

# **Realising Aspirations: Case studies**

**Accompanying the report, Realising Aspirations, from the Accounting for Sustainability Group, convened by HRH The Prince of Wales**

**Realising Aspirations and supporting documents are available on the internet:  
[www.princeofwales.gov.uk/speeches/asg.html](http://www.princeofwales.gov.uk/speeches/asg.html)**

Meeting the challenge of incorporating sustainable principles into the heart of procurement practice is something which many organisations are already starting to grapple with successfully. Increasingly the adoption of broad-based decisions in procurement are producing tangible benefits, in terms of both value and broader social and environmental objectives.

The following case studies are drawn from both UK and international projects, and demonstrate a variety of innovative solutions to the many challenges of sustainable procurement.

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# **UK PRIVATE SECTOR CASE STUDIES**

## **1. British Telecom's green energy contract**

BT is a company with enormous purchasing power, and a clear commitment to procurement practice which is alert to the long-term gain potential in sustainable solutions.

Procurement in BT, whatever the particular project, has built into it broad social, environmental and economic objectives. The company measures and manages this broad agenda in terms of the perceived "risks" to the business and wider community.

The notion that procurement which takes on board a broad agenda is necessarily cost-inefficient was recently challenged by their announcement, on the 1st October this year, of the world's largest purchase of green electricity. The Green Energy Contract will provide for 98% of the company's domestic electricity requirements to be met from environmentally sound sources.

***"The 3 year contracts will provide BT's 6,500 telephone exchanges, satellite earth stations, offices and depots with environmentally friendly power which will come from both sustainable resources such as wind generation, solar, wave and hydroelectric schemes and from CHP (combined heat and power) schemes."***<sup>1</sup>

The result of this move in terms of clear environmental benefit, is a reduction in CO2 emissions of more than 325,000 tonnes or the "equivalent to the amount of carbon dioxide produced by almost 50,000 homes or more than 100,000 cars."<sup>2</sup>

The perceived cost implications of environmentally sustainable solutions was challenged both by BT, and increasingly in the wider market place.

***"It shows for the first time that reducing greenhouse gas emissions not only does not have to cost the earth, but can result in real value creation."***<sup>3</sup>

The Climate Group's recent report "Carbon Down: Profits Up" threw up a variety of examples that helped with BT's business case for their work

***"Big businesses and governments of all levels have actually made money from cutting greenhouse gases," says Steve Howard. "This debunks the myth that it always costs you money to cut CO2 emissions with no return. The report shows for the***

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<sup>1</sup> Chris Wade, British Telecom

<sup>2</sup> Chris Wade, British Telecom

<sup>3</sup> Chris Wade, British Telecom

***first time that reducing GHG emissions not only does not have to cost the earth, but can result in real value creation.”<sup>4</sup>***

At BT there is a view that this project was only made viable by the integrated energy management approach that the company has adopted. The environmental objectives were fully integrated into procurement practice via company strategy:

***“An integrated procurement team that buy to a single strategy is essential. That way our quality and environmental targets are fully integrated, and the procurement professional is delivering to a single internal customer who is able to become fully involved in the procurement process, adding value through expertise.”<sup>5</sup>***

Another key to delivery on this project was the willingness to innovate and pay close “attention to detail.”<sup>6</sup> Through developing a thorough understanding of the company’s existing energy use the company was able to go to the energy market and demonstrate that they were working to eliminate risks, thus making themselves into a more attractive customer. This gave them the leeway to both innovate with new contract formats, and the ability to keep pricing competitive. After two years of presenting their requirements to the market, the levels of detailed understanding could be translated into key contract terms and Key Performance Indicators before any contracts were entered into.

The understanding of energy efficiency and how to achieve it for the company was another important area. To keep pace with a growth in energy demand arising through new service areas such as Broadband, and the rise of energy prices more generally, efficiency has played a vital role.

***“We have been striving to absorb growth through efficiency measures, and when our energy suppliers see our commitment to this sort of endeavour, they are more keen to innovate with us to help provide better energy solutions for the future.”<sup>7</sup>***

There is a real opportunity for BT, through this innovative project, to use these new contracts to help incentivise the production and supply of more renewable energy. The use of long term contracts, it is hoped, will reduce the ability of utility companies to offer short term contracts to large numbers of customers without them investing in further renewable generation. As increased demand for renewables comes into effect, there is an associated benefit to the environment and mitigation of the effects of climate change.

This work is part of ongoing work by BT to continue to reduce energy related CO<sub>2</sub> (already down by c. 1.5m tonnes a year since 1991)<sup>8</sup>. Their future plans include more work on energy efficiency as part of a new internet based network. It is particularly important to bear in mind that whilst cost efficient, for BT, their decision to adopt a more

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<sup>4</sup> Refocus Weekly, 27<sup>th</sup> October 2004

<sup>5</sup> Angus Berry, British Telecom

<sup>6</sup> Angus Berry, British Telecom

<sup>7</sup> Angus Berry, British Telecom

<sup>8</sup> Chris Wade, British Telecom

sustainable approach to procurement, with this project or any other, is not purely down to cost and reputation factors:

***"We pursued this strategy and took this decision because many of us were absolutely convinced this was the right thing to do. BT is not just a commercial organisation, we are part of society– and companies like us need to continue to put back into society."<sup>9</sup>***

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<sup>9</sup> Better World Magazine, November 2004, Quoting BT's Energy Team

## **2. B and Q – Constructing a new approach to timber sourcing**

B&Q are a retailer whose complex international supply base gives them a myriad of issues to deal with when making procurement decisions. However, over the last decade, they have worked hard to build a strong reputation for introducing a broad agenda into their supply chain, that looks at social, environmental and ethical issues as integral to the buying process. Timber sourcing is a good example of this work, where sourcing involves over 130 suppliers in 24 different countries<sup>10</sup>.

***“Over the last 11 years we have achieved ground breaking initiatives to try and deliver the means of ensuring that our timber and timber products are from proven, well-managed sources.”<sup>11</sup>***

In 1990 a Sunday Newspaper journalist called B&Q head office wanting to find out how much tropical timber they sold. The company realised that it could not easily answer this question, which prompted the response that if they did not know then they probably did not care. Being a company that is made up of employees and board members who wanted B&Q to be operating in a socially and environmentally responsible way, this comment was taken very seriously indeed.

***“The B&Q way is to own an issue rather than be reactionary and led by outside factors...we were galvanised by our stakeholder challenge... and so Alan Knight was recruited by our board to conduct a detailed environmental impact review for the company.”<sup>12</sup>***

The potential cost to the business of failing to act in this area was perceived as far outweighing the immediate investments required to move procurement practice on. The customer and society expected action and it is apparent to decision-makers at B&Q that:

***“Customers expect us to ensure that their expectations on timber sourcing are met, in the same way that they expect us to get it right on quality issues”.***

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<sup>10</sup> Environment Fact Sheet, Product Integrity: Timber, B&Q 2004.

<sup>11</sup> Environment Fact Sheet, Product Integrity: Timber, B&Q 2004.

<sup>12</sup> Jane Keiller, B&Q Social Responsibility Manager

The business has been keen to find a solution to independent forest certification and formed a partnership with the WWF to work towards the establishment of an independent organisation. The Forest Stewardship Council (FSC) grew out of this project and is now able to provide the type of independent assessment sought, with about 75% per cent of B&Q products now carry FSC approval over 80% of B&Q products now carrying FSC approval, and the remaining either working towards this certification with B&Q's assistance, or operating under other certification schemes appropriate to specific timber types<sup>13</sup>.

The value for money achieved via this system for the business is complex. It is identified by the business as being a combination of factors. Clearly maintaining competitive pricing from the market by raising awareness and thus moving the goal posts is possible for B&Q as "the size of the business affects your ability to bring about change in the supply chain."<sup>14</sup> This is combined with acknowledgment of the wider impact on brand value resulting in a cost benefit to the business as a whole. Furthermore, there is also the recognition that creating true sustainability in preserving the source of the product is not only beneficial for society and the environment, but ultimately necessary for the long term future of the business.

***"we have been developing innovative solutions that not only address our environmental and social impacts but also add value to our business and reputation"***<sup>15</sup>

As well as independent certification, other innovative approaches have enabled B&Q to move towards their sustainable agenda. For example, whilst trying to keep pace with increasing demand for wood product, they are turning to the use of recycled materials, at a reasonable cost, rather than pure reliance on a finite resource. This also serves to minimise the impact on the environment.

Crucially a serious commitment at board level and a strong belief culture has made the moves viable. The approach has been driven by policy set at the top level of the company which filters down through a clear framework to the procurement professionals:

***"Most buyers that work for us would want to choose to buy from FSC approved sources whether we had this set in policy or not, but our policy has given clarity as to how they can achieve this. What we have found is that having a framework helps the enthusiastic to maximise their efforts, and also provides clarity as to what the business***

<sup>13</sup> Environment Fact Sheet, Product Integrity: Timber, B&Q 2004

<sup>14</sup> Jane Keiller, B&Q Social Responsibility Manager

<sup>15</sup> <http://www.div.com/div/jsp/bq/templates/contentlookup.jsp?content=aboutbandq>

***requires of all our employees. Having this clear framework in which to operate we have achieved change as an organisation far more quickly than we expected.”<sup>16</sup>***

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<sup>16</sup> Jane Keiller, B&Q Social Responsibility Manager

# **INTERNATIONAL PUBLIC SECTOR CASE STUDIES**

## **3. The Federal Buildings Initiative (Canada)**

### **Overview**

**The Federal Buildings Initiative (FBI) guarantees government departments improved value for money and reduced greenhouse gas (GHG) emissions through renovation of their existing buildings.**

Under the FBI, specialist Energy Service Companies (ESCOs) carry out energy and water efficient retrofits of government properties, while raising the upfront investment for this work themselves. ESCOs are repaid over a number of years from the resulting savings to the building's utility bills, with the government body keeping all the savings thereafter. FBI contracts ensure that ESCOs must guarantee net savings to the contracting body; if projected savings are not achieved, payments to the ESCo are reduced by a corresponding rate.

The FBI method is a proven way of getting around one of the main obstacles to sustainable procurement – the split between operational and capital budgets. Under the FBI, a government body is able to pay for capital work over the long term out of the annual savings to its utility bills. The FBI also helps to overcome some of the common personal barriers to acting more sustainably by the emphasis it gives to training, and by the centralised assistance it gives to departments to make the process of using an ESCo as straightforward as possible.

While programmes like this exist in other countries, the Canadian FBI stands out, both for the support it gives to individual government bodies, and for its established record. Since its inception in 1991, it has addressed 35 per cent of all Canadian government properties. Currently, there are 80 energy efficiency contracts in place, covering some 7,500 buildings. To date, this has resulted in £14.2 million<sup>17</sup> in annual savings, and reductions of approximately 200 kilotonnes of GHGs.

### **Project detail**

FBI projects are in all cases a coalition of three partners – the FBI itself, an individual government body, and the contracted Energy Services Company (ESCO):

- **The FBI** provides the government body with a list of prequalified ESCOs, as well as model contracts and advice.
- **The government body** tenders for bids and agrees contract terms, and works with the successful ESCo to realise projected savings.
- **The ESCo** provides federal bodies with a comprehensive energy efficiency service. This includes: a detailed initial energy audit; procurement of goods and services; design, engineering and construction; project financing; project management; specialised employee training; monitoring and verification of savings; and a guarantee of resulting savings.

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<sup>17</sup> All cost figures for Canadian examples in this paper calculated using the exchange rate of 10 February 2005: \$1 Canadian = £0.43.

The FBI estimates that, on average, a 25 per cent reduction in utility bills and GHG emissions over 10 years is available for every building the FBI could cover.

### **Lessons to be learned**

This Initiative uses energy efficiency to deliver two main objectives – saving public money and reducing greenhouse gas emissions. At the outset, officials identified two main barriers to its success: the split between capital and operational budgets, and the lack of energy efficiency expertise within individual government bodies. The Canadian government helped to overcome both these barriers, by arranging for specialist firms to provide both the energy efficiency expertise and the upfront capital – and by allowing federal bodies to pay the firms back out of the resulting savings to their utility bills.

The FBI also helps to overcome some of the common personal barriers to acting more sustainably – where people are ignorant about, suspicious of, or confused by sustainability – by the emphasis it gives on training, and by making the process of using an ESCo as straightforward as possible through high profile central support.

FBI projects include a skills audit to identify staff training needs, which are met using established links with community colleges. FBI head John Brennan estimates that such training delivers a 10 per cent increment to identified savings. In addition, awareness training helps to win the hearts and minds of building users to the projects' aims.

As Jeff Weir, of ESCo Direct Energy, puts it: “If you have 25,000 people on a university campus, and you can motivate 10 per cent to be looking out for energy waste, you've got 2,500 people going about their ordinary day being extra eyes and ears for the project – and they can take this awareness home with them to use in their private lives. You get this by showing people how their organisation impacts on the environment.”

### **Impacts**

- **Financial:** As of December 2004, FBI projects were already yielding £14.2 million in annual savings. The largest savings from individual projects were £580,000 at the Canadian Forces Base at Petawawa; £450,000 at the Canadian Centre for Inland Waters, Burlington; and £430,000 at the National Research Council, Ottawa. In 2000, an assessment by Natural Resources Canada (NRCAN) of the 53 FBI projects then under way projected that by 2012 these would result in total cost savings of £120.4 million.
- **Environmental:** As of December 2004, the FBI had been responsible for reductions of approximately 200 kilotonnes of greenhouse gases. The 2000 NRCAN assessment projected that the 53 projects to that date would by 2012 have reduced GHGs by 885 kilotonnes.
- **Economic:** The FBI is seen as helping to create skilled jobs. It estimates that it creates 20 person-years of employment for every £430,000 of investment it facilitates. As the international market for energy performance contracting matures, Canadian companies and professionals may also be in a position to gain further; assisted by Industry Canada's Sustainable Cities Initiative they are already carrying out work in Latin America.

### **Contacts**

For further information on the Federal Buildings Initiative go to [http://oee.nrcan.gc.ca/fbi/home\\_page.cfm?PrintView=N&Text=N](http://oee.nrcan.gc.ca/fbi/home_page.cfm?PrintView=N&Text=N), and contact John Brennan, Head of the Initiative: [jobrenna@nrcan.gc.ca](mailto:jobrenna@nrcan.gc.ca)

## **4. The Surplus Federal Real Property for Homelessness Initiative (Canada)**

### **Overview**

**Under the Surplus Federal Real Property for Homelessness Initiative (SFRPHI, pronounced “Surfi”), suitable properties or land which government bodies no longer need are converted to house or provide services to the homeless and those in need of affordable housing.**

This Initiative buys the properties from government departments at market value, and transfers them at nominal cost to not-for-profit community groups, and provincial and municipal governments/agencies. A diverse range of properties has been transferred in this way, including vacant land, individual houses, police barracks, and office buildings. Beneficiaries of these projects have included disabled people, women escaping domestic violence, young ex-offenders, and low income families and senior citizens.

The key lesson of this example is that it shows a way of overcoming a recurring barrier to the public sector’s using its assets more sustainably. Often organisations do not choose the sustainable option, even though there would be widespread benefits in doing so, for the simple reason that they themselves would not experience the benefits, merely absorb the costs. SFRPHI’s arrangements help to overcome this barrier by using central funding to buy out departments at full market rates. This enables the disposing department to create external benefits but not to suffer internal costs, and for the SFRPHI program to have priority access to federal properties to help in solutions to homelessness – a “win-win” arrangement.

As of February 2005, 65 properties worth approximately £4.6 million, had been transferred or approved for transfer under this scheme. Through its partnerships, the initiative has also leveraged around a further £8.6 million from other sources to help finance project construction and renovation.

### **Project detail**

SFRPHI is run by a partnership of three federal bodies. One department co-ordinates a regional network of staff who work with local community groups, liaising with them about individual proposals to the Initiative. A second department covers real property aspects such as environmental assessments and property appraisal. It also provides the funding to buy the relevant properties from other government bodies, at full market rates. A third federal agency provides applicant groups with information and expertise relating to issues such as construction, renovation, capital grants and mortgage financing.

Regional staff are made aware of properties as they become surplus, and can inform community partners before these are offered for sale to the public. Through a priority notification and circulation process, surplus federal real properties are first offered for sale to federal departments to meet federal objectives including the SFRPHI program.

Applicant organisations need to be able to demonstrate that their proposals address community needs related to homelessness, and are financially viable and sustainable. Proposals also need to demonstrate the capacity of the sponsoring organisations to

carry out the proposed project and to satisfy all relevant planning and environmental requirements.

Once an applicant group submits its application for a specific property, it is reviewed by a Tripartite Committee of the three federal bodies running the Initiative. If the proposal meets the criteria for approval, and is then approved by relevant Ministers, the property is bought at market cost and transferred for a nominal amount – usually \$1 Canadian.

### **Lessons to be learned: a “win-win” arrangement**

At an early stage of the Initiative’s design, officials faced the barrier of a government policy which states that government assets should not be sold at below market rates. The solution which policy-makers came up with was to propose that a central department would be provided with a specific SFRPHI fund to buy properties from the selling departments at full market cost.

This is the crucial lesson which SFRPHI teaches: reimbursing the custodian department at full market value – a “win-win” arrangement is one proven way of getting over the often-cited barrier to sustainable/joined-up asset use, that the costs would be borne by one department but the benefits accrued elsewhere. Under SFRPHI, the department disposing of the asset both makes an enlightened use of it *and* gets the full market price. Meanwhile, the department spending the money is also accruing the benefits in terms of meeting its given objectives, which include that of using this programme to provide affordable housing and much-needed homelessness services.

### **Impacts**

For government bodies to give away surplus properties or land to be turned into services and affordable housing may often be, not just an enlightened thing to do, but also value for money to the public sector as a whole – especially where it improves the physical and mental well-being of the neediest individuals, thereby reducing their call on a variety of public services.

The cost-effectiveness of providing housing and support for the homeless is backed up by a major study by the Government of British Columbia. According to the study, it costs the public sector on average 33 per cent more – through higher involvement of the criminal justice system, health care, and social services – *not* to house the homeless than to house them. Another study, conducted in New York, estimates that some individuals in the chronically homeless population use an average of £21,400<sup>18</sup> of publicly funded services per year, while it costs about £8,600 per year to house someone in a supportive housing unit.<sup>19</sup>

### **Examples of success**

This Initiative has helped to create many successful projects, among them:

- **Low cost homes in McLevin Woods, Toronto.** Land valued at £1 million was bought by SFRPHI and turned over to Habitat for Humanity, for the token sum of \$2.00 Canadian. Habitat for Humanity is a not-for-profit organisation that builds and

<sup>18</sup> All cost figures for American examples in this paper calculated using the exchange rate of 4 April 2005: \$1 US = £0.53.

<sup>19</sup> National Homelessness Initiative Business Plan 2003-2006, [http://www.homelessness.gc.ca/publications/businessplan/businessplan\\_e.pdf](http://www.homelessness.gc.ca/publications/businessplan/businessplan_e.pdf)

sells homes to low-income working families who would otherwise not be able to afford to buy them. By spring 2005, Habitat for Humanity is to have built homes here for 37 families. Community volunteers have been helping to build the houses, and many of the supplies have been donated for free by private companies.

- **Permanent supportive housing in Souris, Prince Edward Island.** When the local Royal Canadian Mounted Police barracks in Souris became surplus to federal needs, it was bought by SFRPHI (for £40,000) and transferred to the Souris Group Home Association for \$1 Canadian. The Association also received government funding for renovation and job creation, with the local community raising further money. The Home offers accommodation to mentally disabled men whose families are deceased or can no longer care for them. Additionally, this renovated building has been adapted to be physically accessible, has low maintenance costs, and is within walking distance of the training centre where most of the residents work.
- **Red Cross building, Toronto.** SFRPHI has contributed not just houses and land for apartments, but also other facilities such as the non-residential Red Cross building in Toronto, which acts as a centre for street outreach services for thousands of homeless people. The facility is also used as a training centre to expand the pool of volunteers serving the homeless, as a hub for a mobile kitchen, and as a warehouse to store supplies that are distributed to people who are homeless – eg, blankets, hygiene kits, and bottled water.

#### **Contacts**

For further information, go to: [http://www.homelessness.gc.ca/initiative/sfrphi\\_e.asp](http://www.homelessness.gc.ca/initiative/sfrphi_e.asp), or through which you can contact Catherine Dubuc, National Secretariat on Homelessness, Human Resources and Skills Development Canada.

## 5. Chicago Housing Authority (US)

### Overview

**Under a bulk purchase scheme organised by the US Department of Energy and the Consortium for Energy Efficiency, the Chicago Housing Authority was able to lower the costs of purchasing 10,000 energy efficient fridges – in turn, reducing annual electricity bills by more than £265,000.<sup>20</sup>**

### **Project detail**

The US Department of Energy works with partners, such as the Consortium for Energy Efficiency, to create large buyer groups to make bulk purchases of energy efficient appliances – lowering the costs of both manufacturers and buyers, and helping to grow the market for such products.

The Chicago Housing Authority has taken advantage of this scheme to replace 10,700 old refrigerators with new, more efficient models. The new fridges consume an average of 480 kWh per year, a significant improvement on the older models which had on average been consuming 980 kWh per year. This saving of 500 kWh translates to a saving of more than £26 a year, per unit.

### **Lessons to be learned**

This example illustrates two main lessons. First, it shows the potential for joint procurement to reduce costs and to develop the market for more sustainable products. Second, more widely, it shows the potential benefits of organisation and intervention by a central department. Not only did the Department of Energy help to organise the joint purchasing groups, it also developed the energy efficient compressor technology used in the Magic Chef brand fridges bought in this scheme.

### **Impacts**

Through this national initiative, public housing agencies and utility companies in some 38 cities purchased over 71,000 energy efficient fridges. These appliances have saved an estimated £2.14 million in annual electricity costs for housing agencies and low-income consumers across the United States.

### **Contacts**

For further information, go to <http://www.energy.gov/engine/content.do> or <http://www.cee1.org/>.

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<sup>20</sup> All cost figures for US examples in this paper using rate of exchange as of 4 April 2005, \$1 US = £0.53

## **6. Social Purchasing Portal (Canada)**

### **Overview**

**Social Purchasing Portals (SPP) are locally-based websites, bringing together organisations that wish to exercise corporate social responsibility with suppliers that have a commitment to employing the local long-term unemployed or hard-to-employ.**

### **Project detail**

Canada's first SPP was established in Vancouver, in 2003. Since then, SPPs have been set up in Toronto and Winnipeg, with plans to extend this to a further 10 cities. The idea behind them is to boost local social and economic development through increasing the investment made by businesses in their local communities. The aim is to redirect some of the existing money that business already spends on goods and services – such as office supplies, couriers, and catering – to those suppliers which employ or train the local long-term unemployed and disadvantaged.

SPPs gather together details of such suppliers in one place. In this way they act as a “one stop shop” for businesses that wish to use their purchasing decisions to aid the social and economic development of their local communities. By making it easy for businesses to do this, SPPs help to grow the market for such socially-minded suppliers, increasing the job and training opportunities of the disadvantaged.

As SPP Canada puts it “Businesses still buy products and services on the basis of price, quality and service. The portal enables them to inject social value into their buying decisions, giving them the opportunity to contribute to their community. It provides a direct and meaningful way to practice corporate social responsibility. In addition, they have a ready labour pool of qualified, dedicated individuals for entry level jobs such as forklift operation, office administration, cleaning, shipping, wood working, and restaurant help.”

### **Lessons to be learned**

The key strength of SPPs is that they make it easy to procure sustainably. This extends not just to the way in which they serve as one stop shops, but to the fact that the suppliers they feature are competitive in price and quality with other suppliers. The key lesson SPPs demonstrate is that, when all things are equal, organisations will frequently choose the sustainable option; indeed, this can be a marked commercial advantage for suppliers. Moreover, with suppliers competing on price and quality, the job and training opportunities have proven to be economically secure. As SPP Canada report, “The SPP is effective because it uses a business model to create social value that is demand-side driven.”

### **Impacts**

As the most established project, SPP Vancouver can give the best picture of results so far. Established in June 2003, in less than a year over 50 purchasing partners and 35 suppliers were online, generating over £130,000 of targeted business activity, and creating over a dozen full-time jobs for disadvantaged youths and other individuals with difficulties getting jobs in the mainstream economy. In the last year, over 50 jobs have been created in its inner city.

**Contacts**

For further information, go to: <http://www.sppcanada.org/canada/index.cfm>, through which you can contact David LePage, SPP Canada Project Manager.

## **7. Wellington City Council (New Zealand)**

### **Overview**

**In 2003 Wellington City Council successfully ensured that environmental considerations were taken into account when purchasing two significant items of heavy machinery – and secured value for money at the same time.**

### **Project detail**

One item was a road sweeper with a regenerative air system. Although more expensive than other models, it had a better impact on air quality. The Council chose this more expensive replacement road sweeper because regenerative or recycled air is used to collect debris and to pack it into the hopper over a “loop of air”. Because the air remains within the sweeper and passes through a filtering screen, virtually no dust or polluted air is expelled into the atmosphere.

The other item was a piece of “trenchless technology”, that removes the need to dig holes in the ground when replacing pipes. The environmental benefits of this machine were the reduced need to cart tonnes of waste to landfill, and a reduction in the need for virgin material to be quarried for restoring the road surface.

### **Lessons to be learned**

The key barrier in these cases was that the purchase of both machines required additional up-front expenditure. This was overcome by the clear internal presentation of the expected benefits (environmental and other), which persuaded management that the additional expenditure was justifiable.

The road sweeper was not only environmentally superior, but also able to sweep at a faster rate, improving productivity and causing less traffic disruption. It can also be used to carry out the additional task of ducting sump drains, saving the Council from having to purchase an additional vehicle.

The trenchless technology machine also had a number of additional benefits besides the environmental gains, including a reduction in disruption to traffic and to services provided via other underground pipes, and an elimination of the risk that refinished road surfaces would be of inferior quality. The trenchless technology machine also means that pipe replacement work can safely and easily go on in close proximity to neighbouring pipes, cables, or buildings.

### **Impacts**

The road sweeper is more productive, travelling faster and picking up twice as much waste as before; this has resulted in a reduction in storm water pollution. Additionally, it is more economical to run, costing an average £4.47 per hour to operate, as opposed to the £9.55 which the previous model cost. Over a five year lifespan, the projected saving to the Council in running costs is £40,118. The Residents Satisfaction Survey had also indicated that residents believe the standard of road sweeping has improved. As a result, Wellington City Council intends to purchase another similar sweeper and dispose of two older vehicles.

As for the trenchless technology machine, well as the environmental benefits it has resulted in productivity improvements of between 25 per cent and 50 per cent over open

trenching, fewer complaints from residents about pipelaying, lower landfill fees (due to reduced dumping) and no quarry purchases.

**Contacts**

For further information, go to: <http://www.mfe.govt.nz/publications/sus-dev/local-govt-procurement-nov04/html/case-studies/wcc-heavy-machinery.html>.

## 8. City and County of Denver (US)

### Overview

The City and County of Denver has shown leadership by undertaking large scale sustainable procurement operations – such as replacing all its traditional traffic lights and pedestrian signals with LED (light-emitting diode) signals, reducing electricity use and saving money.

### **Project detail**

The City and County of Denver began its work to replace 30,000 pedestrian and traffic signals in 1996. This effort involved replacing traditional incandescent bulbs with high efficiency light-emitting diode (LED) lights. LED signals use less electricity than traditional traffic signals (150-watt and 69-watt bulbs have been replaced by 14- or 8-watt LEDs respectively) and have a longer life expectancy (each LED signal has a lifetime of 100,000 hours, over ten times that of conventional bulbs). There are other advantages as well: not only are they brighter than typical traffic lights, they are more robust and reliable since they are made up of hundreds of small diodes rather than a single light source.

### **Barriers & lessons**

One of the main barriers to switching to such technology in the past was the initial cost of purchasing LED signals, which was significantly higher than using conventional lights. However, technological advances have been driving the cost of LED signals down by some 50 per cent in recent years, thus enabling Denver to select them as the cost-effective option.

A further lesson may be to observe that this operation was part of Denver's participation in the Cities for Climate Protection-US initiative, itself a program of the International Council for Local Environmental Initiatives (ICLEI). In other words, such national and international initiatives may help to stimulate action.

### **Impacts**

Energy, maintenance, and replacement costs have all been substantially reduced. Although the initial cost of the LEDs is higher than the cost of conventional bulbs, the lower energy requirements of the new LED signals saves over £146,300 each year, and the savings on materials and labour are more than £81,600 each year. This results in total annual savings of over £228,000. Altogether, the LED signals have a payback period of less than four years and the total cost savings over the lifetime of the fixtures is estimated to be over £3.23 million. Additionally the reduction in energy consumed by the signals is reducing CO<sup>2</sup> emissions by 5,300 tonnes per year.

### **Contacts**

For further information, go to <http://www.denvergov.org/dephome.asp?depid=375>, through which you can contact Dr. Darryl Winer, Director of Utilities, Denver Utilities Agency.

## **9. Hamilton City Council (New Zealand)**

### **Overview**

**Hamilton City Council has successfully established a scheme for recycling printer toner cartridges, which has reduced both waste and costs.**

### **Lessons to be learned**

The Council has had to overcome two main barriers. The first was staff perception that the quality of refilled cartridges would be inferior. This was largely overcome by working with a supplier that staff perceived as reputable; and through experience of the recycled cartridges in operation.

The second was a decentralised purchasing system, whereby staff from the 22 different units of council were able to make purchases. This was largely overcome by centrally making it simple to buy recycled, and hard to buy new. This included having a single computer consumable supplier, reducing the opportunity for staff to make ad-hoc purchases; and developing an intranet ordering system so that if staff try to order an original toner cartridge, the system overrides and elects re-manufactured product instead.

In addition, the Council sought to win over staff through the staff intranet notice board and articles in staff publications, and through pointing to the cheaper cost of buying recycled.

### **Impacts**

Not only are the recycled cartridges 13 per cent cheaper, the Council has negotiated a financial bonus scheme with the supplier, based on performance targets for recycling.

### **Contacts**

For further information, go to: <http://www.mfe.govt.nz/publications/sus-dev/local-govt-procurement-nov04/html/case-studies/hamilton-city-toner.html>.

## **UK PUBLIC SECTOR CASE STUDIES**

### **10. The Great Western Hospital, Swindon**

#### **Description:**

The existing Princess Margaret Hospital required a major renovation and increase in patient capacity to cope with double the population that the hospital was originally designed for in the 1950's. The project was financed by the PFI scheme and the contractor was Carillion Building Special Projects. The timeframe for the project was October 1999 to November 2002.

**Cost:** £100million

#### **Key Features:**

Design phase - long-life-span, waste minimisation, materials designed out by altering the specification and efficient use of resources.

#### **Balancing pond**

A major issue for any construction site and one issue that has been taken seriously by the project team is protection of water resources from run-off of site pollutants. Washings, among other things, containing cementaceous materials were not allowed to be drained into land on site. The alkaline nature of the materials means that this is potentially hazardous, polluting and is not best practice. A number of actions have been developed to reduce the environmental impact of sediment run-off, keeping the local roads clean and safe and ensuring that local waterways are not polluted. The suppliers of concrete were asked to leave washwater in their mixers and to reuse it for mixing fresh concrete, thereby considerably reducing freshwater usage. The inevitable washings from the chutes of the mixers and tools that have been in contact with concrete are directed into pits lined with stones and when dried and set, crushed for reuse as aggregate.

A balancing pond has been installed to capture the run-off from the site at a cost of £135,000. The pond was constructed early in the construction phase and the void space can take 3,300 m<sup>3</sup> of water. Under normal operations, it will hold 2,060 m<sup>3</sup> and it will remain on the hospital site for the life of the building. The pond serves as a control on floodwater, and is capable of precipitating out suspended solids in the site run-off. This is achieved simply by providing two large 450 mm inlet pipes but only a single smaller 150 mm outlet pipe – the steep basin detains flood peaks and releases the water slowly. It has been designed to cope with the worst possible storm in 100 years. By installing a balancing pond, the toxicity of the site's runoff has been reduced (either off-site and to the local water company) and Carillion has reduced the likelihood of prosecution and fines issued by the Environment Agency for breaches of water pollution legislation. Fines resulting from prosecutions for water pollution incidents in the UK during the year 2000 were, on average, £8,532. However, it is difficult to include this as an actual saving in the balance sheet.

The balancing pond has been planted with wild grasses and flowers and it is hoped that this could become an area for aquatic life and birds. The balancing pond will form part of the exterior landscaped areas that visitors, staff and patients can visit and is just one feature of a wider habitat management plan, which has been implemented at the site.

#### *Summary of direct costs*

- Balancing pond – £135,000

#### *Summary of direct savings*

- Potential for Carillion to reduce fines arising from prosecutions from the Environment Agency

Overall – financial cost of £135,000 in the construction phase, however there are benefits that are difficult to quantify in terms of the attraction of habitat to the site and the amenity benefits derived from the pond.

#### *Summary of indirect environmental and social impacts*

- Reduced environmental impact of sediment run-off, keeping the local roads clean and safe and ensuring that local waterways are not polluted
- Site enhances aquatic and bird life as well as providing amenity for hospital users

#### **Energy efficient design features**

During its operational phase, the GWH will consume 30% less energy and emit 35% less carbon dioxide compared to traditional building methods. This will be achieved by a number of design features, for example, windows with solar glazing to reduce solar gain, use of natural ventilation and super-insulation, all helping to reduce the level of carbon dioxide emissions resulting from using electricity and gas.

By doubling the amount of roof insulation at an extra cost of £24,000 (a one-off cost), Carillion estimates that the hospital's energy bills will be significantly reduced by £250,000 over the 27 years of the operational concession period. This involved replacing the PVC (polyvinyl chloride) roof membrane with a recycled rubber membrane, which also has reduced the negative environmental effects of using PVC products. Although the extra cost of this installation was £24,000, the expense was recouped by installing fewer radiators saving £26,000.

The additional roof insulation will dramatically reduce the electricity consumption over the concession period by an estimated 5 million kWh. In addition, use of glycol refrigerants is also thought to help to reduce energy consumption during the 27-year period by approximately 1.6 million kWh. The combined energy savings of 6.6 million kWh will reduce associated emissions of carbon dioxide (2,838 tonnes); nitrogen dioxide (8 tonnes) and sulphur dioxide (17 tonnes).

More importantly, this will cut the carbon dioxide emissions associated with this part of the hospital's operation by 2,150,000 kg (2,150 tonnes) based on saving £250,000 over the 27-year operation of the hospital. The solar glazed area is approximately 800 m<sup>2</sup> and significantly reduces solar gain, which cost an additional £28.50 per m<sup>2</sup>. However, these energy saving initiatives all help to reduce the overall energy costs. For example, these include a specially designed ventilation system programmed to move from artificial air conditioning to natural cross flow ventilation on demand. The hospital will also be fitted with internal blinds for solar shading to reduce the cooling load on the building.

#### *Summary of direct costs*

- Additional costs associated with this package were with respect to the solar glazing (£28.50 per m<sup>2</sup> totalling £22,800)
- Roof insulation at an extra cost of £24,000

*Summary of direct savings*

- Reduced number of radiators – £26,000
- Energy savings from using glycol refrigerants – £80,000
- Energy savings during the operation of the hospital £250,000 (electricity bills) and at the current rate, £28,388 would be saved in climate change levy (based on 0.43p/kWh)

Overall – direct financial benefit of £337,588 over the concession period

*Summary of indirect environmental and social impacts*

- Total savings in energy consumption is estimated to be 6.1 million kWh. This is based on energy savings of £80,000 from the use of glycol refrigerant and £250,000 in reduced electricity bills. This converts to reductions in energy related emissions of 2,838 tonnes of CO<sub>2</sub>; 8 tonnes of NO<sub>x</sub>; and 17 tonnes of SO<sub>x</sub>)
- Reduction in negative environmental effects of using PVC products
- Improved internal environment for hospital users (patients, staff, visitors) with the move to natural
- cross flow ventilation on demand.

**Plasterboard**

Carillion Building Special Projects (CBSP) worked in partnership with the plasterboard manufacturer to modify the original design from double-skin plasterboard to single skin plasterboard. The change in specification enabled waste and material use to be minimised, with the product comprising one 15 mm skin instead of an industry standard of two 12.5 mm panels (as outlined in the original design). It has been designed to withstand wear and tear and was pre-sealed eliminating skimming, reducing the quantity of paint used. This method was also chosen as it reduced the need for labour intensive wet trades on site, as well as reducing the material inputs to the product and to its installation.

Plasterboard was delivered to the site using plasterboard pallets instead of the traditional wooden pallets. These pallets could be sent back to the manufacturer once the board had been unloaded. Raw material inputs were reduced by around 50% and the boards can be recycled at the end of their life. This also led to economic savings – around £200,000 savings for labour by going to the single board system and an additional £85,000 by reducing the normal three coats of paint system to two coats.

Plasterboard waste has been reduced to effectively zero at the GWH, whereas on other construction projects this accounts for 20% of waste sent to landfill. This was achieved by having a dedicated plasterboard recycling skip that was transported directly back to the manufacturer for reuse. 717 tonnes of plasterboard were recycled via this method saving £4,860 landfill tax costs and £14,940 in transportation and skip/container hire. Other waste and disposal costs avoided were paint cans and excess plaster from skimming that would have been generated.

*Summary of direct costs*

- There were no additional costs associated with this package over and above a non-sustainable option

*Summary of direct savings*

- Labour and raw materials – £200,000
- Paint – £85,000
- Potential lifecycle savings – £129,000
- Landfill taxes and disposal costs avoided – £19,800

*Summary of indirect costs and benefits that accrue to third party stakeholders*

- Reduced waste to landfill (up to 20%); 717 tonnes of waste recycled

Overall – financial benefit of £304,800 in the construction phase rising to a total of £433,800 including the concession period (lifecycle savings).

**Recyclable flooring**

The hospital considered a wide range of different flooring materials and examined the sustainability implications of each of the following – lino, rubber, PVC (polyvinyl chloride) and chlorine free vinyl.

The basic constituents of lino are linseed oil, cork, limestone and jute combined in an energy intensive process. Lino typically has a longer life than other flooring materials therefore offering greater sustainability benefits in terms of less frequent replacement intervals. However, a thick layer of lino would be needed for durability. At end of life, lino is biodegradable, but not easy to recycle.

Rubber flooring is also a very durable product and derived from a potentially sustainable source. It can also be recycled and has good sound absorption properties.

Carillion has also looked at chlorine free vinyl. However, this product is not really at a commercial stage yet, however it may be re-evaluated for future projects.

The evaluation of different types of flooring indicated to Carillion that choosing between options for sustainable purposes is not a straightforward exercise. The final choice was a mix of linoleum and rubber sole, which was considered to enhance the work environment and be the most attractive option for staff and patients, while permitting a low maintenance regime in terms of cleaning to clinical standards. There is the impact of high embodied energy during production, however, the material chosen avoids many other environmental issues and concerns. The package price for the flooring was £1.55m versus £1.76m for the PVC-based flooring option.

It has been estimated that the rubber/lino flooring chosen will only need to be replaced once more during the concession period. Less frequent replacement intervals and low maintenance materials equate to less flooring material requiring replacement, generating less waste. This all adds up to less waste to landfill (using transport and landfill space).

*Summary of direct costs*

- There were no additional costs associated with this package over and above a non-sustainable option.
- Potentially, this option saved around £110,000 compared to a vinyl alternative

#### *Summary of direct savings*

- Potential lifecycle savings of £1.15m (associated with less frequent replacement)
- It is difficult to quantify, but landfill taxes and disposal costs will be reduced in the concession period

#### *Summary of indirect environmental and social impacts*

- Reduced waste to landfill

Overall – financial benefit of at least £1.15m over the concession period

#### **Health and safety issues**

Carillion acknowledges that it has a duty to ensure a safe working environment for all those who undertake activities on projects for which the organisation is responsible. Unfortunately, despite its best efforts, accidents do occur and as part of the process to ensure that Carillion is managing sites safely, a record of accidents is maintained and updated.

A number of initiatives were put in place throughout the construction phase to minimise the accident rate and to improve the health and safety and wellbeing of site staff. Scaffolding was not used at all during the project thereby reducing costs for health/safety insurance and liability, and considerably reducing the incidence of accidents normally associated with this activity. A small capital cost of £7,000 was required for the eyebolts on the roof to attach the safety nets. A handrail around the roof was included in the roof package of the construction at no extra cost. There were operating costs for routine maintenance involving cleaning and safety checks, but these were not thought to be expensive. Mobile elevated operating platforms and a crane were used to fix the 563 concrete cladding panels to the building without the need for scaffolding. In addition, crimp fittings were used for pipework, eliminating the need for hotworks on site. A reduced risk of fire and improved safety for operatives in terms of indoor air quality improvements and fire hazard reductions were attained.

Employee safety training (eg COSHH28, noise and vibration, health awareness) has been undertaken at the site. A total of £38,400 capital cost was invested to build the induction centre for contractors coming on site, a gatehouse and barrier. The gatehouse enables the security staff to know exactly how many members of staff (contractors and employees) are on the construction site at one time. This is particularly crucial if an emergency were to happen somewhere on the 13 acre construction site. Operating costs to date have been £43,500 spent on training personnel in safety awareness with an additional £6,800 spent on safety prizes. In June 2002 (32 months into the construction period) there had only been eight RIDDOR29 accidents where an employee/contractor was off work for more than three days. A penalty point system was also introduced to increase the importance of site safety awareness. Anyone in contravention of Carillion's health and safety procedures risked incurring penalty points – if an operative accrued nine points, they would be removed from site and not allowed back. Examples of penalties include not properly taking note of safety provisions, deliberately placing waste in the wrong place within the waste segregation scheme, and operating machinery without proper certification.

The improved working conditions have helped to recruit and retain quality site operatives and reduce absences. The accident frequency rate at the site is 0.40 (in line with

Carillion plc as a whole) and equates to a company improvement of 18 per cent from 2000 to 2001.

It is notoriously difficult to quantify the costs and benefits of a good safety record. Valuing the cost of accidents is normally accounted for via the cost of compensation, but this site has avoided many thousands of pounds of compensation payouts by demonstrating an excellent record with regard to safety.

#### *Summary of direct costs*

- Eyebolt on the roof – £7,000
- Induction centre, gatehouse and barrier – £38,400
- Training personnel in safety awareness – £43,500
- Safety prizes – £6,800

#### *Summary of direct savings*

- None in monetary terms, but a healthier workforce is likely to be a more productive one.

Overall – financial cost of £95,700 in the construction phase, but it is difficult to quantify the costs and benefits of a good safety record.

### **Community involvement**

The CBSP site team has worked with many stakeholder groups within the local community and further afield. There has been a continuous stream of visitors since the groundworks were completed in early 2000. People who have visited the site include the public, academics, people employed within the construction industry (Carillion plc and non-Carillion staff), charities, schools and disabled groups. All these visitors have collectively helped to raise the profile of the site and public-private partnerships in the healthcare sector have given CBSP and Carillion plc a valuable reputation boost, something that is difficult to quantify.

Members of staff at the site have forged strong links with local schools, businesses and charities. One of the first initiatives was to construct an on-site job centre at a cost of £14,000. Operating costs totalled £9,400 until spring 2002 (including rental and electricity costs). The total number of workers registered is 1,325 with 615 placed in jobs and the majority of these working on the PMH site. Benefits have included reduction in time and money costs for contractors and clients in terms of recruitment and indirectly, transportation savings because many local people have been sourced to work at the site (lower fuel costs for workers and reduced vehicle exhaust emissions).

A community liaison officer was employed part-time for approximately two years at a cost of £24k in total (£12k per annum). The role encompassed, among other things, involvement with local charities and public bodies to help capture and enthuse young people, helping to avoid potential problems on site with vandalism for example. These were effectively cost savings, or costs avoided. Revenues were even generated for local charities via involvement from site staff – for example £3,500 was donated to Focus for Carers following staff fund-raising activities.

Local community projects have included working with Focus for Carers, Education Business Partnership, Trident (work experience), Safety on Construction site and the

Evolution Appeal (to purchase additional equipment for the new hospital). In addition, national community projects have included Education Business Partnership, Local Agenda 21, Southern Careers Construction, and Thames Valley for the Built Environment in Construction. A security fence at the front of the site was given over to the local community for a painting competition and local children painted pictures for decoration.

Although these activities are difficult to quantify, the benefits (and even the costs sometimes), the social and community activities at the PMH are in line with CIRIA's strategic social indicators – these are outlined in three key themes, specifically:

- Respect for staff – eg percentage of annual staff turnover for permanent staff, reportable fatal and non-fatal accidents per 100,000 hours worked
- Working with local communities – eg percentage of projects that include (and implement) a plan for stakeholder dialogue, percentage of appropriate projects that include (and implement) a plan to consult with the end user
- Partnership working – eg percentage of turnover generated by projects undertaken under alliances or other forms of partnership working, average client satisfaction using the KPI 1–10 scale)

#### *Summary of direct costs*

- Construction of an on-site job centre – £14,000 Job centre operating costs – £9,400
- Community liaison officer – employed part-time for approximately two years at a cost of £24,000
- £3,500 donated to local charity

#### *Summary of direct savings*

- It is difficult to quantify savings associated with these investments. However, it is quite possible that Carillion have gained, among other things, additional reputation benefits as a result of this project

#### *Summary of indirect environmental and social impacts*

- Transport savings due to sourcing local people for employment
- Generation of local employment

Overall – financial cost of £50,900 in the construction phase.

*References: Sustainability accounting in the construction industry CIRIA 2002*

## **11. Kingsmead Primary School, Cheshire – sustainable construction**

Kingsmead Primary School in Cheshire cost about £2.4m to build – more than the average school. That's because it has been built as a model of environmental friendliness. With sustainability features including large windows positioned to take in optimal levels of sunlight and cut down on electricity, it is at the forefront of school construction

Solar panels power the school and a biomass boiler, fuelled by pellets of recycled waste, heats the building. A rooftop rainwater collection-trough funnels in the water used for flushing lavatories, while hot water is heated by separate solar panels. Kingsmead's planners expect to make up for increased capital costs in lower upkeep costs.

But more than just a fancy building, Kingsmead is an educational paradise, says Catriona Stewart, Kingsmead's head teacher. "Instead of just consuming the building, the children are going to be learning from it," she says. "It will teach them about the wider world, but in a less hypothetical way."

Through the Building Schools for the Future project, which is set to kick off in the 2005-2006 school year, the Government will have increased capital investment for school buildings by more than 700 per cent by 2005, from £700m in 1996 to more than £5bn in 2005.

"We've been given so much by the local authority, and the best thing we can give back to Cheshire and Northwich and the UK is a bunch of active citizens who are aware of their responsibilities, rights and roles in society," she says.

## **12. Environment Agency - computer screens**

In June 2002 the Environment Agency looked at flat panel display (FPD) screens for its computers. They carried out a detailed examination of the pros and cons of flat screens vs traditional Cathode Ray Tube (CRT) screens. The Agency looked at the following environmental performance criteria: heavy metals content, packaging, power consumption, ergonomics, end-of-life disposal and/or recyclability as well as basic life costs.

They concluded that although FPDs offered significant environmental and other benefits over CRTs it would take the Agency about eight years to recover the additional purchase costs.

In December 2002, they looked again. By this time capital costs for FPD had come down but were still nearly three times greater than CRT. This time they considered i) capital costs and ii) life costs including office space & power consumption and took into account the longer operational lifetime of FPDs. The study confirmed that FPDs were better environmental performers than CRTs and concluded that over their life a FPD would cost significantly less than a CRT. And this only based on a lifespan of four years within the Agency.