



SMART SPP

innovation through sustainable procurement



Working with the market to procure sustainable solutions

A case study from the City of Barcelona

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Introduction to the case study

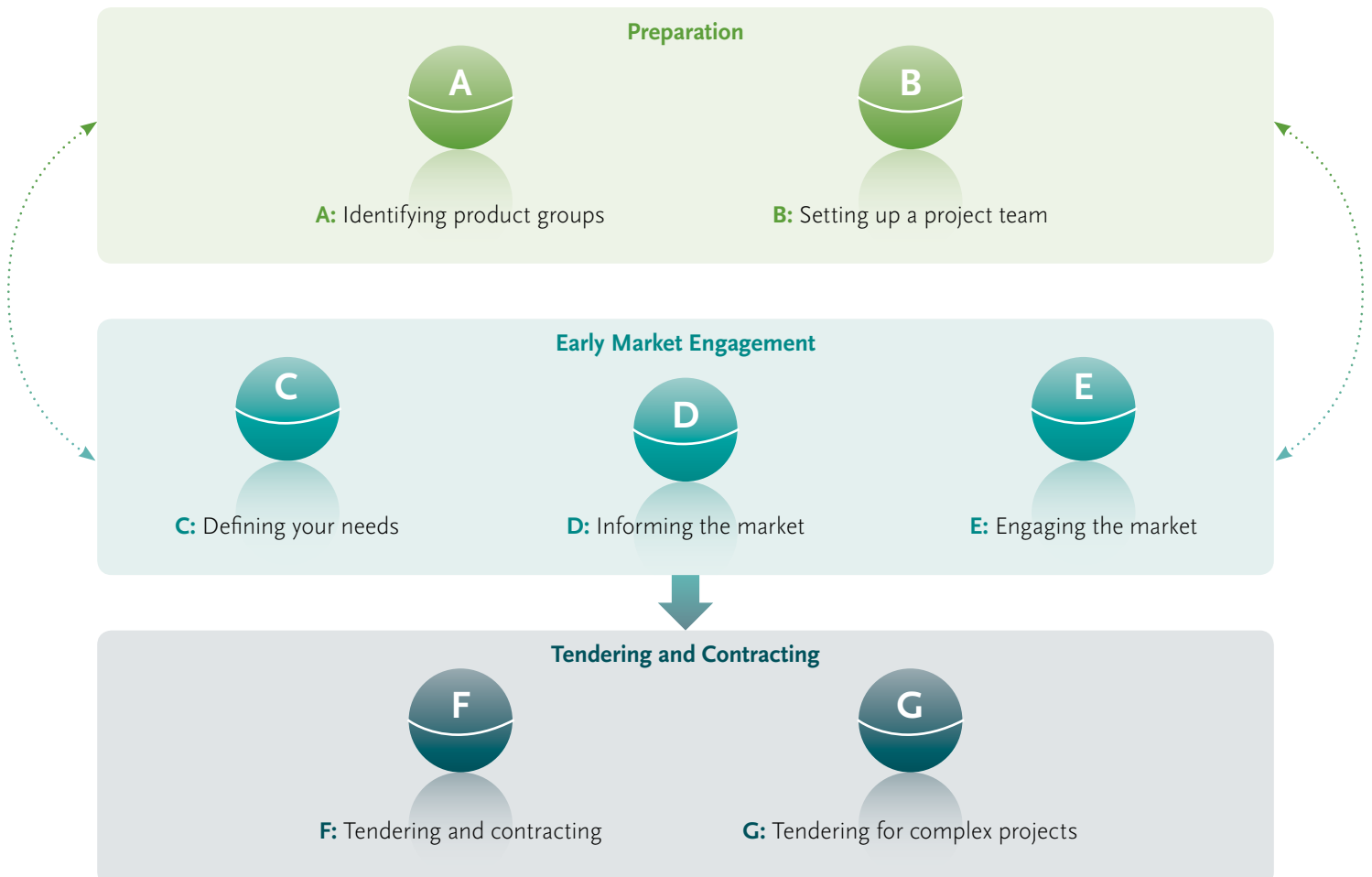
In this case study the City of Barcelona (Spain) shares its experiences, conclusions and lessons learned.

City of Barcelona has used a particular procurement approach (see figure 1) 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.

Figure 1

Activities to guide authorities through a flexible approach to drive innovation through sustainable procurement



Barcelona City Council

1. Summary



Ajuntament  de Barcelona



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)¹ 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 MOVELE² project and the LIVE³ Plan on the initiative of the Agencia de Energía de Barcelona (Barcelona Energy Agency)⁴.

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)⁵ 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.

1 Available at: www.bsmsa.cat/

2 Available at: www.idae.es/index.php/mod.pags/mem.detalle/id.407/lang.es

3 Related information available: [www.movilidadelctrica.com/search/label/proyecto LIVE](http://www.movilidadelctrica.com/search/label/proyecto%20LIVE)

4 Available at: www.barcelonaenergia.cat/cas/laagencia/presentacion.htm

5 Available at: www.bcn.es/agenda21/ajuntamentsostenible/castellano/index.htm

3. Experience with the SMART SPP approach to driving sustainable innovation

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 Energía 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.
- *Área 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 district⁶; 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.

⁶ Available at: www.22bex.php?lang=es



In parallel, the minimum functional requirements for the tender were defined. For this CITCEA-UPC⁷ 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 SPP⁸ 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 organisations 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.

⁷ Centro de Innovación Tecnológica en Convertidores Estáticos y Accionamientos-Universidad Politécnica de Cataluña (Technical Innovation Centre for Static Converters and Drives-Polytechnical University of Catalunya).

⁸ Available at: ted.europa.eu/udl?uri=TED:NOTICE:112139-2009:TEXT:ES:HTML

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.



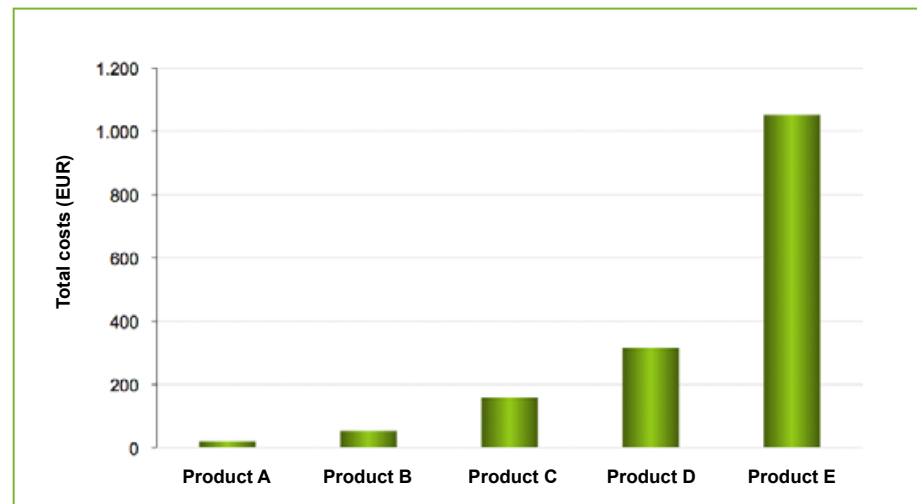
⁹ Available at: www.mpt.es/servicios/fondo_sostenibilidad

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:

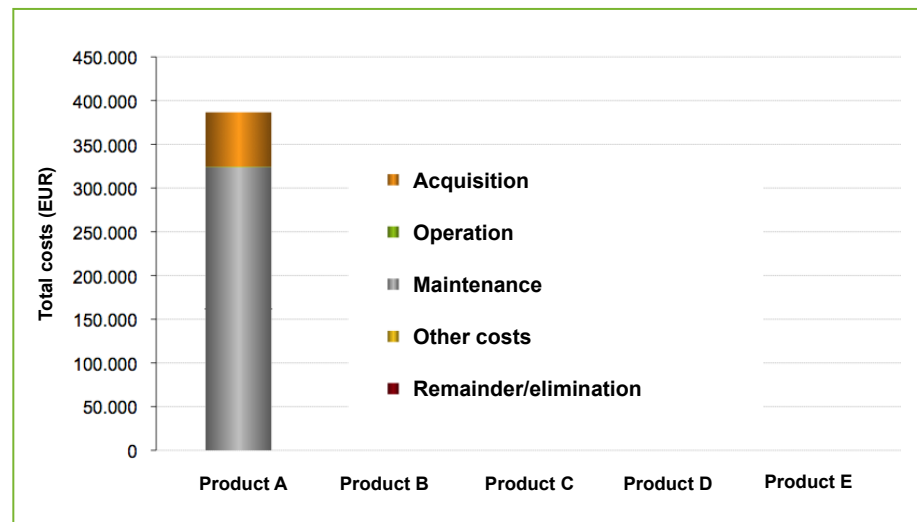
- CO₂ costs and emission values derived from the operation of various types of support column. The annual operating costs calculated from the consumption data for charging points (when not charging) provided by various companies which participated in the seminar are given below:

Figure 2: Annual operating costs per charging point



- 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):

Figure 3: Total costs of service (period of 10 years)



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 on-street 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 possible¹⁰.



¹⁰ Source: Barcelona Energy Agency.

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.

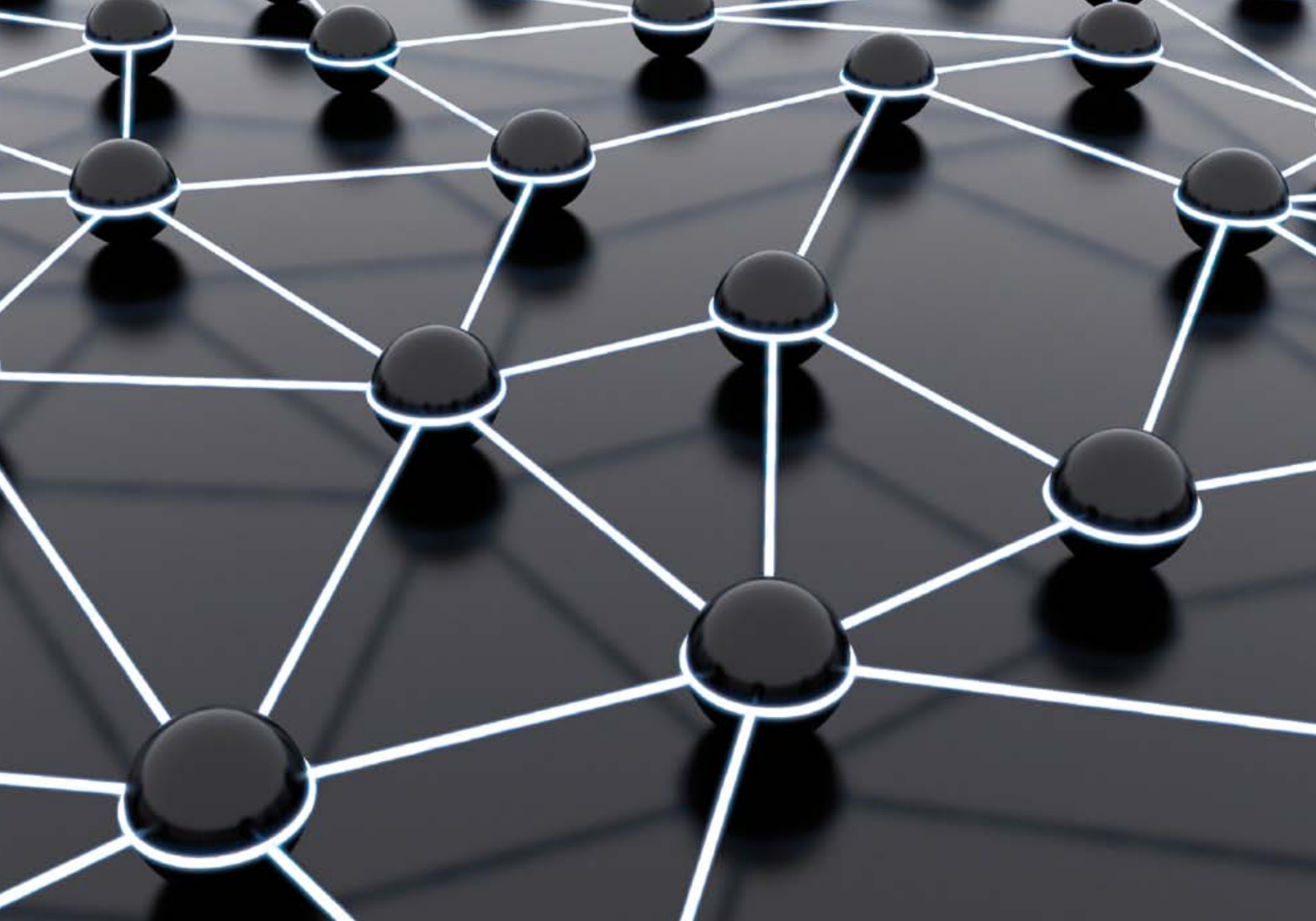
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Annex

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*



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.

SMART SPP is an initiative of the Procura+ Campaign, run by ICLEI – Local Governments for Sustainability and designed to help support public authorities across Europe in implementing Sustainable Procurement and help promote their achievements.

For more information visit www.procuraplus.org

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