

SMART SPP

innovation through sustainable procurement



Final Report

Results and achievements of the European project:

“SMART SPP – Early market creation of innovative highly energy-efficient technologies through smarter engagement with the market in the pre-procurement phase”

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1. Executive summary

Mitigating and adapting to climate change will require the development of new and innovative low carbon emission solutions and technologies for lighting, vehicles, heating and cooling systems, and ICT equipment.

Public authorities purchase large volumes of these products and services, therefore public demand can play an important role in the development and mainstreaming of these technologies and help reduce the carbon footprint of the public authority.

“Public procurement is the biggest single customer side driver that could be harnessed to catalyse business innovation activity.”

CBI Innovation Brief – Innovation and public procurement. A new approach to stimulating innovation. (October 2006)

1.1. About SMART SPP

“SMART SPP – innovation through sustainable procurement” was a three year project aimed using the pre-procurement phase of public tendering to promote the introduction of innovative, low carbon emission technologies and solutions onto the European market.

The term pre-procurement refers to the timeframe prior to the tendering for a particular product or service. Activities undertaken in the pre-procurement phase can include structured discussions between suppliers and procurers and procuring research and development (R&D) services.

With such pre-procurement activities public authorities can meet their procurement needs by accessing the innovating potential of the market. For example, a public authority may identify the purchase of a new lighting system for its office buildings with substantially reduced energy consumption as a preferable measure to reach political targets on CO₂ reduction.

Pre-procurement dialogues with technology suppliers and developers help determine how the market can offer more innovative solutions to achieve this outcome than those currently available.

SMART SPP explored this concept in practice by piloting procurement actions in Austria, Denmark, Portugal, Spain and the United Kingdom.

1.2. Procuring innovation – why?

Public authorities across Europe today face the dual challenge of shrinking budgets and ever stricter CO₂ reduction targets.

Many authorities are now recognising that to meet these challenges we need to change how and what we purchase – we need the market to provide us with new, innovative solutions which can help to cut lifetime costs whilst also lowering CO₂ emissions and offering high performance.

“All cities today are facing huge financial and environmental pressures. We can only face these by finding new, innovative and highly efficient ways to meet our needs. Opening our procurement activities to innovative solutions will help to stimulate developments on the market, and help us achieve best value for money.”

Imma Mayol Beltran, Deputy Mayor, City of Barcelona (Spain)

1.3. SMART SPP pilot actions and outcomes

SMART SPP developed and piloted a standard approach to encourage emerging technologies and solutions through pre-procurement. The approach includes methods for managing the legal and financial risks in pre-procurement, assessing the financial benefits (life-cycle costing), and calculating and communicating the CO₂-emission savings.

The approach was developed in close co-operation with a number of public authority partners and companies to ensure the outcomes of the project are as useful as possible. The results lead to practical guidance and tools.

SMART SPP Guide “Driving energy efficient innovation through procurement – A practical guide for public authorities”

The Guide provides practical advice for public authorities on how to procure in an “innovation friendly” way. It will help you to achieve the most innovative, energy efficient and cost-effective solutions for your needs.

Recommendations are provided on:

- **Engaging the market before you tender** – Consulting with suppliers can help you determine what solutions the market may be able to offer. Informing suppliers of intentions in advance will ensure the market can respond effectively to your demands.
- **Defining your needs** – Don’t tell the market how to achieve your needs, ask it to tell you. Describing your needs in terms of the performance you want, and not prescribing the technical solution itself, allows the market to offer creative, innovative solutions.
- **Building the right team** – Make sure you have the appropriate technical, legal and management skills within the procurement team. If not available in-house, consider bringing in external assistance.
- **Evaluate offers intelligently** – Use award criteria to encourage suppliers to offer highly energy efficient performance. Use life-cycle costing (LCC) to assess not just the purchase price but the total cost of ownership.
- **Manage the risks** – Ensure the technical, organisational and financial risks connected with innovative procurement are properly assessed and minimised.

Life-cycle costing (LCC) & CO₂ assessment tool

An Excel tool has been developed which allows procurers to assess the full life-cycle costs of different products – considering:

- Purchase and installation costs
- Operating costs (for example, electricity, fuel and/or water consumption)
- Maintenance costs
- Disposal costs
- Taxes, subsidies and other costs

The tool also allows for an assessment of the CO₂ emissions related to the different products.

The tool may be used as part of a tendering process, as a contribution to developing a business case, or to analyse the current situation.

SMART procurement in action

The City of Barcelona (Spain) purchased ten electric vehicles charging stations, and launched a pilot test for energy efficient, healthy and fair trade vending machines. In both cases specifications were drawn up after extensive market engagement, including supplier seminars where plans and solutions were openly discussed. Both pilots will now be rolled out more extensively.



Ajuntament  de Barcelona

The Municipality of Cascais (Portugal) was tendering for LED street lighting on its main streets in 2011. The tender was developed after a two-stage dialogue process with potential suppliers including an open seminar and individual meetings with supplier indicating interest.



 **energia**
Agência Cascais energia

The Municipality of Kolding (Denmark) completed a contract for the replacement of traditional bulbs with LED lighting in office buildings schools, kindergartens and other institutions. The tender was carried out jointly on behalf of the Danish 12-City Purchasing Group in 2011. Extensive market consultation and expert input went into the development of the tender specification.

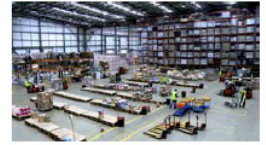


 **Kolding**
Kommune

The London Borough of Bromley (UK) carried out a pilot to install LED lighting in two office buildings in close collaboration with several suppliers. Given the success of the pilot LED will now be specified in all future refurbishments.

 **Bromley**
THE LONDON BOROUGH
www.bromley.gov.uk

The Eastern Shires Purchasing Organisation (ESPO) (UK) was awarding a contract for LED lighting for a car park in Cambridge. ESPO and Bromley have also been co-operating with the Greater London Authority on the procurement of electric vehicles. A framework contract for charging points has already been awarded through a competitive dialogue process.



“By engaging actively with the market, we have discovered that there are suppliers who understand the need to demonstrate solutions which clearly indicate how quickly capital costs can be recovered and how real carbon footprint reduction can be achieved.”

Dave Starling, Head of Procurement, London Borough of Bromley

Exchange and networking

Furthermore, the project enhanced networking and collaboration among public purchasers, developers and suppliers. Awareness raising seminars and study visits were organised and an online platform on innovation and sustainable procurement is available on: www.smart-spp.eu.

2. Introducing the SMART SPP project

“SMART SPP – innovation through sustainable procurement” is about the pre-procurement phase of public tendering to promote the introduction of innovative, low carbon emission technologies and solutions onto the European market. SMART SPP wanted to:

- Bring new innovative highly energy-efficient environmental technologies onto the market through the pre-procurement process to expand the EU product market.
- Enhance mutual awareness, networking, collaboration and foster the capacities among public purchasers and suppliers of innovative highly energy efficient technologies.
- Develop, test and revise a common integrated approach for public authorities in the pre-procurement phase. This consists of guidance for early market engagement and pre-procurement in public authorities, a tool to assess the life cycle costs and to assist public authorities to calculate and communicate CO₂ savings.
- To test the common integrated approach in the pre-procurement and tendering phase done by public authority partners and associate partners of SMART SPP.
- Disseminate the activities and results of the project through online portal, events & training.

SMART SPP has been recognised as a leading initiative in the field of innovation through sustainable public procurement (SPP) across Europe over the last years. This can be particularly seen as the implementation phase of the project was also taking place in Austria, Hungary, Finland, USA, Australia and Greece. The Guidance and Tool developed and available online at <http://www.smart-spp.eu/guidance> have raised considerable interest among public authorities, including national governments and are seen as much needed support.

2.1. Context

Innovation is widely recognised as central to Europe’s future economic development and international competitiveness. The European Commission has for this reason recently published a new strategy for promoting innovation within the EU – Innovation Europe (COM(2010) 546). This strategy strongly highlights the potential role it can play as a launching customer for new technologies and the potential benefits for the public sector in opening up procurement activities to innovative solutions.

SMART SPP is aimed at assisting public authorities in becoming “innovation-friendly” – that is achieving the most innovative, energy efficient solutions within their procurement actions, particularly through increased dialogue with suppliers and producers. An “innovative, energy efficient solution” can be considered as one which meets your needs with substantially increased

energy efficiency leading to reduced related emissions of CO₂ equivalents (CO₂eq.) in comparison to currently available solutions.

Having clear data on both the potential CO₂ emissions reduction, and the costs over the lifetime of new innovative energy efficient technologies or solutions, is vital in making informed procurement decisions and in effectively balancing cost with improved environmental performance.

Acquisition costs are only one part of all costs that an authority pays for a product. Maintenance, operation and disposal may cause higher expenses than expected.

Innovative solutions

Many promising new technologies which offer cost and environmental benefits are available on the market today.

For example

- Lighting systems such as LED office and street lighting, organic-LED lighting and lighting tubes,
- Highly energy efficient electric vehicles (passenger cars and light duty vehicles),
- Intelligent, energy efficient vending machines,
- Heating/cooling systems using renewable energy sources.

The SMART SPP project provides real examples of public authorities purchasing cutting-edge products, and has developed tools to help others do the same.

Why encourage innovation through procurement?

For your organisation

Encouraging innovation in procurement basically means trying to find the solution that best meets your needs – in terms of performance and cost. From the point of view of the public authority, encouraging energy efficient innovative solutions in procurement can mean:

- Using your resources more efficiently and getting the best possible solution
- Helping to meet local/national targets – for example on energy efficiency and CO₂ emission reductions

For society

Taking a wider perspective, public procurement can be seen as a potentially significant driver of innovation on the market. Meeting the challenges of climate change will require significant technical progress to achieve more energy efficient solutions for the needs of society. “Innovation” can mean a

variety of things – from the development of a completely new technology, to the new application of an existing technology, or a new service approach for meeting your needs.

As a major consumer, the public sector has a considerable potential in acting as a demand-side driver for encouraging innovation in both products and services. Major business associations such as Confederation of Business Industry (CBI) in the United Kingdom (UK) also back this: “Public procurement is the biggest single customer-side driver that could be harnessed to catalyse business innovation activity.”

In Spain, for instance, there are different strategies tackling the SMART SPP objectives. On the one hand, the Science and Technology National Strategy mention the need of taking measures to help the market penetration of research and development (R&D) results. Moreover, the National Innovation Strategy includes public demand as one of the five main areas to support innovation. Concretely, it sets the objective of mobilising 100,000 million euros towards a new economy by 2015.

“Encouraging innovation” covers a range of different scenarios within the procurement area:

- An authority wishes to act as a “launch customer” for the best available products on the market, and thereby encourage their greater market penetration.
- An authority wishes to purchase a product or service with an energy efficiency performance better than the market is able to currently provide, which would require certain small improvements in technology or new applications for existing technologies, but would not require major R&D.
- An authority wishes to purchase a product or service with an energy efficiency performance substantially better than the market is able to currently provide, and which would therefore require major investment in R&D.

Engaging the market

Moving away from traditional solutions, requires a new approach to procurement – one open to engagement with the market. An approach designed to:

- help procurers identify what innovative solutions may be available,
- help the market to understand the needs of the authority.

Early market engagement – undertaking a dialogue with the market before tendering – has been embraced by many European public authorities, using a variety of different approaches.

“I think that the most important aspect for having joined the SMART SPP project is that Barcelona has increased cooperation and dialogue with the market.”

Mar Campanero i Sala, Sustainable City Council Programme, Barcelona City Council

SMART solutions

To help public authorities who wish to procure the best the market has to offer SMART SPP has developed a:

- Guide to procuring innovation, including different ways to engage with the market, and a
- Tool to calculate the life-cycle costs and CO₂ emissions of products (LCC-CO₂ tool) so that procurers can assess the true costs of a product throughout its lifetime and its related CO₂ emissions

Cities all across Europe have successfully put SMART sustainable procurement into practice in their purchases of innovative solutions in the fields of electric mobility, indoor and outdoor lighting systems and vending machines.

2.2. Activities

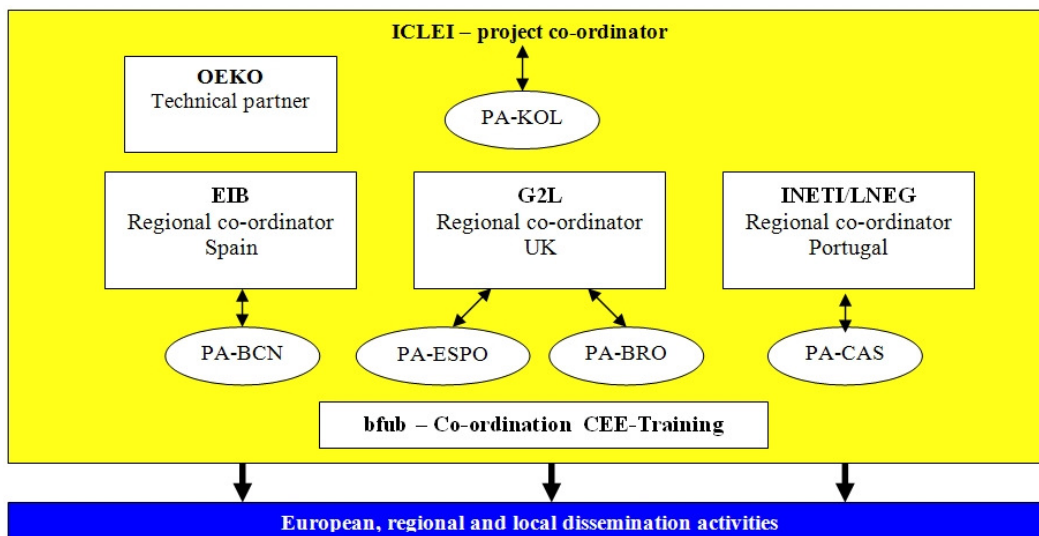
SMART SPP was characterised by the fast development of the practical guide how to drive innovation through sustainable procurement (pre-procurement guide) and the development of support tools such as the LCC-CO₂ Excel Tool and User Guide. The idea behind SMART SPP was to have enough time for testing and implementation which has been achieved completely and thanks to the commitment of all partners from research institutions and public authorities.

During the second half the project moved to implementation leading to eight tendering processes being done or having been prepared during the project (three more than having envisaged). The key experiences with the SMART SPP approach have influenced the final guidance and have been used in an array of dissemination activities including international and national conferences, a promotional video, comprehensive newsletters and a case study series.

2.3. The project consortium

The below figure describes the composition of the consortium. The rationale behind this was based on the requirements to successful implementation of the developed common integrated approach on procurement of innovative highly energy efficient technologies such as:

- Close contact to the participating public authorities to guarantee successful implementation and provide a better understanding of national policy and legislation. It will also assist with any language barriers;
- Involving technical experts with a professional knowledge pool in required topics such as pre-procurement, risk management, LCC and CO₂-monitoring;
- Sufficient implementation partners (public authorities) to guarantee European wide transferability;
- A balanced composition of public authorities implementing the common integrated approach that have sufficient experience in SPP but at the same time represent different types of public authorities such as purchasing organisations (ESPO), big cities (Barcelona) and smaller cities (Kolding) across Europe.



2.4. Associate partners

Public authorities that have made a commitment to participate in the implementation phase of the SMART SPP project are Associate Partners. These Partners piloted the Integrated Common Approach (developed through the project) and tendered for sustainable innovative technologies and solutions using pre-procurement approaches.

These are:

Municipality of Torres Vedras is located in the district of Lisboa, Portugal (in the north) and has a resident population of over 75,000 people. Torres Vedras will tender for LED street lighting and energy efficient electric vehicles and will join the two Portuguese project partners - INETI and the Municipality of Cascais - in regional activities.

www.cm-tvedras.pt



The Greater London Authority (GLA) **GREATERLONDONAUTHORITY**

is the city-wide governing body for London, England, which is responsible for the strategic administration of the 1,579 square kilometres of Greater London. It shares local government powers with the councils of 32 London boroughs and the City of London Corporation. www.london.gov.uk/gla/

Prove Consultancy is specialised in the topic of public procurement and state aid in Austria. Prove assists public authorities in procuring service contracts and in the implementation of procurement contracts oriented towards innovation, sustainability, social responsibility and small and medium sized enterprises (SME).

smart-spp-austria.blogspot.com



The WienWin (Vienna wins) initiative has a two tier objective aimed to create a systematic exchange of information between Vienna's municipal administration and companies owned by the City of Vienna on the one hand, and between innovative Viennese companies on the other hand. Jointly thinking ahead contributes to identifying innovation potential for the City of Vienna and simultaneously opens up new market opportunities for the innovation drivers of the Viennese economy. www.wienwin.at



VITE (Vienna IT enterprises) is a network and information platform for IT enterprises of all sizes (particularly SMEs) as well as for research, development and educational institutions. VITE was founded by the Vienna Business Agency.

www.vite.at



3. Results and publications

3.1. Achieved results

The project has achieved the following results:

- Partners have developed suitable pre-procurement systems in the public authorities testing the SMART SPP approach that includes, overcoming barriers towards inter-team co-operation within each organisation, linking policies and actions e.g. on climate change mitigation and informing and engaging with the market for emerging technologies.
- SMART SPP published cutting-edge guidance that has been developed, tested and revised throughout the project and is now available in four languages as print and electronic versions. The guidance encompasses: (1) guide “Driving energy efficient innovation through procurement - A practical guide for public authorities”, (2) LCC-CO₂ Excel Tool version 2.0 and (3) accompanying User Guide. Furthermore, background reports on needs and existing procurement approaches towards innovation and emerging technologies are available electronically in English.
- A case study series with five case studies from Barcelona, Cascais, ESPO, Bromley and Kolding has been published and is available both electronically and in print in four languages. It tells about the experiences of the public authority partners applying pre-procurement practises to purchase products and services such as electric charging points, LED indoor lighting, vending machines and LED street lighting.
- Having promoted the project via a manifold of targeted activities, including the (1) introductory and final results leaflets available as print and online versions, (2) a promotional video available at the project website in five languages, (3) four regional results seminars, (4) training courses addressing more than 250 procurement practitioners and (5) a final conference in Brussels.
- SMART SPP has been undertaken broad awareness-raising and dissemination activities, having published (1) six newsletters, over 10 press releases and over 300 newsbits on www.smart-spp.eu, (2) promoting SMART SPP at key European and international events, (3) establishing a SMART SPP implementation phase in Austria and (4) having organised two awareness raising workshops in Hungary and the Czech Republic.
- SMART SPP published tenders on LED lighting replacement (Kolding, joint procurement with seven other municipalities planned as a next step in 2011), electric vehicles charging points (Barcelona), vending machines (Barcelona), LED office lighting (Bromley), LED carpark lighting (Leicester), electric vehicles (GLA London), LED street lighting (Cascais) and LED street lighting in Torres Vedras.

3.2. Main lessons learned

The main lessons learnt can be summarised as follows:

- **SMART SPP brought public authorities closer to the market.** The developed guidance was seen as eye-opener, especially starting to understand the process and thinking behind the concept of life-cycle costing and CO₂ emissions assessment.
- **SMART SPP was very well managed** in regards to processes, timing, deadlines, support and documentation. Partners agree that regular phone meetings, side events at the partner meetings (such as visiting a LED street light pilot or driving an electric vehicle) and feedback loops are valuable lessons learnt and good examples for future project work.
- **The work programme of SMART SPP was appropriate**, but it took partners some time to understand the scope of the project which was solved once the draft guidance was produced after 12 months. The implementation phase (18 months), i.e. public authorities testing the approach and going out for tender, could have been longer. The composition of the project was well perceived, such as working in specific countries with technical partners and public authorities and having international expert and network organisations at hand.
- **Working in a multi-departmental project team** partners have learned more about the procedures and work tools from other areas, such as the Energy Agencies or the purchasing departments. Partners now know more about the applicable regulations in these areas and the problems and difficulties they normally face. In addition, with the participation of all departments and areas involved we have achieved that the project results have the approval of everyone concerned so we can ensure they are truly useful.
- Due to the **early stage of the pre-commercial and pre-procurement activities in Europe**, the SMART SPP outcomes have been very well received, and are seen as very practical and useful, since they are applicable at many different procurement phases and situations. SMART SPP received broad support from the European Commission DG ENV, TREN and ENTR (Innovation Union), DG INFSO among other.
- Lessons learnt include that the **visibility in the mass media is of crucial importance** to capture the attention of the suppliers of emerging innovative solutions. If the process takes place in a big city like Barcelona, the interest generated by the providers and suppliers of innovative solutions is multiplied exponentially. Although communication and dissemination within the project were very good, in future international projects partners agree involving a specialised organisation that would only dedicate their time to communication and media work. Additionally, the PR departments in the public authorities would have to be involved in the project's activities right from the beginning.

3.3. Impacts of SMART SPP

SMART SPP successfully showed how early market engagement leads to energy efficient products purchased by public authorities. Our partners at the public authorities will use the developed approach in future tendering (e.g. vending machines 2nd phase in Barcelona, joint procurement tender in Denmark on in-door lighting and public street lighting full tender in Cascais, Portugal later in 2011). ESPO and Barcelona will train all their procurement officers in using the LCC-CO₂ tool. Kolding will use the SMART SPP guidance in their National Green Cities procurement project. Global to Local will inform its client base of over 1,000 professionals in the UK about the advantages of the approach, and has already started by successfully introducing life cycle costing approaches based on SMART SPP.

Furthermore, supported by the German Federal Ministry of Environment and Environmental Agency, ICLEI and Öko-Institut teamed up to develop an html-based online version of the LCC-CO₂ tool that will be available by end of 2011.

Many public authorities such as Leicestershire County Council, Vienna and Bristol test the SMART SPP approach and have set up similar projects looking into purchasing innovative and sustainable solutions.

In summary, the results and impacts are listed as follows:

Result 1: Number of new and innovative highly energy efficient technologies in the scope of SMART SPP

Indicator 1: The 5 SMART SPP public tenders result in innovative technologies procurement with at least 3 different innovative highly energy efficient technologies

Assessment 1: The 7 (+2) tenders have showed how public authorities can drive the market. It is to highlight that the pilot of vending machines (Barcelona), the demand for LED technologies (Cascais, Uk, Denmark) and the focus on electric mobility (Barcelona) show at least 3 different innovative solutions.

Result 2: Successful meetings with public purchasers, developers and suppliers in each region

Indicator 2: Bring together at least 1 purchaser and 5 developers and suppliers per implementation partner (2 out of 5 are SMEs)

Assessment 2: Attendance at engagement seminars and events and informal meetings/telephone calls result in more than 200 contacts of suppliers and manufacturers (most of them were SMEs) as well as more than 60 public authority representatives being involved.

Result 3: Training and awareness-raising events on pre-procurement in each region

Indicator 3: In each region, 1 event in awareness-raising and training in the common integrated approach with 20-30 participants.

Assessment 3: Done in Portugal (35 participants), done in Barcelona (2 times, one over 50 participants, the other 15 participants), done in Kolding (20 participants), done in the UK (2 times, over 75 participants)

Result 4: Mutual awareness, networking and collaboration is enhanced for pre-procurement activities

Indicator 4: Guidance and assistance to public authorities during the pre-procurement and tendering is given

Assessment 4: Seven evaluation sheets have been filled out and send to the co-ordinator for taking comments into account for the completed revision phase (WP6).

Result 5: Guidance on pre-procurement is developed and used by public authorities.

Indicator 5: A guidance document on the common integrated approach available as print and electronically in four languages.

Assessment 5: 4,000 copies of printed guidance including CD-Rom in English, Spanish, Portuguese and Danish are available (also electronically).

Result 6: The guidance document including the tools is applicable and user friendly

Indicator 6: The quality level of the tools reach a high percentage of satisfaction (over 75%) within the participating public authorities.

Assessment 6: All PA partners are satisfied with the guidance, although the majority mentioned that the LCC-CO₂ tool needs a proper introduction at public authority (e.g. via training) and is not aimed to be a stand-alone document.

Result 7: Public authorities use the approaches and tools.

Indicator 7: 5 participating public authorities use the approaches and tools.

Assessment 7: All PA partners and associate PA partners have used and tested the guidance in a variety of forms such as for preparing the early market engagement seminars, assessing draft technical specifications, etc.

Result 8: Other non-project partners join the tendering using the common integrated approach for pre-commercial procurement

Indicator 8: At least 5 other public or semi-public authorities (one from Portugal) join the SMART SPP tenders or set up their own tender using the approach of SMART SPP

Assessment 8: Torres Vedras, the Greater London Authority, prove consulting, VITE Vienna, ZiT Vienna, Austrian City Association, City of Graz and Vienna joined as Associate Partners.

Result 9: There exists a certain variety of technologies tendered for in SMART SPP

Indicator 9: The variety of technologies that will be involved in the tenders consists of at least 3 different emerging technologies that are within the following sectors: construction, transport, ICT and lighting.

Assessment 9: The tenders include at least six technology groups (LED lighting systems for office, outdoor and signal lights, electric vehicles charging infrastructure, electric vehicles (passenger cars and supply cars), vending machines.

Result 10: Yearly energy savings and CO₂ savings achieved by the purchased technologies

Indicator 10: 5-6 GWh/a

Assessment 10: The indicative assessment carried out amounts to about 5,3 GWh per annum in savings generated through electric mobility compared to combustion engines, use of 2,000 vending machines and LED indoor lighting and street lighting. The later can achieve up to 90% of savings and form the major part of savings generated through SMART SPP.

Result 11: Budget spend by the participating public authorities to buy emerging technologies

Indicator 11: 4,000,000 EUR (sum of all issued tenders within SMART SPP)

Assessment 11: About 5 Mio. EUR (street lighting Cascais, Sept. 2011), about 200,000 EUR (replacement of light bulbs, Kolding joint procurement), 190,000 EUR (electric vehicles charging points, Barcelona), about 150,000 EUR (replacement light bulbs car park UK), 0 EUR (vending machines Barcelona, because of service contract with no costs: concession). Furthermore, the planned 12 cities joint procurement in Denmark and the GLA group electric vehicles tenders will account for another about 80 Mio. EUR.

Result 12: Website and other dissemination channels/materials (details see WP 7)

Indicator 12: 10,000 visits on website per year, >2000 downloads of relevant documents from the EU-27, mainly from UK, DK, SP and POR. 4,000 copies of guidance document disseminated across Europe. Estimated 10,000 public procurers and other stakeholders reached through newsletters, leaflets, press releases and speaking at events.

Assessment 12: Over 27,000 visits since February 2009, about 2000 downloads (over 6,5 GB traffic). newsletters distributed to over 3,500 people, introductory and final leaflets distributed to more than 2,000 people, press releases send to about 7,000 people, 3,200 guidance documents disseminated (rest kept for major events in Sept. and Dec. 2011), >30,000 people reached via events

Result 13: Local and regional training take place

Indicator 13: More than 200 participants in all events and trainings

Assessment 13: 35 participants at Barcelona training, 50 at Barcelona supplier/procurer seminar, 50 in Portugal, >75 in the UK (e.g. Newcastle) and 15 in Helsinki

Result 14: EcoProcura 2010 European conference carried out

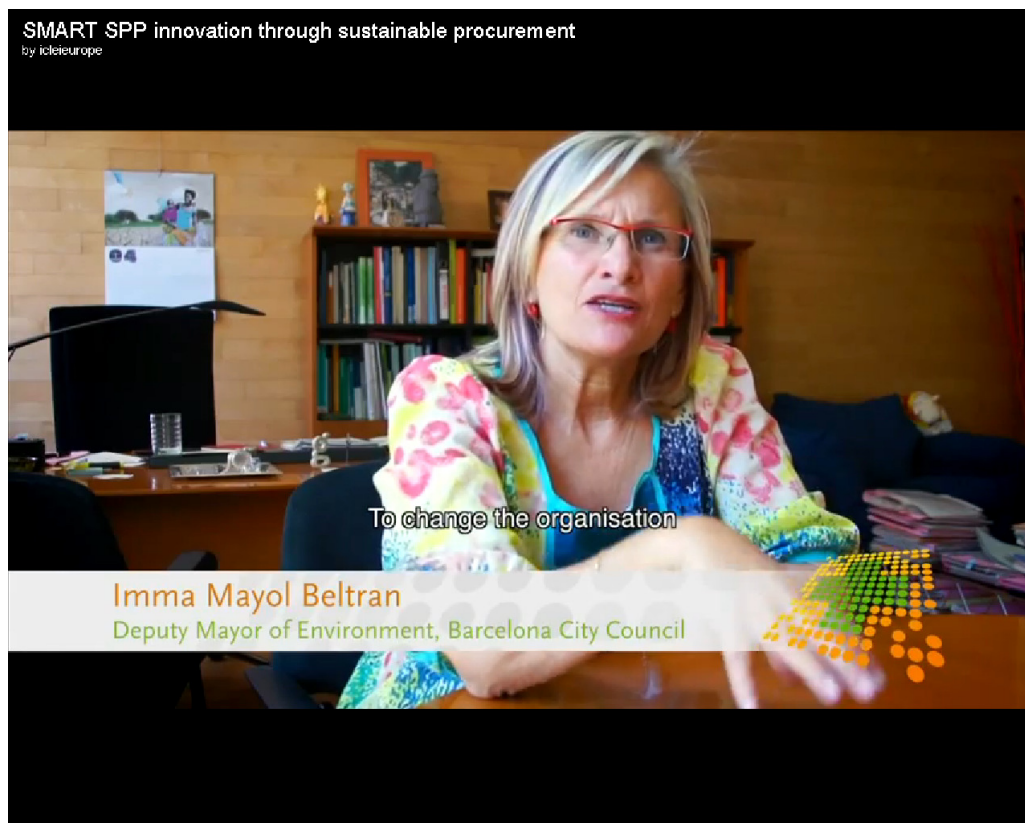
Indicator 14: More than 300 participants attend the EcoProcura conference

Assessment 14: No EcoProcura 2010 conference took place. And alternative final conference in Brussels alongside the Breakfast at Sustainability's event has reached more than 500 invitees and 70 participants.

3.4. Success stories

Listen to some of the stories and see some of the highlights of sustainable procurement in practice by the partners in Barcelona, Kolding, Cascais, Bromley and the Eastern Shires Purchasing Organisation in a short video available online at www.smart-spp.eu.

Versions of the same video with subtitles in Portuguese, Danish, German and Spanish are available on the SMART SPP website, too.

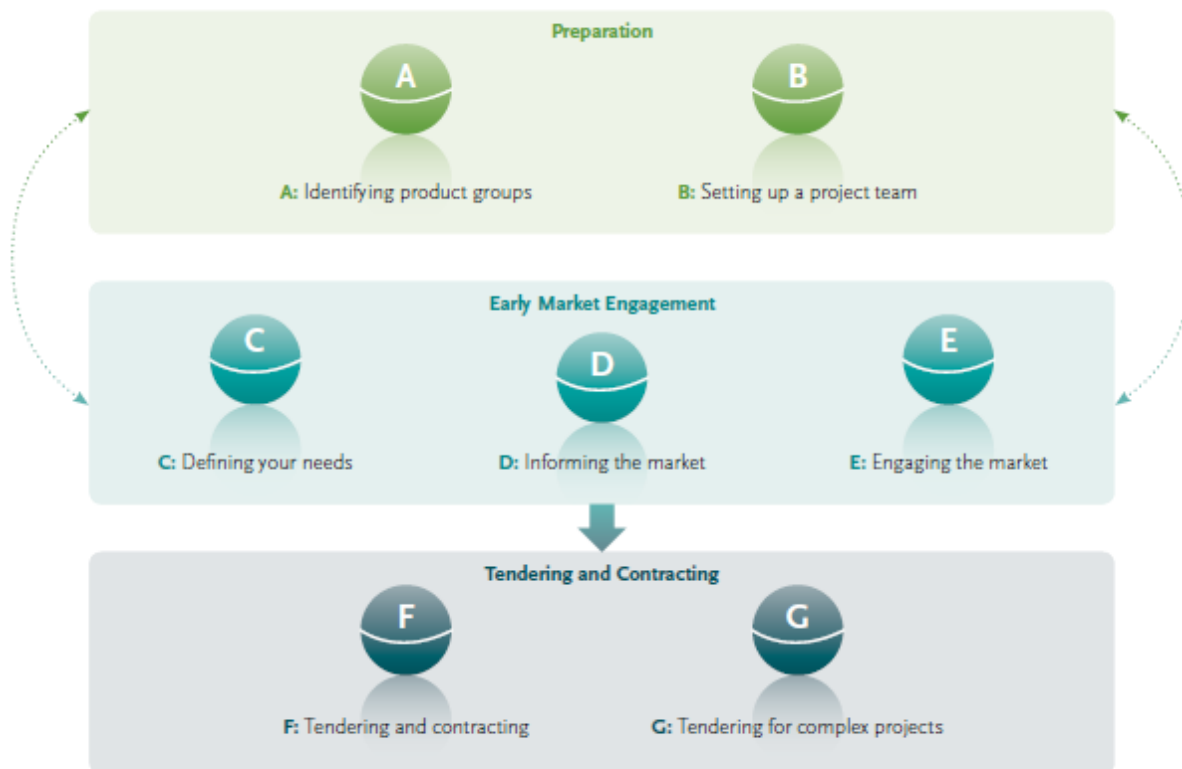


3.5. Case study series

In this case study series the City of Barcelona (Spain), the London Borough of Bromley (United Kingdom), the Municipality of Cascais (Portugal), the Eastern Shires Purchasing Organisation (United Kingdom) and the Municipality of Kolding (Denmark) share their experiences, conclusions and lessons learned.

These SMART SPP public authority partners have used a particular procurement approach (see figure below) which focuses on engaging the market effectively before tendering (early market engagement). This includes the assessment of the life-cycle costs and related CO₂ emissions of innovative products such as Light Emitting Diodes (LEDs) indoor and street lighting, energy efficient vending machines and electric mobility. This has been done before, during and/or after tendering.

The SMART SPP guidance includes a guide to procuring innovation, describing different ways to engage with the market, and a tool to calculate the life-cycle costs and CO₂ emissions of products. It can be downloaded at: www.smart-spp.eu/guidance.



Case study Barcelona City Council

1. Summary

Barcelona City Council has applied the advanced SMART SPP tendering methodology to identify the most innovative and most energy-efficient solution for the installation and management of ten on-street charging stations for electric vehicles with two charging docks in each. Although demand for electric vehicles is still modest in the city, user awareness is increasing daily and there is increasing political support for this type of transport.

After the tendering process; for the first time generating information on the environmental performance of the product; and finally, estimating the real cost of ownership of the offered solutions using the SMART SPP Life-Cycle Costing (LCC) and CO₂ Assessment Tool).

2. Background

Various departments within the City Council of Barcelona have been strongly supportive of expanding the use of electric vehicles in the city and were planning the creation of the first networks of public charging points. The SMART SPP project team in the city identified this as an ideal opportunity for testing the advanced tendering methodology developed for the project.

Before implementing the project, Barcelona already had two charging points in a street near 22@ (Poble Nou) and three on-the-street points for the car parks managed by B:SM (Barcelona de Serveis Municipals – Barcelona Municipal Services) as a test phase. However, the city planned to purchase 380 electric vehicles and install 191 charging points, both at street level and in underground car parks in Barcelona through the MOVELE project and the LIVE Plan on the initiative of the Agencia de Energía de Barcelona (Barcelona Energy Agency).

Specifically, the tender for the first ten of the planned 191 charging points for electric vehicles was selected for testing the SMART SPP approach to engage the market.

The municipal authorities already have a long history of supporting green, socially motivated and innovative contracting based on the *Ayuntamiento mas Sostenible* (a more sustainable city council) which was initiated in 2001 with the *Oficina Verde (Green Office)*. In this respect, the SMART project has added new tools to promote innovation and facilitate knowledge, introduction and acceptance of new technologies for energy efficiency.

3. Experience with the SMART SPP approach

3.1 Activity A – identifying appropriate product groups

The product for tendering was identified as *the supply, installation, integrated management and maintenance, according to environmental and energy efficiency criteria, of a network of ten on-street charging stations for electric vehicles, with two charging docks at each*. The bilateral meetings for Activity C (definition of requirements) defined the contractual management and

maintenance services (the required software for management of the service, handling connection and disconnection, maintenance of stations, resolution of faults, replacement and advertising of the service).

3.2 Activity B – setting up a project team

The development of the specifications and carrying out of the procurement process required a team which included expertise on how renewable energies work and are implemented in urban mobility projects as well as financial, legal and management expertise. The project coordinators were:

- *Agencia de Energia de Barcelona* (Barcelona Energy Agency); managed municipal investments for the installation and management of the charging points, coordinating and providing technical assessment to define the scope and description of works.
- *Area de Medio Ambiente del Ayuntamiento de Barcelona* (Environmental Department of the City Council of Barcelona); coordinated and provided an environmental assessment of the specifications.

Other bodies that provided support throughout the process were:

- Ecoinstitut Barcelona and the remaining SMART SPP team; these offered technical and legal assistance for the inclusion of environmental and energy efficiency criteria in the specifications.
- Procurement section in the *Departamento de movilidad* (Mobility Department) of the City Council of Barcelona; provided legal and technical assistance.
- District 22@Barcelona, the innovation district; offered previous pilot experience with the on-street installation of two charging stations and three parking spaces.

3.3 Activity C – defining your needs

During this phase, market consultation sessions were mainly held to identify possible stakeholders who are affected, involved and/or interested and in order to understand current service provisions.

For example, a market study was carried out by compiling contracts and holding bilateral meetings with suppliers, manufacturers and operators of these types of services (from July to November 2009) in order to gather prior information on the life-cycle costs of the support columns (essential information for application of the SMART SPP methodology): energy output of stations, composition and life-cycle cost of the materials used in the support columns, handling charging sessions, information provided for users, etc. These initial meetings are essential so that key information can be fed into the procurement process and ensure that the terminology used is comprehensible for everyone.

In parallel, the minimum functional requirements for the tender were defined. For this CITCEA-UPC were commissioned to define the technical requirements for the charging points for electric vehicles and were supporting the project with their own expertise in this subject. This included negotiations that were held with districts which were potential locations for charging stations using existing connection points to the electricity grid.

3.4 Activity D – informing the market

The aim of this was raise interest on the market for engaging with the City prior to tendering (see Activity E). This in turn should ensure that the market could meet the final specifications developed.

Promotional activities comprised the following:

- 16/05/2008. The future installation of a network of charging points for electric vehicles in order to reduce CO₂ and noise emissions published on the web site of the Energy Agency of Barcelona.
- 21/04/2009. Prior Information Notice (PIN) on procurement initiatives for innovative technologies with high energy efficiency by the members of the SMART SPP consortium.
- 31/07/2009. Official presentation of the MOVELE project by the Ministry of Industry, with broad coverage by the media.
- Start of 2008 – end of 2009. Various bilateral meetings held between suppliers, manufacturers and operators of this type of services and the Barcelona Energy Agency. These stakeholders were attracted by the city, the capital of Catalonia and a motor of change and innovation in the country, committed to environmentally friendly innovation and maximum energy performance. Companies contacted the City Council on their own initiative to provide information on their products and the operating characteristics of their services. The information obtained during these meetings was matched to the requirements identified in order to establish a basis for prior consultations with the market (see Activity E).

3.5 Activity E – engaging the market

In this case, a seminar was chosen as the most appropriate method of consultation. This allowed an open dialogue with interested suppliers to present the requirements of the tender and answer any questions, as well as discussing potential solutions.

The seminar took place on 23 November 2009 with companies and organizations involved in the manufacture, distribution and maintenance of charging points for electric vehicles invited to attend. Participation was high, with 63 participants attending who represented 32 companies, one electric vehicle association and five local organisations.

In order to facilitate the consultative part of the session, an anonymous questionnaire was filled out on the day (one per company) so as to be able to assess the ability of the market to meet the draft specifications. An open discussion was then held on these measures in order to gather information on more ambitious, future requirements. During the seminar a second questionnaire was sent via email with the aim of compiling more specific data on consumption, efficiency, etc.

15.62 % of participants replied with information on current consumption of support columns during charging and when not charging and the efficiency of the charging process; the service life of the various elements (of the support

column, spare parts, software and other pertinent elements); the possibility of obtaining life-cycle studies for the support columns and the content of recycled materials used in the column and in users' cards.

3.5 Activity F – tendering and contracting

For reasons not related to the project, the tender procedure falls under the umbrella of the State Foundation for Local Employment and Sustainability (FEOSL) 20109. This uses a service type contract model that does not allow for the assessment of environmental and energy efficiency criteria. The SMART SPP LCC-CO₂ tool could therefore not be applied in order to evaluate the best offers in terms of life-cycle costing and the reduction of emissions.

The Energy Agency, together with the Environmental Department and environmental assessment team at the Ecoinstitut Barcelona, incorporated environmental and energy efficiency criteria in the technical specifications (as technical specifications and performance criteria, in view of the limitations mentioned above), based on the feedback from the seminar. The main environmental aspects included were:

1. Service life of components in the electric charging station. Use of recycled materials in the housing of the charging points and protective components.
2. Energy consumption per charging session and information in situ provided for users (consumption or related cost) as well as the implementation of a charging profile and hourly definition of consumption (future management with time-related consumption limitations).
3. The maintenance vehicles for the charging points must be electrically powered and the type of vehicle must be specified (brand, model, registration and battery properties). Attached maintenance reports for charging points with details of kWh for the electric maintenance vehicles and kilometres travelled.

The contract was evaluated on the basis of total volume of employment, economic assessment of the offer and lead time for delivery to the temporary joint venture 'Etra Catalunya-Moncobra' which is using the charging columns of Circutor technology.

3.6 Activity G – invitations to tender for complex processes

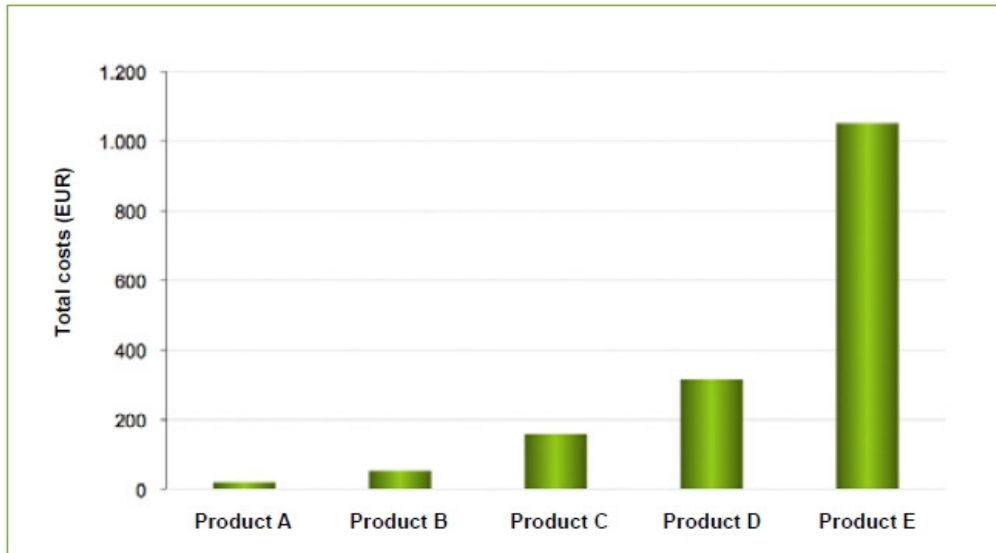
Not relevant in this case.

4. Life-cycle costing (LCC) and CO₂ emissions

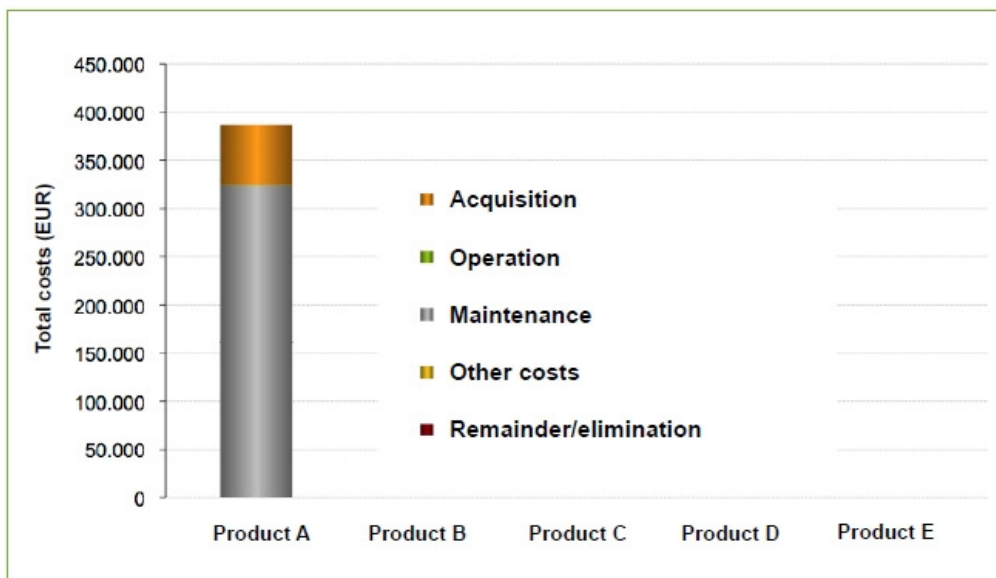
The LCC-CO₂ evaluation tool to determine life-cycle costs was used after awarding the contract since the 'service type contract' of the FEOSL does not allow modifications to be made to evaluation criteria. The main benefit of acquiring this data a posteriori is to evaluate actual costs of the new service for the short and long term and to extrapolate them for future tenders. Specifically the following was calculated:

- CO₂ costs and emission values derived from the operation of various types of support column. The annual operating costs calculated from the

consumption data for charging points (when not charging) provided by various companies which participated in the seminar are given below:



- Total CO₂ costs and emissions derived from the purchase, installation and maintenance of 10 charging points during a period of 10 years (in accordance with the data provided by the successful bidder):



5. Conclusions and lessons learnt

The process applied during the tender process for the installation, operation and management of the first on-street charging stations for electric vehicles in the city of Barcelona identified the following main points:

- The positive background and high exposure for planned energy projects in the *mass media* are defining factors for mobilising suppliers in this emerging sector, including during the phase prior to tendering.
- The type of consultation carried out according to the SMART SPP guide, namely a seminar, was a great success in terms of participation and the technical information gathered. Thanks to the positive dialogue resulting from the exchange of information and knowledge and in view of the flexibility required in tendering for innovative solutions, this greatly helped in the development of a successful tendering process.
- Due to the use of the LCC-CO2 evaluation tool and acquisition of data on energy consumption and CO2 emissions during the product life-cycle, it was possible to estimate the energy costs for the service. This information could be relevant for future tender processes as well as for analysing the proposition that the service is no longer free (energy consumption during charging, use of public space and maintenance costs for the network of charging points).

Likewise, the following weaknesses were identified:

- The offers submitted were significantly lower in number to that expected based on the interest shown by the sector and participation in the seminar, probably due to the short cut-off date of the tender procedure.
- In the end, the tender process permitted under this form of contract allowed very little flexibility for offers to include solutions that were not originally planned.

The main conclusions that the experience of Barcelona can provide with regard to application of the advanced SMART methodology for other public authorities are:

- Establishing communication, dialogue and consultation with the market is essential for emerging technology sectors such as electric vehicles.
- There is no single one-size-fits all methodology. Instead the activities covered by the SMART SPP approach, are intended to be flexible, and may overlap, happen in a different order, or be repeated. This is especially true for larger cities and important contracts, with high interest from suppliers.
- External factors (such as policies requiring a focus on employment creation) may restrict possibilities for the inclusion of environmental criteria such as energy efficiency.

6. Outlook

Other tender processes are due to be carried out with regard to the expansion of the charging points for electric vehicles. Barcelona has one of the largest number of motorcycles (running on petrol) in Europe and therefore the intention is to introduce electric motorbikes as quickly as possible.

Within a period of two years, the intention is that Barcelona should have 28 onstreet public charging points (22 points on the street and 6 in BSM car parks), 32 on-street points for charging municipal fleets (with possible utilisation by the general public during the day) and 131 points in underground public car parks, to ensure equal distribution with the maximum coverage possible.

The uncertainty surrounding the actual development of these projects is significant since this depends on the involvement of many parties and the development of other factors. The Spanish market is currently growing but it needs the collaboration and coordinated efforts of very diverse sectors and has important implications for the GDP of the country (the automotive sector and the energy sector). Nevertheless, all EU governments are committed to reducing emissions by 20% between now and 2020, therefore promoting electric vehicles is one of the more interesting options for the replacement of internal combustion vehicles.

The use of electric vehicles as urban transport by the general public would encourage the use renewable energies and would reduce dependency on oil in the transport sector, thus diversifying the city's energy sources. In this respect, numerous activities will be required such as grants for vehicles, new charging infrastructure, media promotion for electric vehicles, research and development for the implementation of intelligent distribution networks and domestic charging technologies, etc.

Against this background, application of the concepts offered by the SMART SPP approach, such as the evaluation of costs for the whole system as well as dialogue with the market, will be key to finding the best possible solution from the point of view of sustainability.

7. Contact.

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Case study London Borough of Bromley

1. Summary

Through SMART SPP the London Borough of Bromley has been assessing the emerging market for LED lighting technologies. Bromley has worked with the Eastern Shires Purchasing Organisation and Global to Local sustainability consultants to facilitate a framework of LED lighting suppliers accessible to the wider UK public sector.

Bromley has engaged with a wide range of suppliers, both manufacturers and importers, and lighting consultants. These organisations range from small startup companies to large multi-nationals. Bromley has trialed LED office lights at two locations in the Civic Centre, tested the SMART SPP LCC-CO₂ Tool and proved the concept to implement LED lights in forthcoming office refurbishments. The framework notice was advertised by ESPO in July 2011.

2. Background

Located to the south east of central London, Bromley is one of the 33 boroughs that make up Greater London. By area Bromley is the largest London borough; covering 58 square miles, 30% larger than the next largest borough. It comprises a wide mix of land use types within both urban and rural settings. The borough has a population of 300,000 people.

Bromley had a number of key drivers for joining the SMART SPP project. Bromley has long prided itself on being ‘the clean and green’ London borough, a reflection of its relatively rural setting and corporate priority of providing ‘a quality environment’. Finance is another key issue for Bromley, the borough has always set one of the lowest local taxation rates in London each year.

Recently the cost of energy has come under increased scrutiny, the borough now spends circa £3 million on electricity and gas, in addition to which, it is also subject to the ‘Carbon Reduction Commitment’, a UK government levy on energy use for large organisations which will cost a further £300,000 a year. Also, Bromley, like a lot of public sector organisations is experiencing significant cuts to its funding (£30 million over the next two years) and needs to find ways of ‘doing more with less’.

To save money Bromley has recently initiated a programme of office consolidation; refurbishing office accommodation in some buildings to increase capacity and in turn enable the disposal of surplus buildings. This programme has provided the opportunity to investigate and implement options to improve the energy efficiency of the consolidated estate.

This range of factors provided the incentive and opportunity to work on the SMART SPP project, save money and minimise energy use through implementing innovative sustainable technologies.

3. Experiences with the SMART SPP approach

3.1 Activity A – identifying appropriate product groups

Organisational procedures and policy are vital to successful project outcomes. To lay the foundations for the SMART SPP project Bromley changed its internal contract procedure rules (financial regulations) to base contracting decisions on whole life costs. This commits the authority to assessing the total cost of ownership of a good, work or service, factoring running costs and disposal costs etc. (as well as the usual acquisition cost) into the purchasing decision. Bromley also secured executive endorsement for sourcing innovative technologies via the adoption of a Sustainable Procurement Policy agreed by the Council's Chief Officers.

In addition to this procedure and policy framework, Bromley set targets to reduce energy use. Previously Bromley had successfully achieved a Local Area Agreement with central government to reduce total energy use from its core estate, after which, Bromley proceeded to sign up to the Local Authority Carbon Management Programme. This programme is run and externally assessed by the Carbon Trust. Through the programme Bromley is committed to cutting its carbon emissions across all its activities (travel, suppliers, buildings, staff commuting) by 25% by 2015.

Bromley considered several category groups for the SMART SPP before settling on LED lighting. LED lighting was chosen as it would contribute to reducing the council's energy costs, contribute to carbon reduction targets and the office consolidation programme would provide the opportunity for trials and installation. Lighting is also an ideal product to trial the life-cycle costing approach to tendering.

3.2 Activity B – setting up a project team

The Bromley project team worked closely with the other UK partners, the Eastern Shires Purchasing Organisation and Global to Local, sustainability consultants. The internal procurement team is multi-skilled and had expertise in procurement, supplier management, sustainability and procurement law however external advice and clarification was sought when required. The project team drew on the council's property management division and external lighting consultants to advise and assess the differing lighting technologies. Specific advice on the tool was also sought from the UK Government's Cabinet Office and Improvement and Development Agency. This gave the project the key skills to engage with the market, assess the products (whether they were fit for purpose), assess running costs and environmental impacts and establish the appropriate route to market.

3.3 Activity C – defining your needs

Bromley's needs are relatively simple, low energy office lighting. Current lighting arrangements are typically warm white light fluorescent T5 or T8 tubes. These are a conventional common place lighting solution characterised by a low acquisition cost but high running cost, both in terms of electricity consumption and failure rate. Bromley was looking for a solution which provides the same or improved lighting performance which is suitable for office conditions, but also uses less electricity and has lower maintenance costs.

To benchmark this, current lighting consumption was established from calculations based on the wattage and known usage time of the lights. Overall energy costs are known from electricity bills. Carbon emissions are known from calculations for the local authority carbon management programme and carbon reduction commitment.

3.4 Activity D – informing the market

The project team engaged with the market consistently over the course of the project meeting with small SMEs and large multi-nationals. Potential suppliers were sourced through attending conferences and trade shows, internet searches, sales literature and word of mouth. The UK project co-ordinator organised a supplier seminar to further interest in the opportunity. LEDs are a rapidly maturing market with lots of new entrants. Some suppliers were inexperienced when dealing with the public sector procurement rules. All suppliers were interested in our opportunity though some prioritised simple quick orders over participating in a tendering process.

3.5 Activity E – engaging the market

When engaging the market it became apparent that the market was maturing rapidly and new developments were coming on stream all the time. However there was also a wide variety in the quality of supply. There are no agreed quality standards for LED lighting in the UK or Europe and this has led to some suppliers being poor quality and even dangerous; failing to meet minimum health and safety standards.

Due to this there is a need to ensure the performance of all products is adequate and measured in a consistent way to allow fair comparison. After consulting with external expertise a number of performance characteristics will be considered in the tender:

- How is the life of the products defined? This should be stated both in terms of lights loss (performance over time) and physical failures.
- What is the lumen depreciation of the lights?
- What is the colour rendering index?
- How stable is the colour temperature?
- What ambient temperature is the luminaire performance based on?
- What is the photometric distribution
- What is the driver current?
- What is the power factor?

In addition to this we have also installed a number of 8W cool white LED tubes on a trial basis in two offices within the Bromley Civic Centre. These LEDs were retrofitted into existing luminaires and replaced 18W T8 fluorescent tubes on a like for like basis. The luminaires needed to be rewired to have the ballast removed.

This was an unusual procedure and took the electrician an afternoon to complete one office. However by replacing an 18W tube with an 8W tube the

offices now use 50% less electricity to light. The new lights were also well received by the staff affected who enjoyed being part of the trial.

3.6 Activity F – tendering and contracting

ESPO will be tendering for a framework for sustainable lighting suppliers in July 2011. This is proposed to be an open tender with strict pass/fail quality factors. Competitive dialogue was considered however given the number of SMEs in the market, their unfamiliarity with public sector procurement and the accelerated development of LEDs this was considered unnecessary. Whilst it would be preferable to use outcomes and output specifications, there will have to be a level of technical input specification as the quality of supply is so variable.

4. Life-cycle costing and CO2 emissions

Describe the outcomes of using the SMART SPP LCC-CO2 Tool and the results from the process. Include information on the financial results and also note if/how the tender evaluation sheet was used.

Bromley has made use of the tool as a comparator on a recent tender for multifunctional devices (combined printers, photocopiers, scanners and fax machines). Bromley found the tool technically complex to use and that it was difficult to source the information required from the suppliers. The tool was shown to smaller suppliers who also said they would not be able to provide some of the information required, but that they could demonstrate energy saving and payback for their products without using the tool. The tool does provides scope for allowing the different elements of the tender process and options appraisal to be completed and evaluated on a like for like basis, which the different calculation techniques used by the different suppliers did not.

5. Conclusions and lessons learnt

Procurers need a strong risk appetite when sourcing cutting edge innovative solutions; emerging technologies are by their nature unproven and under development. At present there are no defined quality marks for LED lights and some imported supplies would not meet European safety standards.

The supply market for emerging technologies presents risk when compared to purchasing established products; smaller suppliers can be more responsive and innovative, however they can also cease trading at short notice and may not be unable to honour guarantees or maintain technical standards.

A multi-disciplinary team with engineering expertise is vital when assessing product performance and life-cycle costs. The knowledge gained from early market engagement and external advice was crucial when discussing the technical aspects of lighting. Beware of resistance and conflicting messages on the merits of emerging technologies; some colleagues can take a great deal of persuasion to look beyond conventional solutions. We discovered that there is wide variation in quality; this was used to resist implementing LEDs. However this is not a reason to avoid implementing innovative solutions, but it is reason to research the market thoroughly and specify high quality products.

For LED installations a design and fit approach is preferable to supply only and retro-fitting into existing luminaires. The characteristics of the light cast by LEDs differs from fluorescent tubes, fixing LEDs into existing luminaires can compromise the functional performance of the LED resulting in different light temperatures, unwanted shadows and vacant fittings where LEDs are not required but fluorescent tubes were. Conventional fluorescent tube luminaires also need adjusting by an electrician to accommodate LEDs, if luminaires are not adjusted correctly the

LEDs can be compromised and will consume more electricity and burn out quicker, negating the cost savings and environmental benefits. These difficulties can be overcome but it is preferable to start afresh using a planned lighting design. Challenging a supplier to achieve a certain level of energy reduction, light level and budget can be a stronger drive for innovation than suppliers working with the confines of a strict input specification.

6. Outlook

Further LED installations throughout the Bromley estate are planned, both internal and external. The borough will also be looking at street lighting applications. Bromley currently spends £1.2 million each year on street lighting, there is scope for significant energy and cost saving in this area. Beyond LEDs the borough is also looking to take advantage of the new feed-in electricity tariffs to install solar photovoltaic arrays at the Civic Centre site. Feed in tariffs allow on site micro-generation technologies to pass surplus generation back to the grid and claim payment for the electricity. Bromley is engaging in preprocurement discussions with suppliers to understand the technology, market, business case and scope for installation.

7. Contact

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Case study Municipality of Cascais

1. Summary

The Municipal Council of Cascais, the Cascais Energy Agency and the National Laboratory for Energy and Geology (LNEG) have put the SMART SPP methodology into practice in purchasing energy-efficient public lighting, focusing on techniques to involve the market prior to the call for tenders (in the pre-procurement phase).

This approach allowed market-tailored technical specifications to be developed, which avoided complicated tendering procedures and therefore saved time and resources.

2. Background

Cascais Municipality is located in the district of Lisbon, on the eastern estuary of the river Tagus. It consists of six parishes (Cascais, Estoril, Parede, Carcavelos, São Domingos de Rana and Alcabideche), with around 190,000 inhabitants. Since 2007, the authority has had a municipal energy agency – *Cascais Energia* – and has signed the Covenant of Mayors. Within this framework, various initiatives and projects are taking place with the aim of boosting energy efficiency and the use of renewable energy, while reducing CO₂ emissions within the municipality, which includes the SMART SPP project.

3. Experiences with the SMART SPP approach

3.1 Activity A – identifying appropriate product groups

Meetings were held with technicians from departments of the Cascais Municipal Council and Cascais energy Agency, in order to identify the innovative products of greatest interest, taking into account that they would be the subject of a public procurement contract during the three year project. Energy efficient outdoor public lighting emerged as a priority product as the Municipality planned to replace around 40 lamps with high-pressure sodium vapour (HPS) technology in the area around the Pedra do Sal Environmental Centre. This space, which raises awareness on the subject of energy efficiency and renewable energy concepts, already had a pilot LED technology system in place.

3.2 Activity B – setting up a project team

With the aim of ensuring the availability of the various technical skills needed to develop the procurement process, a multidisciplinary team was set up comprising the Cascais Energy Agency, Cascais Urban Services Company, the Electricity and Public Lighting Division, Procurement Division, Transport and Mechanics Division and the Coastal Management Division, as well as the LNEG. The role of the LNEG was to guide and provide technical assistance to Cascais Municipality in applying the methodology developed in the SMART SPP project to promote innovation and energy efficiency through purchasing,

particularly in phases involving the market and those developing the purchasing criteria. This team held regular meetings from October 2009 to July 2011, enabling knowledge to be actively exchanged, thus enriching the final outcome of the project.

3.3 Activity C – defining your needs

Once the decision was made to purchase energy-efficient outdoor public lighting to replace around 40 lamps at the Pedra do Sal Environmental Centre, a market study was performed with the aim of:

1. Identifying existing technologies on the market and other technologies which were about to be introduced onto the market, their main features, advantages and disadvantages;
2. Identifying suppliers of these technologies. LED technology appeared to be a promising, albeit emerging solution on the (outdoor) public lighting market.

Important issues to include in the purchasing process were also defined:

- It was decided to replace the HPS lamps, keeping the existing columns;
- A light control system was included in the call for tenders, so as to allow flux to be regulated and thus boost energy savings;
- Suppliers were asked to carry out a photometric study, taking into account existing conditions (the columns would not be replaced and therefore the distances between the lamps would already be defined) so as to present the best solution, both in terms of photometric performance and in terms of energy performance.

An initial version of the technical and energy efficiency criteria to be included in the tender procedure was established in this phase.

3.4 Activity D – informing the market: Supplier/buyers seminar

In order to bring together suppliers and buyers, an energy efficient lighting seminar was organised, focusing on LED technology for public lighting. In this seminar, the SMART SPP approach was presented and the aim was:

- To convey to potential suppliers information on purchasing intentions and the generic initial requirements
- Increase buyer knowledge on energy-efficient lighting and LED public lighting through the various suppliers presenting their products, followed by a moderated debate.

The suppliers also displayed their products.

3.5 Activity E – consulting the market: Informal meetings with suppliers and collecting data on the products

The Cascais Energy Agency invited eleven LED lamp suppliers to take part in informal and individual meetings with the aim of:

- Learning about the features of the products available on the market
- Informing suppliers about the features of the lamps to be purchased, reflected in the technical and energy-efficiency criteria defined in C;
- Receiving comments from suppliers on the technical and energy-efficiency criteria;
- Gathering technical and energy-efficiency data, and data on product life-cycle costs.

All suppliers identified in the market investigation process, in previous contracts with the Cascais Energy Agency and Cascais Municipal Council and on their own initiative were invited to take part, having access to the same information. The informal involvement process was carried out in a phase prior to the tender process. Questionnaires were sent out to potential suppliers in order to prepare for the meetings. The aim of the questionnaire was to gather technical and energy efficiency data, and data on product life-cycle costs, as well as to validate these criteria for the market.

During the meetings the suppliers raised questions on the criteria used as well as the proposed performance values, which allowed for a better understanding of the most important questions related to this type of technology. These debates undoubtedly helped establish criteria to be included in the specifications, and allowed the public authority to confirm that the market is able to offer suitable solutions.

3.6 Activity F – tendering and contracting

The market involvement phase allowed the abovementioned technical specifications to be improved. Research was also carried out into the criteria used in similar procurement processes around the world.

The criteria developed included energy-efficiency (luminous efficiency) issues, equipment durability (useful lifespan, mechanical resistance and corrosion), as well as issues relating to the photometric performance of the overall solution (colour temperature, light distribution, etc.), using the standard DIN EN 13201 – Road Lighting as a reference. Other issues to be considered in the assessment were the guarantee conditions and integrating the lamps into the site.

For future activities, the decision to extend the procurement process to other streets and sites of tourist interest within the municipality. Given the high purchase cost involved and the fact that this is emerging technology, a restricted call for expressions of interest is to be used. The award criterion will be that of the most economically advantageous bids, and the costs throughout the product life-cycle will be taken into consideration in assessing the bids.

3.7 Activity G – tender process for complex projects

A standard tendering approach was used in this case. Thanks to the early market engagement Cascais was able to save resources since competitive dialogue and pre-commercial procurement are lengthy processes which take up a great deal of time and resources.

4. Life-cycle costing and CO2 emissions

The data gathered in this case study was used to test the LCC-CO₂ tool. Three of the LED lamp solutions available on the market for lighting streets were compared, based on the data obtained in Activity C. Since this involves new technology not all of the data needed for this assessment is available, particularly in relation to use and end-of-life. This test allowed an understanding how the tool works, as well as how to identify their main limitations, and it was very useful in perfecting them.

5. Conclusions and lessons learnt

- Involving the market allowed the development of more rigorous criteria due to the suppliers' comments, as well as saving resources by avoiding more complex tender processes;
- This experience will allow the development of performance specifications applicable to lighting technology in general;
- Having a multidisciplinary team was fundamental in involving the market and in developing procurement criteria, leading to a deeper knowledge of the issues studied;
- Suppliers were made aware of the opportunities for innovation in the public procurement processes and of the need to communicate the performance of their products by means of environmental labelling;
- LED public lighting is still not used a great deal on the site, meaning there has not yet been enough experience to gather data in relation to life-cycle costs;
- SMART SPP methodology for innovation in public procurements could be replicated in other procurement processes;
- The pilot installation demonstrated that energy saving of around 30% could be achieved by simply replacing conventional lighting with LED.

6. Outlook

This experience meant it was possible to verify in practice that there are advantages in the early involvement of suppliers in a phase prior to the call for tenders, as it enhances the way technical and environmental features are refined.

7. Contact

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Case study Eastern Shires Purchasing Organisation (ESPO)

1. Summary

ESPO acting on behalf of Cambridge City Council (CCC) undertook a procurement in spring 2011 for the supply and installation of LED lighting to the Grand Arcade Annex Car Park in Cambridge. CCC's budget for this procurement was £120,000.

The three 'technologies in focus' of SMART SPP are:

1. Lighting systems (e.g. LED lighting, OLED lighting, lighting tubes)
2. Highly energy efficient (electric) vehicles (passengers and duty cars)
3. Construction services (e.g. heating/cooling systems using renewable energy sources)

This procurement has an obvious link to the first technology listed here.

2. Background

Cambridge City Council operates several multi-storey car park sites in and around Cambridge including the Grand Arcade car park. The Grand Arcade car park facility is situated in the city centre and adjoins the Grand Arcade shopping complex. The annexed car park element forms part of an overall car park provision and is an existing below ground multi-level facility that consists of four parking areas/levels which are noted -1, -2, -3 and -4, with level -1 being situated at street level. The car park operates 24 hours a day, seven days a week, 365 days a year.

In line with CCC's environmental strategies the annexe car park site was reviewed and it was felt that significant energy efficiencies could be achieved with the implementation of the latest LED lighting technology. The car park was lit via 200+ multiple self contained ceiling mounted luminaires. Each luminaire lamp was of the metal halide type and rated at 150W. CCC employed the services of an Electrical Design Consultant to review and document the lighting system that was in place and draw up a specification to replace with LED lighting technology.

3. Experiences with the SMART SPP approach

3.1 Activity A – identifying appropriate product groups

The CCC's Executive Councillor for Climate Change and Growth investigated other LED street lighting projects in neighbouring councils and requested that CCC install LED lights into one of their car parks. The main rationale behind this decision was to save electricity and help to reduce CCC's carbon footprint.

In the summer of 2008 enquiries were conducted with lighting design engineers in order to trial some LED lights in a separate car park and zebra crossing. These first trial lights were unsuccessful – the amount of light the sample LED lights emitted was not sufficient.

Further research was carried out online and through local trade associations to identify other LED lighting suppliers and installers. Two companies were identified; one that supplied replacement LED lights and one that supplied retrofit LED lights.

The Grand Arcade Annex car park was then identified as the most suitable car park to install LED lights because it had existing bright lights (it is an underground car park, thus little/no natural light) which were expensive to run in both electricity and spare parts. The indicative payback calculation looked very favourable for installing and running LED lights. Due to the favourable figures and councillor support CCC were able to secure the funding needed for the project from the climate change fund run by the City Council. Two sample LED lights – one retrofit and one remove/ replace – were installed in this car park. It was felt at the time that either of these two samples could offer a successful and cost effective alternative solution to the existing lighting system.

3.2 Activity B – setting up a project team

The team that worked on this project are:

- Project Sponsor, Kevin Willsher, Assistant Director, ESPO
- Kate Shaw, Interim Commercial Manager, ESPO
- Martin Lawson, Buyer, ESPO
- Simon Guy, Electrical Design Consultant, ITserV Design
- Julie Edwards, Administration and Projects Coordinator, Parking Services, Cambridge City Council
- Douglas Streater, Cambridge City Council
- John Bridgwater, Procurement Officer, Cambridge City Council
- Sean Cleary, Operations Manager, Specialist Services, Environmental Department, Cambridge City Council

3.3 Activity C – defining your needs

CCC needed to develop a specification that detailed regulations and standards, an outline of the electrical systems required, comprehensive information on the lights that were currently in situ, an overview of two sample LED lights that had already been installed (one retrofit and one replacement), CAD drawing of the existing car park luminaire layout and light levels, design information requirements and health and safety requirements.

CCC realised very early on in the process that they did not have the specific knowledge of this product area to draw up a specification that detailed all this information. This was the first time CCC had procured this type of technology. Hence the specification that was included in the tender document was produced by an Electrical Design Consultant in December 2010 (an output and performance driven specification).

3.4 Activity D – informing the market

As stated in 3.1 initial enquiries were made with a range of electrical companies. Coupled with this online research was also carried out and two companies were identified to fit samples lights in the designated car park. These fittings were made without prejudice.

In order to gauge further interest in this project and to provide the project team with an understanding of the supply market of LED lighting technology CCC placed an advert in February 2010 on the Improvement East website (see below).

CAMBRIDGE CITY COUNCIL SEEKS PARTNERS FOR INNOVATIVE CAR PARK LIGHTING PROJECT

Cambridge City Council are in the process of producing a specification for the upgrade of all of their existing car parking facilities to LED lighting systems. This solution offers a range of potential benefits, including much lower energy use, lower maintenance and considerably reduced whole life costs. The council are not aware of this system being implemented anywhere else in the region as yet and hope to act as a pilot project, demonstrating both the cost and environmental benefits for others who are considering this type of system.

Cambridge City Council is also seeking potential partners who may be interested in a collaborative procurement exercise for LED lighting systems. If there is sufficient interest, **Improvement East** will consider providing funding support to set up a regional framework, subject to demand. If you are interested in finding out more about this project, or wish to register your interest in collaborating, then please contact colleagues at Cambridge City by e-mail in the first instance.

Operational – Julie Edwards, julie.edwards@cambridge.gov.uk

Procurement – John Bridgwater, John.Bridgwater@cambridge.gov.uk

In summer 2010 CCC approached ESPO to undertake a procurement exercise. ESPO placed formal adverts on Contracts Finder website, ESPO's website and Contrax Weekly. CCC also used the ESPO advert on their website.

Prior to this ESPO placed a PIN in April 2009 for "Energy efficient products/equipment based on innovative low carbon emission technologies and integrated solutions". This PIN put the three technologies in focus, the first of which provided details on LED's.

3.5 Activity E – engaging the market

All companies that responded to ESPO's PIN (April 2009), CCC's first advertisement (February 2010) and the final ESPO advert (April 2011) were logged and each was sent an Invitation to Tender document.

As part of the tender exercise ESPO and CCC agreed it would be beneficial to organise an open day with all potential suppliers/installers. 13 companies

attended this open day and it gave them all a good opportunity to explore the car park and analyse the two sample lights that had been installed. It also gave them a good opportunity to ask questions. All questions that were asked at the open day were logged and the questions plus full answers were circulated to all bidders.

3.6 Activity F – tendering and contracting

An open tender route was taken. The rationale for this was:

- It allows for the assessment of bidders against selection criteria such as track record, financial stability, policies and procedures, etc. However instead of assessing these factors in advance of inviting tenders, they are assessed as ‘qualifying criteria’ within the tender evaluation process.
- Holding the open day helped in limiting the number of bids to only those that have a viable solution.
- The number of firms in the market place wishing to bid for this work was unknown and an open tender allowed the Council to receive bids from all organizations with an LED lighting solution – be it retrofit, remove/replace or other.

Tenderers that passed the selection criteria were evaluated against the award criteria, this was Price (60%) and Quality (40%). Price was scored on a sliding scale published in the tender document. Quality was broken down into four key areas: LED lights, Installation, Staff Support and Contract Management.

3.1 Activity G – tendering for complex projects

This is incorporated into Activity F for this particular project which, although requiring new technology, is not that complex.

4. Life-cycle costing and CO2 emissions

The complexity of the tool coupled with the requirement for suppliers to provide data on emerging technologies raised questions over whether the tool could be employed in this procurement. If it was employed further questions were raised over the validity of the data it would produce (bad data in/bad data out), specifically the calculation of embedded emissions. ESPO had consulted with the IDeA (Local Government Improvement and Development) about use of the tool in UK procurement exercises and the advice provided was not conclusive. It was decided therefore that the SMART SPP LCC-CO₂ Tool would not be used.

ESPO included in the tender award criteria:

- Price
- Recycling and re-use
- Energy savings (including energy usage in watts and energy savings (%) compared with the traditional style lights)
- Robustness

- Warranty period

5. Conclusions and lessons learned

Strengths of the approach taken:

- The six/seven steps provide a structured and logical path to follow.
- Early market engagement provides a better knowledge for the procurement team of what is available on the market.
- Not disclosing the final budget for the project. A sliding scale was used in the tender document for the price scoring.
- The hiring of a consultant to draft the specification. The LED lighting procured in this project was very new and innovative. The consultant was the only person in the procurement team with the technical knowledge to draft a specification.
- Using the open tender route. The contracting authority required a solution as quickly as possible and the open route reduced procurement timescales more than a restrictive approach would have.
- Interviewing the shortlisted bidders. This provided a good opportunity to see, handle and test the LED lights. It was also a useful process to moderate each bidder's scores and decide the contractor CCC would use for this project.

Weaknesses of the approach taken:

- The selection criteria used in the contract was too restrictive. In particular the robust financial checks used by CCC ruled out two very competitive bids.
- Too much weighting was put on price (60%). CCC was very worried about bids coming in over budget and/or very close to their budget thus it was decided to put more emphasis on the price score. Only one of the eight bids submitted came in over budget thus this did not turn out to be a major issue.

Overall the approach and tendering used was the correct route. The company awarded the contract supply a good quality LED lighting solution, a credible installation service and a competitive price. This price (£77,100) offers CCC a significant saving in relation to the budget they had for this project (£120,000) and a tentative quote they had requested very early on in the process (£110,000).

6. Outlook

Dependent upon the success of this installation and funding available for future projects CCC may consider looking at replacing other city centre car parks with an LED lighting solution.

ESPO working in partnership with Pro5 and other UK procurement bodies will establish a new Framework Contract that will be available for the entire UK

public sector to use. We will also consult with the other UK Partners, Bromley and Global to Local, to ensure a joined up approach.

7. Contact

Kevin Willsher, Assistant Director, ESPO, k.willsher@espo.org

Martin Lawson, ESPO, m.lawson@espo.org

Great interest and exchange with the Commission, EU parliament and key purchasing organizations at the June 2011 final event of SMART SPP



Case study Municipality of Kolding

1. Summary

In conjunction with Kolding Municipality's vision and objectives in the energy and climate field, work is ongoing to make a strong contribution through different projects. One of the projects deals with cooperation with manufacturers in the pre-procurement phase: SMART SPP.

In the project, Kolding Municipality chose to focus on energy-efficient LED replacement light sources to replace existing incandescent bulbs, halogen bulbs and halogen spotlights. It is expected that using LED technology will lead to light sources that are considerably more energy-efficient than the existing ones.

2. Background

With its 8,000 employees, Kolding Municipality is the largest business in the Municipality. Kolding Municipality wants to be one of Denmark's leading municipalities within the climate and energy field by the year 2021.

Energy Kolding is the overall initiative that will capture, develop, organise and implement innovative ideas and projects in the field. Within Energy Kolding, citizens and private and public businesses, organisations and research and training institutions will cooperate on the reduction of energy consumption and put into practice initiatives whose objective is to fulfil the following overall objective: *"CO₂ emissions must be reduced by 75% by 2021 compared to 1990, measured per Kolding Municipality inhabitant"*.

1997 saw the adoption of the Municipality's first energy action plan, which contained ambitious goals for the period 1998–2006. The ambitions of the goals were certainly not unachievable, however: the goals were already achieved two years before the end of the plan and the CO₂ reduction markedly exceeded the desired goal as early as 2006. The Municipality's Energy Action Plan II was adopted in 2007 and its objective was to reduce electricity consumption by 8% during 2008-2015. Kolding Municipality also entered into a 'curve breaker agreement' with the Electricity Savings Fund, which undertook to reduce electricity consumption by 2% per year until 2010.

The SMART SPP project with the promotion of new, innovative, energy-efficient products is very well suited to the Municipality's overall goals.

3. Experiences from the SMART SPP approach

3.1 Activity A – identifying appropriate product groups

In Kolding Municipality, lighting constitutes an important part of the overall energy consumption. It was therefore obvious to look at whether the lighting could be made more energy efficient. In the first round, the focus was on energy-efficient light sources to replace the fluorescent tubes hanging in the Municipality's many institutions. LED light sources could constitute an obvious option as a replacement, since the technology is already in existence.

3.2 Activity B – setting up a project team

A project group was formed consisting of two employees, the Municipality's energy coordinator and an employee who is responsible for green acquisitions. A project employee was appointed to assist the project group with the project funds. It quickly became apparent that the project group that was formed did not have the requisite technical knowledge of LED light sources and their capacities, so the Danish Lighting Centre was hired to assist with the project by providing technical competence in lighting. A follow-up group consisting of relevant leaders in the Municipality's organisation was also formed.

3.3 Activity C – defining your needs

The Danish Lighting Centre was consulted on the choice of product group, and they were able to state that the development of efficient LED fluorescent tubes was not imminent. They recommended instead a focus on LED light sources as a replacement for traditional incandescent bulbs, halogen bulbs and halogen spotlights, since this was already a tried and tested technology where there was rapid development in the direction of more energy-efficient light sources.

A number of functional requirements for the LED light sources were developed:

- There must be a significant reduction in CO₂ emissions and in energy costs, that is, they must be significantly more energy-efficient than the current ones
- They must be able to directly replace the existing light sources without, for example, changing installations
- They must emit the same light as the existing light sources with regard to light colour and light strength and the dissemination of the light.

In cooperation with the Danish Lighting Centre, we drew up the technical specifications for the desired light sources, such as the required lifetime, energy efficiency, colour temperature and light quality (RA value). The Danish Lighting Centre also helped us to work out which manufacturers and suppliers were available on the market.

3.4 Activity D – informing the market

In order to create awareness of the project and to inform the potential suppliers of the forthcoming invitation to tender for innovative, energy-efficient LED replacement light sources, they were invited to an information meeting. The invitation was sent to the market players identified by the Danish Lighting Centre. Information on the project and the meeting was also placed on the Municipality's website. This provided contact with several market players.

3.5 Activity E – engaging the market

The information meeting was held ten months before the actual invitation to tender. At the meeting, information was provided on the project and the forthcoming invitation to tender. The technical specifications were presented to the developers, manufacturers and suppliers who turned up. The response from those participating at the meeting was that the specifications were not particularly innovative. They could already be accommodated by almost all those on the market. The message from the market was that the technical specifications should be made more stringent if the ambition was to advance the introduction of energy-efficient and innovative technologies on the market.

New and more stringent technical specifications were drawn up. These are shown in Annex 4 (Table 4). We then invited people to a new meeting at which the new specifications were presented. Further dialogue also took place with the market about options and restrictions where LED and the forthcoming invitation to tender were concerned. The market's feedback was that the new specifications were innovative. The market also indicated that there are no standards in existence for matters such as the calculation of the lifetime, etc. which can be referred to, since this is a new technology. They requested that the technical specifications and allocation criteria in the invitation to tender were very specific.

3.6 Activity F – tendering and contracting

In order to make Kolding a more attractive as a collaboration partner for the market, other municipalities were invited to join the invitation to tender. This would increase the purchase volume and ensure a greater turnover for the chosen supplier. A number of municipalities were invited to an information meeting about the project and to participate in the invitation to tender. The invitation was sent to the municipalities in Kolding's procurement cooperation group ('12 By Gruppens Indkøbscentral') plus other municipalities with ambitious targets in the energy and climate field. Six municipalities from the procurement cooperation chose to participate in the invitation to tender.

An open invitation procedure to tender for the economically most advantageous tender was selected as this was the tender model that best suited the timeframe for the SMART SPP project. This procedure ensured competition on the market to go beyond the minimum technical specifications, and supply the most energy-efficient tender. The evaluation criteria are shown in Annex 4 (Table 5). In order to make it more attractive for small and medium-sized businesses to submit a tender, the invitation to tender was divided into three sub-areas: low-voltage bulbs, 230 Volt halogen bulbs and 230 volt bulbs. Two pilot projects were incorporated into the invitation to tender with full-scale replacement of existing light sources. This was performed in order to test out the technology, to use the results obtained to calculate the energy saving potential and as an incentive to attract interested suppliers.

The invitation to tender material included a spreadsheet indicating all of the light sources for which replacement light sources were required. The spreadsheet showed the sales figures for the traditional light sources. This spreadsheet acted as the tender list. The spreadsheet with the tender list was

supplemented with a spreadsheet on which the tenderers could provide details of the lifetime, lumen output, wattage and RA value of their tendered light sources for use during the evaluation and allocation. These details were to be provided exclusively for the light sources that represented 60% of the sales. The remaining 40% consisted of many light sources with a very small turnover. The assessment was that it would be too costly for the tenderers to state the desired values for all light sources.

Midway through the invitation to tender period, potential bidders were invited to a questions and answers meeting at which they were able to ask additional questions about the invitation to tender material. There was also an opportunity to submit questions in writing. All questions and answers were placed on the municipality's website and were also sent to all interested parties.

4. Life-cycle costing and CO₂ emissions

The SMART SPP LCC CO₂ tool was drawn up to compare the offers submitted. The invitation to tender included more than 200 light sources for which we required tenders for replacement light sources. The tool cannot handle values for 200 products per tender. In order to be able to obtain the values that were to be used in the tool, it was necessary to set up an account in order to obtain values per tender.

Not all light sources have equal sales, so the accounts were worked out on the basis of weighted values. An example of a weighted lifetime calculation is shown in Annex 4 (Table 6)

The tool gives the procurement price per item. An average price was calculated based on the individual supplier's tender prices. The discount rate and the inflation rate were also found on Danske Nationalbank's website and Statistics Denmark's website. Prices for electricity consumption were obtained from the Municipality's electricity supplier.

The SMART SPP tool was used to calculate life-cycle expenses and CO₂ emissions. When allocating points, Kolding prepared their own table, which is shown as Annex 4 (Table 7). Points from here were keyed into the tool. The tool indicated which tender had the lowest lifetime expense and identified the economically most advantageous tenders in order of priority.

5. Conclusions and lessons learnt

The result from the tool showed that the tender with the lowest lifetime expense was not the economically most advantageous tender when taking into consideration the other allocation criteria, energy efficiency and light quality. It was also shown that it is important to have determined in advance how long the planning horizon should be. Too short a planning horizon cannot adequately take into account lifetime differences and cannot therefore indicate how frequently a light source has to be replaced.

Kolding's experiences demonstrate that when working with new technologies, you are dealing typically with a market that is not used to submitting tenders for public invitations to tender. The market is typically smaller businesses. The

questions received regarding the invitation to tender material showed that the invitation to tender material was difficult to understand. It was also evident, after the contract had been allocated, that many tenderers did not understand the use of allocation criteria and the allocation of points.

It can therefore be recommended that the invitation to tender material should clearly show the way in which evaluation and allocation of points will take place, including which allocation table will be used. It can also be recommended that a meeting should be held with interested tenderers at which the invitation to tender material, the use of a tenders list and the evaluation criteria are reviewed.

For new technologies, there are neither ISO nor EN standards that can be referred to in the requirements specification or for the evaluation criteria. It is therefore important for the invitation to tender material to clearly show how the desired values will be stated, e.g. that the stated details apply to the bulb and not to the individual LED unit, where the surrounding temperature is 25oC and that a lifetime (L70) means the expected lifetime where the emission of light constitutes 70% of the bulb's lumen output. The dialogue with the market can provide an indication of how the individual values can be expressed.

The light quality (RA value) was weighted highly (20%) to ensure that tenders for light sources with a low price and poor quality were not received. Following the tender submission period, it became evident that there is no great variation in the RA value of the individual light sources. The weighted RA values for each tender varied between 80 and 86. This led to some inappropriate point intervals.

Weighting the RA value so highly cannot therefore be recommended. Before drawing up the invitation to tender material, not enough had been found out about the tool and its possibilities, including exactly which values should be keyed into the tool. This meant that it then became necessary to have several accounts in order to obtain the desired values for the tool. A more thorough examination of the tool would have given the opportunity to set up the evaluation criteria in a way that used the tool in a more goal-orientated way.

6. Outlook

Kolding Municipality is participating in an environmental cooperation called Green Cities. In this cooperation, they are currently developing ideas for new projects.

One of these is a project in which the SMART SPP progress method described in the Guide, "Encouraging energy-efficient innovation through procurement", will be used. Kolding is currently in the process of finding a suitable product area, but this will probably concern products in which the content of chemical products is problematic for both the work environment and the external environment.

7. Contact

Bente Moller Jessen, Municipality of Kolding, bmje@kolding.dk

3.6. Conclusions

a. Smart engagement with the market

For many partners, working with suppliers of innovative products in the early market engagement phase has been a chance more than a challenge because the public authorities had the advantage of knowing in advance what the market could offer to them.

When dealing with a market of new technologies you're engaging with SME's as well as bigger companies. The SME's are often new on the market and are not familiar with understanding a public tender or the tendering procedure. Therefore it's necessary to communicate how a public tender document is to be understood, and how the bids will be evaluated and awarded.

b. Better inter-departmental cooperation

Innovation procurement through early market involvement can contribute significantly to the widespread of knowledge within the organisation, as it requires cooperation between different departments and a dialogue between buyers and suppliers. This dialogue can establish the basis to turn procurement into a more flexible and open minded function that contributes to innovation both inside and outside the organisation, i.e, by promoting a different way to buy and also promoting the procurement of new and more efficient products/services/systems.

c. SMART SPP guidance supports public innovation

The promotion of early market engagement activities and the use of lifecycle costing and CO₂ emissions assessment tools (LCC-CO₂ tool) can help to remove the major barriers to public innovation.

The LCC-CO₂ tool may be used in all the different phases of the procurement process. However, special attention has to be paid when using it during the awarding phase. Legal restrictions, such as that the direct relation between the awarding criteria and the tender's subject matter, have to be kept in mind rigorously.

4. Further information and links

ICLEI has shared knowledge and cross-involvement in consultations and combined dissemination activities with the following projects/ initiatives: Covenant of Mayors, SolarCombi+, OLED100, AVERE (The European Association for Battery, Hybrid and Fuel Cell Electric Vehicles), ESTIF (European Solar Thermal Industry Federation), Clear About Carbon (Cornwall, UK), pro-EE, Sustainable Now, Lead Market Initiative, London Lord Mayors Action Plan on Electric Vehicles, Defra (UK), the EURO TOPTEN PLUS project and the Procura+ Sustainable Procurement Campaign. Close links have been established with other major research and implementation

organisations in the field of innovation and sustainable procurement such as prove Consulting, Austria and Motiva Oy, Finland.

Below, we want to share with you further resources for your work on sustainable public procurement of innovation.

4.1. SMART technologies

Clean transport & Electric vehicles

EC Clean Energy Efficient Vehicles website, including policy documents, studies and latest news

AVERE (The European Association for Battery, Hybrid and Fuel Cell Electric Vehicles) is a European network of industrial manufacturers and suppliers for electric vehicles. The Association's goal is to promote the use of Battery, Hybrid and Fuel Cell Electric Vehicles and to rationalise the efforts of its member companies in the scientific and technological developments. It is composed of national Associations, 11 up to now, indirectly representing over 500 companies active in the field.

LED lighting

LED Professional – information portal and magazine including business, research and product news, events listings and buyers guides, edited by Luger Research – Institute for Innovation and Technology Business Unit, Austria.

LEDs Magazine – information portal and magazine including technical articles, case studies, market analysis and conference reports as well as news, product and event information, supplier listings and various background and technical resources, published by PennWell Corporation.

ComboLED is a European funded research and development project. The goal of ComboLED is to combine new device structures, advantageous manufacturing approaches and less complex materials with the aim to achieve cost effective OLED lighting solutions.

The goal of OLED100.eu, a EU 7FP-funded project, is to develop all the necessary technologies needed to produce efficient OLED products for exploitation by the European lighting industry.

Renewable energy heating & cooling

The EPBD Buildings Platform is a European Commission initiative in the framework of the IEE programme, which provides information services for practitioners and consultants, experts in energy agencies, interest groups and national policy makers in the European Member States for helping the

implementation of the European Energy Performance of Buildings Directive (EPBD).

IRENA (the International Renewable Energy Agency) aims at becoming the main driving force in promoting a rapid transition towards the widespread and sustainable use of renewable energy on a global scale, providing practical advice and support for both industrialised and developing countries. The agency will facilitate access to relevant information including reliable data on the potential of renewable energy, best practices, effective financial mechanisms and state-of-the-art technological expertise, as well as develop comprehensive solutions, such as fostering all types of renewable energy, and consider various renewable energy policies on the local, regional, and national level.

European Solar Thermal Industry Federation (ESTIF) aims to achieve acceptance of solar thermal as a key element for sustainable heating and cooling in Europe and to work for the implementation of all necessary steps to realise the high potential of solar thermal. ESTIF members include solar thermal associations, manufacturers, service providers and supporting institutions.

Transforming the market from "cooling" to "sustainable summer comfort" (Keep Cool II) is a project which aims to transform the market to achieve good summer comfort conditions with no or limited use of conventional energy and through the use of environmentally non-harmful materials.

4.2. Links to relevant EU policies and legislation

European Commission Green Public Procurement (GPP) website provides advice for policy-makers and practitioners working on GPP. The European Commission's Buying Green! Handbook on GPP is also available on the website as is the EU GPP Training Toolkit

European Commission Innovation Policy and information on Public procurement - Public purchasers as launch customers

FP6 initiative Europe INNOVA aspires to inform, assist, mobilise and network the key stakeholders in the field of entrepreneurial innovation, including firm managers, policy makers, cluster managers, investors and relevant associations. Europe INNOVA adopts a sector-based approach that is strategically designed to identify and analyse the leverages and barriers to innovation within specific sectors

PRO INNO Europe® is an initiative of Directorate General Enterprise and Industry which aims to become the focal point for innovation policy analysis, learning and development in Europe, with the view to learning from the best and contributing to the development of new and better innovation policies in Europe

Environmental Technologies Action Plan (ETAP) was adopted by the European Commission in 2004. The objective of this ambitious plan is to further environmental technologies to improve the environment and European competitiveness. Eco-innovation and green public procurement are two main areas of action

Communication from the European Commission on ICT - COM (2009) 111 [pdf file] - on mobilising ICT to facilitate the transition to an energy-efficient, low carbon economy

DG INFSO PCP website, includes EC Communication and Staff Working Paper on Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe and a series of experts' presentations

European Commission, Directorate-General for Energy and Transport (DG TREN)

European Commission, Intelligent Energy for Europe Programme (IEE)

4.3. Links to relevant projects and initiatives

Sustainable Procurement Campaign, Procura+ is an initiative designed to help support public authorities in implementing sustainable procurement – and help promote their achievements. The Campaign offers a wide range of tools (e.g. purchasing criteria), guidance (e.g. methodologies, case studies) and a framework to assist public authorities in making their procurement actions sustainable.

Sustainable NOW project aims to strengthen the role of local and regional governments in guiding their communities in the sustainable energy transition period. Sustainable NOW will increase the understanding of non-technical energy and management aspects, address capacity building, as well as encourage peer exchange and reviews to create an environment of tangible results. The project is funded by the EU's Intelligent Energy Europe Programme.

The SCI-Network - Sustainable Construction & Innovation through Procurement - connects public authorities looking to procure innovative and sustainable solutions within their construction projects. It aims to jointly identify new construction solutions, and to examine how best to encourage innovation in construction procurement. Five working groups on "Innovation in sustainable renovation - application of environmental assessment systems", "New Technical Solutions", "Procuring Innovation – Procedures & Methods", "Whole-life Costing" and "Financing & Contracting" have been set up to achieve this.

Buy Smart website provides free consultation and information material on green public procurement (GPP) in English, German, Czech, Italian, Latvian, Swedish and Slovenian. The project is funded by the EU's Intelligent Energy programme. In addition to general information on GPP, procurement tools for the product groups building components, green electricity, household appliances, lighting, office equipment and vehicles are also offered.

Public Procurement Boosts Energy Efficiency (PRO-EE) project aims to harness the buying power of public authorities to drive the market for innovative environmental technologies. A partnership of public authorities from 6 European countries will undertake large-scale joint procurement of technologies to secure a higher market share for the most energy efficient products to accelerate their market penetration.

The DEEP project (funded by the EU's Intelligent Energy Europe Programme), was aimed at promoting opportunities for increasing energy efficiency in the public buildings sector. The website contains a selection of useful resources, such as purchasing guidelines for energy efficient construction, green electricity and IT equipment and a tool for calculating the life-cycle costs of products.

EURO-TOPTEN - Reducing energy consumption: making efficient products the normal and best choice for consumers, retailers and manufacturers.

Green Fleet Procurement Models (PROCURA) project developed joint procurement models, fleet scan tools and manuals to facilitate the acquisition and maintenance of alternative fuel vehicles for private and public fleets.

The Blue Economy is a project that focuses on one hundred of the best nature-inspired technologies that could affect the economies of the world, while sustainably providing basic human needs - potable water, food, jobs and shelter. With time, the world could even see innovations ranging from solar water heating systems with a 25 year guarantee as developed in the city of Bogotá (Colombia) to harnessing enough body heat to generate power to charge mobile phones.

The aim of PRISME (PRocurement of Innovation from SMEs) is to improve SMEs' access – and more particularly innovative SMEs' access – to public procurement by bridging the gap between them and public buyers. To achieve this goal, the activities carried out by PRISME will target SMEs on one side, public procurers on the other side, and public procurers and SMEs altogether. Innovation and public procurement will be the cornerstones of the actions implemented throughout the project.

Electric Vehicles in Urban Europe (EVUE) is a project focusing on the development of integrated, sustainable strategies and dynamic leadership techniques for cities to promote the use of electric vehicles.

5. Annex

Annex 1 – London Borough of Bromley

Table 1: List of performance-based specifications used

- *Why lighting-high usage ease to implement quick pay back*
- *Market near readiness*
- *Current situation standard fluorescent T5 tubes*
- *Defining needs*
- *Problematic*
- *Variable quality*
- *Lack of defined standards*
- *Stability of suppliers*
- *Suppliers approach*
- *Design and fit versus off the shelf*

Annex 2 – Municipality of Cascais

Table 2: Main performance specifications for purchasing LED public lighting.

<i>Requirement</i>	<i>Specification</i>
<i>Luminous efficiency (light source + electronic and electrical components + optics)</i>	≥ 80 lumen/W
<i>Overall useful lifespan (MTTF)</i>	$\geq 65\ 000$ hours
<i>Luminous flux depreciation at the end of the useful life of the lamp (L70)</i>	Max. 30 %
<i>Protection index</i>	$\geq IP66$
<i>Mechanical resistance of equipment</i>	$\geq IK08$
<i>Total harmony distortion (THD)</i>	≤ 20 %
<i>Power factor</i>	> 90 %
<i>Colour temperature</i>	Max. 4500 K
<i>Luminance</i>	min. 10 lux
<i>Access to components (in case of fault)</i>	<i>Easy access to components and these can be replaced without difficulty.</i>
<i>Luminous flux regulation capacity of lamp group</i>	<i>Depending on luminosity available and programming</i>
<i>Control and monitoring system</i>	<i>Possibility of future expansion</i>

Annex 3 – Eastern Shires Purchasing Organisation (ESPO)

Table 3: List of performance-based specifications used in the Cambridge City Council Car Park Lighting Project

Regulations and Standards	
<ul style="list-style-type: none"> • BS7671 (2008) IEE Regulations including all Guidance Notes • BS5266 Emergency Lighting • CIBSE (SLL) Lighting Guide • The Electricity Supply Regulations. • Health & Safety at Work Act • Health and Safety at Work Executive Recommendations • CDM Regulations • COSHH Regulations • Building Regulations (as applicable) • Local Bye-Laws and Regulations • Local Authority Regulations and Approvals • BS EN Product Specifications • British Standard Codes of Practice • CE Conformity 	
Design Information Requirements	
<ul style="list-style-type: none"> • Input Voltage • Input Frequency • IP Rating • Operating Temperature • Total Unit Power Consumption • Lumen Output • LED Colour Temperature • LED Useable Lifespan • General Product Warranty 	<ul style="list-style-type: none"> 110V to 230V AC (+/- 10%) 50Hz Minimum IP54 Minimum -20°C to +50°C Max. 60w Min. 3500 Lm 4000 to 4500 Kelvin (Neutral or Cool White) Min. 50,000hrs or 5.7yrs (Based upon max. 30% lumen depreciation) Min. 2yrs, 5 years expected

Annex 4: Municipality of Kolding

Table 4: Technical specification

Product group	Energy efficiency (Lumen/Watt)	Lifetime L70 (timer)	Colour reproduction (RA index)	Colour temperature (degrees Kelvin)
Indoor general lighting	50	20 000	80	2700-3000
Indoor effect lighting	40	20 000	80	2700-3000
Outdoor lighting	50	20 000	75	3000-4000

Table 5: Award criteria

Sub-criterion	Weighting in %
Lifetime price, which will include an evaluation of <ul style="list-style-type: none"> • Procurement price • Lifetime • Operating expenses 	55% divided by 35% 35% 30%
Energy efficiency (Lumen/Watt)	25%
Light quality (RA value)	20%

Table 6: Example of the calculation of weighted value for use in the tool

The example is the lifetime for the sub-area of low-voltage bulbs.

Replacement light source for	W	Base	Weighted number	Lifetime Hours (L70)	Weighted lifetime
10W 12V G4 clear or matt	10	G4	34	20000	680000
20W 12V GU5.3 Titan Ø50	20	GU5	24	35000	840000
20W 12V Ø50	20	G4	15	40000	600000
20W 12V G4 clear	20	GU5,3	15	35000	525000
35W 12V GU5,3 Titan Ø50	35	GU5	12	35000	420000
TOTAL			100		3065000
Weighted value					30650

The “weighted number” column is calculated on the basis of the turnover of the relevant traditional light source converted into hundredths.

The lifetime is the supplier’s stated lifetime for his tendered replacement light sources.

The weighted lifetime column is obtained by: $\text{Weighted lifetime} = (\text{weighted number} \times \text{lifetime})$.

The bottom row, “weighted value”, which is marked in green, is obtained as follows: $\text{Weighted value} = (\text{sum weighted lifetime} / \text{sum weighted number})$. This weighted value is used in the LCC-CO₂ tool.

Table 7: Evaluation and allocation

Evaluation	Supp, 1	Supp, 2	Supp, 3	Supp, 4	Supp, 5	Supp, 6	Supp, 7	Supp, 8
Procurement price	604,434	775,304	770,236	535,077	675,316	464,766	517,291	361,102
Weighted Lifetime	25,400	27,650	30,550	27,650	22,400	37,050	34,250	37,450
Weighted Watts	4.000	4.204	3.700	3.604	4.510	3.428	2.850	3.735
Operating costs (25 years)	1,369,635	1,439,487	1,266,913	1,234,041	1,544,264	1,173,778	975,865	1,278,897
Weighted Lm/W	50	66	76	47	40	66	52	60
Weighted RA	82	85	80	85	81	82	82	83

Conditions for the calculation of operating expenses	
Number of bulbs	5,115
number of hours per year	1,880
Electricity price (DKK)	0.3965
Distribution (DKK)	1.0278
Total electricity price (DKK per kWh)	1.4243

Formula for the calculation of operating expenses

Operating expense = ((weighted Watts x (number of bulbs x hours per day x days per week x weeks per year)/1000) x total electricity price)

Allocation of points	Supp. 1	Supp. 2	Supp. 3	Supp. 4	Supp. 5	Supp. 6	Supp. 7	Supp. 8	Max. point
Procurement price	11.50	8.97	9.02	12.99	10.29	14.96	13.44	19.25	19.25
Weighted Lifetime	5.96	8.44	11.64	8.44	2.65	18.81	15.72	19.25	19.25
Operating costs	11.76	11.19	12.71	13.05	10.43	13.72	16.50	12.59	16.50
Lm/W	6.94	18.06	25.00	4.86	0.00	18.06	8.33	13.89	25.00
RA	8.00	20.00	0.00	20.00	4.00	8.00	8.00	12.00	20.00
Total	44.16	66.65	58.37	59.34	27.37	73.54	61.99	76.98	100.00

Formulae for the calculation of points for lifetime, Lm/W and RA

The highest value gives the maximum points. If the value is equal to the minimum requirement, 0 points are given.

Points are allocated according to the formula for a linear function $y = ax + b$, where x gives the number of points, y gives the lifetime, Lm/W or RA, b = minimum requirement, and $a = (\text{best value} - \text{minimum requirement}) / (\text{max. point} - \text{zero})$

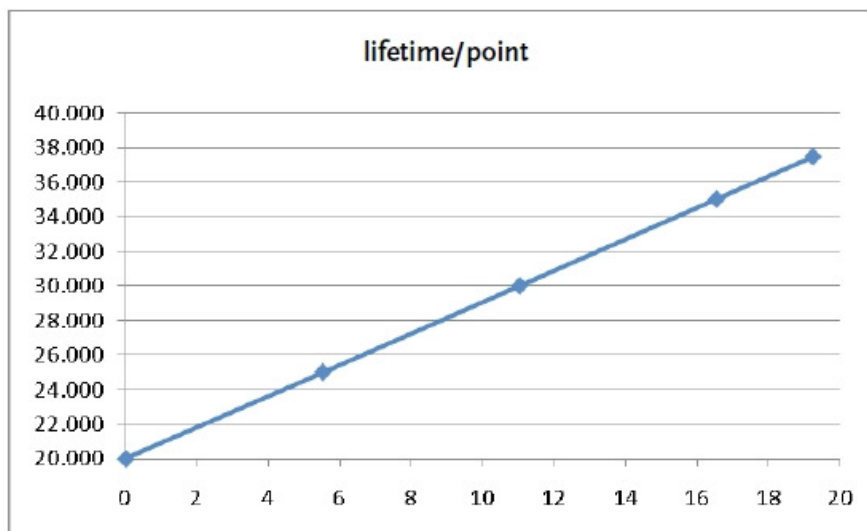
Point = $(y - b) / a$

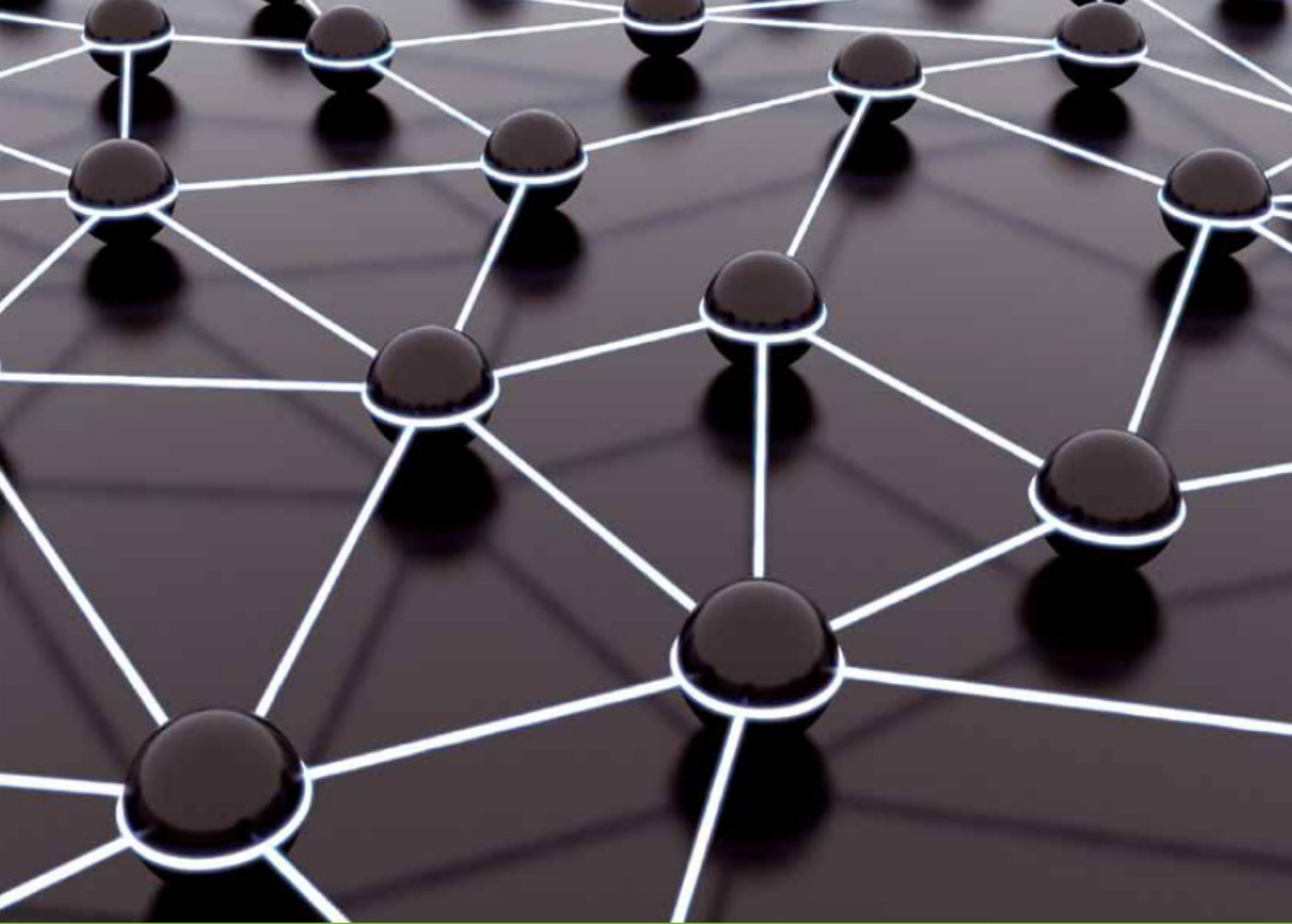
The relationship between the lifetime and the point allocation is shown in the figure below.

Formulae for the calculation of points for procurement and operation

Point = $\text{max point} \times (\text{lowest value}) / \text{tenderer value}$

Figure 1: Relationship between lifetime and point allocation calculated according to the formula above.





SMART SPP – innovation through sustainable procurement

Running from September 2008 until August 2011 “SMART SPP - innovation through sustainable procurement” is a three year project which promotes the introduction of new, innovative low carbon emission technologies and integrated solutions onto the European market. This is being done through encouraging early market engagement between public authority procurers and suppliers and developers of new innovative products and services in the pre-procurement phase of public tendering.

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