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ICLEI
Local Governments for Sustainability

Costs and Benefits of Green Public Procurement in Europe

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Part 3: The Potential of GPP for the Spreading of New/Recently Developed Environmental Technologies – Case Studies

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Abbreviations

ADEME	Agence de l'Environnement et de la Maîtrise de l'Energie
CRT	Continuously Regenerating Technology
CNG	Compressed Natural Gas
CRT	Continuously Regenerating Technology
EDF	Electricité de France
EMS	Environmental Management System
Fahma	Fahrzeugmanagement Region Frankfurt RheinMain GmbH
GPP	Green Public Procurement
HLB	HLB Bahnen GmbH (railway company)
I +D	Investigation and Development
LCA	Life Cycle Analysis
LcA	Lifecycle Assessment
LPG	Liquefied Petroleum Gas
MDT®	Micro Downlight Technology®
MTU	Engine producer MTU
MUPI	Mobilier Urbain pour Publicité et Information
OPI	Optical Point of Information
PIU	Urban Information Panel
PM	Particulate matters
Ppm	parts per million
R&D	Research and Development
RMV	Rhein-Main Transport Network
SPP	Sustainable Public Procurement
GPP	Green Public Procurement
RES-E	Electricity from Renewable Energy Sources
SEPI	Société Européenne de Promotion et d'Investissements
SEV	Société d'Electricité Vendeville
SMDR	Société matériaux de démolition et de recyclage

1 Introduction

The objective of this task was to build a body of qualitative and quantitative evidence to show how tender documents have been established in such a way as to trigger the offer of products based on a new or recently developed eco-technology. This report describes in detail at least 5 procurement procedures including the methodology and different theoretical and practical steps undertaken by a procuring authority.

The case studies

1) Rhein-Main Transport Network, GERMANY – 'particle filters' for train
2) Barcelona, SPAIN – bus shelters
3) Zurich, SWITZERLAND – floorlamps
4) Lille, FRANCE – lighting system
5) Göteborg, SWEDEN – buses

There is strong evidence that green public procurement (GPP) can have an impact on the market, and in particular on the design and production of new 'eco-technologies' or better 'eco-solutions'. However, in light of the difficulty in identifying suitable good practice examples, it has to be pointed out that a single public authority may be rarely in the position to claim that its tender was the sole cause for triggering the offer on the market.

2 Selection of good practice examples

Following an extensive period of literature review, internet research and contacting key organisations, several potential good practice cases were identified across Europe that eventually led to the selection of five best practice examples. With the exception of fahma, a 100% associated company of the regional Rhein-Main Transport Network (see 'Taunusbahn' case), all contracting parties were relatively major cities with experience with GPP. Key selection criteria included the existence of a green tender that had a market impact on new or recently developed 'eco-technology'. Furthermore, the examples were chosen on the basis of the following criteria:

- Legality of the tender that was used;
- Relevance to the EU;
- Likely ability to source data and information, and the consequent scope and quality of evidence that can be gathered;
- Extent of environmental and economic impacts; and
- Replicability in other purchasing organisations.

In order to identify five good practice examples more than 80 suitable authorities, relevant associations, private companies and other experts have been directly contacted by ICLEI.

3 Methodology

3.1 Literature review

The literature was undertaken to analyse the available evidence for tender documents to trigger the offer of products based on a new or recently developed eco-technology.

The following documents were identified:

- OECD review of the environmental performance of public procurement (2003).
- The Green Alliance study on sustainable procurement for DEFRA (2005). The Green Alliance report cites good examples of initiatives in Denmark as well as the UK.
- The results of the Downstream Impacts of Sustainable Public Procurement project undertaken by ERM with ICLEI for DEFRA (2006).
- Cost Benefit Analysis of Sustainable Public Procurement, a research report completed for the Department for Environment, Food and Rural Affairs by SQW Ltd.
- Driving innovation through public procurement, February 2007, Policy Briefing, Nesta
- Guide On Dealing with Innovative Solutions in Public Procurement - 10 elements of good practice, PRO INNO Europe.

To assist in the search for examples a message was sent to ICLEI's Buy-It-Green Network (BIG-Net), which contains over 200 sustainable procurement professionals and ICLEI's Cities for Climate Protection (CCP) mailing list which contains over 225 participants.

3.2 Selecting examples

Based on the research, a list and short summary of examples gathered was sent to the EC to decide with the project team which 5 examples would be most suitable to carry out further research. The selection of examples chosen was based on:

- Legality of the tender that was used;
- Relevance to the EU;
- Likely ability to source data and information, and the consequent scope and quality of evidence that can be gathered;
- Extent of environmental and economic impacts; and
- Replicability in other purchasing organisations.

Following the selection procedure, research was undertaken to identify how, why and what was undertaken to trigger the offer of products based on a new or recently developed eco-

technology. Parts of the tender were translated into English and analysed to extract the important information.

3.3 Design of the questionnaire

The main instrument for the research was a questionnaire for both the public procurers and the suppliers. They were asked to provide information on:

Public authority:

- Background information
  - Total procurement budget / green procurement budget
  - Further experience with GPP
- Information on the product
  - Quantity of products purchased
  - Availability on the market
  - Comparative figures between 'standard' and 'green' product (incl. LCC)
- Drivers responsible for procurement
  - Main reasons, including political support, policy, specific targets and / or implementation strategy
- Tendering process
  - Developing the green procurement criteria (internal and external involvement)
  - The green procurement criteria (from selection to specification; verification)
  - Assessing the tender (number of bidders; timetable of tendering process)
  - Contract management
- Potential of triggering the market
  - Impact on the market; supply chain;
  - Cost analysis
- Barriers and difficulties
- Lessons learned

Private supplier:

- Background information
  - Sales percentage
  - GPP experience with GPP
- Information on the product
  - Cost analysis 'standard' versus 'green' (LCC)

  - Sub-suppliers involved
  - Availability on the market
- Drivers responsible for procurement
  - Main reasons, including policy, specific targets
- Tendering process
  - Compliance with criteria
- Potential of triggering the market
  - Impact on market; market supply, other sectors
  - Duration and sustainability of changes
  - Impact throughout the supply chain
  - Impact on other sectors (sub-suppliers)
  - Impact
- Eco-Technology / Eco-solution used
- Barriers and difficulties

Additionally, the respondents were asked to provide tender and contract documents as well as other relevant information on the product concerned. The questionnaire has been designed professionally using a word formulary that could be filled in electronically. Four language versions of the questionnaire (English, German, French, and Catalan) were available.

3.4 Follow up interviews

Additional to the questionnaire methodology proposed to the EC, ICLEI undertook follow up interviews with both the purchaser and suppliers. The reason for this was that, due to the lengthy selection process to identify suitable good practice examples, short timescales were given to the respondents to reply, and most importantly to obtain more detailed information.

All interviews were undertaken in the native language (Swedish, German, French, and Catalan) to ensure that accurate information was obtained.

A strong asset for handling the survey was the already established contacts to different local and regional authorities, in particular with the cities of Zurich, Barcelona and Lille that are all part of ICLEI's Procura+ Campaign on sustainable procurement in Europe[1]. Despite the limited timeframe, the respondents were keen to get involved in the project.

[1] See online at: www.procuraplus.org

The dates the interviews took place were:

	Purchaser interview	Supplier interview
Case study 1: Taunusbahn - Germany	21 May 2007 Joachim Michels & Gerolf Wogatzki	4 June 2007 Wolfgang Späth & Björn Vitt
Case study 2: Barcelona, Spain	31 May 2007 Adolf Creus & Helena Barracó	31 May 2007 Luís Sánchez Olavarría
Case study 3: Zurich, Switzerland	25 May 2007 Stefan Hösli	25 May 2007 Markus Binda & Markus Simon
Case study 4: Lille, France	30 May 2007 Richard Jullian, Danielle Poliautre, Eric Decaillon	30 May 2007 Christophe Montelimard
Case study 5: Göteborg, Sweden	10 January 2006 and 24 May 2007 Lennart Löfberg 12 January 2006 Pierre Modini	20 January 2006 Peter Danielsson

3.5 The Case studies

The following 5 case studies describe in detail the methodology and different steps undertaken by the procuring authority where tender documents had an impact on the market or developed an eco-solution. The case studies describe the process from the start of the procedure such as the initial policy and idea right through to the development of the criteria and the call for tender as well as the results.

The case studies present the following:

- Background information on the organisation
- Information on the product
- What was the new Eco-Technology
- The drivers responsible for procurement
- The tendering process
- Development of the green procurement criteria
- The green procurement criteria
- Contract management
- Results of the tendering process and the key factors that triggered the market for the Eco-Technology including impacts on the supply chain, impacts on market supply and impacts on the wider market demand
- Barriers and difficulties
- Lessons learned
- Outlook
- Contacts

4 Case study 1: Sustainable Procurement of Public Railcars with the Eco-Technology 'particle filters' for the Taunusbahn, GERMANY

Figure 1 Photo Alstom/ B. Rosenthal

Prepared by ICLEI – Local Governments for Sustainability

With support from:

Joachim Michels, Gerolf Wogatzki – fahma Fahrzeugmanagement GmbH, Sabine Groß, Wolfgang Späth, Björn Vitt, Rdiger Wendt – Alstom LHB GmbH, Mr. Käsberger – Hug Engineering AG

4.1 Background information

The Rhein-Main Transport Network (RMV) covers 14 000 km², serving a population of over 5 Million people. The Taunusbahn is a line that is part of the RMV, operated by the HLB Bahnen GmbH (HLB) railway company supplying regional transport links from Frankfurt main station to cities and communities in the higher Taunus Mountains such as Königstein, Bad Soden and Bad Homburg.

In the last 20 years the passengers per working day on these lines increased by 625%. In order to meet the needs of the passengers, the capacities and the quality of existing services were improved. Therefore, the 'Fahrzeugmanagement Region Frankfurt RheinMain GmbH (fahma)', a 100% associated company with limited liability of the RMV, purchased new railcars and provided them to the HLB.

In 2004 fahma published a European tender for the production and delivery of ten two-part railcars.[2] All railcars have been in operation on the lines since December 2006.

fahma is responsible for the finance, the procurement and the hosting of vehicles for the regional rail transport and the supply of these to railway companies. Since 2003 fahma purchased and tendered for vehicles and services for the 'Odenwaldbahn' and 'Taunusbahn' with an overall budget of 112 Million Euro. Over 30% of the procurement activities have gone beyond the legal minimum requirements for environmental criteria, especially focussing on reducing emissions by applying EU stage IIIa and EU stage IIIb emission standards earlier than required.[3]

The winning bidder for the ten railcars was Alstom LHB GmbH (Alstom)[4], offering vehicles of the type CORADIA LINT 41 / H that are equipped with two powerpack©® engines provided by the company MTU of each 335 kW and particle filters provided by the company Hug Engineering.

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[2] The tender is published under the identification number 2004/S 240-206797 – Public announcement for the award of contract.

[3] Rail Traction Engine standards adopted by the European Parliament on 21 April 2004 (Directive 2004/26/EC) for engines from 130 kW to 560 kW used for the propulsion of railroad locomotives and railcars need to fulfil the following limits: from 1 January 2007 stage IIIa (CO 3,5 g/kWh, HC -, HC+NO_x 4,0 g/kWh, NO_x -, PM 0,2 g/kWh), from 1 January 2012 stage IIIb (CO 3,5, HC -, HC+NO_x 4,0 g/kWh, NO_x -, PM 0,025 g/kWh).

[4] Alstom LHB GmbH and its German site Alstom LHB in Salzgitter offers railway technique all over the world, focussing on high environmental standards and on the same time pushing innovation to get the first mover advantage regarding environmentally friendly products.

4.2 The new Eco-Technology

In 2003 MTU started an EU-funded pilot project to assess the possibilities of including particle filter systems into the engine system. In the CORADIA LINT series, a catalytic coated filter is used consisting of two functional filter units in parallel connection. It is based on the wall flow principle that uses a holed and coated wall through which the exhaust emissions flow, reaching a filtration efficiency of 95% of the particulate matters. The passive regeneration is achieved by the catalytic elements (coated wall).

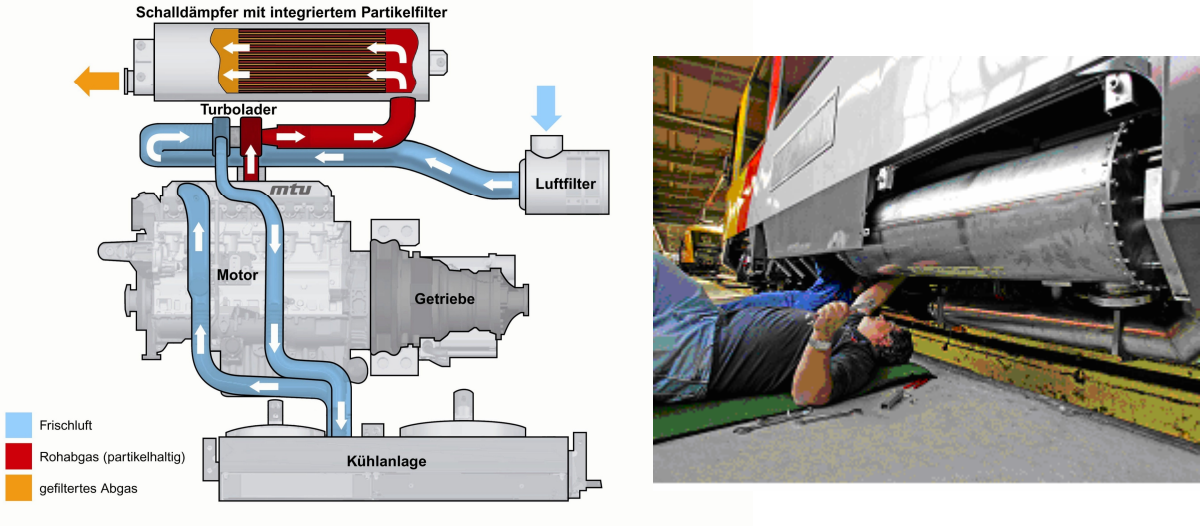

Figure 2 Technical scheme of the engine + particle filter (left); the mounted particle filter (right) (Graphic/Photo: MTU/Alstom/B. Rosenthal)

The availability of the whole product (railcar) has a delivery timeframe of two years. The additional costs for the environmental friendly version are for each filter 45 000 Euro, resulting in approximately 3% additional costs of the total product costs of approximately 2,7 million Euro. With current testing, fuel consumption is the same as those railcars that do not use a particle filter. There are negligible costs for the maintenance of the filter system.

4.3 The drivers responsible for this new Eco-Technology

In 2005 a national discussion about the high emission levels of particulate matters[5] in the air of cities like Munich and Frankfurt/ Main influenced local politicians to take measures in reducing the particulate matters in urban transport.

The discussion on particulate matters in the region Higher Taunus also influenced the tendering of railcars for the 'Taunusbahn'. The Head of the District Authority of Higher

[5] Particulate matters are defined as "A small discrete mass of solid or liquid matter that remains individually dispersed in gas or liquid emissions (usually considered to be an atmospheric pollutant)" (Source: www.wordwebonline.com)

Taunus gave clear political backing of the tendering process and supports the introduction of particle filters in railcars. Additionally, the RMV climate protection strategy builds the base for reducing the emission levels in public transport. It is an objective of the RMV to use vehicles that meet the standards that will come into effective in future years.

4.4 The tendering process

The tender was issued on a European level and the procurement used a negotiated procedure. That means companies showing interest in the tender are invited to discuss the options and possibilities before a modified binding tender is issued. In these consultation sessions companies showing interest in the tender had the possibility to ask questions and communicate remarks to the tender documents and technical specifications. This method proved to be very valuable because the purchaser and supplier were able to discuss technical requirements such as how to achieve EU stage IIIa/ IIIb emission standards. fahma asked for a concept note for a particle filter as part of the tendering procedure with the aim to find a suitable solution to reduce costs for Research and Development and ensure the railcars could be delivered in a two-year timeframe.

4.4.1 Developing the green procurement criteria

The initial development of the green criteria for the tender took place in co-operation among fahma, the RMV and the HLB. They used internal technical knowledge and special expert knowledge on green criteria provided by 'GreenDeltaTC' consultancy as well as criteria relating to the life cycle cost calculation (LCC) developed by 'Die Ingenieurwerkstatt'.

Following the call for tender and during the consultation phase Alstom stated that this approach was the correct approach in that it was focussing on strong environmental impacts during the usage phase of the product. Alstom were also able to use their experience gained with fulfilling the obligations of public tenders in Sweden which have even more stringent requirements and focus more on the whole lifecycle including research and development, production, use and disposal/recycling.

The GreenDeltaTC study delivered a set of green criteria addressing noise reduction, emission levels, fuel consumption, avoiding harmful substances, recycling manual, and life cycle assessment (LCA) among others. The most relevant criteria (emission levels, fuel consumption and avoiding harmful substances) were included into the technical specifications (see 5.3).

4.4.2 The green procurement criteria

The first tender document, which included technical specifications, contained the following minimum green requirements:

Table 1 Minimum green requirements

Noise levels referring to ISO 3095 (L_{Amax} = 90 dBA)	Lowest fuel consumption as possible
Avoidance of specific toxic materials (e.g. arsenic, chrome)	Emission standards based on the Directive 97/68/EG Stage IIIa

These minimum requirements meet current legislation. The selection process was using a quality management system with a scoring matrix, supported by a bonus/malus-system. The selection criteria were as follows:

Table 2 Selection criteria

Price of the offer (60%)	Maintenance – exchange time (10%)
Fuel consumption (10%)	Delivery time (8%)
Maintenance – activities (7%)	Downtime during warranty (5%)

After the consultation round additional green criteria were included into the technical specification parts of the tender documents, focussing on engines that can use low sulphur content fuel (<0,005%) and on the requirement to equip the engines with particle filters or developing an obligatory retrofitting concept. The requirement to equip the engines with particle filters was a key impetus for the further development of this new Eco-Technology and to assist with bringing it onto the market (see section 4.5). Contract performance clauses included tests and environmental documentation related to the above-mentioned criteria. Tests, especially about the performance of the particle filter, are scheduled for 2007.

The green criteria did not refer to any eco-labels, but used current EN and ISO standards. However, self-declarations[6] of the supply and sub-suppliers were used to assess whether the product complies with the requirements set in the tender documents.

4.4.3 Assessing the tender

The tender was issued on 2 December 2004 including both the tender document and the technical specifications. Companies interested in participation had time until 16 February 2005 to express their interest and indicative prices. 5 European-based companies and 2 Asian-based companies presented the required documents. Four bidders were pre-selected using defined selection criteria (see below). The consultation process took place from 18

[6] Technical documents provided by the supplier e.g. showing the fuel consumption of the railcar or that materials used to build the railcar do not contain certain chemicals

March 2005 until 4 April 2005, leading to the adaptation of the tender documents and the technical specifications that were mailed out on 22 April 2005. During this time the inclusion of a particle filter was discussed and included as optional criteria. After this point, the bidders had one month to complete their offer. After receiving two offers fahma awarded the contract to Alstom on 26 June 2005.

4.5 Results of the tendering process and key factors that triggered the market for Eco-Technology

The particle filter using the wall flow system was the first to be included into a diesel railcar at an international level. It has been presented to different regional, national and international stakeholders as a leading example of how innovation, environment and being the first on the market come together and build a real business case that is economically viable. Sigmar Gabriel, Environmental Minister of the Federal Republic of Germany commended the efforts of fahma and Alstom by saying that this Eco-Technology proves that "*ambitious environmental policies and prosperous economic developments do not exclude each other*" (Alstom press release 15/09/2007).

The Eco-Technology 'particle filter for diesel railcars' corresponds to recent technologic developments whose objective is to reduce emissions by improving the engine technologies. The 'Taunusbahn' procurement approach not only stimulated R&D to develop economic efficient eco-solutions at Alstom, MTU and Hug Engineering, but also provided a business case that ended in a breakthrough of this Eco-Technology on international markets.

In the case of the 'Taunusbahn' the inclusion of the particle filter into the tendering process followed a four-step approach:

1. Assessing the current market availability of the product;
2. Calculating the risk for stimulating innovation and fostering development of a new Eco-Technology;
3. Calculating the expected costs;
4. Introducing optional criteria in the post-award phase of the tendering process by demanding a concept note for a particle filter.

The assessment of the market availability was done in advance of the tender with key European suppliers asking for the actual technical capacities to fulfil EU stage IIIb emission standards. The outcomes clearly indicated that technical solutions are ready to be adapted to the specific demands of railcar engines, but that the demand so far (in 2005) did not permit series production. fahma stepped into this gap and awarded the contract to the supplier with the most economically efficient but also ambitious concept to include particle filters. Therefore, a key result of the procurement process was the demand created for the particle filter.

Before including the requirement 'concept note on particle filters' into the technical specification document, fahma undertook a risk calculation including the anticipation of

additional costs and the validation of legal requirements and impacts on market distortion. This risk calculation was a key element to get political back up even though additional costs were anticipated at that stage of the process.

The assessment of the market availability together with the risk calculation provided a realistic figure of the expected additional costs (45 000 Euros per filter).

Excerpt of the technical specifications document – 'Concept note particle filters':

"The diesel engines have to be equipped with particle filters. If there does not exist the possibility to include a technical solution in the binding offer, the offer of the bidder must deliver adequate information on future technical solutions to be developed, time of realisation and preliminary cost calculations for the retrofitting.

The railcar has to be supplied with technical possibilities to retrofit the engines with particle filters. The supplier is obliged to retrofit the engines with particle filters when the required technical solution is available. The costs have to be included in the offer."

After awarding the contract, the concept note on the particle filter was further developed among the purchaser (fahma), the user (HLB railway company) and the supplier (Alstom), in order to get out a suitable solution that is both economic efficient and meets the high emission reduction standards set by fahma (stage IIIb in 2006). This highlights the importance of a good relationship between the purchaser and supplier.

Along with increasing political discussions about particulate matters across Europe and the impending emission standard stage IIIb coming into force 1 January 2012, a steadily growing demand is anticipated by companies further developing engines and filter systems (e.g. Hug Engineering).

When focussing on the element 'particle filter', the impacts on the supply chain, resulting of the issued tender can be seen on three levels: (1) Alstom as the supplier of the whole product, (2) MTU as the suppliers of the engine and (3) Hug Engineering as the supplier of the particle filter.

(1) Since the delivery of the ten railcars for the 'Taunusbahn' end of 2006, Alstom offered the CORADIA LINT series with particle filter in other competitive tender processes, and this has been a strong asset for receiving the award of contract. Due to cost reasons the particle filter was not purchased, but the retrofitting concept developed for fahma was highly appreciated by the purchasing authorities.
(2) For MTU the case 'Taunusbahn' completed a series of R&D activities on how to include particle filters in railcar engines. It was also advantageous that the already developed engine was already emitting less particulate matters. The green procurement of fahma resulted in a business case for MTU and related sub-suppliers for particle filters in railcar engines. MTU raised most but not all the costs for R&D.

Normally, a big engine producer like MTU would not invest too much time in developing specific solutions for the small market of engines for railcars, but the strong signal coming from the tender for the 'Taunusbahn' encouraged MTU to enlarge the offer of environment friendly products (here: engines with particle filter systems).

(3) As one of the leading filter solution providers. Hug Engineering AG sees big development and market potentials. Until now they equipped hundreds of locomotives all across Europe (250 in Switzerland alone) with particle filters of similar construction. Today it is possible to include filter systems into railcar engines with a propulsion power of up to 2 MW, allowing nearly any engine of different power levels to be equipped with a particle filter.

As Eco-Technologies to reduce emissions are steadily developing, the use of this specific particle filter in the 'Taunusbahn' was an important step to make technologic solutions available on the market. It also pushed forward the possibilities to retrofit old railcars with particle filters to meet future EU emission standards before 2012.

Currently, engine producers, in co-operation with railcar suppliers, work on the further development to reach the high emission standards of the whole stage IIIb coming into force in 2012. This requires further developments in the whole motor system. The case 'Taunusbahn' helped to put pressure on this technologic development demonstrating the market demand and economic efficiency.

4.6 Barriers and difficulties

Mentioned obstacles include missing European standards for recent technological developments as well as some difficulties about how to verify the fulfilment of the green criteria when fahma depends on self-declarations (e.g. used materials).

Although the costs are moderate and even include an Eco-Technology that even now fulfils nearly all European emission standards for 2012, the additional costs of approximately 3% of the total product costs mean a barrier for public authorities to purchase this product.

4.7 Lessons learned

The success of this green tender was secured mainly due to political backup resulting from recent discussion about particulate matters and air quality in the region. Therefore, taking the risk to demand innovative product components was limited. It also lead to further discussions of whether these environmental friendly railcars could also ensure competitive advantages in the future, when regulations on vehicles that are allowed to drive into the Frankfurt / Main inner city circle might be tightened, allowing only railcars with stage IIIb emissions to enter.

The external knowledge provided by consultants on how to include green criteria was valuable for a suitable selection procedure. The negotiated procedure gave good results

especially when considering the inclusion of the new Eco-Technology of particle filters for railcars. Detailed tables and figures in the technical requirements allowed the supplier to easily fulfil the green criteria.

4.8 Outlook

fahma will include the lessons learned and the good experiences with implementing green criteria in their future tenders. Regarding the constantly increasing importance of life cycle costing the focus will mainly drift to represent real figures of the relation of purchasing, use and disposal costs in the tender documents by adapting the weighting of selection and award criteria.[7]

In future tenders fahma will include the stage IIIb emission standard as the minimum requirement, because of the existent availability of technical solutions to fulfil these standards for most of the engine power classes. The applied wall flow particle filter is one technical solution to reduce particulate matters. Researchers are currently discussing the possibilities to use filter systems similar to the Continuously Regenerating Technology (CRT), but at reduced maintenance costs.

At the same time discussions on European level arise towards abolishing the regulation to operate in non-compliance under a variance or continuation permit for railcars. If this will apply in the near future, strong requirements fostering the continuous retrofitting to meet the most recent standards can be included into tender documents.

In summary, the experiences with the procurement of railcars for the 'Taunusbahn' indicate the possibilities to trigger the market by introducing new Eco-Technologies and by using specific green criteria. This case study showed that:

- An open and communicative attitude is the key element for a successful tendering process;
- Political discussions foster the introduction of new Eco-Technologies (here: discussion about particulate matters);
- Tendering for Eco-Technologies in the phase of development (here: particle filter adapted to the requirements of diesel railcars) results in a business case (mass offer of the product).

[7] Out of a lifecycle perspective purchasing costs only refer to one-third of the total lifetime costs of the railcars. Out of economic efficiency the weighting of 60% for the purchase price might be reconsidered.

4.9 Contacts

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4.10 Summary

Case study 1: Sustainable Procurement of Public Railcars with the Eco-Technology 'particle filters' for the Taunusbahn, GERMANY	
Purchasing authority	Fahrzeugmanagement Region Frankfurt RheinMain GmbH (fahma)
Subject matter	Tender for the production and delivery of ten two-part railcars
Environmental criteria required	Minimum environmental requirements • Noise levels referring to ISO 3095 (LAmax = 90 dBA) • Avoidance of specific toxic materials – comprehensive list including e.g. arsenic, chrome • Lowest fuel consumption possible • Emission standards based on the Directive 97/68/EG Stage IIIa Technical specifications • The diesel engines have to be equipped with particle filters. If this is not possible, the offer of the bidder must deliver adequate information on future technical solutions to be developed, time of realisation and preliminary cost calculations for the retrofitting. • It must be technically possible to retrofit the railcar engines with particle filters. The supplier is obliged to retrofit the engines with particle filters when the required technical solution is available. The costs have to be included in the offer. Award criteria • Fuel consumption (10%)

The new eco-technology	In the CORADIA LINT series, a catalytic coated filter is used consisting of two functional filter units in parallel connection. It is based on the wall flow principle that uses a holed and coated wall through which the exhaust emissions flow, reaching a filtration efficiency of 95% of the particulate matters. The passive regeneration is achieved by the catalytic elements (coated wall).
Key drivers for triggering market	• National discussion about the high emission levels of particulate matter in the air of cities like Munich and Frankfurt/ Main (2005) • Awareness of local politicians about the role of urban transport regarding particulate matters • Rhein-Main Transport Network (RMV) climate protection strategy setting ambitious targets • The demand of the particle filter was based on recent R&D activities that only needed a business case. A key result of the procurement process was the demand created for the particle filter.
Impact on supply side	• Alstom Transport offered the CORADIA LINT series with particle filter in other competitive tender processes • The green procurement of fahma resulted in a business case for the Engine producer MTU and related sub-suppliers for particle filters in railcar engines. • The filter solution provider Hug Engineering AG sees big development and market potentials all across Europe.
Cost implications	• The additional costs for the environmental friendly version for each filter are €45 000, resulting in approximately 3% additional costs of the total product costs of approximately € 2.7 million. • With current testing, fuel consumption is the same as those railcars that do not use a particle filter. There are negligible costs for the maintenance of the filter system.
Barriers and difficulties	• Lack of European standards for recent technological developments • Some difficulties about how to verify the fulfilment of the green criteria other than by self-declarations by the supplier (e.g. used materials)
Lessons learned	• Political support resulting from recent discussion about particulate matters and air quality in the region secured the green tender • Good external knowledge provided by consultants on how to include green criteria • Choosing a negotiated procedure gave good results • Detailed tables and figures in the technical requirements allowed the supplier to easily fulfil the green criteria.

5 Case study 2: Sustainable Procurement of Bus shelters in Barcelona, SPAIN

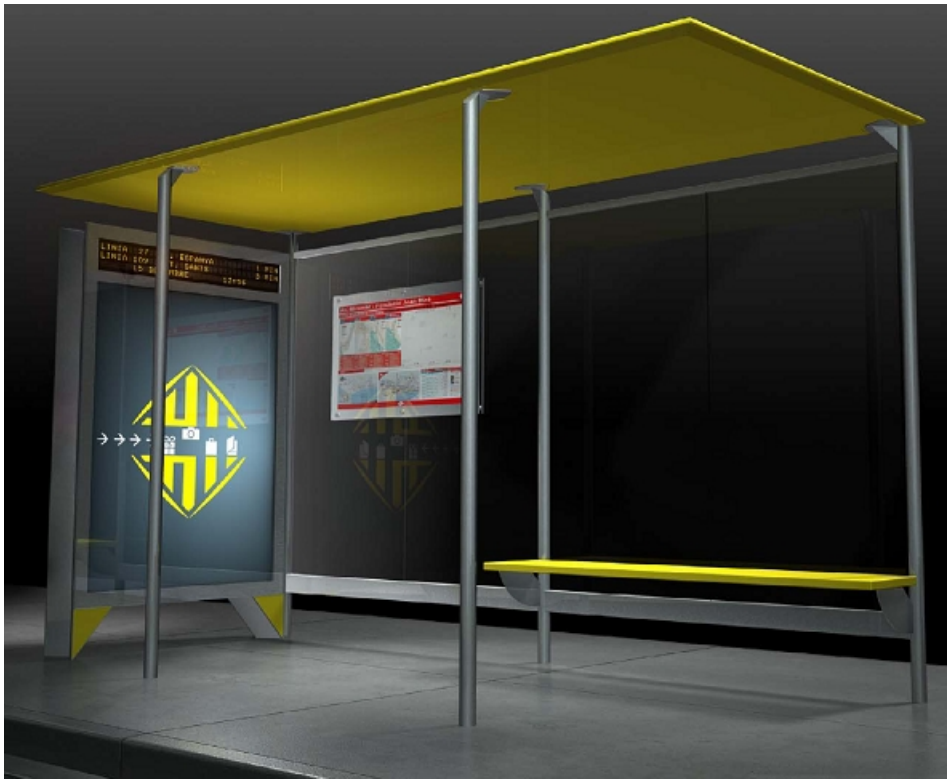

Figure 3 Source: JCDecaux (3D Prototype)

Prepared by ICLEI – Local Governments for Sustainability

With support from:

Helena Barracó, Adolf Creus – Barcelona City Council (Ajuntament de Barelona), Luís Sánchez Olavarría– JCDecaux Spain

5.1 Background information

The city of Barcelona, located on the Mediterranean coast of Spain, is the country's second biggest city with a population of 1 700 000 people. In 2002, the city approved Agenda 21, citizens' commitment to sustainability, in accordance with the guidelines of the United Nations Conference on Environment and Development (UNCED) ('Earth Summit') of 1992. The aim of Agenda 21 is to promote a new model of development based on satisfying present needs without compromising the capacity of future generations. Barcelona City Council, within the framework of Barcelona's Agenda 21, is now promoting the Sustainable City Council Programme[8] in an attempt to spread the incorporation of good environmental and social practices throughout the organisation.

One of the priorities of this programme is the incorporation of environmental and social criteria in the public procurement process. Within this framework, in September 2006 the general administrative tenders of the municipality to contract works, services and goods were modified and published to include environmental criteria which are in line with the new European public procurement directives. In detail, the latter refers to the criteria used to evaluate technical capacity, award criteria and the obligations and responsibilities of the contractor. Furthermore, Barcelona is an active participant of the Procura$^+$ Campaign led by ICLEI and this has pushed them to become a leader in Sustainable Public Procurement (SPP).

For the first time Barcelona included environmental criteria into the tendering process for the purchase of street furniture in 1998. Before reaching the end of this first contract, Barcelona developed a second tender for the conservation, implementation and maintenance of street furniture (including bus shelters).

5.2 Information on the product

Barcelona purchased 500 new bus shelters and adapted all 1200 old existing bus shelters. The winning bidder for the bus shelter in Barcelona was JCDecaux, an international group leader in outdoor communication, offering a unique prototype for the city: the "***Barcelona bus shelter model***", a model compatible with the old ones. Located on busy main streets and venues, near shops and points of sale, each shelter comprises two main elements:

- Bus shelter structure: roof, support structure, glass and bench;

[8] www.bcn.cat/agenda21/ajuntamentsostenible. The objectives are: reduce CO_2 emissions, water consumption and waste production; promote a social and sustainable local economy; exclude products and services which cause social injustice; and create a culture of social responsibility and environmentally friendliness.

- OPI (Optical Point of Information): two large panels at eye level, with the option of placing advertisements on either side of each panel, and a bus timetable.

These two main elements of the bus shelter are comprised of a set of smaller elements made of different materials (the use of chlorine, PVC and non-recycling materials was prohibited); these may be found in Annex 1. For the maintenance of the product, JCDecaux implemented a new technology for the cleaning system using osmosed[9] water instead of conventional water, thus avoiding the need to use soaps/detergents in the cleaning process.

5.3 The developed new Eco-Solution and Eco-Technology

As a result of the tender, the ***'Barcelona bus shelter model'*** appears as a unique bus shelter prototype in the market. Three main elements distinguish this prototype to the rest: the inside part of the roof; the advertising panel; and the cleaning system of the bus shelter.

For the *roof*, the tender specified that it had to be able to resist a load of 500 kg/m^2 (a precaution against vandalism) and at the same time using recyclable materials. JCDecaux worked on the development of a beehive-shaped fibreglass material to go on the inside part of the roof. This particular inner light structure strengthens the roof, as well as being easy to disassemble at the end of its life cycle, enabling it to be recycled[10].

The *advertising panel* is unique for having replaced 4 lamps of high consumption with 3 low consumption T5 lamps[11] of 35 W each. Additionally, side panel reflectors improve the light dispersion, and only one electric balast supplies the energy to all lights instead of the four as before. The light system was highly improved by JCDecaux in comparison with the other bidders. JCDecaux searched the market for new elements to satisfy all requirements from the tender, and to reduce the number of lights from 4 to 3 while still improving the lighting of the panel. For more information see Annex 1.

Finally, the first time world wide in a large scale JCDecaux implemented a new cleaning system exclusive for the maintenance of the bus shelter using osmosed water instead of conventional water, avoiding the need to use soap/detergents in the cleaning process. Cleaning water is obtained in a reverse osmosis plant that JCDecaux has built on their premises in Barcelona.

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9 Water filtered by osmosis procedures. Osmosis is the net movement of water across a partially permeable membrane from a region of high solvent potential to an area of low solvent potential, up a solute concentration gradient.

10 The inner part of the old roof was made of expandable Polystyrene that could not be disintegrated from the other materials and was impossible to recycle at the end of its life cycle.

11 Narrow-diameter fluorescent light tube, 3-4 times more effective than a standard fluorescent bulb of similar wattage.

Figure 4 Cleaning system

Initial water comes from rainwater (when available) or tap water, which is treated through a reverse osmosis process that eliminates the chloride and the dissolved salts. By the end of the process still water is obtained with only 17 ppm of dissolved salts in it, and stored in a tank placed at the back of the cleaning vehicle.[12] The water is then pumped into a special cleaning brush and applied as a water mist system so that the total surface area of the extinguishing water is multiplied many times by fine droplet formation. This special mechanism, together with a special design of the cleaning brush, means that soap or detergents are not needed.[13] Additionally, the structure does not need to be dried after being cleaned, as the water is free of salts and no salt film is left on the surface of the bus shelter.

5.4 The drivers responsible for this new Eco-technology

Leading cities such as Barcelona purchase a great number of products and services using green criteria. GPP helps them to achieve their sustainable policy goals.

As stated earlier, Barcelona intends to lead in SPP and set an example Europe-wide, developing a more challenging tender with the aim of creating new technologies or solutions. It is also important to note that Barcelona provides a good service to their citizens and therefore wanted bus shelters of high quality. The suppliers wanted to develop a new technology to improve the technology of the previous tender that they had with Barcelona, to show their commitment and put them in a strong position for any future tenders. It was also an opportunity for JCDecaux to improve their existing technology which would keep them as a leader in the market.

[12] The cleaning vehicle runs on biodiesel 10 (10% bio, 90% Diesel).

[13] Usual dirt on bus shelters includes dust and non-fatty dirt, easy to eliminate with this system. For that reason, this system is only applied on street furniture and not elsewhere.

5.5 The tendering process

The tender for the bus shelter was part of a larger tender, requiring cooperation among a number of departments. As the tender was also quite large the suppliers were motivated to spent additional effort in order to be successful in their bid. The first tender that included environmental criteria in the purchase of street furniture in Barcelona was issued in 1998. In May 2005, the city did a second call for tender for the purchase of street furniture. After the first publication of the second call for tender, there was a four-month period for the bidders to comment on the tender and to ask clarification questions. The final publication of the tender was on 9 September 2005.

5.5.1 Developing the green procurement criteria

The initial development of the green criteria for the tender took place in co-operation among multiple stakeholders, including the Departament d'Urbanisme i Infrastructures (Urban Planning and Infrastructure sector), TMB (Metropolitan Transports in Barcelona), Via Pública (giving advice on bus shelter placement), Communication Department (giving advice on the advertisements to go in the PIMs[14]), Urban Environmental Department (giving advice on incorporation of bus shelters without causing a visual impact on the environment) and IMI (Computer Services-Informatics Municipal Institute). The involvement of so many departments in the development of the tender presented the challenge of satisfying all their requirements. The bidders could comment on the environmental criteria and their applicability between the first publication of the tender in May 2005 and the closure of the publication in September 2005.

5.5.2 The green procurement criteria

The tender document and the technical specifications included green criteria. It was specified in the technical specifications that during the manufacture phase of the new bus shelters it was preferable to use:

Glass laminate and/or tempered glass of high resistance	Smelting Aluminium type AG-3
Stainless steel – quality AISI 316 L	Stainless steel microfusion
Composites exempt of chlorine	Recycled materials

In addition, the use of PVC and non-sustainable timber was excluded. Special attention was taken in the selection of raw materials, manufacturing procedures and production of the elements composing the bus shelter, assembly and disassembly systems and energy

[14] Municipal Information Point

efficiency of the lighting. These criteria ensured, amongst others, the recycling of the different elements and the careful reintroduction of waste in the manufacturing process.

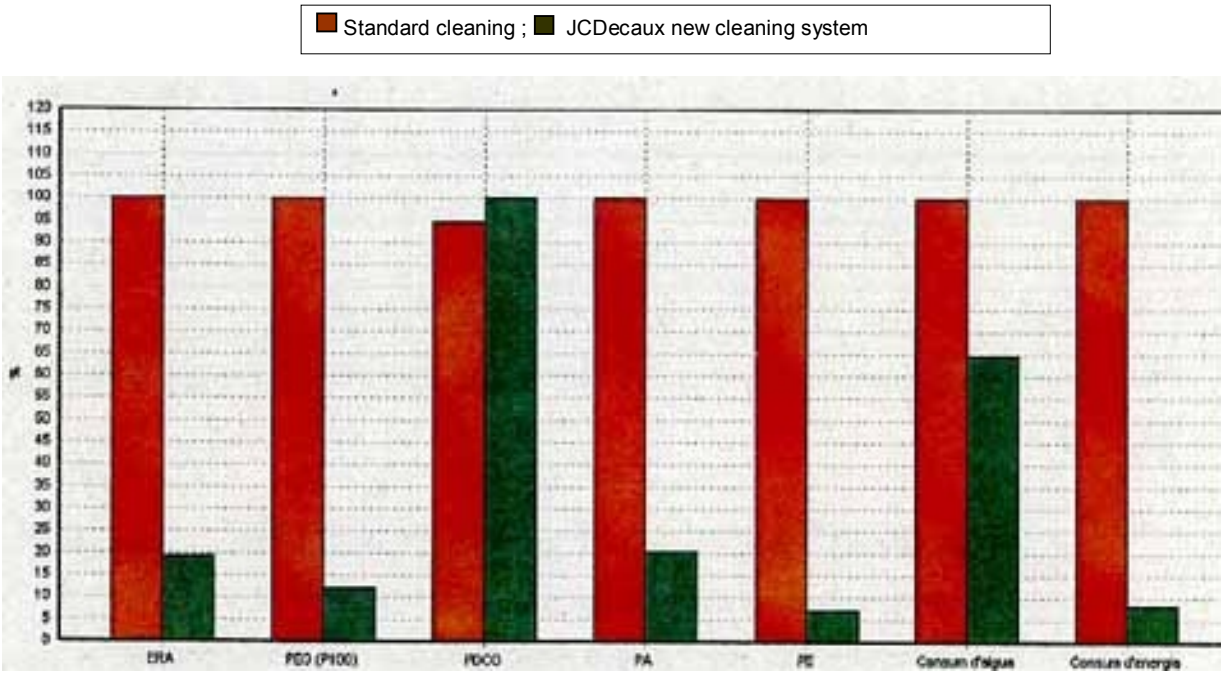

Figure 5 The graphic shows the little impact on the environment caused with the new system. The last two columns show how the new system consumes just half the amount of water, and consumes 80% less energy than the old cleaning system.

The bidders had to include a Life Cycle Analysis (LCA) for each element of the bus shelter in order to justify its compatibility with sustainable development. JCDecaux elaborated a very detailed LCA of all elements comprising the bus shelter, and also included the LCA of all elements, which take part in the maintenance process. Furthermore, for elements containing electrical devices or lighting a document had to be included confirming their compliance with the Spanish *Low Strain Electrotechnic Regulation and Complementary Technical Instruction*[15].

The criteria triggered the development of a new prototype for the bus shelter, which fulfils all requirements. The selection process was using a quality management system with a scoring matrix.

[15] Royal Decree 842/2002, 2 August, BOE number 224 of 18/09/2002

The total amount of the selection criteria was 120 points:

Table 3 Selection criteria

Price of the offer (*60 points*)	**Information service on the bus (*10 points*)**
Improvement regarding the old bus shelters (*15 points*)	Technological improvement and level of environmental respect of the materials and methods used in the construction, imple-mentation and maintenance of the bus shelter. In concrete: - Use of recycled materials and recyclable materials (*5 points*) - Use of non pollutant manufacture procedures (*5 points*) - Use of no pollutant maintenance products (*5 points*) - Quality and effectiveness of the best proposed technologies on any of the elements of the bus shelter (*5 points*)
Material's quality (*5 points*), appearance (assessing their positive relation between the elements design and their integration into the city's landscape) (*5 points*), and their easy maintenance (*5 points*).	

The tender required that bidders develop a proposal on how to improve the bus shelter itself as well as including new elements to improve the quality of the service e.g. cleaning. This paragraph in the tender was a key element in stimulation of research for adequate solutions because it provided the specifications and allowed the bidders to develop new ideas and technologies. JCDecaux went one step further in the tender and also proposed the imple-mentation of a new technology for the cleaning maintenance avoiding the use of soap / detergent.

The bidder also had to prove its technical capacity. They had to commit to the whole maintenance and costs associated with the bus shelter (electricity, water consumption) during the contract period (10 years), as well as covering all costs of the leasing agreement with the city. All street furniture elements included in the tender were used to include all sorts of advertisements, thus becoming an enormous source of income for the company owning the street furniture. In order for the bidder to have the right to advertise and make a business out of it, the tender included a leasing agreement where the winner bidder had to pay an annual fee of € 18 Million to the city council.

Regarding the selection criteria, an Environmental Management System of the company was not required. However, JCDecaux was certified according to ISO 14001, pushing the other bidders to present a certification as well, in order to compete for the contract. Contract performance clauses included several tests and environmental documentation related to the above-mentioned criteria. Every four years, the company has to present a report to the city council of Barcelona on the status of bus shelters. In any case, JCDecaux, is interested in maintaining the good status of bus shelters anyway, as they are their main source of income.

5.5.3 Assessing the tender

The tender was issued on 9 September 2005, including both the tender document and the technical specifications. Companies interested in participation had until 13 December 2005

to present their interest including indicative prices. Four companies presented the required documents: JCDecaux, Cemusa, Viacom and Clear Channel. In February 2006 Barcelona awarded the contract to JCDecaux because of their innovative capacity in bringing new elements respectful of the environment and new Eco-technologies never used before in bus shelter maintenance. Barcelona is currently in the implementation phase of these bus shelters. They estimate that by the end of 2007, 200 new bus shelters will be in place.

5.6 Results of the tendering process and key factors that triggered the market for the Eco-technology

The city of Barcelona has a very high purchasing budget (2,8 Million € annually) and is therefore capable of moving the market and affecting the suppliers and sub-suppliers involved in the process.

The new Eco-solution developed as a consequence of the tender was a unique prototype of bus shelters with a new roof and a new lighting system of the advertising panel, given the name of ***'Barcelona bus shelter model'.*** In order to receive the contract, the bidder went one step further in the tender and implemented a new system for cleaning the bus shelter avoiding the use of soap. This technology to clean street furniture had major impacts on the market after implementation on a large scale for the first time. Although reverse osmosis water treatment systems have existed in the market for many years, they had never been used for the cleaning of street furniture. The first prototype was developed and tested, previously to the tender, in the International Exploitation Department that JCDecaux has in Paris, but was never used. It was implemented for the first time on a large scale (maintenance of around 1700 bus shelters, including the 1200 old bus shelters and the 500 new ones) in Barcelona as a consequence of the tender. This implementation moved the market as it entailed a big investment from the bidder's side, both to adapt the new system into their cleaning vehicles and facilities, as well as to train employees.

JCDecaux, as an international company with offices worldwide, has started to market this technology on a much wider basis. Following the tender, the cleaning system is now ready to be implemented by the 21 Spanish offices and in all other European subsidiaries of JCDecaux. Innovations successful in one subsidiary are regularly adopted as a standard for the other subsidiaries.

The purchase of these bus shelters in Barcelona has also triggered further demand in the market. At the local level, neighbour cities Badalona and Sabadell have already set up contracts with JCDecaux. In Badalona they are testing a new prototype with a photovoltaic panel on the roof of the bus shelter. Elsewhere in the country, the city of Vigo awarded the contract to JCDecaux for the same product in May 2007. The exchange of experiences in the drafting of public tenders between municipal experts has contributed to raising the interest and has greatly increased the potential of spreading this recently developed environmental technology.

As a result of this tender this system is now also applied to clean other street furniture like advertising panels, toilets attached to bus shelters, bus stops, MUPIs[16] and roadside posts when a new contract is awarded to any European subsidiary of JCDecaux.

A series of key factors enabled the new eco-solution (the new prototype for the bus shelter) and the implementation of a new eco-technology (the new cleaning system) to be developed and put on the market:

1. It was specified in the tender for the bidders to develop proposals on how to improve the quality of the service:

   Excerpt of the technical specifications document – 'conditions of the different elements':

   "Bidders will present proposals for the adaptability of the new bus shelters as well as new elements to improve the quality of the service". "Bidders will present to Barcelona's City Council technical solutions for a technological improvement or operation of the product or that improves its energy efficiency".

2. More points were given to the bidder presenting better technologies to improve the quality and the effectiveness of the product:

   Excerpt of the tender document – 'award points':

   "Quality and effectiveness of the proposed technological improvements on the product: 5 points".

   The high value given to environmental criteria both in the technical specifications and in the award criteria was a key factor that motivated JCDecaux to go further in the tender. They introduced new improvements in the advertising panel and implemented the new cleaning technology in order to stand out among the other bidders and win the contract.

3. The introduction of these new elements and the new cleaning system appear as improvements in relation to the old tender that was also awarded to JCDecaux in 1998. After 8 years experience in the maintenance of old bus shelters, they perfectly knew the weaknesses in the maintenance of the product (environmental pollution caused by the cleaning products, salt film left by poor quality water, high water consumption, etc.) and where to improve the system. As part of the company's strategy, JCDecaux is always willing to improve with time. One of the main reasons for JCDecaux to stand out among the other offers was its innovative capacity. They knew that with the new cleaning system

[16] Mobilier Urbain pour Publicité et Information

they could easily compete among the other bidders who still used the traditional cleaning system with water and soap.

4. Another key factor for JCDecaux to bid on the tender and to invest on an innovative Eco-Technology was the major source of income for the company: advertising on the bus shelters. JCDecaux are world leaders in outdoor communication, and bus shelters become strategic elements for advertising and to receive revenue. For that reason, they are the first ones interested in maintaining the good status of bus shelters.

5. Regarding the maintenance, it is specified in the contract that the bidder has to take care of the maintenance and the costs involved during the whole duration of the contract (10 years). This clause in the contract was another key factor that pushed them in the development of a new Eco-Solution with better lights that would hardly need to be changed, as well as to invest in the implementation of the new technology with a cleaning system that does not need soap.

6. As leaders in outdoor communication, JCDecaux want to showcase their improvements to the world, and show their innovative capacity.

5.7 Barriers and difficulties

The challenging criteria of the tender pushed the market to find new materials and new elements to fulfil all requirements. This market research had a multiplier effect on the supply chain. Sub-suppliers were faced to search for a much broader market in order to comply with the new requirements imposed by the main supplier. In some cases, such as the T5 lights, which had to be purchased in Sweden, it had a negative impact due to the need to source them from an overseas supplier. The fact that PVC and chlorine materials were excluded in the tender affected the supply chain, requiring alternative materials to introduce in the design of the new bus shelter. It was difficult to select specific criteria to satisfy all the different departments involved in developing the tender.

5.8 Lessons learned

The purchaser stated that they went for the economically most advantageous offer. They invested on the bidder with a higher innovative capacity, leading to a successful cleaning system that in the mid- to longer term implies a smaller environmental impact and a reduction in the maintenance costs. JCDecaux stated that they are really enthusiastic about the way they are performing, and are sure that they are following the right path. Both the

purchaser and the supplier also agreed on the importance of analysing the status of each city, as it is not always possible to implement certain elements even if they are more attractive[17]. The external knowledge by other departments on the selection of green criteria was also valuable for a successful result.

5.9 Outlook

The city of Barcelona believes to have all new bus shelters implemented by the end of 2007. During the next 10 years (duration of the contract), JCDecaux will take care of the maintenance of bus shelters, using the new cleaning system with osmosed water. The city of Barcelona will include the lessons learned and the good experiences made with implementing green criteria in future tenders. Also, JCDecaux will showcase the implementation of the new eco-technology to their other international offices, serving as an example to follow by other cities. JCDecaux has settled a consistent strategy for the design of their products that will be applied much more broadly. For instance, the new cleaning system will be applied systematically into any new city managed by JCDecaux. The same is applied with the new lighting system for all MUPIs and bus shelters.

5.10 Contacts

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[17] In one of the offers, JCDecaux offered the implementation of solar panels on top of the roofs of the bus shelter. However, the offer was discarded because it required a really big dimension of the solar panel in order to supply enough energy to the OPI, the timetable and the bus shelter light. Moreover, more space would be needed for the batteries and therefore a new design of the bus shelter. Last but not least, most of the bus shelters are located in streets were the sun is hardly present during the day (the sunlight is covered by the shadow of street trees and buildings).

5.11 Summary

Case study 2: Sustainable Procurement of Bus shelters in Barcelona, SPAIN	
Purchasing authority	City of Barcelona, Urban Department
Subject matter	Tender for the purchase of 500 new bus shelters and adaptation of all 1200 old existing bus shelters.
Environmental criteria required	Minimum environmental requirements • Use of: Glass laminate and/or tempered glass of high resistance, Smelting Aluminium type AG-3, Stainless steel – quality AISI 316 L, Stainless steel microfusion, Composites exempt of chlorine, Recycled materials • Exclusion of PVC and non-sustainable timber • Life Cycle Analysis (LCA) for each element of the bus shelter in order to justify its compatibility with sustainable development. Selection criteria • Use of recycled materials and recyclable materials (5 points) • Use of non pollutant manufacture procedures (5 points) • Use of no pollutant maintenance products (5 points) • Quality and effectiveness of the best proposed technologies on any of the elements of the bus shelter (5 points)
The new eco-technology	The ***'Barcelona bus shelter model'*** is a unique bus shelter prototype in the market. Three main elements distinguish this prototype from the rest: • The roof: the inside consists of a beehive-shaped fibreglass material. This strengthens the roof, and makes it easier to disassemble at the end of its life cycle, enabling it to be recycled. • The advertising panel is unique for using 3 highly efficient T5 lamps of 35W each instead of 4 inefficient lamps. Additionally, side panel reflectors improve the light dispersion, and only one electric balast supplies the energy to all lights. • New cleaning system developed exclusively for the maintenance of the bus shelter using osmosed water instead of conventional water, avoiding the need to use soap/detergents.
Key drivers for triggering market	• It was specified in the tender for the bidders to develop proposals on how to improve the quality of the service. • More points were given when presenting better technologies to improve the quality and the effectiveness of the product. • The introduction of new elements and the new cleaning system appear as improvements in relation to the old tender also awarded to JCDecaux in 1998. • JCDecaux's major source of income for the company: advertising on the bus shelters. JCDecaux are world leaders in outdoor communication, and bus shelters become strategic elements for advertising and to receive revenue • Regarding the maintenance, it is specified in the contract that the bidder has to take care of the maintenance and the costs involved during the whole duration of the contract (10 years).

	This clause in the contract was another key factor that pushed them in the development of a new Eco-Solution with better lights that would hardly need to be changed, as well as to invest in the implementation of the new technology with a cleaning system that does not need soap. • As leaders in outdoor communication, JCDecaux want to showcase their improvements to the world, and show their innovative capacity.
Impact on supply side	• The new technology to clean street furniture was implemented on a large scale for the first time, entailing a big investment from the bidder's side, both to adapt the new system into their cleaning vehicles and facilities, as well as to train employees. • JCDecaux marketed this technology on a much wider basis in all other European subsidiaries of JCDecaux. • At the local level, neighbour cities Badalona and Sabadell have already set up contracts with JCDecaux. Elsewhere in the country, the city of Vigo awarded the contract to JCDecaux for the same product in May 2007.
Barriers and difficulties	• Sub-suppliers needed to search for a much broader market in order to comply with the new requirements imposed by the main supplier. • The fact that PVC and Chlorine materials were excluded in the tender affected the supply chain, requiring alternative materials to introduce in the design of the new bus shelter. • It was difficult to select specific criteria to satisfy all the different departments involved in developing the tender.
Lessons learned	• The purchaser selected bidder with a higher innovative capacity, leading to a successful cleaning system that in the mid- to longer term implies a smaller environmental impact and a reduction in the maintenance costs. • Importance of analysing the status of each city, as it is not always possible to implement certain elements even if they are more attractive (Eg. in one of the offers, JCDecaux offered the implementation of solar panels on top of the roofs of the bus shelter, but due to the local conditions it was not possible). • Using the knowledge of other departments in the selection of green criteria was also valuable for a successful result.

6 Case study 3: 'The better floorlamps' of the City of Zurich, SWITZERLAND

Figure 6 Photo: Regent Beleuchtungskoerper AG

Prepared by ICLEI – Local Governments for Sustainability
Photo: Regent Beleuchtungskoerper AG

With support from:
Simon Markus (Simon Markus), Regent Beleuchtungskörper AG (Markus Binda),
eteam GmbH (Stefan Gasser)

6.1 Background information

Zurich is the largest Swiss city with approximately 350 000 inhabitants and a public procurement budget of over one billion Euro per year.[18] The city is one of the most active Procura+ cities[19] and has put sustainability as a specific target on its political agenda since 1998. A recent draft Guideline on Sustainable Procurement states as an overall principle that *"all products and services that have to be purchased should comply with high economic, ecological and social requirements throughout their entire life cycle.*[20]

The city is subject to the Inter-cantonal Agreement on Public Procurement (IvöB 2003)[21] and bound to general procurement principles such as non-discrimination and transparency which are also valid at EU level. 'Sustainability' is legally recognised as an award criterion and can be inserted in public tenders to specify the nature of the product concerned.

For the last 10 years, the Building Construction Department of Zurich (Amt für Hochbauten der Stadt Zürich), which is responsible for the procurement of the product concerned, has been developing and including 'General Ecological Building Conditions' as minimum requirements in all contracts on public construction works. This list of conditions includes green criteria for product materials and constructions, for disposal and waste management. When purchasing new products the Building Construction Department of Zurich requires environmental product declarations that are checked by the Specialist Department on Sustainability Construction (Fachstelle Nachhaltiges Bauen)

Regent Beleuchtungskörper AG, the successful bidder of the product concerned (floor-lamps), is Switzerland's market leader in lighting systems and is ISO 9001 and 14001 certified. Currently, more than 80% of the lighting systems they sell are designed and manufactured on their own premises. The company has an environment policy which aims at reducing the use of non-renewable resources, recycling, waste management and awareness raising on sustainability issues. Energy-efficiency is regarded as a key objective in the production process and all products are composed of multiple units without being glued together. This means that individual parts can be replaced instead of the whole unit and the discarded parts can be recycled.

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[18] Zurich's public procurement budget: EUR 1.211.896.015,86 / year

[19] See ICLEI's European Sustainable Procurement Campaign Procura+ - online at: www.procuraplus.org

Some sustainable purchasing examples in 2005:
- 2,166 energy efficient computers = 127,114kg CO_2 saved during its use
- Energy efficiency & sustainable building materials criteria = (45,081 m^2) 175.1Million EUR
- Organic food worth 390,000 EUR (5.6%) of its total budget

[20] Stadt Zürich *"Leitfaden – Die Stadt Zürich beschafft nachhaltig"* 2006

[21] Interkantonale Vereinbarung über das öffentliche Beschaffungswesen

MINERGIE® is a sustainability brand and labelling system initially developed for new and refurbished buildings[22]. MINERGIE® is an association, which is supported by the Swiss Confederation, and the Swiss Cantons along with the department of Trade and Industry. It is registered in Switzerland and around the world. The MINERGIE® lighting standard was developed in connection with the tendering process regarding Zurich's purchase of 2 000 floorlamps.

To be in compliance with the MINERGIE® Standard, products must fulfil the following requirements:

- Energy consumption must be at least 25% and the fossil energy consumption at least 50% below the average consumption of the state of the art;
- The cost must not exceed 10% of a comparable standard product;
- Used products must be disposable in at least the same way as average standard products.

6.2 Information on the product and the developed new Eco-Technology

In 2002, the Building Construction Department of Zurich, in collaboration with the Electricity Power Company ("EWZ"), launched a project for the development of MINERGIE® floorlamps, which, at the same time formed part of the tendering procedure for floorlamps. The aim was to renovate Zurich cities administration centre "Werd" to meet the MINERGIE® Standard with a need of 2 000 lamps in total, including approximately 800 floor lamps.

Zurich did not encounter difficulties in finding bidders for the specific product on the market, which is clearly shown by the fact that 13 suppliers produced 18 floorlamps that could meet the tender specifications. Eventually, REGENT Lighting was the successful bidder with a floorlamp called Level/MDT®. The new floorlamp reduces energy consumption by half compared to a standard floorlamp and lowers the life cycle costs significantly. It also offers ergonomic advantages and reduces electromagnetic radiation.

Apart from a minimum stand-by-power of 0,3 watt and a sensor that cuts off all power when no light is needed, the new Micro Downlight Technology® (MDT®) allows optimal light output suitable for all desk monitors and working spaces. Four sub-suppliers were involved in the development of the lamp, including the producer of electronic components, of aluminium parts, light directing and of the lighting tubes. Neither Regent nor Zurich undertook any life cycle assessment on the product.

The project and tendering procedure for 'better' floorlamps triggered the development of a specific product that was not previously on the market before. Almost 30 different new floorlamps were specifically developed in view of Zurich's tender. They all met the newly

[22] see MINERGIE® - online at: www.minergie.ch

developed MINERGIE® criteria for floorlamps that contain a series of challenging minimum requirements for floorlamp manufacturers. Eventually, 18 floorlamps met the MINERGIE® standards (see Table 1 below) that were also included in the tender.

Table 4 Standard versus MINERGIE floorlamps

	Conventional floorlamp	MINERGIE® standard floorlamp
Illumination level at working place	500 Lux	500 Lux
Max. operating performance	240 watt	140 watt
Power in stand-by mode	0,2 watt to 1,2 watt	0,2 watt to 1,2 watt
Consumption of floorlamp with standard use	22,3 kWh/m^2 Standby: 4,5 watt	11,9 kWh/m^2 Standby: 0,5 watt
MINERGIE® requirement for illumination	13,1 kWh/m^2	13,1 kWh/m^2
Norm SIA 380/4: Threshold	22,5 kWh/m^2	13,1 kWh/m^2

From an environmental perspective, the innovation of the product lies mainly in terms of energy-efficiency, sustainable material and reduced electromagnetic radiation (≤ 2V/m). More specifically, apart from granting an environmentally friendly production process, all floorlamps had to use sustainable, long-lasting material and guarantee that the floorlamp is assembled without the use of harmful adhesives.

Regent succeeded with its floorlamp Level/MDT® to reduce the stand-by mode by a factor of 10, meaning from 4 watt to 0,4 watt. With sufficient daylight, the floorlamp switches off automatically by virtue of a special sensor.

Another technical advantage of the Level/MDT® floorlamp was the new type of anti-glare used the so-called Micro Downlight Technology® (MDT®) which allows an optimal surrounding anti-glare of the working space.

6.3 The drivers responsible for procurement

The main driver for the city of Zurich was the “7 Milestones for Ecological and Energy-Efficient Construction” that include several key targets to be implemented for all public buildings until 2010. These milestones were developed by the Building and Construction Department as strategic guidelines and engage all departments and affiliated bodies to organise their work and construction according to these parameters.

Milestone 3 refers to lighting systems where MINERGIE® lighting and devices are seen as a priority. They should be purchased according to www.topten.ch standards[23] and fulfil energy class A[24].

6.4 The tendering process

The tendering procedure was set up in two phases (see Table 2) over a period of two years involving internal and external sources and including the participation of producers and sub-suppliers, such as the producers of electronic components, of aluminium parts, light directing and of the lighting tubes.

Within the Building Construction Department, several sub-departments such as the Administration Centre Werd, the Special Department on Sustainability, the Special Department on Energy and Electronics and the Real Estate Department were involved in the project, together with the assistance of the Energy Manager of the city of Zurich. *The eteam GmbH* was contracted as external expert for the development of a specific MINERGIE® standard for floorlamps to be used for the tender criteria.

Table 5 Tendering procedure for floorlamps

PHASE I		
Date	**Activities**	**Background**
January 2002	Start of project/tendering procedure	
August 2002	Workshop on floorlamps	- 27 participants (companies) - Discussion and development of proposed criteria
October 2002	Final list of requirements for call for tender on floorlamps	List included - Conditions for participation - Criteria for floorlamps - Timetable
November 2002	Registration	Note: registered participants committed to hand in floorlamp prototypes

[23] Topten is a new web portal to help consumers find out the most energy efficient appliances and cars in Europe. With a simple click, responsible consumers can check the best products available in their country. Each national Topten website points consumers to the most energy efficient cars, TVs and appliances available in their country, and provides detailed information in local language(s) on product characteristics, including photos and manufacturer contact information.
Topten is supported by the EU-programme "Intelligent Energy – Europe" (IEE), through the project Euro-Topten, co-ordinated by ADEME (French Agency for Environment and Energy Management). It organises a competition for best campaigns on efficient products (see online at: www.topten.ch)

[24] 'Energy classes' refer to the level of energy consumption and efficiency of products. The more energy efficient they are the higher the class. The classes go from G (less efficient) to A (more efficient) A+ products are therefore top products in terms of energy saving and efficiency.

PHASE I		
Date	**Activities**	**Background**
April 2003	Date of submission for prototype of floor lamp	Note: prototype had to be ready for mass production starting from October 2003
June 2003	11 out of 27 floor lamp prototypes fulfilled the criteria	Note: Till the publication of the tender registered suppliers were given the possibility to submit additional prototypes. Cost of new compliance verification: EUR 1500,00 Eventually, 18 floorlamps fulfilled the criteria
PHASE II		
April 2004	Call for tender	13 bidders
August 2004	Contract	Successful bidder: REGENT Beleuchtungs-körper

6.4.1 Developing the green procurement criteria

The project to develop the floorlamp with MINERGIE standards and the tendering procedure started at the beginning of 2002.

In a first phase, almost 30 floorlamp manufacturers, mainly from the greater area of Zurich, participated in a workshop on floorlamps. At the workshop, an initial list of criteria for floorlamps that had been prepared by the eteam GmbH together with the Building Construction Department was discussed and further developed, in particular with regards to the electronic parts. This draft served first as production guidelines for potential bidders and later as a basis for the actual tender. Any revision of criteria took place in the first phase only. Following the publication of the call for tender on April 2004, the bidders were given two months to submit their bid. By the end of July all 13 bids were evaluated and in August 2004 REGENT Beleuchtungskörper was informed that its bid had been successful.

6.4.2 The green procurement criteria

The ‘General Ecological Building Conditions’ represent a catalogue of minimum green requirements that are an integrated part of all works contracts with the Building Construction Department of the city of Zurich and has to be fulfilled by every supplier interested in submitting a bid.

To ensure they meet these minimum green requirements, bidders had to provide Environmental Product Declarations (EPDs)[25] according to the recommendation SIA 493 ("Declaration of ecological characteristics of building products") that were checked by the Specialist Department on Sustainability Construction (Fachstelle Nachhaltiges Bauen). The catalogue lists a series of ecological requirements for building material, such as concrete, timber products ('sustainable origin') and insulation material (excluding toxic material) etc. One of the green criteria relevant for floorlamps was:

"all conductor materials for electric assets […] have to be halogen-free"

The first specification sheet that was developed together with floorlamp manufacturers already included a series of technical specifications for suppliers that were maintained in the call for tender. Producers interested in submitting a floorlamp prototype, which was at the same time a precondition for being admitted to the tendering procedure, had to meet technical specifications in the field of energy-efficiency, ergonomics and electronics. In terms of energy efficiency, the technical specifications included the following specifications:

- *The Stand-by performance must not exceed 2 watt: the use of a regulator or control system depending on daylight is mandatory. […]*
- *With sufficient daylight the floorlamp must automatically switch off or turn on the stand-by mode. Continued operation at minimum light power (e.g. 10%) is not permitted.*
- *The electrical output must not exceed the standard output of the floorlamp (see Table 6)*

Table 6 Requirement for electrical output – as included in the tendering document

				Standard	
Stand-by power	0.0 watt	0.5 watt	1.0 watt	**133 watt**	2.0 watt
Max. power with sensor	145 watt	141 watt	137 watt	**133 watt**	129 watt
Max. power without sensor	116 watt	112 watt	109 watt	**106 watt**	103 watt

[25] The international community has developed a set of standards for environmental labelling. These ISO standards define three types of environmental labels.
Type III "environmental product declarations" provide environmental data about a product. These declarations are produced by the company making the product or service, and are often certified by a third party. They usually take the form of brochures, rather than a simple label or logo. The declaration is typically based on a life cycle study, as required by the ISO technical report for Type III declarations. The declaration contains quantified data from various life cycle stages of the product, including: material acquisition, manufacturing, transportation, use and end-of-life disposal or recycling. The declaration may also contain qualitative data about the product and the company. Type III declarations allow consumers to compare products based on all of their environmental impacts and make their own decision about which product is preferable. Competition among companies on environmental grounds is encouraged by this kind of declaration.

Furthermore, the floorlamp had to be constructed in a way to reduce electromagnetic radiation to a minimum (≤ 2 V/m)

Regarding the contract performance clauses, the integrated 'General Ecological Building Conditions' state that all packaging material has to be taken back by the suppliers. The costs for the environmentally friendly disposal have to be included in the unit price. The working tools and containers have to be cleaned in an ecological manner by avoiding chemicals that could enter the water system. Upon request, the suppliers have to provide a disposal certificate for disposal and recycling of material.

According to the 'General Ecological Building Conditions', random checking of the compliance of the product with the tender criteria is possible at any time. Following the completion of the works, the contracting body reserves the right to measure the air quality of the room, for example, Zurich's specification for formaldehyde is <60 $\mu g/m^3$, total volatile organic carbons (TVOC) <1 000 $\mu g/m^3$ as measured by the standard conditions of VDI 4300.

6.5 Results of the tendering process and the key factors that triggered the market for the eco-technology

The following were the key factors in developing the new eco-technology:

- The political commitment to sustainability;
- The strong experience in sustainable procurement;
- The 2010 target of the '7 Milestones for Ecological and Energy-Efficient Construction' that include several key targets for all public buildings;
- The lack of floorlamps on the market conforming to the demanding criteria of the MINERGIE® standard.

The first project phase, which at the same time was part of the tendering procedure, included a workshop with 27 manufacturers and led to the production of 27 floorlamp prototypes. After the technical examination phase, 11 lamps were deemed to comply with the specific requirements. Following the publication of the tender, 7 more floorlamps were approved. In other words, the effect of Zurich's procurement action resulted in the production of 18 new high-quality floorlamps which were subsequently put on the market.

The competition among suppliers helped to keep the price of the floorlamps at a reasonable level. It also generated a significant production activity in the field of floorlamps manufacturing as all 27 companies were competing for the best lamp. The production process for floorlamps did involve a considerable number of subsuppliers on the market, more specifically the producers of the various floorlamps components, such as the electronics, the aluminium, the directional light components and the light tubes.

The bidders, and in particular the successful bidder Regent Lighting, applied the advanced criteria to other products as well and, hence, developed a new series of products in compliance with the tender criteria.

Approximately 2 500 of these floorlamps have been sold so far, mainly to the city of Zurich. Currently, further MINERGIE® conforming floorlamps are in process of being developed.

Figure 7 MINERGIE® Conforming Floorlamp

Despite the interest in purchasing these new floorlamps, no Swiss city has tendered for MINERGIE® conforming floorlamps up to now. At private sector level, however, the interest in these floorlamps is growing. The banking sector followed the example of the city of Zurich and started tendering for floorlamps by using the same criteria. Approximately 15 companies, all active in the public service field, tendered or ordered MINERGIE® conforming floorlamps. Organisations interested in the specific product now have the possibility to choose between at least 13 new high-quality floorlamps from different companies that are also displayed on the Swiss 'topten' website[26]. The winning bidder also felt that it was very important to be involved in the discussion of the tender criteria for its own production line. As a direct impact, in the same year of the tender, the company started to include the criteria in the production process even though at that stage they had not been awarded the contract. Even if they hadn't been awarded with the contract, they would have maintained the new changes in production.

[26] see online: www.topten.ch

As far as the costs of green versus standard floorlamp are concerned, initial costs were needed for the improvement of the components. From the supplier's perspective, overall, the cost of the Level/MDT® floorlamps did not increase as the initial investment in research led to new expertise, which was used for the development and design of several new lighting products (mostly floorlamps), and a reduction of costs was possible for the electronic components. Especially in the electronics sector the impact of the tender was significant as it resulted in the development of a new technology (stand-by mode; new Micro Downlight Technology® (MDT®)). Any initial investment costs were borne by the company and were not reflected in the final price that was 303 Euros per lamp (excluding VAT of 7.5%). By contrary, the city of Zurich calculated for approximately 800 lamps significant economic savings amounting to approximately 485 000 Euros over a period of two years. Since 2004 more than 2500 Level/MDT® floorlamps have been produced, mostly for the city of Zurich (2 000 units). Apart from the difficulty to quantify the direct impact on the supply chain, in particular on the sub-supplier, an indirect impact is evident as the number of orders for these specific floorlamps is growing. Thanks to the Zurich tender, Regent was able to strengthen its profile on the national market, benefiting also its subsuppliers. This applies, to a certain extent, also to the other bidders whose floorlamps met the tender criteria but did not succeed in winning the tender.

According to the successful supplier, Zurich's tender also had an impact on the perception of the product concerned. The city of Zurich sent a signal that the price was not the only criterion and that it would maintain this attitude in the long term.

The contract covered a period of 3 years, which – considering the product concerned – presents a long contract period. This was certainly another convincing argument for many suppliers to participate in the tendering process and to invest in the development of the product concerned. The fact that Zurich is planning to expand the MINERGIE® conforming lighting to all its public buildings certainly added to the attractiveness of the tender. Regent is now in the third year and is confident to have the contract extended for another year.

6.6 Barriers and difficulties

The specific tender requirements were regarded as highly challenging from a technical perspective. The main difficulty was to obtain maximum light output with minimum energy input in order to reach a clearly defined light level. A delay in the delivery of Regent's floor-lamps was caused by legal disputes following the marketing strategy of other floorlamps manufacturers that promoted themselves as successful bidders though their success was based on parts of the criteria only.

6.7 Lessons learned

To split the tender procedure in two phases was seen as a very effective approach to obtain the best offer on the market of the product concerned. To invite interested suppliers to assist

in defining the tender criteria gave a strong signal to the market and triggered the production process. The approach added to the transparency of the tendering process and opened it up to fair competition.

6.8 Outlook

Following the excellent feedback by floorlamps manufacturers, other cities but also the private (especially service) sector are now showing an increasing interest in purchasing MINERGIE® conforming floorlamps. The Building Construction Department of Zurich is now planning to expand the new lighting in all public buildings. Regent Lighting, the successful bidder, has already started to include the tender criteria in the production of new products. In the light of the increasing interest in the newly developed floorlamps other floorlamps manufacturers are likely to follow suit. The approach might be further fostered by the wide promotion of the MINERGIE® conforming floorlamps that are also displayed on the Swiss topten website[27].

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[27] see online: www.topten.ch

6.9 Summary

Case study 3: 'The better floorlamps' of the City of Zurich, SWITZERLAND	
Purchasing authority	Building Construction Department of Zurich (Amt für Hochbauten der Stadt Zürich)
Subject matter	Tender for the delivery of MINERGIE® conforming floorlamps
Environmental criteria required	The 'General Ecological Building Conditions' as minimum environmental requirements include: • Environmental Product Declarations (EPDs) according to the recommendation SIA 493 ("Declaration of ecological characteristics of building products") • List of ecological requirements for building material, such as, concrete, timber products ('sustainable origin') and insulation material **Technical specifications** • The Stand-by performance must not exceed 2 watt: the use of a regulator or control system depending on daylight is mandatory. • With sufficient daylight the floorlamp must automatically switch off or turn on the stand-by mode. Continued operation at minimum light power (e.g. 10%) is not permitted. • The electrical output must not exceed the standard output of the floorlamp • The floorlamp has to be constructed in a way to reduce electromagnetic radiation to a minimum (≤ 2V/m) **Contract performance clauses** • All packaging material has to be taken back by the suppliers. • The costs for environmentally friendly disposal have to be included in the unit price. • The working tools and containers have to be cleaned in an ecological manner by avoiding chemicals that could enter the water system. Upon request, the suppliers have to provide a disposal certificate for disposal and recycling of material. • Zurich reserves the right to carry out indoor air quality checks
The new eco-technology	• Focus on energy-efficiency, sustainable material and reduced electromagnetic radiation (≤ 2V/m). • Apart from using an environmentally friendly production process, all floorlamps use sustainable, long-lasting material and guarantee that the floorlamp is assembled without the use of harmful adhesives. • Winning floorlamp Level/MDT® reduced the stand-by mode by a factor of 10, meaning from 4 watt to 0.4 watt. • With sufficient daylight, the floorlamp switches off automatically by virtue of a special sensor. • New type of anti-glare used (MDT®) which allows an optimal surrounding anti-glare of the working space.
Key drivers for triggering the market	• Zurich's political commitment to sustainability • 2010 target of the "7 Milestones for Ecological and Energy-Efficient Construction"

	• Lack of MINERGIE® conforming floorlamps on the market • Involvement of 27 floorlamp manufacturers in the pre-tendering phase • 3-year-contract periods • Zurich signalised that it was planning to expand the MINERGIE® conforming lighting to all its public buildings.
Impact on supply side	• Zurich's procurement action resulted in the production of 18 new high-quality floorlamps, which were subsequently put on the market. • The production process for floorlamps did involve a considerable number of subsuppliers on the market, more specifically the producers of the various floorlamp components, such as the electronics, the aluminium, the directional light components and the light tubes. • The bidders, and in particular the successful bidder Regent Lighting, applied the advanced criteria to other products as well and, hence, developed a new series of products in compliance with the tender criteria. • Approximately 2500 of these floorlamps have been sold so far, mainly to the city of Zurich. Currently, further MINERGIE® conforming floorlamps are in process of being developed. • Especially in the electronics sector the impact of the tender was significant as it resulted in the development of a new technology (stand-by mode; new Micro Downlight Technology® (MDT®). • Apart from the difficulty to quantify the direct impact on the supply chain, in particular on the sub-supplier, an indirect impact is evident as the number of orders for these specific floorlamps is growing.
Cost implications	From the supplier's perspective, overall, the cost of the Level/MDT® floorlamps did not increase as the initial investment in research led to new expertise, which was used for the development and design of several new lighting products (mostly floorlamps), and a reduction of costs was possible for the electronic components. Zurich calculated for approximately 800 lamps significant economic savings amounting to approximately €485 000.00 over a period of two years.
Barriers and difficulties	• Technical difficulty to obtain maximum light output with minimum energy in order to reach a clearly defined light level. • Legal disputes with other manufacturers that promoted themselves as successful bidders delayed delivery of product
Lessons learned	To split the tender procedure into two phases, i.e. inviting interested suppliers to assist in discussing the tender criteria gave a strong signal to the market and triggered the production process.

7 Case study 4: Sustainable Procurement of the Public Lighting Service of the City of Lille, FRANCE

Figure 8 Photo Jean-Marc Charles

Prepared by ICLEI – Local Governments for Sustainability

With support from:

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7.1 Background information

With over 226 000 inhabitants the City of Lille, together with the associated towns Helemmes and Lommes, is the largest in the North of France. Despite this relatively small population, the City of Lille is part of France's fourth largest metropolitan area called „*Lille Métropole Communauté Urbaine*" - consisting of Lille and 85 suburban municipalities and comprising more than 1,1 million inhabitants (2005).

The City of Lille, one of the pioneer cities on sustainable development in France, is a signatory to the 'Charter of European Cities & Towns Towards Sustainability' (1995) and to the 'Aalborg Commitments' (2004).

In 2000, Lille became one of the first French cities to implement Local Agenda 21 and since then has undertaken 180 projects and more than 500 activities in the field of sustainable development. Several major campaigns have been carried out in the framework of Agenda 21, such as the Water Campaign (2001-2002), the Food Campaign (2003-2004), the Campaign *'Lille Ville Nature'* and in 2007 the Campaign 'Acting together for a sustainable and fair city'[28]. Lille is integrating sustainable procurement into these campaigns. In 2004 Lille joined ICLEI's European Procura+ Campaign[29] on Sustainable Procurement and since April 2007 has been the Chair of the Campaign.

The most important tender in recent years has been the city's street, façade and passage way lighting which involved the Public Lighting Service of the city of Lille, five bidders and several subcontractors (such as SEPI, SEV, LUMIVER, SMDR). External technical expertise was provided by HEXA Engineering. The contract involved a budget of 35,2 million EUR - 4,4 million EUR per year.

The winning bidder ETDE is an affiliated company of the Bouygues Construction group with branches all over the world. ETDE/SOSIDEC is active in the field of utility networks construction and services (lighting systems and illumination of buildings), electrical, mechanical and HVAC[30] engineering, facility management real estate (performance of building) and telecommunications. Even though the group was starting to make headway in terms of environmental performance by progressively integrating environmental considerations into its global strategy, the contract signed with Lille was the first real eco-solution developed by ETDE.

Lille's old lighting systems will also be made more energy efficient and transferred to Lille's twinning town in Senegal, Saint-Louis. Local engineers will be taught by Lille's technical services department on how to construct and manage the old lighting system.

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28 *La Campagne 'agir ensemble pour une ville durable et solidaire'* (2007)

29 See ICLEI's Procura+ Campaign at: www.procuraplus.org

30 Heating, Ventilating and Air Conditioning

7.2 Information on the product

The City's main objective for this service was to ensure that public lighting be managed in an exemplary manner and achieve the best results possible in terms of energy efficiency and environmental performance. The subject matter of the European tender of the city of Lille was based on the maintenance of the City's street lighting services and the service package included:

- General maintenance of the whole system;
- Reconstruction and replacement of the 300 control boxes and 22 000 lighting units;
- Operation of the lighting systems, and
- Energy management.

ETDE is in charge of the management of the whole service package and the tasks to be carried out by the four subcontractors, which are as follows:

- SEPI and SEV – for the reconstruction works,
- LUMIVER – for the lighting waste treatment (bulbs, tubes, glass, mercury, metal components) disposal, and
- SMDR – for waste recycling of remaining materials.

The new approach of Lille was to apply green criteria throughout the implementation process and for all different contract components.

Lille's sustainability policy ensured that key objectives of its Agenda 21 were integrated into the tenders. These were, for example, reducing energy consumption and greenhouse gas emissions into the management of its public lighting system. As a result of this ETDE adapted its usual management approach to public lighting to take on board these objectives. Several components of ETDE usual service package were revised to present the new lighting service as a new eco-solution (see section 3). Lille also had a number of social objectives its call for tender; however, these are not addressed in this case study. Lille joined the European GreenLight project[31] after the Public Lighting contract was signed. GreenLight is an on-going voluntary programme whereby private and public organisations commit to reducing their lighting energy use, thus reducing polluting emissions. ADEME[32] introduced the programme at a national level.

[31] GreenLight was launched in February 2000. See online at: http://www.eu-greenlight.org/

[32] ADEME is the French Environment and Energy Management Agency.

7.3 The developed new Eco-Solution

Lille was the first city in France to hand over control of its lighting system to a private company and request that this company provide an eco-solution. Lille's eco-solution comprised the following innovative aspects:

Part 1 Integration of green criteria throughout the implementation of the tender (see Table 7);

Part 2 Continuous improvement through a 'Virtuous circle scheme';

Part 3 New environmental technology tested and applied;

Part 4 Continuous auditing and monitoring system of the strategy and management of the lighting system.

7.3.1 Integration of green criteria throughout the implementation of the tender

From an environmental perspective, the following measures have to date been implemented:

Table 7 Lille's 'green' lighting service

Components of the tendered Lighting service	Green components
General maintenance of the installation	- Digital public lighting system (management software) to guarantee automatic and flexible lighting service, save time and costs as well as avoid excessive paper use - Use of LPG vehicles in carrying out the contract to limit CO_2 emissions
Reconstruction and replacement of the asset base	- Replacement of the equipment with energy-efficient equipment - Recycling of the old material and reconstruction with recyclable material (98%), such as glass or cast aluminium
Operation of the lighting systems	Focus on the reduction of the energy consumption: - Implementation of power reducers and electronic ballasts[33] - Automatic light modulation (dimmer switch) - Reduction of light pollution
Energy management	- 25,7% green energy provided from hydropower, including 16% from small hydro. - Use of solar power is in schoolyards and parks is currently being piloted

[33] Ballasts: an electrical device for starting and regulating fluorescent and discharge lamps.

7.3.2 Continuous improvement through a 'virtuous circle scheme'

The so-called 'virtuous circle scheme' implies that the financial gains through energy saving are continuously reinvested, primarily in the development of new environmental technologies, products and services. ETDE's approach of managing public lighting services according to the virtuous circle scheme (Figure 9 below), offered high expectations in terms of quickly achieving significant results for the cities involved, especially in terms of cost efficiency and ecology.

Figure 9 Virtuous Circle for the management of public lighting systems

The 'virtuous circle' approach was adapted to take on board environmental considerations following Lille's tender see Figure 10 below.

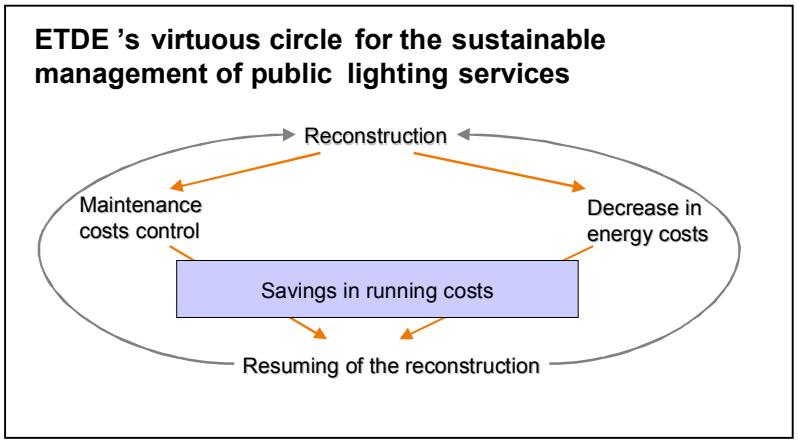

Figure 10 ETDE's virtues circle model for Lille's public lighting service

Over a period of only three years, the investment in the reconstruction of energy-efficient assets already allowed the City to save 32 to 35% of its energy. By the end of the contracting period, Lille will have made more than 40% savings in energy efficiency. In terms of global costs, there are also savings for the City since the budget for public lighting was lowered by 5% in comparison to Lille's former contract. The average cost per lamp in the previous contract was 210 EUR, with the new contract total 200 EUR per lamp.

7.3.3 New technology applied and tested

The new eco-technologies in which ETDE particularly invested are electronic power reducers. At the beginning of the contract period, in November 2004, 360 power reducers developed by the company Honeywell were already being installed. Electronic ballasts[34] are being tested and implemented on power values higher than 400 W SHP.

An experiment on solar energy is being carried out. So far, luminaires from photovoltaic solar energy were implemented in some schoolyards and parks. If this experiment proves efficient, their implementation could expand to other sites. For this project ETDE and Lille are working in partnership with L2EP- Lille's Labor for Electrical Power Engineering.[35]

The public lighting system is also being monitored through innovative IT technology. An embedded computing system has been installed at the beginning of 2005 in the aerial work platform[36] and in the tracking vehicles, which identify defects in the lighting system. This system allows the City's street lighting services to access and monitor in real time processing the information gathered by the teams such as failures, repairs, modifications of the equipment, etc.

Apart from the technology mentioned above, which ETDE is constantly improving through the virtuous circle model, new eco-technologies are being discussed by the Public Lighting Department of Lille and the service provider. Recent developments and testing of new eco-technologies currently regard new energy-efficient lamps, new types of ballasts cabinets and wireless.

7.3.4 Continuous auditing and monitoring system

In order to ensure the interaction between the 3 main aspects of the contract (reconstruction, energy management, and maintenance) and integrate environmental considerations throughout all aspects, a big part of auditing is included in the service package. ETDE thus carries out many surveys to analyse and follow-up the results, plan the next steps of the strategy, or test new products and services and integrate them to the service package. For these auditing tasks, ETDE associated a consulting firm, ProG' HEI[37].

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[34] Ballasts: an electrical device for starting and regulating fluorescent and discharge lamps

[35] L2EP -"*Laboratoire d'électrotechnique et d'électronique de puissance*" – is an inter-university research institute in the fields of electrical power engineering.

[36] Aerial devices used on construction sites to lift the personnel working at height.

[37] ProG'HEI – the Project "*Hautes Etudes d'Ingénieur*" is a junior enterprise composed of students in Engineering Technologies

7.4 The drivers responsible for this new Eco-Solution

A key driver that laid the ground for the tendering procedure on public lighting was Lille's political commitment to sustainable development in the framework of its Agenda 21 activities. A commitment taken in partnership with 46 associations and several important public institutions, such as the Chamber of Commerce and Industry, ADEME, the Regional Council etc.

In 2001, Lille adopted an integrated approach of sustainable procurement. The growing experience in sustainable procurement eventually led to this important tender on Public Lighting. The Deputy Mayor also wanted Lille to become a lead in the field of sustainable procurement. Therefore a big tender needed to be identified and greened. In this case the lighting tender was the next big tender. Lille also has a charter of for clean construction works. It includes a series of recommendations for the disposal of waste, the use of environmentally friendly packaging and recyclability of material as well as materials that should be avoided. For instance, suppliers are not allowed to use PVC for the lighting envelope.

From the supplier side they knew that environment issues were important to Lille because they were aware of all the commitments made by Lille to sustainable development. This encouraged trying and achieving the best environmental eco-solution as possible in their bid. The tender was also a large amount of money and covered a period of 8 years; therefore it allowed for a long-term commitment reducing the enterprises' risk. The supplier also wanted to expand their market and build up a presence in the north of France.

Lille's tender took place in the context of the progressive liberalisation of the energy market.[38] Since July 2004, French local governments are able to choose their electricity supplier and also the origin of the energy they consume. Regarding France's commitments towards the EU to achieve a part of 21% of electricity from renewable sources (RES-E) by 2010[39], and given the poor share of RES-E consumption in France so far (15% in 2005), the opportunity for local governments to purchase a certain amount of green energy should contribute to achieve these goals. On this subject, Lille was in 2004 one of the first signatories of a national campaign launched by WWF and the Ecological Mayors Association "Ecomaires" to encourage 100 local authorities to a 21% share of RES-E consumption.

[38] The national supplier EDF – Electricité de France – losing his historical monopoly.

[39] Dir. 2004/77/EC of 27 September 2001

Another driver for this new eco-solution was the perspective of the energy certificates scheme, which was to be implemented in 2006 in France. This environmental policy system is based on green and white certificates, which are tradable on the market[40].

In France, these certificates are managed by the French labelling body Observ'ER[41], who is responsible for the controlling, auditing and certification of producers and buyers.

7.5 The tendering process

Lille's tender, the 'General management and maintenance of the public lighting system'[42], was published at European level on 19 June 2003 in the European Union Official Journal.

This tender followed a result-oriented approach, offering the bidders a large margin of discretion within defined key objectives. Instead of providing details about how to do the tender, there was more of a focus on the aims and results. Neither quantitative objectives nor specific thresholds were given, leaving it up to the market to develop solutions. In order to push the market through its full potential, the City of Lille decided to engage and send strong signal to the market.

It is mainly at the evaluation stage (award criteria) that the offers were examined and judged by the tender commission (city of Lille's Department of public lighting, public procurement department and HEXA INGENIERIE).

Table 8 Key stages Lille's tendering procedure

Key dates	Introduction of criteria
Notification - 24 March 2003: Deliberation n° 03/189 authorising the call for tender - 19 June 2003: Preinformation Notice in the European Official Journal - 29 August 2003: Notice of the Call for Tender **Pre-selection** - 16 October 2003: Opening to the Applications -> 8 application files - 12 November 2003: Reunion of the Tender Commission – Selection of the applicants => 5 bidders selected **Preparation** - 15 January 2004: Tender documents are being sent to the bidders - 18 February 2004: Night tour of the city to review the public lighting asset base with all the bidders	Green criteria included in the tender as general goals to achieve.

[40] Green certificates are documents guarantying that the energy supplied comes from renewable sources, and white certificates that a certain reduction of energy consumption has been achieved.

[41] Observ'er ('Observatoire des Energies renouvables') is the national representative of the European RECS (Renewable Energy Certification System) organisation.

[42] '*Maintenance globale et maintien a niveau des ouvrages d'eclairage public*'

Key dates	Introduction of criteria
Examination of the offers by the Tender Commission - 17 March 2004: Meeting of the Tender Commission – official opening of the offers (5 application files) - 14 April 2004: meeting of the tender commission – stages report, presentation of the offers, examination of the questions to ask to each bidder **Interviews / dicussions stage** - 4 May 2004: Reunion of the tender commission – audition of each bidder during 90 min to present the bid and answer questions. **Awarding the contract** - 7 July 2004: the contract is being awarded to the group ETDE/SOSIDEC - 9 September 2004: Notice of the award - 1° October 2004: Beginning of the contract period for 8 years	Evaluation of the offers according to the award criteria, including detailed green criteria

7.5.1 Developing the green procurement criteria

Given the level of technical knowledge required to develop the environmental criteria, the two municipal departments, the Department for Public Tenders and the Department for Public Lighting Services, involved in the tendering procedures sought external expert assistance. This was provided by the consultant firm HEXA INGENIERIE, based in Douai, France. HEXA INGENIERIE helped the City Departments develop the green criteria according to the political objectives of the City, addressing issues such as energy efficiency, renewable energy, reduction of light pollution, and use of recycling material. The consultant firm was also part of the tender commission, and hence participated in the examination of the offers provided by the bidding parties.

The aims of the tender were defined in the call for tender, it was up to the bidders to suggest and describe the means of achieving these results. They had therefore to include in their bids a detailed technical document containing the specific technical terms and conditions of the service they wanted to offer.

After submitting their bids, the bidders were also invited, one by one, to technical interviews, to discuss the technical means of the contract with the tender commission. This particular stage of discussion, which took place on the 4th May 2004, was also an opportunity to improve and complete the reviewed offers. Between the publication of the tender and the announcement of the successful bidder was a period of 18 months.

7.5.2 The green procurement criteria

As previously mentioned the intention of the City of Lille was to give indications rather than defining specific quantitative specifications. The green criteria included in the tender were:

- Reduction of the energy consumption;
- Optimal use of renewable energies;

- Improvement of life quality: suppressing excessive lighting and light pollution (e.g. by taking off globe lamps, to avoid directing light upwards into the sky)
- Use of recycling materials (lamps, masts, apparatus, wall brackets, etc.);
- Replacement of obsolete materials;
- Development of new innovating eco-technologies.

As far as the pre-qualification of the suppliers is concerned, the tender commission essentially focused on the experience of the supplier to provide this kind of maintenance services, and no "green" criteria were required to participate in the tendering process.

The bidders were allowed to submit a maximum of two variants of the offer on the condition that they wouldn't exceed the fixed annual budget.

It was only at the evaluation stage on 17 March 2004, that the Tender Commission presented its detailed attribution scheme, including the green award criteria chosen for the evaluation of the bids and the corresponding attributive points (see Table 10). The table below is an extract of the award scheme table used by the Tender Commission to evaluate the results. The original document contained 3 parts ("Reconstruction and commitments to the results"; "Energy"; and "Maintenance and quality of the service"), each of them divided into several sections and subsections. In the table below, only the sections and subsections containing or corresponding to green criteria are appearing, also leaving aside the criteria corresponding to other aspects of sustainable development than the environment.[43]

Table 9 Green criteria used for the award phase

Sections and green award criteria used	Points
1. RECONSTRUCTION AND COMMITMENTS TO THE RESULTS:	**/140**
• **Reconstruction of the asset base:**	**/90**
◦ waste management policy	/5
• **Implementation of innovating and cost-effective equipment with positive impacts on sustainable development:**	**/40**
◦ Quality, choice and life-cycle of the equipment	/15
◦ Reduction of light-pollution	/10
◦ Technologic innovation	/15

[43] As the aim of the tender was to integrate the goals of the City's Agenda 21 into Public Lighting, the award criteria also contained many ethical and social considerations, i.e. good governance, equity of lighting in the different districts, local development, development aid, etc.

Sections and green award criteria used	Points
2. ENERGY	**/100**
• **Commitment of the bidder towards the reduction of energy consumption**	**/50**
• Commitments in terms of kWh consumed /year	/10
• Year of implementation of the commitments of consumption in kW	/20
• Operation mode of the installations	/7
• Critical examination of the existing asset base	/5
• Power reduction	/5
• Control of the applied power	/3
• **Commitment of the bidders towards the provenance of the electricity and towards sustainable development**	**/35**
• Suggestions for handling sustainable development	/20
3. MAINTENANCE AND QUALITY OF THE SERVICE	**/60**
• **Assistance and attendance on the City's sustainable development projects**	**/8**
• integration and environmental considerations	/4
• suggestions for communication	/4
TOTAL (IN BOLD)	**300**

With regards to lamps containing toxic content, the tender documents specify that the supplier had to recycle them according to a specific procedure and to provide justification to the public lighting service.

The main tender document itself did not include any specific targets in the green criteria; however, bidders were directed to a number of related documents e.g. Lille's charter for clean construction works. They include a series of recommendations for the disposal of waste, the use of environmentally friendly packaging and recyclability of material as well as materials that should be avoided. For instance, suppliers are not allowed to use PVC for the lighting envelope. The bids also had to comply with the local urban planning documents and road regulations as well as the recommendations of the French Agency for Lighting (A.F.E).[44]

7.5.3 Awarding the contract

Following the evaluation phase, ETDE was awarded the contract, mainly because sustainability was integrated throughout the whole offer, according to a transversal approach. The strong points of the offer were especially the commitments taken by the

[44] The A.F.E (*Agence Francaise de l'Eclairage*) produces recommendations and technical guides on lighting, and among others a collection of general and technical recommendations for the street lighting sector.

service provider towards environmental performance (i.e. achieving 40% of energy savings by the end of the contract, using 25% of renewable energies) and reconstruction.

Following the award phase, the commitments made by the awarded service provider were inserted in the contract as contract clauses.

7.5.4 Contract management

ETDE is responsible for the management of the public lighting services. This is a public service delegation: the City stays in charge of the public lighting service and owner of the assets but delegates the management function to one private society for the contracting period. During the contracting term, ETDE is responsible for the operation of the whole street lighting systems, the management, and the energy supply (the energy producer being the main national supplier group EDF, at least for the period 2004-2008), the reconstruction of the assets and the replacement of the lamps.

As it was specified in the tender documents, the service is regularly evaluated and discussed with the City's Department for Public Lighting:

- Regular discussion and continuous evaluation of the results, compliance with the results engagements: correction actions when the results are not satisfying or do not correspond to the City's expectations;
- Yearly reports to the City council are undertaken.

In order to encourage the participation of citizens, the actions are also presented at the annual meeting for Saint Lucia's Day, the Feast of Light, where all municipal elected officials and district councils are invited to help choosing the coming year's program.

7.6 Results of the tendering process and key factors that triggered the market for the Eco-Technology

The sustainable management of public lighting systems is a complex service package, which represents a new "eco-solution". It is only in response to Lille's tender that the service provider ETDE decided to concentrate its management strategy of street lighting systems on environmental performance, and to transform its existing practices into a new green service package. With a value of 32,5 million EUR and a contract period of over 8 years, the tender presented a very attractive service package, including many components (maintenance, reconstruction, and operation of the system's energy management) and involving several suppliers and subcontractors. It was certainly a challenge for suppliers to identify the best strategy to modulate the different components in line with the new environmental strategy. ETDE was thus very motivated to be awarded Lille's contract. Apart from the economic advantage of a long term contract for the exclusive management of the whole street lighting, the tender also offered them a key business advantage in the entire north region, at the time the only area of France where they were not yet well positioned.

Three years after the publication of the tender, the public lighting system of Lille is increasingly attracting interest at the national and international level. The good practice example is also prominently showcased in the French National Action Plan on GPP.

The main motivation for Lille to "green" the tender was the potential energy savings to be achieved. Following the first assessment after three years, it is very likely that by the end of the contract, the French city will have made at least 42% energy savings through energy-efficient street lighting. Following their Agenda 21 strategy, including several major campaigns and around 500 activities in the field of sustainable development, this tender definitely strengthened Lille's position as one of the French leading cities in the field of sustainable procurement.

A few French cities, including Lille's neighbouring municipalities, for example, Bondues, Saint-André and Marquette-Lez-Lille, but also cities from other French regions, for example, Rouen, Sevran, Nevers and Fougères have already published similar tenders and signed contracts according to the same approach for the sustainable management of their public lighting systems. Of course, many cities are also interested in purchasing such services, and still are preparing their green tender based on Lille's pioneering approach, for example, the case of Marcq-en-Bareuil and Villeneuve d'Asq.

Lille's call for tender was setting environmental performance as a priority, and included strategic aims such as the use of renewable energies, a cut in energy consumption, and avoiding light pollution. However, since the tender was result-oriented with generic criteria, the market was free to develop an appropriate offer. The dialogue between the contractor and supplier engaged in the tender process was also a key factor that pushed the market to its full potential, and encouraged the creativity of the bidders.

Even though all of the bidders had made the effort to "green" their offer, ETDE was the one who put more emphasis on environmental performance. It committed to achieving 40% of energy saving by the end of the contract period and to reinvest all the savings into the reconstruction of the assets (and replacement with new energy-efficient equipment), eco-technologies, and into environmental projects in the fields of public lighting (i.e. technology transfer to Senegal or awareness-raising actions).

The contract value was fixed at 4,4 millions EUR per year. According to the contract, potential extra costs caused by the improvement of the service would not be passed on to the City of Lille. ETDE performed a life cycle costs analysis to prepare its green offer before the tender, but an analysis is being undertaken regularly to allow a continuous improvement in the strategy. At the beginning of the contract period, ETDE in fact had to bear some additional costs - in comparison to its standard management practices -, mainly due to the purchase of renewable energies (small hydro, solar), which are on average 25% more expensive than non-green energy. Concerning the equipment (energy-efficient lamps), the prices are 10 to 20% higher than standard equipment. However, over the medium term, the increase in costs is compensated by the savings made through energy-efficiency measures:

- a reduction of 1,3 million Euros in Lille's running costs from 2005 on (- 47% of 2004's budget)
- The energy consumption was reduced by more than 30% in average (42% foreseen by the end of the contract period): from 20,6 million kWh in 2004 to 14,3 million kWh in 2006.

The new eco-solution gave ETDE a temporary advantage on the market, and helped the company obtain the same type of contract for some of Lille's neighbouring municipalities, thus positioning itself in northern France. ETDE's strategy was soon replicated by many of its competitors. The example of Lille's contract with ETDE showed clearly that it is possible and profitable for such service providers to focus their strategy on energy efficiency and environmental performance. More and more suppliers are now offering green services for the management of public lighting systems, especially the companies that participated in Lille's tender, and learned from the process. Those companies have since made efforts to adapt and "green" their offers as well.

According to ETDE, the tender and the changes it caused on the public lighting market also had impacts on other sectors. For example, the 'virtuous circle of energy-efficiency' and reinvestment at the heart of ETDE's offer expanded in the Bouygues group, and the approach is being implemented in lots of their public contracts, such as public building and construction.

According to the 'virtuous circle' of continuous improvement through gains and reinvestments on which the new eco-solution is based, ETDE is continuously investing in new eco-technologies as well as improving the new technology in use (electronic power reducer; digital lighting system, etc). The Department for Public Lighting and the service provider are regularly discussing the possibilities and the availability of new eco-efficient products on the market, and continuously testing new green products and services.

7.7 Barriers and difficulties

No major barriers or difficulties have been mentioned; neither by the supplier nor by the public service provider. As a minor difficulty, ETDE spoke about the energy market in Europe: though the national electricity market is now partially open, only few companies (EDF) control the market. Only five out of 36 suppliers currently offer green electricity in France. In the northern part of France, the offer of green electricity is even more limited, making for electricity operators to identify their suppliers, to manage the prices etc.

7.8 Outlook

There are now 5 years left until the end of the contracting period (2004-2012). By then, all the lighting equipment will have been replaced by energy-efficient equipment; the City is expecting to have made at least 42% savings in energy consumption for public lighting, in comparison with the reference year of 2004.

There are 7 millions lighting units in France. The electricity used for public lighting represent 1,5 billion kWh a year, that is to say 1,2% of the country's total consumption in electricity.

7.9 Contacts

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7.10 Summary

Case study 4: Sustainable Procurement of the Public Lighting Service of the City of Lille, FRANCE	
Purchasing authority	City of Lille, Public Lighting Department
Subject matter	Tender for the general maintenance of the municipal street lighting services
Environmental criteria required	The intention of the City was to give indications rather than defining specific quantitative specifications. The green criteria included in the tender were : • Optimal use of renewable energies • Waste management policy during the reconstruction phase and use of recycled materials • Environmental impacts of the equipment implemented (life cycle costs, reduction of light pollution) • Development of new and innovative eco-technologies • Reduction in energy consumption (commitments in terms of kWh/year, duration to achieve commitments, power reduction and power control) • Suggestions for handling sustainable development • General integration of environmental considerations • Communication, training and awareness raising The bidders were invited to bring their offers in line with these general objectives, and to present their commitments (i.e. energy savings achieved by the end of the contract period, percentage of renewable energy to be used, etc.) and suggestions (ideas on how to integrate sustainable development to the service) during the interview stage. The main tender document also referred to a number of related documents the offers had to comply with, such as Lille's charter for clean construction, the local urban planning documents and road regulations, etc.

The new eco-solution	The management of Lille's street lighting services represented an "eco-solution" including many components (maintenance, reconstruction, operation of the systems, energy management). Lille was the first city in France to hand over control of its lighting system to a private company and at the same time requested that this company provide an eco-solution. Lille's eco-solution comprised the following innovative aspects: • Integration of green criteria throughout the implementation of the tender • Continuous improvement through a 'Virtuous circle scheme' of energy savings and reinvestment into eco-efficient equipment • New environmental technology tested and applied • Continuous auditing and monitoring system of the strategy and management of the lighting system
Key drivers for triggering the market	• Lille's political commitment to sustainable development in the framework of its Agenda 21 activities, as well as its charter for sustainable construction. • The City's integrated approach of sustainable procurement to all public tenders (public lighting being the first tender of a substantial size). • Motivation of the supplier, ETDE, to be awarded the contract involving a budget of 35,2 million EUR and a long commitment over 8 years. • ETDE has a long history of experience in the management of public lighting management in general and seized the opportunity to create a cost-efficient eco-solution by investing from the start into energy-efficient equipment. • General context of the progressive liberalisation of the energy market and the ability for French local governments, since July 2004, to choose their electricity supplier and also the origin of the energy they consume. • France's commitments to achieve a part of the 21% target of electricity produced from renewable sources (RES-E) by 2010. • Perspective of the energy certificates scheme, which was to be implemented in 2006 in France.
Impact on supply side	• Lille's public lighting system is increasingly attracting interest at the national and international level. Several other French cities have replicated Lille's tender, while others are planning or considering it. • The first mover advantage the supplier (ETDE) benefited from did not last very long, since its strategy was soon replicated by many of its competitors, which have since made efforts to adapt and "green" their offers as well. • According to ETDE, the tender also had impacts on other sectors. For example, the virtuous circle of energy-efficiency and reinvestment at the heart of ETDE's offer expanded in the Bouygues group. • The contract includes a continuous investment in new ecotechnologies and an improvement of the new technology in use (i.e. electronic power reducer; digital lighting system). They are regularly discussing with the City the opportunities and the availability of new eco-efficient products on the market, and continuously testing new green products and services.

Cost implications	• The supplier had to bear some additional costs concerning the purchase of electricity from renewable energy sources (on average 25% more expensive) and of materials (energy efficient lamps with prices 10 to 20% higher). However, this increase was not passed on to the procurer since the contract budget was blocked by 4,4 million EUR annually, and since these additional costs were balanced with greater savings in energy. • For the City of Lille, global costs went down by 5% in comparison with their last contract, mostly thanks to the savings achieved in running costs (42% savings in energy consumption).
Lessons learned	• Tenders on performance-based specifications allow more scope to push the market to its full potential, and encourages bidders to be more creative. • Handing over the entire street lighting services to one supplier is a challenge for a City, but proves to be a good way to implement an efficient eco-solution which integrates the City's environmental objectives throughout all aspects of the service package.

8 Case study 5: Sustainable Procurement of Low Emission Buses for Göteborg, SWEDEN

Figure 11 Photos: Vasttraffik/Ingemar Carlson

Prepared by ICLEI – Local Governments for Sustainability

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Lennart Löfberg (Västtrafik Göteborgsområdet AB), Peter Danielsson (Volvo), Pierre Modini (Göteborgs Spårvägar AB)

8.1 Background information

The city of Göteborg, located on the west coast of Sweden, is the country's second biggest city. The population of the Göteborg region is 750 000 with approximately 470 000 people living within the city boundaries. Non-commercial traffic has been growing steadily at an annual rate of 2-4% in the urban area and 4-6% in suburban areas.

Trafikkontoret (Traffic and Public Transport Authority) regulates the City's public transport system, which since 1991 has been the "purchaser-operator" within the City administration. In 1999, the Västtrafik public transport authority was formed at the regional level and this authority has a subsidiary, Västtrafik Göteborgsområdet, for the Greater Göteborg Area. Västtrafik Göteborgsområdet now undertakes planning and tendering for Göteborg.

8.2 Information on the product

Various low emission buses are in use in the Göteborg region. In 1998, the city bus fleet consisted of 117 diesel buses with CRT-filters, 94 diesel buses without a filter and 38 biogas or natural-gas-fuelled buses. Today Västtrafik operates a total of 93 Compressed Natural Gas (CNG) buses, 10 biogas buses and 32 ethanol buses. However, the biogas and ethanol buses are not used in Göteborg but in smaller towns in the south-west of Sweden. Around 40 different bus operators currently have contracts with Västtrafik AB. Around half of the total bus traffic commissioned by Västtrafik takes place in the Greater Göteborg Area.

8.3 The new Eco-Technologies

One of the effects of the procurement practises in the Göteborg region is that companies were encouraged to develop vehicles using recent Eco-Technologies. The development of particle filters, engines adapted to high blends of agro-fuels, natural gas, LPG (liquefied petroleum gas), hydrogen, electric motors and hybrid vehicles combining combustion engines with electric motors was stimulated. Göteborg is seen as a forerunner with regard to starting to implement the clean vehicle procurement obligations of the European Commission.

8.4 The drivers responsible for procurement of the buses

There have been overarching national, regional and local political goals of achieving a sustainable society and a sustainable public transport system in Sweden for many years. In addition, national law in Sweden has required the provision of public transport services to be tendered since the early 1990s. These factors are reflected in the transport plan for Göteborg, which formulates a vision based on competition and sustainability. Over several years, the transport authority has tried to develop transport infrastructure in a way that

makes best use of existing facilities in order to minimise the use of the private car. Specific aims are to:

- Improve the local environment by reducing traffic sources and other forms of pollution;
- Improve the overall quality and accessibility of public transport, as well as its safety record.

To achieve this, Göteborg aims to develop the public transport system further and to make it more efficient. Bus operation is very important. The environmental goals are intended to be achieved with the use of more natural gas/biogas powered buses, using latest Eco-Technologies and the application of an environmental protection zone in the city centre.

In Göteborg the objective when implementing national law at the local level has been to use the new tender specifications and contract agreements to:

- Increase the quality and frequency of public transport services;
- Achieve a better relationship between public subsidies granted and transport provided;
- Increase environmental standards;
- Enable small bus companies to access the market; and
- Allow public as well as private companies to participate in tenders (there is no intention to privatise).

8.5 The tendering process

The first call for tender by Trafikkontoret of the public transport system was issued in 1992, which covered one third of the bus operation. The second and third followed in 1996 while the remainder occurred in 1998. Following the introduction of Västtrafik as the regional traffic authority, subsequent tenders have been made, such as that in late 2003 which awarded the contract for bus transport within the region to Göteborgs Spårvägar AB (a transport company wholly owned by, but independent of, the City of Göteborg). The latest tender was in 2005 for the Göteborg regional transport area. Bus operations are carried out by private enterprises, but Västtrafik, as the region's public transport authority, sets the requirements and issues the calls for tender. The bus suppliers sell the buses to the operators – such as the service provider Göteborgs Spårvägar AB – who acts as both purchasers (from the bus suppliers) and suppliers of the service to the region – which is part of the tender requirements. Göteborgs Spårvägar AB passes on the tender requirements to their suppliers, and chooses a supplier who can best fulfil these obligations.

8.5.1 Developing the green procurement criteria

The sustainable development focus is introduced at the very beginning of the procurement process. Before Västtrafik act, they first must consult their annual policy document for future tenders/bids and then take up the question of sustainability. Parallel to this, the owners of Västtrafik – the local authorities of the region – are consulted about the environmental needs

they consider applicable. This forms the foundation of the requirements / demands issued to suppliers.

8.5.2 The green procurement criteria

In order to achieve the objectives outlined on the previous pages, two strategies have been followed. The first targeted environmental emissions:

- Strict emission standards were achieved by including the requirement as part of the technical specifications of the call for tender. The requirements for NO_x and particulate matter were already strict in Sweden and in 1999 the City of Göteborg specified that NO_x levels would have to be below 5 g/kWh and particulate matter below 0,11 g/kWh. These requirements reflected the EURO 3 standards, which applied to all fifteen EU Member States since 2001. While these standards were required, some flexibility was left on how to achieve them. Between 2006 and 2008 the requirements will adjust to incorporate the EURO 4 and 5 standards respectively;
- Previous specifications required that by 2000, 10% of fuels would have to come from renewable resources and that the maximum age of the bus fleet should not be more than 10 years, with the average age being no higher than 5 years old. Contracts prescribe that all new buses shall be equipped with diesel particulate filters. Older diesel buses that enter the “environmental zone” of the inner city of Göteborg must be retrofitted with particulate filters in order to meet the local exhaust regulations that apply to that zone.

In the second approach, incentives to strive for better results than demanded were set:

- The tendering authorities have consistently made attempts to advance the quality of results by opting for challenging target setting. This is not necessarily a scientific process, in the sense that decisions have been made deliberately to advance the science and force new technological developments. In the award phase of such tendering processes, companies who could deliver emissions reductions in advance of the target were rewarded with bonuses. Volvo says that such tactics have in turn resulted in aggressive product development on their part as a supplier. The motivation for staying ahead of the game is higher, as the company has a better chance of securing future contracts and receives a good public profile for its innovation and eco-efficiency as a consequence. As similar initiatives have occurred in other Swedish cities, this also reflects the need of companies such as Volvo to respond to their consumers;
- Awarding 25% of the income generated from transport fares to the operator set incentives for good quality service. This differs from standard practice, which is for all income generated from fares go to the authority and for operators to be paid according to the number of operated vehicle kilometres; and

- The tender process allows potential bidders about 60 days to react and/or modify their approach before calculations (with an extra 30 days in summer). Within the 60 days, potential suppliers have the right until 14 days prior to the submission deadline to ask written questions regarding all aspects of the tender. Västtrafik must respond to any such demands. After the deadline passes, bids cannot be altered except in the case of urgent clarifications.

The key people involved in the development of the criteria and the nature of those criteria were officials at the public transport authority and through sources such as consultants.

8.5.3 Contract management

The bus operators' present annual written reports document how all the environmental requirements of the tender specification have been fulfilled. Some random testing of a few vehicles has also been done, but not every year. The operators have met mostly all the environmental requirements. Also, contracts containing specific targets were used which set certain performance goals and procedures of monitoring their achievement, for example an independent market research institute assesses the quality of service.

8.6 Results of the tendering process and key factors that triggered the market for the Eco-Technology

One of the key elements to achieve real improvements in raising standards for low-emission buses was the continuos competitive tendering of Västtrafik. This secured that the bidding suppliers were encouraged to achieve low emission levels earlier than the respective Directives for emission standards of heavy vehicles come into force.

The tendering proceedings especially fostering new Eco-Technologies while at the same time not being prescriptive on the way on how to achieve this, together with the included environmental standards were key factors to successful triggering of the market for products with Eco-Technologies. The inclusion of environmental criteria in the tendering process contributed to getting buses on the road meeting EURO 3, EURO 4 and EURO 5 standards earlier than the legal requirements. Also the aim of increasing the share of renewable resources, hence decreasing the reliance of fossil fuels, was achieved two years earlier than required by the tender specification in Göteborg. Furthermore, in 1998, fuels from renewable sources covered 15% of total fuel consumption (compared to 10% in the tender specification).

These demands together with similar demands from other Swedish cities primarily have resulted in achieving a critical mass that strongly supports a business case for the use of low emission buses.

The winning service supplier – Volvo – not only maintained this practice but also made it even more stringent and changes were implemented in a number of other supply contracts held by the supplier. The full cost increase was passed on to the procurer. The costs

increased by 10% of the total bus cost. This cost was sustained until the next generation of technology was implemented. The increase in costs is attributed as follows:

- 50% were incurred in the development of the technology; and the other
- 50% in new components.

Within the Volvo Group, they have a set of environmental requirements applicable to all their suppliers. There is a questionnaire that has to be completed and a scoring system in place to evaluate their environmental performance. The outcome is very positive since both Volvo and the suppliers have a better control and follow up of the environmental performance. Volvo has a list of forbidden or restricted chemicals/ materials and an environmental management system is in operation.

Volvo suggests that the first-mover advantage i.e. that they were the first company to green their bus fleet in response to the tender has been a positive outcome of the tendering process. They did this because the home market supports and demands innovation and this provides a platform for development of higher standards and strengthening of the brand's domestic and international image.

This approach has succeeded in its attempt to influence market supply and there has been a guarantee for the supplier that this policy of procurement practices will be sustained.

Following Göteborg's tenders other public-sector buyers across Sweden have also influenced the market in Sweden. Volvo stated that once a critical mass has been reached, with similar demands coming from similar cities, the business case for low emissions buses becomes sound. Supporting this claim, figures from another company Scania AB show that the company sold 283 buses to Swedish cities in the first two months of 2005, 123 of which were ethanol-fuelled products for the Stockholm transport authority. Stockholm, like Göteborg, has consistently set ambitious emissions-related targets. Other Swedish cities, such as Malmö and Uppsala, pursue similar objectives.

According to Volvo, this practice has influenced the wider market demand, which has started to change and now cities in several EU countries carry out similar practices. The key changes regarding the purchasing behaviour of customers are more focus on environmental features in general and a willingness to pay a premium for these features. Customers of public transport are also noticing the environmental improvements gained by improved bus technology and an increase in social standards.

8.7 Barriers and difficulties

There have not been specific barriers or difficulties related to the implementation of green criteria into the tendering process with the aim to trigger the market of new Eco-Technologies. Nevertheless, experiences with green tenders developed steadily since 1992, sometimes struggling with difficulties in the availability of the desired products and sometimes taking time to adapt the environmental policies to the daily work of the procurement departments.

8.8 Lessons learned

For those cities willing to undertake a similar project, it is recommended to set specific emission levels as a criterion when tendering, not demand a specific technology, for example, demanding diesel fuelled buses. The body which sets the tender will theoretically then only receive the reduction in emission levels, whilst the suppliers must then provide the adequate technology to achieve the reduction. Competition in Göteborg has shown to bring major cost savings in traffic operation whilst improving social and environmental standards and increasing the number of passenger by 7,5%. Financial savings were used to increase the service level and to reduce ticket prices. Competitive tendering has also enabled modernisation of the bus fleet.

8.9 Outlook

In a related development, the European Commission has proposed new legislation aimed at contributing towards the creation of a market for “clean” vehicles in order to reduce pollutant emissions and make energy savings in the transport sector. By requiring public bodies to earmark a quarter of their annual procurement requirements to such vehicles, the new European rules will make it possible to give manufacturers the assurances they need in order to develop these vehicles for a wider market. At present, the technologies needed remain more expensive than conventional vehicle manufacturing technologies.

Consequently, the Commission proposal provides that public bodies (state, regional or local authorities, bodies governed by public law, public undertakings and operators contracted by public bodies to supply transport services) will be obliged to allocate a minimum quota of 25% of their annual procurement (purchasing or leasing) of heavy-duty vehicles (with a weight greater than 3,5 tonnes) to ‘enhanced environmentally friendly vehicles’ as defined in the European Performance Standard (EEV). Heavy-duty vehicles include buses and most utility vehicles, such as refuse collection lorries.

The Commission proposal on the procurement of clean and energy efficient vehicles has been dropped in the meantime, because no agreement was achieved in the European Parliament. Nevertheless, the Directorate-General Energy and Transport is now working on a new initiative that is likely to be proposed in the end of 2007.

If adopted and implemented the Directive could increase the demand for less-polluting vehicles that make it possible to support their development by manufacturers establishing a viable market by creating sufficient demand to generate economies of scale. Former studies carried out by the Commission have demonstrated the positive impact on the competitiveness of the European motor industry. The supply of ‘clean’ vehicles by manufacturers will become an important factor in competitiveness given the urban pollution problems encountered by a number of countries experiencing rapid economic growth.

8.10 Contacts

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40126 Göteborg
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Tel. +46-31-629244
E-mail: lennart.lofberg@vasttrafik.se

Volvo
Peter Danielsson
Environmental Manager
Sweden
E-mail: peter.j.danielsson@volvo.com

Göteborgs Spårvägar AB (bus operator)
Pierre Modini
Sweden
E-mail: pierre.modini@sparvagen.goteborg.se

8.11 Summary

Case study 5: Sustainable Procurement of Low Emission Buses for Göteborg, SWEDEN	
Purchasing authority	Västtrafik Göteborgsområdet, for the Greater Göteborg Area
Subject matter	Delivery of low emission buses partly with alternative fuel technologies
Environmental criteria required	Two strategies have been followed. The first targeted environmental emissions: • Strict emission standards were achieved by including the requirements as part of the technical specifications of the call for tender. • Between 2006 and 2008 the requirements will adjust to incorporate the EURO 4 and 5 standards respectively; • Previous specifications required that by 2000, 10% of fuels would have to come from renewable resources and that the maximum age of the bus fleet should not be more than 10 years, with the average age being no higher than 5 years old. • Contracts prescribe that all new buses shall be equipped with diesel particulate filters. • Older diesel buses that enter the “environmental zone” of the inner city of Göteborg must be retrofitted with particulate filters. In the second approach, incentives to strive for better results than demanded were set: • In the award phase of such tendering processes, companies who could deliver emissions reductions higher than the targeted amount (i.e. specified in the technical specifications) were rewarded with bonuses.
The new eco-technology	One of the effects of the procurement practises in the Göteborg region is that companies were encouraged to develop vehicles using recent Eco-Technologies. The development of particle filters, engines adapted to high blends of agro-fuels, natural gas, LPG (liquefied petroleum gas), hydrogen, electric motors and hybrid vehicles combining combustion engines with electric motors was stimulated. Göteborg is seen as a forerunner with regards to starting to implement the clean vehicle procurement obligations of the European Commission.

Key drivers for triggering the market	• The continuos competitive tendering of Västtrafik secured that the bidding suppliers were encouraged to achieve low emission levels earlier than the respective Directives for emission standards of heavy vehicles came into force. • The tendering procedure fostered the development of new Eco-Technologies but at the same time was not prescriptive on the way on how these should be achieved. • The inclusion of environmental criteria in the tendering process contributed to getting buses on the road meeting Euro 3, Euro 4 and Euro 5 standards earlier than the legal requirements. • The aim of increasing the share of renewable resources, hence decreasing the reliance of fossil fuels, was achieved two years earlier than required by the environmental tender specifications used in Göteborg. • These specific tenders together with similar demands from other Swedish cities have resulted in achieving a critical mass that strongly supports a business case for the use of low emission buses.
Impact on supply side	• Following the Göteborg tender, the winning service supplier - Volvo Group - developed a set of stringent environment requirements which was applied to all their suppliers. • Volvo stated that once a critical mass has been reached, with similar demands coming from similar cities, the business case for low emissions buses becomes sound. • Supporting this claim, figures from another company Scania AB show that the company sold 283 buses to Swedish cities in the first two months of 2005, 123 of which were ethanol-fuelled products for the Stockholm transport authority. • Following Göteborg's tenders other public-sector buyers across Sweden have also influenced the market in Sweden.
Cost implications	The full cost increase was passed on to the procurer. The costs increased by 10% of the total bus cost. This cost was sustained until the next generation of technology was implemented. The increase in costs is attributed as follows: • 50% were incurred in the development of the technology; and • the other 50% in new components. Competition in Göteborg has shown to bring major cost savings in traffic operation whilst improving social and environmental standards and increasing the number of passenger by 7.5%. Financial savings were used to increase the service level and to reduce ticket prices.
Barriers and difficulties	• No specific barriers or difficulties related to the implementation of green criteria into the tendering process. • Some difficulties were found regarding the availability of the desired products • Some time was needed to adapt the environmental policies to the daily work of the procurement departments.
Lessons learned	• It is recommended to set specific emission levels as a criterion (target) when tendering and not demand a specific technology, for example, demanding diesel fuelled buses. Subsequently, it is then up to the suppliers to provide the adequate technology to achieve the level of emissions specified. • Competitive tendering has also enabled modernisation of the bus fleet.

9 Sources

9.1 Sources case study 1

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- Interview with Wolfgang Späth, Björn Vitt, Sabine Groß and Rüdiger Wendt (all Alstom LHB GmbH), 4 June 2007, Salzgitter
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9.2 Sources Case study 2

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- Interview with Helena Barracó (Barcelona City Council, Environmental programmes Office), 31 May 2007, Barcelona
- Interview with Luís Sánchez Olavarría (Director JCDecaux Catalan office), 31 May 2007, Barcelona

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- www.bcn.cat
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9.3 Sources Case study 3

- Interview with Markus Binda (Regent Beleuchtungskoerper AG) Zurich, Switzerland, 25 May 2007
- Interview with Markus Simon (Regent Beleuchtungskoerper AG) Zurich, Switzerland, 25 May 2007
- Telephone interview with Stefan Gasser (eteam GmbH), 31 May 2007

Internet sources

- Regent Lighting - http://www.regent.ch
- MINERGIE Standard – www.minergie.ch

9.4 Sources case study 4

Meeting in Lille's City hall, 30 May 2007 and interview with:

- Danielle POLIAUTRE, Deputy Mayor for the Quality of Life and Sustainable Development, City of Lille.
- Christophe MONTELIMARD, Operation Director in charge of Lille's public lighting, ETDE
- Eric Decaillon, Head of Public Lighting Department, City of Lille

Internet sources

- http://www.etde.fr
- http://www.mairie-lille.fr

9.5 Sources case study 5

- Telephone interviews and questionnaire response from Lennart Löfberg, Vice VD/Affärsområdeschef Stadstrafik, 10 January 2006 and 24 May 2007
- Telephone interview and questionnaire responses Mr Pierre Modini, Göteborgs Spårvägar AB, Sweden, 12 January 2006
- Questionnaire responses from Peter Danielsson, Volvo, 20 January 2006
- Västtrafik Göteborgsområdet AB, Tel. 031-629244 0708-629244, Besöksadress: Folkungagatan 20, Box 405, 401 26 Göteborg, Sweden.
- Ragnar Domstad, Consultant on public transport, "Västrafik GO", Truelsväg 11, S-433 46, Partille, Sweden, ragnar.domstad@spray.se.
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10 Appendix 1: Questionnaires for the Sustainable Procurement of Public Railcars with the Eco-Technology 'particle filters' for the Taunusbahn, Case Study

10.1 Questionnaire purchaser

Name der verantwortlichen Person für die Ausschreibung	Volker Sparmann (verantwortlich) Gerolf Wogatzki und Joachim Michels (Ausführung)
Name der Organisation	fahma GmbH
Was (Produkt/ Service) wurde ausgeschrieben?	Dieseltriebzug
Wie lautet der Name/ Titel der Ausschreibung (Betreff)? (*Bitte fügen Sie eine Kopie der Ausschreibung bei.*)	D-Hofheim am Taunus: Eisenbahn- und Straßenbahnpersonenwagen und Oberleitungsbusse, 2004/S 240-206797
Wann wurde die Ausschreibung veröffentlicht (Datum)?	2.12.2004
Kontaktangaben (Adresse, Telefon, E-Mail)	Dipl.- Ing. Joachim Michels Alte Bleiche 5 65719 Hofheim am Taunus Tel. (06192) 294-660 Fax. (06192) 294-665 info@fahma-rheinmain.de www.fahma-rheinmain.de
Wir würden uns freuen, Ihre Kontaktangaben in der Fallstudie benutzen zu dürfen, um zu einem besseren Erfahrungsaustausch beitragen zu können. Sind Sie damit einverstanden?	☒ Yes ☐ No

Hintergrundinformationen

Wie hoch ist das Gesamtbudget für Beschaffung ihrer Organisation/ Abteilung?	68 Mio. (Odentalbahn), 27 Mio. (Taunusbahn), 15 Mio. (Odentalbahn Aufstockung) = 110 Mio. seit 2000
Wie hoch ist der Anteil umweltfreundlicher Beschaffung (in Proxent)? (*Bitte schätzen.*)	45 Mio. von 112 Mio. erfüllen stage IIIa + Russpartikel stage IIIb; Odentalbahn II soll stage IIIb komplett erfüllen (Ausschreibung geplant für 2007)
Was für Erfahrungen haben Sie mit grüner öffentlicher Beschaffung?	Bisher zufällig umweltfreundliche Kriterien eingebaut. Aus Gutachten (green delta) Kriterien zu Material, Treibstoffverbrauch eingebaut. RPF optional verlangt. Für Triebwagen wird ungern neu entwickelt (zu geringer Absatzmarkt), sondern eher

	bestehende Komponenten (zB LKW Motoren) angepasst und aufgerüstet. Die politische Debatte um Feinstaub Anfang 2005 hat maßgeblich zum Einbau der RPF beigetragen.

Informationen zum Produkt

Wieviel wurde eingekauft? (*Anzahl und Gesamtkosten in Euro*)	10 Triebwagen ALSTOM CORADIA LINT H, Gesamtkosten 27 Mio. Euro
Wie hoch ist die Verfügbarkeit des Produkts auf lokalen, regionalen und nationalen Märkten?	Lokaler Markt: nicht zutreffend Regionaler Markt: nicht zutreffend Nationaler Markt ☐ niedrig ☒ mittel ☐ hoch Internationaler Markt: 2 von 7 Bietern Durchschnittlich 2 Jahre Lieferzeit
Haben Sie vergleichbare Daten (zusätzliche Kosten oder Einsparungen) für umweltfreundliche und konventionelle Produkte? (*Wenn verfügbar fügen Sie bitte Daten zu den Lebenszykluskosten ein.*)	45.000 Euro pro Filter (= 900.000 insgesamt, 2x10 Filter) ca. 3% Mehrkosten Verbauch - vorraussichtlich gleichbleibend Wartungskosten: geringer Mehrbedarf (vernachlässigbar) durch jährliche Filterreinigung

Die "Zugpferde" für umweltfreundliche Beschaffung

Was waren die Hauptgründe, bestimmte umweltfreundliche Produkte auszuschreiben? Gab es politische Unterstützung? Andere Gründe?	Diskussion um Feinstaub, Landrat Hoch-Taunus (wohnhaft entlang der Strecken) setzt sich für Partikelfilter ein Neue Partikelstrategie Frankfurt: Einfahrt in City nur mir IIIa/b für LKW, noch nicht bei Zügen, aber denkbar)
Hat Ihre Organisation ein politisches Leitbild zu nachhaltiger und/oder umweltfreundlicher Beschaffung? Wenn ja, halfen diese, die Ausschreibung voranzutreiben?	fahma=nein, RMV Klimaschutzstrategie
Hat Ihre Organisation Ziele zu nachhaltiger und/ oder umweltfreundlicher Beschaffung aufgestellt? Wenn ja, halfen diese, die Ausschreibung voranzutreiben?	Grundsätzlich nicht, eher technische Spezifikationen
Hat Ihre Organisation eine Umsetzungsstrategie zu nachhaltiger und/ oder umweltfreundlicher Beschaffung aufgestellt? Wenn ja, halfen diese, die Ausschreibung voranzutreiben?	RPF 1) Wer hat was im Angebot? 2) Abwägung des Risikos bei Vorreiterrolle 3) wichtig: Preisabfrage im Vorwege 4) als Option erwähnt

Der Ausschreibungsprozess

Entwicklung der umweltfreundlichen Kriterien

Wer war an der Entwicklung der umweltfreundlichen Kriterien beteiligt?	fahma, RMV, Betreiber, ext. Berater
Wieviel **interne** Beratung war für die Entwicklung der Kriterien und der Ausschreibung notwendig (z.B. mit Hilfe der Umweltabteilung, der Finanzabteilung, der Energieabteilung, etc.)?	
Wieviel **externe** Beratung war für die Entwicklung der Kriterien und der Ausschreibung notwendig (z.B. Consultants, Ingenieure, andere Kommunalverwaltungen, andere Anbieter)?	Consultants: 1) Green delta studie für Odenwaldbahn als Vorlage vorhanden 2) Die Ingenieurwerkstatt (macht viel zu LCC)
Waren die Anbieter/ Bieter zu irgend einem Zeitpunkt im Ausschreibungsprozess involviert (z.B. Informationsgespräche)?	Verhandlungsrunde: Was ist machbar (mit 4 Anbietern getrennt, Protokoll)

Die umweltfreundlichen Kriterien

Welche umweltfreundlichen Mindestanforderungen haben Sie an die Anbieter gestellt?	Kraftstoffverbrauch LCC System Disposal (ein wenig), recycling erfüllt aber eher durch schwedische Vorlage Weitere s. Lastenheftauszug s. 33ff.
Brauchten Sie bestimmte technisches Wissen, um die Mindestanforderungen aufzustellen?	Ja, durch consultants geliefert
Welche technischen Anforderungen haben Sie gestellt?	Siehe Lastenheft s. 33
Was waren die Auswahlkriterien?	s. Vergabebekanntmachung (VGB) EU
Wurden Kriterien für die Zuschlagsphase verwendet? Wenn ja, welche?	ja, s. VGB EU
Was waren die Vertragsbedingungen?	s. VGB EU
Wurden Hinweise auf Umweltlabel verwendet? Wenn ja, welche?	Nein, nicht gebräuchlich, aber DIN/EN Normen und teilweise Kriterien für noch nicht bestehende Normen
Wurden Kriterien nach der Zuschlagsphase angewendet? Wenn ja, welche?	Ja, RPF als Option
Welche Beweise wurden vom Anbieter eingefordert, um die Anforderungen einzuhalten?	Self declaration + test (incl. penalties), e.g. RPF Messprotokoll, Test Kraftstoffverbrauch

Daten zur Ausschreibung

Wie war der Zeitplan der Ausschreibung?	Startdatum: 1.10.04 Zeit für Vorbereitung: 2 Monate Veröffentlichungsdatum: 2.12.04

	Wieviel Zeit hatten die Bieter, um zu reagieren? 2,5 Monate Wieviel Zeit brauchte es, die Angebote zu prüfen? 3 Monate Datum der Zusage an den erfolgreichen Bieter: 26.06.05
Wieviele Bieter gab es?	1) 7, 2) 4, 3) 2 Angebote
Wieviel Zeit wurde potenziellen Bietern gegeben, um zu reagieren und/ oder ihre Herangehensweise zu ändern?	3 Monate Verhandlungen

Vertragsmanagement

Gab es Probleme bei der Erfüllung der Kriterien?	Grenzwertig aber wahrscheinlich erreicht
Wie wurde Durchführung, Monitoring und Evaluation sichergestellt?	Technische Begleitung durch Vollzeitstelle (im Bereitstellungspreis enthalten) Tests

Marktpotential

Welche Veränderungen in Lieferung/ Angebot können direkt auf die Ausschreibung zurückgeführt werden (inklusive nicht verlangter/ beabsichtigter Veränderungen)?	MTU hat etwas neues und muss auch weiterentwickeln, da IIIb mit stand of the art nicht erreichbar
Was für Auswirkungen konnten auf dem Markt gesehen werden? Gab es Auswirkungen auf die Versorgungskette? Welche? Wurden Auswirkungen bei der Nachfrage auf Wurden Auswirkungen auf andere Sektoren gestg	HUG Engineering vergrößert die Produktion von Partikelfiltern MTU hat business case durch Taunusbahn Auftrag, RPF ist aus Testphase herausgekommen.
Hat der Anbieter die Veränderungen nach Ablauf der Vertragszeit beibehalten oder ist er in “alte Praktiken” verfallen?	Beibehalten und ausgebaut
Sind die Kosten angestiegen? Wenn ja, warum und wie hoch?	Zusätzliche Kosten zum RPF sinken kontinuierlich (kommt auf das Fahrzeug/ Motortyp an)
Wenn die Kosten angestiegen sind, haben sie sich über die Zeit amortisiert? Falls ja, wie lange dauerte dies?	Amortisierungsphase nicht relevant
Wenn die Kosten angestiegen sind, wurden sie auf den Einkäufer übertragen?	Ja
Wie weit in der Versorgungskette sind die Auswirkungen der Ausschreibung/ des Vertrags sichtbar?	Filterproduzent – Motorproduzent - Anbieter
Konnten Sie irgendwelche ungewollten Auswirkungen aufgrund der Ausschreibung feststellen?	Nein

Hindernisse und Schwierigkeiten

Welche Schwierigkeiten traten bei der Entwicklung und Umsetzung der Ausschreibung auf?	EN Normen tlw. nicht vorhanden schwierig, Kriterien nur mit self-declaration zu überprüfen
Traten Probleme bei der Einhaltung der aufgestellten Kriterien auf?	Nein

Gemachte Erfahrungen

Was können Sie anderen öffentlichen Einrichtungen empfehlen?	Politik: aktuelle Umweltdiskussionen (hier Feinstaub) aufgreifen, pol. Rückendeckung einholen. Wettbewerbsvorteile (Einfahrt City) in Zukunft ausschöpfen
Was kann wo anders wiederholt werden?	Verhandlungsverfahren green criteria Bonus/Malus System TSI Lärm einbauen

Zusätzliche Informationen

Zukunstaussichten LCC: 1/3 Beschaffung (Anschaffungskosten) IIIb fordern - es gibt Motoren mittlerweile (differenziert nach geforderter Leistung) Bestandsschutz ist am wanken (vielleicht demnächst Nachrüstgebot nach 5 Jahren, dann härtere Ausschreibungen push) Agrokraftstoffe: Motoren < 250 kw Mehrverbrauch? Tankstellen/Infrastruktur Bsp Priegnitzer Eisenbahn CRT (entwicklung ohne Harnsäure nutzen zu müssen aus LKW Motorenentwicklung

Kontaktangaben

Bitte fügen Sie Ihre vollständigen Kontaktangaben, wie Sie in der Fallstudie erscheinen sollen, ein.	s.o.

Quellen

Bitte geben Sie verwendete und hilfreiche Quellen an (z.B. Internetquellen, Publikationen).	fahma allianz pro schiene EU Ausschreibung

10.2 Questionnaire supplier

Allgemeine Informationen

Name der verantwortlichen Person für das Angebot	Wolfgang Späth/ Björn Vitt
Name des Anbieters	Alstom LHB GmbH
Kontaktangaben (Adresse, Telefon, E-Mail)	Linke-Hofmann-Busch-Straße 1, 38239 Salzgitter Tel. 05341-900 4525 (Späth) wolfgang.spaeth@transport.alstom.com Tel. 05341-900 6797 (Vitt) bjoern.vitt@transport.alstom.com
Wir würden uns freuen, Ihre Kontaktangaben in der Fallstudie benutzen zu dürfen, um zu einem besseren Erfahrungsaustausch beitragen zu können. Sind Sie damit einverstanden?	☒ Ja ☐ Nein

Hintergrundinformationen

Bitte beschreiben Sie kurz ihre Organisation/ Firma.	Alstom Transport gehört zu den weltweit führenden Anbietern von Bahntechnik. Zwei STandorte repräsentieren Alstom Transport in Deutschland: Die Alstom LHB GmbH im niedersächsischen Salzgitter und die Alstom Lokomotiven Service GmbH in Stendal. Alstom Transport in Deutschland liefert als Systemhersteller komplette Schienenfahrzeuge.
Stellen Sie die relevanten Produkte selber her oder vertreiben Sie ausschließlich die Produkte?	Das Unternehmen entwickelt und produziert die Produkte zum größten Teil selbst.
Bitte geben Sie einige Kerndaten zu ihren umweltfreundlichen Produkten an (Umsatzanteil, Auftragvolumina etc.)	Alstom Transport ist per se dem Umweltschutz verpflichtet und produziert mit Schienefahrzeugen grundsätzlich umweltfreundliche Produkte.
Was für Erfahrungen haben Sie mit grüner öffentlicher Beschaffung oder öffentlichen Ausschreibung die umweltfreundlich ausschreiben?	Ausschreibung Hamburger S-Bahn (DT5) Verhandlungen zum Einbau von RPF (Nürnberg, Augsburg, S-H.)

Informationen zum Produkt

Bitte beschreiben Sie kurz das umweltfreundliche Produkt.	Zweiteiliger Dieseltriebzug Coradia LINT mit RPF zur Reduzierung von Feinstaub. Der Filter reduziert die Emissionen von Rußpartikelfiltern um mehr als 95% und unterbietet damit die stage IIIb Emissiongrenze für Feinstaub (gültig 2012) von 0,025 g/kWh schon heute. Der

	eingebaute Wandstromfilter von HUG wurde in Zusammenarbeit mit dem Motorenhersteller MTU entwickelt.
Wie viele Unterauftragnehmer/ Zulieferer sind an der Erstellung des Produkts beteiligt? Wofür?	HUG - MTU - Alstom
Verwenden Sie eine Lebenszyklusberechnung bei dem Produkt? Wenn ja, wie gehen sie dabei vor?	LCC klein: ja (zB Wartungszeiten, Tauschintervalle) LCC komplett für Schwedische Aufträge (S-Bahn Stockholm), inkl. R&D, Produktion, Nutzung, Entsorgung
Gibt es Unterschiede in den Kosten/ Preis zwischen Standard- und umweltfreundlichen Produkten (selber Zweck, Leistung etc)?	Mehrkosten von 45.000 Euro pro Filter
Wie viel wurde von dem o.g. Produkt geliefert? An wie viele Kunden? (*Anzahl und Gesamtkosten in Euro*)	10 Coradia LINT an die Taunusbahn mit RPF weitere Coradia LINT in Verhandlungen
Wie hoch ist die Verfügbarkeit des Produkts auf lokalen, regionalen und nationalen Märkten?	Lokaler Markt ☐ niedrig ☐ mittel ☐ hoch Regionaler Markt ☐ niedrig ☐ mittel ☐ hoch Nationaler Markt ☐ niedrig ☒ mittel ☐ hoch

Die “Zugpferde” für umweltfreundliche Beschaffung

Warum bieten Sie umweltfreundliche Produkte an?	Wettbewerbsvorteil, Einsparung von Lebenszykluskosten, Kundenanforderungen, Image
Warum haben Sie sich dazu entschlossen, in die (Weiter)entwicklung dieses umweltfreundlichen Produkts zu investieren?	Wettbewerbsvorteil, da hohe Umweltstandards in Zukunft immer wichtiger werden. (EU) Normen vorausgreifen
Verfolgen Sie eine spezielle Firmenstrategie hinsichtlich umweltfreundlicher Produkte? Ziele? Politische Unterstützung?	Alstom LHB hat Umwelt-, Arbeits-, Gesundheitsschutz und Qualitätswesen in einem integrierten Managementsystem gebündelt. Ziel ist, die Umweltausweirkungen bei der Herstellung, beim Betrieb und bei der Entsorgung der Produkte so gering wie möglich zu halten. Alstom ist seit langem EMAS und ISO 14001 zertifiziert

Der Ausschreibungsprozess – Kriterien

Gab es Probleme bei der Erfüllung der Kriterien? Falls ja, in welcher Phase des Ausschreibungsprozesses?	Nein

Marktpotential

Glauben Sie, dass die “grüne” Ausschreibung die Markfähigkeit/ Verfügbarkeit des Produkts erhöht hat (auch: Degressionseffekt)?	RPF wurde dadurch marktfähig
Welche Veränderungen in Lieferung/ Angebot können direkt auf die Ausschreibung zurückgeführt werden (inklusive nicht verlangter/ beabsichtigter Veränderungen)?	n/a

Dauer und Nachhaltigkeit der veränderten Produktionsabläufe

Haben Sie die Veränderungen nach Ablauf der Vertragszeit beibehalten?	Der Coradia LINT mit RPF wird vermehrt angeboten, obwohl leider bisgher der zusätzliche Preis des RPF abschreckend wirkte.
Wurden die Veränderungen auch für andere Angebotsabgaben/ -verträge verwendet?	s.o.

Einfluss auf die Vertragsgestaltung über die Zulieferkette, die auf die vertragsführende Einrichtung zurückzuführen sind

Sind die Kosten angestiegen? Wenn ja, warum, wo und wie hoch? Wurden die Kosten (inkl. R&D) an den Einkäufer weitergegeben?	Ja, um ca. 45.000 Euro pro Filter
Welche Auswirkungen hatte die Ausschreibung auf die Wettbewerbsfähigkeit (über die gesamte Zulieferer- und Produktionskette betrachtet)? (Positive Wirkungen sind Vorreitervorteile, Anheben von Standards, Exportvorteile. Negative: Abhängigkeit von ausländischen Zulieferern)	MTU hat nun ein neues aktuelles Produkt im Angebot. R&D wurde größtenteils von MTU getragen.

Auswirkungen auf andere Sektoren

Wurden die Anforderungen auch bei z.B. privaten Ausschreibungen berücksichtigt/ übernommen?	Nicht bekannt
Fördert der Staat die Umsetzung der aufgestellten Anforderungen? Falls ja, wie nützlich ist dies für die Entwicklung dieses Produkts gewesen?	Es gibt eine Diskussion zur zukünftigen Förderung von RPF in Schienenfahrzeugen, an der sich auch Alstom beteiligt.

Auswirkungen auf die Zuliefererkette

Wie weit können Auswirkungen innerhalb der Zuliefererkette durch diese Ausschreibung festgestellt werden?	n/a
Welche Anforderungen haben Sie an Zulieferer weitergegeben? Wie wurden diese kommuniziert und	Das erstellte Konzept Partikelfilter wuirde an die Zulieferer weitergegeben (zB MTU).

aufgefasst?	

Unbeabsichtigte Auswirkungen

Konnten Sie irgendwelche unbeabsichtigten (positiven/ negativen) Auswirkungen aufgrund der Ausschreibung/ Angebotsabgabe feststellen? (Unbeabsichtigte Auswirkungen können entstehen bei der Zulieferung, durch Preisschwankungen, bei der Verfügbarkeit etc.)	Nicht bekannt, aber der Umweltminister S. Gabriel interessierte sich für den Fall.

Auswirkungen auf die Marktversorgung

Hat diese Herangehensweise dazu beigetragen, den Markt zu beleben? Warum? (Bitte beschreiben Sie Gründe für Erfolg/Misserfolg, z.B. lange Vertragszeiten gaben positive Signale an den Anbieter, um seine R&D Kosten zu amortisieren.)	Ja, da dringend notwendige Beweise zur Markttauglichkeit von RPF erstellt wurden.
Haben konsistente öffentliche Ausschreibungen in der EU den Markt beeinflusst?	EU Ausschreibungen nur ein Teil der Ausschreibungen. Ansonsten viele private Eisenbahnunternehmen, die auch in andere Richtung experimentieren (s. Prignitzer Eisenbahn Biokraftstoffe).
Wie hat sich die Kommunikation zwischen ausschreibender Organisation und Anbieter aus ihrer Sicht gestaltet?	Sehr erfreulich - gute Verhandlungsbasis und Kommunikation (Transparenz)
Hatten Sie Probleme mit EU Richtlinien zu öffentlicher Beschaffung? *Bitte erläutern.*	Nein

Auswirkungen auf breitere Marktnachfrage

Haben die Aktivitäten eine erhöhte Marktnachfrage stimuliert?	Ja, HUG vergrößert seine Produktion auf europäischer Ebene
Welche Veränderungen gibt es hinsichtlich des Einkaufsverhaltens von Kunden, Anbietern und/oder anderen involvierten Organisationen (z.B. Consultants)?	n/a

Verwendete Öko-Technologie/ umweltfreundliche Lösung

Glauben Sie, dass ihr Produkt auf einer neuen oder aktuellen Umwelttechnologie beruht?	Ja, angepasste Filtertechnologie, speziell für Dieseltriebwagen weiterentwickelt.
Wie entwickelte sich der Absatzmarkt für dieses Produkt nach der Zuschlagserteilung?	RPF werden bei Verhandlungen erwähnt. Es wird davon ausgegangen, dass neue technische Lösungen (zB Harnsäureeinspritzung im Motorblock) den RPF ersetzen werden. Dennoch ist die Filterbranche am boomen, da alle Neufahrzeuge ab 2012 den Standard IIIb einhalten müssen

Hindernisse und Schwierigkeiten

Traten Probleme bei der Einhaltung der aufgestellten Kriterien auf?	Nein

Zusätzliche Informationen

Kontaktangaben

Bitte fügen Sie Ihre vollständigen Kontaktangaben, wie Sie in der Fallstudie erscheinen sollen, ein.	s.o.

Quellen

Bitte geben Sie verwendete und hilfreiche Quellen an (z.B. Internetquellen, Publikationen).	s. Pressespiegel

11 Appendix 2: Questionnaires responses for Sustainable Procurement of Bus Shelters in Barcelona, Case Study

11.1 Questionnaire purchaser

Name of person responsible for the tender	Adolf Creus
Name of the authority	Urban Department, Barcelona City Council
What (product/ service) was tendered?	Bus shelters and other street furniture
What was the name/title of the tender (subject matter) (*Please attach a copy*)	"Plec de clàusules administratives reguladores de la concessió per a la conservació, instal.lació i explotació de mobiliari urbà de la ciutat de Barcelona, i de la seva adjudicació per concurs".
When was the call for tender (date)?	9 September 2005
Contact details	Urban Department – Barcelona City Council Av. Diagonal 240 2a planta 08018 Barcelona Spain Tel. +34 93 2914 422 E-mail: acreus@bcn.cat
In order to foster exchange of best practises in Europe, may ICLEI use your contact details in the case study?	X☐ Yes ☐ No

Background information

Is the authority a member of a relevant (purchasing) network?	Yes. In 2002, the city approved its Local Agenda 21, the "Citizens' Commitment towards Sustainability". Within this framework, Barcelona is now promoting the +Sustainable City Council Programme in an attempt to spread the incorporation of good environmental and social practices throughout the organisation. One of the priorities of this programme is the incorporation of environmental and social criteria in the public procurement process. Barcelona is an active participant of the Procura+ Campaign led by ICLEI, being the Vice-Chair of the Campaign since 2005. The city is also member of the Eurocities Working Group on Responsible Consumption. Barcelona was one of the local organisers of the EcoProcura2006 conference.
What is the total procurement budget of your organisation/department?	€ 2,800 Million € annually

What is the amount spending on green purchasing? (*If not known please estimate*)	Aprox. 28% (estimate)
Do you have further experience with green public procurement?	Yes. A Green Procurement policy was passed in 2001. Since then almost all centralised purchases (IT equipment, paper, office material and machines, office furniture, building cleansing, etc.). Other tenders that have greened are: urban lighting, urban cleansing and waste collection, fountains maintenance, parks and gardens maintenance, urban furniture, public housing and some public buildings among others. Also social and ethical criteria has been included in tenders for workwear and fair trade products. In September 2006 the general administrative tenders of the municipality to contract works, services and goods were modified and published to include environmental criteria which are in line with the new European public procurement directives. In detail, the latter refers to the criteria used to evaluate technical capacity, award criteria and the obligations and responsibilities of the contractor.

Information on the product

How much was purchased? (*Number of units and total costs in EURO*)	Of a total amount of 1.200 bus shelters, a minimum of 500 new bus shelters and a minimum of 200 elements to be adapted in the old bus shelters.
What is the availability of the product on the local, regional, national market?	Local market X☐ low ☐ medium ☐ high Regional market X☐ low ☐ medium ☐ high National market X☐ low ☐ medium ☐ high
Are there any comparative figures (additional cost or savings) between costs of green and standard products? (*Please include life cycle costs figures if available*)	Yes, in the LCA done by JCDecaux. Graphic included in the case study.

The drivers responsible for procurement

What were the **main reasons** for tendering for the specific green product? Was there any political support? Any other drivers?	Sustainability Local Authority policy goals Barcelona wants to lead on SPP Barcelona wants to provide a good service for the citizens, and improve in regards to the old tender.
Does your organisation have a sustainable or green procurement policy	Yes. A green procurement government measure was passed in 2001, stating the

and did this assist in pushing for this tender?	willingness of the City Council in greening the municipal services and buildings, creating the "+Sustainable City Council" programme and internal cross-cutting working group.
Does your organisation have any sustainable or green procurement targets and do these assist in pushing for this tender?	Yes, as part of the +Sustainable City Council Programme: reduce CO_2 emissions, water consumption and waste production; promote a social and sustainable local economy; exclude products and services which cause social injustice; and create a culture of social responsibility and environmentally friendliness.
Does your organisation have a sustainable or green procurement implementation strategy and did this assist in pushing for this tender?	There is and internal cross-cutting working group, and annual work plan that has follow-up indicators. Also there is trainning to municipal workers, a bimonthly newsletter, 2 environmental guides have been published, a web page and an e-mail to which the workers has write in case they need assistance for greening tenders. An external technical assistance has been contracted in order to help in the process.

The tendering process

Developing the green procurement criteria

Who was involved in the development of the criteria?	Alfons Creus from the Urban Department of Barcelona
How much advice was received from internal sources in developing the tender and criteria, e.g. through the environment department, finance department, energy department etc?	6 Departments: Urban Planning and Infrastructure sector, TMB (Metropolitan Transports in Barcelona), Via Pública (giving advice on bus shelter placement), Communication Department (giving advice on the publicity to go in the PIMs[45]), Urban Environmental Department (giving advice on incorporation of bus shelters without causing a visual impact on the environment) and IMI (Computer Services- Informatics Municipal Institute).
How much advice was received through external sources in developing the tender and criteria, e.g. consultants, consulting engineers other government departments, or suppliers?	Not too much, it was more from internal advice, through the other departments.
Were the suppliers/bidders at any stage involved in the tendering process? (e.g.	The bidders could comment on the environmental criteria and their applicability

[45] Municipal Information Point

consultation round)?	between the first publication of the tender in May 2005 and the closure of the publication in September 2005.

The green procurement criteria

Did you define any green pre-qualifications for suppliers?	Yes, technical capacity and financial capacity.
Was there any technical capacity required?	Yes, the bidder had to prove that they were able to do it (page 14 in the tender).
What were the technical specifications?	Yes. See tender document page "Plec resultant". Life Cycle Analysis of the different elements was requiered.
What were the selection criteria?	In the tender it was not specified for the bidder to have an EMS.
Was there any award criteria, if so what?	Yes. See in the tender (pages 15-16)
What were the contract performance clauses?	They can be found in chapter 8 of the "Plec de condicions administratives - Obligacions del concessionari". They include supply, maintenance and cleaning of all elements, electricity and water consumption, periodical actualization of cartographic data, insurance, and every 4 years an external company has to evaluate the state and operation of the bus shelters. Every six months all departments involved will meet with the supplier to discuss the amount of bus shelters and elements to implement and where to place them, according to the necessities each time.
Was there any reference to eco-labels, if so what?	No
Were there any post-award criteria, if so what?	Once the tender was awarded, they could always discuss the new design of the bus shelter with the winning bidder.
What forms of evidence/proof were required from the supplier to demonstrate compliance?	Every four years, the company has to present a report to the city council of Barcelona on the status of bus shelters.

Assessing the tender

Which were the dates of the tendering process?	Starting date:9 September 2005 Time for preparation: Publishing date: 13 December 2005 How much time did the bidders have to react?: How much time did it take to evaluate the offers? 3 months Information date to the successful bidder : March 2006
How many bidders were there?	4: JCDecaux, Cemussa, Biacom & Clear

	Channel
How much time were potential bidders given to react and/or modify their approach?	4 months

Contract management

Were there any problems with compliance with the criteria?	hard to develop criteria to satisfy all departments involved in the tender
How was the monitoring/enforcement handled?	

Potential of triggering the market

What changes in supply/offering resulted that can be directly attributed to the tender, including those not explicitly required?	Development of a new prototype of bus shelters using a less polluting cleaning system, and consuming less energy
What has been the impact on the market supply following the tender? Has there been any impacts on the supply chain, if so what? Have there been any impacts on wider market demand? Have there been any impacts on other sectors?	These kind off activities move the market. The tender criteria have pushed into the development of a new roof structure, light system and implementation of a new cleaning system. The criteria were applied to other street furniture. Exclusion of PVC in all street elements.
Did the supplier maintain changes after the end of the contract period, or revert to old practices?	Maintain.
Did costs increase, and if so then by how much?	The new cleaning system involved an initial cost at the beginning.
Did this increase in costs amortise over the time? If yes, how long did it take?	Yes, in the mid-long term
If there was an increase in costs, were these passed onto the procurer?	no, the winning bidder assumed all costs
How far down the supply chain can the impacts of the tender/ contract been detected?	Sub-suppliers were faced to search for a much broader market in order to comply with the new requirements imposed by the main supplier. In some cases, such as the T5 lights, which had to be purchased in Sweden, it had a negative impact due to the need to source them from an overseas supplier. The fact that PVC and Chlorine materials were excluded in the tender affected the supply chain, requiring alternative materials to introduce in the design of the new bus shelter.
Have there been any unintended consequences as a result of the call for tender/ initiative?	More environmental friendly bus shelters for other clients of the bidder.

Barriers and difficulties

What were the difficulties with developing and implementing this tender?	To satisfy all departments. There were a lot of discussions involved.

Have there been any problems with compliance with criteria?	The supplier said it was hard to develop a roof with recicled materials and with a load of 500Kg/m^2

Lessons learned

What can you recommend to other public authorities?	They invested on the bidder with a higher innovative capacity, leading to a successful cleaning system that in the mid- to longer term implies a smaller environmental impact and a reduction in the maintenance costs. The external knowledge by other departments on the selection of green criteria was also valuable for a successful result.
What could be repeated elsewhere?	implementation of bus shelters with this cleaning system

Additional information

Contacts

Please, insert your full contact details as you wish that it will appear in the final cas study.	Adolf Creus Urban Department – Barcelona City Council Av. Diagonal 240 2a planta 08018 Barcelona Spain Tel. +34 93 2914 422 E-mail: acreus@bcn.cat

Sources

Please, indicate any used and helpful sources (e.g web sources, publications).	www.bcn.cat, tender, LCA book

11.2 Questionnaire supplier

General information

Name of person responsible for the bid	Luís Sánchez Olavarría
Name of the supplier	JCDecaux
Contact details	Director of the Catalan Office of JCDecaux C/Botánica. 172-174 – Polígono Gran Vía Sur 08908 L'Hospitalet de Llobregat (Barcelona) Spain Tel. +34 93 3357110 E-mail: luis.sanchez@jcdecaux.es
In order to foster exchange of best practises in Europe, may ICLEI use your contact details in the case study?	☒ Yes ☐ No

Background information

Can you provide a short description of your company?	JCDecaux is the 2nd largest outdoor advertising specialist in the world, the market leader in Europe and number 1 in China. The inventor of the "street furniture" concept in 1964, the JCDecaux Group is the only company worldwide to focus exclusively on outdoor advertising and develop activities in all three segments: street furniture, billboard, and transport advertising. JCDecaux is n°1 worldwide for street furniture, 1 in Europe for billboard advertising and n°1 worldwide for airport advertising with concessions in 141 airports, and n°1 worldwide in self-service bicycles. Employing a total of 8,100 people, the Group is present in 48 different countries and 3,500 cities of more than 10,000 inhabitants and generated revenues of €1,946m in 2006.
Do you also manufacture or only supply products?	Manufacture and supply
Can you provide figures about your green products (Sales percentage, volume etc)?	Check LCA graphics in the documents provided for the bid.
Do you have any experience with green public procurement or public authorities doing GPP?	Yes, JCDecaux works with many cities which include environmental criteria in their tenders.

Information on the product

Can you provide a short description of the specific product supplied?	New prototype of bus shelter with a beehive-shaped inner part of the roof, night lighting system with low emission lamps (T5

	of 38W each) and a new cleaning system with osmosed water avoiding the need to use soap/detergent in the cleaning porcess.
How many sub-suppliers are involved in the production process? What for?	Around 7 for: T5 lights, the síde reflectors and the electronic ballast
Has there been any life cycle (cost) assessment involved?	For every single element of the bus shelter and also for the cleaning sytem, a LCA has been done (See book)
Are there significant differences in costs between your standard and green product?	JCDecaux has an ecodesign criteria, and keep on improving their products each time something new is implemented.
How much was delivered – in general and to the specific authority? (Number of units and total costs in EURO)	A minimum of 500 new bus shelters and a minimum of 200 elements to be adapted in the old bus shelters
What is the availability of the product on local, regional, national market (competition, monopoly conditions)?	This bus shelter prototype is unique for the city of Barcelona, given the name of: Barcelona bus shelter

The drivers responsible for procurement

Why do you offer green products in principle?	It is part of the company's policy
Why did you decide to invest in the development of that specific green product?	Opportunity to improve in regards to the old tender also awarded to JCDecaux in 1998, and to improve their technology and keep them as leaders in the market More points were given to the bidder presenting better technologies Possibility to advertise in the bus shelters: major source of income
Do you pursue a specific policy? Any specific targets? Do you have a particular strategy? Was there any political support? Any other drivers?	Ecodesign Innovation Capacity building Environmentally respectful with the environment

The tendering process – criteria

Were there any problems with compliance with criteria? If yes, at what tendering stage?	It was hard to manufacture a roof with recycled materials and also with a load of 500Kg/m2

Potential of triggering the market

Do you think that the green procurement tender triggered the offer of the green product? If yes, how?	Yes, definitely. New search in the market to find new products, also new cleaning system: training of the employees, adaptation in their facilities.
What changes in supply/offering resulted that can be directly attributed to the tender, including those not explicitly required?	roof, cleaning system with osmosed water

Duration and sustainability of those changes

Did you maintain changes after the end of the contract period, or quickly revert to old practices?	Yes. innovations successful in one subsidiary are regularly adopted as a rule for the other subsidiaries.
Were the changes implemented in other supply contracts?	

Impact of the policy or contracts on costs throughout the supply chain, including those borne by the contracting authority

Did costs increase (i.e. any costs), and if so then by how much? Were these increases over the short term and in the medium-longer term? Where did the cost increases occur in the supply chain? Were these passed on to the procurer?	Yes, specially for the new cleaning system. An initial investment was done in order to place a reverse osmosis system to treat the water, to train the staff that has to use it, and to adapt the cleaning vehicles with the new system.
What was the impact of those changes on the overall competitiveness of the supplier and its supply chain? (Positive impacts would include e.g. first-mover advantage, raising of standards, supportive home market providing a platform for export. Negatives might include the need to source from foreign suppliers.)	T5 lights had to be purchased broad (in Sweeden), but in general they try to get local suppliers

Impacts on other sectors

Have sustainable purchasing initiatives in this area been adopted more widely? *(For example, have 'sustainable' specifications been adopted by procurers in the private sector?)*	Yes. The neighbouring cities of Badalona and Sabadell have already signed contracts with JCDecaux for the same reason. Also Vigo in Galicia. Cleaning system applied in all europeaan subsidiaries from JCDecaux.
Has this been influenced by the activity of the government?	By the Barcelona city council

Impacts on the supply chain

How far down the supply chain can the impacts of the policy or contract be detected?	Hard to tell
Crucially, what requirements are suppliers passing onto their own suppliers? How are these communicated and what is the result?	Lights, materials with no PVC and no Chlorine,…

Unintended consequences

Have there been any unintended positive or negative consequences as a result of the call for tender / initiative? (Unintended consequences could include impacts on market supply and subsequent price swings e.g. not enough renewable energy, organic produce or recycled paper	More contracts with other cities!

to satisfy demand.)	

Impact on market supply

Has this approach succeeded or failed in its attempt to influence market supply, and why? (Please, identify reasons for success/failure e.g. has a long contract position taken by a public-sector buyer given increased certainty to the supplier of demand being sustained)	Succeed: New search in the market to find new products, also new cleaning system: trainning of the employees, adaptation in their facilities,.. also its being adapted now european wide. Also cities have shown their interest.
Has concerted and consistent action by numerous public-sector buyers, across the wider EU, influenced the market?	Not really
Has inconsistency or lack of communication by the procurer led to confusion and a lack of influence on the suppliers?	No
Have you had any difficulties with EU public procurement rules / directives? Please explain.	No

Impact on wider market demands

Has this activity influenced wider market demand?	Yes, at national and European level
What changes have been seen regarding the purchasing behaviour of customers, suppliers, and/ or other organisations?	They have shown their interest in the new cleaning system

Eco-Technology / Eco-solution used

Do you think that the product is based on a new or recent eco-technology? If yes, please explain in more detail.	Eco-solution
What has been the impact on market supply following the tender?	Explained above

Barriers and difficulties

Have there been any problems with compliance with the criteria in the tender?	Roof (explained before)

Additional information

Contacts

Please, insert your full contact details as you wish that it will appear in the final cas study.	Luís Sánchez Olavarría Director of the Catalan Office of JCDecaux C/Botánica 172-174 Polígono Gran Vía Sur 08908 L'Hospitalet de Llobregat (Barcelona) Spain Tel. +34 93 3357110 E-mail: luis.sanchez@jcdecaux.es

Sources

Please, indicate any used and helpful sources (e.g web sources, publications).	www.jcdecaux.com

11.3 Bus shelter

Bus shelter structure	
Element	**Description**
Roof	Composed by two layers of polyester and fibreglass one in each side of the roof. The inner part is composed of fibreglass material in a beehive shape. This particular inner light structure allows the roof to be highly resistible (overload of 500Kg/m^2), as well as being easy to disintegrate at the end of its life cycle, enabling an easy recycle. This new model of the roof is more respectful with the environment in comparison with the old roof, where the inner part was made of expandable Polystyrene unable to disintegrate from the other materials, and therefore impossible to recycle at the end of its life cycle.
Support structure	Stainless steel material or carbonized steel (to prevent the structure to rust, due to water infiltration).
Glass	Tempered glass.
Bench	The inner part is made of stainless steel, covered with an outer part of fibreglass in yellow. Also the new model is more ergonomic, as the bench is a bit bigger.
PIM – Municipal Information Point	
Element	**Description**
Advertising panel	Panel to advertise in both sides of the panel. The number of lamps to illuminate the panel was reduced from 4 fluorescent lamps T8 of 58W each, to 3 fluorescent lamps T5 of 35W each, with electronic ballast that supplies the energy to all 3 lamps. This change in the number and type of lamps supposed a reduction in the electricity consumption of 45%. Also, the panel disposes of side reflectors enabling a better light dispersion. In addition they are back-lit, allowing for 24-hour visibility. Thanks to these lights, a more uniform and softer light is produced. So far, 95% of the lights in all bus shelters in Barcelona have been replaced with this new one.
Bus timetable	It includes information on the running hours of the bus. The old ones did not have a light, making it difficult for the user to read the information at night. The new prototype includes LED lights (34W) that work at night.
Lighting of the bus shelter	The old bus shelters did not include a light on top of the bench, creating a black area during the night. The new prototype includes one LED light (6W) with a movement sensor, so that when someone sits on the bench the light turns on.

12 Appendix 3: Questionnaires for the "The better floorlamps" of the City of Zurich, SWITZERLAND

12.1 Questionnaire purchaser

Allgemeine Informationen

Name der verantwortlichen Person für die Ausschreibung	Stefan Hösli Tel 0041 44 216 4005
Name der Organisation	Stadt Zürich
Was (Produkt/ Service) wurde ausgeschrieben?	Stehleuchten
Wie lautet der Name/ Titel der Ausschreibung (Betreff)? (*Bitte fügen Sie eine Kopie der Ausschreibung bei.*)	Stehleuchten nach dem Minergie Standard'
Wann wurde die Ausschreibung veröffentlicht (Datum)?	April 2004
Kontaktangaben (Adresse, Telefon, E-Mail)	XX
Wir würden uns freuen, Ihre Kontaktangaben in der Fallstudie benutzen zu dürfen, um zu einem besseren Erfahrungsaustausch beitragen zu können. Sind Sie damit einverstanden?	X Yes ☐ No

Hintergrundinformationen

Wie hoch ist das Gesamtbudget für Beschaffung ihrer Organisation/ Abteilung?	Laufende Rechnung pro Jahr 9,5 Mio. CHF für sämtliche Dienstleistungen (Materiallieferungen für neue Objekte nicht eingerechnet) der Immobilien-Bewirtschaftung (IMMO).
Wie hoch ist der Anteil umweltfreundlicher Beschaffung (in Proxent)? (*Bitte schätzen.*)	100%
Was für Erfahrungen haben Sie mit grüner öffentlicher Beschaffung?	Bei neuen Produkten werden die Materialdeklarationen verlangt und von der Fachstelle Nachhaltigkeit (Ökologie) überprüft.

Informationen zum Produkt

Wieviel wurde eingekauft? (*Anzahl und Gesamtkosten in Euro*)	Einkaufspreis pro Leuchte unter CHF 500.-- exkl. Mehrwertsteuer (7,5%) ca 1000
Wie hoch ist die Verfügbarkeit des Produkts auf lokalen, regionalen und nationalen	Lokaler Markt ☐ niedrig ☐ mittel X hoch

Märkten?	Regionaler Markt ☐ niedrig ☐ mittel X hoch Nationaler Markt ☐ niedrig ☐ mittel X hoch
Haben Sie vergleichbare Daten (zusätzliche Kosten oder Einsparungen) für umweltfreundliche und konventionelle Produkte? (*Wenn verfügbar fügen Sie bitte Daten zu den Lebenszykluskosten ein.*)	Nein

Die "Zugpferde" für umweltfreundliche Beschaffung

Was waren die Hauptgründe, bestimmte umweltfreundliche Produkte auszuschreiben? Gab es politische Unterstützung? Andere Gründe?	7 Meilenschritte des Hochbaudepartements -> Meilenstein 3
Hat Ihre Organisation ein politisches Leitbild zu nachhaltiger und/oder umweltfreundlicher Beschaffung? Wenn ja, halfen diese, die Ausschreibung voranzutreiben?	Legislaturschwerpunkte 2006 - 2010
Hat Ihre Organisation Ziele zu nachhaltiger und/ oder umweltfreundlicher Beschaffung aufgestellt? Wenn ja, halfen diese, die Ausschreibung voranzutreiben?	Siehe 'Allg. Bauökologische Submissionsbedingungen'
Hat Ihre Organisation eine Umsetzungsstrategie zu nachhaltiger und/ oder umweltfreundlicher Beschaffung aufgestellt? Wenn ja, halfen diese, die Ausschreibung voranzutreiben?	Nein

Der Ausschreibungsprozess

Entwicklung der umweltfreundlichen Kriterien

Wer war an der Entwicklung der umweltfreundlichen Kriterien beteiligt?	Siehe Projektteam
Wieviel interne Beratung war für die Entwicklung der Kriterien und der Ausschreibung notwendig (z.B. mit Hilfe der Umweltabteilung, der Finanzabteilung, der Energieabteilung, etc.)?	Zwischen Abteilungen
Wieviel externe Beratung war für die Entwicklung der Kriterien und der Ausschreibung notwendig (z.B. Consultants, Ingenieure, andere Kommunalverwaltungen, andere Anbieter)?	eteam -> Stefan Gasser
Waren die Anbieter/ Bieter zu irgend einem	In der 1. Phase, bei der Entwicklung der

Zeitpunkt im Ausschreibungsprozess involviert (z.B. Informationsgespräche)?	Leuchte (workshop mit 27 Herstellern)

Die umweltfreundlichen Kriterien

Welche umweltfreundlichen Mindestanforderungen haben Sie an die Anbieter gestellt?	Siehe Aussschreibung
Brauchten Sie bestimmte technisches Wissen, um die Mindestanforderungen aufzustellen?	eteam
Welche technischen Anforderungen haben Sie gestellt?	Siehe Aussschreibung und allg. Bauökologische
Was waren die Auswahlkriterien?	Internes Punkteverfahren
Wurden Kriterien für die Zuschlagsphase verwendet? Wenn ja, welche?	Siehe Aussschreibung
Was waren die Vertragsbedingungen?	S.4
Wurden Hinweise auf Umweltlabel verwendet? Wenn ja, welche?	Keine, aber Stehlampen sollten nach Minergie Standard sein
Wurden Kriterien nach der Zuschlagsphase angewendet? Wenn ja, welche?	Nein
Welche Beweise wurden vom Anbieter eingefordert, um die Anforderungen einzuhalten?	Siehe Ausschreibung

Daten zur Ausschreibung

Wie war der Zeitplan der Ausschreibung?	Startdatum: Anfang 2002 Zeit für Vorbereitung: 10.2002 Veröffentlichungsdatum: April 2004 Wieviel Zeit hatten die Bieter, um zu reagieren? 7 June Wieviel Zeit brauchte es, die Angebote zu prüfen? Ende Juli Datum der Zusage an den erfolgreichen Bieter: August 04
Wieviele Bieter gab es?	13
Wieviel Zeit wurde potenziellen Bietern gegeben, um zu reagieren und/ oder ihre Herangehensweise zu ändern?	2 Monate

Vertragsmanagement

Gab es Probleme bei der Erfüllung der Kriterien?	Nein
Wie wurde Durchführung, Monitoring und Evaluation sichergestellt?	Siehe Ausschreibung

Marktpotential

Welche Veränderungen in Lieferung/ Angebot können direkt auf die Ausschreibung zurückgeführt werden (inklusive nicht verlangter/ beabsichtigter Veränderungen)?	www.topten.ch großes Interesse von Banken 13 Minergie Lampen auf dem Markt
Was für Auswirkungen konnten auf dem Markt gesehen werden? Gab es Auswirkungen auf die Versorgungs Wurden Auswirkungen bei der Nachfrage auf Wurden Auswirkungen auf andere Sektoren festestgestellt?	Beleuchtung wird auf gesamte öffentliche Gebäude ausgeweitet Siehe Produktbeschreibung
Hat der Anbieter die Veränderungen nach Ablauf der Vertragszeit beibehalten oder ist er in “alte Praktiken” verfallen?	Beibehalten => siehe Hersteller
Sind die Kosten angestiegen? Wenn ja, warum und wie hoch?	Aufgrund Wettbewerb tiefere Kosten
Wenn die Kosten angestiegen sind, haben sie sich über die Zeit amortisiert? Falls ja, wie lange dauerte dies?	/
Wenn die Kosten angestiegen sind, wurden sie auf den Einkäufer übertragen?	/
Wie weit in der Versorgungskette sind die Auswirkungen der Ausschreibung/ des Vertrags sichtbar?	/
Konnten Sie irgendwelche ungewollten Auswirkungen aufgrund der Ausschreibung feststellen?	

Hindernisse und Schwierigkeiten

Welche Schwierigkeiten traten bei der Entwicklung und Umsetzung der Ausschreibung auf?	Teilweise Kommunikation. Manche Hersteller dachten, sie müßten bereits in der 1. Phase den Preis liefern, also bevor der Ausschreibung
Traten Probleme bei der Einhaltung der aufgestellten Kriterien auf?	Siehe oben

Gemachte Erfahrungen

Was können Sie anderen öffentlichen Einrichtungen empfehlen?	Zweistufige Ausschreibung erfolgversprechend
Was kann wo anders wiederholt werden?	/

Zusätzliche Informationen

Siehe beigelegtes Material

Kontaktangaben

Bitte fügen Sie Ihre vollständigen Kontaktangaben, wie Sie in der Fallstudie erscheinen sollen, ein.	**www.minergie.ch** www.topten.ch

Quellen

Bitte geben Sie verwendete und hilfreiche Quellen an (z.B. Internetquellen, Publikationen).	

12.2 Questionnaire supplier

Allgemeine Informationen

Name der verantwortlichen Person für das Angebot	Markus Binda
Name des Anbieters	Regent Beleuchtungskörpter AG
Kontaktangaben (Adresse, Telefon, E-Mail)	
Wir würden uns freuen, Ihre Kontaktangaben in der Fallstudie benutzen zu dürfen, um zu einem besseren Erfahrungsaustausch beitragen zu können. Sind Sie damit einverstanden?	X Ja ☐ Nein

Hintergrundinformationen

Bitte beschreiben Sie kurz ihre Organisation/ Firma.	Wird erbracht
Stellen Sie die relevanten Produkte selber her oder vertreiben Sie ausschließlich die Produkte?	Entwicklung, Herstellung und Vertrieb von Beleuchtungskörper 80 Eigenüproduktion
Bitte geben Sie einige Kerndaten zu ihren umweltfreundlichen Produkten an (Umsatzanteil, Auftragvolumina etc.)	Bei allen Produkten Energieeffizienz immer im obersten Marktsegment. Hoher Prozentsatz ZB alles trennbar, es gibt keine zusammengeklebten Produkte, immer energieeffizienz, Nach Minergiezertifkat gibt es nicht, dann wären aber mind 70% zertifize
Was für Erfahrungen haben Sie mit grüner öffentlicher Beschaffung oder öffentlichen Ausschreibung die umweltfreundlich ausschreiben?	Im Zusammenhang mit Minergie (label für beleuchtung im gesamten Gebäude zB energiebedarf in einem Jahr) Zürich nur noch Minergie (privat) Mehrere Auschreibungen – aber nicht die Leuchte, sondern die gesamte Beleuchtung. Zürich ist führend. Bei anderen Städten eher im Anfangsstadium.

Informationen zum Produkt

Bitte beschreiben Sie kurz das umweltfreundliche Produkt.	Produktbeschreibung wird nachgereicht
Wie viele Unterauftragnehmer/ Zulieferer sind an der Erstellung des Produkts	4 relevant sub-suppliers (elektronische Komponenten; Aluminumprofile

beteiligt? Wofür?	(Norditalien); Lichtlenkung; Rohrlieferant) Zusammengestellt in Basel.
Verwenden Sie eine Lebenszyklusberechnung bei dem Produkt? Wenn ja, wie gehen sie dabei vor?	Nein
Gibt es Unterschiede in den Kosten/ Preis zwischen Standard- und umweltfreundlichen Produkten (selber Zweck, Leistung etc)?	Initialkosten. Im speziellen Fall wurden Komponenten verbessert. Preis für Kunden hat sich nicht verbessert. Keine wesetnlcihen preisuntershciede.
Wie viel wurde von dem o.g. Produkt geliefert? An wie viele Kunden? (*Anzahl und Gesamtkosten in Euro*)	Knapp 2,5 tausend Größtenteils für Zürich (2000) , der Rest sonst Weiterentwicklung bestehender Leuchte
Wie hoch ist die Verfügbarkeit des Produkts auf lokalen, regionalen und nationalen Märkten?	Lokaler Markt ☐ niedrig ☐ mittel X hoch Regionaler Markt ☐ niedrig ☐ mittel X hoch Nationaler Markt ☐ niedrig ☐ mittel X hoch

Die "Zugpferde" für umweltfreundliche Beschaffung

Warum bieten Sie umweltfreundliche Produkte an?	Siehe Regents Umweltgrundsatzpapier
Warum haben Sie sich dazu entschlossen, in die (Weiter)entwicklung dieses umweltfreundlichen Produkts zu investieren?	Technische Herausforderung – wir haben alles inhause wissen, dass der Markt diese Produkte in absehbarer Zeit braucht war ein impuls
Verfolgen Sie eine spezielle Firmenstrategie hinsichtlich umweltfreundlicher Produkte? Ziele? Politische Unterstützung?	ISO 14001 zertifiziert Keine politische Vorgabe Keine Förderung

Der Ausschreibungsprozess – Kriterien

Gab es Probleme bei der Erfüllung der Kriterien? Falls ja, in welcher Phase des Ausschreibungsprozesses?	Besonders technische Herausforderung zb Gradwanderung zwischen sehr hohem Wirkungsrad in Beleuchtung und Blende, dh mit wöglichst wenig energie ein klare definiertes Lichtniveau erreichen sonst keine Probleme

Marktpotential

Glauben Sie, dass die "grüne" Ausschreibung die Markfähigkeit/ Verfügbarkeit des Produkts erhöht hat (auch: Degressionseffekt)?	Ganz klar, die private Beschaffung ist sehr schnell daruaf aufmerksam geworden. Besonders Bankengeschäfte! Nur Private, die haben sehr ähnliche Ausschreibungen gemacht. Es gibt offene Ausschreibungen auch im privaten Sektor. Städte keine!

Welche Veränderungen in Lieferung/ Angebot können direkt auf die Ausschreibung zurückgeführt werden (inklusive nicht verlangter/ beabsichtigter Veränderungen)?	Kausal schwer quantifizierbar

Dauer und Nachhaltigkeit der veränderten Produktionsabläufe

Haben Sie die Veränderungen nach Ablauf der Vertragszeit beibehalten?	Die Anforderungen der Stadt Zürichj wurdenauf anderen Firmenprodukte übertragen.
Wurden die Veränderungen auch für andere Angebotsabgaben/ -verträge verwendet?	Ja, kommt später

Einfluss auf die Vertragsgestaltung über die Zulieferkette, die auf die vertragsführende Einrichtung zurückzuführen sind

Sind die Kosten angestiegen? Wenn ja, warum, wo und wie hoch? Wurden die Kosten (inkl. R&D) an den Einkäufer weitergegeben?	Kosten sind nicht gestiegen, da wir das neue know-how Forschung gemäß der neuen Anforderungen entwicklung wurde auf andere Produkte übertragen In der Elektronik war Senkung der Kosten möglich
Welche Auswirkungen hatte die Ausschreibung auf die Wettbewerbsfähigkeit (über die gesamte Zulieferer- und Produktionskette betrachtet)? (Positive Wirkungen sind Vorreitervorteile, Anheben von Standards, Exportvorteile. Negative: Abhängigkeit von ausländischen Zulieferern)	Nach hinten in der Produktionskette keine, höchstens indirekt da er mehr auftraäg hat. Das Regent gewonnen hat, war sicher für die Firma sehr positiv . Auf nationaler Ebene.

Auswirkungen auf andere Sektoren

Wurden die Anforderungen auch bei z.B. privaten Ausschreibungen berücksichtigt/ übernommen?	Dienstleistungssektor – ab 100 leuchten - ca 15 Firmen Städte keine
Fördert der Staat die Umsetzung der aufgestellten Anforderungen? Falls ja, wie nützlich ist dies für die Entwicklung dieses Produkts gewesen?	Nein – Minergie ist private Geschichte

Auswirkungen auf die Zuliefererkette

Wie weit können Auswirkungen innerhalb der Zuliefererkette durch diese Ausschreibung festgestellt werden?	Ganz schwierig. Beinahe nicht auszumachen. Mit Zulieferanten gab es neue Entwicklungen, speziell im Elektronikbereich.

Welche Anforderungen haben Sie an Zulieferer weitergegeben? Wie wurden diese kommuniziert und aufgefasst?	Ziemlich früh – beim Workshop – weitergegeben. In diesem Fall an Elektroniklieferant speziell im Bereich standby

Unbeabsichtigte Auswirkungen

Konnten Sie irgendwelche unbeabsichtigten (positiven/ negativen) Auswirkungen aufgrund der Ausschreibung/ Angebotsabgabe feststellen? (Unbeabsichtigte Auswirkungen können entstehen bei der Zulieferung, durch Preisschwankungen, bei der Verfügbarkeit etc.)	Negativ: das Vorgehen anderer gewisser Mitbewerber war mitunter nicht immer seriös: Firmen, die Sieger in einem Punkt waren und sich quasi als Gesamtsieger vermarktet haben. Rechtliche Auseinandersetzung hat Lieferung zeitlich knapp gemacht -> 2 Monate blockiert.

Auswirkungen auf die Marktversorgung

Hat diese Herangehensweise dazu beigetragen, den Markt zu beleben? Warum? (Bitte beschreiben Sie Gründe für Erfolg/Misserfolg, z.B. lange Vertragszeiten gaben positive Signale an den Anbieter, um seine R&D Kosten zu amortisieren.)	Ja, es hat dann plötzlich 13 neuen, doch sehr qualitativ hochwertige Leuchten gegeben! Das hat den Markt belebt.
Haben konsistente öffentliche Ausschreibungen in der EU den Markt beeinflusst?	/
Wie hat sich die Kommunikation zwischen ausschreibender Organisation und Anbieter aus ihrer Sicht gestaltet?	Sehr gut und sehr transparent. Vorbereitung war ja beinahe 2 Jahre. Der Workshop war für diese Entwicklung bereits ein Auslöser.
Hatten Sie Probleme mit EU Richtlinien zu öffentlicher Beschaffung?*Bitte erläutern.*	/

Auswirkungen auf breitere Marktnachfrage

Haben die Aktivitäten eine erhöhte Marktnachfrage stimuliert?	
Welche Veränderungen gibt es hinsichtlich des Einkaufsverhaltens von Kunden, Anbietern und/oder anderen involvierten Organisationen (z.B. Consultants)?	Stellenwert hat sich geändert. Preis-leistung ist nicht mehr an erster Stelle. Für uns wichtig, dass auch über andere Punkte diskutiert wird. Das positive Signal war, dass es ein anhaltender Trend war. Schon im selben jahr wurde im Betrieb mit der Produktion umgestellt. Auch wenn wir den Vertrag nicht bekommen hätten, hätten wir die Veränderungen beibehalten.

Verwendete Öko-Technologie/ umweltfreundliche Lösung

Glauben Sie, dass ihr Produkt auf einer neuen oder aktuellen Umwelttechnologie	Standby modus um Faktor 10 gesenkt (von 4 watt auf 0,4 watt)

beruht?	Störemission – elektrischen Felder Nichts verklebt – alles recyclebar Betriebwirkungsgrad (wieviel licht im betrieb)
Wie entwickelte sich der Absatzmarkt für dieses Produkt nach der Zuschlagserteilung?	Steigend – Zahlen geht nicht

Hindernisse und Schwierigkeiten

Traten Probleme bei der Einhaltung der aufgestellten Kriterien auf?	Forschung Entwicklung Lichttechnik- Problem viel licht wenig blendung

Zusätzliche Informationen

Werden weitergegeben

Kontaktangaben

Bitte fügen Sie Ihre vollständigen Kontaktangaben, wie Sie in der Fallstudie erscheinen sollen, ein.	

Quellen

Bitte geben Sie verwendete und hilfreiche Quellen an (z.B. Internetquellen, Publikationen).	

13 Appendix 4: Questionnaires for the Sustainable Procurement of the Public Lighting Service of the City of Lille, Case Study

13.1 Questionnaire purchaser

General information

Name of person responsible for the tender	Ms Danielle POLIAUTRE Deputy Mayor for Public Lighting
Name of the authority	Directorate for the Management of Public Land and Environment Public Lighting Department
What (product/ service) was tendered?	Municipal Public Lighting
What was the name/title of the tender (subject matter) (*Please attach a copy*)	General Maintenance of street lighting services
When was the call for tender (date)?	Pre-information Notice in the EU Official Journal on the 19. June 2003 Opening to the offers on the 17 March 2004 Award Notice on the 9 September 2004

Contact details	Hôtel de Ville Place Augustin Laurent B.P. 667 59033 LILLE Cedex FRANCE Web: http://mairie-lille.fr
In order to foster exchange of best practises in Europe, may ICLEI use your contact details in the case study?	☒ Yes ☐ No

Background information

Is the authority a member of a relevant (purchasing) network?	Only campaign: Procura+, ecomaires, etc.
What is the total procurement budget of your organisation/department?	
What is the amount spending on green purchasing? (*If not known please estimate*)	around 5 million EUR a year if you count the Public lighting contract (4,4 million a year)
Do you have further experience with green public procurement?	No previous experience in GPP for the Public Lighting Department

Information on the product

How much was purchased? (*Number of units and total costs in EURO*)	8 years contract for the management of the public lighting services, icluding: the general maintenance of the whole system, the reconstruction and replacement of the 300 control boxes and 22,000 lighting units, the operation of the lighting systems and the energy management
What is the availability of the product on the local, regional, national market?	Local market ☒ low ☐ medium ☐ high Regional market ☒ low ☐ medium ☐ high National market ☐ low ☐ medium ☒ high
Are there any comparative figures (additional cost or savings) between costs of green and standard products? (*Please include life cycle costs figures if available*)	No, apart from the difference of global costs between this contract and the former one (from 210 EUR pro light point to 200 EUR)

The drivers responsible for procurement

What were the **main reasons** for tendering for the specific green product? Was there any political support? Any other drivers?	The City of Lille used the opportunity to reaward its contract for the maintenance of public ligting services to go from a contract setting obligations of means towards a contract setting obligations of results, through the service provider's commitments on a certain performance to guarantee in the service . the political support was definitely a driving power, given the politician in charge of the tender is also one of the main drivers for the Agenda 21
Does your organisation have a sustainable or green procurement policy and did this assist in pushing for this tender?	At the time of the tender, no concrete operational policy had been implemented yet, but they received some support from the Agenda 21 Department.
Does your organisation have any sustainable or green procurement targets and do these assist in pushing for this tender?	There were no real objectives appart from those of the Agenda 21 (reduce energy consumption and greenhouse gas emissions)
Does your organisation have a sustainable or green procurement implementation strategy and did this assist in pushing for this tender?	Not proper strategy but sustainable procurement was integrated into all actions. It was also integrated into the training of the procurers. Lille only joined Procura+ in 2004.

The tendering process

Developing the green procurement criteria

Who was involved in the development of the criteria?	Public Lighting Department Public Market Department
How much advice was received from internal sources in developing the tender and criteria, e.g. through the environment department, finance department, energy department etc?	Not much advice from internal sources given the specificity of the tender
How much advice was received through external sources in developing the tender and criteria, e.g. consultants, consulting engineers other government departments, or suppliers?	The consulting firm HEXA INGENIERIE(based in Douai, FR) was assisting in the development
Were the suppliers/bidders at any stage involved in the tendering process? (e.g. consultation round)?	They were not directly involved in the tendering process. But as it is a negociated tender, the bidders had to provide a technical document describing their offer in detail. They also discussed their offer with the tender commission during the interview of each bidder (4 May 2004)

The green procurement criteria

Did you define any green pre-qualifications for suppliers?	There were no green prequalification, only the experience of the bidders in managing public lighting systems counted
What were the technical specifications?	
Was there any award criteria, if so what?	See Case study, table 3 page 12
What were the contract performance clauses?	See tendering documents
Was there any reference to eco-labels, if so what?	No
Were there any post-award criteria, if so what?	i.e. 40% of energy savings, 25% of energy from renewable sources
What forms of evidence/proof were required from the supplier to demonstrate compliance?	

Assessing the tender

Which were the dates of the tendering process?	Starting date: 19 June 2003 Time for preparation:9 months Publishing date: 17 March 2004 How much time did the bidders have to react?:2 Months How much time did it take to evaluate the offers? 4 Months Information date to the successful bidder 7 July 2004
How many bidders were there?	5

Contract management

Were there any problems with compliance with the criteria?	No
How was the monitoring/enforcement handled?	Every-day control with the municapl services (LIlle, Hellemmes and Lomme) and yearly evaluation of the service provider's activity

Potential of triggering the market

What changes in supply/offering resulted that can be directly attributed to the tender, including those not explicitly required?	Reproducing of the tender by other cities, reproducing of the ETDE's strategy by other service providers.
What has been the impact on the market supply following the tender? Has there been any impacts on the supply ch Have there been any impacts on wider marke Have there been any impacts on other sec	
Did the supplier maintain changes after the end of the contract period, or revert to old practices?	The contract comes to end in 2012
Did costs increase, and if so then by how much?	No costs increase, the costs rather went down compared to the last contract (at n+3

	years). the price of each light point was 210 EUR, now 200 EUR (-5%).
Did this increase in costs over the time? If yes, how long did it take?	
If there was an increase in costs, were these passed onto the procurer?	
How far down the supply chain can the impacts of the tender/ contract been detected?	Development of new products for public lighting (new energy-performant material, power reducers, etc)
Have there been any unintended consequences as a result of the call for tender/ initiative?	

Barriers and difficulties

What were the difficulties with developing and implementing this tender?	
Have there been any problems with compliance with criteria?	

Lessons learned

What can you recommend to other public authorities?	Not to hesitate handling over their public lighting system to one service provider to manage it, in order to let them manage a strategy which integrates environmental criteria throughout the whole system
What could be repeated elsewhere?	The negociated tendering procedure can be repeated

Additional information

Contacts

Please, insert your full contact details as you wish that it will appear in the final cas study.	Hôtel de Ville Place Augustin Laurent B.P. 667 59033 LILLE Cedex FRANCE Web: http://mairie-lille.fr

Sources

Please, indicate any used and helpful sources (e.g web sources, publications).	Lille Agenda 21

13.2 Questionnaire supplier

General information

Name of person responsible for the bid	M. Gaëtan DESRUELLES - Président Directeur Général
Name of the service provider	ETDE
Contact details	1, avenue Eugène Freyssinet - 78062

	SAINT QUENTIN EN YVELINES - www.etde.fr
In order to foster exchange of best practises in Europe, may ICLEI use your contact details in the case study?	☒ Yes ☐ No

Background information

Can you provide a short description of your company?	ETDE is an integrator and full-service provider offering French and international clients prime know-how in utility network construction and services
Can you provide figures about your green service (Sales percentage, volume etc)?	Concerning the contract with Lille (= ETDE's first "green"contract): 42% savings in energy, 25% renewable energies, 15.000 energy-efficient luminaires
Do you have any experience with green public procurement or public authorities doing GPP?	Yes

Information on the product

Can you provide a short description of the specific product supplied?	Global maintenance of the public lighting services(energy supply, operation, reconstruction) (see case study, section 2, page 5)
How many sub-suppliers are involved in the production process? What for?	2 (SEPI and SEV for the reconstruction work) / LUMIVER (for the lamps treatment) / SMDR (for the waste recycling sector) (see case study, section 2, page 5)
Has there been any life cycle (cost) assessment involved?	Yes, for preparing the tender
Are there significant differences in costs between your standard and green services?	Not in terms of global costs, but electricity from renewable sources is in average 25% more expensive, and energy efficient equipment 10 to 20% (this is balanced with the energy savings achieved through a drastic reduction in energy consumption) (see Case study, section 6, page 14)
How much was delivered – in general and to the specific authority? (*Number of units and total costs in EURO*)	For the energy (25% from renewable sources); for the reconstruction all materials used (so far 3500 luminaires), replacement of 20.000 lamps, solar experiment (schoolyard and park), sending luminaries to Saint Louis in Sénégal, light vehicles running on LPG
What is the availability of the product on local, regional, national market (competition, monopoly conditions)?	National availability (energy - small hydraulic-solar), Europe (lamps supplier) and both national and Europe (materials)

The drivers responsible for procurement

Why do you offer green products in principle?	To adopt a voluntary approach of sustainable development and to answer

	Lille's expectations
Why did you decide to invest in the development of that specific green product?	To answer Lille's tender
Do you pursue a specific policy? Any specific targets? Do you have a particular strategy? Was there any political support? Any other drivers?	The group Bouygues committed to a sustainable development approach in order to deal with issues such as environment, social equity and economical efficiency

The tendering process – criteria

Were there any problems with compliance with criteria? If yes, at what tendering stage?	No

Potential of triggering the market

Do you think that the green procurement tender triggered the offer of the green product? If yes, how?	Yes, the criteria "sustainable development" was clearly set as a priority in the tender (Agenda 21, reduction of energy consumption, and of greenhouse gas emissions, etc.)
What changes in supply/offering resulted that can be directly attributed to the tender, including those not explicitly required?	ETDE's offer was based on 7 key points, developed according to specific criteria of sustainable development: Social equity and solidarity, cost-efficiency, improvement of the environment and of the quality of life, local and participatory democracy, mobilisation of partnerships, application of innovative technologies, communication and exchange)

Duration and sustainability of those changes

Did you maintain changes after the end of the contract period, or quickly revert to old practices?	The contract is still running until 2012. As the new practices were integrated into ETDE's standard offer, they are not going to revert to old practices. ETDE is now suggesting this new eco-solution to all cities tendering for the maintenance of their public lighting system.
Were the changes implemented in other supply contracts?	Yes, i.e. Bondues, Saint-André and Marquette-Lez-Lille, Rouen, Sevran, Nevers and Fougères (see case study, section 6, page 14)

Impact of the policy or contracts on costs throughout the supply chain, including those borne by the contracting authority

Did costs increase (i.e. any costs), and if so then by how much? Were these increases over the short term and in the medium-longer term? Where did the cost increases occur in the supply chain?	Yes. i.e. the electricity from renewable energy sources is in average 25% more expensive, concerning materials (energy efficient lamps) prices are 10 to 20% higher than those of standard equipment. The increase is not passed on to the procurer

Were these passed on to the procurer?	since the contract budget is blocked by 4,4 million EUR annually until the end of the contract period.
What was the impact of those changes on the overall competitiveness of the supplier and its supply chain? (Positive impacts would include e.g. first-mover advantage, raising of standards, supportive home market providing a platform for export. Negatives might include the need to source from foreign suppliers.)	ETDE benefited of the first mover advantage, but it was only a temporary advantage on the market, since many of its competitors reproduced the same strategy.

Impacts on other sectors

Have sustainable purchasing initiatives in this area been adopted more widely? *(For example, have 'sustainable' specifications been adopted by procurers in the private sector?)*	Yes, for the Bouygues group, in the field of construction (high environmental quality), this approach is also generalising to most ETDE public contracts and is integrated into its bids
Has this been influenced by the activity of the government?	No

Impacts on the supply chain

How far down the supply chain can the impacts of the policy or contract be detected?	There is a positive impact on the offer for products used in public lighting
Crucially, what requirements are suppliers passing onto their own suppliers? How are these communicated and what is the result?	ETDE and Lille enforced standards for the materials and the organisation of the construction site (waste management, noise pollution, etc.)

Unintended consequences

Have there been any unintended positive or negative consequences as a result of the call for tender / initiative? (Unintended consequences could include impacts on market supply and subsequent price swings e.g. not enough renewable energy, organic produce or recycled paper to satisfy demand.)	Yes, in terms of energy procurement, the market is not stabilised yet. It is therefore complicated to apprehend the scope of action. There is also a lack of knowledge regarding possible suppliers to buy energy from, following the liberalisation of the energy market. It is not simple to follow the changes in terms of legislation...

Impact on market supply

Has this approach succeeded or failed in its attempt to influence market supply, and why? (Please, identify reasons for success/failure e.g. has a long contract position taken by a public-sector buyer given increased certainty to the supplier of demand being sustained)	Yes, since other local authorities reproduce the same approach. As for the offer, it only depends on the legal frame (if regulated or not)
Has concerted and consistent action by numerous public-sector buyers, across the wider EU, influenced the market?	No

Has inconsistency or lack of communication by the procurer led to confusion and a lack of influence on the suppliers?	No
Have you had any difficulties with EU public procurement rules / directives? Please explain.	No

Impact on wider market demands

Has this activity influenced wider market demand?	Yes, concerning the evolution of products used for public lighting. But not regarding energy supply, which is too strictly reglemented and not flexible enough
What changes have been seen regarding the purchasing behaviour of customers, suppliers, and/ or other organisations?	Yes, sustainable procurement start to be integrated into ETDE's procurement approach

Eco-Technology / Eco-solution used

Do you think that the product is based on a new or recent eco-technology? If yes, please explain in more detail.	It is full service package including many green components, this is thus more a new eco-solution, which also encourages the development of new eco-technologies (through the
What has been the impact on market supply following the tender?	Development of new eco-technologies (see section 3.3, page 7)

Barriers and difficulties

Have there been any problems with compliance with the criteria in the tender?	No

Additional information

Contacts

Please, insert your full contact details as you wish that it will appear in the final cas study.	ETDE - 1 avenue Eugène Freyssinet 78062 SAINT QUENTIN EN YVELINES FRANCE www.etde.fr ETDE Métropole Lilloise 6 rue de l'Europe - 59160 LOMME (Christophe MONTELIMARD)

Sources

Please, indicate any used and helpful sources (e.g web sources, publications).	

14 Appendix 5: Questionnaires for the Sustainable Procurement of Low Emission Buses for Göteborg, SWEDEN

14.1 Questionnaire purchaser

General information

Name of person responsible for the tender	Lennart Löfberg (Vasttrafik), Pierre Modini (GS)
Name of the authority	Vasttrafik, Göteborgs Spårvägar AB (GS)
What (product/ service) was tendered?	Buses
What was the name/title of the tender (subject matter) (*Please attach a copy*)	Several tenders, titles with the subject matter "procurement of low-emission buses"
When was the call for tender (date)?	1992, 1998, 2003, 2005
Contact details	
In order to foster exchange of best practises in Europe, may ICLEI use your contact details in the case study?	Yes

Background information

Is the authority a member of a relevant (purchasing) network?	N/a
What is the total procurement budget of your organisation/department?	N/a
What is the amount spending on green purchasing? (*If not known please estimate*)	N/a
Do you have further experience with green public procurement?	

Information on the product

How much was purchased? (*Number of units and total costs in EURO*)	In total about 300 buses
What is the availability of the product on the local, regional, national market?	Local market ☐ low ☒ medium ☐ high Regional market ☐ low ☒ medium ☐ high National market ☐ low ☒ medium ☐ high
Are there any comparative figures (additional cost or savings) between costs of green and standard products? (*Please include life cycle costs figures if available*)	No

The drivers responsible for procurement

What were the main reasons for tendering for the specific green product? Was there any political support? Any other drivers?	National, regional and local political overall goals on reaching a sustainable society and a sustainable transport system.
How do sustainable procurement initiatives or actions interact with other policies and demands to influence the practices of procurers and suppliers?	Sustainable demands in the tendering process for bus operations are simply part of the many different demands set in the tendering documents. The form of the tender process, with a purchase-operator-supplier chain, creates downward pressure that is both economic and environmental. The City sets targets that demand ever-improving performance from the operator on emissions and renewable fuel usage, which in turn forces the suppliers to research, design and innovate. The process is not, however, completely arbitrary – whilst the targets are set by the City administration, there is an awareness as to what is scientifically achievable. The relationships between the three parties is one of constant 'utveckling' or development/ learning, where the outcome should be environmental improvements and economic efficiency.
Does your organisation have a sustainable or green procurement policy and did this assist in pushing for this tender?	Yes, it helped to give a base for the specifications The provision of public transport services was made subject to calls for tender by national law in Sweden in the early 1990's. Implementing this law at the local level, in Göteborg the objective was to use the new tender specifications and contract agreements to increase the quality and frequency of public transport services • achieve a better relationship between public subsidies granted and transport provided • maintain social standards in public transport • increase environmental standards. • provide small companies should access to the market.
Does your organisation have any sustainable or green procurement targets and do these assist in pushing for this tender?	During the mid 90's the politicians on the board of the Göteborg Transport Authority set the goal of increasing the number of travels in public transport by 20% by 1999 and having the cost coverage increased

	from 28 % to 50 % in 2-3 years. • Benchmarking/ targets; • Supplier pre-qualifications; • Establishing the Technical capacity
Does your organisation have a sustainable or green procurement implementation strategy and did this assist in pushing for this tender?	Yes, a management document helped to derive relevant information

The tendering process

Developing the green procurement criteria

Who was involved in the development of the criteria?	A few officials at the public transport authority and a few consultants.
How much advice was received from internal sources in developing the tender and criteria, e.g. through the environment department, finance department, energy department etc?	N/a
How much advice was received through external sources in developing the tender and criteria, e.g. consultants, consulting engineers other government departments, or suppliers?	Consultants working for Vasttrafik
Were the suppliers/bidders at any stage involved in the tendering process? (e.g. consultation round)?	Post award phase

The green procurement criteria

Did you define any green pre-qualifications for suppliers?	Yes, emission levels according to newest upcoming EU emission standards
Was there any technical capacity required?	N/a
What were the technical specifications?	Strict emission standards were achieved by directly integrating them into the specifications of the call for tender. Already from the beginning, the requirements for NOx and particulates were tough and in 1999 they demanded that NOx levels would have to be below 5 g/kWh and particulates below 0,11 g/kWh. This reflected the EURO 3 standards, which are valid in all Europe from 2001. While these standards were demanded, some flexibility was left on how to achieve them. The same specifications demanded that by 2000 10% of fuels would have to come from renewable resources and that busses should not be older than 10 years, with the fleet average being no higher than 5 years old.
What were the selection criteria?	Fuel consumption, recycling, delivery time etc.

Was there any award criteria, if so what?	In the award phase of the tendering process a bonus was given to those, who would achieve even stricter emission standards. Furthermore, incentives for good service quality were set by leaving 25% of transport charges to the operator. Also, contracts containing specific targets were used which set certain performance goals and procedures of monitoring their achievement. For example, the quality of service is assessed by an independent market research institute. Through competition, the price paid for bus traffic in the western part of Göteborg has been reduced by 45% from 1989-93 and a further 5 % in the following year. The initial set up costs of the transport authority were insignificant as this involved a transfer and restructuring of existing staff from Göteborgs Spårvägar AB. Due to rising fuel and labour costs, the price level on new contracts increased to about 20 % the last two years, a new index, in addition to the regular consumer index, now also takes into account fuel and labour costs.
What were the contract performance clauses?	Contract performance clauses are an important part of the system – incentives, not penalties, encourage the suppliers and operator to provide better services. For the purchaser, this creates efficiency. For the operator, it ensures successful and low-cost work, and for the supplier, market-leading product development and delivery. For all parties, the principle is that success breeds success. Contract performance clauses are a mechanism through which the sustainable development focus in policy statements can be realised. As already mentioned, the targets demanded by the City are bold, and suppliers often fail to meet these in the early stages of the tender. With time and commitment, products are developed that meet and/or surpass the expectations of the tenderer.
Was there any reference to eco-labels, if so what?	N/a
Were there any post-award criteria, if so what?	s.a.
What forms of evidence/proof were required from the supplier to demonstrate	Self-declarations, EMS certificates or similar

compliance?	

Assessing the tender

Which were the dates of the tendering process?	Starting date: Several tenders, each appr. 6 month period from start to awarding the contract
How many bidders were there?	Depending: mostly 5
How much time were potential bidders given to react and/or modify their approach?	They got about 60 days fore calculations but they are not allowed too modify the tender after that.
Has a similar approach been used when preparing other tenders of a different subject matter, i.e. has this purchase influenced other purchases?	Yes, it has influenced the implementation of Environmental zones for heavy duty vehicles as well as environmental demands in the tendering process for building and construction contracts (regarding construction equipment).
Has the approach used for preparation of this tender been used in preparation of subsequent tenders? Or has the focus or approach been modified?	Similar environmental demands have been part of the tendering process for bus operations in Gothenburg since 1992.

Contract management

Were there any problems with compliance with the criteria?	no
How was the monitoring/enforcement handled?	The bus operators' present annual written reports to document how al the environmental demands have been fulfilled. Some random testing of a few vehicles has also been done, but not every year. The City maintains a testing team that certifies new products, such as buses. The system is designed so that the producer is encouraged to create innovative and effective solutions. Initial non-compliance does not necessarily mean failure is likely, and nor is non-compliance penalised. However, producers realise that it is in their interest to meet agreed targets if their business is to continue growing. Successful participation in a world-leading partnership is a tremendous asset.

Potential of triggering the market

What changes in supply/offering resulted that can be directly attributed to the tender, including those not explicitly required?	Increased R&D activities, esp. for alternative fuels
What has been the impact on the market supply following the tender? Has there been any impacts on the supply chain, if so what? Have there been any impacts on wider	Supply chain: Volvo increased recycability quote with changing sub-suppliers

market demand? Have there been any impacts on other sectors?	
Did the supplier maintain changes after the end of the contract period, or revert to old practices?	Maintained and expanded
Did costs increase, and if so then by how much?	Costs increased and where allocated by 50% to the price of the product
Did this increase in costs amortise over the time? If yes, how long did it take?	Slow amortisation e.g. less fuel consumption
If there was an increase in costs, were these passed onto the procurer?	s.a.
How far down the supply chain can the impacts of the tender/ contract been detected?	Different sub-suppliers from Volvo made out profit from this tenders (e.g. engine construction)
What did the procurer do, and what did the supplier see?	Göteborgs Stad sets ambitious targets for its operator and suppliers. By doing so, producers have been forced to innovate, and this has resulted in successful economic and environmental product development.
Have there been any unintended consequences as a result of the call for tender/ initiative?	no

Barriers and difficulties

What were the difficulties with developing and implementing this tender?	One legal case but not referred to the implementation of new technologies
Have there been any problems with compliance with criteria?	no

Lessons learned

What can you recommend to other public authorities?	Having strong environmental laws, even stricter than EU regulations helps to push forward environmental considerations in public procurement
What could be repeated elsewhere?	Negotiations with suppliers

Additional information

Contacts

Please, insert your full contact details as you wish that it will appear in the final cas study.	s.a.

Sources

Please, indicate any used and helpful sources (e.g web sources, publications).	Newsletters from Vasttrafik

Questionnaire supplier

General information

Name of person responsible for the bid	Peter Danielsson
Name of the service provider	Volvo Sweden
Contact details	N/a
In order to foster exchange of best practises in Europe, may ICLEI use your contact details in the case study?	☒ yes Y

Background information

Can you provide a short description of your company?	Volvo Sweden is one of the main suppliers of low-emission buses in Sweden.
Can you provide figures about your green service (Sales percentage, volume etc)?	N/a
Do you have any experience with green public procurement or public authorities doing GPP?	Yes, with several bids for low-emission buses

Information on the product

Can you provide a short description of the specific product supplied?	Several types of buses using alternative fuels and meeting emission level EURO III/IV/V standards
How many sub-suppliers are involved in the production process? What for?	N/a
Has there been any life cycle (cost) assessment involved?	Yes, Volvo works with LCC since years.
Are there significant differences in costs between your standard and green services?	Costs increase was for 50% covered by R&D and for 50% put on the end price of the buses
How much was delivered – in general and to the specific authority? (*Number of units and total costs in EURO*)	Several hundred units

The drivers responsible for procurement

Why do you offer green products in principle?	To meet the requirements of the tender; to get a market advantage
Do you pursue a specific policy? Any specific targets? Do you have a particular strategy? Was there any political support? Any other drivers?	N/a

The tendering process – criteria

Were there any problems with compliance with criteria? If yes, at what tendering stage?	No

Potential of triggering the market

Do you think that the green procurement tender triggered the offer of the green	Together with similar demands from other cities in primarily Sweden has resulted in a

product? If yes, how?	critical mass that can support a business case for a unique low emission buses.
What changes in supply/offering resulted that can be directly attributed to the tender, including those not explicitly required?	N/a

Duration and sustainability of those changes

Did you maintain changes after the end of the contract period, or quickly revert to old practices?	The supplier not only maintained this practice but also made is even more aggressive
Were the changes implemented in other supply contracts?	Yes, in numerous examples.

Impact of the policy or contracts on costs throughout the supply chain, including those borne by the contracting authority

Did costs increase (i.e. any costs), and if so then by how much? Were these increases over the short term and in the medium-longer term? Where did the cost increases occur in the supply chain? Were these passed on to the procurer?	The costs increased by 10% of the total bus cost. This cost where sustained until the next generation of the technology was implemented. The cost where to 50% in the development of the technology and to 50% in new components. The full cost increased where passed on to the procurer.
What was the impact of those changes on the overall competitiveness of the supplier and its supply chain? (Positive impacts would include e.g. first-mover advantage, raising of standards, supportive home market providing a platform for export. Negatives might include the need to source from foreign suppliers.)	Yes, first mover advantage, export opportunities, and strengthening of the brand. Positive impacts would include e.g. first-mover advantage, rising of standards, supportive home market providing a platform for export. Negatives might include the need to source from foreign suppliers

Impacts on other sectors

Have sustainable purchasing initiatives in this area been adopted more widely? *(For example, have 'sustainable' specifications been adopted by procurers in the private sector?)*	In a sense this is valid. The bus operations are carried out by private enterprises but the public transport authority sets the demands. The bus producers sell the buses to the operators.
Has this been influenced by the activity of the government?	No, only by the public transport authorities.

Impacts on the supply chain

How far down the supply chain can the impacts of the policy or contract be detected?	The supply of the components and sub systems for emissions control are affected in the sense that the main suppliers have sub-suppliers. No possible to say how far down the line.
Crucially, what requirements are suppliers passing onto their own suppliers? How are these communicated and what is the result?	Within the Volvo Group we have a set of environment requirements on all our suppliers. There is a questioneer that have

	to be filled in and a scoring system in place to evaluate the environmental performance. The outcome is very positive since both Volvo and the suppliers have a better control and follow up of the environmental performance. We can secure that the Volvo list of forbidden or restricted chemicals/materials is implemented and that environmental management systems are is in operation. Information on recycling and data supporting LCA can be secured.

Unintended consequences

Have there been any unintended positive or negative consequences as a result of the call for tender / initiative? (Unintended consequences could include impacts on market supply and subsequent price swings e.g. not enough renewable energy, organic produce or recycled paper to satisfy demand.)	No

Impact on market supply

Has this approach succeeded or failed in its attempt to influence market supply, and why? (Please, identify reasons for success/failure e.g. has a long contract position taken by a public-sector buyer given increased certainty to the supplier of demand being sustained)	There has been a certainty that this policy of procurement practises will be sustained
Has concerted and consistent action by numerous public-sector buyers, across the wider EU, influenced the market?	Yes, in the case of the Swedish market.
Has inconsistency or lack of communication by the procurer led to confusion and a lack of influence on the suppliers?	No
Have you had any difficulties with EU public procurement rules / directives? Please explain.	No

Impact on wider market demands

Has this activity influenced wider market demand?	It has started to change and now cities in several EU countries have similar practices.
What changes have been seen regarding the purchasing behaviour of customers, suppliers, and/ or other organisations?	More focus on environmental features in general and a willingness to pay a premium for these features.

Eco-Technology / Eco-solution used

Do you think that the product is based on a	Yes, new eco-technologies have been

new or recent eco-technology? If yes, please explain in more detail.	inserted continously iin the offered buses, e.g. particle filters, CRT-filters, alternative fuel systems

Barriers and difficulties

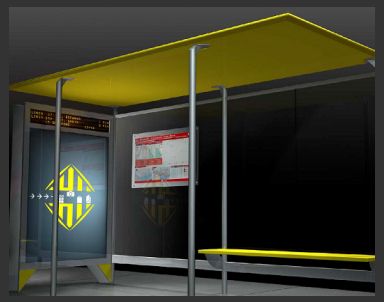
Have there been any problems with compliance with the criteria in the tender?	No

Additional information

Contacts

Please, insert your full contact details as you wish that it will appear in the final cas study.	Volvo Peter Danielsson Environmental Manager Sweden E-mail: peter.j.danielsson@volvo.com

15 Summary of all case studies

Case study	1: Sustainable Procurement of Public Railcars with the Eco-Technology 'particle filters' for the Taunusbahn, GERMANY	2: Sustainable Procurement of Bus shelters in Barcelona, SPAIN	3: "The better floorlamps" of the City of Zurich, SWITZERLAND	4: Sustainable Procurement of the Public Lighting Service of the City of Lille, FRANCE	5 : Sustainable Procurement of Low Emission Buses for Göteborg, SWEDEN
					
Purchasing authority	Fahrzeugmanagement Region Frankfurt RheinMain GmbH (fahma)	City of Barcelona, Urban Department	Building Construction Department of Zurich (Amt für Hochbauten der Stadt Zürich)	City of Lille, Public Lighting Department	Västtrafik Göteborgsområdet, for the Greater Göteborg Area
Subject matter	Tender for the production and delivery of ten two-part railcars	Tender for the purchase of 500 new bus shelters and adaptation of all 1200 old existing bus shelters.	Tender for the delivery of MINERGIE® conforming floorlamps	Tender for the general maintenance of the municipal street lighting services	Delivery of low emission buses partly with alternative fuel technologies
Environmental criteria required	Minimum environmental requirements • Noise levels referring to ISO 3095 (LAmax = 90 dBA) • Avoidance of specific toxic materials – comprehensive list including e.g. arsenic, chrome • Lowest fuel consumption possible • Emission standards based on the Directive 97/68/EG Stage IIIa Technical specifications • The diesel engines have to be equipped with particle filters. If this is not possible, the offer of the bidder must deliver adequate information on future technical solutions to be developed, time of realisation and preliminary cost calculations for the retrofitting.	Minimum environmental requirements • Use of: Glass laminate and/or tempered glass of high resistance, Smelting Aluminium type AG-3, Stainless steel – quality AISI 316 L, Stainless steel microfusion, Composites exempt of chlorine, Recycled materials • Exclusion of PVC and non-sustainable timber • Life Cycle Analysis (LCA) for each element of the bus shelter in order to justify its compatibility with sustainable development. Selection criteria • Use of recycled materials and recyclable materials (5 points) • Use of non pollutant manufacture procedures (5 points)	The 'General Ecological Building Conditions' as minimum environmental requirements include: • Environmental Product Declarations (EPDs) according to the recommendation SIA 493 ("Declaration of ecological characteristics of building products") • List of ecological requirements for building material, such as, concrete, timber products ('sustainable origin') and insulation material Technical specifications • The Stand-by performance must not exceed 2 watt: the use of a regulator or control system depending on daylight is mandatory. • With sufficient daylight the floorlamp must automatically switch off or turn on the stand-by mode. Continued operation at minimum light power (e.g. 10%) is not permitted.	The intention of the City was to give indications rather than defining specific quantitative specifications. The green criteria included in the tender were : • Optimal use of renewable energies • Waste management policy during the reconstruction phase and use of recycled materials • Environmental impacts of the equipment implemented (life cycle costs, reduction of light pollution) • Development of new and innovative eco-technologies • Reduction in energy consumption (commitments in terms of kWh/year, duration to achieve commitments, power reduction and power control) • Suggestions for handling sustainable development • General integration of environmental considerations	Two strategies have been followed. The first targeted environmental emissions: • Strict emission standards were achieved by including the requirements as part of the technical specifications of the call for tender. • Between 2006 and 2008 the requirements will adjust to incorporate the EURO 4 and 5 standards respectively; • Previous specifications required that by 2000, 10% of fuels would have to come from renewable resources and that the maximum age of the bus fleet should not be more than 10 years, with the average age being no higher than 5 years old. • Contracts prescribe that all new buses shall be equipped with diesel particulate filters. • Older diesel buses that enter the "environmental zone" of the inner city of Göteborg must be retrofitted with particulate filters.

Environmental criteria required	• It must be technically possible to retrofit the railcar engines with particle filters. The supplier is obliged to retrofit the engines with particle filters when the required technical solution is available. The costs have to be included in the offer. Award criteria • Fuel consumption (10%)	• Use of no pollutant maintenance products (5 points) Quality and effectiveness of the best proposed technologies on any of the elements of the bus shelter (5 points)	• The electrical output must not exceed the standard output of the floorlamp • The floorlamp has to be constructed in a way to reduce electromagnetic radiation to a minimum (≤ 2V/m) Contract performance clauses • All packaging material has to be taken back by the suppliers. • The costs for environmentally friendly disposal have to be included in the unit price. • The working tools and containers have to be cleaned in an ecological manner by avoiding chemicals that could enter the water system. Upon request, the suppliers have to provide a disposal certificate for disposal and recycling of material. Zurich reserves the right to carry out indoor air quality checks	• Communication, training and awareness raising The bidders were invited to bring their offers in line with these general objectives, and to present their commitments (i.e. energy savings achieved by the end of the contract period, percentage of renewable energy to be used, etc.) and suggestions (ideas on how to integrate sustainable development to the service) during the interview stage. The main tender document also referred to a number of related documents the offers had to comply with, such as Lille's charter for clean construction, the local urban planning documents and road regulations, etc.	In the second approach, incentives to strive for better results than demanded were set: In the award phase of such tendering processes, companies who could deliver emissions reductions higher than the targeted amount (i.e. specified in the technical specifications) were rewarded with bonuses.
The new eco-**technology**	In the CORADIA LINT series, a catalytic coated filter is used consisting of two functional filter units in parallel connection. It is based on the wall flow principle that uses a holed and coated wall through which the exhaust emissions flow, reaching a filtration efficiency of 95% of the particulate matters. The passive regeneration is achieved by the catalytic elements (coated wall).	The "***Barcelona bus shelter model***" is a unique bus shelter prototype in the market. Three main elements distinguish this prototype from the rest: • The roof: the inside consists of a beehive-shaped fibreglass material. This strengthens the roof, and makes it easier to disassemble at the end of its life cycle, enabling it to be recycled. • The advertising panel is unique for using 3 highly efficient T5 lamps of 35W each instead of 4 inefficient lamps. Additionally, side panel reflectors improve the light dispersion, and only one electric balast supplies the energy to all lights. New cleaning system developed exclusively for the maintenance of the bus shelter using osmosed water instead of conventional water, avoiding the need to use soap/detergents.	• Focus on energy-efficiency, sustainable material and reduced electromagnetic radiation (≤ 2V/m). • Apart from using an environmentally friendly production process, all floorlamps use sustainable, long-lasting material and guarantee that the floorlamp is assembled without the use of harmful adhesives. • Winning floorlamp Level/MDT® reduced the stand-by mode by a factor of 10, meaning from 4 watt to 0.4 watt. • With sufficient daylight, the floorlamp switches off automatically by virtue of a special sensor. New type of anti-glare used (MDT®) which allows an optimal surrounding anti-glare of the working space.	The management of Lille's street lighting services represented an "eco-solution" including many components (maintenance, reconstruction, operation of the systems, energy management). Lille was the first city in France to hand over control of its lighting system to a private company and at the same time requested that this company provide an eco-solution. Lille's eco-solution comprised the following innovative aspects: • Integration of green criteria throughout the implementation of the tender • Continuous improvement through a 'Virtuous circle scheme' of energy savings and reinvestment into eco-efficient equipment • New environmental technology tested and applied Continuous auditing and monitoring system of the strategy and management of the lighting system	One of the effects of the procurement practises in the Göteborg region is that companies were encouraged to develop vehicles using recent Eco-Technologies. The development of particle filters, engines adapted to high blends of agro-fuels, natural gas, LPG (liquefied petroleum gas), hydrogen, electric motors and hybrid vehicles combining combustion engines with electric motors was stimulated. Göteborg is seen as a forerunner with regards to starting to implement the clean vehicle procurement obligations of the European Commission.
Key drivers for triggering market	• National discussion about the high emission levels of particulate matter in the air of cities like Munich and Frankfurt/ Main (2005) • Awareness of local politicians about the role of urban transport regarding particulate matters	• It was specified in the tender for the bidders to develop proposals on how to improve the quality of the service. • More points were given when presenting better technologies to improve the quality and the effectiveness of the product.	• Zurich's political commitment to sustainability • 2010 target of the "7 Milestones for Ecological and Energy-Efficient Construction" • Lack of MINERGIE® conforming floorlamps on the market • Involvement of 27 floorlamp manufacturers in the pre-tendering phase	• Lille's political commitment to sustainable development in the framework of its Agenda 21 activities, as well as its charter for sustainable construction. • The City's integrated approach of sustainable procurement to all public tenders (public lighting being the first tender of a substantial size).	• The continuos competitive tendering of Västtrafik secured that the bidding suppliers were encouraged to achieve low emission levels earlier than the respective Directives for emission standards of heavy vehicles came into force. • The tendering procedure fostered the development of new Eco-Technologies but at the same time was not prescriptive on the way on how these should be achieved.

Key drivers for triggering market	• Rhein-Main Transport Network (RMV) climate protection strategy setting ambitious targets • The demand of the particle filter was based on recent R&D activities that only needed a business case. A key result of the procurement process was the demand created for the particle filter.	• The introduction of new elements and the new cleaning system appear as improvements in relation to the old tender also awarded to JCDecaux in 1998. • JCDecaux's major source of income for the company: advertising on the bus shelters. JCDecaux are world leaders in outdoor communication, and bus shelters become strategic elements for advertising and to receive revenue • Regarding the maintenance, it is specified in the contract that the bidder has to take care of the maintenance and the costs involved during the whole duration of the contract (10 years). This clause in the contract was another key factor that pushed them in the development of a new Eco-Solution with better lights that would hardly need to be changed, as well as to invest in the implementation of the new technology with a cleaning system that does not need soap. • As leaders in outdoor communication, JCDecaux want to showcase their improvements to the world, and show their innovative capacity.	• 3-year-contract periods • Zurich signalised that it was planning to expand the MINERGIE® conforming lighting to all its public buildings.	• Motivation of the supplier, ETDE, to be awarded the contract involving a budget of 35,2 million EUR and a long commitment over 8 years. • ETDE has a long history of experience in the management of public lighting management in general and seized the opportunity to create a cost-efficient eco-solution by investing from the start into energy-efficient equipment. • General context of the progressive liberalisation of the energy market and the ability for French local governments, since July 2004, to choose their electricity supplier and also the origin of the energy they consume. • France's commitments to achieve a part of the 21% target of electricity produced from renewable sources (RES-E) by 2010. • Perspective of the energy certificates scheme, which was to be implemented in 2006 in France.	• The inclusion of environmental criteria in the tendering process contributed to getting buses on the road meeting Euro 3, Euro 4 and Euro 5 standards earlier than the legal requirements. • The aim of increasing the share of renewable resources, hence decreasing the reliance of fossil fuels, was achieved two years earlier than required by the environmental tender specifications used in Göteborg. • These specific tenders together with similar demands from other Swedish cities have resulted in achieving a critical mass that strongly supports a business case for the use of low emission buses.
Impact on supply side	• Alstom Transport offered the CORADIA LINT series with particle filter in other competitive tender processes • The green procurement of fahma resulted in a business case for the Engine producer MTU and related sub-suppliers for particle filters in railcar engines. • The filter solution provider Hug Engineering AG sees big development and market potentials all across Europe.	• The new technology to clean street furniture was implemented on a large scale for the first time, entailing a big investment from the bidder's side, both to adapt the new system into their cleaning vehicles and facilities, as well as to train employees. • JCDecaux marketed this technology on a much wider basis in all other European subsidiaries of JCDecaux. • At the local level, neighbour cities Badalona and Sabadell have already set up contracts with JCDecaux. Elsewhere in the country, the city of Vigo awarded the contract to JCDecaux for the same product in May 2007.	• Zurich's procurement action resulted in the production of 18 new high-quality floorlamps, which were subsequently put on the market. • The production process for floorlamps did involve a considerable number of subsuppliers on the market, more specifically the producers of the various floorlamp components, such as the electronics, the aluminium, the directional light components and the light tubes. • The bidders, and in particular the successful bidder Regent Lighting, applied the advanced criteria to other products as well and, hence, developed a new series of products in compliance with the tender criteria. • Approximately 2500 of these floorlamps have been sold so far, mainly to the city of Zurich. Currently, further MINERGIE® conforming floorlamps are in process of being developed • Especially in the electronics sector the impact of the tender was significant as it resulted in the development of a new. technology (stand-by mode; new Micro Downlight Technology® (MDT®).	• Lille's public lighting system is increasingly attracting interest at the national and international level. Several other French cities have replicated Lille's tender, while others are planning or considering it. • The first mover advantage the supplier (ETDE) benefited from did not last very long, since its strategy was soon replicated by many of its competitors, which have since made efforts to adapt and "green" their offers as well. • According to ETDE, the tender also had impacts on other sectors. For example, the virtuous circle of energy-efficiency and reinvestment at the heart of ETDE's offer expanded in the Bouygues group. • The contract includes a continuous investment in new ecotechnologies and an improvement of the new technology in use (i.e. electronic power reducer; digital lighting system). • They are regularly discussing with the City the opportunities and the availability of new eco-efficient	• Following the Göteborg tender, the winning service supplier - Volvo Group - developed a set of stringent environment requirements which was applied to all their suppliers. • Volvo stated that once a critical mass has been reached, with similar demands coming from similar cities, the business case for low emissions buses becomes sound. • Supporting this claim, figures from another company Scania AB show that the company sold 283 buses to Swedish cities in the first two months of 2005, 123 of which were ethanol-fuelled products for the Stockholm transport authority. • Following Göteborg's tenders other public-sector buyers across Sweden have also influenced the market in Sweden

			• Apart from the difficulty to quantify the direct impact on the supply chain, in particular on the sub-supplier, an indirect impact is evident as the number of orders for these specific floorlamps is growing.	• products on the market, and continuously testing new green products and services.	
Cost implications	• The additional costs for the environmental friendly version for each filter are €45,000, resulting in approximately 3% additional costs of the total product costs of approximately €2.7 million. • With current testing, fuel consumption is the same as those railcars that do not use a particle filter. There are negligible costs for the maintenance of the filter system.	• The new cleaning system involved an initial investment (placing of a reverse osmosis system to treat the water, staff training, adaptation of the cleaning vehicles to the new system, etc.). These costs were not passed on to the procurer, since they were entirely assumed by the winning bidder.	• From the supplier's perspective, overall, the cost of the Level/MDT® floorlamps did not increase as the initial investment in research led to new expertise, which was used for the development and design of several new lighting products (mostly floorlamps), and a reduction of costs was possible for the electronic components. • Zurich calculated for approximately 800 lamps significant economic savings amounting to approximately €485,000.00 over a period of two years.	• The supplier had to bear some additional costs concerning the purchase of electricity from renewable energy sources (on average 25% more expensive) and of materials (energy efficient lamps with prices 10 to 20% higher). However, this increase was not passed on to the procurer since the contract budget was blocked by 4,4 million EUR annually, and since these additional costs were balanced with greater savings in energy. • For the City of Lille, global costs went down by 5% in comparison with their last contract, mostly thanks to the savings achieved in running costs (42% savings in energy consumption).	The full cost increase was passed on to the procurer. The costs increased by 10% of the total bus cost. This cost was sustained until the next generation of technology was implemented. The increase in costs is attributed as follows: • 50% were incurred in the development of the technology; and • the other 50% in new components. Competition in Göteborg has shown to bring major cost savings in traffic operation whilst improving social and environmental standards and increasing the number of passenger by 7.5%. Financial savings were used to increase the service level and to reduce ticket prices.
Barriers and difficulties	• Lack of European standards for recent technological developments • Some difficulties about how to verify the fulfilment of the green criteria other than by self-declarations by the supplier (e.g. used materials)	• Sub-suppliers needed to search for a much broader market in order to comply with the new requirements imposed by the main supplier. • The fact that PVC and Chlorine materials were excluded in the tender affected the supply chain, requiring alternative materials to introduce in the design of the new bus shelter. • It was difficult to select specific criteria to satisfy all the different departments involved in developing the tender.	• Technical difficulty to obtain maximum light output with minimum energy in order to reach a clearly defined light level. • Legal disputes with other manufacturers that promoted themselves as successful bidders delayed delivery of product	• No major barriers or difficulties have been mentioned neither by the supplier nor by the public service provider. • As a minor difficulty, ETDE spoke from the energy market in Europe: the French national producer EDF has now lost his monopoly and the energy supply has opened to concurrence. Therefore, it is hard for electricity operators to identify their suppliers, to manage the prices etc	• No specific barriers or difficulties related to the implementation of green criteria into the tendering process. • Some difficulties were found regarding the availability of the desired products • Some time was needed to adapt the environmental policies to the daily work of the procurement departments.
Lessons learned	• Political support resulting from recent discussion about particulate matters and air quality in the region secured the green tender • Good external knowledge provided by consultants on how to include green criteria • Choosing a negotiated procedure gave good results • Detailed tables and figures in the technical requirements allowed the supplier to easily fulfil the green criteria.	• The purchaser selected bidder with a higher innovative capacity, leading to a successful cleaning system that in the mid- to longer term implies a smaller environmental impact and a reduction in the maintenance costs. • Importance of analysing the status of each city, as it is not always possible to implement certain elements even if they are more attractive (Eg. in one of the offers, JCDecaux offered the implementation of solar panels on top of the roofs of the bus shelter, but due to the local conditions it was not possible). • Using the knowledge of other departments in the selection of green criteria was also valuable for a successful result.	• To split the tender procedure into two phases, i.e. inviting interested suppliers to assist in discussing the tender criteria gave a strong signal to the market and triggered the production process.	• Tenders on performance-based specifications allows more scope to push the market to its full potential, and encourages bidders to be more creative. • Handing over the entire street lighting services to one supplier is a challenge for a City, but proves to be a good way to implement an efficient eco-solution which integrates the City's environmental objectives throughout all aspects of the service package.	• It is recommended to set specific emission levels as a criterion (target) when tendering and not demand a specific technology, for example, demanding diesel fuelled buses. Subsequently, it is then up to the suppliers to provide the adequate technology to achieve the level of emissions specified. • Competitive tendering has also enabled modernisation of the bus fleet