PROCURA+
European Sustainable Procurement Network

Procura+ Case Study

Procuring energy saving building technologies for residential buildings

Procura+ award runner up

Procura+ Participant:	ATC Torino (Home Territory Agency of Central Piedmont)
Contract:	The supply of innovative solutions for the rennovation of the Via Monte Ortigara 3 building in Rivalta Awarded: 2015
Savings:	CO_2: 16% Energy: 42,96 MWh per Year (30kWh/mq per year) Other: total reduction across project partners of 670kWh per year

SUMMARY

- ATC Torino sought to procure technical solutions for the building energy performance of a residential building.
- In conjunction with partners from the PAPIRUS project, a market consultation and coordinated public procurement of innovation (PPI) process was undertaken.
- Contracts were awarded using most economically advantageous (MEAT) criteria, with an emphasis on energy efficiency, sustainability and life cycle costs (LCC) of products.
- In total, the innovative solutions procured by PAPURUS parters have saved over 670kWh per year.

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Background

ATC Turin (ATC) is a public agency providing social housing in the Italian province of Turin. It has been improving the environmental and energy performance of its properties since 1996.

ATC was a partner of the Public Administration Procurement Innovation to Reach Ultimate Sustainability (PAPIRUS) project - funded by European Union CIP Entrepreneurship and Innovation Programme - which aims to promote, implement and validate innovative solutions for sustainable construction through public procurement pilots with a particular focus on nearly zero energy consumption.

The PAPIRUS project consortium consisted of six partners, including four Public Contracting Entities (ATC Torino, Landratsamt Enzkreis, Sestao Berri 2010 S.A. and Omsorgsbygg Oslo) and two Research and Technology Organisations (Tecnalia and ASM). These partners each explored a pilot approach to procuring innovative materials for the renovation and construction of buildings. ATC's pilot site consisted of three social housing blocks (21 apartments) situated on the Via Monte Ortigara in the Municipality of Rivalta (a former industrial suburb of Turin).

The ATC Torino procurement process had three objectives:

1. Reducing energy losses through walls (vertical building opaque envelope) without reducing the net floor area of apartments;
2. Insulating roofs without reducing the floor to ceiling height of rooms; and
3. Providing more effective window systems which decrease heat loss and increase solar gain in winter, while reducing solar gain in summer.

ATC Torino was the runner up in the Procura+ 'Tender Procedure of the Year' award 2017 for its approach procuring building energy performance solutions.

Procurement Approach

The PAPIRUS project was based on a Public Procurement of Innovation (PPI) approach. The main challenge of a PPI process is finding the best solution to an identified problem or need, which in this case was energy performance and sustainability. By using performance-based specifications and evaluating bids against both quality and price, it is possible to facilitate the introduction of new products to the market.

Initially, PAPIRUS solutions focused on materials and technologies that:

- reduce energy losses through the opaque envelope of both new and already erected buildings;
- decrease solar gains in summer and energy losses in winter through windows and fenestrations;
- provide good quality natural daylight;
- store thermal energy shifting heating and cooling peak loads; and
- reduce CO_2 emissions in the production, construction and in-use phase.

Market engagement activities were carried out to give potential suppliers time to prepare their proposals before the call for tenders was published. This also allowed ATC time to gain more knowledge of the market, such as the availability, cost and possible practical implications of the different alternatives/solutions. As a result of the market engagement, thermal storage material and

natural lighting providing technologies were ultimately excluded from the procurement process due to lack of feedback from the market, and lack of economic efficiency.

The remaining applied technologies were then advanced as independent lots in a tender, and an open procedure was carried out to award the contract.

This purchase concerned a public supply contract of products for subsequent building refurbishment works. Delivery of the refurbishment works was not part of this tender, and was organised as part of a separate process. It was specified that the winning bidder of the public supply contract would have to interact with the main contractor for the refurbishment stage.

Criteria used in the procurement process

Subject matter of the contract

The supply of innovative solutions for the façade, attic insulation and the replacement of windows and doors for the Via Monte Ortigara 3 building in Rivalta (Turin).

Selection criteria

Bidders were required to provide clear proof of their economic and financial standing, and their technical and professional ability. If they were to rely on the capacities of other entities (such as sub-contractors), proof of the technical, financial and professional reliability of other entities was also required.

Technical specifications

The tender was divided into three lots in order to make the participation of small and medium-sized enterprises (SMEs) easier. These were as follows:

- Lot one: Integral façade solution to reduce energy losses through the building's vertical opaque envelope.
- Lot two: Partial roof solution to reduce energy losses at roof level (inner leaf).
- Lot three: Reduced solar gains in summer and increased solar gains in winter through windows.

The façade, roof and window solutions were required to have an innovative character. An innovative material was defined as either new, or as already existing but substantially improved. In addition, products which had not yet reached a significant market share (below 20%), where a contracting authority could act as a launch customer or early adopter, could also be considered innovative (under European Commission (EC) Decision C (2013) 8631).

The innovativeness of the solutions was also implicitly required through demanding values for some properties of the products. For example, required values for thermal transmittance were more demanding than in usual tenders.

Where wooden materials were used, all elements were required to be meeting the requirements of the Forest Stewardship Council (FSC) label or those of the Programme for the Endorsement of Forest Certification (PEFC), or equivalent.

Products containing hazardous substances for the environment and health were also not accepted, and products had to comply with the Classification and Labelling (C&L) Inventory of the European Chemicals Agency.

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 were available in the 'façade' and 'roof' lots, and 40 in the 'windows' lot)
B. Sustainability (10 points)
C. Installation, maintenance and others (30 points available the 'façade' and 'roof' lots, and 20 in the 'windows' lot)
D. Economic criteria (30 points)

Energy efficiency (point A) was comprised of the following sub-award criteria:

- 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. The minimum proposed thermal transmittance value received the maximum score, while values equal to the maximum value allowed (which differed according to the lot) were awarded zero. The rest of the values were then scored proportionally using a mathematical formula.
- Thermal bridges (only applicable to 'façade' and 'roof' lots): This criterion evaluated the capacity of innovative solutions to reduce thermal bridges. Maximum points were awarded to those solutions with complete continuity of the insulation layer and good treatment of special joints.
- Capacity of windows to reduce solar gains and to increase them in winter (only applicable to 'windows' lot): this evaluated the proposed window systems' ability to reduce solar gains in summer while increasing them in winter. Maximum points were awarded to systems where heating and cooling demands were reduced by more than 20% compared to standard windows.

The award criterion for sustainability was based on global warming potential. 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.

Contract performance clauses

The resulting contract for the supply of innovative materials included provisions for early termination in the situation that any environmental terms and conditions arising from the general regulations were breached.

Results

The procurement notice was first published in the Official Journal of the European Union in March 2015, with the deadline for submitting offers in May 2015.

The expected total value of the contract was €340,000 split between the three lots as follows:

- Lot one - €195,000
- Lot two - €25,000
- Lot three - €120,000

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.

The total number of submitted and accepted bids was three, all of which were for lot three. The procurement was declared void for the first two lots because no bids were received. The purchase of the solutions for lots one and two (façade and roof) were subsequently included as part of a separate tender to contract the renovation works. The requirements were formulated in a way which took into account the experiences learned through the first round of procurement (for the solutions/products).

The tender for Lot three was awarded in July 2015 and the subsequent renovation works were carried out between April and August 2016.

Sustainability impacts

Buildings consume around 40% of total final energy requirements in Europe and 36% of CO_2 emissions in the EU (source). In order to reach the 90% greenhouse gas (GHG) reduction target for 2050, each building on average will have to demonstrate very low CO_2 emission levels and consume very little energy. By participating in the PAPIRUS pilot project, ATC demonstrated that buildings can be successfully retrofitted to increase their energy efficiency, and thereby reduce CO_2 emissions, while also potentially decreasing household energy bills for residents.

A technological validation was performed to quantify and assess the improvements through the implementation of the awarded innovative solution. Physical measurements were carried out in the social housing before and after retrofitting activity using the 'blower door test method', which measures the building envelope's air-tightness. The results of the test confirmed that improvements had been realised (below), with infiltration dropping by more than 35%, and building users also reported satisfaction with the solutions and greater comfort in the home. Across the whole PAPIRUS project, more than 670.688 kWh/year have been saved by the implementation of the innovative solution awarded in the framework of the PAPIRUS project.

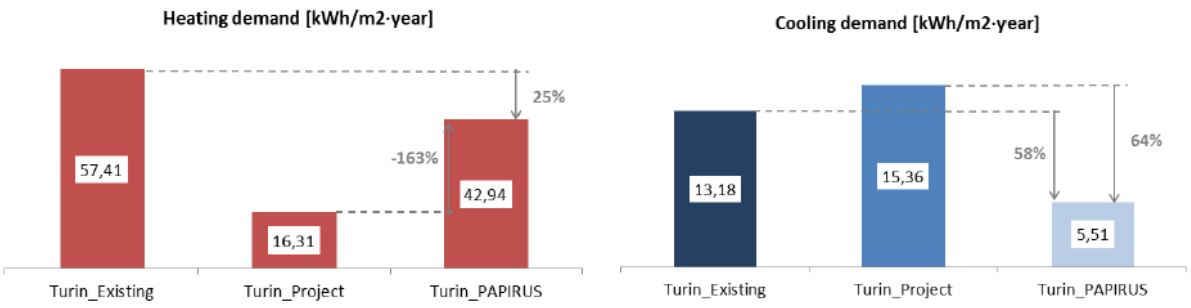

Figure 1: Normalised heating and cooling demands for Rivalta social housing

Using an innovation approach also created added value through its facilitation of organisational innovation. All the procuring entities achieved best value for public money as well as wider economic, environmental and societal benefits, and the project also addressed transparency and non-discrimination principles. The innovative approach to market consultation promoted equal treatment of all potential bidders in order to ensure that no bidder is unfairly advantaged.

The bar chart above gives a clear idea about the dramatic saving that the refurbishment project allowed to achieve. The external new coating gave the opportunity to ATC del Piemonte Centrale to save about the 16% of heating demand, but even more representative is the situation in the summer where the new selected windows grant at present great comfort to the tenants. Social housing are not provided with cooling system, although the temperature in the summer with closed windows was proved to be around 21°C instead of the average 27 °C.

The survey performed at the end of the project provided a good tenant's satisfaction also regarding the great decrease of the humanity and dampness level in the common areas and ground floor apartments.

Lessons learned

- Contracts were divided into lots in order to encourage the participation of smaller companies, such as SMEs. However, this can also have unfavourable effects when solutions which are dependent on one another (such as windows and walls) are not sufficiently taken into account. In situations like this, a system integrator would be useful, which is a role that is usually performed by a larger company. This could instead be provided by the procurer in order to retain direct engagement with the SME/provider. However, such an arrangement requires specialist knowledge and expertise, which is not always available in-house.
- 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, particularly SMEs, to come forward with solutions.
- The market engagement events carried out by ATC were also used to obtain feedback on suitable award criteria for the upcoming procurement; however, SMEs with limited experience in taking part in public procurement procedures may not have sufficient resources to engage in these types of processes. In future, it would be more effective to establish award criteria first, and then present these for discussion with potential suppliers at these events.
- The implementation of joint purchases between different European countries turned out not to be possible, due to the differences in the legal requirements for each country.
- The requirements and documentation provided as part of this tender proved to be too complex – this was the feedback received during the tendering phase. This complexity limited the innovation from the supplier's side and had consequences such as low participation in the procurement process and a poor quality of the provided documentation in the bids. For upcoming procurements, the technical requirements should be less detailed and instead specify clearly the procurement goals, with minimum requirements focusing on a functional description of the needs.

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About Procura+

Initiated and co-ordinated by ICLEI, Procura+ is a network of European public authorities and regions that connect, exchange and act on sustainable and innovation procurement.

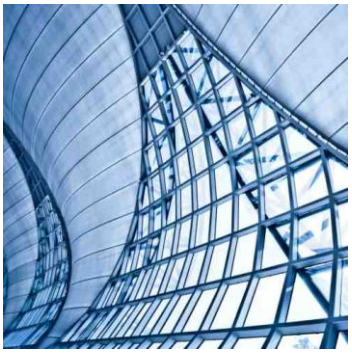
Connect.

We are a network of European public authorities that connect, exchange and act on sustainable and innovation procurement.

Exchange.

Our combined knowledge and experience allows us to provide advice, support and publicity to any public authority that wants to implement sustainable and innovation procurement.

Act.



The Procura+ Network joins forces to champion sustainable and innovation procurement at the European level.

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