Procuring innovative energy efficiency solutions for educational buildings
Rural District of Enzkreis (Germany)

Background

The Rural District Office (or ‘Landratsamt in German) of Enzkreis is a district administration located in the German State of Baden-Württemberg (south-west Germany). It covers a population of almost 200,000.

Enzkreis is a partner of the EU-funded Public Administration Procurement Innovation to Reach Ultimate Sustainability (PAPIRUS) project, which aims to promote, implement and validate innovative solutions for sustainable construction through public procurement pilot actions across four European countries (Germany, Italy, Norway and Spain). A number of purchasing actions have been piloted which involved the procurement of innovative materials characterised by nearly zero energy consumption for the repair and construction of buildings.

Procurement objectives

Enzkreis set out to refurbish the roof of a workshop building at the Mühlacker Vocational School, which houses 16 workshops for apprentices in the metal industry. The main procurement objectives were the following:

• Reduce energy losses through improving the building envelope;
• Improve energy efficiency through the installation of better energy performance windows systems.

The procurement placed emphasis on finding product solutions with an innovative character; that is, thinner roofs with good insulation properties.

Market events were conducted before the publication of the call for tender in order to inform suppliers in advance about the inclusion of innovation criteria in tenders. These took place across the four partner countries, as well as in Brussels. The Enzkreis event was held at the pilot site, making it easier for the 30 suppliers in attendance to understand the technical and structural challenges of the site.

This pre-procurement activity was an important starting point as it gave suppliers time to prepare their proposals, and provided procurers with time to gain early and specific knowledge of the market, and build knowledge on innovations, project feasibility and market capacity/capability.

Criteria used in the procurement process

Subject matter of the contract:
Mühlacker Vocational School/Workshop building roof refurbishment, including roof windows.

Selection criteria:

In order to participate, bidders had to prove that they had the necessary skills, efficiency, experience and reliability through means of self-declaration about economic and financial standing, technical and professional ability, personal situation, and their commitment to German law regarding payment of workers.
Technical specifications:

The contract was divided into two lots:

- Lot one: Roof sealing and covering, carpentry and plumbing work (opaque envelope to reduce energy losses).
- Lot two: Metal construction and glazing work (windows with high solar gains in winter and reduced heating gains in summer).

Alternative offers were not accepted. However, offers presenting a technical solution which exceeded the minimum requirements were evaluated favourably in the award criteria.

The facade and roof solutions were required to employ innovative materials, and products which used recycled materials, or materials which were recyclable at the end of the useful life.

An innovative material was defined as either new, or as already existing but substantially improved. In addition, products which have not yet reached a significant market share (below 20%), where a contracting authority can act as a launch customer or early adopter, can also be considered innovative under European Commission (EC) Decision C (2013) 8631.

Award criteria:

The contract was awarded on the basis of the most economically advantageous tender. This was based on the following criteria and weightings:

a. Energy efficiency (30 points)
b. Sustainability (10 points)
c. Installation, maintenance and others (30 points)
d. Economic criteria (30 points)

The energy efficiency criteria was comprised of the following:

- Thermal transmittance coefficient U-value: The aim of this criterion was to assess the capacity of the proposed innovative product or system to reduce energy losses through the external roof and windows of the building. The minimum predefined thermal transmittance value received the maximum 20 points, while values equal to the maximum allowed were awarded 10 points. The rest were then scored proportionally according to a mathematical calculation.

- Thermal bridges (applicable to lot one – ‘roof’): This criterion evaluated the capacity of innovative solutions to reduce thermal bridges. Maximum points were awarded to those solutions nearly completely free of thermal bridges, displaying complete continuity of the insulation layer and good treatment of special joints.

- Solar gains (applicable to lot two – ‘windows’): This criterion focuses on the capacity of windows to reduce solar gains and to increase them in winter.

The award criterion for sustainability was based on global warming potential (GWP). This assessed the environmental impact of the proposed innovative solution by calculating the equivalent carbon released during the whole life of the product, with respect to “Cradle to Grave” system boundary conditions. A product declaration of the manufacturer containing a statement about the GWP of the insulation GWP100-value (GWP for a time horizon of 100 years) had to be submitted.

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Results

The procurement notice was first published in the Official Journal of the European Union in March 2015, with a deadline of May 2015 for submitting offers. Contract execution was split into two phases due to the ongoing use of the building, with the first phase between May and September 2016, and the second phase between May and September 2017.

Due to the similar character of the tender framework under the PAPIRUS project, the contracting authorities in the partner countries were also supported by a Joint Cross-Border Evaluation Team (JCBET), which was comprised of technical and legal experts. The JCBET was responsible for answering the questions of bidders prior to the deadline for tenders, evaluating the technical offers and submitting an evaluation result report to the contracting authority.

A total of ten bids were received. Six bids were received for lot one, and four for lot two. Some of the bids were rejected for not meeting all of the requirements and in the end, one proposal was accepted for lot one and three proposals for lot two. The contract was awarded in August 2015 to a single bidder for every lot and the final values of the purchased solutions were 204,967 euro (lot one) and 324,785 euro (lot two).

The solutions contracted exceeded the demands requested in the tender and overcame the challenge of providing innovative lightweight materials for insulating the roof and glazing the windows, while at the same time, ensuring improvements in energy efficiency. The innovative aspects were not only in the materials supplied, but also in the techniques which were to be employed for the renovation works.

Environmental impacts

Buildings consume around 40% of total final energy requirements in Europe and represent around one third of Europe's CO₂ emissions. In order to reach the 90% greenhouse gas (GHG) reduction target for 2050 each building on average will have to demonstrate very low CO₂ emission levels and consume very little energy. By participating in the PAPIRUS pilot, Enzkreis has demonstrated that by considering factors beyond investment costs, it is possible to purchase more sustainable materials which can achieve nearly zero energy consumption.

Lessons learned

- Freedom to innovate can be challenging for suppliers; especially when they are used to public administrations outlining their exact requirements. Thorough market engagement is thus essential to encourage suppliers to participate in public procurement processes, particularly small and medium-sized enterprises (SMEs).
- Carrying out a joint procurement between different European countries was not possible, due to the differences in legal requirements among the various countries involved.
- Difficulties were faced in finding consolidated standards that allowed for measuring sustainability parameters in this specific field. Standard procedures should be developed and included in future tenders of a similar nature.
- Suppliers found difficulties in delivering some of the requested means of proof, such as certifications, etc. If an innovation is sought, the type of documentation requested needs to be closely considered as it can have greater impacts on the procurement process, particularly regarding products/solutions with low market penetration rates. This issue should be thoroughly considered in the preparation of future purchases.

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For related information, please see European GPP criteria for Office Building design, construction and management and the Procurement Practice Guidance Document.