of the members of the project team for a better coordination: the public demand is frequently fragmented. This is due to lack of coordination among functional departments that buy goods or services separately. This reduces the purchasing power and the impact on the market of public authority (Yeow et al., 2015). This poor intra-organisational interaction can hamper the decision process and the relationships with the suppliers. The lack of coordination before the call is a problem for the buying organisation during the procurement process which may require new organisational routines.

The creation of the project team appears even more sensitive for small municipalities which are characterised by a lack of internal staff with relevant qualifications. Thus, there is a need to firstly identify the key people who may be involved in the project and the professional ability which are missing. External resources must be hired to compensate this gap. Hiring external expertise is also complex because most consultancy firms prefer to work with large municipalities resources and tend to propose standardised services.

All municipalities involved in Prominent MED never experienced PPI. Thus, PPI appeared complex for the procurement departments. The assistance of exterior consultants specialised in PPI was necessary. In the four pilot projects, internal and external experts were gathered to compose the project team. Municipalities used the services of external consultants for both legal and technical aspects of building renovation. The project manager worked either for the municipality or the association of municipalities. The case of **the municipality of Alzira** illustrates this situation:

The internal project team was composed with several actors:

(i) The Department of urban participation did a survey to define the use of the building;

(ii) Engineers and architects defined the technical requirements (most involved),
(iii) The legal/procurement service examined issues dealing with the implementation of PPI,
(iv) The innovation department followed up the implementation of the project,
(v) Major and councillors brought their political support.

External organisations supplemented this project team:

- Consorci de la Ribera (CRIB), the association gathering 47 municipalities (Alzira is one of them);
- The Polytechnic University of Valencia;
- TECNALIA, a leading private technology centre in Spain.

The involvement of these different actors changed during the evolution of the projects:

- CRIB oversaw the administrative procurement procedure;
- CRIB-UPV-TECNALIA took part to the following steps: Analysis of needs, definition of requisites, market engagement, performance of TOR and evaluation tools, analysis of bids;
- CRIB-UPV monitored the works

Different resources were involved at each step of the PPI process. Costs also changed according to the stage concerned:

<table>
<tr><th></th><th>Needs identification</th><th>Market engagement</th><th>Market consultation (from the publication to the selection of the best offer)</th><th>Works</th></tr>
<tr><td>Duration of the task (starting date to the end)</td><td>May 2017-March 2018</td><td>November 2017-March 2018</td><td>March 2018/ February 2019</td><td>April 2019-July 2019</td></tr>
<tr><td rowspan="3">Cost (human resources)</td><td>CRIB: 14,000€ + 3,120 € (experts)</td><td>CRIB: 8,000€ + 7,280 € (experts)</td><td>CRIB: 21,300€ + 7,500 € (experts)</td><td>CRIB: 9,200€ + 5,000 € (experts)</td></tr>
<tr><td>UPV: 4,980 € + 2,400 € (experts)</td><td>UPV: 11,620€ + 5,600 € (experts)</td><td>UPV: 38.280 €</td><td>UPV: 25.520 €</td></tr>
<tr><td colspan="2">City of Alzira: 3,000 €</td><td>City of Alzira: 2,000 €</td><td>City of Alzira: 3,000€</td></tr>
<tr><td>Costs (events such as seminars…)</td><td colspan="2">CRIB: 3,500</td><td>CRIB: 3,500</td><td></td></tr>
<tr><td rowspan="3">Internal people involved (full time)</td><td colspan="2">CRIB: 2</td><td>CRIB: 2</td><td>CRIB: 2</td></tr>
<tr><td colspan="2">UPV: 2</td><td>UPV: 4</td><td>UPV: 4</td></tr>
<tr><td colspan="2">City of Alzira: 0.5</td><td>City of Alzira: 0.2</td><td>City of Alzira: 0.5</td></tr>
<tr><td>External people involved (partially involved)</td><td>2</td><td>2</td><td>2</td><td>2</td></tr>
</table>

Definition of specifications

"*The purpose of the specifications is to set out to the market a clear, accurate and full description of the contracting authority's needs, and thus to enable economic operators to propose a solution to meet those needs*" (European Commission, 2018a: 59).

The technical specifications are essential for the success of the procurement since they provide economic operators who intend to prepare a tender, the information they need to participate.

The European Commission distinguishes three main types of specifications:

1. "*The input-based specification is a series of instructions on how to execute a determined task*." In this situation, the public buyer describes the detailed solutions that he expects. The economic operators who will answer to the tender will not have any incentive to propose a solution that exceeds the minimum requirements set by descriptive technical specifications. Indeed, this solution would probably be more expensive. Thus, they will propose less innovative solutions that fit the minimum requirements and have better chance of success.
2. "*The output-based specification focuses on the desired outputs or deliverables in business terms, rather than on detailed technical specifications of how the outputs are to be provided*."
3. "*The outcome-based (or result-based) specification (…) is a description of a need and a statement of expected benefits rather than a description of inputs and deliverables*."

   In these last two cases, the public buyer does not bear the responsibility for the quality and performance levels. It is the responsibility of the economic operator to reach a better performance. To be successful, the public buyer must have a good knowledge of the market potential.

The outcome-based specification in Alzira

The case of **the municipality of Alzira** illustrates this outcome-based approach:

The renovation of the former factory was centred on the acquisition and installation of innovative windows that could respond to the following outcome-oriented requirements:

- To maximise the use of natural light;
- To minimise heat gains in summer and take advantage of solar gains in winter;
- To provide ventilation (either by opening windows or integrating ventilation system);
- To guarantee soundproofing (Acoustic insulation);
- To ensure the quality of the assembly with the opaque envelope;
- To limit maintenance and cleaning costs;
- To minimise waste and consider the life cycle of the installation;
- To provide security against vandalism.

Step 2: Market engagement

The market engagement stage comes once public procurers have identified their needs. It is used to inform economic operators about the forthcoming procurement but also to examine whether the needs previously identified can be fulfilled by the market. The aim is to go away from the routine while most procurements are perfunctorily procured. "*Market engagement breaks down barriers between customers and suppliers to the benefit of all concerned"* (Whyles, 2018).

The market engagement stage comes also just before the procurement procedure. It helps to prepare it. It is a way to examine the market acceptance of the contractual conditions envisaged during the procurement. The information obtained during the exchanges with the supply chain and influences the choice of the procedure. For example, if no solution is available on the market, investments in R&D through Pre-Commercial Procurement or innovation partnership may be explored.

Market analysis

Public authorities have seldom a good understanding of the organisation of the supply chain for an innovative solution. The market analysis aims at circumventing this limit and providing public authorities with a good knowledge and understanding of the potential solutions available on the market to satisfy their needs. It allows public authorities to obtain information on the key suppliers, the maturity and capability of the market, the prices.

The market analysis strongly depends on the fragmentation of the market. In oligopoly situations, it is easy to identify all the suppliers. Conversely, when markets are fragmented, it is almost impossible to identify all the competing companies. For example, in every country the number of energy suppliers is very limited while the suppliers of energy audit are infinite. In such situation public authorities do not need to identify all suppliers. A market analysis based on a representative sample of the market provide reliable information on the current technologies, the market trends and the pricing practices. This analysis does not require to meet suppliers. Professional websites, press publications, trade associations, internal departments dealing with the issue are the main sources of information (European Commission, 2018a). At this stage, there is no need to meet the suppliers.

The project team in **the municipality of Alzira** carried out a very precise **market analysis** which can be considered as a model. The project focused on windows and other elements aiming at solving the facade openings were selected. Different components were identified: window frames, glazes and possible shadowing systems. The municipality expected innovations on any of these three elements, individually or in combination, considering the use of innovative materials or innovative structural elements in the windows.

Finally, the project became centred on the acquisition and installation of innovative windows that could respond to the needs of the contracting authority (cf. the outcome-based specification in Alzira). Information was not publicly available but a database with more than 200 companies was compiled (161 suppliers and 50 installers). Information on their location in Spain (Andalucía, Aragon, Asturias…), size (micro, small, medium and large enterprises) and market (carpentry, shadowing and glass) provided the public authority with a very precise vision of the market. The maturity of the technology was also evaluated, and available solutions were classified in three categories: 1/ traditional; 2/ introduced in the market for the last three years; 3/ Not available on the market yet.

Public and private entities such as clusters of companies, professional associations, technological platforms which had close contact with the construction market were also listed and considered as influencers. With this detailed market analysis, the municipality of Alzira perfectly understood the potential solutions available on the market to satisfy its needs.

Preliminary market consultation

Market engagement is considered by most public authorities as new and many of them do not use this possibility because they fear to distort competition and to violate the principles of non-discrimination and transparency. However, the role of market engagement is not to distort the rules of the game but to break down barriers between public procurers and suppliers to the benefit of all concerned.

Preliminary market consultation is even recognised and encouraged in legal documents. The European Directive on public procurement (2014/24/EU) clearly mentions preliminary market consultation in its article 40: "*Before launching a procurement procedure, contracting authorities may conduct market consultations with a view to preparing the procurement and informing economic operators of their procurement plans and requirements*." The information provided during the exchanges between the market and the public authorities must be available to all economic operators in order to avoid providing anybody with an unfair advantage or disadvantage.

These consultations:

- *"Brings the supply-side perspectives to a procurement process*
- *Gives the supply chain advance information about forthcoming procurements (suppliers need time to innovate)*
- *Tests the reaction of the market to a proposed requirement*
- *Helps you to design an effective pro-innovation procurement approach*
- *Provides invaluable insights to potential suppliers – helps them to differentiate their offering on factors other than price*
- *Reduces the risks borne by the suppliers and convinces them that this is something worth investing in"* (Whyles, 2018)[2].

Public authorities must convince suppliers that their demand is credible to attract them. It can be demonstrated through several ways (Whyles, 2018):

- The demand must be genuine;
- The organisation must be committed, professional and thoughtful;
- The public authority must demonstrate suppliers that the market could be wider. Indeed, implementing the innovative solutions may be complex and time consuming. However, if the solutions can be duplicated, then the investment may be worth it.

A wide range of tools can be used by contracting authorities to communicate with the markets: A market sounding prospectus to assess the reaction of the market to a proposed requirement, prior information notice (PIN), webpages, site visits and market consultation workshop.

The city of Koprivnica used most available tools to inform the market about its renovation project:

Webpages: The project team launched a bilingual pilot project web page (in Croatian and English language), containing all technical and legal information concerning the future renovation of the kindergarten. This was a helpful way to keep suppliers up to date and engaged.

Prior information notice without call for competition was published in the Croatian National Official Journal and in Tenders Electronic Daily (16 and 26 March 2018). The PIN must be published between 35 days and 12 months prior to the publication of the contract notice or invitation to candidates.

[2] A large part of this section is based on the international webinar organised by CSTB in February 2018 with Gaynor Whyles, a leading European expert on innovation procurement, as the main speaker in this workshop.

The Market Sounding Prospectus was published simultaneously with the PIN. The aim was to provide advance information of requirements and open a dialogue with the supply chain. It indicated that the results would "*be used to inform and develop the procurement specification and strategy to later carry out the tendering process for the requested solution and works*." The municipality informed suppliers about its needs: "significant improvement of the energy efficiency, indoor space functionality, childcare, learning and play environment quality." The prospectus also explained suppliers that they were expected to equally participate and express their interest. "*This market sounding is an opportunity for potential suppliers to inform the City of Koprivnica of the options and solutions available to address introduced challenge. The City of Koprivnica will define the framework of the future procurement based on this market sounding and exchanged information with the supply side*." Finally, the prospectus presented the indicative timeline of the project (from the PIN to the Proposed period for construction works in July/August 2019).

Questions and Answers: Potential suppliers were also invited to ask questions by sending an e-mail to the public authorities. Answered questions were regularly collated and published (without the suppliers' details) on a public website.

Expressions of Interest is part of market sounding exercise aimed to provide advance information of requirements and open a dialogue with the supply chain. Suppliers were invited to fill out an Expressions of Interest Form (Market Response Form) which started the market research and dialog with potential suppliers. By filling out the form, they also registered for project site visit and Market Consultation Workshop. Expressions of Interest were collected until the end of June 2018.

Site Visits: The City of Koprivnica organised three site visits to enable suppliers to examine the pilot project location and building.

A Market Consultation Workshop was organised under the name "*Innovative pilot project for extensive transformation of a prefabricated building*". It was hosted by the Croatian Chamber of Economy in Zagreb. 60 participants (project designers, suppliers, contractors, local authorities, educators/faculties, etc) attended the event. It presented requirements for the energy-efficient extensive transformation of the kindergarten, innovation examples of development and implementation of ECO-SANDWICH® house. Moreover, suppliers who never experienced PPI, had several questions about this procurement approach. For public authorities, it was the opportunity to explain the challenges of the project and discover the technological solutions available on the market to address the energy challenge. It allows them to assess the reaction of the market and to get an idea of perceived barriers. After this stage, they decided to reduce the ambition of the project because they realised that it was not possible to reach all environmental targets with the budget. All the suppliers who participated, received a report on the results of the workshop.

The main challenge for the city and its partners was to attract contractors and to demonstrate that the renovation of the kindergarten would not be unique. For this specific purpose, representatives of 127 cities in Croatia were interviewed and the research revealed that at least 25 similar buildings exist in Croatia. None of these buildings were ever renovated. Moreover, almost 60 cities and municipalities, owning prefabricated or similar buildings, and other public business entities expressed an interest for the project and asked information about possible solutions. Furthermore, the Ministry of Construction and Physical Planning recognised the importance of the pilot project, expressed the support and appointed its project team member. The Ministry closely monitored this pilot to assess the possibility of replication of the approach adopted during Prominent MED.

With these actions the municipality showed suppliers that there was an opportunity to develop and/or test new products or processes within this project and later capitalise the effort on the market. For example, the designed solutions may be applicable not only to this kindergarten but also to similar ground level buildings or even smaller buildings (prefabricated or masonry one)

Step 3: Selection and implementation of the procurement procedure

The choice of the procedure for PPI strongly depends on the former market analysis which provides the procuring authority with information on the structure of the market and solutions available on the market, the definition of specification and the time and resources available for the procurement.

Table 2 shows how the different steps are interacting with each other. Once the needs have been identified, the question is to know whether a solution exists on the market to satisfy these needs. Then the choice of the relevant procedure depends on the ability of the contracting authority to establish technical specifications with sufficient precision.

Table 2: Factors influencing the selection of the procedure

<table>
<tr><td colspan="5">Sufficient knowledge of the market to define requirements for end-solutions?</td></tr>
<tr><td colspan="2">Yes</td><td colspan="3">No</td></tr>
<tr><td colspan="2"></td><td colspan="3">Preliminary market consultation (Art. 40)</td></tr>
<tr><td colspan="5">Need R&D services prior to procurement?</td></tr>
<tr><td colspan="2">Yes</td><td colspan="3">No</td></tr>
<tr><td colspan="2">Do you wish to acquire innovative products or services on a commercial scale, as part of the same procedure?</td><td colspan="3">Can a specification of the end products/services to be procured be developed?</td></tr>
<tr><td>Yes</td><td>No</td><td>Yes</td><td>Yes</td><td>No</td></tr>
<tr><td>Innovation Partnership (Art. 31)</td><td>Pre-commercial procurement</td><td>Open procedure (Art. 27)</td><td>Competitive procedure with negotiation (Article 29)</td><td>Competitive dialogue (Article 30)</td></tr>
<tr><td colspan="5">Levels of competition or time/ resources inadequate for above procedures?
Consider joint procurement or, in exceptional cases only, derogation from the directives</td></tr>
</table>

Procurement area covered by Prominent MED

Source: Adapted from Semple, 2014

Analysis of the procedure

The choice of the procedure strongly depends on the ability of the contracting authority to specify the end product / service. Adopting procedures that lead to a discussion with the bidders (a competitive procedure with negotiation or a competitive dialogue) can only be done under specific circumstances (Directive 2014/24/EU of the European Parliament and of the Council on public procurement – article 26):

i. *"the needs of the contracting authority cannot be met without adaptation of readily available solutions;*
ii. *they include design or innovative solutions;*
iii. *the contract cannot be awarded without prior negotiations because of specific circumstances related to the nature, the complexity or the legal and financial makeup or because of the risks attaching to them;*
iv. *the technical specifications cannot be established with sufficient precision by the contracting authority with reference to a standard, European Technical Assessment, common technical specification or technical reference within the meaning of points 2 to 5 of Annex VII."*

Finally, when an open or restricted procedure has attracted only irregular or unacceptable tenders, contracting authorities may apply a competitive procedure with negotiation or a competitive dialogue.

Both procedures are adapted to procure works, supplies or services which include innovative solutions. However, the competitive dialogue is favoured when *"matters such as technical specifications and price levels can be defined during the dialogue rather than being predetermined*" (Hoezen et al, 2010: 1178). Conversely, with the competitive procedure with negotiations, the characteristics of the goods or services can be specified in advance of the competition. The negotiation focuses more on the way the solutions are implemented.

Moreover, in some very specific situation needs identification and market engagement may have led to a perfect understanding of the technical specifications and the price levels proposed by the market. This situation results from extensive market research, discussions with suppliers and contractors during workshop, etc. In such a situation, the technological solutions and the prices can be described before the beginning of the tender process. Consequently, **the open procedure** becomes adapted.

Moreover, below European thresholds, different procedures can be used for the award of certain works, supply and service contracts. The thresholds of the contracts depend on the subject of the purchase, and who is making the purchase. When the monetary value of the tenders exceeds a certain amount, the EU rules apply while for tenders of lower value national rules with the respect of the general principles of EU law apply. The aim is to ensure that the award of contracts of higher value is equitable, transparent and non-discriminatory.

In the case of works contracts, the thresholds are identical both for central government authorities (national public bodies) and sub-central contracting authorities (authorities operating at regional and local level). Above €5,350,000, the EU rules apply.

Among these procedures, the competitive dialogue is particularly adapted for complex projects. The reward can be high when the candidates are willing to fully participate in the dialogue. However, public authorities must be aware that this complexity requires a high level of expertise and is time consuming. According to the European Commission (2018, 44)), "*a high level of technical expertise on the subject matter is necessary in-house for the contracting authority to carry out the procedure with the best chances of success and to be able to hold the dialogue with the selected candidates*."

For small municipalities, open procedures or other national procedures may be more adapted since transaction and organisation costs linked to the competitive dialogue are usually quite high.

Dialogue with the economic operators

The lack of interaction between procurers and suppliers is frequently perceived as a barrier to innovation since procurer supplier interaction is a major source of innovation. "*Interaction in procurement can create an environment of trust that reduces opportunism, the need for costly monitoring and general transaction costs associated with exchange in instances where there is information asymmetry*" (Uyarra et al., p.633, 2014).

With the competitive procedure with negotiation and the competitive dialogue, parties start to exchange during the procurement stage while in traditional public procurement, they start to know each other after the awarding of the contract. These discussions lead to a better understanding of a project. And contribute to the implementation of customised solutions.

During the dialogue, the selected candidates must benefit from an equal treatment. During a competitive procedure with negotiation, minimum requirements and award criteria cannot be the subject of any negotiations.

The four municipalities involved in Prominent MED implemented innovative technology systems and solutions aiming at improving energy performance of public buildings. However, they used **different types of public procurement procedures**:

1. The open procedure at the municipality of Alzira: this traditional procedure was chosen after the needs identification and the market engagement phases. Thanks to the interactions with the market during market engagement, the contracting authorities were able to obtain enough information to define the terms of reference in detail;
2. The competitive procedure with negotiation in Koprivnica and Narni;
3. The competitive dialogue in Mértola.

The competitive procedure with negotiation at the municipality of Narni

The renovation of the school required a solution which combines static safety, thermo-acoustic efficiency and multisensory quality and that did not find a precise and clear response in the current market. Thus, it was necessary to carry out a preliminary market consultation to test the market and identify any suitable product. This preliminary market consultation was successful and produced sufficient data to prepare a first set of technical specification to launch a competitive dialogue with negotiation.

After the publication of the notice for expression of interest, 104 economic operators manifested an interest. Ten were selected and were invited to submit an offer (first invitation letter in April 2019). Only three tenderers submitted their offers which were evaluated by a technical commission, which assigned them a score according to the criteria set out in the invitation letter. Subsequently, the Commission met the competitors separately, establishing a constructive comparison with them in which the needs of the authority were highlighted, in order to improve the offer. Finally, in June, competitors were invited (second invitation letter) to reformulate the offer which was again evaluated by the Commission by following the award criteria. The contract was awarded to the competitor proposing the most economically advantageous offer.

Step 4: Selection and evaluation: the award criteria

Integrating innovation requirements in the award criteria of tenders is a necessity in PPI. The shift from input to outcome implies this change. This is the only way to attract innovative suppliers who will otherwise consider that contracting authorities tend to select firms on price rather than quality. Suppliers are stimulated when the award criteria integrate innovation requirements (Edler et al, 2011).

The European Commission (2018a) distinguishes three types of criteria to choose the winning tender: 1/*Exclusion grounds;* 2/ *Selection criteria;* 3/ *Award criteria.*

Most selection criteria relate to:

a) "*suitability to pursue the professional activity;*
b) *economic and financial standing;*
c) *technical and professional ability*" (Article 58 of the European Directive of 26 February 2014).

The last criterion aims at checking that the candidates have the appropriate human resources (e.g. qualified and experienced employees) to execute the works and / or provide the service.

The municipality of Alzira asked bidders to prove recent experiences in energy rehabilitation of buildings, professional competency (relevant qualification and experience of project team), full civil liability insurance coverage, and solvency (economic viability, good standing with public administration).

With PPI, the works and the services provided are not standardised. Thus, award criteria cannot be based on the "lowest price". They must promote the "economically most advantageous tender". It is usually better to mix quantitative (e.g. maintenance costs, life cycle costing, net present value of the energy cost savings during the contract – energy simulations may be used to judge the proposed solutions) and qualitative criteria (e.g. quality of the action plan, compatibility of the innovative solution with existing systems, ease of installation…). Award criteria must be weighted in order to get the select the approach that offers the best value over the lifespan of the contract. These award criteria cannot be amended during the procurement process.

At **the city of Koprivnica**, the award criteria were the following: Price 50 % - Warranty 20 % (up to 60 months) - Innovation criteria 30 %

"Warranty" was a criterion to evaluate a Defects Liability Security/Guarantee period duration offered by the bidders.

The innovation criterion was appreciated for two outcome-based requirements (measures 1 and 2):

- **Measure 1: Remediation of all inadequate water supply and drainage system of the building**
- **Measure 2: The thermal protection of building envelope**

Measures 3 to 8 were not included in innovative evaluation, but the preferred bidder was forced to implement them.

- Measure 3: Increase of the daylight illumination of rooms by increasing the transparency the canopy
- Measure 4: Didactic and learning elements as a part of new envelope
- Measure 5: Damaged internal walls remediation
- Measure 6: New final floor layer in children's rooms
- Measure 7: High-efficiency heat energy production system
- Measure 8: Ventilation system with recuperation

Table 3: Award criteria calculation in Koprivnica

CRITERIUM NAME	MEASURING UNIT	SYMBOL	RELATIVE %	METHODOLOGY	POINTS
The Price	The price without VAT; calculated up to two decimal places [0,00]	**C**	**50,00%**	C_{Pmin} = lowest bidder's price offered C_P = price of currently evaluating bid 50,00 = the relative importance of this criterium	Score is calculated as follows: $C = \left(\frac{C_{Pmin}}{C_P}\right) \times 50,0$
nnovative pecification Measure 1	Innovative features offered? YES / NO	**MI_1**	**15,00%**	NO	0,00
				YES	15,00
nnovative pecification Measure 2	Innovative features offered? YES / NO	**MI_2**	**15,00%**	NO	0,00
				YES	15,00
Warranty Period	In months; in whole numbers, without decimal places	**J**	**20,00%**	24 months	0,00
				25 up to 29 months	2,50
				Od 29 up to 34 months	5,00
				Od 35 up to 39 months	7,50
				Od 40 up to 44 months	10,00
				Od 45 up to 49 months	12,50
				Od 50 up to 54 months	15,00
				Od 55 up to 59 months	17,50
				More than 60 months	20,00
MAXIMUM COMBINED SCORE			**100,00%**	100,00	
COMBINED SCORE IS CALCULATED AS FOLLOWS: $E = C + MI_1 + MI_2 + J$					

When Measure 1 and/or Measure 2 were offered with innovative characteristics, they had to meet or exceed the following requirements for innovative solutions:

- Measure 1: A) No invasive works in internal or external walls, except works in bathrooms. B) Minimal invasive work for new drainage system. C) No raising of the existing level of ground floor in order to carry out the plumbing and drainage system. D) Newly installed water supply system (pipes) and drainage system shall not be visible to occupants.
- Measure 2: A) Implement thicker thermal protection than possible because 75 % of external walls are wooden and hollow (sandwich walls). The maximum thickness is calculated in static analysis document issued by Faculty of Civil Engineering. B) Works must be organised to allow kindergarten to be in basic function for the users during June and from the last week of August onward.

The bidders had to describe their innovative solutions for Measure 1 and/or Measure 2 as pure technical specifications. These specifications were then evaluated as appropriate (YES in table 4) or not appropriate (NO in table 4) by Joint Evaluation Team (national procurement and technical expert).

Ten key lessons from the public procurement innovation implementation strategy in MED countries

1/ The **identification of the needs** constitutes the base of the functional/performance-based specifications. It is the prerequisite of the call for tenders. However, most building users were not reactive, and the needs were frequently defined by the municipal project teams. Despite the difficulties to reach the users, it seems important to involve them in building renovation aiming at reducing energy consumption. Indeed, users' behaviours have a strong impact on building energy performance. This involvement before the renovation may positively influence the appropriation of the building in operation.

2/ An **outcome-based specification focus** is central for the success of PPI to promote innovative solutions. Most procurers consider that they know their needs. Thus, to get the best from the market, they tend follow traditional prescriptive approaches, where the subject matter of the contract is described, specified and procured, resulting in service, supply or work with an implicit set of attributes. Under these circumstances, there is no possibility for suppliers to propose innovative solutions with good value for money for public authorities.

3/ The **market engagement** is really the cornerstone of PPI. Before the pilot project public authorities never tested the reaction of the market to a proposed requirement included in a call for tenders. This stage was particularly complex because of the fragmentation of the market in the building sector. However, municipalities handled well this stage. It allows contracting authorities to adapt their ambitions to the reality of the market and to avoid unsuccessful call for tenders.

4/ During the preliminary market consultation, the municipalities used the different tools (market sounding prospectus, Prior Information Notice, webpages, market consultation workshop) in order to present their needs and their goals and to test the appetite of the market. This approach contributed to the success of the forthcoming projects. However, it is important to keep a **proportionality** between resources engaged during market engagement and the size of the tender.

5/ Most barriers during the market engagement were caused by the **lack of knowledge and skills** of public authorities and economic operators. During workshops, it was necessary to spend time to explain suppliers the specificities of this approach. Hiring external consultants appeared positive to bring complementary competencies and reduce the capability gap.

6/ During market engagement, getting an appropriate technical feedback from potential suppliers was sometimes troublesome. This is due to the lack of experience of suppliers with PPI. Moreover, some of them apparently feared information leakage. Thus, the exchanges were sometimes restrained. To avoid this situation, public authorities must ensure **equality of treatment among all tenderers** and keep the principles of **transparency and confidentiality**. This issue is also very important during procurement procedure leading to a discussion with the bidders (a competitive procedure with negotiation or a competitive dialogue).

7/ The creation of a strong project team is a key to the success of building renovation project. Internally, it is important to identify the person who can lead the project and speak in the name of municipal stakeholders. Moreover, if PPI is a new approach, it requires to receive the **assistance of local and national experts (consultants, academic researchers…)**. These "brokers" act as intermediaries between public bodies and suppliers. All municipalities recognised that this technical and legal support was essential to face the technical and administrative issues linked to the PPI. They help them to conduct a preliminary market analysis and to gauge the technologies available on the market. These experts also contributed to the diffusion of a new procurement culture.

8/ The **award criteria** were never based on the “lowest price”. The “economically most advantageous tender” was always promoted. Municipalities used a mix of quantitative criteria (e.g. guaranty of the materials for five years, extendable to 10 years; life cycle costing approach; potential reduction in energy consumption; high-efficiency heat energy production system) and qualitative criteria (e.g. sustainable nature of the solution; innovative character of the technical systems; solutions that can promote a more suitable environment for learning; solutions that allow easy management and maintenance of the wall). However, it appears that the distribution of weights between qualitative and quantitative evaluation criteria was complex and that departing from the price criterion was not so easy.

9/ PPI deals with the promotion of innovative solutions. Defining innovation is frequently problematic for municipalities. Thus, it is important to understand that innovation does not have to be radical. Adopting radical innovation would be too risky and not fit the expectations of public authorities. Municipalities were not looking for solutions that did not exist yet. They wanted to buy solutions available on the market but not widely adapted and containing novel characteristics. The novelty was more based on **the combination of existing products** and materials.

10/ The competitive procedure with negotiation and the competitive dialogue are regularly mentioned as the two solutions to procure innovation. This is true that the dialogue and the negotiations with the economic operators tend to enhance the quality of the offers. However, when contracting authorities involve a lot of resources in preliminary market consultation to understand which solutions are available on the market, they become also more able to define the terms of reference in details. Then, the open procedure which is **less time consuming and requires less technical competences**, may become the best option.

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