

Costs and Benefits of Green Public Procurement in Europe

Part 3 – Potential of GPP for the spreading of new/recently developed
environmental technologies

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Case study **The better floorlamps** Zurich, Switzerland

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Case Study

“The better floorlamps” of the City of Zurich, Switzerland



Photo: Regent Beleuchtungskörper AG



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REGENT
Lighting

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MDT[®] Micro Downlight Technology[®]

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 year¹. The city is one of the most active Procura⁺ cities² 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"*³.

The city is subject to the Inter-cantonal Agreement on Public Procurement (IvöB 2003)⁴ 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 department 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 (floorlamps), is Switzerland's market leader in lighting systems and ISO 9001 and 14001 certified. Currently, more than 80% of the lighting systems they sell are designed and manufacture 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.

¹ Zurich's public procurement budget: EUR 1.211.896.015,86 / year

² 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 CO₂ saved during its use
- Energy efficiency & sustainable building materials criteria = (45,081 m²) 175.1Million EUR
- Organic food worth 390,000 EUR. 5.6% of its total budget

³ Stadt Zürich *"Leitfaden – Die Stadt Zürich beschafft nachhaltig"* 2006

⁴ Interkantonale Vereinbarung über das öffentliche Beschaffungswesen

MINERGIE® is a sustainability brand and labelling system initially developed for new and refurbished buildings⁵. 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 2000 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*

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 2000 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.

⁵ see MINERGIE® - online at: www.minergie.ch

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 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.

Table1: "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 ($\leq 2V/m$). 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.

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 standards⁶ and fulfil energy class A⁷.

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 2: 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

⁶ 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) [Factsheet Topten]. It organises a competition for best campaigns on efficient products [more].

see online at: www.topten.ch

⁷ '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.

		- Criteria for floorlamps - Timetable
November 2002	Registration	Note: registered participants committed to hand in floorlamp prototypes
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 Beleuchtungskörper

5.1 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.

5.2 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)⁸ according to the recommendation SIA 493 ("Declaration of

⁸ The international community has developed a set of standards for environmental labelling. These ISO standards define three types of environmental labels.

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 3)*

Table 3: Requirement for electrical output

				Standard	
Stand-by power	0.0 watt	0.5 watt	1.0 watt	1.5 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

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

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

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.

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 $<60 \mu\text{g}/\text{m}^3$, total volatile organic carbons (TVOC) $<1000 \mu\text{g}/\text{m}^3$ as measured by the standard conditions of VDI 4300.

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 was at the same time 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 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.



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' website⁹.

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.

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 EUR per lamp, VAT (7.5%) excluded. By contrary, the city of Zurich calculated for approximately 800 lamps significant economic savings amounting to approximately 485.000,00 EUR over a period of two years. Since 2004 more than 2500 Level/MDT® floorlamps has been produced, mostly for the city of Zurich (2000 units)

⁹ see online: www.topten.ch

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 sub-suppliers. 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 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 in order to reach a clearly defined light level. A delay in the delivery of Regent's floorlamps 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.

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.

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 website¹⁰.

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10 Sources

Interview with Simon Markus (Hochbaudepartment) Zurich, Switzerland, 25 May 2007

Interview with Markus Simon (Regent Beleuchtungskörper AG) Zurich, Switzerland, 25 May 2007

Telephone interview with Stefan Gasser (eteam GmbH), 31 May 2007

Internet sources

¹⁰ see online: www.topten.ch

Regent Lighting - <http://www.regent.ch>

MINERGIE Standard – www.minergie.ch