

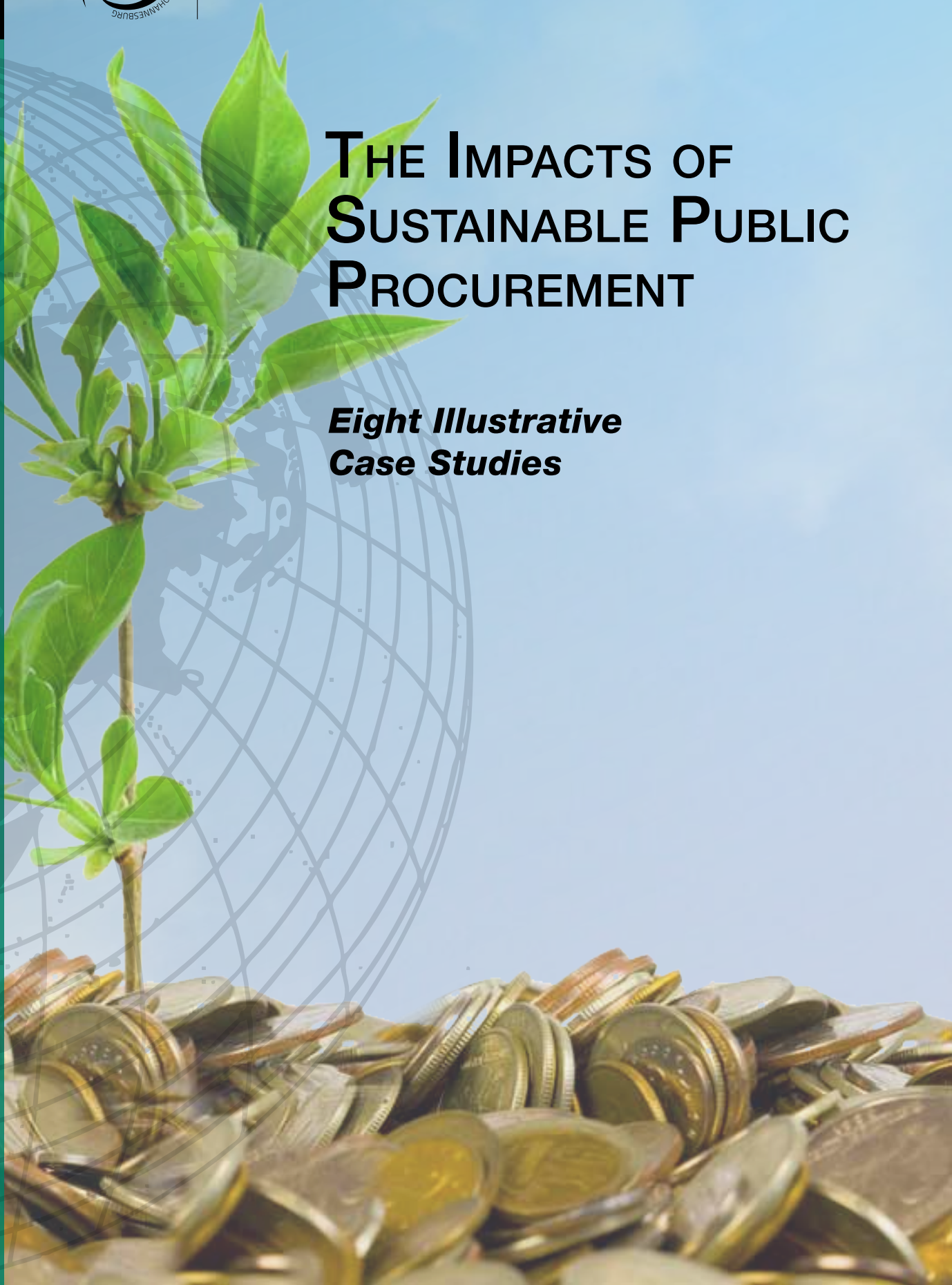


1972-2012:
Serving People
and the Planet

THE IMPACTS OF SUSTAINABLE PUBLIC PROCUREMENT

*Eight Illustrative
Case Studies*

UNITED NATIONS ENVIRONMENT PROGRAMME



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THE IMPACTS OF SUSTAINABLE PROCUREMENT

Eight Illustrative Case Studies

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Foreword

Public spending, which represents between 15 per cent and 30 per cent of GDP in a given country, can help drive markets towards innovation and sustainability, thereby enabling green growth and the transition to a Green Economy. Sustainable Public Procurement (SPP) was identified in Agenda 21 and in Chapter III of the Johannesburg Plan of Implementation as one of the means to achieve sustainability. More recently, SPP was recognized as a priority theme for all regions during the 19th Session of the Commission on Sustainable Development (New York, May 2011), and highlighted as a key enabling policy instrument for sustainable consumption and production towards a green economy in UNEP's Green Economy Report.

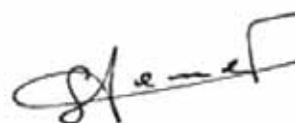
It has thus become increasingly clear among policy makers that public procurement can play a strategic role, and that, it can specifically contribute to achieving sustainable development goals. Through SPP, governments can lead by example and deliver key policy objectives in the environmental, social and economic fields. With respect to environment, sustainable procurement can allow governments to reduce greenhouse gas emissions, improve energy and water efficiency and support recycling. Positive social results include poverty reduction, improved equity and respect for core labor standards. And from an economic perspective, SPP can generate income, reduce costs and support the transfer of skills and technology.

Aware of these potential benefits, an increasing number of countries, local authorities, businesses and organizations are gradually embarking on sustainable procurement. Nevertheless, the

emergence of SPP does not seem to be matched by a sufficient assessment of the impacts of SPP activities on sustainable development or on market transformation. The measure of these impacts is critical to evaluate current activities and to encourage new countries and organizations to join the global movement towards SPP. The present study intends to address the lack of assessment of SPP activities by analyzing eight SPP contracts to contribute to the development of an impact evaluation methodology. The selected case studies, from developed and developing countries, demonstrate the tangible and measurable impacts of sustainable public procurement, and its support towards the achievement of economic, social and environmental goals.

Our intention is also to dispel certain misconceptions about SPP. Policy makers and procurers assume for instance that sustainable goods will usually be more expensive than 'traditional' items. Yet SPP does not need to cost more, particularly when total costs are calculated over the lifetime of products and services. Another common misconception is that SPP revolves mainly around environmental concerns. This study demonstrates that socio-economic goals such as the promotion of local industries, the creation of jobs, and the support to micro, small and medium-sized businesses are objectives that can be achieved through sustainable public procurement.

We hope that this SPP impact study will encourage governments, and procurement stakeholders, to engage in SPP and will be a first step towards the elaboration of a commonly agreed methodology to measure the sustainable development impacts of SPP activities.



Sylvie Lemmet

Director

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Introduction

Background of the study

The Marrakech Task Force on Sustainable Public Procurement (MTF on SPP) led by Switzerland from 2006 to May 2011 has developed an approach for implementing sustainable public procurement (SPP) known as the MTF Approach to SPP.

In 2008, the Swiss government and the United Nations Environment Programme (UNEP) designed a project to roll out this approach at world level. This project, entitled Capacity building for Sustainable Public Procurement in Developing Countries, is supported by the European Commission, Switzerland and the Organization of Francophone countries. It is currently being piloted by UNEP in Chile, Colombia, Costa Rica, Lebanon, Mauritius, Tunisia and Uruguay.

The lessons learned from the project have helped to improve the approach which is evolving into a standard methodology for the design and implementation of national policies on sustainable public procurement.

The MTF on SPP and UNEP have also delivered a first set of policy conclusions and recommendations, which were presented at a side event on SPP organized during the 19th session of the Commission on Sustainable Development in New York in May 2011.

In 2012, UNEP plans to scale up the scope of the project by providing support to 20 countries in SPP implementation through the revised SPP Approach.

The SPP impact study

The SPP impact study is a joint project of UNEP and of the Swiss-led Marrakech Task Force on SPP. The study aims at demonstrating the benefits of sustainable public procurement on developing, developed and in transition countries. It also seeks to initiate a methodology to quantify the sustainable development and market impacts of SPP activities: increased availability of sustainable goods and services, strengthening of productive capacities and export capacities, employment creation, improved

labor conditions, reduced energy and water consumption, reduced GHG emissions, increased competitiveness of green industries, uptake of green technologies, more efficient use of natural resources, etc.

Prior to selecting the case studies, the consultants have carried out a thorough literature review which has underlined the limited number of existing SPP impact studies. In the case of the EU a study of 7 leading EU countries has been undertaken in 2006/2007 to assess the financial and GHG impacts of GPP policies. The study concluded that 45 % of the total value and 55% of the total number of contracts in were “green” for 10 product groups (source: DG Environment).

The Consultant was asked to survey existing SPP activities in developed, emerging and developing countries in order to propose a selection of 8 SPP cases with significant impacts and a balanced geographical coverage. Other selection criteria were considered such as the volume of the contracts, the types of goods or services procured (i.e. commonly purchased by public entities), the nature of the contracting authorities and the availability of data on the procurement contracts.

Challenges and constraints

The data collection and subsequent selection of the case studies required substantial outreach and mobilization of stakeholders. Several difficulties arose during this phase:

- Difficulty of selecting a geographically balanced number of case studies due to the weak penetration of SPP in some countries or regions (e.g. sub-Saharan Africa, Middle East, Southeast Asia, ...);
- Poor understanding of the purpose of the study due to a lack of awareness and knowledge on sustainable procurement, in particular in Africa and Asia;
- Difficulty in identifying contact persons with relevant information and data. This is particularly true in developing countries where SPP has not yet started or where it is still a low priority;

- Low level of feedbacks, especially after the first email exchanges and phone calls due to availability and logistical problems or to the confidential nature of some information (South Africa, Australia, Chile, China).
- Lack of availability of quantitative and qualitative data due to the weakness of monitoring and evaluation mechanisms of the contracting authorities.

Main results

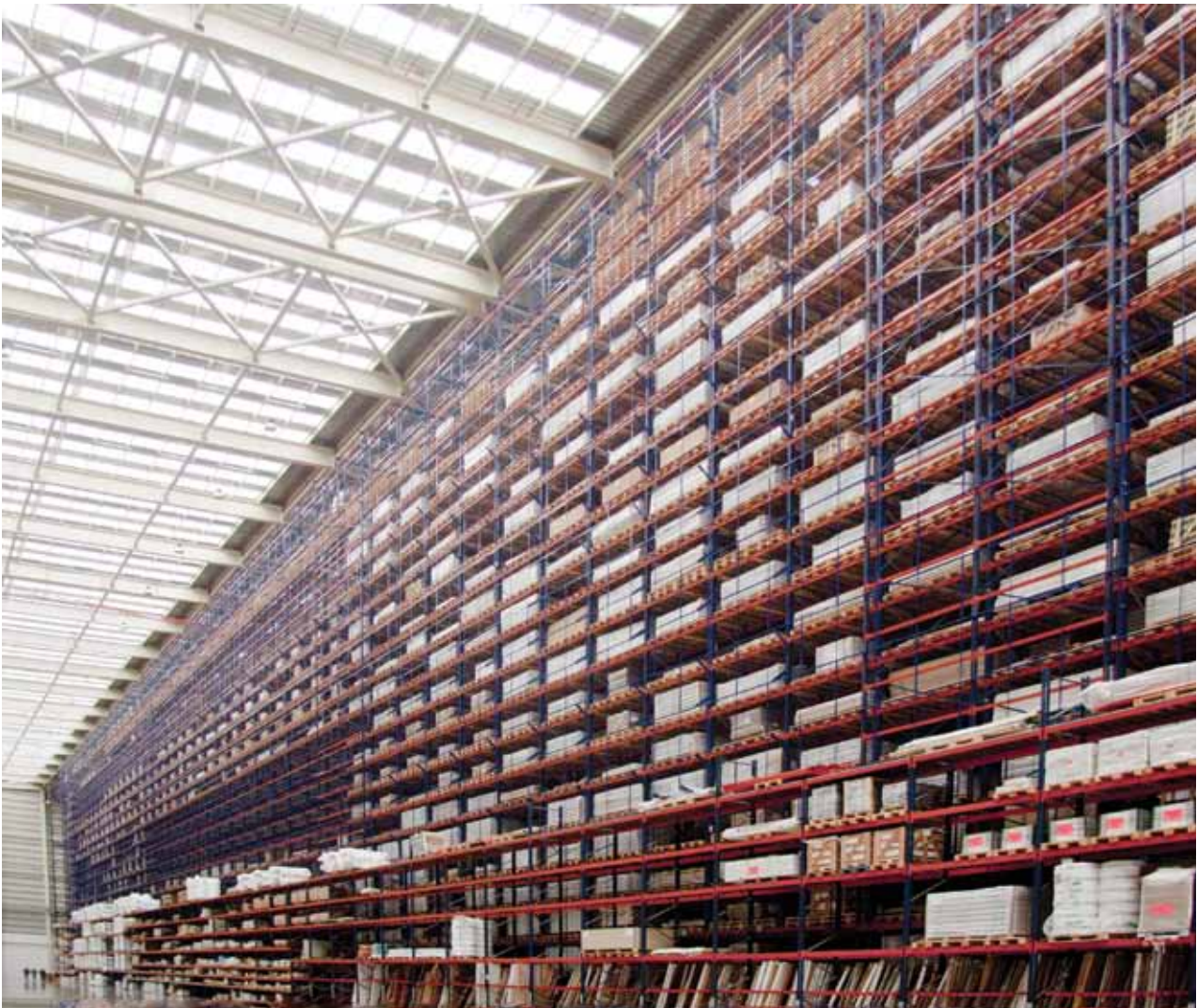
Selected case studies

The following case studies were selected:

- The procurement of school item kits including a notebook made out of recycled paper, State of São Paulo (Brazil);
- The procurement and disposal of tires by the Costa Rican Government, involving efforts to

reduce environmental impacts throughout the life cycle of the product;

- The procurement of consulting services by the Scottish Government in order to promote SMEs and supporting literacy improvements;
- The procurement of construction management services by YORbuild, a joint venture of the local government of Yorkshire and of the Humber Region (United Kingdom);
- The procurement of remanufactured consumables by the French Ministry of Education promoting companies employing disabled persons;
- The procurement of Light Emitting Devices (LED) by the Ministry of Transport of Hong Kong Special Administrative Region to replace all conventional traffic lights in the region;
- The procurement of organic food for school canteens by the municipality of Ferrara (Italy);



- The procurement of waste transport services by Metro Waste, the metropolitan regional government of Portland (Oregon, United States).
- The selected cases encompass a diversity of sustainable development impacts covering the economic, social and environmental fields.

Main characteristics of the selected cases

- The geographical coverage of the selected cases is consistent with the current penetration of SPP/ GPP at world level: two cases selected in Latin America, one in North America, four in Europe and one in Asia.
- The selected procurement contracts deal with goods and services commonly purchased by public entities such as paper, waste transport, consumables, and food.
- The procuring entities in charge of the selected contracts represent various administrative levels: ministries, federal states and municipalities.

The importance of the context

The analysis of the cases has revealed three levels of maturity in terms of national capacities to implement sustainable public procurement. These are outlined in Table 1 below.

Economic impacts

The study recorded a number of direct economic impacts, such as the support to small business activity in Scotland, the support to local industries in Costa Rica, or the financial savings done by the State of São Paulo, Brazil. Indirect impacts, such as tax benefits linked to the employment of disabled people have also been demonstrated. The variety

Table 1: Maturity levels for Sustainable Public Procurement

Key elements	Lack of maturity	Intermediate/low level of maturity	High level of maturity
Political willingness	Lack of political support. SPP is a low priority.	There is a political will to promote / test sustainable public procurement, however initiatives are in the pilot phase and cannot rely yet on a more comprehensive approach (eg, national action plan).	There is a strong political will to promote sustainable public procurement.
Adoption of a global strategy		SPP activities are undertaken without long term perspectives and are not integrated in overarching sustainable development or green economy strategies	SPP is part of a more comprehensive approach and embedded in overarching strategies.
Knowledge of SPP	There is very little awareness and understanding of the concepts of sustainable public procurement.	Actors engaged with sustainable public procurement issues have little experience and expertise in that field.	Actors have a good experience of sustainable public procurement.
Legal framework	Legal frameworks do not specifically promote the inclusion of environmental and social criteria into the procurement process	Legal frameworks partially promote the inclusion of environmental and social criteria into the procurement process	The legislation promotes the inclusion of social and environmental criteria into the procurement process
Monitoring		SPP activities are partially monitored. Impacts of SPP activities are not assessed.	Monitoring systems are initiated.
Market readiness	The supply of green products is limited.	Increasing supply and availability of sustainable goods and services	The offer on the market is solid and standardized.

of economic impacts described in the different case studies clearly shows that the economic pillar of SPP cannot be underestimated.

Environmental impacts

The eight case studies reveal a diversity of environmental impacts at various stages of the products' life cycle. The purchase of remanufactured ink cartridges by the French Ministry of Education has led to a decrease in the amount of waste generated at the manufacturing stage. The construction or services case studies (Yorkshire and Humber Region, UK, and Oregon, USA) demonstrate significant impacts related to the reduction of CO2 emissions, of waste production, and of water consumption. The Ferrara study (Italy) and the recycled paper case (São Paulo, Brazil) show positive environmental impacts distributed throughout the life-cycle.

Social impacts

Although the social component of sustainable development has often been considered as the most neglected one, the eight case studies show a strong commitment from public purchasers to tackle social issues. Employment and social inclusiveness issues are considered essential by the public entities who promote these priorities through their procurement processes. Some of the social impacts are directly targeted by tenders, such as the participation of companies employing disabled persons in the French case or the fight against illiteracy in Scotland. Other impacts are the results of the specific purchase, as in the State of São Paulo case (notebooks using recycled paper) which demonstrates a clear positive impact for waste pickers.

The analysis of the case studies illustrates the diversity and strength of the recorded sustainable development impacts. Public purchasers can be clearly seen as key potential actors of society, able to impact a wide range of sustainable development fields.

Way forward

UNEP plans to pursue the work initiated with the present study. Our objectives are to collect additional cases, through yearly calls for contributions, in order to highlight the qualitative and quantitative impacts of SPP. We also plan to set up an online database to better categorize the cases and facilitate the access and exchange of information.

The organization of annual awards of SPP cases ranked according to the consideration given to the monitoring and evaluation of impacts is also considered by UNEP.

The study highlighted the fact that monitoring and evaluation of sustainable procurement activities by public authorities are neither granted nor systematic. This observation opens up new perspectives for UNEP to promote the design of guidance document for the monitoring and evaluation of SPP impacts as well as specific training modules on this particular subject which will be incorporated in our existing capacity building tools. A particular attention will also be given to the further refinement of the measurement methodology of SPP impacts initiated by this study.

Basic information

- Country: Brazil
- HDI: 0.813
- Entity: The Foundation for Education Development, executive branch of the Secretary of Education (State of São Paulo)
- Population: São Paulo -19.96 million
- Procured goods/services: Kits of school supplies for secondary and high school pupils
- Amount: R\$ 79 354 073 (about US\$ 50 Million)
- Duration: 180 days
- Sustainable development impacts: environmental, social, economic
- Size of the global market: 400 million tonnes of pulp and paper per year¹

¹ World Wide Fund for Nature (WWF) - http://wwf.panda.org/what_we_do/footprint/forestry/sustainablepulppaper/aboutpulppaperproductionuse/



Context

Legal framework for SPP

In Brazil, the regulatory framework for sustainable public procurement (SPP) finds its legitimacy in the Federal Constitution. In fact, the Article 225 of the Constitution of 1988 requires Public Administration to protect and preserve the Environment for present and future generations.

The first regulatory framework for SPP at a federal level (*Instrução Normativa n°1, de 19 de Janeiro de 2010*) was adopted in January 2010 by the Ministry for Planning in order to incorporate environmental criteria into the procurement process. The federal Law n°12.349 was enacted the same year in order to make the promotion of SPP by all public entities mandatory.

Work in favor of SPP has also taken place at State level. In 2008, the State of São Paulo adopted the decree N°53.336/08 in order to promote SPP, which led to the creation, in each of its departments, of an internal commission responsible for reporting annually on SPP efforts. This decree also launched the State program for Sustainable Public Procurements (*Programa Estadual de Contratações Públicas Sustentáveis - 2008*), coordinated by the Secretariat for Public Management.

Education: a decentralised sector

The Brazilian basic education system is structured as described in Table 2.

The Brazilian Education system is extremely decentralized, spread across 27 regional and 5 500 municipal entities, which benefit from a high level of independence towards the Brazilian Federal State.

Table 2: Basic Education in Brazil

Age	School Level
3 to 5 years	Nursery school (Infantário)
6 to 10 years	Primary school (ensino fundamental 1)
11 to 14 years	Middle school (ensino fundamental 2)
15 to 17 years	High school (ensino médio)



The Education sector represents important investments for the State of São Paulo due to the number of pupils (more than 4.5 million pupils in about 5 000 public schools).

Important challenges for the State of São Paulo

In Brazil, education represents an important challenge as the illiteracy rate is still high. According to the Brazilian Institute of Geography and Statistics (IBGE), there were still 14.1 million of illiterate people in 2010, which represent 9.7% of the population.

In the State of São Paulo, illiteracy represents 5.6% of the population, which is quite high taking into account that this State represents 22% of the Brazilian population² and 33% of national wealth. Moreover, 42% of São Paulo inhabitants have not completed middle school.

In order to increase pupils' motivation to go to school, to fight poverty and meet the Millennium Development Goals³, the State of São Paulo, through the Foundation for Education Development (*Fundação para o desenvolvimento da Educação* – FDE, the equivalent of the regional Ministry for Education), distributes a school kit every year to all pupils. This school kit contains basic school items like: pens, pencils, notebooks, rulers, etc. This initiative allows children to study in good conditions regardless of their social background.

The Brazilian school calendar is organized at the federal level, with the first semester running from February to July and the second one from August to December. Consequently, Brazilian pupils are in vacation one and a half months between December and January. In order to ensure that all pupils receive their school kits in time, the production and distribution

2 Instituto Brasileiro de Geografia e Estatística (IBGE): It is the most populated State of Brazil with 41 252 360 inhabitants, according 2010 population count.

3 The Millennium Development Goals are 8 international development goals that all 193 United Nations member states and at least 23 international organizations have agreed in 2000 to achieve by the year 2015, such as eradicating extreme poverty, reducing child mortality rates, fighting disease epidemics such as AIDS, and developing a global partnership for development. <http://www.un.org/millenniumgoals/>

is achieved the year before. Thus, for school year 2011, the production and delivery have been organized as follows:

Production: July 2010 to August 2010

Distribution: November 2010 to January 31 2011

Project

The Foundation for Education Development launched a call for tender in May 2008 for the production and distribution of school kits for middle and high schools. School kits for primary school pupils were purchased through a separated procurement framework. This case study deals with the procurement of school kits (see Table 3) for middle and high schools for the 2011 school year.

Table 3: Items purchased in the school kits

High schools (lot 1)	Middle schools (lot 2)
4 notebooks (180 sheets per piece)	3 notebooks (180 sheets per piece)
1 notebook (96 sheets)	1 notebook (96 sheets)
1 plastic ruler	1 plastic ruler
Color pens	Color pens
4 pencils	3 pencils
3 blue pens	2 blue pens
3 pencil sharpeners	3 pencil sharpeners
2 white erasers	2 white erasers
	1 scissor
	1 tube of glue

Five companies participated in the call for tender including producers as well as distributors. To streamline the process, the State of Sao Paulo chose to award the contract to companies with experience in supplying packages. It therefore selected two distributors: *Ataka Brasil Papelaria LTDA.* for the first lot, *Kalunga Comércio e Indústria Gráfica LTDA.* for the second one.

This study case will focus on one item of the school kit: the notebook made out of recycled paper and produced by the *Bignardi Papéis* company.

1. RECYCLED PAPER

Source: FDE, State of São Paulo



A notebook made out of recycled paper

The Foundation for Education Development (FDE) decided to buy notebooks made out of recycled paper for middle and high schools. The call for tender separated the purchase in two lots: one dedicated to middle schools and the other to high schools.

In 2010 the FDE purchased for school year 2011:

- 1 797 866 school kits for High school pupils, for a total cost of R\$ 38 294 545.80 (about US\$ 24M) (lot 1)
- 1 994 149 school kits for Middle school pupils, for a total cost of R\$ 41 059 627.91 (about US\$ 26M) (lot 2)

Every school kit included one notebook made out of recycled paper which amounts to 3 792 015 notebooks for lots 1 and 2 in 2010 (for school year 2011).

The purchase of these notebooks made out of recycled paper reached R\$ 15 850 622 (about US\$ 9 488 466), representing about 20% of the total cost allocated to the purchase of school kits for both lots.

Results and impacts

Environmental results and impacts

In Brazil, the Brazilian environmental official Standard ABNT NBR 15755:2009 requires recycled paper to contain at least 50% of recycled fibers. As mentioned above, the main notebook producer in this procurement is the firm *Bignardi Papéis*, which goes beyond the official Standard by making paper containing at least 60% of recycled fibres⁴.

The purchase of 3 792 015 notebooks (with 180 sheets per piece) made of 60% recycled paper fibers, allows savings of:

- 8 829 m³ of water, which represent more than 8 million liters;
- 1 766 tonnes of waste;
- 241 kg of organo-halogen compounds.

Impacts on public health

In Brazil, used paper represents an important part of waste volumes (19% of solid waste in São Paulo in 2001)⁵.

Through recycling, the State of Sao Paulo can not only reduce the need for raw materials, but also fight against

⁴ Information verified by the Research Department of the Foundation for Education Development.

⁵ <http://www.fozdoiguacu.pr.gov.br/portal2/home/> - Municipality of Foz de Iguaçu, Paraná

Table 4: Environmental impacts for one ton of paper

Type	Water consumption	Energy consumption	Waste production ⁷	Organo-halogen compounds in waste water
Paper with virgin fibers, chemical pulp	15 m ³	9 600 kWh	1 500 kg	280 g
Recycled paper	8 m ³	3 600 kWh	100 kg	50 g

Source: Pollution Prevention in the paper industry, Regional Activity Centre for Cleaner Production (Centre d'activités régionales pour la production propre). CAR/PP, 2005, p. 114

Table 5: Calculation of environmental impacts

First scenario: notebooks with classical paper	Second scenario: notebooks made of recycled paper
<p>3 792 015 notebooks with 180 sheets of paper (20.0 cm x 27.5 cm), with a size distribution/consist of 56g/m² and containing 0% of recycled fibers:</p> <ul style="list-style-type: none"> 3 792 015 notebooks x 180 sheets of paper x 56 g/m² x 0.2m x 0.275 m x 100% = 2 102.3 t of "new" paper <p><i>Environmental Impacts:</i></p> <ul style="list-style-type: none"> Water consumption: 15 m³ x 2 102.3 t = 31 534 m³ Waste production: 1 500 t x 2 102.3 t = 3 153 t Organo-halogen compounds: 280 g x 2 102.3 t = 589 kg 	<p>3 792 015 notebooks with 180 sheets of paper (20.0 cm x 27.5 cm), with a size consist of 56g/m² and containing 60% of recycled fibers:</p> <ul style="list-style-type: none"> 3 792 015 notebooks x 180 sheets of paper x 56 g/m² x 0.2 m x 0.275 m x 60% = 1 261.4 t of recycled paper 3 792 015 notebooks x 180 sheets of paper x 56 g/m² x 0.2 m x 0.275 m x 40% = 840.9 t of "new" paper <p><i>Environmental Impacts:</i></p> <ul style="list-style-type: none"> Water consumption: 15 m³ x 840.9 t + 8 m³ x 1 261.4 t = 22 705 m³ Waste production: 1 500 t x 840.9 t + 0.1 t x 1 261.4 t = 1 387 t Organo-halogen compounds: 280 g x 840.9 t + 50 g x 1 261.4 t = 298 kg

open-air rubbish dumps which represent 29.6% of the total Brazilian waste in 2007⁶ and pose a threat to the community because of ground and water pollution. Open-air dumps can contribute to the spreading of various diseases among vulnerable populations already living in a precarious situation.

Social impacts

This contract has great potential social impacts due to the fact that in Brazil, as in many other developing countries, the waste collecting sector involves a large number of

waste pickers who collect solid wastes mainly in the street and open-air rubbish dumps. In Brazil, nearly 90% of waste collection is done by waste pickers. This population is estimated to reach a number of 140 000 individuals in the whole State of São Paulo, (among whom 3 000 are homeless in the city of Sao Paulo only). Their average wage per month reached nearly \$R 500 in 2010 (about US\$ 311.72)⁸, which is almost as high as the country minimum wage (\$R 545 per month in 2011).

Thus, buying notebooks made out of recycled paper has also been a way to promote the economic activity of a number of socially excluded people. Knowing that a waste picker collects in average 2.5 tones of wastes per month⁹:

6 Study 2007 Panorama de resíduos sólidos no Brasil, published by the association ABRELPE (Associação Brasileira de Empresas de Limpeza Pública e Resíduos Especiais)

7 The pulp and paper industry produces mostly solid waste. For example, waste generated during the raw material treatment (wood and bark residues from the tank farm, debarking and chipping), during the pulp conception (fibers process, de-inking sludge, ash from combustion, etc.), during paper manufacture and in the framework and the biological treatment of water treatment plant (organic sludge)

8 <http://www.salariominimo.net/>

9 Study 2007 Panorama de resíduos sólidos no Brasil, published by the association ABRELPE (Associação Brasileira de Empresas de Limpeza Pública e Resíduos Especiais)

1. RECYCLED PAPER



Calculation of social impacts

- › 90% of waste collection realized by waste pickers
- › 1 261.4 tonnes of recycled paper needed for the notebooks production
- › $0.9 \times 1\,261.4 \text{ tonnes} / 2.5 \text{ tonnes} = 454$

It is estimated that the purchase of notebooks made with recycled paper provided a one month economic activity to 454 waste pickers.

Further improvements pushed by the State of São Paulo

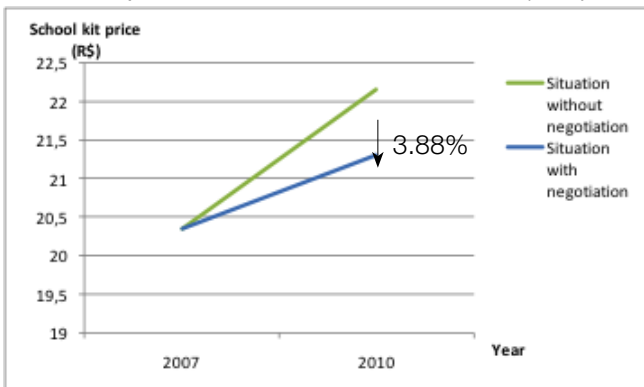
Notebooks (recycled or not) represent more than 60% of the cost of a school kit. The total amount of notebooks bought by the FED represents about 10% of the annual national production of paper in Brazil¹⁰. This definitely confers the FED a strong bargaining power when negotiating with the school supply or paper industry. The State of Sao Paulo saw an opportunity to tackle different issues for more sustainability:

- **Employment and economy:** By ordering such quantities, to some extent, the State guarantees jobs to many inhabitants.

In this specific case, the State could also provide an economic incentive to sustain activity the whole year by rescheduling its order. Thus, in 2006, the FED carried out a market analysis on the school supply industry with the support of a few associations. The results revealed that this industry experienced a near-shut-down between March and October due to low demand. This is all the more important as the Brazilian paper industry employed 67 830 workers in

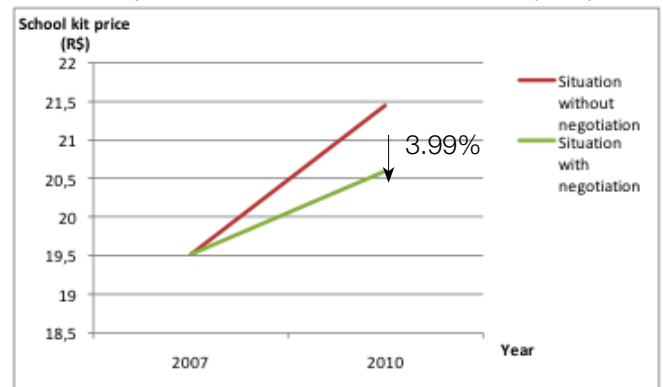
¹⁰ In Bracelpa (Associação Brasileira de Celulosa e Papel) study of 2007/2008, the annual Brazilian production capacity was: 109 324 tonnes of paper; the Foundation for Education Development consumption in 2008 was: 11 142 tonnes

School kit price evolution for Middle school (lot 1)



The negotiation allowed a decrease of 3.88% of school kit price for High school (lot 1) in 2010.

School kit price evolution for Middle school (lot 2)



The negotiation allowed a decrease of 3.99% of school kit price for Middle school (lot 2) in 2010.

2008, so potentially 67 000 individuals out of work for six months.

In addition to the market analysis, the FED decided to schedule the production and delivery process of school kits between July and January in order to maintain the economic activity of the suppliers during this period.

- **A decrease in purchasing costs, saving public money for other necessary investments:** School kit price increases annually because of inflation, but the negotiations that took place in 2008 between the State of São Paulo and the suppliers allowed a lower price for school kits. Thus, the two graphs below show the impact of negotiation on price evolution for school kits, between 2007 and 2010.

Lessons learned and key success factors

A bottom-up approach

Conducting a market analysis is one of the key success factors. It provided a good understanding of the supply chain and allowed to optimize resources as well as decreasing costs. From then on, the determination of the State of São Paulo and its bargaining power were crucial to promote sustainability at different levels (economic, social and environmental).

It is also worth underlining that this benefits a very vulnerable social group: the waste pickers. Beyond the environmental aspect, integrating them in this initiative for paper first and later maybe for other kinds of wastes is very likely to have long-term positive impacts.

Showing interest and engaging with stakeholders

By showing interest and conducting a market analysis, the State of São Paulo got a clear picture of all the stakes in the school supply industry and more particularly in the paper industry. It could then use its bargaining power to improve the situation of all stakeholders. There, the collaboration with the associations is of prime importance because they are often directly in touch with the people, the industry and the State. Because of their relationship based on trust, they could probably gather more relevant information than the authorities could provide. This shows that

involving stakeholders enabled the State to make the right decision for the community as a whole.

Stakeholder engagement is a part of this initiative: the idea was given in one of the satisfaction surveys distributed by the State to the schools. Thus, the recycled paper notebook initiative has proved to bring a win-win situation for both the environment (1 766 tonnes of waste avoided in the production phase) and the community.

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Basic Information

Country: Costa Rica

HDI: 0.725

Entity: The Institute of Electricity of Costa Rica (ICE)

Population: 4.5 million (2010)

Procured goods/services: Tire distribution, collection and disposal management

Amount: US\$ 1.6 million

Duration: 1 year

Sustainable development Impacts: environmental, social, economic

Size of the global market: US\$ 130 billion (2007)



Context

The global tire industry is a large market with great prospects for expansion: 1.4 billion tires¹¹ are sold each year. This activity produces just as many end of life tires, which poses a potential threat to the environment, if improperly handled. Tires exposed to the elements can hold water and be a breeding space for disease-carrying mosquitoes. In addition, tire piles can be set on fire through arson or accident, which may create substantial pollution in the air and ground.

End of life tire management is therefore a high priority goal for all stakeholders in a given region where waste tires' landfilling still occurs. This concern is of paramount importance for Costa Rica given the fact that the country took up the challenge to become one of the first carbon-neutral countries by 2021¹². The country is currently experiencing a series of environmental problems due to an increase in waste generation during the past two decades, from 0.47 kg / inhabitant / day in 1991 to 1.1 kg / inhabitant/ day in 2010¹³. The local tire market contributes to this trend with an average of 50,000 tonnes of tires produced and imported per year¹⁴, of which 40% only are reused or recycled. 60% of waste tires purchased on the Costa Rican market are buried, burned or illegally dumped into poorly managed landfills.

Improper management of waste tires and waste in general is therefore one of the major environmental concerns in Costa Rica. This issue has been addressed through the development of several plans and policies such as the National Solid Waste Plan (PRESOLAR) in 2007, the National Policy on Integrated Waste Management for 2010-2021, and the enactment of Law 8839 in 2010. National laws and policies on integrated waste management deal with the promotion of waste separation, treatment and recycling. The objective is

¹¹ Data from *End of Life Tyres, a valuable resource with growing potential*, ETRMA.

¹² Declaration from Nobel Peace Prize Winner and Costa Rican President Óscar Arias Sánchez in 2007.

¹³ *Business Success: Green Public Procurement in Costa Rica* (Cegesti)

¹⁴ Data from the *National Report on Material Handling* (Programacyma).



Costa Rica

to recover waste material, economic value and energy and to prevent waste impact on ecosystems through water, soil and air contamination. Regulation No. 33745 of 2007 deals specifically with the management of waste tires and establishes the Extended Producer Responsibility (EPR), whereby end sellers are responsible for waste tires management.

Recognizing that government procurement plays an important role in the orientation of more sustainable production and consumption patterns, Law 8660 of 2008 for the Strengthening and Modernization of Public Entities of the Telecommunications sector made mandatory the incorporation of environmental considerations into the procurement process. Similarly, article 29 of Law 8839 encourages public entities to purchase and use reusable, recyclable, biodegradable and recoverable products.

Costa Rica is currently in the process of amending its legal framework to add provisions regulating sustainable public procurement. This effort is a result from its involvement with UNEP since 2009, for the implementation of the Marrakech Task Force Approach to Sustainable Public Procurement. While there are no specific provisions as of yet regulating sustainable public procurement, the Administrative Contract Law No. 33411H of 2006 allows public entities to include environmental and social criteria into the procurement process.

Project

The Institute of Electricity of Costa Rica (ICE) is located in San José and was established in 1949 as an autonomous institution with legal personality. Its primary objectives were to develop energy-producing sources and to provide electricity services in a sustainable manner. The ICE has evolved since then as a corporate group of state enterprises including the ICE itself (Electricity and Telecommunications sectors) and its companies, Radiographic Costarricense SA (RACSA) and the National Company for Power and Light SA (CNFL).

The ICE Group has become one of the flagship companies involved with sustainable public procurement

in Costa Rica and has successfully linked the philosophy of sustainability and efficiency in procurement. The ICE has incorporated environmental criteria into public tenders for the purchase of various products and services, while applying the concept of Best Value for Money¹⁵ in procurement operations.

*“The Institute of Electricity of Costa Rica plans and implements its activities based on the principle of sustainable development; its management is oriented towards the conservation, protection, recovery and responsible use of the environment”.*¹⁶

In 2008 the ICE decided to better respond to stakeholders' needs and to reinforce its commitment towards sustainable development. The institution engaged into the modernization and redesign of its supply chain management for tires¹⁷, with a view to increase the economic and operational efficiency of this activity. Additionally, the ICE incorporated environmental considerations into the procurement process for this product, in order to improve waste management. The ICE mobilized a corporate team of experts to conduct market and feasibility studies and make investigations on best international practices in the field of logistics management and hazardous waste treatment and disposal. As a result of these investigations, the ICE decided to outsource the entire management service for tire distribution, collection and disposal and requested suppliers to have a waste management process in place that complies with international standards and regulations from the Ministry of Health.

In 2009 the ICE published a public tender for the procurement of 71 different types of tires for corporate vehicles. The call for tenders included provisions for the distribution, management, and collection services for new and waste tires under the concept of “delivery

¹⁵ Best Value for Money: optimum combination of whole life cost and quality (or fitness for purpose) to meet customers' requirements.

¹⁶ Article 2 of the Environmental Policy of the ICE.

¹⁷ The ICE's efforts to modernize supply chain and waste management processes are currently concentrated on the supply of tires and batteries for vehicles.

2. TIRE MANAGEMENT SERVICES

on demand"¹⁸. These services were previously handled by the ICE, which was responsible for all arrangements regarding tires distribution, collection and disposal. This process was very demanding in terms of time, finances, equipment and manpower resources. At that time the ICE was purchasing batches of 5,000 units of tires that were stored in the main ICE storage facilities located in the Central Metropolitan Area, in San José. New tires were then distributed on a weekly basis to the 19 storage facilities located throughout the country¹⁹, while waste tires were being picked up simultaneously and transported to various collection centers located across the country. These facilities did not always meet the right storage conditions and waste tires were sometimes kept in the open until the appropriate steps were taken for their collection. Some of these lots of scrap tires were donated to social welfare organizations in the country that used them in artistic and cultural exhibitions; others were used as barriers to prevent land erosion, or as fuel for boilers and cement kilns.

The new system put in place with this contract shifted the responsibility of the range of services to the contractor. The supplier is now responsible for the delivery of the number and type of tires requested by the ICE on a monthly basis, as well as for the collection and treatment of waste tires.²⁰

18 Delivery on demand: tires delivery and collection is executed on the ICE's request through the emission of a purchase order.

19 ICE stores location: 4 stores are located in the Central Metropolitan Area, 5 in the Alajuela-Central Pacific region, 3 in the Chorotega region, 5 in the Atlantic region, and 2 in the Brunca region.

20 Tire purchase and tire collection and disposal services account respectively for 95% and 5% of the amount of the contract.

The contractor is requested to submit a monthly report containing detailed information regarding contract execution, such as the number of new tires delivered to the ICE storage facilities and the number of waste tires collected and treated. Additionally, the call for tenders for this contract contained the sustainable requirement for bidders²¹ to provide waste tires management and treatment services that comply with national regulations dealing with the disposal and treatment of waste tires.

Six national companies and one international company replied to the call for tenders. The contract of a value of US\$ 1.6 million (to date) was awarded to a local company, Distribuidora Ad Nat, SA for 1 year and ended in June 2011. Distribuidora Ad Nat, SA is specialized in the import and distribution of tires and offered to use its regional network to provide transport services for tire delivery and collection. The company highlighted its partnership with S.A.G. Geocycle Environmental Services Inc., member of the Holcim Group, world leader in cement production. Geocycle specializes in the management of industrial, commercial and institutional waste in Costa Rica with a special focus on co-processable waste in cement kilns. Distribuidora Ad Nat, SA partnered with Geocycle to manage the final disposal and treatment of scrap tires produced by the ICE that are used as combustible for cement fabrication.

21 Requirement contained in the tender document.

22 The average weight value of a tire is 20kg or 0.02Tonnes.

23 Global emissions of CO₂ are calculated as follows: (tonnes of tires transported*emission factor)/1000.

24 CO₂ emissions per tire are calculated as follows: (global emissions/number of tires transported)*1000.

25 Emission factor corresponding to a 22 Tonne truck.

26 Emission factor corresponding to a 15 Tonne truck.

27 Emission factor corresponding to a 3 Tonne truck.

28 Emission factor corresponding to an 8 Tonne truck.

Table 7: Reduction of emissions 2008 vs. 2010

Year	Transport Emission factor (kgeq CO ₂)	Number of tires	Tonnes of tires ²²	Kilometres travelled	Tonnes of tires transported	Global emissions of CO ₂ (teq CO ₂) ²³	Emissions of CO ₂ per tire (kgeq CO ₂ /tire) ²⁴
2008	0,206 ²⁵	5,300	106	100	10,600	2	0,4
	0,245 ²⁶	11,243	225	126,847	28,522,816	6,988	622
	0,716 ²⁷	978	20	11,030	215,747	154	158
	0,206	6,376	128	25,760	3,284,915	677	106
	TOTAL						7,821
2010	0,716	18,059	361	26,380	9,527,928	6,822	378
	0,390 ²⁸	2,006	40	2,932	117,632	46	23
	TOTAL						6,868

Results and impacts

The execution of the contract brought about several positive impacts. It led to overall annual cost savings of 20% since all operating costs were eliminated and transferred to the contractor that handles operations with greater efficiency.

Tire stocks are now minimized which reduced inventory and storage related administrative and operating costs by a factor of 9, and therefore diminished the obsolescence level of tires. Additionally, the new contract shifted the risk of theft, spill and loss of materials to the supplier.

New tires are now stored for an average of 1 month, versus 9 months when the ICE was handling all operations. This is explained by the fact that new tires are delivered directly to the ICE storage facilities, where they are stored for one month prior to being picked up by end users. New tires were previously delivered to the central warehouse facility located in San José, where they were stored for an average of 8 months. These tires were then transferred to the ICE storage facilities where they were stored for another month prior to being collected by end users.



Transport costs decreased by a factor of 4 with the execution of the new contract, since tire delivery and collection is now executed on a monthly basis, as opposed to once a week when the ICE was in charge of these operations. Additionally, the average number of kilometres travelled for the delivery and collection of a tire decreased in average by 4.5 times. The reduction in the number of kilometres travelled is due to streamlined delivery and collection operations. New tires are now directly delivered to the ICE storage facilities. Waste tires are collected and transported to the closest collection center²⁹, as opposed to being previously transferred back to the central warehouse in San José, and later on transported to collection centers located throughout the country. Results related to the transport efficiency of this contract are outlined in Table 6.

Table 6: Transport efficiency gains

Year	Number of tires transported	Number of kilometres travelled	Average number of kilometres travelled/tire
2008	23.897	163.737	6,8
2010	20.065	29.312	1,5

The important reduction in the number of kilometres travelled also enabled to reduce CO₂ emissions. In 2008, the operations generated 7,821 teq CO₂ or 886 kgeq CO₂ per tire, versus 6,868 teq CO₂ or 401 kgeq CO₂ per tire in 2010. A reduction in the emission of 953 teq CO₂ was achieved between 2008 and 2010, reducing the level of CO₂ emissions per tire of 54.7%, as outlined in Table 7 (previous page).

Regarding the disposal of end of life tires, the ICE focuses since 2009 on the following waste management strategies:

- Until 2009, some of the lots of scrap tires produced by the ICE were donated to social welfare organizations. This is no longer a practice followed by the ICE since the institution had no control over tire waste management procedures followed by these organizations.
- In 2009, the ICE reinforced its recycling strategy of waste tires with the implementation of the new contract. Hence, 127.5 tonnes of scrap tires were used as propellant for the fabrication of cement against 206.6 tonnes in 2010. The “co-processing” method used by Distribuidora Ad. Nat. SA under this contract showed some positive results in terms of

²⁹ Waste collection centers are located in Barranca, Alajuela, Colima/ La Carpio, Siquirres, San Isidro, Paradise and Colorado de Abangares.

2. TIRE MANAGEMENT SERVICES

energy production and CO₂ emissions. Comparative results for the use of 206.6 tonnes of waste tires in relation to commonly used fuels or raw materials under the co-processing method are highlighted in Table 8, below.

In addition to avoiding the production of 206.6 tonnes of waste, the co-processing method appears to be a valuable solution for energy generation. The use of scrap tires as combustible for the cement industry provides 15.6% more energy than the combustion of coal. This solution enables also to avoid the extraction of 244 tonnes of coal or 204 tonnes of petroleum coke for the same purpose. Furthermore, the combustion of waste tires produces less CO₂ emissions than other raw materials. It is estimated that this method generates about 30% and 6.5% less emissions than respectively the combustion of petroleum coke and coal.

Furthermore, the ICE is reinforcing its reuse strategy of waste tires through an increased implementation of the retread³⁶ method. In 2009 and 2010, 100 scrap tires were treated under this process. The ICE announced that more than 500 tires will be retreaded in 2011. This

will lead to significant cost savings since tire retreading increases the tire life-span of approximately 80%. A tire may under normal conditions be retreaded twice, and the cost of the retreading process is estimated at 50% of the value of a new tire. This process reduces recurrent purchasing costs of new tires by nearly 60%.

From a social perspective, the implementation of the contract fostered economic growth in the region. The supplier uses its network of regional distributors to execute the contract, which created 15 jobs in the area in 2009. This allowed the ICE to refocus internal transport resources previously involved with tire delivery and collection towards the institution's core activities, such as the transport of electricity and telecommunications material.

Positive effects on public health can also be noted since the elimination of open storage for waste tires contributes to the eradication efforts of the dengue fever in the region³⁷. Measures such as proper tire waste disposal prevent access by egg-laying female mosquitoes, and therefore contribute to the containment of the epidemic.

Lessons learned and key elements of success

The success of this contract relies on the combination of best acquisition practices and the integration of sustainability considerations into the procurement process. Public procurement legislation in Costa Rica allows for the use of various acquisition strategies among which the concept of "delivery on demand", that

30 Energy produced by the combustion of tires: 32 Gigajoule/tonne.

31 CO₂ emissions produced by the combustion of tires: 2.270 kgCO₂/tonne.

32 Energy produced by the combustion of coal: 27 Gigajoule/tonne.

33 CO₂ emissions produced by the combustion of coal: 2.430 kgCO₂/tonne.

34 Energy produced by the combustion of petroleum coke: 32.4 Gigajoule/tonne.

35 CO₂ emissions produced by the combustion of petroleum coke: 3.240 kgCO₂/tonne.

36 Retread: process whereby a used tire is remoulded to give it new treads.

37 World Health Organization, Fact sheet N°117, March 2009.

Table 8: Comparison of energy and emissions of waste tires vs. other common fuels

Fuel	Energy		CO ₂ Emissions	
	Energy generated (in Gigajoule/tonne)	Energy increase generated by the combustion of tires (in %)	CO ₂ emissions (in Kg CO ₂ /tonne)	CO ₂ emissions reduction generated by the combustion of tires (in %)
Tires	6,611.2 ³⁰	-	468,982 ³¹	-
Coal	5,578.2 ³²	15.6%	502,038 ³³	6.5%
Petroleum coke	6,693.8 ³⁴	-1.2%	669,384 ³⁵	30%

enables public entities to streamline internal processes and therefore increase operational and cost efficiency.

Additionally, national regulations promote the implementation of sustainable public procurement. Regulations encourage public entities to purchase and use reusable and recyclable products in order to minimize the impact of public activities on the environment.

One of the most effective ways to control the environmental impact is to build specific partnerships with other organizations such as suppliers. The knowledge of the market and the innovative solutions it may offer in that matter is part of the implementation of a sustainable procurement strategy. Public employees have a prominent role to play in that respect and their training is critical to the successful integration of sustainable considerations into the procurement process.

With that perspective in mind, the ICE conducted in 2008 several training workshops on the integration of environmental aspects into public tenders. The skills built by procurement employees during these sessions were directly used for the preparation of the upcoming contract for the distribution, collection and disposal management of tires.

Pursuing its efforts towards the promotion and implementation of sustainable public procurement, the ICE created in 2010 the Institutional Green Purchasing Committee. The Committee is composed of corporate employees specialized in different areas of supply and environmental management, who are responsible for raising awareness and training procurement personnel on sustainable procurement techniques and procedures.

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Entity contacts

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“As an institution, our commitment to the environment is a priority. This is due to the fact that our activity focuses on the generation of electricity supplied at 90% from renewable resources, and because we feel we have a responsibility as a public entity to protect the future for our society. We consider the proper use of natural resources of paramount importance for the sustainability of any organization, which is why our resources management strategy is oriented towards the protection of the environment. Our objective is to minimize the environmental impact of our activities, hence our efforts to incorporate sustainability criteria into all our contracts.”

Mr Johan Orozco, Logistics Management Directorate of the Institute of Electricity of Costa Rica ICE



Basic information

Country: France

HDI: 0.961

Entity: French Ministry of Education

Procured goods/services: Supply and delivery of remanufactured toner cartridges

Amount: € 310 138

End date: December 2011

Sustainable development impacts: economic, social and environmental

Size of the global market: 1.1 billion ink and toner cartridges sold per year³⁸

³⁸ European Toner & Inkjet Remanufacturers Association - <http://www.etira.org/w/environment/15>



Context

Legal framework and National Action Plan for Sustainable Procurement

The French legal framework for public procurement has been reviewed over the last few years. As a result, public policies now have to promote sustainable development in accordance with the EU directives of March 31, 2004 (2004/18/CE) as well as article 6 of the French Constitutional Charter of the Environment. Integrating sustainability component means considering not only economic development, but also social and environmental challenges when purchasing a good or service.

As a consequence of the EU legislation and of the Union's international commitments such as the Agenda 21, the French government adopted the National Action Plan for Sustainable Public Procurement (PNAAPD) in March 2007 covering a three-year period (2007-2009). It aimed at making France one of the most advanced European countries in the promotion of sustainable development through public procurement.

In 2006, the French Public Procurement Code (PPC) integrated sustainable development concerns through a set of articles described below:

- Article 5 deals with the determination of the needs. It states that public purchasers are required to conduct an in-depth needs assessment based on the availability of innovative solutions on the market. This phase should not be a simple and systematic renewal of previous contracts.
- Article 6 allows the introduction of sustainability considerations in technical specifications.
- Article 10 defines the allotment as the rule in Public Procurement and therefore promotes the access of SMEs to public procurement as main contractors and not only sub-contractors to bigger firms.
- Article 14 states that the conditions for contract



execution (delivery, packaging, transport...) may include social and environmental requirements.

- Article 15 provides an opportunity for public purchasers to contract businesses employing exclusively persons with disabilities.

Because of its greater impacts on all areas of sustainable development, the following case study will be dedicated to a Request for Tender under Article 15 of the French Public Procurement Code.

Toner cartridges purchasing: background

The Ministry of Education

In 2004, the French Ministry of Education launched a national Request for Tender related to the purchase of toner cartridges. To increase its bargaining power, the Ministry decided to order larger volumes. Thus, it broadened the scope of this tender, including not only the Ministry headquarters, but also regional departments and the headquarters the Ministry of Higher Education and Research, amounting to a total expenditure of € 2.2 million.

In 2008, the Ministry of Education carried out a project for the renewal of this previous toner cartridge contract, under a national context more favorable to the inclusion of sustainable development considerations into public procurement for a two year cartridge supply contract.

Project

Article 15: A new opportunity for the Ministry of Education

The Request for Tender was divided into two lots, as follows:

- Lot 1: supply and delivery of classical and remanufactured toner cartridges;
- Lot 2: supply and delivery of remanufactured toner cartridges, provided by businesses employing mainly persons with disabilities, within the

framework of article 15 of the Public Procurement Code.

According to Article 15, the Ministry of Education chose to source its toner cartridges from a supplier employing mainly disabled people. As this procedure was rather new at the time, the procurement process lasted longer than usual. To allow for the implementation of a real and concrete integration process of disabled people under this contract, the Ministry had to do an upstream market study.

After research, around sixty references of toner cartridges were included into lot 2, to be purchased in the framework of article 15 of the Public Procurement Code.

This study focuses on lot 2, and its economic, social and environmental impacts.

Sustainability criteria for bid evaluations of lot 2

The evaluation of the offer was carried out at the second phase of the process. The Ministry first evaluated the bidders' professional, financial and technical capacities. Under this scheme, the sustainable development policy criterion was given a 40% weight.

Table 9: Percentage allocation of evaluation criteria

Evaluation criteria	Percentage
Financial capacities	20%
Professional capacities	40%
Commitment for sustainable development	40%
Total	100%

Two companies applied to the call. The Ministry awarded lot 2 to the Association des Paralysés de France (*APF Entreprises 34 – The French Association of Paralyzed People*), an organization based in the French department of Hérault and dedicated to the support of disabled and paralyzed people.

3. LASER PRINTER TONER CARTRIDGES

APF Entreprises 34 was one of the first French organizations to apply to the Sustainable Development Standard AFAQ 1000 NR in 2008. This Standard evaluates the companies' commitment to sustainable development, based on four levels:

1. Commitment;
2. Improvement;
3. Maturity;
4. Exemplarity.



APF Entreprises 34 was ranked at the Maturity level. The international equivalent of AFAQ 1000 NR is currently the International Standard ISO 26000 delivered by AFNOR CERTIFICATION since November, 2010.

The purchase

APF Entreprises 34 has supplied the different regional and headquarters departments of the Ministry all around the country over the last two and a half years. The contract has been extended for a third year, until the end of 2011.

Table 10: Number of cartridges delivered

Year	Number of toner cartridges delivered	Cost
2009	1 962	€ 121 000
2010	2 021	€ 127 000
2011 (January to June)	985	€ 62 138
Total	4 968	€ 310 138

Source: APF Entreprises 34



Results and impacts

Environmental results and impacts

Currently 40% of the toner cartridges purchased by the Ministry are remanufactured compared to 6% prior to 2008. The Ministry started a communication campaign in 2008 which promoted the use of remanufactured toner cartridges and highlighted their lower environmental impacts.

The average savings in electronic waste obtained from a remanufactured toner cartridge is 1.5kg³⁹.

4.968 toner cartridges x 1.5 kg = 7 452 kg

It is therefore estimated that 7 452 kg of waste have been saved from January 2009 to June 2011.

In addition, *APF Entreprises 34* collects toner cartridges used by the Ministry departments in the following regions: Île-de-France, Provence-Alpes-Côte-d'Azur, Midi-Pyrénées and Languedoc-Roussillon regions. Since 2009, thousands of toner cartridges have been recovered.

Table 11: Cartridges and waste recovered

Year	Weight of recovered waste (used toner cartridges), kg	Number of used ink cartridges recovered
2009	3 528	2352
2010	4 851	3234
2011 (January to July)	3 103	2069
Total	11 482	7655

Economic results and impacts

This contract has positive economic impacts for both public purchasers and their supplier.

From the administration's point of view, the purchase of remanufactured toner cartridges carried a significant economic benefit since the cost for remanufactured toner cartridges is 30% to 40% lower than conventional toner cartridges⁴⁰. In fact, the Ministry spent € 310 138

³⁹ According to the consulting network Ecoconso, <http://www.achatsverts.be/> - Ecoconso is an initiative of Belgium associations, with the support of Belgium local authorities.

⁴⁰ <http://www.ecoconso.be/Les-cartouches-d-imprimante>

from January 2009 to June 2011. This represents a cost reduction of 30 % over two and half years.

It is important to underline the fact that supply quality has not been neglected since the same penalties and delays were required in both lots.

From the supplier's perspective, (*APF Entreprises 34*), the value of this contract has accounted for nearly 4.57% of the company's turnover since 2009.

Table 12: Contract value as a proportion of APF sales

Year	APF Entreprises 34 Sales	Amount of the contract	Portion (%)
2009	€ 2 640 000	€ 121 000	4.58%
2010	€ 2 750 000	€ 127 000	4.61%
2011 (January to June)	€ 1 391 777	€ 62 138	4.46%
Total	€ 6 781 777	€ 310 138	4.57%

Source: *APF Entreprises 34*

Financial benefits for the Ministry

The application of Article 15 had also a major financial impact on the Ministry of Education.

The law of 10 July 1987 sets the obligation for private companies and public entities with more than 20 employees to employ at least 6% of disabled persons. The Ministry of Education employed 1.5% of disabled people (12,498 employees) in 2010. If an entity does



3. LASER PRINTER TONER CARTRIDGES

not meet this requirement, it must pay an annual compensation fee to the *Fonds pour l'Insertion des Personnes Handicapées dans la Fonction Publique (FIPHFP – a fund for the integration of disabled people in public services)*. However, the law also states that entities may be allowed to depart from this rule by contracting companies employing disabled people, such as *APF Entreprises 34*, to reach their quotas, allowing a reduction of the annual compensation fee by up to 50%.

In the case of the Ministry of Education, the toner cartridge contract led to a fee reduction of € 41 330 in 2009 and € 49 332 in 2010.

Social results and impacts

The use of the specific procedure introduced by article 15 of the French Public Procurement Code allows the promotion of companies employing exclusively people with disabilities, such as *APF Entreprises 34*. Supplying

and delivering toner cartridges to regional and headquarter departments of the Ministry enabled *APF Entreprises 34* to provide full-time jobs to 7 disabled persons in 2009 and to 9 disabled persons in both 2010 and 2011.

Table 13: Jobs created

Year	Full-time worker equivalent dedicated to toner cartridges production and delivery ⁴¹
2009	7.81
2010	9.278
2011 (January to July)	9.42
Total average	8.5

Source: *APF Industrie 34 (Montpellier)*

⁴¹ Represents the equivalent of full-time jobs dedicated to disabled workers that have been created by this procurement for toner cartridges production and delivery



“The Ministry wants to make full use of public procurement as an efficient tool to strengthen its commitment towards sustainable development. This procurement has been the first one implemented by the Ministry of Education under the procedure outlined in article 15 of the Public Procurement Code.

We did an upstream and on-the-ground work to assess the commitment level of the firms employing disabled people. That was a question of credibility and responsibility of our action.

This procurement has allowed us to contribute to the insertion of excluded people, and at the same time to lower our impacts on the environment. Additionally, the dynamics of the market have allowed significant savings. Thanks to these positive results, we are currently working on replicating this experience and widening the application of the concept of sustainable public procurement to other purchases.”

Myriam Azoulay-Trojman, Chief of the Purchasers Network and Law Assistance Office, Procurement Department, Ministry of Education.



Lessons learned and key success factors

The improvements brought by the French Public Procurement Code

The above mentioned economic, social and environment impacts were made possible by the French public procurement code which allows, through its Article 15, for the possibility to favor an organization or a company employing mainly disabled people. The sustainability component has helped to improve their employability and to create a virtuous circle at all 3 levels of sustainability.

The Ministry of Education already wishes to increase the number of toner cartridges in the next call for tender, which is due to start in December, 2011.

An upstream work: identifying the market offer

Determination is crucial when working toward sustainability, as extra efforts are often required in terms of time, staff and other costs, but it is important to interpret up-front costs as long-term investments, as the study case clearly shows.

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- AchatsVerts.be: http://www.achatsverts.be/sousrubrique.php?id_rubrique=12

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4

Basic Information

Country: Hong-Kong, Special Administrative Region (SAR) of China

HDI: 0.862

Entity: The Transport Department of Hong Kong SAR (HKSAR)

Population: 7 million (2010)

Procured goods/services: LED Road Traffic Signals supply, installation and maintenance services

Amount: US\$ 9 million

Duration: 4 years

Sustainable development impacts: Economic, environmental

Size of the global market: US\$ 5.6 billion (2008)



Context

In May 2010, Hong Kong⁴² set a target of 50-60 % reduction of carbon intensity⁴³ by 2020, compared to 2005 levels. In 2008 Hong Kong's total Greenhouse Gas emissions were equivalent to 42 million tonnes of CO₂, which represented 0.1% of global emissions. Energy consumption increased by 26% from 1990 to 2007 in Hong Kong. The lighting sector constitutes quite a large proportion of the overall energy consumption, amounting to one sixth of total energy consumption.

In order to meet the challenge of climate change, the Government of Hong Kong announced in the 2008-2009 Policy Address its intention to enhance energy efficiency policies and to foster efforts towards a low-carbon economy. Subsequently the Government engaged into a series of initiatives to pursue this goal, such as promoting more efficient lighting systems and progressively restricting the sale of incandescent light bulbs.

The Government of Hong Kong is involved in an effort to implement sustainable public procurement which can play an important role in the promotion of energy-efficient lighting products. In 2000, the Stores and Procurement Regulations (SPR) were amended to require Government departments to give consideration, as far as possible and where economically rational, to the purchase of products with improved recyclability, higher recycled content, greater energy efficiency, and reduced use of toxic substances. The Government announced in the 2009-2010 Policy Address that it would expand the scope of sustainable public procurement and take the lead in making Hong Kong a "green" city, through the enactment of relevant legislation and the implementation of specific measures to promote sustainable development. In this perspective, an Inter-Departmental Working Group on Climate Change (IWGCC) led by the Environment Bureau was set up in 2007 and is composed of representatives from five bureaux and 16 departments among which the Transport Department of Hong Kong Special Administrative Region (HKSAR).

⁴² Declaration from Edward Yau, Secretary for the Environment of Hong Kong.

⁴³ The amount of carbon by weight emitted per unit of energy consumed.



Hong Kong SAR, China

The Transport Department is the authority responsible for managing road traffic, regulating public transport services, and operating major transport infrastructures. The Department's vision is "to provide the world's best transport system which is safe, reliable, efficient, environmentally friendly and satisfying to both users and operators". With the objective of promoting more sustainable transport solutions, the Transport Department implemented in 2008 a project for the territory-wide replacement of conventional traffic signals with Light-Emitting Diode (LED) traffic signals.

Project

In the perspective of reducing the environmental impact of its activities and reducing costs, the Transport Department of Hong Kong Special Administrative Region (HKSAR) has engaged in the LED Traffic Light Retrofit project, whereby all conventional traffic signals at 1,800 junctions currently employing incandescent lamps bulbs in Hong Kong were to be replaced by LED modules. This project is being implemented in three phases:

Phase 1: 400 junctions on Hong Kong Island

Phase 2: 640 junctions in Kowloon

Phase 3: 760 junctions in the New Territories

The first stage, covering traffic signals at about 400 junctions in Hong Kong region, started in February 2009 and was completed in the first quarter of 2010.

The second stage, covering traffic signals at about 640 junctions in Kowloon region, commenced in September 2009 and was completed in the first quarter of 2011.

The third stage, covering traffic signals at about 760 junctions in the New Territories region, has started in December 2010 and is expected to be completed in the third quarter of 2012.

About 63% of the road junctions in Hong Kong have been replaced with LED traffic light modules to date.

The Transport Department had been monitoring the development of LED traffic signals since 2000. The Department invited product samples from various suppliers in order to understand the technology level and prices in the market. Following this exercise, the Transport Department initiated a pilot scheme from May 2007 to February 2008, for the replacement of conventional traffic lights by LED modules at about 100 road junctions. After verification that the installed LED traffic signal modules were operating satisfactorily, the Transport Department took the decision to replace all conventional traffic lights by 85,000 LED traffic light modules in Hong Kong, through 3 public contracts.

⁴⁴ Power requirements provisions are contained in section 4.3.1. of TCS(PQ)-022.

⁴⁵ Millimetre.

⁴⁶ Reliability requirements provisions are contained in section 6.2.1. of TCS(PQ)-022.

Table 14: Technical specifications for LED signals

Specification area	Details
Power requirements ⁴⁴	Under day (bright) conditions, the average power for 210 mm ⁴⁵ vehicular traffic signals (red, amber and green), vehicular symbolic traffic signals (green arrows and amber "T") and pedestrian traffic signals (red and green) shall not exceed a nominal power of 15W
	Under night (dim) condition, the average power shall not exceed a nominal power of 10W
	For 300 mm vehicular traffic signals (red, amber and green), the average power shall not exceed a nominal power of 25W under day (bright) condition and 20W under night (dim) condition.
Reliability requirements ⁴⁶	The reliability for the LED road traffic signal module including the power supply shall meet mean time between failure (MTBF) of not less than 61,320 hours (7 years) under continuous operation

4. LED TRAFFIC LIGHT RETROFIT

The Transport Department published three calls for tenders in 2008, 2009 and 2010 for the supply and installation of LED road traffic signals on respectively Hong Kong Island, Kowloon and the New Territories. The replacement works covered the supply, installation, commissioning and contained a mandatory five-year defects liability period (DLP) for the LED signals. The object of the tenders dealt with the replacement of the optical assembly of the existing traffic signal aspect housing in use, composed of incandescent lamps and coloured filter combination. The LED retrofit of traffic light signals applied to traffic signal controllers, traffic lights and electronics audible traffic signals, and pushbuttonnes. Sustainable considerations were integrated into the procurement process in order to maximise the energy-efficiency of the equipment to be purchased. The technical specifications⁴⁷ were stated as described in Table 14 (previous page).

Furthermore, suppliers were required to submit monthly fault reports on all LED traffic signal failure incidents during the execution of the project, for the evaluation of the overall performance of the contracts.

47 Technical specifications provisions are contained in the document entitled "Specification for LED Road Traffic Signals" (TCS(PQ)-022).

The open tendering process used for each of the 3 contracts followed a prequalification scheme under which potential bidders were invited initially to submit their technical offer, in order to register on an approved suppliers list and be eligible for participation to the call for tender. The prequalification process⁴⁸ comprised 4 stages as described in Table 15.

Following the prequalification process that was completed in 2007, 2 suppliers were declared prequalified to submit their bid for the LED replacement contracts. Both of them participated in the tendering process for the 2 initial phases implemented in Hong Kong Island and Kowloon in respectively 2008 and 2009. An additional supplier was prequalified in 2009, allowing 3 suppliers to participate in the tendering exercise for the last phase of the LED replacement project.

48 Pre-qualification provisions are contained in the document entitled "Specification for Prequalification Procedures for LED Road Traffic Signals" (TCS (PQ)-(202).

49 Maintenance costs are the total costs for maintaining the whole traffic control system including other control equipment such as traffic signal controllers, traffic lights, CCTVs, and network.

50 The existing traffic signal controllers needs to be upgraded to suit the LED operation. This is a one-off expense in the order of US\$ 2.56 million. The expected life-span for the modification is 10 years therefore a cost of US\$ 1.79 is included in the above calculations.

Table 15: Tender prequalification process

Prequalification stage	Process description
Stage 1 - Preliminary Details	Suppliers are required to submit their technical proposal with full documentation on the equipment offered, along with relevant information on the supplying organisation and the proposed maintenance arrangements
Stage 2 - Initial Testing of Sample Equipment	Suppliers are required to submit sample equipment (including each type of LED road traffic signals tendered for) for assessment and testing in the laboratory of the Transport Department
Stage 3 - On-site Testing of Sample Equipment	Upon satisfactory completion of the initial testing stage, suppliers are requested to install the sample equipment at one or more road junctions for testing. The objective is to assess the operational performance of the equipment in actual situation
Stage 4 - Acceptance for Prequalification	Subject to the satisfactory completion of the entire evaluation process, suppliers are declared prequalified to participate in the call for tender

Table 16: Comparative cost estimates of LED and incandescent lamp modules (over 7 years, in million \$US)

Costs	Incandescent module	LED module	Savings (in million US\$)
Purchase costs	1,05	6,86	-5,81
Maintenance costs ⁴⁹	55,76	55,14	0,62
Energy costs	11,63	4,31	7,32
Equipment upgrade costs ⁵⁰	-	1,79	-1,79
TOTAL			0,34

The 3 contracts established under this project have an overall value of US\$ 9 million. Shun Hing Systems Integration Company Limited, a local agent of Panasonic Systems Sales Taiwan, was awarded the 2 contracts for the replacement of conventional traffic signals on Hong Kong Island and the New Territories in 2009 and 2010 respectively. Avion Group Company Limited, a local agent of Korea Electric Traffic Co. Ltd., was awarded in 2009 the contract for the replacement work in Kowloon.

Results and impacts

The replacement of incandescent traffic signals with LED systems will bring about a cost reduction estimated at US\$ 340.000 over the life-span of LED modules, representing an annual cost savings of US\$ 48.500. This is due to the fact that higher initial purchase costs of LED traffic signals are offset by a reduction in recurrent purchase and maintenance costs as well as energy costs over the life of LED systems, compared with incandescent lamp systems composed of halogen bulbs.

LED modules are designed to last between 60,000 to 80,000 hours while the average life-span of incandescent halogen lamp systems is estimated between 8,000 and 9,000 hours. The estimated cost savings of 2.7%

in maintenance of LED traffic signals are due to fewer requirements for attending fault maintenance and regular replacement of incandescent modules. LED modules are solid state devices with no moving parts whereas incandescent systems are composed of fragile glass and filaments that break easily. Moreover, halogen lamps cannot be manipulated with bare hands otherwise the quartz component of the halogen bulb would be exposed to salts and oils presents in the hand, which may cause the bulb to overheat when lit, and then quickly burn out. Oil prevents the thin layer of glass from allowing heat to escape properly, which is why incandescent lamps must be manipulated with gloves or cloth to prevent unnecessary contact, and wiped down if they are handled. The replacement of halogen lamps with LED systems saves therefore man-power resources used to clean the halogen lamp during installation. Additionally, LED traffic signals save on the average 63% of the electricity consumed by conventional incandescent signals. Comparative cost estimates of LED and incandescent lamp modules are outlined in Table 16.

Furthermore, LED modules have a greater luminous efficacy⁵³ than incandescent systems. During daylight hours (under normal mode), it is estimated that LED systems are on the average 78% more energy efficient

51 Candela. Figures extracted from Clause 4.1.2.1 in TCS(PQ)-022.

52 Lumen. The formula used to convert cd/W to lm/ W is $F = I * 2 \pi * (1 - \cos(A/2))$, i.e. $F = 1.841$.

53 The luminous efficacy of a source is a measure of the efficiency with which the source provides visible light from electricity.

Table 17: Energy use in Normal Mode

Type of light bulb	Minimum luminous intensity (in cd ⁵¹)	Nominal Power (in watt)	Estimated efficiency (in cd/W)	Estimated efficiency in (lm ⁵² /W)	Luminous efficacy increase of LEDs (in %)
210 mm					
Red	300	11,5	26,1	48,0	85%
Green	300	11,5	26,1	48,0	85%
Amber	360	12,5	28,8	53,0	86%
300 mm					
Red	600	17,5	34,3	63,1	88%
Green	600	16,5	36,4	66,9	89%
Amber	720	13	55,4	101,9	93%
Arrow	180	11,5	15,7	28,8	74%
Pedestrian Red	130	11	11,8	21,7	66%
Pedestrian Green	130	12	10,8	19,9	63%
T-signal	120	14,5	8,3	15,2	52%
Incandescent light bulb	200	50	4,0	7,4	-

4. LED TRAFFIC LIGHT RETROFIT



than incandescent modules, against 71% under dim mode, as shown in Table 17 and 17. From an environmental perspective, this contract allows for a projected annual savings of 7.88 million kWh and a reduction of 5,500 tonnes of CO₂ emissions, as outlined in Table 19.

The contract has had some important impacts on the local market. The Transport Department had been monitoring since 2000 the market for LED traffic signals. The quality of early LED products was unsatisfactory. Nevertheless, with gradual advancement in LED technology and intensive product development, there have been significant improvements in the quality of LED signals in recent years. The Transport Department initially invited various local agents representing foreign suppliers to submit their samples of traffic signal equipment, in order to be aware of the local market

Table 18: Energy use in Night (dim) Mode

Type of light bulb	Minimum luminous intensity (in cd) ⁵⁴	Nominal Power (in watt)	Estimated efficiency (in cd/W)	Estimated efficiency in (lm/W)	Luminous efficacy increase of LEDs (in %)
210 mm					
Red	150	7,5	20,0	36,8	80%
Green	150	8	18,8	34,5	79%
Amber	180	8	22,5	41,4	82%
300 mm					
Red	300	10	30,0	55,2	87%
Green	300	10,5	28,6	52,6	86%
Amber	360	10,5	34,3	63,1	88%
Arrow	90	7	12,9	23,7	69%
Pedestrian Red	65	7	9,3	17,1	57%
Pedestrian Green	65	8	8,1	15,0	51%
T-signal	60	10	6,0	11,0	33%
Incandescent light bulb	100	26,45	4,0	7,4 ⁵⁵	-

Table 19: Annual reduction in energy consumption and CO₂ emissions

Location	Electricity consumption before LED replacement	Estimated electricity consumption after LED replacement	Estimated electricity savings after LED replacement (in million kWh)	Annual reduction in CO ₂ emissions (in ton) ⁵⁶
Hong Kong Island	2,24	0,83	1,41	980
Kowloon	4,41	1,63	2,78	1.940
New Territories	5,86	2,17	3,69	2.580
TOTAL	12,51	4,63	7,88	5.500

technology advancements and prices. At the same time, the Department started engaging suppliers through the collaborative development of technical specifications for LED traffic signal equipment, in view of the upcoming LED traffic light retrofit project. Suppliers needed to invest considerable amount of resources in order to enter the market. They had to modify their products so that these were compatible with existing traffic signal equipment in Hong Kong. These technical modifications dealt with elements such as the number and layout of LED bulbs on the Printed Circuit Board, filters and reflectors design, control circuit adjustments to meet day and dim mode requirements as well as power consumption requirements and fault detection functions of the traffic controllers. Suppliers took generally between 9 months to one year to go through the modification and pre-qualification process.

The project value was initially estimated at US\$ 18 million, based on the prevailing market prices at the time of the implementation of the pilot scheme. LED unit costs have progressively decreased by 58% to 42% during the last phase of the project, which reduced the aggregated value of the contracts to US\$ 9 million.

Lessons learned and key elements of success

Traffic signals need to be reliable, function properly under different environmental conditions and must be compatible with the operations of the existing traffic signal controllers and systems. Suppliers who participated in the tendering phases have invested considerable amount of resources to make their products compatible with all existing traffic signal controllers in Hong Kong. Suppliers naturally expected to get a return on their investment through the expected upcoming business. The success of this contract relies on the sizeable market created by the Transport Department which encouraged suppliers to participate in the tendering exercises for these contracts. Additionally, technological advances have produced reliable LED products at low cost. Suppliers that have successfully developed LED traffic signal products compatible with the existing traffic signal system in Hong Kong have cultivated a competitive tendering environment,

⁵⁴ Dim mode luminous intensity is 50% of day mode (Clause 4.2.4 in TCS(PQ)-022).

⁵⁵ Same efficacy is assumed during dim mode for incandescent light.

⁵⁶ Calculations are based on an emission factor of 0,7kg/kWh as the territory-wide default value in Hong Kong.

and therefore rendered the project economically and technically viable. This successful experience may be duplicated in the future. The expertise gained through the implementation of this project may be applied to the replacement of other traffic control equipment by LED systems, such as conventional internal illuminated signs and belisha beacons.

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- C40 Cities Case Study “Hong Kong LED Traffic Light Retrofit”
- “Powering Hong Kong: by Sustainable Lighting” (The Professional Commons, 2009).
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- Internet website of the Treasury Branch Financial Services and the Treasury Bureau (<http://www.fstb.gov.hk/tb/eng/procurement>)

Entity contacts

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Basic information

Country: Italy

HDI: 0.854

Entity: Municipality of Ferrara, Region of Emilia Romagna

Population: 135 369 inhabitants

Procured goods/services: Organic food

Amount: 7 033 162 € for a 3 year contract, 2 680 567 € for school year 2010/2011

Duration: 3 years

Sustainable development impacts: environmental, social, economic

Size of the global market: 37.5 million hectares cultivated for organic food all around the world (0.9% of agricultural land)⁵⁷

⁵⁷ This estimate made is based on data from IFOAM and others: <http://www.agencebio.org/>



Context

Organic food in Italy, a model for European countries

With 44,000 producers, Italy holds the first place in Europe and seventh place worldwide for the number of organic farms. With over 1 million hectares of certified organic farmland corresponding to more than 9% of the agricultural land, Italy ranks second in Europe and eighth in the world with respect to acreage devoted to organic farming.

Control of organic food in Italy and legal framework for public organic food procurement

In Italy, organic certification is undertaken through a system of approved private inspection bodies, authorized by the control authority for organic agriculture, the Ministry for Agriculture, Food and Forestry Policies (MiPAAF – *Ministero delle Politiche Agricole Alimentari e Forestali*). The ministry has set up a specific office for organic agriculture in the Economic & Rural Development Department, under the General Direction for Agri-food Development, Quality and Consumers Guardianship. Besides this office, another department of the Ministry, the Central Inspectorate for Quality Control of Agri-food Products (ICQ), is in charge of the guardianship towards the private certification bodies and institutional control over all operators in the agri-food sector, including therefore organic farmers, processors, canteens and retailers.

Sustainable food procurement has quite a long history in Italy. Indeed, the “Guidelines for a Healthy Italian Diet”, published by the National Institute for Nutrition, explicitly promoted back in 1986 the Mediterranean food model in public catering.

A multifunctional view of school meals supports sustainable procurement in 3 ways: contracting authorities have complete control over the service; they have the possibility of discriminating in favour of local operators and of using a broad interpretation of “best value”.

The municipalities manage by themselves (using an internal structure) the catering service for school



canteens, or outsource it to private companies through call for tenders.

Sustainable school catering in Ferrara

The city of Ferrara, the capital of the province of Ferrara in the Emilia-Romagna region, has 135,369 inhabitants. Despite the large share of agriculture in the local economy (12.7% in 2010⁵⁸), the number of farms has been decreasing dramatically over the last years, making this a crucial issue for the municipality.

The case below presents the situation of school catering in Ferrara, a pioneer city in Italy.

In 2010-2011, 13.458 students were registered in the different schools of the city and split as follows:

Table 20: Number of students in various age groups

Age	Students in Municipality of Ferrara
0 to 2 years	3 013 students
3 to 5 years	2 858 students
6 to 10 years	4 671 students
11 to 13 years	2 916 students

In Ferrara, *l'amministrazione comunale gestisce direttamente la Ristorazione scolastica* in a total of 14 nurseries, 17 pre-schools, 25 primary schools and 6 secondary schools.

School catering can be organized either directly by the school (when it has its own kitchen) or it can be organized by the administration. The municipality of Ferrara has developed two distinct requests for proposal (RFP) for school catering:

The first type of RFP aims at buying organic food directly to suppliers and processing it in the own kitchen of schools, preparing meals on site. It is important to underline the fact that this type of catering concerns municipal nursery schools only. It also clearly shows the municipality's political will to invest in people.

The second type of RFP relates to schools having their organic meals delivered after being prepared in a large central production kitchen. This mainly applies to State schools (pre-schools, primary and secondary schools

and summer camps). Meal production and meal delivery work in a linear manner, being perfectly coordinated and belonging to one process, with very strict quality control system was put in place in 2001. Cooked food is delivered in containers to the various canteens every day. Furthermore, controls are regularly done on food products on one hand, but also on the equipment used on the other hand.

Project

From a “food - man – environment” project to a pioneer position in sustainable school catering

The city of Ferrara engaged in sustainability challenges very early and committed to a process of change as early as the 1990s.

On May 20th, 1994, the city council of Ferrara adopted a global project named “Food – man – environment” (*Cibo-uomo-ambiente*). This ambitious project aims at promoting students' health and well-being through the municipality's commitment to organic food in school canteens. This project benefited from a particular attention since it was set up directly in relation with the universal right of children to meals and nourishment, and the guaranteed access to healthy food. It is important to underline that at that time, offering organic food was a pioneering approach.

The city of Ferrara then identified two main challenges:

1. There had to be quality agriculture, to respect the environment and to preserve local traditions and know-how.
2. The second challenge was to ensure compliance between sanitary and quality requirements of the Municipality as well as budgetary and legal constraints.

The “Food – man – environment” project tried to tackle these challenges by focusing on two main directives: making choices for the municipality canteens that would respect the environment on the one hand and betting on the students' curiosity for taste on the other hand. The project actually intended to make Ferrara students aware of what responsible consumption meant.

58 Source : Municipality of Ferrara

5. ORGANIC FOOD FOR SCHOOL CHILDREN

This approach led to the introduction of organic food in the menus without any impacts on meal prices.

Before launching the program, the city of Ferrara conducted a feasibility analysis which highlighted a range of available organic products which would not entail any cost increases. Cost was a central issue since families were quite skeptical, not to say reluctant to organic food at the beginning.

The project started in two pilot pre-schools in 1994 before spreading to all pre-schools the following year.

Organic food was progressively introduced in school canteens and has now reached 85% of the food in 2011. In 1998, for instance, the following organic foods were offered to children between 0 and 5 years old: bread, pasta, rice, dry beans, can tomatoes, flour, marmalade, potatoes, carrots, lettuce salad and apples. In 2000, organic bananas were added to this list and organic food was offered to all children between 0 and 13 years old.

Since 2000, the city of Ferrara has renewed its contracts for organic food every 3 years: for instance, in 2006, a 3 year contract amounts to € 3 745 901 for a total of 1 305 000 meals served. In 2009, the contract was renewed again, this time for € 7.033.162 and a total of 1.553.000 meals will have been served by 2012.

- The study case will focus on the figures for the school year 2010-2011: 1 608 nursery and pre-

school students eating at the canteen from Monday to Friday;

- 4.088 primary and secondary school students eating in average 2 days a week at the canteen.

Strong and ambitious requirements to promote organic food

In the framework of the project, one common evaluation criterion was validated for the RFP of both calls for tender (for canteens cooking onsite and for those being delivered the meals): all companies applying for the bid had to resort to suppliers ISO 14001 or EMAS certified.

Besides, both RFPs stipulated that the following food items had to be organic: bread, pasta, corn flour, rice, dry beans, tomato cans, tomato purée, flour, marmalade, pearled barley, soluble barley, chamomile, orange juice, beef, green salad, potatoes, carrots, apples, bananas, frozen vegetables, pasteurized eggs.

The company which won the bid even went beyond the requirement of the RFP by offering additional organic products. Thus, by proposing a wider range of organic products, this company enabled the municipality to fulfill its objectives: providing healthy food for children to get aware of the variety of tastes in the nature.

Efforts on cleaning services

On June 30, 2010, the municipality of Ferrara got ISO 14001 certified for its environment management system. In the framework of this certification, one of the areas of improvement relates to the cleaning of the canteens (kitchen and eating room) in a more environmentally-friendly way. Thus, the following requirements were included into the RFPs concerning cleaning services:

- Use of safe products with a very low environmental impact (biodegradable products for ground cleaning, soap for hands, detergent for dishes...);
- Use of micro-fiber clothes;
- Cleaning staff training to recycling by the Education Services Institution (*Instituzione dei Servizi Educativi*).

Some actions in favor of waste recycling

As part of the « Food – man – environment » project, the city of Ferrara also tried to foster recycling in school canteens, promoting the sorting out of rubbish. To do so, teachers, support staff, kitchen staff and other employees got trained. In the school year 2010-2011, plastic and paper recycling was imposed to all schools. On top of that, 11 schools also recycled biodegradable wastes, mainly coming from served food. However, the



recycling of organic wastes is still very limited due to some problems linked to the waste collection. This will improve once an agreement is signed with the company in charge of collecting wastes (*Azienda per la raccolta pubblica – HERA*).

Awareness-raising actions to recycling and fight against food wasting

During the school year 2010-2011, the municipality collaborated with its supplier to raise awareness and hence different initiatives were put in place. A recycling kit was distributed in the Ferrara schools; awareness-raising flyers about recycling and waste reduction were also handed out. Additionally, a bag made out of 100% organic cotton was given to every student so that the latter could put the food he or she would not have eaten (bread, fruit...) inside to bring it back home, so as to minimize waste.

School catering as a tool for the dialogue between cultures

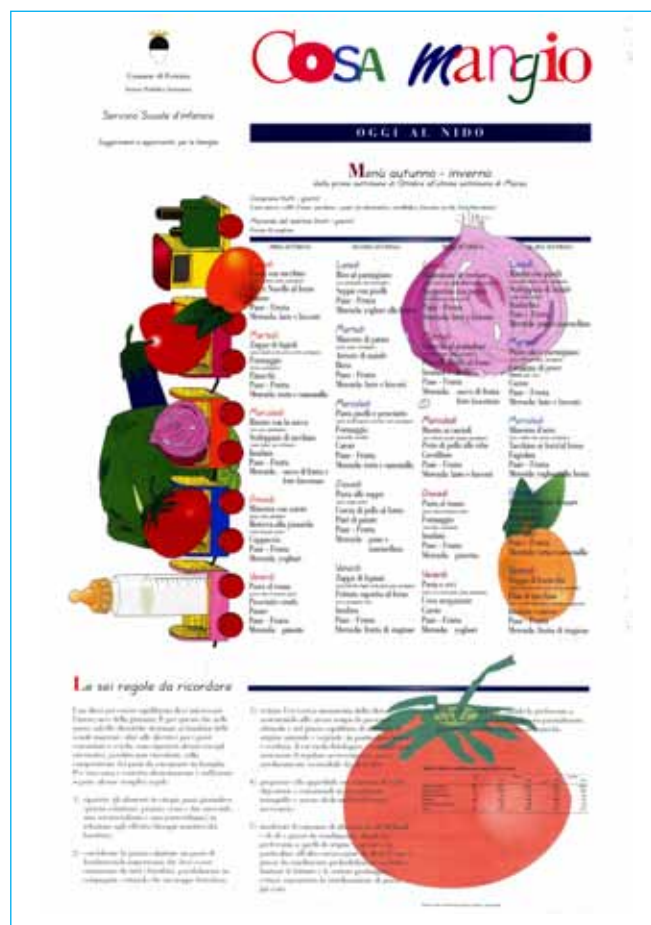
In its sustainable school catering project, the city of Ferrara included specificities on multiculturalism. Thus, students in all Ferrara public schools can have meals prepared with halal or kosher chicken, turkey or beef meat, in respect of either Muslim or Jewish traditions.

Besides, theme lunches have been organized in all canteens. By offering exotic menus, the City of Ferrara aimed at making children discover foreign culinary dishes, new flavours to open their senses.

Results and impacts

As mentioned above, the RFP for organic farming bans the usage of fertilizers, pesticides, insecticides, fungicides, and genetically modified organisms in farming. Among the positive impacts which are often referred to, the following ones are really worth being mentioned:

- The deep and surface water pollution is reduced thanks to organic farming. With conventional farming, those waters are indeed easily polluted by nitrates which are wastes of synthetic fertilizers resulting from leaching and field lixiviation.
- Biodiversity is protected and people's health was not endangered thanks to the prohibition of the usage of synthetic pesticides in organic farming.
- The use of petrochemical products could be reduced by imposing organic farming. This is important in so far as those chemicals (fertilizers, pesticides, insecticides, fungicides, growth stabilizers) need much energy to be produced.



However, in this case, we will only consider GHG emissions.

If the positive impacts of organic farming on the environment and on people's health are commonly recognized, quantifying them in a precise way is still difficult today. For the positive environmental impacts for instance, several experts⁵⁹ contend that organic farming allows savings ranging between 0 and 30% of greenhouse gases (GHG) compared to conventional farming. Indeed, nitrogen fertilizer is cited as the biggest energy sink in non-organic production. Not only is nitrogen fertilizer produced with fossil fuel but the conversion process to usable fertilizer is energy intensive and logically triggers off GHG emissions⁶⁰.

Thus, emission factors were calculated for a large number of products. The emission factor of a product shows the quantity (in carbon equivalent or in carbon dioxide equivalent) of greenhouse gases emitted by the production of one kilogram of the said product. Thanks to these factors, the maximum GHG emissions saved through the introduction of 85% organic food in the

59 Environmental impacts of food production and consumption, A Research Report Completed For The Department for Food and Rural Affairs by Manchester Business School, December 2006.

60 Energy use in organic food systems, Natural Resources Management and Environmental Department, FAO, Rome. August 2007.

5. ORGANIC FOOD FOR SCHOOL CHILDREN

Table 21: Reference scenario: Carbon impact of a menu composed of standard menu for a primary school student

Course	Product					Emission (g C-equiv)
Starter	Salad	Tomatoes	Carrot	Potatoes		
Weight (g)	50	80	100	80		11,2
Emission Factor (g C-equiv/kg product)	144	144	144	144		
Frequency	0,25	0,25	0,25	0,25		
Main dish	Chicken	Pork	Beef	Eggs	Fish	
0,5Weight (g)	60	60	60	50	60	66,6
Emission Factor (g C-equiv/kg product)	630	1350	4870	345	620	
Frequency	0,25	0,4	0,05	0,05	0,25	
Starches	Pasta	Rice				
Weight (g)	45	45				14,2
Emission Factor (g C-equiv/kg product)	195	795				
Frequency	0,8	0,2				
Vegetable	Tomatoes	Zucchini	Peas/Spinach	Beans		
Weight (g)	40	40	40	40		5,8
Emission Factor (g C-equiv/kg product)	144	144	144	144		
Frequency	0,3	0,25	0,2	0,25		
Other	Parmesan	Mozarella/Ricotta	Bread	Vegetable oil	Fruit	
Weight (g)	8	45	50	20	100	165,5
Emission Factor (g C-equiv/kg product)	3280	1620	270	370	455	
Frequency	1	1	1	1	1	
					Total (g C-equiv)	= 263,3
					Total (g CO ₂ -equiv)	= 964

Table 22: Maximum GHG savings under different scenarios

	Scenario 1: Carbon emission from food coming 100% from conventional farming		Scenario 2: Carbon emission from food coming 100% from organic farming		Scenario 3 : Carbon emission from food coming 85% from organic farming	
	Nursery	Primary	Nursery	Primary	Nursery	Primary
GHG emission for one meal (g CO ₂ -equiv)	677	964	474	675	504	719
Number of students	1608	1635	1608	1635	1608	1635
Number of Scholar days	200	200	200	200	200	200
Total GHG emission (t CO ₂ -equiv)	533		373		397	
CO ₂ maximum saving compared to scenario 1 (t CO ₂ -equiv and %)	-		160 (30%)		136 (25,5%)	

Ferrara canteens can be calculated more precisely. To do so, a standard menu reflecting the variety of food offered to the Ferrara students throughout the year was created. Coefficients were given to the different products depending on how often they were part of the students' menus. Thanks to the emission factors, the carbon impact of the standard menu could be calculated for food items coming from organic farming and for those coming from conventional farming.

GHG savings were first calculated in carbon equivalents. Then, the result was formulated in CO₂ equivalent with a simple conversion. (in 1kg of CO₂ there is 0,2727 kg of carbon⁶¹). So, to convert a carbon equivalent result into a CO₂ equivalent result, a multiplication by 1/0,2727=3,66 must be done).

Different carbon impact scenarios

The emission factor changes if the product under consideration is organic, as well as the amount (in grams) depending of the age of the child (student at the nursery or at the primary school). To do so, it was assumed that organic farming emitted 30% GHG less than conventional farming did to get the same results in terms of productivity. For the municipality of Ferrara, it is also essential to take into account the fact that 85% of the menus served in the school restaurants come from organic farming. The maximum GHG savings are summarized in Table 22.

Assuming that organic farming emits at most 30% GHG less than conventional farming, with 85% of organic food in the canteen menus, the city of Ferrara can save between 0 to 136 tonnes of CO₂ equivalent per year for the total amount of menus served. This represents a 25.5% maximum reduction compared to an alternative scenario without organic food.

Key success factors

At all stages of the process, efforts were made to raise awareness about the stakes of sustainable school catering. Taking into account the constraints of all stakeholders (schools, students, parents, and organic farmers) was decisive to make this project successful. The feasibility study was a key step as it to the identification of different constraints and to learn about the possible suppliers as well as the quantities they could deliver, which in turn helped define minimum requirements. This first contact with the suppliers was

⁶¹ Molecular mass calculator : <http://www.webqc.org/mmcalt.php>

also crucial since it provided ownership of the project.

Family constraints and fears were also carefully considered. Everything was done so that the introduction of organic food in the meals offered in the school canteens would not entail any price increase. Besides, students were made aware of food waste issues.

Those initiatives all contribute to make the project successful today and in the long run. Stakeholder engagement is key for sustainable public purchasing and even more for school catering. The commitment of the kitchen staff, the students' parents and of the students themselves was crucial to achieving actions such as recycling or tackling food waste successfully.

The sustainability project launched by the City of Ferrara includes all dimensions of sustainability (environment, social and economy but also other dimensions) and efforts keep being made to move forward. Nutrition quality, environmental education, rhythm of life, waste recycling are among the many issues the Municipality of Ferrara takes into account, making its school catering project an important reference at the national level.

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6

Basic information

- Country: England, UK
- HDI: 0.947
- Entity: Joint venture called YORbuild (Local government bodies from Yorkshire and Humber)
- Population: (Yorkshire and Humber) 5 301 000
- Procured goods/services: Construction
- Amount: \$471 m (£300 m) per annum
- Duration: 4 years
- Sustainable development impacts: environmental, social, economic



Context

With a spending level across all local authorities in the Yorkshire and Humber region of England said to be \$1.86 bn per annum, construction is the largest category of expenditure. The vast sums of money invested into construction contracts, tied to the high potential impacts of this activity, have led to the development of a more innovative approach towards sustainability.

“YORbuild is a series of collaborative construction frameworks for the procurement of new build, refurbishment and design build construction works for the Yorkshire and Humber region’s 22 local authorities and other regionally based public sector bodies, including third sector organizations. The YORbuild framework has been developed to provide collaborative construction frameworks for the region’s local authorities, public sector bodies and third sector organizations.

YORbuild is structured to complement the geography and diversity of demand across the region. The Yorkshire and Humber region covers some 15,500 square kilometers with a population of approximately 5 million situated in its cities, towns and villages.”⁶²

The framework participants include Leeds City Council, Scarborough Borough Council, Rotherham Metropolitan Borough Council, and East Riding of Yorkshire Council. The joint venture was funded by the Yorkshire and Humber Regional Improvement and Efficiencies Partnership (RIEP).

Project

The YORbuild framework is a 4 year agreement between the YORbuild local authorities and the firms⁶³ it chose to award the contract to. As detailed in YORbuild’s documentation, the framework offers the following benefits to its signatories:

⁶² YORbuild – <http://yorbuild.com/>

⁶³ Over 400 applications were received in December 2008 to participate in the YORbuild Framework procurement process with over 200 duly completed pre-qualification questionnaires submitted for evaluation. A shortlist of 132 Contractors were invited to tender against a challenging tender document which examined the qualitative and commercial aspects of the tendering contractor in detail. List of the contractors appointed to a specific areas lots of the YORbuild Framework: <http://yorbuild.com/contractors/>



England, UK

- Provides five different call-off methods⁶⁴ to suit users' individual needs, which can be administered in a matter of weeks as the requirements of EU legislation have already been met;
- Engenders flexibility in the allocation of price/quality weightings;
- Facilitates appointment of contracts under the NEC3⁶⁵ suite of contracts, which is the Government Procurement Service's (UK central government) recommended form of construction contract for the public sector, respected for its encouragement of sound project management principles practices, and legal foundation;

The framework was divided into 6 lots to encourage a greater diversity of contractors. By proceeding in this manner, YORbuild aimed at offering the same opportunities to both large companies and SMEs, the latter often being subcontractors of the former.

The YORbuild framework resulted in the initiation of 97 construction projects in 2010 but by far and away it's most innovative aspect is the effort that was made in the initial procurement process – and the call-offs thereafter – to try to incorporate all three pillars of sustainable development.

Social pillar

Under social responsibility, YORbuild focused on actively promoting employment and skills through formal contractual arrangements rather than the usual 'best endeavours' approach, which is passive. As part of the evaluation, bidders had to populate a table committing 'investment' in a number of relevant areas. For projects of a certain size – respecting the thresholds already mentioned for the 6 lots – they had to decide on a level of commitment for the following: number of school/college site visits and workshops, participation in university research, work experience placements for

⁶⁴ A call off method is a type of contract which offers more flexibility

⁶⁵ NEC3 is a family of contracts that facilitates the implementation of sound project management principles and practices as well as defining legal relationships. It is suitable for procuring a diverse range of - Works, Services and Supply spanning major framework projects through to minor works and purchasing of supplies and goods. <http://www.neccontract.com/>

16-17 year olds, work experience plus entry and level 1 qualifications for people aged 18+, apprenticeships, and development of the existing workforce through things like national vocational qualifications (NVQs)⁶⁶. The numbers submitted were compared to pre-determined scheme specific industry baselines. These were verified by a body known as 'Construction Industry Training Board (CITB): Construction Skills' and provided to the bidders as an addendum to the tender documentation. In the subsequent evaluation, ambition above or below those levels was scored appropriately. The higher the value of specific projects, the more YORbuild expected from bidders in terms of improving employment opportunities and skills generation.

Economic pillar

The strength of positive economic impacts can be argued through the inclusion of local companies in the supply chain for sub-contracting arrangements and as materials and plant suppliers, and also by the involvement of social enterprises, the 3rd sector, and community groups.

During the tender evaluation, potential contractors were asked to explain their supply chain management, including their interactions with SMEs found within the areas they work. Once finalised, the framework imposed a supply chain engagement programme that aimed at integrating more SMEs into framework contractors' supply chains.

YORbuild also sought to maximise positive impacts on the local economy. The project actively encouraged bidders to show how they had adopted locality-focussed supply chain management practices in the past (via a request for case studies) and furthermore, to demonstrate how they could bring benefits to the local economy through their framework activities. The

⁶⁶ NVQ stands for National Vocational Qualification. It is a 'competence-based' qualification: this means participants learn practical, work-related tasks designed to help them develop the skills and knowledge to do a job effectively.

NVQs are based on national standards for various occupations. The standards cover what a competent person in a job should have in terms of relevant skills. As students progress through the course, they compare their skills and knowledge with these standards as they learn, so they can see what they need to do to meet them. http://www.direct.gov.uk/en/EducationAndLearning/QualificationsExplained/DG_10039029

6. YORBUILD SUSTAINABLE CONSTRUCTION

initiators of the YORbuild project were particularly keen to learn about the inclusion of local subcontractors in the wider supply chain of bidders, particularly in sourcing building materials and plant machinery made within the region. Priority was also given to those bidders that could demonstrate proactive relationships with the 3rd sector, i.e. voluntary and community groups, charities, and social enterprises.

Environmental pillar

Construction is a sensitive sector when it comes to the environment. This is why companies have to demonstrate efforts made to limit environmental damage. For the YORbuild framework, the bidders' knowledge and experience of carbon reduction techniques and renewable energy technologies was taken into consideration, as was organisational commitment to waste reduction and recycling.

YORbuild determined 2 major parameters:

- Carbon reduction techniques in construction, and
- Construction waste measures.

Regarding carbon reduction techniques, the YORbuild framework required all contractors to demonstrate their ability to use mitigation techniques. By imposing a carbon reduction criterion, YORbuild expected the contractors to:

- Show a high level of proficiency in terms of specific knowledge and experience of carbon reduction technologies;
- Explain how appropriate technologies and techniques could be used specifically as part of the framework itself to deliver tangible carbon reductions across the region;
- Put forward an extensive and appropriate governance regime; and,
- Offer a formalised implementation plan.

All bidders had to provide 3 examples of past experience in terms of sustainable construction. A favourable allocation of points was given where the company could demonstrate having previously adopted far-reaching approaches in the pursuit of sustainable building solutions. Additionally, YORbuild were careful to make it clear that its definition of robust sustainability would consider the design process as well as the construction phase itself.

Aside from carbon-related matters, YORbuild gave special attention to construction waste. In the UK, the construction industry generates almost a third of the

country's total waste. To tackle this issue, the bidders were required to show continuous improvement in terms of waste **reduction** and waste **recycling**. Robust evidence had to be provided to support the projections. In line with the waste hierarchy, preference was given to bidders who focused on waste reduction rather than on recycling alone.

Table 23: Overall Evaluation Parameters

Supply chain management	<ul style="list-style-type: none"> • Transparent approach • Encouragement of local supply chain sourcing • Effective measurement and management
Employment and skills	<ul style="list-style-type: none"> • Proactive intervention • Linked to project award/delivery • Use of key performance indicators (KPIs)
Environment	<ul style="list-style-type: none"> • Practical project based effort • Zero waste to landfill mentality/ carbon reduction • Sustainability-conscious design and good contract management
Economic regeneration	<ul style="list-style-type: none"> • Focus on recycling the local £ • Support of social enterprise and SMEs • Continuous improvement

Table 24: Breakdown of Evaluation Scoring

Price	50%
Quality	50%, of which:
General quality component	• 35%
Social responsibility	• 10%
Environmental sustainability	• 5%

Results and impacts

The YORbuild construction projects undertaken so far relate to different types of buildings, including: schools, hospitals, public office buildings, and residential housing. Whilst the socioeconomic impacts of construction projects are usually independent from the purpose of the resulting building, environmental impacts are more directly applicable to the use of the final building. Therefore, we will discuss socioeconomic impacts across the broad spectrum of all projects managed through the YORbuild framework, whereas for environmental ones; we will focus on 2 specific projects: Carleton Community High School and Humberside Police Headquarters construction sites.

Table 25: Waste Reduction - Five-year Performance

	Benchmark	2009	2010	2011	Target
Waste arising per £100k	10 tonnes	57 tonnes	13 tonnes	5.1 tonnes	5 tonnes
Waste to landfill per £100k	4 tonnes	1.6 tonnes	0.66 tonnes	0.27 tonnes	2 tonnes

Social impacts

The overall project has had considerable social impacts; for example, thus far: 2,091 school pupils have attended construction site visits/workshops; 286 people have progressed from training to employment as a direct result of the scheme; 310 sponsored NVQs have been completed for existing staff; 195 work experience placements have been provided; and, 45 apprenticeships have been offered.

This is far beyond the targets set by the CITB⁶⁷ construction expertise center which recently awarded the National Skills Academy for Construction status to the YORbuild framework in recognition of its ground-breaking work. Indeed, YORbuild is the only framework in the whole country to be awarded this honor. This encourages the CITB to keep providing both funds and resources to assist YORbuild contractors, thus helping to train new people.

Substantial efforts have also been made to create partnerships with a myriad of organizations in the construction sector, including Education Business Partnerships and the Yorkshire and Humber Apprenticeship Training Agency (YHATA). YHATA's mission

67 CITB: Council and Industry Training Board <http://www.cskills.org/>



is to lead to the development of flexible and high quality construction apprenticeships from the perspective of both employers and apprentices in the region.

Environmental impacts

In the YORbuild case, the intention is that all construction projects should take project-specific environmental impacts into account. For instance, a large number of schemes have achieved BREEAM⁶⁸ 'very good' ratings. Furthermore, numerous projects have incorporated at least one of the following techniques/technologies: passive systems for ventilation and lighting, rainwater harvesting, combined heat and power generation, microgeneration (incl. photovoltaic cells, air source heat pumps, & wind turbines), solar panels, recycled-content/renewable materials, and green roofs.

As mentioned previously, YORbuild pays particular attention to construction waste. Monitoring waste figures is an obligation because the YORbuild framework is a signatory of the Waste and Resources Action Programme's (WRAP's) 'halving waste to landfill' initiative. The current performance figures below show that there is a strong trend towards continuous improvement. Additionally, the results show that YORbuild projects have already reached the WRAP-related target. Thus, the following KPIs are applied to all YORbuild call-offs:

68 **BREEAM Label**, <http://www.breeam.org/page.jsp?id=66>
 BREEAM sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognized measures of a building's environmental performance.
 A BREEAM assessment uses recognized measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes.

Impacts taken into account :

- market recognition for low environmental impact buildings,
- confidence that tried and tested environmental practice is incorporated in the building,
- inspiration to find innovative solutions that minimize the environmental impact,
- a benchmark that is higher than regulation,
- a system to help reduce running costs, improve working and living environments,
- a standard that demonstrates progress towards corporate and organizational environmental objectives

6. YORBUILD SUSTAINABLE CONSTRUCTION

Table 26: Waste Reduction

YORbuild framework – Waste reduction onsite	Results/Statistics from case study sites
<p>The KPI used for monitoring construction waste arisings, set by the construction company (BAM construction), is 130 m³/£1 million. At the point of drafting this case study, both construction projects were roughly half-way to completion. The company concedes that more waste is produced in the 2nd part of the construction process but based on the data provided up to press, it looks like their target, which is already ambitious (higher than the industry standard), is likely to be reached and perhaps improved upon.</p>	National statistics for waste production in the construction sector
	<p>Average density for construction waste (ADEME): 0.84t/m³ Average construction waste: 10t per £100k, 100t per £1million tranche of works 100t/0.84, which is equivalent to 119 m³/£1 000 000</p>
	Focus on the impacts of construction site 1 – Carleton Community High School
	<p>The KPI for construction waste set by BAM construction is 130 m³/£1 million. This construction site represented £8 900 000. As for the KPI itself, the data gathered to date for the project show that 60.7 m³ of waste were created per £1 million of project expenditure. As such, the company made significant inroads towards achieving a better standard than its KPI. (119 m³/£1 000 000) – (60.7 m³/£1 000 000) = 58.3 m³/£ 1 000 000 (58.3 m³ × £8 900 000) / £1 000 000 = 518.87 m³ In this construction site, the efforts made by the firm (via YORbuild coercion) have enabled a waste saving of 518.87 m³.</p>
	Focus on the impacts of construction site 2 – Humberside police HQ
<p>The KPI for construction waste set by BAM construction is 130 m³/£1 million. The value of the construction project represents £23 000 000. As for the KPI itself, the data gathered for the project at the time of this study showed that 57.6 m³ of waste had been created per £1 million of project expenditure. As such, the company has made substantial progress towards achieving a better standard than its KPI. (119 m³/£1 000 000) – (57.6 m³/£1 000 000) = 61.4 m³/£ 1 000 000 (61.4 m³ × £23 000 000) / £1 000 000 = 1 412.2 m³ For this project, the commitment of the company, under YORbuild direction, has allowed them to save 1 412.2 m³ of waste from being generated onsite.</p>	

Table 27: Energy Reduction

YORbuild framework – Energy reduction onsite	Results/statistics from case study sites
<p>BAM target for CO₂ production is 14,000kg CO₂/£1m.</p>	Focus on the impacts of construction site 1 – Carleton Community High School
	<p>Thus far, 22,641kg of CO₂ has been produced as part of the project. Against the spend linked target, the result achieved up to this point is 8,250kg CO₂/£1m. This shows that performance in respect of minimising site specific emissions is very good.</p>
	Focus on the impacts of construction site 2 – Humberside police HQ
<p>Thus far, 130,787.4kg of CO₂ has been produced as part of the project. Against the spend linked target, the result achieved up to this point is 22,098.9kg CO₂/£1m. This shows that performance in respect of minimizing site specific emissions is underperforming at present.</p>	

- Reduce waste arising to under 10 tonnes per £100k tranche of works
- Reduce waste to landfill to under 5 tonnes per £100k tranche of works
- Recover 70% of construction waste
- Recover 80% of demolition and excavation waste
- 15% of materials used to be recycled/reused
- Performance must be reported on the WRAP Waste Reporting Portal at <http://reportingportal.wrap.org.uk>

As already explained, since the YORbuild Framework covers a large number of constructions and those constructions are largely homogenous in nature – when it comes to waste, water, and energy use onsite – we have chosen to focus on two YORbuild projects in order to assess their sustainability credentials covering the construction process itself:

1. Construction site 1*: Carleton Community High School (which aims to obtain a ‘very good’ level through BREEAM)
2. Construction site 2*: The Humberside Police Headquarters (hoping to achieve an ‘excellent’ BREEAM rating)

**For reference, both buildings were constructed by the BAM Construction company.*

In order to measure waste, water, and energy flows, the company used its own monitoring tool called BamSMART, a tool based on a programme developed by the Building Research Council. Performance statistics for the two sites mentioned are given in Tables 25, 26, and 27.

Economic (market) impacts

The initial development of YORbuild’s local sourcing program has seen the framework management team organise and deliver 4 ‘meet the buyer’ events, which have been attended by over 1.200 delegates from regional YORbuild suppliers, their subcontractors, and potential new entrants. In addition, a partnership is being formed with Think Zero, who will be assisting the YORbuild team in further developing engagement strategies with a view to bolstering the local economy even further through YORbuild’s cross-tier supply chain relationships. Based on the meet the buyer attendance, surveys have shown that 73% of the attendees found new clients and 27% found opportunities to bid for subcontracting work under one of the main YORbuild contractors, hence showing the success of the initiative.

Analysis has shown that the efficiency improvements provided by consolidation of demand across the YORbuild participants has equated to a cost reduction of approximately 10%. The business plan moving

Table 28: Water Reduction

YORbuild framework – Water reduction onsite	Results/statistics from case study sites
BAM have a site target for mains water usage in the construction process, which is 95m ³ /£1m.	Focus on the impacts of construction site 1 – Carleton Community High School
	Total on-site water usage thus far has been 501.3m ³ and against the KPI, performance is currently 182.7m ³ and as such, is not currently on target and will require some focused action to redress the balance. It may well be that as the construction process progresses, water usage shows a natural reduction or perhaps the site itself lends itself to higher water intensiveness. Please note that the final building will include rainwater harvesting, which will result in a substantial reduction in ongoing water consumption at the school, once it’s operational.
	Focus on the impacts of construction site 2 – Humberside police HQ
	Total on-site water usage thus far has been 292m ³ and against the KPI, performance is currently 49.3m ³ and as such, is well on target. Please note that the final building will include a sustainable urban drainage system (SUDS). Although this won’t reduce water consumption, it will assist in reducing pollution, controlling flooding, recharging groundwater, and enhancing the environment. Furthermore, permeable tarmac will be used, which will enable the harvesting of rainwater and will help reduce flood risk.

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forward is to capture some of the efficiency savings from the framework and recycle them into a fund that will help provide resources which can thereafter be invested into a bilateral initiative called '4 Good Projects'. These will take the form of grant awards and users of the framework will be able to apply for them where they can show that their proposals offer significant and sustained benefits to respective local communities.

Key success factors and lessons learned

YORbuild is a very good example of how taking a pragmatic approach in terms of sustainability can reap significant benefits. In order to influence all sustainable development pillars, the Yorkshire and Humber regional partners identified one of the most important sectors in terms of sustainability impacts, i.e. construction. Through the insertion of strong environmental and socioeconomic criteria, the framework has been able to secure a suite of fully capable contractors, in terms of social responsibility experience and expertise. So far, the framework has proven hugely successful, surpassing all expected targets, and this has set the backdrop for even more impressive achievements going forward. The challenge now is for the contracting authorities using the framework to display heightened ambition and be more forward thinking when specifying their requirements, especially from an environmental and social perspective. Nevertheless, the omens are good and there is much cause for optimism.

The upshot of YORbuild's focused work is that the infrastructure in the region should become progressively greener and create greater added value, not just in terms of new buildings but also refurbishment and retrofitting projects as well. The framework could have many indirect

benefits as well. For instance, in a social housing complex built using the framework, there should be incorporated measures that make the accommodation more energy efficient. In turn, this should mean that generally, poor and vulnerable tenants will save money on their utility bills, thus helping to alleviate fuel poverty. Schools and other public sector buildings party to the framework will also harness the potential to achieve lower energy costs and the opportunities given to people that might otherwise be lacking appropriate skills or unemployed reduces the pressure on the taxpayer-funded benefits system underpinning our welfare state and helps prepare the local economy for future growth. The efficiency gains from consolidating regional public sector demand have been approximated to be in the order of tens of millions of pounds over the lifetime of the agreement, which will save a considerable amount of money.



The YORBuild Framework Management Team



Members, from left to right:

Fergus Aitken - East Riding of Yorkshire Council - Framework Manager - East Area;

Michael Mullins - Rotherham Metropolitan Borough Council - Framework Manager - South Area;

David Gomersall - Scarborough Borough Council - Framework Manager - North Area;

David Galloway - Leeds City Council - Framework Manager - West Area;

Mark Scott - Leeds City Council - Employment and Skills Coordinator.

Lessons Learned

The YORbuild joint venture offers the following lessons:

- Sharing competences and knowledge about both sustainable procurement and the construction sector is highly beneficial.
- Creating this sort of framework allows for better results in terms of sustainable development by pushing the market to deliver sustainable solutions.
- The key success factor of this project is its pioneering socioeconomic work and the innovative approach it adopted with the aim of creating efficiency savings and supporting strategic objectives around sustainable development. Furthermore, a strong collaborative ethos between local authorities was pivotal in the creation of the YORbuild joint venture and this new structure has helped all of the partners to not only spend more wisely but also, deliver shared societal benefits as well. In fact, the common link between all of the framework goals was efficiency.

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“The YORbuild Framework is an excellent example of an intelligent and collaborative approach to procurement which delivers improved efficiency and maximises socioeconomic and environmental outcomes. Central to the framework’s success has been close cross Local Authority working and a focus upon measurable outcomes from the integrated framework management strategy. The YORbuild Framework has led the way in developing intelligent and value adding frameworks on a regional basis and the framework is now complimented by similar frameworks for civil engineering, consultancy services and social housing which provide a single regional source for collaborative procurement solutions. Through the frameworks use we are seeing competitive costs for project delivery and high levels of employment and skills, waste and carbon reduction, supply chain engagement and the creation of funds which can support community activities. The YORbuild Framework has provided the capacity to all Public Sector Bodies based in the Yorkshire and Humber to improve the efficiency, socioeconomic and environmental outcomes and provides a solid basis for developing similar framework arrangements on a sustainable basis in the future.”

Nigel Leighton, East Riding of Yorkshire Council – Director of Neighbourhoods and Environment Services and Chair of the YORbuild Framework Management Board.



Basic information

- Country: Scotland, UK
- HDI: 0.849
- Entity: the Government of Scotland
- Population: 5,194,000⁶⁹
- Procured goods/services: Temporary staff and business management consultancy
- Amount: \$144 million per annum
- Duration: 3 years
- Sustainable development impacts: social, economic

⁶⁹ Demographic Change in Scotland, Scottish Government, <http://www.scotland.gov.uk/Publications/2010/11/24111237/3>



Context

Around one-quarter of the Scottish population (26.7%) faces challenges and related to literacy issues. Geographic clustering of these problems can also contribute to the economic difficulties faced by some areas in comparison with others.

Scotland's economy relies heavily on small and medium sized enterprises (private sector firms with fewer than 250 employees). Small or Medium Enterprises (SMEs) account for 99% of the total number of Scottish businesses and for over half of all private sector employment, underlining their pivotal role in Scotland's economy and their high potential. They greatly contribute to support less able individuals and help to improve literacy and numeracy levels. However, many of these firms have not historically 'reached up' and competed successfully for public sector business opportunities.

The Scottish Government's purpose is "to focus Government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth". The key challenge for procurement professionals in the Scottish public sector is therefore to reach this goal while maximizing economic efficiency in public expenditure.

The Scottish Government seeks to capitalize on the opportunity to further support economic growth by providing access to public contracts for Small and Medium Enterprises.

Project

The supply of flexible staff (temporary and consulting staff) for the Scottish public sector involves around 700 separate organisations and thousands of stakeholders. Temporary work constitutes a well-recognised route into the workforce used by a cross-section of society from entry level to highly experienced professionals⁷⁰. While the requirements of public sector organizations and stakeholders are very diverse with public expenditures

⁷⁰ The Recruitment and Employment Confederation: <http://www.rec.uk.com/about-recruitment/externalrelations/campaigns/tempingfacts>



Scotland, UK

that reach up to US\$ 144m per year, the potential to use this purchasing power to facilitate economic growth and education of the workforce in Scotland is considerable.

Market research conducted for the procurement of these framework agreements, showed that consultants and temporary staff were part of a continuum “flexible resource” that went from relatively unskilled jobs right up to director/partners of Multi-national consultancy firms, costing up to US\$ 4 000 per day. The Scottish Government chose to tender for the whole continuum under one large group of coordinated exercises. They decided to break the continuum down into 13 separate frameworks to allow SMEs to compete. In order to meet the Scottish public sector’s complex requirement for flexible staff, Scottish Procurement set up 5 framework agreements that supply Business Management Consultants and 8 that supply Temporary staff (it includes, for example, road sweepers that are employed to cover longer absences like maternity leaves or long term-illnesses).

Aim

Carry out a public procurement exercise that reduces costs and at the same time facilitates and encourages local economic and skills growth by:

- Increasing coordination and collaboration in the sourcing of flexible staff across the Scottish public sector;
- Increasing SMEs access to public sector business opportunities;
- Working with suppliers towards increasing numeracy and literacy levels, to improve career progression.

Solutions

- Engage and work with a wide range of potential suppliers prior to the tender exercise
- Encourage smaller firms to collaborate with each other in order to bid for complex contracts and compete more successfully with larger firms
- Design a procurement strategy that facilitates equal competition from firms of all sizes
- Allow bidders the freedom to innovate in how they deliver training initiatives.

Delivery

Twelve months prior to publishing the tender, Scottish Procurement met with suppliers, user organisations of all sizes and with the Scottish Government’s Office of the Chief Economic Advisor⁷¹ in order to gain a detailed understanding of the supply market and the users’ requirements. In addition to informal meetings and surveys, the team held “Supplier Engagement Days” where Scottish Procurement Authorities shared their sourcing strategies and expectations from the market as well as the likely scope of resulting tender exercises.

This included suggesting consortia and sub-contracting as company structures through which several firms might formalise new or existing relationships in order to demonstrate sufficiently wide geographical cover and range of services for the frameworks agreement. Each meeting included networking opportunities during which firms were able to exchange contact details and forge new relationships. Standard tendering timescales were extended to promote collaboration between potential bidders and the team agreed to take a flexible approach when successful bidders came to formalise their partnerships. In order to further increase SME participation, the requirement was split into specialist markets (e.g. separate frameworks for administrative staff and for catering staff). This allowed small groups of niche firms to compete alongside larger firms. Several frameworks were split into regional lots, allowing geographically limited suppliers to bid for the business in their area. As the tenders were completed using a two-stage, short-listing tender process, companies that failed to progress to the second stage were given the opportunity to enter into sub-contracting relationships with those firms that did progress. Complete lists of successful bidders at both tender stages were published on the Procurement Scotland website for all companies to access.

A requirement to facilitate literacy, numeracy and career progression improvements in the flexible workforce was included within the specifications. Firms were asked to

⁷¹ The Scottish Government, Office of the Chief Economic Adviser: <http://www.scotland.gov.uk/Topics/Economy/EconDept/OCEAEcon>

7. CONSULTANCY & TEMPORARY STAFF SERVICE

propose their own solutions. The innovative proposals included: directing innumerate and illiterate individuals towards government-funded education and employment schemes (for example, the Scottish Government's "The Big Plus"⁷² scheme), developing working partnerships with Job Centres, and implementing professional training and progression schemes for workers under their care.

Results and impacts

The Scottish Procurement exercise looked to remove barriers to SME participation and to require companies to support training, which brought about the following results in 2011:

- 15 SMEs (14 based in Scotland) were awarded contracts as suppliers on national collaborative sourcing agreements (out of a total of 53 primary contractors), where none were named previously;
- A total of 33 SMEs gained access to public sector business opportunities through either consortium or subcontracting, where none were named previously;
- Via the frameworks, 3000 temporary work placements were made through companies that are now required to support improvements in workers' training (e.g. literacy, numeracy and career progression). One of the aims of the frameworks was to establish a detailed baseline for levels of literacy and numeracy training as the only 'baseline' was that the companies had not previously been directed to support these initiatives;
- 44% of total public expenditure on temporary staff procurement is now dedicated to SME firms;
- Savings of up to 46% have been realized on expenditure on flexible resources. This means that there is a cost reduction of 46% compared to previous costs; and
- Companies that had previously operated only in direct competition have now collaborated to compete for Scottish public sector business opportunities: 51 separate firms developed collaborative bids in order to win contracts within the framework agreements. The total number of firms collaborating to work on the frameworks and the total number of new collaborations (including consortia and subcontracting relationship are:
 - › 9 new consortia and 15 firms that are using sub-contractors on consultancy frameworks; and

- › 3 consortia and 3 firms using subcontractors on the temporary staff frameworks.

Work is already underway to include explicit targets and key performance indicators relating to literacy and numeracy in the next re-tender of the Scottish Procurement sourcing frameworks (likely to be tendered in 2014). This will continue to develop the Scottish Government's policy of providing opportunities for all of Scotland to flourish.

Lessons learned

Prior to these procurement exercises, the provision of flexible staff in Scotland was fragmented across 700 organizations. Regionalised collaboration of this scale had never been achieved before in the procurement of staffing solutions. The only collaborative solutions available required UK-wide range of services to be covered and so favoured larger firms that had small "economic footprints" in Scotland. By working closely with the market and by encouraging them to join forces, firms that had previously been in direct competition began to collaborate and therefore were able to compete and win public sector contracts.

By designing a sourcing strategy that encourages competition from smaller firms and requires suppliers to promote education and career development, sustainable procurement not only supports local jobs and local economic growth but also contributes to raise the skills level of the Scottish workforce.



⁷² The Big Plus, The Big Plus is Scotland's campaign to promote the free help that's available across the country <http://www.scotland.gov.uk/Topics/Education/Life-Long-Learning/17551/big-plus>

Lessons learned:

- Working in partnership with supply markets, prior to full competition or tender, allows firms to offer innovative solutions;
- Sustainable procurement can deliver positive outcomes for all parties concerned: the buying organisation, the suppliers and the wider community;
- Firms that are unwilling to be flexible can be left behind in the face of innovative procurement strategies; and
- Measuring the impact of training initiatives has been a difficult exercise - very detailed Key Performance Indicators should be included in contracts for procurement solutions that target training, literacy and numeracy improvement.

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- The Recruitment and Employment Confederation: <http://www.scotland.gov.uk/Topics/Economy/EconDept/OCEAEcon>
- The Big Plus: <http://www.scotland.gov.uk/Topics/Education/Life-Long-Learning/17551/big-plus>

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“The Scottish Government takes sustainability seriously, and this means more than protecting our environment. Our national frameworks for temporary staff are a great example of socially and economically sustainable procurement. The contracts are open to 700 different public organisations, located right across the country.

And yet, our approach encouraged SMEs to compete for and win regional business in Scotland. It also secured substantial savings and made suppliers work with 3000 temporary staff to improve numeracy, literacy and professional skills.”

Alex Neil MSP, Cabinet Secretary for Infrastructure and Capital Investment



8

Basic information

Country: United States of America

HDI: 0.902

Entity: Metropolitan Regional Government of Portland (Oregon)

Population: 3.8 million (Oregon)

Procured goods/services: Waste transport

Amount: \$180 million

Duration: 10 years

Sustainable development impacts: social, economic, environmental



Context

What is Metro?

The Metropolitan Regional Government of Portland, so-called Metro, is an elected regional government of Oregon that serves more than 1.5 million residents in Clackamas, Multnomah, Washington counties and 25 cities in the Portland region. It is a public entity of the State of Oregon which is located on the Pacific coast of the United States.

Metro involved in sustainability

Metro has been promoting sustainability for a number of years. Its goal is to work with communities, businesses and residents to create a vibrant and sustainable region for all. In recent years, Metro has been experiencing high unemployment rates due to the global economic downturn.

The Metro Charter, approved by voters in 1992 and amended in 2000, states that:

“We, the people of the Portland area metropolitan service district, in order to establish an elected, visible and accountable regional government that is responsive to the citizens of the region and works cooperatively with our local governments; that undertakes, as its most important service, planning and policy making to preserve and enhance the quality of life and the environment for ourselves and future generations; and that provides regional services needed and desired by the citizens in an efficient and effective manner, do ordain this charter for the Portland area metropolitan service district, to be known as Metro”.⁷³

Metro and its legal framework

In the field of sustainable public procurement, the public procurement code is based on state law and makes local action and promotion of local minorities, women and small businesses by Metro possible. The Metro Code is divided into titles, each corresponding to an area of Metro’s jurisdiction under the Charter (solid waste, planning...). The procurement and contracting policies are found in Chapter 2.04 of the Metro Code and identify specific steps to be taken to ensure a level

⁷³ Preamble of Metro Charter, November 1992



United States of America

playing field for small emerging businesses. The Metro Code is consistent with the state procurement code found in Oregon Revised Statutes, Chapter 279A, B and C. In recent years Oregon revised its procurement code based on the Model Procurement Code developed by the American Bar Association.

Project

Metro and waste transport: background...

In 2007, Metro decided to secure a long-term contract to haul solid waste from its transfer stations to a disposal site up to the Columbia Gorge, seventy miles away from Portland. Starting in 1989, Metro contracted a trucking firm to provide the service, but over the years, the contract became hard to manage for the Solid waste division of Metro. Because of corporate restructuring and buyouts, the trucking firm was no longer locally owned, but part of a larger national corporation based near Chicago, Illinois. Moreover, the firm faced environmental issues due to the lack of investment in maintenance and replacement of trucks. Through a huge amount of work and a proactive Request for Proposal (RFP), Metro was able to secure quality services through a financially solid contractor, while at the same time working towards the protection of the environment and providing local economic and social benefits. From planning and development to contract negotiation, each stage of the procurement cycle now takes into account sustainable development.

Determination of needs and public meetings – Pre-procurement and market engagement

The procurement process started 2 years before the end of the on-going contract, synchronizing the process with overall institutional needs. Metro began a dialogue with the local community, by connecting people, sharing the decision-making process to discuss the social aspects of waste transport. They organized public meetings with community groups, neighborhood associations and environmental advocates in order to determine what was important in the selection process of a new contractor and to give a voice to their concerns and priorities. They developed a draft RFP and shared it with the transport industry for contributions. Even if trucking had historically been the industry that

hailed the regional waste, the rail and barge sectors were also considered viable alternatives and therefore included in the process.

Sustainable development in the RFP: an opportunity to recover from recession

The finalized RFP document included the inputs from all stakeholders (transport industry, local community,...). The challenge for Metro was to balance the RFP requirements and maintain a fair and open process. The RFP paid particular attention to environmental impacts, provision of local jobs and economic impact in the region. It was a good way to create added value given the economic downturn in this region. Award criteria is detailed in Table 29 (next page).

Selection and contract negotiation

A total of 8 offers were submitted by different suppliers, proposing various modes of transportation, although trucking was predominant (7 bidders). In order to assess the 8 proposals, Metro engaged external expertise in the selection process and hired a consulting engineer specialized in waste industry. Based on the criteria described above, each proposal was evaluated and scored.

Finally, after all deliberations, Walsh Trucking, located in Gilliam County, was the firm selected for award of the 10-year contract.

Results and impacts

Environmental results and impacts

Estimations show that the contract has had the following positive impacts:

- In 2010, Walsh Trucking, the selected firm, transported 12 787 loads (one load is equivalent to one truck) of waste. They travelled 3.9 million miles per year to haul solid waste from Metro transfer stations to the Columbia Ridge Landfill compared to the 5.7 million miles with the previous contractor. The significant reduction is partly due to larger payloads of trucks used by the current contractor (larger trailers holding 35 tonnes), therefore reducing greenhouse gas (GHG) emissions by 2 800 teqCO₂ (14% reduction compared to the previous contractor).

8. SUSTAINABLE WASTE TRANSPORT

Table 29: Award criteria

Criteria	Points (Max: 100)	Details
Cost	45	
Operational considerations	25	Proposed sustainable practices - Flexibility of the system in adapting to changes in technology, fuel supplies or transfer station relocations/additions
Environmental impacts	20	Evaluated emissions: (1) Generation of particulate matter, particularly as they impact Metro area (2) NOX and SOX emissions (3) Total emissions of carbon dioxide and other greenhouse gases
Socioeconomic impacts	10	The impacts included: (1) Noise and traffic effects on neighborhoods (2) Enhancement of regional freight mobility in the Metro area (3) Supporting economic development in Gilliam County: half of the truck drivers would be based out of Gilliam County (4) minority, women, and emerging small business utilization of subcontractors and suppliers

- Fuel efficiency: All trucks are equipped with automatic idle shutdowns after 5 minutes to conserve fuel. This system has an impact on fuel savings and greenhouses gases emissions. Regarding fuel savings, there is a reduction of fuel consumption of 5% as well as a 5% reduction on GHG emissions, equivalent to 460kgeqCO₂. All trucks use B5 fuel, containing 5% of biodiesel, further reducing GHG emissions by 460 kgeqCO₂.
- Finally, all trucks respect US EPA (United States Environmental Protection Agency) standards concerning NO_x emissions and particulate matters. Regarding NO_x emissions, an estimation based on the truck manufacturer data shows a reduction of 60.9 tonnes of NO_x, equivalent to 95.6% reduction compared to the previous contractor.

Previous contractor	63.7 tonnes of NO _x (11.17 g NO _x /miles*5.7 million miles)
Walsh	2.8 tonnes of NO _x (0.73 g NO _x /miles*3.9 million miles)

- Regarding particulate matters (PM), the new equipment reduced emissions by 1.2 tonnes making it reduction of 80% compared to the previous contractor.

Previous contractor	1.5 tonnes of PM (0.26 g de PM/miles *5.7 million miles)
Walsh	0.3 tonnes of PM (0.08 g de PM/miles *3.9 million miles)

In addition to the previous positive impacts described above, all trucks are equipped with automatic air

systems to keep the tire at maximum air pressure which extends mileage, hence increasing fuel efficiency and therefore further reducing GHG emissions.

Socioeconomic results and impacts

Thanks to the new waste contract, 39 drivers were recruited locally out of a total of 52 having a positive impact on the unemployment.

Since 2010, the waste transport contract has contributed to the economic revival of the region. Gilliam County receives \$1.75 per ton of solid waste (+\$.45 for each ton of special waste) reaching \$2,492,835 in 2010. The funds are redistributed to cities, social funds and public projects and Small Business Development for the economic strengthening of the region.

Key success factor and lessons learned: US public procurement code, a tool for SPP

Key success factors

The public procurement code based on the Oregon State law (Oregon Revised Statutes, Chapters 279 A, B, and C) has definitely played a key role to ensure the feasibility and the sustainable nature of this procurement contract.

The Code gives purchasers in the possibility to promote local businesses. State laws provide the ability to give preference to resident bidders and to local production. It can take the form of a specific margin of preference (5% for example) given to local bidders.

Thus, Metro had the legal possibility to set up its own criteria which favored local businesses in the procurement process.

Metro promotes minority and women businesses which are highly represented in the Portland area.

Lessons learned

The method used to determine needs was definitely a key element to make this purchase a success in term

Examples of criteria used by Metro

Diversity in Employment and Contracting:

- Work Force Diversity: Describe your work force demographics (number of employees, race and gender) and the measurable steps taken to ensure a diverse work force
- Diversity in Contracting: Describe your history of working with diverse firms, including any MWESB-certified firms¹.
- Diversity of Firm: Describe the ownership of your firm and whether or not your firm is certified by the State of Oregon as an MBE, WBE or ESB².

Sustainable Business Practices:

- Economy: Describe your business practices to reduce environmental impacts of your operations.
- Environment: Describe your support of local businesses and markets within the Portland Metro region.
- Community: Describe the employee compensation structure of your organization.

¹ MWESB : Minority Women and Emerging Small Business

² MEB (Minority Business Enterprise) WBE (Women Business Enterprise) ESB (Emerging Small Business): These programs are designed to promote economic opportunities for small businesses. As the sole certification authority in Oregon, OMWESB provides a “one-stop” certification process for Oregon disadvantaged, minority- and woman-owned and emerging small businesses. Certification opens the door to targeted government contracting opportunities <http://www.oregon4biz.com/Grow-Your-Business/Business-services/Minority-Owned-Business-Certification>

of sustainability. Indeed engaging with stakeholders, ranging from the neighbour association, to environmental NGOs, not forgetting expert lawyers, enabled to clearly identify the different needs and stakes. This was critical to come up with an “out of the box” solution, tailor-made in order to satisfy all stakeholders. Even though stakeholder engagement makes sense when thinking in terms of sustainability, this is too often underestimated. To this extent, the determination about the method is innovative.

The process of transporting waste was also entirely overhauled. By analysing and rethinking each step of the process, a more sustainable approach was adopted. From bigger trucks to the less polluting engines, all these solutions now contribute to make waste transport in Metro more sustainable, from both an environmental and a socio-economic point of view.

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“Working with our solid waste department during the planning stage was a privilege. It allowed our office to collaborate on a procurement method that would be most effective for our solid waste disposal program. I believe it is a good example of the strategic role procurement should be playing, particularly in contracts that are high dollar and high impact to public agencies”.

Darin MATTHEWS, Chief procurement officer for Metro



Notes

About the UNEP Division of Technology, Industry and Economics

Set up in 1975, three years after UNEP was created, the Division of Technology, Economics (DTIE) provides solutions to policy-makers and helps change the business environment by offering platforms for dialogue and co-operation, innovative policy options, pilot projects and creative market mechanisms.

DTIE plays a leading role in three of the six UNEP strategic priorities: climate change, harmful substances and hazardous waste, resource efficiency.

DTIE is also actively contributing to the Green Economy Initiative launched by UNEP in 2008. This aims to shift national and world economies on to a new path, in which jobs and output growth are driven by increased investment in green sectors, and by a switch of consumers' preferences towards environmentally friendly goods and services.

Moreover, DTIE is responsible for fulfilling UNEP's mandate as an implementing agency for the Montreal Protocol Multilateral Fund and plays an executing role for a number of UNEP projects financed by the Global Environment Facility.

The Office of the Director, located in Paris, coordinates activities through:

- > **The International Environmental Technology Centre** - IETC (Osaka), which implements integrated waste, water and disaster management programmes, focusing in particular on Asia.
- > **Sustainable Consumption and Production** (Paris), which promotes sustainable consumption and production patterns as a contribution to human development through global markets.
- > **Chemicals** (Geneva), which catalyzes global actions to bring about the sound management of chemicals and the improvement of chemical safety worldwide.
- > **Energy** (Paris and Nairobi), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.
- > **OzonAction** (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.
- > **Economics and Trade** (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies. This branch is also charged with producing green economy reports.

UNEP DTIE activities focus on raising awareness, improving the transfer of knowledge and information, fostering technological cooperation and partnerships, and implementing international conventions and agreements.

For more information, see
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This publication outlines the sustainable development and market transformation impacts of sustainable public procurement (SPP) practices through eight case studies that were selected, among other criteria, on the basis of the availability of data, relevance and expected impacts. In order to reach out to public purchasers around the world, the selected studies are both representative of current SPP practices and transferable.

A tailored approach to each case has been developed to assess the impact of SPP on sustainable development since different purchases and contexts require specific parameters for comparison and analysis. The criteria for measuring the impact of sustainable procurement are specific to each market, and differ when considering a contract for goods (furniture, ITC) or services (cleaning). The study analyzes the sustainable development impacts of the various choices made throughout the procurement cycle.